MS4 Storm Water Permit

City of Santa Rosa
Sonoma County
and the
Sonoma County Water Agency

Fact Sheet

STATE OF CALIFORNIA

California Regional Water Quality Control Board
North Coast Region

FACT SHEET

for
Order No. R1-2009-0050
NPDES No. CA0025054
WDID No. 1B96074SSON

Waste Discharge Requirements

For

The City of Santa Rosa, the County of Sonoma, and
the Sonoma County Water Agency

Storm Water and Non-Storm Water Discharges
from Municipal Separate Storm Sewer Systems

Sonoma County

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Background of Storm Water Regulations

The federal Clean Water Act (CWA) prohibits the "discharge of any pollutant," 33 U.S.C. § 1311(a), from a "point source" into the navigable waters of the United States. 33 U.S.C. § 1362(12)(A). An entity can, however, obtain a National Pollutant Discharge Elimination System (NPDES) permit that allows conditionally for the discharge of some pollutants. 33 U.S.C. § 1342(a)(1). The CWA defines point sources as "discernible, confined and discrete conveyances, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure" such as a pipe, ditch, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. 33 U.S.C. § 1362; 40 CFR 122.2.

In 1987, the U.S. Congress amended the Clean Water Act to specifically require storm water discharges, including those from municipalities with populations 100,000 or greater, conveyed by a separate storm sewer system, to be addressed as point sources of pollution under the NPDES permit program. These municipalities were required to reduce the discharge of storm water pollutants to the maximum extent practicable (commonly referred to as the MEP standard) and to require the effective prohibition of non-storm water discharges into storm sewers. The U.S. and California Courts have since interpreted federal statutes to give the permitting authority the discretion to also require compliance with water quality standards. In addition, conditions in NPDES permits must be consistent with the assumptions of Total Maximum Daily Loads (TMDLs) that have been adopted.

The CWA amendments require NPDES permits for storm water discharges from Municipal Separate Storm Sewer Systems (MS4s) to waters of the United States. The storm water discharge permits for MS4s:

(a) May be issued on a system- or jurisdiction-wide basis;
(b) Shall include a requirement to effectively prohibit unauthorized non-storm water discharges into the storm sewers; and
(c) Shall require controls to reduce the discharge of pollutants from storm water to the maximum extent practicable, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. (See CWA §402(p)(3)(B)).

On November 16, 1990, pursuant to CWA § 402(p), the United States Environmental Protection Agency (U.S.EPA) promulgated regulations at section 122.26 of title 40 of the Code of Federal Regulations which established requirements for storm water discharges under the NPDES program. U.S.EPA defines storm water at 40 CFR 122.26 (b)(13) as 'storm water runoff, snow melt runoff, and surface runoff and drainage' (related to storm events or snow melt) (See also 55 Fed. Reg. 47990, 47995). Non-storm water discharges to the MS4 are to be "effectively prohibited" by the MS4 operator. "Effective prohibition" meant that the MS4 permittee was to implement programs to eliminate "illicit discharges" to the storm drain system unless authorized under NPDES permits issued independent of the MS4 permit.[1] (55 Fed. Reg. 47995). The storm water regulations also intended to not hold MS4 permittees responsible for certain categories of non-storm water discharges such as uncontaminated ground water infiltration, natural springs, rising groundwater, and stream diversions from the MS4. Such discharges might need to be addressed under independent NPDES permits when specifically identified on a case-by-case basis by the MS4 permittees or the permitting authority.

U.S.EPA intended that storm water discharges from the MS4 be primarily addressed through the implementation of Best Management Practices (BMPs) on an iterative approach because of the intermittent and variable nature of storm flows and pollutant concentrations as well as insufficient available effluent and receiving water data rather than numerical effluent limitations (61 FR 43761). However, U.S.EPA's scheme for non-storm water discharges from the MS4 is to bring them under the existing framework of the NPDES program at 40 CFR 122.44(d). (55 Fed. Reg. 47995). In any case, if the permittee fails to implement adequate BMPs to prevent exceedance of receiving water objectives, the permitting authority "may have to consider other approaches to water

[1] While MS4 permits generally contain exceptions for some non-storm water discharges, these exceptions do not extend to non-storm water discharges identified as a source of pollutants. (State Water Resources Control Board WQO No. 2009-0008, p. 9-10.)

quality protection" (61 Fed. Reg. 43761; *Interim Permitting Approach*, Response #6, EPA 833-D-96-00, 1996).

Legal Authority

The following statutes, regulations, and Water Quality Control Plans provide the basis for the requirements of Order No. R1-2009-0050:

(a) Clean Water Act (CWA);
(b) California Water Code (Water Code);
(c) 40 CFR Parts 122, 123, 124 (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, Final Rule);
(d) Part II of 40 CFR Parts 9, 122, 123, and 124 (National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule);
(e) Water Quality Control Plan – Ocean Waters of California (California Ocean Plan);
(f) Water Quality Control Plan for the North Coast Basin (Basin Plan); and
(g) 40 CFR 131 Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California Rule (California Toxics Rule), and the California Toxics Rule Implementation Plan.

The legal authority citations below generally apply to requirements in Order No. R1-2009-0050 (Order), and provide the North Coast Regional Water Quality Control Board (Regional Water Board)with ample underlying authority to require each of the requirements of this Order.

CWA 402(p)(3)(B)(ii) requires that permits for discharges from municipal storm sewers "shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers."

CWA 402(p)(3)(B)(iii) requires that permits for discharges from municipal storm sewers "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

CWA 402 prohibits the discharge of any pollutant to waters of the United States from a point source, unless that discharge is authorized by a NPDES permit. Though storm water runoff comes from a diffuse source, it is discharged through MS4s, which are point sources under the CWA. Federal NPDES regulation 40 CFR 122.26(a) (iii) and (iv) provide that discharges from MS4s, which service medium or large populations greater than 100,000 or 250,000 respectively, and interconnected MS4s, shall be required to obtain an NPDES permit. Federal NPDES regulation 40 CFR 122.26(a)(v) also provides that a NPDES permit is required for "A [storm water] discharge which the Director, or in states with approved NPDES programs, either the Director or the

U.S.EPA Regional Administrator, determines to contribute to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States." Such sources are then designated into the program. The discharges from the Co-Permittees' MS4s as detailed in the Fact Sheet, contribute to violations of water quality standards and are a contributor of pollutants to the Laguna watershed.

40 CFR 122.26(d)(2)(i)(B,C,E, and F) provide that each permittee's permit application "shall consist of: adequate legal authority. A demonstration that the applicant can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the applicant at a minimum to: prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; control through ordinance, order or similar means the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water; require compliance with condition in ordinances, permits, contracts or orders; and carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition of illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) provides that the permittee shall develop and implement a proposed management program which "shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate. The program shall also include a description of staff and equipment available to implement the program. Proposed programs may impose controls on a system wide basis, a watershed basis, a jurisdiction basis, or on individual outfalls. Proposed management programs shall describe priorities for implementing controls."

40 CFR 122.26(d)(2)(iv)(A - D) requires municipalities to implement controls to reduce pollutants in storm water runoff from new development and significant redevelopment, construction, and commercial, residential, industrial, and municipal land uses or activities. Control of illicit discharges is also required.

Water Code section 13377 provides that "Notwithstanding any other provision of this division, the State Board or the regional boards shall, as required or authorized by the CWA, as amended, issue waste discharge requirements and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

Federal NPDES regulation 40 CFR 122.44(d)(1) requires MS4 permits to include any requirements necessary to "achieve water quality standards established under CWA

section 303, including State narrative criteria for water quality." The term "water quality standards" in this context refers to the beneficial uses of waters, water quality objectives, and antidegradation policies.

Legal Authority for Discharge Prohibitions

Water Code Section 13241 requires each regional board to "establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance […]."

Water Code Section 13243 provides that "A regional board, in a water quality control plan or in waste discharge requirements, may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted."

Water Code Section 13263(a) provides that waste discharge requirements prescribed by the Regional Water Board implement the Basin Plan.

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban runoff from commercial, residential, industrial, and construction land uses or activities.

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A - D) require municipalities to have legal authority to control various discharges to their MS4.

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]chieve water quality standards established under CWA Section 303, including State narrative criteria for water quality."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Legal Authority for Development Planning Requirements

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that permittees develop and implement a management program which is to include "A description of planning procedures including a comprehensive master plan to develop, implement and enforce controls to reduce the discharge of pollutants from municipal separate storm sewers which receive discharges from areas of new development and significant redevelopment. Such plans shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed."

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal storm water permits to include any requirements necessary to "[a]chieve water quality standards established under CWA Section 303, including State narrative criteria for water quality."

Legal Authority for Construction Requirements

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) provides that the proposed management program include "A description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water runoff from construction sites to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) provides that the proposed management program include "A description of procedures for site planning which incorporate consideration of potential water quality impacts."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(2) provides that the proposed management program include "A description of requirements for nonstructural and structural best management practices."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) provides that the proposed management program include "A description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) provides that the proposed management program include "A description of appropriate educational and training measures for construction site operators."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that a permittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that "The following categories of facilities are considered to be engaging in 'industrial activity' for the purposes of this subsection: … (x) Construction activity including cleaning, grading and excavation activities …."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be

discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Legal Authority for Municipal Operation Requirements

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) provides that the proposed management program include "A description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal separate storm sewers."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(3) provides that the proposed management program include "A description for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from municipal storm sewer systems…"

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) provides that the proposed management program include "A description of procedures to assure that flood management projects assess the impacts on water quality of receiving water bodies and that existing structural flood control devices have been evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(5) provides that the proposed management program include "A description of a program to monitor pollutants in runoff from operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste, which shall identify priorities and procedures for inspections and establishing and implementing control measures for such discharges."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) provides that the proposed management program include "A description of a program to reduce to the maximum extent practicable, pollutants in discharges from municipal separate storm sewers associated with the application of pesticides, herbicides, and fertilizer which will include, as appropriate, controls such as educational activities, permits, certifications, and other measures for commercial applicators and distributors, and controls for application in public right-of-ways and at municipal facilities."

Federal NPDES regulation 40 CFR 122.44(d)(1)(i) requires NPDES permits to include limitations to "control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which will cause, have reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality."

Statutory and Regulatory Considerations

Agency Coordination

The CWA authorizes U.S.EPA to permit a state to serve as the NPDES permitting authority in lieu of U.S.EPA. The State of California has in-lieu authority for the NPDES program. The Porter-Cologne Water Quality Control Act authorizes the State Water Board, through the Regional Water Boards, to regulate and control the discharge of pollutants into waters of the State. The State Water Board entered into a Memorandum of Agreement with U.S.EPA, on September 22, 1989, to administer the NPDES Program governing discharges to waters of the United States.

U.S.EPA has entered into a Memorandum of Agreement (MOA) with the U.S. Fish and Wildlife Service, and the National Marine Fisheries Service (also jointly referred to as "the Services") for enhancing coordination regarding the protection of endangered and threatened species under Section 7 of the Endangered Species Act, and the CWA's water quality standards and NPDES programs. Among other actions, the MOA establishes a framework for coordination of actions by U.S.EPA, the Services, and CWA delegated States on CWA permit issuance under § 402 of the CWA [66 Fed. Reg. 11202-11217].

This Order is intended to develop, achieve, and implement a timely, comprehensive, cost-effective storm water pollution control program to reduce the discharge of pollutants in storm water to MEP from the MS4 subject to the jurisdiction of the City of Santa Rosa, County of Sonoma, and the Sonoma County Water Agency (Co-Permittees) to surface waters subject to the jurisdiction of the Regional Water Board.

Federal regulations (40 CFR 122.26(d)(2)(iv)(A) and 40 CFR 122.26(d)(2)(iv)(C)) require that MS4 Co-Permittees implement a program to monitor and control pollutants in discharges to the municipal system from industrial and commercial facilities that contribute a substantial pollutant load to the MS4. The regulations require that Co-Permittees establish priorities and procedures for inspection of industrial facilities and priority commercial establishments. This Order, consistent with U.S.EPA policy, incorporates a cooperative partnership, including the specifications of minimum expectations, between the Regional Water Board and the Co-Permittees for the inspection of industrial facilities and priority commercial establishments to control pollutants in storm water discharges.

The State Water Board has issued NPDES General Permits for the regulation of storm water discharges associated with industrial and construction activities. In addition, the Regional Water Board has adopted a General Permit Order No. R1-2009-0045for low threat discharges to surface waters. Under the CWA, the Co-Permittees cannot enforce these NPDES permits. However, the Co-Permittees are required to enforce local storm water ordinances and permit conditions at industrial facilities and construction sites. If

the Co-Permittees become aware of industrial or construction site discharges that are in violation of statewide general NPDES permits, the Regional Water Board will rely on the Co-Permittees to promptly report such incidents to Regional Water Board staff for appropriate follow-up actions. In those areas where the local and state requirements overlap, the staffs of the respective agencies will work together to gain compliance in a streamlined manner.

It is the Regional Water Board's intent that this Order shall ensure attainment of water quality standards, applicable water quality objectives, and protection of beneficial uses of receiving waters. This Order therefore prohibits discharges from causing violations of water quality objectives or causing conditions to occur that create a condition of nuisance or water quality impairment in receiving waters as a result of MS4 discharge. Accordingly, these requirements shall be addressed through the effective implementation of BMPs to reduce pollutants in storm water discharges.

There may be federal or state entities within the Co-Permittees' boundaries that operate storm drain facilities and/or discharge storm water to storm drain systems regulated by this Order. The Co-Permittees may lack legal jurisdiction over these entities. Consequently, the Regional Water Board recognizes that the Co-Permittees should not be held directly responsible for such federal or state facilities and/or discharges, if the Co-Permittees have exercised due diligence to reduce or eliminate the discharge of pollutants. Some of these entities have their own MS4-type discharges to surface waters and are required to obtain storm water permit coverage in accordance with U.S.EPA Phase II storm water program. If these entities are not required to obtain permit coverage under Phase II but are found to be discharging storm water that causes or threatens to cause a violation of water quality objectives, they may be required to obtain an individual storm water discharge permit from the Regional Water Board. The California Department of Transportation (Caltrans) is a state agency that discharges storm water within the permit boundary. On July 15, 1999, the State Water Resources Control Board issued a separate NPDES storm water permit to Caltrans (NPDES No. CAS000003 - Order No. 99-06-DWQ.)

Small MS4s, such as those serving universities and community colleges, exist within the watersheds included in this Order. While these MS4s are not subject to this Order, they are subject to the Phase II NPDES storm water regulations. Over time, these MS4s will be designated for coverage under the State Water Board's statewide general storm water permit for small MS4s.

MS4 Pollutants and Non-Storm Water Discharges

As operators of the MS4s, the Co-Permittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to waters of the United States, a Co-Permittee essentially accepts responsibility for discharges into the MS4 that it does not prohibit or control. These

discharges may cause or contribute to a condition of pollution, contamination or a violation of water quality standards.

CWA section 402(p) requires operators of MS4s to prohibit non-storm water discharges into their MS4s. This is necessary because pollutants which enter the MS4 generally are conveyed through the MS4 to be eventually discharged into receiving waters without any sort of treatment. If a municipality does not effectively prohibit unauthorized non-storm water discharges, it is providing the pathway (its MS4) which enables pollutants to reach receiving waters. Since the municipality's storm water management service can result in pollutant discharges to receiving waters, the municipality must accept responsibility for the water quality consequences resulting from this service.

Furthermore, third party discharges may cause a municipality to be out of compliance with its permit. Since pollutants from third parties which enter the MS4 will eventually be discharged from the MS4 to receiving waters, the third party discharges can result in a situation of municipality non-compliance if the discharges lead to an exceedance of water quality standards. For these reasons, each Co-Permittee must prohibit and/or control discharges from third parties to its MS4. U.S.EPA supports this concept when it states "the operators of regulated small MS4s cannot passively receive and discharge pollutants from third parties" and "the operator of a small MS4 that does not prohibit and/or control discharges into its system essentially accepts 'title' for those discharges. At a minimum, by providing free and open access to the MS4s that convey discharges to waters of the United States, the municipal storm sewer system enables water quality impairment by third parties."[2]

Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the United States unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. For this reason, pollutant discharges into MS4s must be reduced to the MEP using a combination of management measures, including source control, and an effective MS4 maintenance program implemented by each Co-Permittee.

Enforcement of local storm water runoff related ordinances, permits, and plans is an essential component of every storm water runoff management program and is specifically required in the federal storm water regulations and this Order. Each Co-Permittee is individually responsible for adoption and enforcement of ordinances and or policies, implementation of identified control measures/BMPs needed to prevent or reduce pollutants in storm water runoff, and for the allocation of funds for the capital,

[2] Federal Register/Vol. 64, No. 235/Wednesday, December 8, 1999/Rules and Regulations. p. 68765-68766.

operation and maintenance, administrative, and enforcement expenditures necessary to implement and enforce such control measures/BMPs under its jurisdiction.

The Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A – D) are clear in placing responsibility on municipalities for control of storm water runoff from third party activities and land uses to their MS4.[3] In order for municipalities to assume this responsibility, they must implement ordinances, permits, and plans addressing storm water runoff from third parties. Assessments for compliance with their ordinances, permits, and plans are essential for a municipality to ensure that third parties are not causing the municipality to be in violation of its municipal storm water permit. When conditions of non-compliance are determined, enforcement is necessary to ensure that violations of municipality ordinances and permits are corrected. When a Co-Permittee determines a violation of its storm water ordinance, it must pursue correction of the violation.

Without enforcement, third parties do not have incentive to correct violations. U.S.EPA supports enforcement by municipalities when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations. Enforcement mechanisms […] also must be described."[4]

State Regulations

The Coastal Zone Act Reauthorization Amendments of 1990 (CZARA), Section 6217(g), requires coastal states with approved coastal zone management programs to address non-point source pollution impacting or threatening coastal water quality. CZARA addresses five sources of non-point pollution: agriculture, silviculture, urban, marinas, and hydromodification. In September 1995, the State Water Board and the California Coastal Commission submitted the state's response to the CZARA requirements. In lieu of a separate state program for the coastal zone, the state decided to apply the CZARA requirements on a statewide basis. This Order does address some CZARA requirements (urban and hydromodification) within the permit area however, this Order does not address the CZARA management measures required for the coastal areas of Sonoma County that are not included within the permit boundary. Compliance with requirements specified in this Order does not relieve the Co-Permittees from developing a non-point source plan for other programs identified under CZARA.

On May 18, 2000, U.S.EPA established numeric criteria for priority toxic pollutants for the State of California (California Toxics Rule (CTR) 65 Fed. Reg. 31682 (40 CFR 131.38)) for the protection of human health and aquatic life. These apply as ambient water quality criteria for inland surface waters, enclosed bays and estuaries. On March

[3] U.S.EPA, 2000. EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. Code of Federal Regulations, Vol. 40, Part 122.
[4] U.S.EPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA/833-B-92-002.

2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California* (SIP) for implementation of the CTR (State Water Board Resolution No. 2000-15, as amended by Board Resolution No. 2000-030). This policy requires that discharges comply with TMDL derived load allocations for a CTR criterion as soon as possible, but no later than 20 years from the effective date of the policy.

The Regional Water Board supports watershed management planning to address water quality protection in the region. The objective of watershed management planning is to provide a comprehensive and integrated strategy towards water resource protection, enhancement, and restoration while balancing economic and environmental impacts within a hydrologically defined drainage basin or watershed. It emphasizes cooperative relationships among regulatory agencies, the regulated community, environmental groups, and other stakeholders in the watershed to achieve the greatest environmental improvements with available resources.

State Water Board Resolution No. 68-16 contains the State Antidegradation Policy, titled "Statement of Policy with Respect to Maintaining High Quality Waters in California" (Resolution 68-16); this policy applies to all waters of the State, including ground waters of the State, whose quality meets or exceeds (is better than) water quality objectives. Resolution No. 68-16 incorporates the federal Antidegradation Policy (40 CFR section 131.12) where the federal policy applies, (State Water Board Order WQO 86-17). Both state and federal antidegradation policies acknowledge that an activity that results in a minor water quality lowering, even if incrementally small, can result in violation of Antidegradation Policies through cumulative effects, for example, when the waste is a cumulative, persistent, or bioaccumulative pollutant.

(a) Federal Antidegradation Policy (40 CFR131.12) states that the State shall develop and adopt a statewide antidegradation policy and identify the methods for implementing such policy pursuant to this subpart. The antidegradation policy and implementation methods shall, at a minimum, be consistent with the following:
    (1) Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
    (2) Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

(3) Where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

State Water Board Resolution No. 68-16 establishes essentially a 2-step process for compliance with the state anti-degradation policy.

(a) Step 1: if a discharge will degrade high quality water, the discharge may be allowed if any change in water quality:
  (1) Will be consistent with maximum benefit to the people of the State;
  (2) Will not unreasonably affect present and anticipated beneficial use of such water; and
  (3) Will not result in water quality less than that prescribed in state policies (e.g., water quality objectives in Water Quality Control Plans).

(b) Step 2: any activities that result in discharges to high quality waters are required to:
  (1) Meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to avoid a pollution or nuisance.
  (2) Maintain the highest water quality consistent with the maximum benefit to the people of the State.
    (A) If such treatment or control results in a discharge that maintains the existing water quality, then a lowering of water quality would not be consistent with State Antidegradation Policy.
    (B) Likewise, the discharge could not be allowed under State Antidegradation Policy if:
      (i) The discharge, even after treatment, would unreasonably affect beneficial uses; or
      (ii) The discharge, would not comply with applicable provisions of Water Quality Control Plans.

The Hydromodification Control and Low Impact Development (LID) provisions of this Order are intended to promote the State Water Board and Federal Antidegradation policies by preventing water quality and habitat degradation, consistent with beneficial uses identified in the Basin Plan.

On June 17, 1999, the State Water Board adopted Order No. WQ 99-05, which specifies standard receiving water limitation language to be included in all municipal storm water permits issued by the State and Regional Water Boards.

The State Water Board adopted a revised Water Quality Control Plan for Ocean Waters of California (Ocean Plan) in 2005. The California Ocean Plan establishes water quality objectives for California's ocean waters and provides the basis for regulation of wastes discharged into the State's coastal waters. It applies to point and nonpoint source discharges. The Ocean Plan identifies the applicable beneficial uses of marine waters

that include preservation and enhancement of designated Areas of Special Biological Significance (ASBS) (now called "State Water Quality Protection Areas") and establishes a set of narrative and numerical water quality objectives designed to protect beneficial uses. The State Water Board adopted the California Ocean Plan and amendments thereto, and both the State Water Board and the six coastal Regional Water Boards implement and interpret the California Ocean Plan.

The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. 'Water quality standards' (WQS) means beneficial use designations, water quality objectives based upon those beneficial uses, an antidegradation policy, and certain policies generally affecting the application and implementation of water quality standards. (40 CFR §§ 131.6(a), (c), and (d); 40 CFR § 131.13.) Water quality objective(s) means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area. (Water Code §13050(h).) Water quality objectives and standards are referred to collectively in this Order as WQS, and generally consist of narrative or numeric water quality criteria contained in the Basin Plan, the California Ocean Plan, the National Toxics Rule, the California Toxics Rule, State Implementation Policy for the California Toxics Rule, and other state or federally approved surface water quality plans. This Order implements applicable sections of the Basin Plan.

Beneficial uses applicable to the receiving waters within the permit boundary and downstream waters are contained in Attachment A.

In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply.

This Order incorporates BMPs referenced in the *California Stormwater Quality Association (CASQA) Storm Water Best Management Practice Handbook Construction (January 2003*[5]*)* (website: http://www.cabmphandbooks.com/Construction.asp) and from the *Stormwater Quality Handbooks, Project Planning and Design Guide, Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Plan (WPCP) Preparation Manual, Construction Site Best Management Practices (BMPs) Reference Manual, March 2007* (Caltrans Document Number CTSW-RT-06-171.11-1) (website: http://www.dot.ca.gov/hq/construc/stormwater/stormwater1.htm), and other CASQA handbooks (website: http://www.cabmphandbooks.com/)

[5] Including future updates and revisions.

On May 6, 2008, the State Water Board adopted Resolution No. 2008-30 Requiring Sustainable Water Resources Management. It was resolved that the State Water Board:

(a) Continues to commit to sustainability as a core value for all Water Boards' activities and programs;
(b) Directs Water Boards' staff to require sustainable water resources management such as LID and climate change considerations, in all future policies, guidelines, and regulatory actions; and
(c) Directs Regional Water Boards to aggressively promote measures such as recycled water, conservation, and LID Best Management Practices where appropriate and work with Dischargers to ensure proposed compliance documents include appropriate, sustainable water management strategies.

On May 15, 2008, the California Ocean Protection Council (OPC) adopted the Resolution Regarding Low Impact Development. In the Resolution, OPC:

(a) Resolves to promote the policy that new developments and redevelopments should be designed consistent with LID principles so that storm water pollution and the peaks and durations of runoff are significantly reduced and, in the case of a new development, are substantially the same as before development occurred on the site;
(b) Finds that LID is a practicable and superior approach that new and redevelopment projects can implement to minimize and mitigate increases in runoff and runoff pollutants and the resulting impacts on downstream uses, coastal resources and communities; and
(c) Resolves to advance LID implementation in California through NPDES Permit Requirements: When crafting storm water NPDES permit requirements, the State Water Board and Regional Water Boards should ensure that LID designs are utilized as the primary approach to satisfying post-construction runoff control requirements and that LID designs can be utilized to control pollutants and the rate and volume of runoff.

The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code, section 21000 et seq.) in accordance with section 13389 of the Water Code. The renewal of this NPDES permit is also exempt from CEQA pursuant to Title 14, California Code of Regulations, section 15301, because it is for an existing facility.

This Order does not authorize any take of endangered species. To ensure that endangered species issues have been raised to responsible agencies, the Regional Water Board notified the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration Fisheries, and the California Department of Fish and Game of the Regional Water Board's consideration of this Order.

Order No. R1-2009-0050 is an essential mechanism for achieving the water quality objectives and water quality standards that have been established for protecting the beneficial uses of the water resources in the Laguna de Santa Rosa and Mark West Creek watersheds and the urban clusters outside of Healdsburg and Graton.

Permit is Not an Unfunded State Mandate

This Order does not constitute an unfunded local government mandate subject to subvention under Article XIIIB, section (6) of the California Constitution for several reasons, including, but not limited to, the following. First, this Order implements federally mandated requirements under federal CWA section 402, subdivision (p)(3)(B). (33 U.S.C. § 1342(p)(3)(B).) This includes federal requirements to effectively prohibit non-storm water discharges, to reduce the discharge of pollutants to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. Federal cases have held these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc. v. U.S. E.P.A.* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.) The authority exercised under this Order is not reserved state authority under the CWA's savings clause (*cf. Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements which are not "less stringent" than federal requirements]), but instead, is part of a federal mandate to develop pollutant reduction requirements for municipal separate storm sewer systems. To this extent, it is entirely federal authority that forms the legal basis to establish the permit provisions. (See, *City of Rancho Cucamonga v. Regional Water Quality Control Bd.-Santa Ana Region* (2006) 135 Cal.App.4th 1377, 1389; *Building Industry Ass'n of San Diego County v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 882-883.)

Second, the Co-Permittees' obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental dischargers who are issued NPDES permits for storm water discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 U.S.C. § 1342) and the Porter-Cologne regulates the discharge of waste (Wat. Code, § 13263), both without regard to the source of the pollutant or waste. As a result, the "costs incurred by local agencies" to protect water quality reflect an overarching regulatory scheme that places similar requirements on governmental and nongovernmental dischargers. (See *County of Los Angeles v. State of California* (1987) 43 Cal.3d 46, 57-58.)

The CWA and the Porter-Cologne Water Quality Control Act largely regulate storm water with an even hand, but to the extent there is any relaxation of this even-handed regulation, it is in favor of the local agencies. Except for MS4s, the CWA requires point source dischargers, including discharges of storm water associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C.

§ 1311(b)(1)(C), *Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1164-1165.) As discussed in prior State Water Board decisions, this Order does not require strict compliance with water quality standards. (SWRCB Order No. WQ 2001-15, p. 7.) The Order, therefore, regulates the discharge of waste in municipal storm water more leniently than the discharge of waste from non-governmental sources.

Third, the Co-Permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Local agencies can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *Apartment Ass'n of Los Angeles County, Inc. v. City of Los Angeles* (2001) 24 Cal.4th 830, 842.) The ability of a local agency to defray the cost of a program without raising taxes indicates that a program does not entail a cost subject to subvention. (*County of Fresno v. State of California* (1991) 53 Cal.3d 482, 487-488.)

Fourth, the Co-Permittees have requested permit coverage in lieu of compliance with the complete prohibition against the discharge of pollutants contained in federal CWA section 301, subdivision (a) (33 U.S.C. § 1311(a)) and in lieu of numeric restrictions on their discharges. To the extent the local agencies have voluntarily availed themselves of the permit; the program is not a state mandate. (Accord *County of San Diego v. State of California* (1997) 15 Cal.4th 68, 107-108.) Likewise, the Co-Permittees have voluntarily sought a program-based municipal storm water permit in lieu of a numeric limits approach. (See *City of Abilene v. U.S. E.P.A.* (5th Cir. 2003) 325 F.3d 657, 662-663.) The local agencies' voluntary decision to file a report of waste discharge proposing a program-based permit is a voluntary decision not subject to subvention. (See *Environmental Defense Center v. U.S.EPA* (9th Cir. 2003) 344 F.3d 832, 845-848.)

Fifth, the local agencies' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under state law predates the enactment of Article XIIIB, section (6) of the California Constitution.

Discharge Characteristics

In general, the substances that are found in municipal storm water runoff can harm human health and aquatic ecosystems. The National Urban Runoff Program (NURP) study reported that heavy metals, organics, coliform bacteria, nutrients, oxygen demanding substances (e.g., decaying vegetation), and total suspended solids are found at relatively high levels in storm water runoff. It also found that MS4 discharges draining residential, commercial, and light industrial areas contain significant loadings of total suspended solids and other pollutants. In addition, the State Water Board Urban Runoff Technical Advisory Committee (TAC) finds that storm water runoff pollutants

include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, viruses, and pesticides.[6] Runoff that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through storm drain networks directly to the receiving waters of the North Coast Region.

The 1992, 1994, and 1996, National Water Quality Inventory Reports to Congress prepared by U.S.EPA showed a trend of impairment in the nation's waters from contaminated storm water runoff.[7] The 1998 National Water Quality Inventory Report states that ocean shoreline impairment due to storm water runoff increased from 55 percent in 1996 to 63 percent in 1998. The report notes that storm water runoff discharges are the leading source of pollution and the main factor in the degradation of surface water quality in California's coastal waters, rivers, and streams.

Storm water runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may eventually be consumed by humans. Pollutants such as heavy metals and pesticides, which are commonly found in storm water runoff, have been found to bioaccumulate and biomagnify in long-lived organisms at the higher trophic levels.[8]

Since many aquatic species are utilized for human consumption, toxic substances accumulated in species' tissues can pose a significant threat to public health. U.S.EPA supports this finding when it states, "As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans."[9]

Watershed development and urbanization result in increased pollutant loading, runoff volume and discharge velocity to receiving waters. In many cases, development results in naturally vegetated, pervious areas being converted to impervious surfaces such as paved highways, streets, rooftops and parking lots. In addition, development and urbanization results in natural ground surfaces being graded or otherwise disturbed and subject to compaction, erosion, and sediment discharge. Land development creates

[6] State Water Board, 1994. Urban Runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.
[7] U.S.EPA, 2000. Quality of Our Nation's Waters: Summary of the National Water Quality Inventory 1998 Report to Congress – U.S.EPA 841-S-00-001; Water Quality Conditions in the United States: Profile from the 1998 National Water Quality Inventory Report to Congress – U.S.EPA 841-F-00-006.
[8] Abel, P.D, 1996. Water Pollution Biology.
[9] U.S.EPA, 2000. Storm Water Phase II Compliance Assistance Guide. Washington D.C. EPA 833-R-00-002.

new pollution sources as the increased density of human population brings proportionately higher amounts of vehicle emissions, vehicle maintenance wastes, municipal sewage waste, pesticides, household hazardous wastes, pet wastes, trash, and other anthropogenic pollutants. Storm water runoff from these developed areas can collect and mobilize these pollutants. Storm water runoff from these developed areas are usually conveyed by a system of roads, gutters, pipes and drainage ditches and discharged directly to streams and rivers, without treatment. Retaining naturally vegetated soil can both absorb rainwater and act to remove pollutants, thereby providing an effective natural purification process. In contrast, pavement and concrete have limited ability to absorb water and remove pollutants, and thus the natural purification characteristics are lost. Retaining natural soil helps capture and slowly infiltrate runoff and also aids in sequestering carbon. The pool of organic carbon in the soil is approximately twice as large as that of the atmosphere. Soils can contain as much or more carbon than the vegetation they support. For example, 97 percent of the 335 billion tons of carbon stored in grassland ecosystems is held in the soil. Soil carbon storage can help offset release of carbon dioxide, a major greenhouse gas that contributes to global climate change.

The quality and quantity of MS4 discharges vary considerably because of the effects of hydrology, geology, land use, seasonality, and sequence and duration of precipitation events. Storm water runoff discharges typically contain pollutants that lower the quality of receiving waters and impact beneficial uses of receiving waters. Nationwide and local studies have shown exceedances of water quality standards including instances of aquatic toxicity in receiving waters associated with storm water discharges. Specific pollutants that are contained in storm water include, but are not limited to, heavy metals from sources such as automobiles and metal pipes; mercury from atmospheric fallout and improper disposal of mercury switches; lead from fuels, paints, automotive parts; copper from brake pad wear and roofing materials; zinc from tire wear and galvanized sheeting and fencing; bis (2-ethylhexyl) phthalate from the break down of plastic products; sediment from land disturbance and erosion; dioxins as products of combustion; petroleum hydrocarbons from sources such as leaking automobiles and minor spills; microbial pathogens from sewer overflows, pet waste, and failing domestic wastewater systems; pesticides from over application and spills; nutrients from fertilizer application and decomposing plant material; and litter.

Storm water is frequently a significant source of nutrient loading to receiving waters, well above background levels. In fact, the TMDL and Waste Reduction Strategy for the Laguna de Santa Rosa, Sonoma County developed by Regional Water Board staff and approved by U.S.EPA in 1995, identifies storm water runoff as a significant source of the nutrient loading in the Laguna watershed. This increase in nutrient loading can impair beneficial uses in several different ways. Nutrients are a primary driving factor in excess algal growth, low dissolved oxygen, extreme diurnal pH and dissolved oxygen cycles which can contribute to shifts in composition of aquatic species that are a primary component of a beneficial use. Ammonia as Nitrogen, and Nitrate plus Nitrite Nitrogen

are biostimulatory substances that can cause or contribute to eutrophic effects impairing warm freshwater and wildlife habitats. Ammonia is highly toxic to fish and other aquatic life. Excessive ammonia can cause aquatic life toxicity. Currently the Laguna de Santa Rosa is listed as impaired for nitrogen, phosphorus, low dissolved oxygen, sediment, temperature, indicator bacteria, and mercury.

Elevated bacterial indicator densities impair the water contact recreation (REC-1) beneficial use at beaches, rivers, creeks, estuaries, lagoons, and marinas. Swimming in waters with elevated bacterial indicator densities has been associated with adverse health effects. Specifically, epidemiological studies indicate that there is a causal relationship between recreational water quality, as measured by bacterial indicator densities, and adverse health effects. Sources of elevated bacteria to marine and fresh waters may also include illegal discharges from improperly maintained onsite water treatment systems and illicit discharges from private drains. Santa Rosa Creek is listed as impaired under section 303(d) of the CWA for pathogens as denoted by indicator bacteria. The sources of pathogens are currently unknown, but storm water runoff is a common contributor of pathogens and bacteria to watersheds. Regional Water Board staff will develop a TMDL to address the listed impairment.

Pesticides are substances used to prevent, destroy, repel or mitigate pests such as insects, weeds, and microorganisms. Their effects can be direct (e.g. fish die from a pesticide entering waterways, or birds do not reproduce after ingesting contaminated fish), or indirect (a hawk becomes sick from eating a mouse dying from pesticide poisoning). Pesticide categories include: Organochlorine, Organophosphorus, Organophosphate, and Pyrethroid. Storm water runoff can carry these substances into waterways.

Polychlorinated Byphenyls (PCBs) are a subset of the synthetic organic chemicals known as chlorinated hydrocarbons. Concern over PCBs toxicity, persistence (chemical stability) in the environment, and demonstrated ability to bioconcentrate has led to prohibitions on PCBs.

Storm Water Pollutants and Hydromodification

The high volumes and velocities of storm water discharged from MS4s into natural watercourses can adversely impact aquatic ecosystems and stream habitat and cause stream bank erosion and physical modifications. These changes can also result in increased flooding, impacting downstream property owners and creating an added burden to flood control agencies. These changes are collectively termed hydromodification. Municipal point source discharges from urbanized areas remain a leading cause of impairment of surface waters in California.

The Natural Resources Defense Council (NRDC) 1999 Report, "*Stormwater Strategies, Community Responses to Runoff Pollution*" identifies two main causes of the storm

water pollution problem in urban areas. Both causes are directly related to development in urban and urbanizing areas:

(a) Increased volume and velocity of surface runoff. There are three types of human-made impervious covers that increase the volume and velocity of runoff: (i) rooftop; (ii) transportation imperviousness; and (iii) non-porous (impervious) ground surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants as well as altering the timing and magnitude of the flood hydrograph.

(b) The concentration of pollutants in the runoff. Certain industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in storm water runoff. As human population density increases, it brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, and trash.

As a result of these two causes, runoff leaving developed urban areas is significantly greater in volume, velocity, and pollutant load than pre-development runoff from the same area.

By accommodating the traditional approach to storm water management, urbanization has also altered the flow regime (rate, magnitude, frequency, timing, and flashiness of runoff) that supports aquatic and riparian habitats.

These hydrologic changes are driven by the loss of water storage capacity in the watersheds,[10] and exacerbated by physical alterations of the stream channel network.[11] This relationship between urbanization and stream channel integrity has been documented nationally and in localized studies.

Hydrologic changes from urban development also directly and indirectly adversely affect wetlands. Natural wetlands support many beneficial uses and provide important water-quality related ecological services, including pollutant removal, flood attenuation, and groundwater recharge.[12] The Center for Watershed Protection recently provided U.S.EPA with a synthesis of more than 100 scientific studies on the direct and indirect impacts of urbanization on wetlands and the role wetlands play in watershed quality. The report found that the three changes from land development with the most potential

[10] Konrad, Christopher P. and Derek K. Booth, 2005. *Hydrologic Changes in Urban Streams and Their Ecological Significance.* American Fisheries Society Symposium Vol. 47 p.157-177.
[11] Poff. N.L. et al. 1997. The Natural Flow Regime: A paradigm for river conservation and restoration. Bioscience Vol. 47, No. 11, p.769-784.
[12] Water Quality Control Plan for the North Coast Region, Ch. 2 “Beneficial Uses,” p. 2-16.00. Wright, Tiffany, et al. 2006. “Direct and Indirect Impacts of Urbanization on Wetland Quality.” Prepared by the Center for Watershed Protection. Available at: http://www.cwp.org.

to impact wetlands include: increased storm water runoff, decreased ground water recharge, and flow constriction. Each of these changes may often be avoided or minimized by implementing site design and hydromodification BMPs.

When development reduces riparian buffers or flood plains are confined within levees, habitat loss and hydromodification can result. Modified flow characteristics, higher flow velocities and increased channel erosion are some of the impacts to receiving waters that may result from reduction of riparian buffers and loss of flood plain.

Studies have shown that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[13] One comprehensive study, which looked at numerous areas, variables, and methods, revealed that stream degradation occurs at levels of imperviousness in the watershed as low as 10 to 20 percent. Stream degradation is a decline in the biological integrity and physical habitat conditions that are necessary to support natural biological diversity. For instance, few urban streams can support diverse benthic communities with imperviousness within the watershed greater than or equal to 25 percent.

Non-urban land use changes such as agriculture, grazing, timber harvesting, and low density residential development may also have significant hydromodification impacts on receiving waters due to removal of natural vegetation, reduction of riparian vegetation and riparian buffers, and soil compaction. These non-urban land uses, cumulatively, may have similar hydromodification impacts to receiving waters as urban development.

Increased volume and velocity of runoff adversely impacts receiving waters and their beneficial uses in many ways. According to the State Water Board Urban Runoff Technical Advisory Committee (TAC)report, increases in population density and imperviousness result in changes to stream hydrology including:

(a) Increased peak discharges compared to pre-development levels;
(b) Increased volume of storm water runoff with each storm compared to pre-development levels;
(c) Decreased travel time to reach receiving water; increased frequency and severity of floods;
(d) Reduced stream flow during prolonged periods of dry weather due to reduced levels of infiltration;
(e) Increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from channelization; and
(f) Decreased infiltration and diminished ground water recharge.

[13] U.S.EPA, 1999. Part II. 40 CFR Parts 9, 122, 123, and 124. National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule. Federal Register.

Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including:

(a) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil);
(b) taking reasonable steps to prevent the illegal disposal of wastes;
(c) protecting footings and foundations;
(d) ensuring that each drainage feature is adequately maintained in perpetuity; and
(e) pretreatment.

Water quality assessments conducted by the Regional Water Board and others have identified impairment, or threatened impairment, of beneficial uses of water bodies within the permit boundary. The causes of impairments include pollutants of concern that are typically contained in municipal storm water discharges. Pollutants of concern within the Mark West Creek and Laguna watersheds include: sediments; temperature; nutrients; mercury and pathogens.

A one-time annual pollutant loading estimate was submitted in the Co-Permittees' Part II storm water permit application (1996). Annual loading estimates for Santa Rosa Creek were determined for sediments and nutrients (TSS: 21,400 tons; TDS: 9,600 tons; Phosphorus: 31 tons; Nitrate: 36 tons; TKN: 85 tons; Total Organic Nitrogen: 78 tons). This estimate was based on limited monitoring data and was not intended to quantify loadings for other runoff years or for areas outside of the City of Santa Rosa. Implementation of the MS4 program since 1997 is expected to have resulted in reductions in pollutant loadings to receiving waters. As with all municipal storm water programs, the goal is that the permit and municipal compliance efforts will evolve over time. Each new permit builds on program efforts that are proven to be effective in reducing storm water pollution and adds new programs where necessary. This Order contains additional program elements specifically intended to focus on sediment and nutrient pollutant reduction.

Certain pollutants present in storm water runoff may be derived from extraneous sources that the Co-Permittees have no or limited jurisdiction over. Examples of such pollutants and their respective sources are: polycyclic aromatic hydrocarbons (PAHs) which are products of internal combustion engine operation, nitrates, bis (2-ethylhexyl) phthalate and mercury from atmospheric deposition, lead from fuels, copper from brake pad wear, zinc from tire wear, dioxins as products of combustion, and naturally occurring minerals from local geology. However, the presence of urban development and the MS4 system is responsible for delivering these pollutants to the receiving water. The implementation of the measures set forth in this Order is intended to reduce the entry of these pollutants into storm water and their discharge to receiving waters.

Municipal storm water and non-storm water discharges may contain pollutants that cause or threaten to cause an exceedance of water quality standards, as outlined in the Basin Plan. Wet weather and dry weather discharges are subject to the conditions and requirements established in the Basin Plan for point source discharges. Additionally, discharges from the MS4 that cause or contribute to exceedances of water quality standards within the receiving water are prohibited.

Sediment and Temperature

Storm water can be a significant source of sediment in waterways through two primary mechanisms: (1) External - direct transport of large volumes of sediment from impervious and developed landscapes into stream channels; and (2) Internal - de-stabilization of the stream channel and stream bed from excess hydraulic energy leading to high rates of erosion within the stream channel.

Some types of sediment (sands and gravels) are natural components of stream systems and often provide benefits for aquatic habitat. However, excessive fine sediments, common in storm water runoff, may impact beneficial uses in several ways: (1) Filling in the stream channel and thus reducing the number and depth of pools and complexity of stream habitat features; (2) Creating a shallower stream environment that is more susceptible to increased temperature; (3) Increased nutrient loading, shallow pools, impaired flows all of which contribute to nuisance algal conditions; and (4) Direct effects from smothering of spawning gravels and benthic macroinvertebrate communities.

Natural peak flows may be beneficial to stream systems for sediment transport, promoting deeper pools with cooler water. Storm water flows may alter the natural temperature regime of receiving waters by changing the channel morphology and through direct differences in runoff temperature versus natural flows. Often direct flows are much warmer than the receiving water and can lead to temperature stress in many cold water aquatic species. For example, increased runoff from impervious surfaces such as paved areas and rooftops may increase the temperature of receiving waters. The impact of warmer flows can also be less direct, for example it can cause the stream to have less oxygen because warmer water has a lower oxygen saturation potential and therefore lower dissolved oxygen. These temperature changes can impact the biotic community within an aquatic ecosystem. Additionally, stream and aquatic ecosystems may already be stressed in summer due to lack of vegetation and ground water infiltration.

The majority of surface waters of Sonoma County within North Coast Regional Water Board jurisdiction are impaired for excess sediment and temperature. The Regional Water Board has adopted Board Resolution R1-2004-0087 which directs Regional Water Board staff to utilize existing regulatory programs, including storm water permitting, to address sources of sediment within sediment impaired watersheds.

Development patterns in the County indicate that development will continue, thereby increasing MS4 discharges into impaired waters.

Impaired Water Bodies and TMDLs

CWA section 303(d) and 40 CFR 130.7 require States to identify water quality-impaired water bodies and pollutants of concern and develop TMDLs. A TMDL is a numerical calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing sources (point sources, which are given Waste Load Allocations (WLAs) and non-point sources, which are given Load Allocations (LAs)). Storm water and non-storm water discharges from MS4s are considered point sources.

The Regional Water Board is currently in the process of developing TMDLs for listed water bodies within the Region. The Co-Permittees' discharge of storm water into an impaired water body will be subject to load allocations and implementation plans established under any TMDLs adopted by the Regional Water Board and approved by U.S.EPA. Certain early actions and/or assessments by the Co-Permittees to address 303(d) listed water bodies and pollutants of concern are warranted and required by this Order. The impaired water bodies that are within or downstream of the permit boundary are listed below in Table 1.

Table 1. Impaired Waters

Hydrologic Drainage	**Pollutant**
Russian River HU, Lower Russian River HA, Austin Creek HSA	Sediment Temperature
Russian River HU, Lower Russian River HA, Guerneville HSA	Pathogens[14] pH[15] Sediment Temperature
Russian River HU, Middle Russian River HA, Laguna de Santa Rosa	Low Dissolved Oxygen Mercury Nitrogen Phosphorous Sediment Temperature

[14] Listing covers only the Monte Rio area of this watershed from the confluence of Dutch Bill Creek to the confluence of Fife Creek and Healdsburg Memorial Beach from the Hwy 101 crossing to the railroad crossing upstream of the Beach.
[15] Listing only applies to Pocket Canyon Creek, a tributary to the lower Russian River within the greater Guerneville HSA.

Hydrologic Drainage	Pollutant
Russian River HU, Middle Russian River HA, Mark West Creek HSA	Sediment Temperature
Russian River HU, Middle Russian River HA, Santa Rosa Creek	Pathogens Sediment Temperature

Where reasonable potential has been established for a pollutant through the TMDL process, WLAs must be translated to water quality-based effluent limitations (WQBELs).

Laguna de Santa Rosa TMDL

On March 1, 1995, the Regional Water Board approved a TMDL for the Laguna watershed that assigned numeric, seasonal targeted reductions and net load goals for Total Nitrogen and Total Ammonia in urban storm water in four areas of the Laguna watershed. The Waste Reduction Strategy for the Laguna de Santa Rosa (Strategy) was approved on the same day to implement the TMDL. On May 4, 1995, U.S.EPA approved the TMDL and Strategy as a phased-approach TMDL. The Strategy anticipated attaining the targeted reductions and net load goals by July, 2000, to address excess nutrient and low dissolved oxygen impairment in the Laguna watershed. The Strategy found that storm water and non-storm water runoff contributed to the impairment of the Laguna de Santa Rosa.

The Strategy implements the TMDL using four programs aimed at reducing nitrogen and organic matter inputs to the Laguna. One of these programs is the storm water permit program to eliminate or reduce the discharge of pollutants from storm water systems. The estimated waste loads were separated into storm event, non-storm loadings and summer loadings.

The Strategy identified the City of Santa Rosa, the City of Rohnert Park, the City of Cotati, the City of Sebastopol, and the Town of Windsor as contributing urban storm water to the Laguna watershed, and it recommended that all urban areas reduce nutrient loads to the Laguna watershed. The Strategy states, “Urban development has increased rapidly in the greater Santa Rosa area and contributes to the water quality problems in the Laguna.” Sonoma County was identified in the Strategy for development of a storm water program as a Co-Permittee with Santa Rosa because of their discharges of storm water to the Laguna watershed and the interconnectedness of the City and County’s storm drain system.

The Strategy anticipated that TMDL implementation would reduce the total nitrogen, ammonia, total phosphate and organic matter discharges to the Laguna, and lead to a reduction of algal productivity and reduce the daily dissolved oxygen and pH excursions in the Laguna.

The Strategy was based on a watershed approach, and proposed targeting specific pollutant sources found within different areas of the watershed. The Laguna watershed was divided into four attainment areas, the lowermost point in the stream for each area being the point of attainment. Attainment point one is located in the Laguna at Trenton-Healdsburg Road, attainment point two at Guerneville Road, attainment point three at Occidental Road, and attainment point four at Stony Point Road.

These net load goals are not enforceable and are included in this Fact Sheet for reference only, because the Strategy did not include a firm compliance date. These goals will be replaced with updated waste load allocations when the updated Laguna TMDL is adopted.

Table 2. Laguna TMDL Net Load Goals for Total Nitrogen (pounds/season) in Urban Runoff

Attainment Point	**Winter Net[16]**	**Spring Net**	**Summer Net**	**Fall Net**
1. Trenton-Healdsburg Road	182,353	11,789	0	7,718
2. Guerneville Road	129,960	5,321	0	2,543
3. Occidental Road	42,025	1,161	0	514
4. Stony Point Road	17,054	1,161	0	514

Table 3. Laguna TMDL Net Load Goals for Total Ammonia (pounds/season) in Urban Runoff

Attainment Point	**Winter Net[17]**	**Spring Net**	**Summer Net**	**Fall Net**
1. Trenton-Healdsburg Road	16,174	942	0	539
2. Guerneville Road	11,593	376	0	140
3. Occidental Road	3,589	50	0	10
4. Stony Point Road	1,318	50	0	10

[16] Net Load in (pounds/season).
[17] Net Load in (pounds/season).

Until adoption of this Order, the storm water program did not include monitoring to determine compliance with the waste loads for each attainment point. This Order includes a Monitoring and Reporting Program with outfall monitoring to collect data related to Strategy compliance.

This Order includes several programs to implement the Strategy, such as treatment requirements for new development, inspections for nurseries, information and outreach for businesses and the public on fertilizer use and storage, municipal operations fertilizer use and catch basin clean out, new outfall monitoring, BMPs to control non-storm water flows, and special studies. Section A. Discharge Prohibitions and Section E. Special Provisions of this Order include requirements to meet the goals of the Laguna TMDL for storm water and non-storm water discharges. Monitoring and Reporting Program No. R1-2009-0050 includes requirements to monitor MS4 outfalls to compare with the goals of the TMDL.

Regional Water Board staff is currently developing an updated TMDL for the Laguna watershed and anticipates that it will be adopted within the term of this Order. This Order includes a requirement in year five to submit a report on compliance with Strategy goals, unless the updated TMDL is adopted prior to the due date of the report.

In support of the TMDL effort, Regional Water Board staff recently collaborated with the Laguna de Santa Rosa Foundation to conduct an assessment of existing water quality, hydrology, sediment transport, and ecosystem function to develop a conceptual framework for conducting the updated Laguna TMDL. The Altered Laguna, A Conceptual Model for Watershed Stewardship, published in 2007, was developed with a Technical Advisory Committee and was peer reviewed by the San Francisco Estuary Institute. The Altered Laguna confirmed the impaired conditions within the Laguna relative to temperature, nutrients, sediments, and dissolved oxygen.

The Altered Laguna identified urban storm water discharges during the wet season and urban non-storm water discharges during the dry season as potentially significant sources of all pollutants of concern (POCs). The updated TMDL analyses will better define the contributions of the MS4s that discharge to the Laguna and will provide allocations to the system for each parameter and include an implementation plan with recommendations on how the allocations can be achieved.

The updated TMDL will also need to address the role of impervious surfaces within the Laguna watershed. Impervious surfaces are linked to increased delivery of sediments, nutrients, and other oxygen consuming wastes to waterways within the Laguna. In addition, the hydrological modification that has resulted from high levels of impervious surfaces within the Laguna watershed has contributed to degraded stream channel, stream bank, and riparian conditions which are important risk co-factors for impairment related to bio-stimulatory substances. The effect of a greater area of impervious

surface is two-fold: increased loading of pollutants and decreased assimilative capacity of stream ecosystems.

This Order requires the use of post-construction storm water treatment BMPs and requires consideration and preference of LID strategies for new development to reduce the impact of new development to the Laguna and other impaired waterbodies.

Storm Water Management Plan and Report of Waste Discharge

The Co-Permittees submitted a request for permit renewal (Report of Waste Discharge) on December 21, 2007 and it contained a proposed Storm Water Management Plan and Monitoring Program (Management Plan) to be considered by the Regional Water Board for incorporation into an MS4 NPDES Permit to demonstrate compliance with federal law. The Co-Permittees are entitled, but did not elect to pursue a permit with numeric end-of-pipe limits for storm water discharges, which would have required them to satisfy specific effluent limitations rather than implement storm water management programs. Where an MS4 permittee voluntarily chooses a Best Management Practice (BMP) based storm water management program rather than end-of-pipe numeric effluent limits, there exists no compulsion of a specific regulatory scheme that would violate the 10th Amendment to the United States Constitution. (City of Abilene V. EPA, 325 F.3d 657 (5th Cir. 2003)).

The intent of the Management Plan is to identify specific tasks and programs to reduce the discharge of pollutants in storm water to the MEP in a manner designed to achieve compliance with water quality standards and objectives. The Management Plan was developed during discussions between the Co-Permittees and Regional Water Board staff. Based on these discussions, the Co-Permittees submitted a Management Plan including their recommendations on how to achieve MEP. The Regional Water Board is requiring that the Management Plan be revised in this Order to meet the MEP standard. Modifications to the Management Plan could include additional measurable goals, improvements in program elements to reduce pollutant discharge to impaired waters, and/or modifications to implementation schedules. The Management Plan fulfills the Regional Water Board's permit application requirements subject to the condition that it will be improved and revised in accordance with the provisions of this Order. Each of the Co-Permittees developed individual plans that were incorporated into the Management Plan. The Management Plan defines the actions and sets measurable goals that will meet the MEP standard, when revised as required by this Order.

The Management Plan submitted on December 21, 2007, is incorporated into this Order and is an enforceable component of this Order. A summary of the Management Plan submitted on December 21, 2007, is included with this Order as Attachment D. Updates to the Management Plan shall be approved by the Regional Water Board as needed and will be an enforceable component of this Order.

The Management Plan describes a framework for management of storm water discharges during the term of this Order. The Management Plan describes the program's goals, objectives and activities, and the annual reporting and program evaluation process. Measurable goals and associated implementation dates, which represent the baseline level of effort required of each of the Co-Permittees, are contained in the Management Plan. They will serve as a reference point upon which to base overall program effectiveness evaluations. Each of the Co-Permittees is individually responsible for implementing their own individual Management Plan components to reduce, control and/or otherwise address sources of pollutants within their jurisdiction. These components contain individual strategies for storm water runoff control and elimination or reduction of non-storm water flows, including specific measurable goals, BMPs and implementation schedules, and procedures that detail how these control measures will be achieved.

Joint program activities that are described in the Management Plan include:

(a) Program Management – This program's goals are to facilitate communication and coordination among the Co-Permittees, Regional Water Board and other appropriate entities; ensure the Management Plan elements are implemented on schedule; and ensure that all requirements of the permit are met. Program management includes annual reporting and effectiveness evaluations.
(b) Santa Rosa Area Standard Urban Storm Water Mitigation Plan – This program outlines post construction storm water control, treatment and disposal measures for new development and significant redevelopment. Program goals are to manage storm water runoff from new development and significant redevelopment for both quality and quantity, as close to the point of origin as possible, through design and engineered measures.
(c) Monitoring Program – This program includes monitoring of outfalls and receiving waters to assess receiving water quality and direct efforts to control POCs.

Specific program activities are focused on the following elements:

(a) Legal Authority
(b) Private Construction
(c) Industrial and Commercial Discharge Sources
(d) Municipal Operations
(e) Public Construction Activities Management
(f) Landscape and Recreational Facilities Management
(g) Storm Drain System Operation and Management
(h) Street and Road Maintenance
(i) Parking Facilities Management
(j) Emergency Procedures
(k) Illicit Discharge Detection and Elimination
(l) Public Education and Outreach
(m) Industrial/Commercial Outreach
(n) School Education

(o) Effectiveness Evaluation
(p) Fiscal Analysis

The Management Plan contains specific measurable goals that the Co-Permittees believe would achieve pollution reductions to the MEP. The selection of the measurable goals was made using projections of future revenues to fund the implementation of these goals. Those revenue projections may change considerably over the permit term, especially when considering forecasts for the state budget as a whole. If the state makes budgetary changes that reduce available discretionary funding for the municipalities, certain measurable goals now required by the Management Plan may become cost prohibitive. The Regional Water Board has delayed the implementation of the majority of the requirements in the Order to April 1, 2011 or later. In such budgetary conditions, it may be necessary to delay the implementation of those measurable goals. If this situation occurs, the Co-Permittees may request a delay or modification of the measurable goals. It is expected that these requests will be included in the annual report for that year. The Co-Permittees will have the burden to demonstrate to the Regional Water Board that a delay in measurable goals is appropriate based on a showing of the applicable budgetary constraints, prior best efforts to secure financing, and a plan to prospectively restore the prior level measurable goal implementation. The Co-Permittees will identify the measurable goals proposed to be delayed and will discuss program priorities and funding limitations with Regional Water Board staff. Proposed modifications of the Management Plan to delay the implementation of cost prohibitive measurable goals would then be proposed for consideration by the Regional Water Board at a duly noticed public hearing.

Regional Water Board staff has worked with the Co-Permittees in order to develop a Management Plan that meets the MEP criteria, would be consistent with the iterative BMP implementation process and would include measurable goals to evaluate program performance. The submitted Management Plan contains many significant improvements over the Management Plan for the previous permit term. However, Regional Water Board staff has identified several other tasks that are necessary to help improve storm water quality and meet the MEP criteria. These tasks are consistent with permit language in other MS4 permits in California and reflect current storm water management practices, and are being required in this Order.

The storm water permit program is dedicated to a process of continuous program review and improvement, which includes seeking new opportunities to control storm water pollution and to protect beneficial uses. The Co-Permittees have committed to working with other agencies and individuals to form mutually beneficial partnerships. The Co-Permittees will look for opportunities to obtain grants and other funding sources to improve their storm water program. The Co-Permittees are encouraged to conduct and document peer review of their control and evaluation programs to ensure that they are cost-effective and meet design goals. The Co-Permittees will conduct ongoing evaluations of each relevant element of their program and revise activities, control

measures and BMPs as deemed necessary. These reviews can provide an opportunity for local staff to benefit from the experience of other storm water professionals and to explore statewide and national storm water program models that have been shown to be successful in other areas. Any program modifications from this evaluation would be formally proposed for inclusion in the Management Plan and approved by the Regional Water Board in accordance with provisions of this Order.

It is the intent of Regional Water Board staff to perform, in coordination with the Co-Permittees and interested persons, an annual performance review and evaluation of the storm water program and its activities. The reviews are a useful means of evaluating overall storm water program effectiveness, implementation of measurable goals, and continuous improvement opportunities. The following areas will be evaluated:

(a) Overall Program effectiveness;

(b) Adherence to measurable goal schedules;

(c) Co-Permittees' coordination and implementation of watershed based management actions (e.g., flood management, new development and construction, industrial source controls, public information/participation, monitoring);

(d) Partnership opportunities with other local storm water programs; and

(e) Consistency in meeting MEP measures within the Program and with other compatible Regional, Statewide, and National municipal storm water management program elements, with respect to pollutants of concern.

Implementation of this Order

CEQA (Cal. Pub. Resources Code section 2100 et seq.) requires that public agencies consider the environmental impacts of the projects they approve for development. CEQA applies to projects that are considered discretionary (a governmental agency can use its judgment in deciding whether and how to carry out or approve a project (14 Cal. Code Regs., § 15357)) and does not apply to ministerial projects (the law requires a governmental agency to act on a project in a set way without allowing the agency to use its own judgment (14 Cal. Code Regs., § 15369)). A ministerial project may be made discretionary by adopting local ordinance provisions or imposing conditions to create decision-making discretion in approving the project. This process would change a ministerial permit into a discretionary permit. In the alternative, Co-Permittees may establish standards and objective criteria that mitigate the effects of storm water discharges that must be met to comply with this Order prior to the municipalities providing ministerial approvals for projects. For water quality purposes, regardless of whether approvals for projects that may cause storm water impacts are discretionary or ministerial, the Regional Water Board requires in this Order that all new development and significant redevelopment activity in specified categories incorporate storm water treatment requirements.

The objective of this Order is to protect the beneficial uses of receiving waters in that part of Sonoma County within the jurisdiction of the Regional Water Board. To meet this objective, the Order requires that BMPs will be implemented to reduce the discharge of pollutants in storm water to MEP, and achieve water quality objectives and standards. U.S.EPA envisioned that municipal storm water programs would be implemented in an iterative manner and improved with each iteration by using information and experience gained during the previous permit term. (*Interpretative Policy Memorandum on Reapplication Requirements for MS4 permits* - 61 Fed. Reg. 41697.) Municipalities are required to evaluate what is effective and make improvements in order to protect beneficial uses of receiving waters. This Order requires implementation of an effective combination of pollution control and pollution prevention measures, education, public outreach, planning, and implementation of source control BMPs and structural and treatment control BMPs. The prescribed BMPs combined with the performance objectives outlined in this Order have the purpose of attaining water quality objectives and standards (*Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*- 61 Fed. Reg. 43761).

The implementation of measures set forth in this Order is reasonably expected to reduce the discharge of pollutants conveyed in storm water and non-storm water discharges into receiving waters.

During the term of the Order, the Co-Permittees shall implement all necessary control measures to reduce pollutant(s) which may cause or contribute to water quality impairments, but for which TMDLs have not yet been developed or approved to eliminate the water quality impairment(s). Successful efforts to reverse MS4 related impairments during the permit term for such pollutants may avoid the need for a WLA or the need to develop a TMDL in the future.

This Order provides flexibility for Co-Permittees to petition the Regional Water Board Executive Officer to substitute a BMP program under this Order with an alternative BMP program, if they can provide information and documentation that the effectiveness of the alternative is equal to or greater than the prescribed BMP program in meeting the objectives of this Order.

Co-Permittees are to work cooperatively to control the contribution of pollutants from one portion of the MS4 to another portion of the system through inter-agency agreements or other formal arrangements.

Updating ordinances and approval processes is necessary in order for the Co-Permittees to control discharges to their MS4s. U.S.EPA supports updating ordinances and approval processes when it states “A crucial requirement of the NPDES storm water regulation is that a municipality must demonstrate that it has adequate legal authority to control the contribution of pollutants in storm water discharged to its MS4. […] In order to have an effective municipal storm water

management program, a municipality must have adequate legal authority to control the contribution of pollutants to the MS4. […] 'Control,' in this context, means not only to require disclosure of information, but also to limit, discourage, or terminate a storm water discharge to the MS4."[18]

The State Water Board amended the Policy for the Implementation of Toxics Standards In Inland Surface Waters, Enclosed Bays and Estuaries of California (State Implementation Policy – SIP) on February 24, 2005. This Order includes a Monitoring Program that incorporates Minimum Levels (MLs) established under the State Implementation Policy. The MLs represent the lowest quantifiable concentration for priority toxic pollutants that is measurable with the use of proper method-based analytical procedures and factoring out matrix interference. The SIP's MLs therefore represent the best available science for determining MLs and are appropriate for a storm water monitoring program. The use of MLs allows the detection of toxic priority pollutants at concentrations of concern using recent advances in chemical analytical methods.

This Order is not intended to prohibit the inspection for or abatement of vectors by the State Department of Health Services or local vector control agencies in accordance with CA Health and Safety Code, § 116110 et seq. Certain treatment control BMPs if not properly designed, operated or maintained may create habitats for vectors (e.g., mosquitoes and rodents). This Order contemplates that the Co-Permittees will closely cooperate and collaborate with local vector control agencies and the State Department of Health Services for the implementation, operation, and maintenance of treatment control BMPs in order to minimize the risk to public health from vector borne diseases.

This Order contemplates that Co-Permittees will ensure that implemented BMPs will not pose a safety or health hazard to the public. This Order contemplates that Co-Permittees will ensure that the maintenance of implemented BMPs will comply with all applicable health and safety regulations, such as, but not limited to requirements for worker entry into confined spaces under OSHA Safety and Training education, § 1926.21(b)(6)(i).

Receiving Water Limits and Water Quality Standards

The Receiving Water Limitations (RWL) language specified in this Order is consistent with language recommended by U.S.EPA and established in State Water Board Order 99-05, Own Motion Review of the Petition of Environmental Health Coalition to Review Waste Discharge Requirements Order No. 96-03, NPDES Permit No. CAS0108740, adopted by the State Water Board on June 17, 1999. The RWL in this Order require

[18] U.S.EPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

compliance with water quality standards, which is to be achieved through an iterative approach requiring the implementation of improved BMPs over time. Compliance with receiving water limits based on applicable water quality standards is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality standards and the creation of conditions of pollution.

The iterative BMP process requires the implementation of increasingly stringent BMPs until receiving water standards are achieved. This is necessary because implementation of BMPs alone cannot ensure attainment of receiving water quality standards. For example, a BMP that is effective in one situation may not be applicable in another. An iterative process of BMP development, implementation, and assessment is needed to promote consistent compliance with receiving water quality standards. If assessment of a given BMP confirms that the BMP is ineffective, the iterative process should be restarted, with redevelopment of a new BMP that is anticipated to result in compliance with receiving water quality standards.

The issue of whether storm water discharges from MS4s must meet water quality standards has been intensely debated in past years. The argument arises because CWA section 402(p) fails to clearly state that municipal dischargers of storm water must meet water quality standards. On the issue of industrial discharges of storm water, the statute clearly indicates that industrial dischargers must meet both:

(a) the technology based standard of “best available technology economically achievable (BAT)”; and
(b) applicable water quality standards.

On the issue of municipal discharges however, the statute states that municipal dischargers must meet:

(a) the technology-based standard of MEP; and
(b) “such other provisions that the Administrator or the State determines appropriate for the control of such pollutants.”

The statute fails, however, to specifically state that municipal dischargers must meet water quality standards. As a result, the municipal storm water dischargers have argued that they do not have to meet water quality standards, and that they only are required to meet MEP. Environmental interest groups maintain that not only do MS4 discharges have to meet water quality standards, but that MS4 permits must also comply with numeric effluent limitations for the purpose of meeting water quality standards. On the issue of water quality standards, U.S.EPA, the State Water Board, and the Regional Water Board have consistently maintained that MS4s must indeed comply with water quality standards. On the issue of whether water quality standards must be met by numeric effluent limits, U.S.EPA, the State Water Board (in Order Nos. WQ 91-03 and WQ 91-04), and the Regional Water Board have maintained that MS4

permits can contain narrative requirements for the implementation of BMPs in place of numeric effluent limits.[19]

In addition to relying on U.S.EPA's legal opinion concluding that MS4s must meet MEP and water quality standards, the State Water Board also relied on the CWA's explicit authority for States to require "such other provisions that the Administrator or the State determines appropriate for the control of such pollutants" in addition to the technology based standard of MEP. To further support its conclusions that MS4 permit dischargers must meet water quality standards, the State Water Board relied on provisions of the Water Code that specify that all waste discharge requirements must implement applicable Basin Plans and take into consideration the appropriate water quality objectives for the protection of beneficial uses.

The State Water Board first formally concluded that permits for MS4s must contain effluent limitations based on water quality standards in its Order No. WQ 91-03. In that Order, the State Water Board also concluded that it was appropriate for Regional Water Boards to achieve this result by requiring best management practices, rather than by inserting numeric effluent limitations into MS4 permits. Later, in Order No. WQ 98-01, the State Water Board prescribed specific precedent setting RWL language to be included in all future MS4 permits. This language specifically requires that MS4 dischargers meet water quality standards and allows for the use of narrative BMPs (increasing in stringency and implemented in an iterative process) as the mechanism by which water quality standards can be met.

In Order No. WQ 99-05, the State Water Board modified its RWL language in Order No. WQ 98-01 to meet specific objections by U.S.EPA (the modifications resulted in stricter compliance with water quality standards). State Water Board Order No. WQ 99-05 sets out receiving water limitations, based upon U.S.EPA's objection to the receiving water limitation language in Order No. WQ 98-01 and its adoption of alternative language. That alternative language requires permittees to comply with discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in discharges in accordance with the storm water management plan (SWMP), which is designed to achieve compliance with receiving water limitations, and other requirements of the permit. If exceedances of water quality objectives or water quality standards (collectively referred to as WQS) persist notwithstanding implementation of the SWMP and other requirements of the permit, the permittees must assure compliance with discharge prohibitions and receiving water limitations by complying with a procedure that implements an iterative process that requires modification of BMPs and updates to the SWMP. In this Order, the Regional

[19] For the most recent assessment, see Storm Water Panel Recommendations to the California State Water Resources Control Board, 2006. *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities.*

Water Board made a slight modification of the language from Order No. WQ 99-05. In that Order, the permittees are not required to repeat procedures for continuing or recurring exceedances of the same RWL unless directed by the Regional Water Board to develop additional BMPs. Based on the Regional Water Board staff's experience in the implementation of this section, the Regional Water Board changed the section to require that the Co-Permittees continue to implement the iterative process, using alternative BMPs or combination of BMPs unless otherwise directed by the Regional Water Board Executive Officer. The concern was that without the requirement to continue the iterative process unless otherwise directed, the Co-Permittees would stop the process of trying additional BMPs, and too much time would pass before the Regional Water Board would know of the continuing violation and be able to require additional BMPs. If, however, the Co-Permittees find that their efforts are futile, they can come to the Regional Water Board Executive Officer to request that they not be required to continue the iterative process.

In the 1999 case involving MS4 permits issued by U.S.EPA to several Arizona cities (*Defenders of Wildlife v. Browner*, 1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit upheld U.S.EPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of U.S.EPA's discretion rather than on the basis of strict compliance with the Clean Water Act. In other words, while holding that the Clean Water Act does not require all MS4 discharges to comply strictly with state water quality standards, the Court also held that U.S.EPA has the authority to determine that ensuring strict compliance with state water quality standards is necessary to control pollutants. On the question of whether MS4 permits must contain numeric effluent limitations, the court upheld U.S.EPA's use of iterative BMPs in place of numeric effluent limits.

On October 14, 1999, the State Water Board issued a legal opinion on the federal appellate decision and provided advice to the Regional Water Boards on how to proceed in the future. In the memorandum, the State Water Board concludes that the recent Ninth Circuit opinion upholds the authority of U.S.EPA and the State to (continue to) issue permits to MS4s that require compliance with water quality standards through iterative BMPs. Moreover, the memorandum states that "[…] because most MS4 discharges enter impaired water bodies, there is a real need for permits to include stringent requirements to protect those water bodies. As TMDLs are developed, it is likely that MS4s will have to participate in pollutant load reductions, and the MS4 permits are the most effective vehicles for those reductions." In summary, the State Water Board found that the Regional Water Boards should continue to include the RWL established in State Water Board Order No. WQ 99-05 in all future permits.

The issue of the RWL language was also central to the Building Industry Association's appeal of Order No. 2001-01 (San Diego MS4 permit). The Building Industry Association (BIA) contended that the MEP standard was a ceiling on what could be required of the Co-Permittees in implementing their storm water runoff management

programs, and that Order No. 2001-01's RWL requirements exceeded that ceiling. In other words, BIA argued that the Co-Permittees could not be required to comply with receiving water limitations if they necessitated efforts which went beyond the MEP standard. Again, the courts upheld the Regional Water Board's authority to require compliance with water quality standards in municipal storm water permits, without limitation. The Court of Appeal, Fourth Appellate District found that the Regional Water Board has "the authority to include a permit provision requiring compliance with water quality standards."[20] On further appeal by BIA, the California State Supreme Court declined to hear the matter.

While implementation of the iterative BMP process is a means to achieve compliance with WQS, it does not shield the discharger from enforcement actions for continued non-compliance with WQS. Consistent with U.S.EPA guidance,[21] regardless of whether or not an iterative process is being implemented, discharges that cause or contribute to a violation of water quality standards are in violation of Order No. R1-2009-0050.

Maximum Extent Practicable (MEP)

Under CWA section 402(p), municipalities are required to reduce the discharge of pollutants from their MS4s to the maximum extent practicable (MEP). This Order specifies requirements necessary for the Co-Permittees to comply with MEP. However, since MEP is a dynamic performance standard which evolves over time as storm water runoff management knowledge increases, the Co-Permittees' storm water runoff management programs must continually be assessed and modified to incorporate improved programs, control measures, BMPs, etc. in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of storm water runoff management program implementation is expected to ultimately achieve compliance with water quality standards.

To achieve the MEP standard, municipalities must employ whatever BMPs are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive. In selecting BMPs to achieve the MEP standard, the following factors may be useful to consider:

(a) Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
(b) Regulatory Compliance: Is the BMP in compliance with storm water regulations as well as other environmental regulations?

[20] Building Industry Association et al., v. State Water Resources Control Board (2004) 124 Cal.App.4th, 866 871.
[21] U.S.EPA, 1998. Jan. 21, 1998 correspondence, "State Board/OCC File A-1041 for Orange County," from Alexis Strauss to Walt Petit, and March 17, 1998 correspondence from Alexis Strauss to Walt Petit.

(c) Public Acceptance: Does the BMP have public support?
(d) Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?
(e) Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources, etc?

If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive BMPs, it is likely that MEP has not been met. On the other hand, if a municipal discharger employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost is prohibitive, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs that would address a pollutant source, or to pick a BMP based solely on cost, if that BMP would be clearly less effective. In selecting BMPs the municipality must make a serious attempt to comply, and practical solutions may not be easily dismissed. In any case, the burden is on the municipal discharger to show compliance with its permit. After selecting BMPs, it is the responsibility of the discharger to ensure that all BMPs are implemented.[22]

A definition of MEP is not provided in either the federal statute or regulations. The final determination regarding whether a municipality has reduced pollutants to the MEP can only be made by the Regional Water Board or the State Water Board, and not by the municipal discharger. While the Regional Water Board or the State Water Board ultimately defines MEP, it is the responsibility of the Co-Permittees to initially propose actions that implement BMPs to reduce pollution to the MEP. In other words, the Co-Permittees' storm water runoff management programs submitted in their Management Plan are the Co-Permittees' proposals of MEP. Their total collective and individual activities conducted pursuant to their storm water runoff management programs become their proposal for MEP as it applies both to their overall effort, as well as to specific activities. The Regional Water Board determined that additional activities and measurable goals were needed to meet the MEP standard. This Order provides a minimum framework to guide the Co-Permittees in meeting the MEP standard.

This Order contains new or modified requirements that are necessary to improve Co-Permittees' efforts to reduce the discharge of pollutants in storm water runoff to the MEP and achieve water quality standards. Some of the new or modified requirements, such as the LID requirements, are designed to specifically address these high priority water quality problems. Other new or modified requirements address program deficiencies that have been noted during inspections, report reviews, and other Regional Water Board and U.S.EPA contracted compliance assessment activities. The

[22] State Water Resources Control Board, 1993. Memo entitled Definition of Maximum Extent Practicable.

Co-Permittees are required to update and expand their storm water runoff management programs in order to improve their efforts to reduce the contribution of pollutants in storm water runoff to the MEP and meet water quality standards.

It is the Regional Water Board's responsibility to evaluate the proposed programs and specific BMPs to determine what constitutes MEP, using the above guidance and the court's 1994 decision in NRDC v. California Department of Transportation, Federal District Court, and Central District of California. The federal court stated that a Co-Permittee must evaluate and implement BMPs except where:

(a) other effective BMPs will achieve greater or substantially similar pollution control benefits;
(b) the BMP is not technically feasible; or
(c) the cost of BMP implementation greatly outweighs the pollution control benefits.

In the absence of a proposal acceptable to the Regional Water Board, the Regional Water Board will define MEP by requiring implementation of additional measures by the Co-Permittees.

The Co-Permittees' continual evolution in meeting the MEP standard is expected to achieve compliance with water quality standards. U.S.EPA has consistently supported this expectation. In its Interim Permitting Approach for Water Quality-Based Effluent Limitations (WQBELs) in Storm Water Permits, U.S.EPA states "the interim permitting approach uses best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for attainment of water quality standards."[23]

U.S.EPA reiterated its position in 1999, when it stated regarding the Phase II municipal storm water regulations that "successive iterations of the mix of BMPs and measurable goals will be driven by the objective of assuring maintenance of water quality standards" and "EPA anticipates that a permit for a regulated small MS4 operator implementing BMPs to satisfy the six minimum control measures will be sufficiently stringent to protect water quality, including water quality standards […]."[24]

Best Management Practices

The State Water Board finds in its Order No. WQ 98-01 that BMPs are effective in reducing pollutants in storm water runoff, stating that "implementation of BMPs [is] generally the most appropriate form of effluent limitations when designed to satisfy technology requirements, including reduction of pollutants to the maximum extent

[23] Federal Register/Vol. 61, No. 166/August 26, 1996/p. 43761.
[24] Federal Register/Vol. 64, No. 235/Wednesday, December 8, 1999/Rules and Regulations/p. 68753-68754.

practicable." A State Board Technical Advisory Committee Report further supports this finding by recommending "that nonpoint source pollution control can be accomplished most effectively by giving priority to [BMPs] in the following order:

(a) Pollution Prevention – implementation of practices that use or promote pollution free alternatives;
(b) Source Control – implementation of control measures that focus on preventing or minimizing storm water runoff from contacting pollution sources; and
(c) Treatment Control – implementation of practices that require treatment of polluted runoff either onsite or offsite."[25]

Pollution prevention, the reduction or elimination of pollutant generation at its source, is an essential aspect of BMP implementation. Fewer pollutants are available to be washed from urban areas when the generation of pollutants by urban activities is limited. Thus, pollutant loads in storm water discharges are reduced from these areas. In addition, there is no need to control or treat pollutants that are never generated. Furthermore, pollution prevention BMPs are generally more cost effective than removal of pollutants by treatment facilities or cleanup of contaminated media.[26,27]

In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. Water Code section 13263.3(a) also supports pollution prevention, stating "The Legislature finds and declares that pollution prevention should be the first step in a hierarchy for reducing pollution and managing wastes, and to achieve environmental stewardship for society. The Legislature also finds and declares that pollution prevention is necessary to support the federal goal of zero discharge of pollutants into navigable waters."

U.S.EPA also supports the utilization of a combination of BMPs to address pollutants in storm water runoff. For example, U.S.EPA has found there has been success in addressing illicit discharge related problems through BMP initiatives like storm drain stenciling and recycling programs, including household hazardous waste special collection days.[28]

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[25] State Water Board, 1994. Storm water runoff Technical Advisory Committee Report and Recommendations. Nonpoint Source Management Program.
[26] Devinny, J.S. et al. 2004. *Alternative Approaches to Stormwater Quality Control.* Prepared for the Los Angeles Regional Water Quality Control Board. Prepared for the California State Water Resources Control Board by the Office of Water Programs California State University, Sacramento. Available on-line at: http://www.owp.csus.edu/research/npdes/
[27] Schueler, T.R.., 2000. Center for Watershed Protection. Assessing the Potential for Urban Watershed Restoration, Article 142.
[28] 92 U.S.EPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System - Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges. 64 FR 68728.

This Order requires the use of specific BMPs shown to be effective for activities covered under this Order. The BMPs identified in this Order are technically feasible, practicable, and cost-effective. Consistent with Water Code section 13360, where an identified BMP may be impracticable on a particular site or for a specific activity, this Order includes a provision to select and implement an alternative BMP.

Economic Issues

The California Supreme Court ruled that although Water Code section 13263 requires the Water Boards to consider the factors set forth in Water Code section 13241 when establishing waste discharge requirements, when issuing an NPDES permit, the Water Boards may not consider the factors to justify imposing pollutant restrictions that are less stringent than the applicable federal regulations require (*City of Burbank v. State Water Resources Control Bd*., 35 Cal.4d, 618 (2005)). However, when the pollutant restrictions in an NPDES permit are more stringent than federal law, Water Code section 13263 requires that the Water Boards consider the factors described in Water Code section 13241. The requirements in this Order may be explicit or more specific than those enumerated in federal regulations under 40 CFR122.26 or in U.S.EPA guidance. However, the requirements have been prescribed to be consistent with the federal statutory mandates described in CWA § 402(p)(3)(B)(ii) and (iii) and the related federal regulations and court decisions. Consistent with federal law, all of the conditions in this Order could have been included in a permit adopted by U.S.EPA in the absence of the in lieu authority of California to issue NPDES permits. These requirements are necessary to reduce the discharges of pollutants to the maximum extent practicable, and to attain water quality standards. Hence they are not more stringent than federal law.

Economic discussions of storm water runoff management programs tend to focus on the significant costs incurred by municipalities in developing and implementing the programs. However, when considering the cost of implementing storm water runoff programs, it is also important to consider the alternative costs incurred by not fully implementing the programs, as well as the benefits which result from program implementation. For instance, unhealthful surface water quality conditions negatively affect residents, tourists, and related portions of the Sonoma County economy. It is very difficult to ascertain the true cost of implementation of the Co-Permittees' storm water runoff management programs because of inadequate detail in reporting program costs by the Co-Permittees. Despite these problems, efforts have been made to identify storm water runoff management program costs, which can be helpful in understanding the costs of program implementation.

<u>Estimates of Phase I Storm Water Program Costs</u>

U.S.EPA, the California Regional Water Boards, and the State Water Board have attempted to evaluate the costs of implementing municipal storm water programs. The

assessments demonstrate that true costs are difficult to ascertain and reported costs vary widely. Nonetheless, they provide a useful context for considering the costs of requirements within draft Order No. R1-2009-0050. In addition, reported fiscal analyses tend to neglect the costs incurred to municipalities when storm water runoff is not effectively managed. Such costs result from pollution, contamination, nuisance, and damage to ecosystems, property, and human health.

In 1999, U.S.EPA reported on multiple studies it conducted to determine the cost of storm water runoff management programs. A study of Phase II municipalities determined that the annual cost of the Phase II program was expected to be $9.16 per household. U.S.EPA also studied 35 Phase I municipalities, finding costs to be $9.08 per household annually, similar to those anticipated for Phase II municipalities[29].

A study on program cost was also conducted by the California Regional Water Quality Control Board, Los Angeles Region (LARWQCB), where program costs reported in the municipalities' annual reports were assessed. The LARWQCB estimated that average per household cost to implement the MS4 program in Los Angeles County was $12.50.

The State Water Board also recently commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study includes an assessment of costs incurred by Phase I MS4 permittees throughout the State to implement their programs. Annual cost per household in the study ranged from $18-46, with the City of Encinitas in San Diego County representing the upper end of the range.[30] The City of Encinitas's program cost can be considered as the high end of the spectrum for storm water runoff management program costs because the City has a consent decree with environmental groups regarding its program, and City of Encinitas has received recognition for implementing a superior program.

It is important to note that reported program costs are not all attributable to compliance with MS4 permits. Many program components, and their associated costs, existed before any MS4 permits were ever issued. For example, street sweeping and trash collection costs cannot be solely attributable to MS4 permit compliance, since these practices have long been implemented by municipalities and serve additional purposes. Therefore, true program cost resulting from MS4 permit requirements is some fraction of reported costs. The California State University, Sacramento study found that only 38 percent of program costs are new costs fully attributable to MS4 permits. The remainder of the program costs were either pre-existing or resulted from enhancement of pre-existing programs.

[29] Federal Register/Vol. 64, No. 235/Wednesday, December 8, 1999/Rules and Regulations. p. 68791-68792.
[30] State Water Board, 2005. NPDES Stormwater Cost Survey. p. ii.

Other Economic Considerations

Economic considerations of storm water runoff management programs cannot be limited only to program costs. Evaluation of programs requires information on the implementation costs and information on the benefits derived from environmental protection and improvement.[31] Attention is often focused on program costs, but the programs must also be viewed in terms of their value to the public.

For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by U.S.EPA to be $158-210.[32] This estimate can be considered conservative, since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. The California State University, Sacramento study corroborates U.S.EPA's estimates, reporting annual household willingness to pay for statewide clean water to be $180.[33]

The effect of storm water runoff on receiving waters can also influence the value of real estate in Sonoma County. Real estate marketing often includes access information to rivers, streams, and the ocean. This demonstrates the added value of healthy aquatic environments to property values. The real estate industry recognizes that home buyers are willing to pay for access to clean water environments. The ability to market water-based recreational activities is dependent on healthy water quality conditions.

Another important way to consider storm water runoff management program costs is to consider the implementation cost in terms of costs incurred by not improving the programs. Storm water runoff has been found to cause illness in people recreating in water near storm drains. Storm water runoff and its impact on receiving waters also affect tourism. Current waters impaired on the CWA 303d list as well as proposed draft listings for waters in Sonoma County, beach closures, and algae blooms are all likely to have a negative impact on recreational use of surface waters and on tourism.

Finally, it is important to consider the benefits of storm water runoff management programs in conjunction with their costs. A recent study conducted by the University of Southern California and University of California, Los Angeles assessed the costs and benefits of implementing various approaches for achieving compliance with the MS4 permits in the Los Angeles Region. The study found that non-structural systems would cost $2.8 billion but provide $5.6 billion in benefit. While these findings are not for the Sonoma County area, such cost/benefit analyses are still useful in evaluating the costs and benefits of storm water programs in our area. Such findings are corroborated by

[31] Ribaudo M.O. and D. Heelerstein. 1992, *Estimating Water Quality Benefits: Theoretical and Methodological Issues.* U.S. Department of Agriculture. Technical Bulletin No. 1808.
[32] Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.
[33] State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.

U.S.EPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.[34]

U.S.EPA Inspections

U.S.EPA contractors performed an inspection of the City of Santa Rosa's storm water programs on November 7 and 8, 2007. The contractors identified program deficiencies in the following areas: private construction; public construction; storm drain operation and maintenance; vehicle maintenance, material storage facilities, corporation yards management; and implementation of the post-construction treatment BMP guidance manual, BMP construction oversight, and maintenance and tracking of BMPs.

The conclusion of the inspection report[35] states, "[…] The information gathered during the inspection indicates that the City of Santa Rosa's MS4 program is being implemented, but that program element improvements are needed to ensure compliance. Based on the results of this inspection, additional routine inspections focusing on the Private Construction Element, Public Construction Activities Management, and SRA-SUSMP appear warranted."

U.S.EPA contractors performed an inspection of Sonoma County's and the Sonoma County Water Agency's storm water programs on November 27 and 28, 2007. The contractors identified program deficiencies in the following areas: private construction; public construction; storm drain operation and maintenance; vehicle maintenance, material storage facilities, corporation yards management; streets and road maintenance; illicit discharge detection and elimination; implementation of the post-construction treatment BMP guidance manual, BMP construction oversight, and maintenance and tracking of BMPs.

The conclusion of the inspection report states, "[…] The information gathered during the inspection indicates that the permittees' programs are being implemented, but that program element improvements are needed to ensure compliance."

Non-Storm Water Discharges

The discharge of wash waters, irrigation runoff, and other non-storm water flows as well as contaminated storm water may adversely impact public health and the environment. Pollutants contained in such discharges include organic material from food waste, oil and grease, sediment, pharmaceuticals, nutrients and toxic chemicals. Consistent with the requirement in 402(p)(3)(B)(ii) that municipalities effectively prohibit non-storm water discharges into storm sewers, this Order requires the proper use of BMPs to reduce or

[34] Federal Register/Vol. 64, No. 235/Wednesday, December 8, 1999/Rules and Regulations. P. 68791.
[35] Complete inspection reports are included in the file for review.

eliminate these discharges, and where they cannot be eliminated, decreases in the water quality impact of these discharges. The Co-Permittees are required to implement programs to eliminate or reduce the discharge of non-storm water discharges to the MS4 systems.

Currently, the Basin Plan prohibits discharges of waste during the dry season to surface waters. The Regional Water Board has adopted a Basin Plan amendment to allow certain non-storm water discharges (low threat discharges) to surface waters during the dry season, and shall be considered by the State Water Board, Office of Administrative Law and U.S.EPA. The Basin Plan amendment for low threat discharges requires that municipalities develop a BMP program for Executive Officer approval to eliminate or reduce non-storm water discharges in order for their non-storm water discharges to be compliant with the Basin Plan.

This Order requires the Co-Permittees to either prohibit non-storm water discharges to their MS4 or develop a BMP program for Executive Officer approval that minimizes or eliminates the volume and frequency of low threat discharges.

This Order includes a table (Table 1 in the Order) of potential low threat discharges that the Regional Water Board Executive Officer will consider for authorization based on a BMP program submitted by a Co-Permittee. The BMPs set out in Table 1 in the Order are to be applied during the discharge of authorized non-storm water discharges to the MS4 and require, where applicable, dechlorination of the discharge, prevention of erosion and control of sediment, and reduction of other harmful pollutants. The BMPs identified in Table 1 are technically feasible, practicable, and cost-effective. Consistent with Water Code section 13360, where an identified BMP may be impracticable on a particular site, this Order includes a provision to select and implement an alternative BMP.

Public Information and Participation Program (PIPP)

The implementation of an effective PIPP is a critical component of a storm water management program. While commercial and industrial facilities are traditionally subject to multiple environmental regulations and receive environmental protection guidance from multiple sources, the general public, in comparison, receives significantly less education in environmental protection. An effective PIPP is required because:

(a) Activities conducted by the public such as vehicle maintenance, improper household waste materials disposal, improper pet waste disposal and the improper application of fertilizers and pesticides have the potential to generate a significant amount of pollutants that could be discharged in storm water.

(b) An increase in public knowledge of storm water regulations, proper storage and disposal of household wastes, proper disposal of pet wastes and appropriate home vehicle maintenance practices can lead to a significant reduction of pollutants discharged in storm water.

The State Water Board Technical Advisory Committee "recognizes that education with an emphasis on pollution prevention is the fundamental basis for solving nonpoint source pollution problems."

U.S.EPA's Public Participation/Involvement Minimum Control Measure Fact Sheet finds that public education and outreach involves using effective mechanisms and programs, guided by a detailed outreach strategy, to engage the public's interest in preventing storm water pollution. A key factor to consider when developing a strategy is that the public has varying levels of background knowledge of both storm water management and their role in reducing storm water pollution. Furthermore, the public can provide valuable input and assistance to a municipal storm water management program and, therefore, should play an active role in the development and implementation of the program. An active and involved community is essential to the success of a storm water management program because it allows for:

(a) Broader public support since residents who participate in the development and decision making process are partially responsible for the program and, therefore, are more likely to take an active role in its implementation;
(b) Shorter implementation schedules due to fewer obstacles in the form of public and legal challenges and increased resources in the form of residents and volunteers;
(c) A broader base of expertise and economic benefits since the community can be a conduit to other valuable, and free, intellectual resources; and
(d) Public involvement in the storm water program development process that makes important cross connections and builds relationships with other community and government programs.

The US EPA Phase II Fact Sheet 2.3 (Fact Sheet 2.3) finds that "An informed and knowledgeable community is critical to the success of a storm water management program and results in greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters."

This Order requires Co-Permittees to participate in watershed protection groups or citizen advisory groups or committees. The intent of this requirement is to solicit public input for messages and information that will persuade the public to modify their common activities to reduce or prevent pollutants from being discharged in storm water. A paper presented by David Galvin during the 4th National Conference Nonpoint Source and Stormwater Pollution Education Programs October 17-20, 2005, "Measuring Results from Outreach and Education Programs: Can We See Improvements Downstream?" states, "Experiential programs appear to be more powerful than information campaigns, more likely to connect people with their watershed. Activities such as citizen volunteer monitoring, hands-on restoration, storm-drain stenciling projects, and other ways to get an experiential element incorporated into the program have a greater likelihood of

success. Get peoples' feet wet and their hands dirty. Once they have invested in the watershed, even in a tiny part of it, they will have more ownership." Direct feedback from the public on storm water pollution prevention messages can be an inexpensive alternative to traditional surveys and studies as well as promoting increased public support for storm water pollution prevention campaigns.

This Order requires an increase in media impressions and identifies the media venues. The intent of these changes is to provide an increase in public knowledge of storm water pollution prevention practices in an effective and cost effective manner. An increase in the frequency of storm water pollution prevention messages contributes to the likelihood that these messages will be remembered.

This Order requires outreach to ethnically diverse communities. According to U.S.EPA, (in Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children Fact Sheet), "many residents of ethnically and culturally diverse communities don't speak English. English messages contained in public education outreach materials may not be effectively reaching a significant portion of some communities." The intent of this provision is to encourage behavior changes that reduce pollutants in storm water to a portion of the population who might otherwise be overlooked.

This Order requires the Co-Permittees to work with other regional and/or statewide agencies and associations such as the California Storm Water Quality Association (CASQA), to develop a corporate outreach program to educate and inform corporate and local managers about storm water regulations and BMPs. The intent of this provision is to ensure that management is aware of the potential impacts their business can have on storm water quality, facilitate compliance with storm water requirements, and give management sufficient guidance to train staff throughout their business on appropriate practices to mitigate the potential water quality impacts of their operations.

Industrial and Construction Site Regulation

U.S.EPA finds the control of pollutant discharges from industrial and construction sites so important to receiving water quality that it has established a dual (state and local) storm water regulation system. Under this dual system, each Co-Permittee is responsible for enforcing its local permits, plans, and ordinances, and the Regional Water Board is responsible for enforcing the General Construction Activities Storm Water Permit, State Water Board Order 99-08 DWQ, NPDES No. CAS000002 (General Construction Permit) and the General Industrial Activities Storm Water Permit, State Water Board Order 97-03 DWQ, NPDES No. CAS000001 (General Industrial Permit).

These two regulatory systems are designed to complement and support each other. Municipalities are not required to enforce Regional Water Board and State Water Board permits; however, they are required to enforce their ordinances and permits. The Federal regulations are clear that municipalities have responsibility to address runoff

from industrial and construction sites which enters their MS4. Municipalities have this responsibility because they have the authority to issue land use and development permits. Since municipalities are the lead permitting authority for industrial land use and construction activities, they are also the lead for enforcement regarding runoff discharges from these sites. For sites where the municipality is the lead permitting authority, the Regional Water Board will work with the municipality and provide support where needed. The Regional Water Board will assist municipalities in enforcement against non-compliant sites after the municipality has exhibited a good faith effort to bring the site into compliance.

U.S.EPA discusses the "dual regulation" of construction sites in its Storm Water Phase II Compliance Assistance Guide, which states "Even though all construction sites that disturb more than one acre are covered nationally by an NPDES storm water permit, the construction site runoff control minimum measure […] is needed to induce more localized site regulation and enforcement efforts, and to enable operators […] to more effectively control construction site discharges into their MS4s."

NPDES municipal regulations require that municipalities develop and implement measures to address runoff from industrial and construction activities. Those measures may require the implementation of additional BMPs than are required under the statewide general permits for activities subject to both state and local regulation.

Inspections provide a necessary means for the Co-Permittees to evaluate compliance of pollutant sources with their municipal ordinances and minimum BMP requirements. U.S.EPA recommends inspections of construction, municipal, and industrial sources. Inspection of high risk sources are especially important because of the ability of frequent inspections to help ensure compliance, thereby reducing the risk associated with such sources. U.S.EPA suggests that inspections can improve compliance when it states "Effective inspection and enforcement requires […] penalties to deter infractions and intervention by the municipal authority to correct violations."[36]

Industrial/Commercial Facilities Program

Industrial sites are significant sources of pollutants in storm water runoff. Pollutant concentrations and loads in runoff from industrial sites are similar or exceed pollutant concentrations and loads in runoff from other land uses, such as commercial or residential land uses. In an extensive review of storm water literature, the Los Angeles Regional Water Board found widespread support for the finding that "industrial and commercial activities can also be considered hot spots as sources of pollutants." It also

[36] U.S.EPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.

found that "industrial and commercial areas were likely to be the most significant pollutant source areas" of heavy metals.

These findings are corroborated by U.S.EPA, which states in the preamble to the 1990 Phase I NPDES storm water regulations that "Because storm water from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for storm water discharges associated with industrial activity through their system in their storm water management program."

The Phase I NPDES storm water regulations require the Co-Permittees to "control through ordinance, permit, contract, order, or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity" (40 CFR 122.26(d)(2)(i)). In addition, it has been established that the MEP standard for the control of storm water runoff from new development projects includes incorporation of the Standard Urban Stormwater Mitigation Plan (SUSMP) requirements. Since the Co-Permittees must both control pollutants from industrial sites and meet the MEP standard for new development, it is appropriate to apply the SUSMP requirements to industrial sites. As with other land uses, LID site design, source control, and treatment control BMPs are needed at industrial sites in order to meet the MEP standard.

Studies indicate that facilities with paved surfaces subject to frequent motor vehicular traffic (such as strip malls, parking lots, commercial business parks, and fast food restaurants), or facilities that perform vehicle repair, maintenance, or fueling (automotive service facilities) are potential sources of POCs in storm water.

Identification of sources of pollutants in storm water runoff (such as municipal areas and activities, industrial and commercial sites and sources, construction sites, and residential areas), development and implementation of BMPs to address those sources, and updating ordinances and approval processes are necessary for the Co-Permittees to ensure that discharges of pollutants into and from its MS4 are reduced to the MEP. Inspections and other compliance verification methods are needed to ensure minimum BMPs are implemented. Inspections are especially important at high risk areas for pollutant discharges.

Source identification is necessary to characterize the nature and extent of pollutants in discharges and to develop appropriate BMPs. It is the first step in a targeted approach to storm water runoff management. Source identification helps detect the location of potential sources of pollutants in urban runoff. Pollutants found to be present in receiving waters can then be traced to the sites which frequently generate such pollutants. In this manner source inventories can help to target inspections, monitoring, and potential enforcement. This allows for limited inspection, monitoring, and

enforcement time to be most effective. U.S.EPA supports source identification as a concept when it recommends construction, municipal, and industrial source identification in guidance and the federal regulations.[37,38]

The development of BMPs for identified sources will help ensure that appropriate, consistent controls are implemented at all types of industrial development areas. Co-Permittees must reduce the discharge of pollutants in storm water runoff to the maximum extent practicable. To achieve this level of pollutant reduction, BMPs must be implemented. Designation of minimum BMPs helps ensure that appropriate BMPs are implemented for various sources. These minimum BMPs also serve as guidance as to the level of water quality protection required. U.S.EPA requires development and implementation of BMPs for construction, municipal, commercial, industrial, and residential sources at 40 CFR 122.26(d)(2)(iv)(A-D).

This Order incorporates presumptive BMPs to reduce pollutants in storm water discharges from commercial and industrial sites to the MEP. The BMPs are identified in the Order in Table 4 (BMPs at Restaurants), Table 5 (BMPs at Automotive Service Facilities), Table 6 (BMPs at Retail Gasoline Outlets), and Table 7 (BMPs at Nurseries). These BMPs include the implementation of good housekeeping practices designed to control pollutants at the source, promote the use of proper waste management practices, and implement control practices to keep pollutants away from any entrance to the storm drainage system. The BMPs listed in Part 3 of the Order were selected based on the Water Boards' experience of regulating such sites since 1992 and referenced in the CASQA Storm Water Best Management Practice Handbook Commercial/Industrial Activity, which serves as an industry standard for California. The BMPs identified in the Tables are technically feasible, practicable, and cost-effective. Consistent with Water Code section13360, where an identified BMP may be impracticable on a particular site, this Order includes a provision to select and implement an alternative BMP.

Specific categories of industries and businesses listed in this Order that are to be inspected by the Co-Permittees have the potential to discharge contaminated storm water and non-storm water into the MS4, which is an environmental threat because it can adversely impact public health and safety and the quality of receiving waters. For example, pretreatment program compliance inspections and audits performed in Sonoma County indicate that automotive service and food service facilities have discharged polluted storm water and non-storm water to the MS4s. The pollutants of concern in such runoff include oil and grease, toxic chemicals, trash and food waste. This Order contains specific inspection requirements and lists types of BMPs to be implemented at these sources.

[37] U.S.EPA, 1992. Guidance Manual for the Preparation of Part II of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems. EPA 833-B-92-002.
[38] 40 CFR 122.26(d)(2)(ii).

Planning and Land Development Program

Post-Construction BMPs and Land Development

Post-construction land development control requirements on new development and redevelopment offer the most cost-effective strategy to reduce pollutant loads to surface waters. Retrofit of existing development will be expensive and may be necessary with the development of TMDLs. Studies on the economic impacts of watershed protection indicate that storm water quality management has a positive or at least neutral economic effect while greatly improving the quality of surface waters.[39]

The U.S.EPA storm water regulations at 40 CFR 122.26 require that pollutants in storm water be reduced to MEP. The U.S.EPA's definition is intentionally broad to provide maximum flexibility in MS4 permitting and to give municipalities the opportunity to optimize pollutant reductions on a program-to-program basis.[40] It is recommended that storm water BMPs be designed to manage both flows and water quality for best performance.[41] It is equally important that treatment control BMPs once implemented are routinely maintained.

Financing the MS4 program offers a considerable challenge for municipalities. A proven successful financing mechanism is the establishment of a storm water utility.[42] Utility fees, which are assessed on the property owner based on some estimate of storm water runoff generated for the site, are a predictable and dedicated source of funds. Utility fees can also provide a mechanism to provide incentives to commercial and industrial property owners to reduce impervious surface areas. Such incentives offer flexibility to property owners to choose the better economic option, paying more fees or making improvements to reduce runoff from the site.

The American Society of Civil Engineers (ASCE) and the Water Environment Federation (WEF) have recommended a numerical BMP design standard for storm water that is derived from a mathematical equation to maximize treatment of runoff volume for water quality based on rainfall/runoff statistics and which is economically

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[39] *The Economics of Watershed Protection*, T. Schueler (1999), Center for Watershed Protection, Endicott, MD. The article summarizes nationwide studies to support the statement that watershed planning and storm water management provides positive economic benefits.
[40] *Storm Water Phase II Final Rule* – Pre-Federal Register Version, p 87 (U.S.EPA 1999). See U.S.EPA's discussion in response to challenges that the definition is sufficiently vague to be deemed adequate notice for purposes of compliance with the regulation.
[41] *Storm water runoff Pollution – Summary Thoughts* – The State of Practice Today and for the 21st Century. Wat. Sci. Tech. 39(2) p. 353-360. L.A. Roesner (1999).
[42] *Preliminary Data Summary of Urban Storm Water Best Management Practices* (1999), Report No. U.S.EPA-821-R-99-012, U.S.EPA. The document reviews municipal financing mechanisms and summarizes experience in the U.S. to date.

sound.[43] The maximized treatment volume is cut off at the point of diminishing returns for rainfall/runoff frequency. On the basis of this equation the maximized runoff volume for eighty-five percent treatment of annual runoff volumes in California can range from 0.08 to 0.86 inches depending on the imperviousness of the watershed area and the mean rainfall.[44]

Other methods of establishing numerical BMP design standards include:
(a) Percent treatment of the annual runoff;
(b) Full treatment of runoff from rainfall event equal to or less than a predetermined size; and
(c) Percent reduction in runoff based on a rainfall event of standard size.[45]

These numerical design standards have been applied to Development Planning in Puget Sound, WA; Alexandria, VA; Montgomery County, MD; Denver, CO; Orlando, FL; Portland, OR; and Austin, TX. Some States have established numerical standards for sizing storm water post-construction BMPs for new development and significant redevelopment. The State of Maryland has established storm water numerical criteria for water quality of 0.9 to 1 inch, and BMP design standards in a unified approach combining water quality, stream erosion potential reduction, groundwater recharge, and flood control objectives.[46] The State of Florida has used numerical criteria to require treatment of storm water from new development since 1982, including BMPs sized for 80 percent reduction (95 percent for impaired waters) in annual TSS loads derived from the 90 percent (or greater for impaired waters) annual runoff treatment volume method for water quality.[47] The State of Washington has proposed at least six different approaches of establishing storm water numerical mitigation criteria for new development that adds 10,000 square feet of impervious surface or more for residential development and 5,000 square feet of impervious surface or more for other types of development.[48]

On a national level, U.S.EPA is planning to standardize minimum BMP design and performance criteria for post-construction BMPs, and will likely build from the

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[43] In Storm Water Runoff Quality Management, WEF Manual of Practice No. 23, ASCE Manual and Report on Engineering Practice No. 87. WEF, Alexandria, VA; ASCE, Reston, VA. 259 pp. (1998).
[44] Sizing and Design Criteria for Storm Water Treatment Controls, Presentation to California Storm Water Quality Task Force, November 13, 1998, Sacramento, CA. L.A. Roesner, Camp Dresser McKee.
[45] Sizing and Design Criteria for Storm water Quality Infrastructure, Presentation at California Regional Water Quality Control Board Workshop on Standard Urban Storm Water Mitigation Plans, August 10, 1999, Alhambra, CA, R.A. Brashear, Camp Dresser McKee.
[46] *Maryland Storm Water Design Manual* - (Maryland Department of the Environment 2000).
[47] *Florida Development Manual: A Guide to Sound Land and Water Management* (Florida Department of Environmental Protection). The manual describes structural and non-structural construction and post-construction BMP design criteria.
[48] Storm Water Management in Washington State Volumes 1 – 5. (Washington Department of Ecology 2001).

experience of effective state and local programs to establish national criteria.[49] The U.S.EPA, based on the NURP, supports the first half-inch of rainfall as generating first flush runoff.[50] First flush runoff is associated with the highest pollutant concentrations, and not pollutant load. The U.S.EPA considers the first flush treatment method, the rainfall volume method, and the runoff capture volume method as common approaches for sizing of water quality BMPs.

This Order promotes a land development and redevelopment strategy that considers the water quality and water management benefits associated with smart growth techniques. Such measures include hydromodification mitigation requirements, minimization of impervious surfaces, integrated water resources planning, and low impact development guidelines. (References: *Protecting Water Resources with Smart Grow*th, EPA 231-R- 04-002, U.S.EPA 2004; *Using Smart Growth Techniques as Storm Water Best Management Practices,* EPA 231-B-05-002, U.S.EPA 2005; *Parking Spaces/Community Places: Finding the Balance through Smart Growth Solutions*, EPA 231-K-06-001, U.S.EPA 2006; *Protecting Water Resources with Higher-Density Development*, EPA 231-R-06-001, U.S.EPA 2006.)

Local Land Use Authority and Water Quality

Storm water runoff needs to be addressed during the three major phases of development (planning, construction, and use) in order to reduce the discharge of pollutants to the MEP and protect receiving waters. Urban development which is not guided by water quality planning policies and principles can unnecessarily result in increased pollutant load discharges, flow rates, and flow durations which can impact receiving water beneficial uses. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. Existing development generates substantial pollutant loads which are discharged in storm water runoff to receiving waters.

Most municipalities have land use authority and make planning decisions based on that authority. The ultimate responsibility for the pollutant discharges, increased runoff, and inevitable long-term water quality degradation that results from urbanization lies with local governments. This responsibility is based on the fact that it is the local governments that have authorized the urbanization (i.e., conversion of natural pervious ground cover to impervious urban surfaces) and the land uses that generate the pollutants and runoff. Furthermore, the MS4 through which the pollutants and increased flows are conveyed, and ultimately discharged into natural receiving waters, are owned

[49] 1 *Storm Water Phase II Final Rule* – 64 Fed. Reg. 68759. See U.S.EPA's discussion on construction and post-construction BMP requirements for Phase II.
[50] *A Watershed Approach to Storm water runoff: Handbook for Decision makers*, Terrene Institute and U.S.EPA Region 5 (1996). See discussion on sizing rules for water quality purposes, p 36.

and operated by the same local governments. In summary, the Co-Permittees under this Order are responsible for discharges into[51] and out of their MS4s because:

(a) They own and operate the MS4; and
(b) They have the legal authority that authorizes the very development and land uses which generate the pollutants and increased flows in the first place.

For example, since grading cannot commence prior to the issuance of a local grading permit, the Co-Permittees have a built-in mechanism to ensure that all grading activities are protective of receiving water quality. A Co-Permittee has the authority to withhold issuance of the grading permit until the project proponent has demonstrated to the satisfaction of the Co-Permittee that the project will not violate their ordinances or cause the Co-Permittee to be in violation of its MS4 permit. Since the Co-Permittee will ultimately be held responsible for any discharges from its MS4 by the Regional Water Board, the Co-Permittee will want to use its own permitting authority to ensure that whatever measures the Co-Permittee deems necessary to protect discharges into its MS4 are in fact taken by the project proponent.

This Order holds the local government accountable for this direct link between its land use decisions and water quality degradation. This Order recognizes that each of the three major stages in the urbanization process (development planning, construction, and the use or operational stage) are controlled by and must be authorized by the local government. Accordingly, this Order requires the local government to implement, or require others to implement, appropriate best management practices to reduce the discharges of pollutants and increased flow from each of the three stages of urbanization. Including plans for BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce storm water runoff pollutant loads to surface waters.[52]

U.S.EPA expands on this and recommends that Co-Permittees: "Adopt a planning process that identifies the municipality's program goals (e.g., minimize water quality impacts resulting from post-construction runoff from new development and redevelopment), implementation strategies (e.g., adopt a combination of structural and/or non-structural BMPs), operation and maintenance policies and procedures, and enforcement procedures. In developing your program, you should consider assessing existing ordinances, policies, programs and studies that address storm water runoff

[51] This Order's approach to regulating discharges into and from the MS4 is in accordance with State Water Board Order WQ 2001-15. In that order, the State Water Board reviewed the San Diego County permit (Order No. 2001-01) requirements and removed the prohibition of discharges *into* the MS4 that cause or contribute to exceedances of water quality objectives. The revision allows for treatment of storm water flows once the pollutants have entered the MS4. It does not affect the effective prohibition on certain dry-weather flows into the MS4 that is required by the Clean Water Act and the Basin Plan.
[52] U.S.EPA, 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

quality." The program must also ensure the adequate long-term operation and maintenance of BMPs.[53]

The project size criteria in this Order that requires the implementation of post-construction storm water treatment BMPs is smaller than required by the Phase II regulations to reflect the expectations that Phase I municipalities have a more mature program, have a more severe adverse impact to water quality due to their larger size, and the local reality that we should not allow new sources of pollution into our many impaired waters.

Low Impact Development

This Order requires preferential consideration of LID techniques in order to mitigate storm water quality and quantity impacts from new development. LID is a development site design strategy with a goal of maintaining or reproducing the pre-development hydrologic system through the use of design techniques to create a functionally equivalent hydrologic setting. Hydrologic functions of storage, infiltration, and ground water recharge, as well as the volume and frequency of discharges, are maintained through the use of integrated and distributed small scale storm water retention and detention areas, reduction of impervious surfaces, and the lengthening of flow paths and runoff time. Other LID strategies include the preservation and protection of environmentally sensitive site features such as riparian buffers, wetlands, steep slopes, valuable trees, flood plains, woodlands, native vegetation and permeable soils. Other benefits from LID implementation include reducing global warming impacts from new development (preserving carbon sequestering in native soils and retaining native vegetation), increasing water supply (by encouraging ground water recharge) and reducing energy consumption.

The use of LID site design BMPs helps reduce the amount of impervious area associated with urbanization and allows storm water to infiltrate into the soil. Natural vegetation and soil filters storm water runoff and reduces the volume and pollutant loads of storm water. Studies have revealed that the level of imperviousness resulting from urbanization is strongly correlated with the water quality impairment of nearby receiving waters.[54] In many cases, the impacts on receiving waters due to changes in hydrology can be more significant than those attributable to the contaminants found in storm water discharges. These impacts include stream bank erosion (increased sediment load and subsequent deposition), benthic habitat degradation, and decreased diversity of

[53] U.S.EPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System-Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule. 64 FR 68845.
[54] U.S.EPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.

macroinvertebrates. Although conventional BMPs do reduce pollutant loads, they may not effectively control adverse effects from changes in the discharge hydrologic conditions.[55]

Open space designs which maximize pervious surfaces and retention of "natural" drainages have been found to reduce both the costs of development and pollutant export.[56] Moreover, U.S.EPA finds including plans for a "natural" site design and BMP implementation during the design phase of new development and redevelopment offers the most cost effective strategy to reduce pollutant loads to surface waters.[57] In addition, a recent U.S. Department of Housing and Urban Development guidance document on LID notes that the use of LID-based storm water management design allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts.[58]

As a result of the adverse effects to water quality and beneficial uses, the State of California nonpoint source pollution program includes management measures for urban areas limiting the destruction of natural drainage features and natural conveyance areas.[59] Through its process of conditioning development projects under the CWA section 401 Water Quality Certification program, the Regional Water Board has found that the level of LID and post-construction BMP implementation required by this Order is feasible for all projects. LID BMPs are a critical component of storm water runoff management at new development projects and provide multiple benefits including preservation of hydrologic conditions, reduction of pollutant discharges, cost effectiveness, and green space.

LID options do not need to be costly.[60] Some design options, such as concave vegetated surfaces or routing rooftop or walkway runoff to landscaped areas, are cost neutral.[61] Other LID BMPs, such as minimizing parking stall widths or use of efficient irrigation devices, are often already required. In addition, use of LID BMPs reduces

[55] U.S.EPA, 2000. Low-Impact Development: A literature review. EPA-841-B-00-005, p. 35.
[56] Center for Watershed Protection, 2000. "The Benefits of Better Site Design in Residential Subdivisions." Watershed Protection Techniques. Vol. 3. No. 2.
[57] U.S.EPA, 1999. 40 CFR Parts 9, 122, 123, and 124 National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges; Final Rule.
[58] U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2003. "The Practice of Low Impact Development." Prepared by: NAHB Research Center, Inc. Upper Marlboro, Maryland. Contract No. H-21314CA. 131p.
[59] California Nonpoint Source Encyclopedia, Management Measure 3.1.b. Runoff from Developing Areas, Site Development and Management Measure 3.3.a. Runoff from Existing Development.
[60] U.S.EPA, 2000. Low-Impact Development: A literature review. EPA-841-B-00-005. 35p.
[61] Bay Area Stormwater Management Agencies Association, 1999. Start at the Source. Forbes Custom Publishing. Available on-line at: http://www.scvurppp-w2k.com/basmaa_satsm.htm. p. 149.

runoff quantity, allowing for treatment control BMPs and other storm water infrastructure on site to be smaller, therefore savings costs for both developers and municipalities.[62,63]

Because of the potential economic and environmental benefits of using LID site design, the U.S. Department of Housing and Urban Development, Office of Policy Development and Research, developed "*The Practice of Low Impact Development (LID)*" to assist the housing industry during the land development process.[64] This document focuses specifically on technologies that affect both the cost impacts and environmental issues associated with land development. Much of the report focuses on storm water management because LID storm water management systems can save capital costs for developers and maintenance costs for municipalities. The executive summary of the HUD report states, "This approach to land development, called LID, uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. LID still allows land to be developed, but in a cost-effective manner that helps mitigate potential environmental impacts."

This Order recognizes that there will be an increase in discharges of storm water and pollutants discharged through storm water sewer systems because of continuing development within the Co-Permittees' jurisdiction, and it is therefore possible that future degradation of receiving water quality may occur. The continued revisions and implementation of each Co-Permittees' Management Plan in compliance with this Order will reduce the potential for discharges from MS4s to cause degradation of receiving water quality. In addition, other measures implemented by the Management Plan are intended to reduce the impacts of storm water runoff from areas of existing development. The Co-Permittees shall continue to look for additional opportunities to reduce pollutants discharged from the MS4 system. This Order is therefore consistent with applicable antidegradation provisions of 40 CFR 131.12 and the State Water Board Resolution 68-16.

<u>New Development Standards</u>

Santa Rosa Area Standard Urban Stormwater Mitigation Plan (SRA-SUSMP)

On October 5, 2000, the State Water Board adopted Order No. WQ 2000-11, a precedential decision upholding the use of SUSMPs in MS4 permits for new

[62] National Association of Home Builders Research Center. *Builders Guide to Low Impact Development.* Available on-line at http://www.toolbase.org.
[63] National Association of Home Builders Research Center. *Municipal Guide to Low Impact Development.* Available on-line at http://www.toolbase.org
[64] U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2003. *The Practice of Low Impact Development."* Prepared by: NAHB Research Center, Inc. Upper Marlboro, Maryland. Contract No. H-21314CA.

development and significant redevelopment projects. Regional Water Board orders are required to be consistent with applicable portions of the State Water Board's precedential decisions. The program developed by the Co-Permittees in their current permit is referred to as the SRA-SUSMP. The existing SRA-SUSMP requires design review and post-construction storm water treatment only for large projects (one acre or more). Consistent with the storm water program goals of requiring iterative improvements to storm water quality, this Order will require new development controls for smaller projects, based on land use categories. The SRA-SUSMP shall also be revised during this permit term to prioritize post-construction storm water treatment BMPs for their efficacy in removing POCs, to include guidance on LID, and to minimize hydromodification.

Federal regulations (40 CFR 131.10(a)) prohibit states from designating waste transport or waste assimilation as a beneficial use for any water of the United States. Authorizing the construction of a storm water runoff treatment facility in a water body may be considered as accepting waste assimilation as an appropriate use for that water body. Furthermore, the construction and operation of a pollution control facility in a water body can impact the physical, chemical, and biological integrity as well as the beneficial uses of the water body. Therefore, storm water treatment and/or mitigation in accordance with the SRA-SUSMP and any other requirements of this Order must occur prior to the discharge of storm water pollutants into surface waters.

Co-Permittees are responsible for adopting and enforcing local SRA-SUSMP ordinances necessary to implement effective BMPs to prevent or reduce pollutants in storm water as a result of new development or redevelopment, in public and private projects within their jurisdiction. The Co-Permittees are also responsible for ensuring that adequate permit conditions or funding is in place to cover costs associated with construction, operation, and maintenance of storm water treatment BMPs. This requirement may be implemented by placing conditions into project approvals to implement SRA-SUSMP ordinances and to provide for the long-term operation and maintenance of storm water control measures that are implemented. Projects requiring only ministerial approvals can be required to prove compliance with pre-existing criteria before development is allowed. Regardless of whether approvals are discretionary or ministerial, compliance with this Order is required.

In the precedential order WQ Order 2000-11, the State Water Board found that the design standards that essentially require that storm water runoff generated by 85 percent of storm events from specific development categories be infiltrated or treated, reflect the MEP standard. This Order also finds that the SUSMP requirements are appropriately applied to the development categories in Part 4 – Planning and Land Development Program.

Retail Gasoline Outlets (RGOs)

Retail Gasoline Outlets (RGOs) are points of convergence for vehicular traffic and are similar to parking lots and urban roads. Studies indicate that storm water discharges from RGOs have high concentrations of hydrocarbons and heavy metals. New development projects that have areas of high vehicle use are identified in this Order for implementation of post-construction storm water treatment BMPs. To meet MEP, source control and structural treatment BMPs are needed at RGOs that develop or redevelop 10,000 square feet of impervious surface. These are appropriate thresholds since development size is a good indicator of potential impacts of RGO storm water runoff on receiving waters.

This requirement has been added to satisfy direction included in State Water Board WQ Order No. 2000-11 for including RGOs as a priority development category. Order No. 2000-11 acknowledged that a threshold (size, average daily traffic, etc.) appropriate to trigger SUSMP requirements should be developed for RGOs and that specific findings regarding RGOs should be included in MS4 permits to justify the requirement.

Development Construction Program

Soil disturbing activities during construction and demolition exacerbate sediment losses. Sediment is a primary pollutant impacting beneficial uses of watercourses. Sediments and other construction activity pollutants must be properly controlled to reduce or eliminate adverse impacts.

U.S.EPA explains in the preamble to the Phase II regulations that storm water discharges generated during construction activities can cause an array of physical, chemical, and biological water quality impacts. Specifically, the biological, chemical and physical integrity of the waters may become severely compromised due to runoff from construction sites. Fine sediment from construction sites can adversely affect aquatic ecosystems by reducing light penetration, impeding sight-feeding, smothering benthic organisms, abrading gills and other sensitive structures, reducing habitat by clogging interstitial spaces within the streambed, and reducing intergravel dissolved oxygen by reducing the permeability of the bed material. Water quality impairment also results, in part, because a number of pollutants are preferentially absorbed onto mineral or organic particles found in fine sediment. The interconnected process of erosion (detachment of the soil particles), sediment transport, and delivery is the primary pathway for introducing key pollutants such as nutrients, metals, and organic compounds into aquatic systems.

This Order includes requirements for grading restrictions for the wet season for projects that discharge to water bodies included in the CWA section 303(d) list for siltation, sediment or temperature and includes restrictions on grading on slopes 20 percent or

steeper. The Co-Permittees may grant an exception to these requirements, and the process to grant an exception is included in this Order. These grading restrictions are needed to protect impaired waters from sediment discharges from sites that because of their geography or geology cannot be controlled through the use of conventional BMPs during storm events. During storm water program audits, U.S.EPA contractors identified inadequate site regulation and erosion and sediment controls on several constructions sites in the Co-Permittees' jurisdiction.

This Order incorporates presumptive BMPs to reduce pollutants in storm water discharges from construction sites to the MEP. The BMPs are identified in Table 8 (BMPs at Construction sites less than 1 acre) and Table 9 (BMPs at Construction Sites 1 acre or greater). These BMPs include erosion control, sediment control, and construction site waste management practices. The BMPs listed in Part 8 of the Order were selected based on the Water Boards' experience of regulating such sites since 1992, and are referenced in the CASQA handbook and Caltrans BMP manuals which serve as an industry standard for California. The BMPs identified in the Tables are technically feasible, practicable, and cost-effective. Consistent with Water Code section 13360, where an identified BMP may be impracticable at a particular site, this Order includes a provision to select and implement an alternative BMP. If these BMPs are not effective in controlling the discharge of pollutants, the Co-Permittees shall require additional BMPs including active, advanced treatment controls, or additional weather grading restrictions.

Development and urbanization especially threaten environmentally sensitive areas (ESAs). ESAs have a much lower capacity to withstand pollutant shocks than might be acceptable in the other circumstances. In essence, development that is ordinarily insignificant in its impact on the environment may, in a particular sensitive environment, become significant. These ESAs designated by the State include:

(a) Regional Water Board's areas listed in the Basin Plan as supporting the "Rare, Threatened, or Endangered Species (RARE)" Beneficial Use;
(b) Designated areas of special biological significance (ASBS) in ocean waters; and
(c) Wetlands, riparian areas, and headwaters streams that offer high habitat value and basin-wide value for pollution removal, floodwater retention, channel stability and habitat connectivity. These waters provide habitat for a high number of special-status species and because of the high percentage of historic losses of these waters in California and the vulnerability of these waters to future impacts from projected population growth and land development, these waters warrant special protection in the land development process.

The Co-Permittees should consider appropriate controls to protect water quality in ESAs.

Public Agency Activities

A municipal operations program is a fundamental component to a storm water management program. Public agency activities such as road maintenance and public construction require BMPs and can have the same water quality impacts as private projects. Street sweeping and catch basin and ditch maintenance are also important to keep pollutants out of the MS4 and remove pollutant sources from the MS4 before they are discharged to surface waters.

This Order incorporates presumptive BMPs to reduce pollutants in storm water discharges from public agency activities to the MEP. The BMPs are identified in Table 10 (BMPs at Vehicle Maintenance/Material Storage Facilities/Corporation Yards). These BMPs include the implementation of good housekeeping practices designed to control pollutants at the source, promote the use of proper waste management practices, and implement control practices to keep pollutants away from any entrance to the storm drainage system and from being deposited or discharged directly into waters of the U.S. The BMPs listed in Part 9 of the Order were selected based on the Water Boards' experience of regulating similar activities, and are referenced in the Caltrans Storm Water Quality Handbook Maintenance Staff Guide May 2003 (Caltrans Document Number CTSW-RT-02-057), which serves as a statewide standard for Caltrans. The BMPs identified in the Table are technically feasible, practicable, and cost-effective, and are the standard of practice for Caltrans sites statewide. Consistent with Water Code section 13360, where an identified BMP may be impracticable at a particular site, this Order includes a provision to select and implement an alternative BMP.

Illicit Connections and Illicit Discharges Elimination Program

Common sources of pollutants to the MS4 are illicit connections and illicit discharges. Common wastes discharged into the MS4 include washwater from painting and concrete work, overflows from onsite wastewater systems, and vehicle and sidewalk washwater. In addition, overflows from clogged sanitary sewer lines have a high likelihood of reaching the receiving waters via MS4s. Illicit discharges may occur either through direct connections, such as deliberate or mistaken piping, or through indirect connections, such as dumping, spillage, subsurface infiltration, and wash-downs. This Order contains specific language requiring that the Permittees promptly respond to reports of illicit discharges and implement enforcement measures where necessary.

Monitoring data from MS4 programs across the nation have shown that dry weather discharges can contribute significant pollutant loads to receiving waters. The U.S.EPA publication titled *"Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments"*[65] (referred to hereafter as "*Illicit*

[65] U.S.EPA No. 833B04005. October 2004.

Discharge Detection and Elimination") finds, if these non-storm water discharges are ignored by only focusing on storm water runoff, little improvement in receiving water quality may occur. The manual was developed as part of a cooperative agreement with the U.S.EPA, to serve as a comprehensive up-to-date guidance manual for illicit connection/illicit discharge elimination programs. The manual was developed from surveys of Phase I MS4 permittees serving multiple population sizes with the goal of coming up with cost effective methods for screening and eliminating illicit connections/illicit discharges.

The objective of a municipality's illicit connection/illicit discharge (IC/ID) elimination program should be to detect illicit connections and illicit discharges to the storm drain system, and to promptly remove such discharges and connections. Municipalities typically employ the approaches described below to achieve this objective:

(a) Permitting connections to the municipal storm drain;
(b) Mapping the storm drain system, locations of catch basins, outfalls, permitted connections, and the names and locations of all waters of the U.S. that receive discharges from the outfalls;
(c) Adopting a storm water/non-storm water runoff ordinance to prohibit unauthorized non-storm water discharges into the MS4;
(d) Implementing appropriate enforcement procedures and actions;
(e) Implementing a program to detect and eliminate non-storm water discharges to the MS4, including illegal dumping;
(f) Educating public employees, businesses, and the general public about the dangers associated with illegal discharges and improper disposal;
(g) Establishing a public reporting hotline or other mechanism to report illicit discharges and illegal dumping; and
(h) Establishing measurable goals to evaluate successful program implementation.

This Order requires the Co-Permittees to conduct field screening of their storm drain systems in accordance with procedures described in *"Illicit Discharge Detection and Elimination".* The goal of specifying that the procedures in the manual be followed is to provide guidance and ensure effective methods are used for screening storm drain systems. The provision is not meant to exclude Co-Permittees from using equally effective alternative methods not listed in the manual.

This Order requires the Co-Permittees, upon discovery or upon receiving a report of a suspected illicit connection, to complete an investigation within 21 days; to determine the source of the connection, and the nature and volume of discharge through the connection; and to identify the responsible party for the connection. The Order requires Co-Permittees, upon confirmation of an illicit storm drain connection, to ensure the termination of the connection within 180 days of completion of the investigation. The intent of this requirement is to ensure the timely elimination of illicit connections upon discovery and eliminate the unauthorized discharge to receiving waters.

This Order requires the Co-Permittees to maintain records of all illicit discharge discoveries, reports of suspected illicit discharges, their response to the illicit discharges and suspected illicit discharges, and the formal enforcement taken to eliminate all illicit discharges. The intent of this documentation provision is to facilitate the recognition of trends to assist in the discovery of unidentified illicit connections and identify areas where illicit connections and discharges have a greater probability of occurring.

Reporting Requirements

Annual reporting requirements included in this Order are necessary to meet federal requirements and to evaluate the effectiveness and compliance of the Co-Permittees' programs. The annual reporting requirements are consistent with federal NPDES regulation 40 CFR 122.42(c), which states: "The operator of a large or medium municipal separate storm sewer system that has been designated by the Director under section 122.26(a)(1)(v) of this part must submit an annual report by the anniversary of the date of the issuance of the permit for such a system. The report shall include:

(a) The status of implementing the components of the storm water management program that are established as permit conditions;
(b) Proposed changes to the storm water management program that are established as permit condition; such proposed changes shall be consistent with § 122.26(d)(2)(iii) of this part;
(c) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under § 122.26(d)(2)iv) and (d)(2)(v) of this part;
(d) A summary of data, including monitoring data, that is accumulated throughout the reporting year;
(e) Annual expenditures and budget for year following each annual report;
(f) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and
(g) Identification of water quality improvements or degradation."

Water Code section 13267 provides that "the regional board may require that any person who has discharged […] shall furnish, under penalty of perjury, technical or monitoring reports which the regional board requires."

The Regional Water Board must assess the reports to ensure that the Co-Permittees' programs are adequate to assess and address water quality. The reporting requirements can also be useful tools for the Co-Permittees to review, update, or revise their programs. Areas or issues which have received insufficient efforts can also be identified and improved.

Monitoring Program

Water quality monitoring has become a high priority because of the number of water bodies not supporting their beneficial uses due to constituent exceedances and

therefore being placed on the State's CWA section 303(d) list of impaired waters. Water quality monitoring is needed in conjunction with the 1995 Laguna TMDL and to assist in developing the updated Laguna TMDL. Water quality monitoring and assessments help prioritize water body segments within a watershed that have the most degraded waters and to assess which stressors, such as nutrients, sedimentation, and habitat disturbances are the most important in that watershed. Monitoring is a useful and cost-effective method of evaluating the health of a watershed.