CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-XXXX

NPDES NO. CAS083470

FACT SHEET

CITY OF STOCKTON
AND
COUNTY OF SAN JOAQUIN
STORM WATER DISCHARGES FROM
MUNICIPAL SEPARATE STORM SEWER SYSTEM
SAN JOAQUIN COUNTY

I. PURPOSE

The Regional Water Quality Control Board, Central Valley Region (Regional Water Board) will be considering adoption of a renewal of the City of Stockton and County of San Joaquin's Municipal Separate Storm Sewer System NPDES Permit. The purpose of this Fact Sheet is to provide the Permittees and interested persons an overview of the proposed permit and to provide the technical basis for the permit requirements. Sections I through IV describe water quality problems from storm water and urban runoff, and permit conditions designed to address these problems. Sections V and VI discuss each major element of the Permittee's Storm Water Management Plans (SWMP), that were adopted by the Regional Water Board on 8 October 2009. The Permittees' SWMPs are considered an integral and enforceable component of the proposed permit.

The proposed permit specifies requirements necessary for the Permittees to reduce the discharge of pollutants in urban runoff to the maximum extent practicable (MEP). However, since compliance with the MEP standard is an iterative process, the Permittees' storm water programs must continually be assessed and modified as urban runoff management knowledge increases, to incorporate improved programs, control measures, best management practices (BMPs), etc. in order to achieve the MEP standard. This continual assessment, revision, and improvement of storm water management program implementation is expected to achieve compliance with water quality standards.

II. THE NEED TO REGULATE STORM WATER DISCHARGES

A. Impacts

The quality of storm water and urban runoff are fundamentally important to the health of the environment and the quality of life in the Central Valley Region. Polluted storm water runoff is a leading cause of water quality impairment in the Stockton-San Joaquin-Delta Area, as well as other potential sources as aerial deposition and runoff from agricultural areas upstream of the Stockton urbanized area. Storm water and urban runoff (during dry and wet weather) are often polluted with pesticides, fertilizers, animal droppings, food wastes, automotive byproducts, and many other toxic substances generated by urban environments. Water that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these pollutants through the storm drain systems directly into the receiving waters of the Stockton-San Joaquin-Delta Area. The water quality impacts and increased public health risks from municipal separate storm sewer system (MS4) discharges that affect receiving waters nationwide and in the Central Valley Region are well documented.

The **National Urban Runoff Program** (NURP) Study [U.S. Environmental Protection Agency (U.S. EPA) 1983] showed that MS4 discharges draining from residential, commercial, and light industrial areas contain significant loadings of total suspended solids. Although the NURP Study did not cover industrial sites, the study suggested that runoff from industrial sites may have significantly higher contaminant levels than runoff from other urban land use sites. Several studies tend to support this observation. For example, in Fresno, a NURP project site, industrial areas had the poorest storm water quality of the four land uses evaluated. The study found that pollutant levels from illicit discharges were high enough to significantly degrade receiving water quality, and threaten aquatic life, wildlife, and human health.

The 1992, 1994, and 1996 National Water Quality Inventory Reports to Congress prepared by the U.S. Environmental Protection Agency (U.S. EPA) showed a trend of impairment in the nation's waters from contaminated storm water and urban runoff. The 1998 National Water Quality Inventory [305(b) Report][1] showed that urban runoff/storm water discharges affect 11% of rivers, 12% of lakes, and 28% of estuaries. The report notes that urban runoff and storm water discharges are the leading

[1] *Quality of Our Nation's Waters: Summary of the National Water Quality Inventory 1998 Report to Congress* - U.S. EPA 841-S-00-001 - June 2000; *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 - June 2000

source of pollution and the main factor in the degradation of surface water quality[2] in California's rivers and streams.

The Natural Resources Defense Council (NRDC) 1999 report, *Stormwater Strategies, Community Responses to Runoff Pollution*[3] 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:

1. 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) surfaces. As these impervious surfaces increase, infiltration will decrease, forcing more water to run off the surface, picking up speed and pollutants.

2. The concentration of pollutants in the runoff. Certain activities, such as those from industrial sites, are large contributors of pollutant concentrations to the storm water system.

The report also identified several activities causing storm water pollution from urban areas, practices of homeowners, businesses, and government agencies.

B. Benefits of Permit Program Implementation

Implementation of Best Management Practices (BMPs) should reduce pollutant discharges, and improve surface water quality. The expected benefits of implementing the provisions of the City of Stockton and County of San Joaquin MS4 National Pollutant Discharge Elimination System (NPDES) permit include:

1. **Enhanced Aesthetic Value**: Storm water affects the appearance and quality of a water body, and the desirability of working, living, traveling, or owning property near that water body. Reducing storm water pollution will increase benefits as these water bodies recover and become more desirable.

2. **Enhanced Opportunities for Boating**: reducing sediment and other pollutants, and increasing water clarity, which enhances the boating experience for users, offer additional benefits.

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[2] *Quality of Our Nation's Waters: Summary of the National Water Quality Inventory 1998 Report to Congress* – U.S. EPA 841-S-00-001, June 2000.
[3] *Clean Water & Oceans: Water Pollution: In Depth Report Stormwater Strategies, Community Responses to Runoff Pollution*. Natural Resources Defense Council (NRDC), 1999.

3. **Enhanced Commercial Fishing**: Important because commercial fisheries are a significant part of the nation's economy, and 28% of the estuaries in the 305(b) Report were impacted by storm water/urban runoff.

4. **Enhanced Recreational and Subsistence Fishing**: Pollutants in storm water can eliminate or decrease the numbers, or size, of sport fish and shell fish in receiving waters.

5. **Reduced Flood Damage**: Storm water runoff controls may mitigate flood damage by addressing problems due to the diversion of runoff, insufficient storage capacity, and reduced channel capacity from sedimentation.

6. **Reduced Illness from Consuming Contaminated Fish**: Storm water controls may reduce the presence of pathogens in fish caught by recreational anglers.

7. **Reduced Illness from Swimming in Contaminated Water**: Epidemiological studies indicate that swimmers in water contaminated by storm water runoff are more likely to experience illness than those who swim farther away from a storm water outfall.

8. **Enhanced Opportunities for Non-contact Recreation**: Storm water controls reduce turbidity, odors, floating trash, and other pollutants, which then allow waters to be used as focal point for recreation, and enhance the experience of the users.

9. **Drinking Water Benefits**: Pollutants from storm water runoff, such as solids, toxic pollutants, and bacteria may pose additional costs for treatment, or render the water unusable for drinking.

10. **Water Storage Benefits**: Storm water is a major source of impairment for reservoirs. The heavy load of solids deposited by storm water runoff can lead to rapid sedimentation of reservoirs and the loss of needed water storage capacity.[4]

[4] *Report to Congress on Phase II Storm Water Regulations*. U.S. EPA, Office of Water. EPA-833-R-99-001, Oct. 1999.

III. STATUTORY AND REGULATORY HISTORY AND OTHER CONSIDERATIONS OF THE STORM WATER PROGRAM

A. Basis for Permit Conditions

Over the past 35 years, water pollution control efforts have focused primarily on certain process wastewater discharges from facilities such as factories and sewage treatment plants, with less emphasis on diffuse sources. The 1972 amendments to the federal Clean Water Act (CWA) prohibit the discharge of any pollutant to waters from a point source, unless a NPDES permit authorizes the discharge. Because the focus on reducing pollutants was centered on industrial and sewage treatment discharges, the U.S. Congress amended the CWA in 1987, requiring the U.S. EPA to create phased NPDES requirements for storm water discharges.

In response to the 1987 Amendments to the CWA, the U.S. EPA developed Phase I of the NPDES Storm Water Program in 1990. Phase I requires NPDES permits for storm water discharges from: (i) "medium" and "large" MS4s generally serving, or located in incorporated places or counties with, populations of 100,000 or more people; and (ii) eleven categories of industrial activity (including construction activity that disturbs one acre or greater of land).

Phase II, adopted in December 2000 and became effective in March 2003, requires operators of small MS4s and small construction sites (construction activity disturbing greater than or equal to 1 acre of land or less than 1 acre if part of a larger common plan of development or sale) in urban areas to control storm water runoff discharges. Phase II establishes a cost-effective approach for reducing environmental harm caused by storm water discharges from previously unregulated small MS4s.

B. Statutory Basis for Permit Conditions

The intent of the permit conditions is to meet the statutory mandate of the CWA. The conditions established by this permit are based on Section 402(p)(3)(B) of the CWA which mandates that a permit for discharges from MS4s must: (1) effectively prohibit the discharges of non-storm water to the MS4; and (2) require controls to reduce pollutants in discharges from MS4 to the maximum extent practicable (MEP) including best management practices, control techniques, system design and engineering methods, and such other provisions determined to be appropriate. Compliance with water quality standards is to be achieved over time, through an iterative approach requiring improved BMPs.

The permit requires the implementation of a comprehensive SWMP through a selection of BMPs [see 40 Code of Federal Regulations (CFR) 122.44(k)] as the mechanism to achieving the reduction of pollutants in storm water to the maximum extent practicable (MEP) [see CWA § 402(p)(3)(B)(iii)].

C. Regulatory Basis for Permit Conditions

As a result of the statutory requirements of the CWA, the U.S. EPA promulgated the MS4 Permit application regulations set forth in 40 CFR 122.26(d). These federal regulations described in detail the permit application requirements for MS4s operators. The information in the Report of Waste Discharge was utilized to develop the permit conditions and determine the Permittees' status in relationship to these conditions.

D. Discharge Limitations

No numeric effluent limitations are proposed at this time. In accordance with 40 CFR 122.44(k), the U.S. EPA has required a series of increasingly more effective BMPs[5], in the form of a comprehensive SWMP and performance standards, in lieu of numeric limitations.[6]

On 14 November 2003, the California Superior Court ruled; "Water quality-based effluent limitations are not required for municipal Stormwater discharges [33 USC §1342(p)(3)(B)] and [40 CFR §122.44(k)(3)]. For municipal stormwater discharges, the Permits must contain best management practices (BMPs), which reduce pollutants to the maximum extent practicable [33 USC §1342(p)(3)(B)]. These Permits do contain these through the Stormwater Management Plan which is incorporated into the Permits by reference." (*San Francisco Baykeeper vs. Regional Water Quality Control Board, San Francisco Bay Region,* Case No. 500527, 14 November 2003).

The State Water Resources Control Board (SWRCB) convened a Storm Water Panel (Blue Ribbon Panel) of experts to address the issue of numeric effluent limits.[7] The study, finalized in June 2006, also concludes that it is not feasible at this time to set enforceable numeric effluent limits for storm water and non-storm water discharges from MS4s.

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[5] *Interpretative Policy Memorandum on Reapplication Requirements* of MS4s issued by U.S. EPA (61 Fed. Reg. 41697)
[6] *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* (61 Fed. Reg. 43761)
[7] Recommendations of the Blue Ribbon Panel were finalized as *The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities,* dated 19 June 2006.

E. Policy

The State Water Resources Control Board adopted Resolution 68-16 ("Statement of Policy with Respect to Maintaining High Quality of Waters in California") (Antidegradation Policy), which requires the Regional Water Board to assure maintenance of the high quality of waters of the State unless the Regional Water Board makes certain findings. Under this policy, water quality degradation may be allowed if the following conditions are met: 1) any change in water quality must be consistent with maximum benefit to the people of the State; 2) will not unreasonably affect present and anticipated beneficial uses; 3) will not result in water quality less than prescribed in the Basin Plan; and 4) the discharge is required to meet waste discharge requirements that result in the best practicable treatment or control necessary to assure that pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the state will be maintained. The communities covered by this Order have continued to develop since adoption of the previous permit. The increase in volume and mass of pollutants from the new urban runoff will not have significant impacts on aquatic life, municipal and domestic supply, and recreation uses, which are the beneficial uses most likely affected by the pollutants discharged.

An antidegradation analysis was submitted in August 2007.[8] The water quality impacts presented in the analysis shows that storm water runoff emanating from new urban development projected to occur in the Stockton Urbanized Area during the next five years will generally produce minor changes in loadings and concentrations of the ten pollutants evaluated. The pollutants evaluated include: diazinon, dissolved copper, dissolved oxygen, *E. coli,* phenanthrene, total dissolved solids (TDS), total mercury, total nitrogen, total organic carbon (TOC), and total suspended solids (TSS). Constituents selected for evaluation include those identified by the Permittees as pollutants of concern in the Report of Waste Discharge,[9] constituents for which the Regional Water Board is developing TMDLs, or constituents considered particularly relevant to the water quality of the Sacramento-San Joaquin Delta.

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[8] City of Stockton/County of San Joaquin, *Antidegradation Analysis – Storm Water Management Program,* August 2007, Larry Walker and Associates.

[9] City of Stockton/County of San Joaquin, National Pollutant Discharge Elimination System, Municipal Stormwater program, *Report of Waste Discharge & Proposed Stormwater Management Plan,* April 2007, Larry Walker Associates.

Section 5.0 of the analysis[10] provides an assessment of the Storm Water Management Program. The program elements include new development standards that were developed and implemented during the last permit term. This Order requires the revision of the development standards (a.k.a. *Storm Water Quality Control Criteria Plan* (2005, Revised March 2009),[11] as part of the SWMP, which states that all new urban development and significant redevelopment priority projects are subject to the source control measures, runoff reduction control measures, and treatment control measures. Site design and site-specific source controls are generally the most effective means to control urban runoff pollution because they minimize the need for treatment and are required for all applicable projects. Treatment controls are required in addition to source controls to minimize the discharge of pollutants to the storm water conveyance system.

The Water Quality Impacts Assessment Methodology, found in Section 6.3 of the antidegradation analysis, includes a rainfall-runoff mass balance model that conservatively estimates a reduction in pollutants by the conversion of agricultural land use to new urban development. The model shows that the estimated pollutant loading attributable to new urban development show both increases and decreases depending on the constituent. The constituent-by-constituent evaluation of modeled impacts due to new urban development is presented in Section 6.3.3. The analysis reports that the estimated pollutant reductions for existing and new urban development range from 5% to 10%, with the exception of reductions assumed for diazinon. Diazinon has been phased out of urban use and its use in agriculture has greatly decreased, but a conservative estimate of 75% rather than 100% pollutant reduction was chosen to account for stockpiling and continued allowable use of products containing the pesticide. The percent reductions shown in Table 6-6[12] reflect a very conservative estimate for pollutant reduction due to implementation of Storm Water Management Plan best management practices. Additionally, implementation of best management practices (primarily, extended detention basins) for new urban development, along with elements of low impact development, such as onsite infiltration, are expected to further reduce pollutant concentrations and flows attributable to new urban development runoff. Specific elements of the Permittee's Storm Water Management Plan are discussed in Section 5, and outlined in Appendix B of the analysis.

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[10] *Antidegradation Analysis*, page 22-34.
[11] City of Stockton, *Storm Water Quality Control Criteria Plan,* - Revised March 2009. Larry Walker and Associates.
[12] *Antidegradation Analysis,* page 42.

Based on the antidegradation analysis: 1) some degradation for a limited number of constituents is consistent with the maximum benefit to the people of the state; 2) the activity is necessary to accommodate important economic or social development in the area; 3) resulting water quality is adequate to fully protect and maintain existing beneficial uses; and 4) the discharge will not cause measurable changes in the receiving waters that cause the receiving waters to fall below applicable water quality objectives.

The analysis included an examination of: 1) existing applicable water quality standards; 2) ambient conditions in receiving waters compared to standards; 3) incremental changes in constituent loading, both concentration and mass; 4) treatability and levels of treatment or controls to be used and whether increased treatment is proposed to offset any increased volume or mass of discharge; 5) reduction of the discharge of pollutants from the urban areas to the maximum extent practicable (MEP); 6) comparison of the proposed increased volume or mass of pollutants relative to the volume or mass of pollutants that existed when the current permit was adopted; 7) an assessment of the significance of changes in ambient water quality compared to historic conditions, and 8) an analysis of alternatives to the discharge and treatment or control methods that would reduce water quality impacts.

The discharge from continued urban development will result in some minimal degradation of waters of the state and navigable waters of the United States, but in this case, such degradation is consistent with the maximum benefit to the people of the state. Limited degradation that does not cause exceedance of water quality objectives is warranted to allow for the economic benefit stemming from local growth. There is also a need in Stockton to accommodate growth. The Regional Water Board does not have the jurisdiction to control growth in the City of Stockton/San Joaquin County, but is required to assure that the receiving waters are adequately protected as a result of urban discharges. The proposed Order allows storm water utility service necessary to accommodate housing and economic expansion in the area, and is considered to be a benefit to the people of the State. Compliance with these requirements will result in the reduction of discharge pollutants from the urban areas to the MEP. Reducing pollutants in the discharge to MEP will result in an insignificant impact on existing water quality.

IV. BACKGROUND - CITY OF STOCKTON AND SAN JOAQUIN COUNTY MS4

A. City of Stockton and San Joaquin County MS4 Permit History

The City of Stockton (hereafter City) is defined as a large municipality (population greater than 250,000) in the Code of Federal Regulations (CFR). As such, the City must obtain an NPDES municipal storm water permit. The County of San Joaquin (hereafter County) contains urbanized areas and areas of potential growth, which are enclosed within the City limits or surround the City (see Attachment A). Under the CFR, the County is considered part of the large municipal separate storm sewer system and is subject to the permit requirements.

The City and County (Permittees) are currently regulated by Waste Discharge Requirements Order No. R5-2007-0173, NPDES No. CAS083470, adopted on 6 December 2007. The Permittee's SWMPs were approved by the Regional Water Board on 8 October 2009 (Resolution No. 2009-0105). On 6 June 2012, the Permittees submitted a ROWD to the Central Valley Water Board requesting permit re-issuance. The ROWD included proposed amendments to the Storm Water Management Plans based on a completed program effectiveness assessment.

City of Stockton Statistics

1. Storm Sewer Fees: An annual fee of $25.20 ($2.10/month) is charged on all water bills collected for the operation of the Storm Water Utility Program.

2. Connection Fees: There are no storm drainage connection fees. New developments must complete all required improvements, including post construction BMPs, at there own expense.

3. Population: The calculated population of the Phase I NPDES permit area is approximately 286,041.

4. Grants/Loans: The City of Stockton does not receive grant/loan funds for the operation of the storm water program.

County of San Joaquin Statistics

1. Storm Sewer Fees: Storm sewer fees collected by the County are for operation and maintenance of specific drainage system such as a County Service Area or a Maintenance District. Fees vary based on the type of system (gravity or pumped), operational costs and the limitations imposed by Proposition 218, which requires voter approval of any increase in fees for service charges. Each District is independent and revenues may only be expended for the uses in the

establishing resolutions.

2. Annual Fees: County Service area 54 is coterminous with the County Phase I permit area and collects an annual fee of $35.00 ($2.92/month) per parcel for Storm Water Pollution Prevention to fund the NPDES program. With 16,000 properties in the permit area, this results in approximate revenues of $560,000 per year.

3. Connection Fees: There are no storm drainage connection fees. New developments must complete all required improvements, including post construction BMPs, at there own expense. New Special Districts or Zones are established in existing Special Districts are formed for ongoing maintenance. The new fee structures will include an escalator clause for inflation to meet the requirements of Proposition 218 for assessment increases without an election.

4. Population: The calculated population of the Phase I NPDES permit area is approximately 43,000.

5. Grants/Loans: San Joaquin County has not received any loans or grants for storm water. Without the ability to levee new fees a special district would not be able to repay any loan.

B. Storm Drain System

The Permittees own and operate a municipal storm drain system which collects storm water runoff and surface runoff generated from various land uses within the Permittees' jurisdictions. The outfalls drain to Bear Creek, Mosher Slough, Five Mile Slough, Fourteen Mile Slough, the Calaveras River, Smith Canal, the Deep Water Channel, Mormon Slough, Walker Slough, Duck Creek, Little Johns Creek, and the San Joaquin River. Respectively, the City and County have identified 158 and 47 outfalls within their jurisdictions. The City has 400 miles of storm drain lines. The County has not determined the length of its storm drain system.

C. Total Maximum Daily Loads (TMDLs)

In compliance with the current Order No. R5-2007-0142, the Permittees submitted a Pesticide Plan, Pathogen Plan, and Smith Canal/Dissolved Oxygen Plan, which were approved by the Regional Water Board. The proposed Order requires the Permittees to continue or initiate implementation of control programs for pollutants that have been identified to cause or contribute to exceedances of water quality standards and potential impairment of beneficial uses. The proposed permit requires the Permittees to submit a Mercury Plan, Low Dissolved Oxygen Plan,

and begin sampling for Sediment Toxicity for pesticides (e.g., pyrethroids). The proposed permit requires continued sampling, implementation of BMPs, and assessment of the effectiveness of the BMPs to ensure that they are performing to the MEP.

The Regional Water Board is currently in the process of developing TMDLs for listed water bodies within the Region. The proposed Order includes Provisions consistent with the TMDL waste load allocations, the need to developed TMDLs for impaired waterbodies, and the Basin Plan implementation program. A separate Order will specify monitoring and assessment requirements for these Provisions. In the meantime, Permittees should implement actions and/or assessments to address water quality impairments. Once the Regional Water Board and U.S. EPA approve TMDLs, the proposed Order may be reopened to incorporate provisions to be consistent with waste load allocations established under the TMDLs.

The CWA Section 303(d) Listed Waterbodies in the Stockton Urbanized Area are included the following under Finding 70. These impairments are based on identified exceedances of water quality standards.

TMDLs for these water bodies are in various stages of completion. NPDES permits must be consistent with approved TMDL waste load allocations. This Order implements control programs developed to attain waste load allocations.

The Regional Water Board Toxic Hot Spots Clean-up Plan (California Water Code section 13394) identified the following hot spots that are applicable to this discharge:

a. Mercury in the Delta;
b. Dissolved oxygen in the San Joaquin River in the City of Stockton; and
c. Diazinon and Chlorpyrifos in Mosher Slough, Five-Mile Slough, Calaveras River, and Mormon Slough.

The California Water Code section 13395 requires the reevaluation of waste discharge requirements for dischargers who have discharged pollutants causing all or part of the toxic hot spot. The waste discharge requirements must be revised to include requirements that “prevent the maintenance or further pollution of existing toxic hot spots.” Further “(t)he Regional Water Board may determine it is not necessary to revise a waste discharge requirement only if it finds that the toxic hot spot resulted from practices no longer being conducted by the discharger... or that the discharger’s contribution to the creation or maintenance of the toxic hot

spot is not significant." Requirements to prevent the creation of new or maintenance of existing toxic hot spots are included with the provisions to address the 303(d) listings for these waterbodies.

The California Water Code allows the Regional Water Board to require dischargers submit technical and monitoring reports where the burden of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. The Regional Water Board may require the monitoring and technical reports that are identified specifically in this Order or in a separate Order under authority of the California Water Code.

The Monitoring and Reporting program contains monitoring requirements necessary to evaluate compliance with the Order and its provisions. The Regional Water Board seeks to obtain supplemental information related to the Regional Water Board's water quality based program for pesticides, dissolved oxygen, pathogens, and mercury/methylmercury. Because the information and monitoring associated with these programs is in addition to and not directly related to this Order, the Regional Water Board has required such monitoring through the Regional Water Board's authority pursuant to Water Code (WC) section 13267. Thus, a separate order pursuant to WC section 13267 was issued to the Permittees prior to the Regional Water Board's adoption of the Order and its associated monitoring provisions.

V. STORM WATER MANAGEMENT PROGRAM ELEMENTS

Federal regulations (40 CFR 122.26(d)(2)(iv)) provide that, "A proposed management program covers the duration of the permit. It 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."

As part of their application for permit renewal, the Permittees have submitted a draft SWMP describing the framework for management of storm water discharges during the term of this permit. The draft SWMP represents an improvement over the previous SWMP because it incorporates new and enhanced control measures and performance standards. The draft SWMP provides the goals and objectives, legal authorities, source identification process, funding sources, best management practices (BMPs) evaluation and improvement process, approach for effectiveness assessments of the programs, and a monitoring plan. The draft SWMP also includes specificity for each

program element and control measures that identifies what actions are to be taken, the timeframe for the actions, the responsible parties and the data that needs to be collected in order to identify if the program is effective. The overall goals of the Permittees' SWMP are to a) reduce the degradation of waters of the State and Waters of the United States (U.S.) by urban runoff and protect their beneficial uses, and b) develop and implement an effective SWMP that is well understood and broadly supported by regional stakeholders. The SWMP is an integral and enforceable component of the proposed permit.

The SWMP includes the following program components:

- Program Management
  - Legal Authority
  - Fiscal Analysis

- Programs Elements
  - Construction Program
  - Planning and Development Program
  - Industrial and Commercial Program
  - Municipal Operations Program
  - Illicit/Illegal Discharge Program
  - Public Education and Outreach Program

- Baseline Monitoring
  - Urban Discharge Monitoring
  - Receiving Water Monitoring
  - Water Column Toxicity Monitoring
  - Dry Weather Field screening

- Sediment Toxicity

- Bioassessment

- Water Quality Based Programs
  - Pesticide Plan
  - Low Dissolved Oxygen Plan
  - Pathogen Plan
  - Mercury Plan

- Program Effectiveness Assessment and Reporting

Some of these program elements and the corresponding proposed permit requirements under those elements are discussed below.

A. Program Management

The proposed permit requires submission of an Annual Work Plan by 1 April of each year. The Annual Work Plan provides the SWMP's and the Permittees' proposed activities for the upcoming year beginning 1 July of current year and ending 30 June the following year. The proposed permit also requires submission of an Annual Report by 1 September of each year. The Annual Report documents the status of the SWMP's and the Permittees' activities during the previous fiscal year, including the results of a qualitative and quantitative field level assessment of activities implemented by the Dischargers, and the performance of tasks contained in the SWMP. The Annual Report shall include a program effectiveness assessment and recommended modifications for each Program Element. Each Annual Report shall build upon the previous year's efforts using and identifying best management practices to the maximum extent practicable. The Annual Report includes a compilation of deliverables and milestones completed during the previous 12-month period, as described in the SWMP and Annual Work Plan.

B. Construction Program

Legal Authority

Federal regulations [40 CFR 122.26(d)(2)(iv)(D)] provide that a proposed management program must 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."

Background

As stated in the *California Storm Water Best Management Practice Handbook for Construction Activity* (BMP Handbook), "Construction usually increases the amount of impervious area causing more of the rainfall to run off, and increasing the speed at which runoff occurs. Unless properly managed, this increased runoff will erode natural and/or unprotected watercourses causing the watercourse to widen…Sedimentation can also contribute to accelerated filling of reservoirs, harbors, and drainage systems."[13]

C. Industrial and Commercial Program

Legal Authority

[13] *California Storm Water Best Management Practice Handbook for Construction Activity*. 1993.

Federal regulations [40 CFR 122.26(d)(2)(iv)(C)] require the following, “A description of a program to monitor and control pollutants in storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system. The program shall:

1. Identify priorities and procedures for inspections and establishing and implementing control measures for such discharges;

2. Describe a monitoring program for storm water discharges associated with industrial facilities […]”

Background

The municipality is ultimately responsible for discharges from the MS4. Because industrial awareness of the program may not be complete, there may be facilities within the MS4 area that should be permitted but are not (non-filers). The Phase I regulations requirement for industries to obtain permit coverage for storm water discharges is largely based on Standard Industrial Classification Code. This has been shown to be incomplete in identifying industries (which include commercial businesses) that may be significant sources of storm water pollution. In addition, the permitting authority may not have adequate resources to provide the necessary oversight of permitted facilities. Therefore, it is in the municipality’s best interest to assess the specific situation and implement an industrial/ commercial inspection and enforcement program to control the contribution of pollutants to the MS4 from all these potential sources.

In the preamble to the 1990 regulations, the U.S. EPA clearly states the intended strategy for discharges of storm water associated with industrial activity:

"Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system." The U.S. EPA also notes in the preamble *"municipalities will be required to meet the terms of their permits related to industrial dischargers*."

Similarly, in the U.S. EPA's Guidance Manual[10] (Chapter 3.0), it is specified that MS4 applicants must demonstrate that they possess adequate legal authority to:

- Control construction site and other industrial discharges to MS4s;
- Prohibit illicit discharges and control spills and dumping;
- Carry out inspection, surveillance, and monitoring procedures.[14]

The document goes on to explain that *"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. Further, to satisfy its permit conditions, a municipality may need to impose additional requirements on discharges from permitted industrial facilities, as well as discharges from industrial facilities and construction sites *not* required to obtain permits.

In the same Guidance Manual[15] (Chapter 6.3.3), it is stated that the municipality is ultimately responsible for discharges from their MS4. Consequently, the MS4 applicant must describe how the municipality will help the U.S. EPA and authorized NPDES States to:

- Identify priority industries discharging to their systems;
- Review and evaluate storm water pollution prevention plans (SWPPPs) and other procedures that industrial facilities must develop under general or individual permits;
- Establish and implement BMPs to reduce pollutants from these industrial facilities (or require industry to implement them); and
- Inspect and monitor industrial facilities discharging storm water to the municipal systems to ensure these facilities are in compliance with their NPDES storm water permit, if required.

[14] *Guidance Manual For the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Storm Sewer Systems* - U.S. EPA -November 1992
[15] *Ibid.*

Discussion

Recognizing that the municipality is ultimately responsible for the quality of storm water discharges from the MS4, the municipalities are required to evaluate the industrial/commercial facilities and determine their compliance with the permit requirements, as well as their contribution to the MS4 and potential impacts to the receiving waters. The proposed permit requires the Permittees to update existing ordinances/standards/ specifications if they do not provide sufficient legal authority to implement the Industrial and Commercial Program components as required by the regulations.

Integration of NPDES Program for MS4 with NPDES Program for Industrial Activities

Recognizing the dual coverage envisioned by the federal regulations[16], and suggested partnership between local and State authorities, this Order requires Permittees to coordinate with State activities for the implementation of the General Industrial Activities Storm Water Permit (General Industrial Permit). The goal is to control industrial sources and other sources not specifically covered under Phase I storm water regulations but identified as significant contributors of pollutants by the municipalities through their identification and prioritization studies. The net result should be a better and improved coordinated program with greater impact on limiting and eliminating (as a final goal) the contribution of pollutants to the receiving water while maintaining and/or restoring the capacity of the receiving water to sustain the beneficial uses without impairments.

Based on the dual coverage and partnership approach between the permitting authority and municipalities that the U.S. EPA envisioned in the storm water regulations[17,18], and in order to best use limited resources at the State and local levels, the proposed permit requires the Permittees to: (i) Control the storm water discharges associated with industrial activities and other commercial facilities identified as significant contributors of pollutants; and (ii) Assist the Regional Water Board in implementing the general permit for industrial activities. This approach is consistent with the

[16] Federal Register Vol. 55, No 222, pp. 48000; U.S. EPA Storm Water Phase II Compliance Assistance Guide, 2000, pp. 4-32 and 5-11, where it clarifies the dual responsibility
[17] Letter dated December 19, 2000, from Alexis Strauss, Director, Water Division, U.S. EPA Region IX, to Dennis Dickerson, Executive Officer, Regional Water Quality Control Board-Los Angeles Region.
[18] Letter dated April 30, 2001, from Alexis Strauss, Director, Water Division, U.S. EPA Region IX, to Honorable Stephen Horn, U.S. House of Representatives

nationwide approach used by the U.S. EPA in issuing MS4 permits.[19] The education and outreach should be continued under the auspices of the Public Education program.

The strategy, as outlined in the draft permit, builds on the State/ municipality's partnership by focusing their limited resources on the following activities:

- The Permittees will take a lead role in inspecting restaurants, automotive service facilities, retail gasoline outlets, and industrial facilities not covered by the General Industrial Permit;

- The Regional Water Board will be the lead agency for inspections of facilities covered or in need of coverage under General Industrial Permit;

- The Permittees will assist the Regional Water Board in its activities to fully enforce the General Industrial Permit through spot check inspections, referrals, data information research, joint inspections; and

- The Regional Water Board and Permittees will coordinate their information systems and task scheduling to avoid duplication and strengthen their inspections activities.

D. Municipal Operations Program

Legal Authority

Federal regulations [40 CFR 122.26(d)(2)(iv)(A)(1,3,4,5, and 6)] require that each Permittee must develop a program to reduce the discharge of pollutants from the MS4 to the maximum extent practicable for all urban land uses and activities, including municipal areas and activities.

Background

Many Permittees provide services that ultimately result in the enhancement of the lives of the residents. Some examples of services include the prevention of sanitary sewer overflows; implementation of standard protocols for storage, usage, and disposal of pesticides, herbicides and fertilizers; conduct street sweeping activities; and annually

[19] MS4 NPDES Permits issued to Palm Beach County, Broward County, Sarasota County, Florida, Tulsa, Oklahoma, Denver, Colorado.

determine the effectiveness of these services and identify necessary modifications to improve services.

Each Permittee is required to update and continue to implement a Municipal Program in its SWMP to effectively prohibit non-storm water discharges and prevent or reduce pollutants in runoff from all municipal land use areas, facilities, and activities to the MEP.

E. **Illicit Connection/Illegal Discharge Program**

Legal Authority

Federal regulations [40 CFR 122.26(d)(2)(iv)(B)] state that a proposed management program shall be based on a description of a program, including a schedule, to detect and remove (or require the discharger to the municipal storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer. It states further that a Permittee must include in its proposed management program a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system.

Background

During dry weather, much of the discharge to storm drain systems consists of non-storm water sources. A significant amount of such discharges may be from illicit discharges or connections, or both. 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 washdown.

Each Permittee is required to update and continue to implement an Illicit Discharge Detection and Elimination Program component of the SWMP to actively seek and eliminate illicit discharges and connections to the MEP.

F. **Public Outreach Public Education Program (Collectively Public Outreach Program)**

Legal Authority

Federal regulations [40 CFR 122.26(d)(2)(iv)(A)(6)] provide 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 sewer system 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." These regulations [40 CFR 122.26(d)(2)(iv)(B)(6)] also provide that the proposed management program include, "A description of education activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

To satisfy the Public Outreach Program, the Permittees need to:
(i) Implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of storm water discharges on local water bodies and the steps that can be taken to reduce storm water pollution; and (ii) Determine the appropriate BMPs and measurable goals for this minimum control measure.

Background

Implementation of a Public Outreach Program is a critical BMP and a necessary component of a storm water management program. The State Board Technical Advisory Committee "recognizes that education with an emphasis on pollution prevention is the fundamental basis for solving nonpoint source pollution problems." The U.S. EPA Phase II Fact Sheet 2.3 finds that "An informed and knowledgeable community is critical to the success of a storm water management program since it helps insure the following: (i) greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important, and (ii) 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.[20] [21]

Furthermore, the public can provide valuable input and assistance to a municipal storm water management program and 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.

[20] *Storm Water Phase II Final Rule – Public Education and Outreach Minimum Control Measure*, U.S. EPA Fact Sheet 2.3, January 2000.
[21] Phase II Fact Sheet 2.3

Discussion of Requirements

Based on the background information, the Permittees should continue their educational storm water and urban runoff outreach programs. According to the U.S. EPA, materials and activities should be relevant to local situations and issues, and incorporate a variety of strategies to ensure maximum coverage.[22] To help address local situations and sources of specific pollutants, the Public Outreach Program requires specific programs for targeted communities, for example, ethnic groups, retail gasoline outlets (RGOs), and restaurants, that may not be reached by or understand existing storm water educational materials. In an effort to reach these groups the Public Outreach Program must requires the development of a strategy to provide outreach information including bilingual materials to target ethnic communities. The U.S. EPA encourages partnerships and cooperation.[23] The proposed permit requires coordination between the Permittees and other MS4 permittees. This requirement will ensure that the Permittees are apprised of the most efficient and effective program. It is generally more cost-effective to have numerous operators coordinate to use an existing program than all developing their own local programs. Furthermore, directing materials or outreach programs toward specific groups of commercial, industrial, and institutional entities likely to have significant storm water impacts is recommended.[24] The next step in this targeted outreach program is education of specific businesses to facilitate employee compliance. Therefore, the permit requires implementation of a business outreach program to educate management and employees at prioritized businesses about storm water regulations. Also, a non-regulatory business assistance program would encourage small businesses that lack access to the expertise necessary to comply with storm water regulations and to implement pollution prevention measures. The business assistance program is not a requirement, however, its implementation is encouraged.

Program Performance Measures

The Permittees shall implement a Public Outreach Program using all media as appropriate to (1) measurably increase the knowledge of target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment.

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[23] *Ibid.*
[24] Phase II Fact Sheet 2.3

Each Permittee will be required to update and continue to implement the Public Outreach Component of its SWMP to educate the public and encourage their participation in the implementation of the SWMP to the MEP. In addition, each Permittee will be required to continue to incorporate a mechanism for **public participation** in the implementation of the SWMP (i.e., programs that engage the public in cleaning up creeks, removal of litter in river embankments, stenciling of storm drains, etc.).

G. Water Quality-Based Programs

Section 303(d)(1)(A) of the CWA requires that "Each state shall identify those waters within its boundaries for which the effluent limitations…are not stringent enough to implement any water quality standard (WQS) applicable to such waters." A TMDL is a quantitative assessment of the total pollutant load that can be discharged from all sources each day while still meeting water quality objectives. The CWA also requires states to establish a priority ranking of impaired waterbodies known as Water Quality Limited Segments and to establish Total Maximum Daily Loads (TMDLs) for such waters. This priority list of impaired waterbodies is called the Section 303(d) List. The 2010 CWA Section 303(d) List was approved by USEPA on 11 October 2011. With one exception, the USEPA issued its final decision regarding the water bodies and pollutants USEPA added to California's 2010 CWA Section 303(d) List based on the of the State's assessment determinations by letter dated12 November 2010. The Permittees' discharge of storm water into an impaired water body will be subject to load allocations and implementation plans established under the TMDLs.

As discussed and shown in the table above under "TMDLs," the Stockton Urbanized Area has listed impaired water bodies pursuant to Section 303(d) of the CWA.

H. Planning and Land Development Program

Legal Authority

Federal regulations (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.[25] The definition of MEP has generally been applied to mean implementation of economically achievable management practices. Because storm water runoff rates can vary from storm to storm, the statistical probabilities of rainfall or runoff events become economically significant and are central to the control of pollutants through cost effective BMPs. Further, it is recommended that storm water BMPs be designed to manage both flows and water quality for best performance.[26] It is equally important that treatment BMPs once implemented be routinely maintained.

Background

On a national level, the U.S. EPA is planning to standardize minimum BMP design and performance criteria for post-construction BMPs, and will likely build from the experience of effective state and local programs to establish national criteria.[27] The U.S. EPA, based on the NURP, supports the first half-inch of rainfall as generating first flush runoff.[28] 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.

On 5 October 2000, the State Water Board adopted Order WQ 2000-11[29] concerning the use of Standard Urban Storm Water Mitigation Plans (SUSMPs) in municipal storm water permits for new developments and significant redevelopments by the private sector. The precedent setting decision largely sustained the LA Regional Board SUSMPs. The State Board amended the SUSMP to limit its application to discretionary projects as defined by CEQA, eliminated the category for projects in environmentally sensitive areas, and set aside the requirement for retail gasoline outlets to treat storm water until a threshold is developed in the future. In addition, the State Board articulated its support for regional solutions and the mitigation banking. The State Water Board recognized that the decision includes significant legal or policy determinations that are likely to recur (Gov. Code §11425.60). Due to the precedent setting nature of Order WQ 2000-11, the proposed permit must be consistent

[25] *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.
[26] *Urban Runoff Pollution – Summary Thoughts* – The State of Practice Today and For the 21st Century. Wat. Sci. Tech. 39(2) pp. 353-360. L.A. Roesner (1999)
[27] *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.
[28] *A Watershed Approach to Urban Runoff: Handbook for Decisionmakers*, Terrene Institute and U.S. EPA Region 5 (1996). See discussion on sizing rules for water quality purposes, p 36.
[29] *State Water Board Order WQ 2000-11*: SUSMP; Memorandum from Chief Counsel to Regional Board Executive Officers, (December 26, 2000) discusses statewide policy implications of the decision.

with applicable portions of the State Water Board's decision and include SUSMPs, which the proposed permit refers to as Development Standards.

Discussion of Requirements

This component of the Phase I program requires each Permittee update and continue to implement the Planning and Land Development Component of its SWMP to minimize the short and long-term impacts on receiving water quality from new development and redevelopment.

New/Revised Development Standards - Impacts from New Development

Treatment control BMP 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 considered on a targeted basis. 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.[30]

Financing the MS4 program offers a considerable challenge for municipalities. A proven successful financing mechanism is the establishment of a storm water utility.[31] 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.

Low Impact Development (LID) and Hydromodification

This Order requires the Permittees revise their Development Standards within one year from adoption of the proposed Order to incorporate LID design concepts. The Permittees are also required to revise applicable ordinances/standards/specifications within one year of the revision of the Development Standards.

VI. MONITORING PROGRAM

Legal Authority

Federal regulations (40 CFR 122.26(d)) require the following: (1) quantitative data from representative outfalls designated by the permitting authority, which shall designate between five and ten outfalls or field screening points as representative of the commercial, residential, and industrial land use activities of

[30] *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.
[31] *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.

the drainage area contributing to the MS4; (2) estimates of the annual pollutant load of the cumulative discharges to waters of the United States from all identified municipal outfalls and the event mean concentration of the cumulative discharges for constituents of concern; (3) estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of SWMP implementation; and (4) the Permittees to submit an annual report that identifies, among other things, water quality improvements or degradation. Items 1-3 are required as Part 2 of the initial application. However, since they are needed to evaluate the SWMP, they are being incorporated into this Order.

Although the Monitoring and Reporting Program has evolved since the first stormwater permit was issued, the Permittees have been monitoring storm events since 1992 and dry weather events since 2004. The current monitoring program is intended to assess the impact of urban discharge on receiving waters. The data collected are from sites with residential, commercial, industrial, and mixed land uses, and they encompass a wide range of storm conditions, which has resulted in a robust dataset. However, it is recognized that revisions to the MRP may be appropriate to ensure that the Permittees are directing their resources to the most critical water quality issues and collecting data to support management decisions to address these water quality issues. This Order is being renewed for a limited term to allow the option to participate in a RMP and to propose an alternative monitoring program immediately rather than having to wait until the Region-wide MS4 general permit is adopted.

Regional Monitoring Program

The Regional Water Board requires individual Permittees and Permittee groups to conduct local water quality monitoring. The purpose of this local water quality monitoring is to provide information regarding the impacts of discharges on local receiving waters, and on the extant condition of those waterbodies. However, the equivalent funds spent on current local water quality monitoring efforts could be used more efficiently and productively to better characterize the spatial and temporal distribution of contaminants and physical conditions of Central Valley waterbodies on a regional scale or other regional water quality issues, if those funds were used for a coordinated monitoring effort, rather than continue to be used in individual, uncoordinated local water quality monitoring programs. Regional Monitoring Programs (RMPs), such as the Delta RMP,[32] provide data to better inform management and policy decisions regarding Central Valley region waterbodies.

[32] Specific information regarding the Delta RMP is available at http://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/comprehensive_monitoring_program/index.shtml.

With this Order, the Regional Water Board is authorizing Permittees that elect to participate in a RMP and reduce some of the local water quality monitoring required in the Monitoring and Reporting Program (MRP) and related monitoring described in the SWMP. If the Permittees elect to reduce local water quality monitoring and participate in a RMP, the Permittees shall submit a letter signed by an authorized representative to the Executive Officer informing the Regional Water Board that the Permittee will participate in a RMP and the date on which local water quality monitoring, would be modified. To ensure consistency with this Order and the MRP, reductions in local water quality monitoring require the Executive Officer's prior written approval as well as RMP Steering Committee action on a forthcoming Regional Monitoring Program monitoring plan.

RMP data is not intended to be used directly to represent receiving water quality for purposes of determining if a discharge is causing or contributing to an exceedance of any applicable water quality standards. RMP monitoring stations are established generally as "integrator sites" to evaluate the combined impacts on water quality of multiple discharges into Central Valley region waterbodies; RMP monitoring stations would not normally be able to identify the source of any specific constituent, but would be used to identify water quality issues needing further evaluation. RMP monitoring data may be used to help establish receiving water quality for a water quality data analysis after evaluation of the applicability of the data for that purpose. In general, monitoring data from samples collected in the immediate vicinity of the discharge will be given greater weight in permitting decisions than receiving water monitoring data collected at greater distances from the discharge point. RMP data, as with all environmental monitoring data, can provide an assessment of water quality at a specific location and time that can be used in conjunction with other information, such as other receiving water monitoring data, spatial and temporal distribution and trends of receiving water data, point and non-point source discharges, receiving water flow rate and velocity, and to determine potential source or sources of a constituent that contributed to an exceedance of any applicable water quality standards.

If the Permittees participate in a RMP and reduce some local water quality monitoring, the Permittees shall continue to participate in the RMP until such time as the Permittees inform the Regional Water Board that participation in the RMP will cease and all local water quality monitoring is reinstituted. Some monitoring under Provisions II, Monitoring and Reporting Program, is not required under this Order so long as the Permittees adequately support the RMP. Participation in the RMP by a Permittees shall consist of providing funds and/or in-kind services to a RMP at least equivalent to discontinued local water quality monitoring efforts. If the Permittees fail to maintain adequate participation in a RMP, as determined through criteria to be developed by an RMP, the RMP will recommend to the Regional Water Board that a local water quality monitoring program be reinstated for that Permittee.

Data from a RMP may be utilized to characterize the receiving water in the permit renewal. The Permittees may, however, conduct any site-specific monitoring deemed appropriate by the Permittees and submit that monitoring data to the Regional Water Board provided the modified monitoring program approved by the Executive Officer is conducted at a minimum. Historic receiving water monitoring data taken by the Permittees and from other sources may also be evaluated to determine whether or not that data is representative of current receiving water conditions. If found to be representative of current conditions, then that historic data may be used in characterizing receiving water quality.

A. **Urban Discharge Monitoring**

Since 1992, the Permittees have been monitoring five drainage basins, shown in Attachment A. Three of these basins are from residential areas. Two of these residential basins, MS-14 and MS-18, are in the same general vicinity and both discharge to Mosher Slough. Due to the similarity of monitoring data from these two residential basins and the fact that they both discharge to the same receiving water, this monitoring program requires monitoring of MS-14 only along Mosher Slough. Samples will be taken from representative outfalls for the following drainage basins: CR-46, discharging to the Calaveras River; DC-65, discharging to Duck Creek; and MS-14, discharging to Mosher Slough. The locations of these basins are shown in Attachment A of the Order. Samples will also be taken at a representative outfall for the urban area surrounding Smith Canal, and near the receiving water sampling location designated as SC-1M in Attachment A. The proposed locations of urban discharge monitoring stations will be presented in the revised SWMP. If additional sample station locations are needed, they shall be established under the direction of Board staff, and a description of the stations shall be attached to this MRP. Urban discharge monitoring shall be consistent with the frequency and schedule shown on Table 1. Sample collection and analysis shall follow standard U.S. EPA protocol. Each year, samples shall be collected **during two storm events** and **two during the dry season**, at a minimum.

B. **Receiving Water Monitoring**

All receiving water samples shall be grab samples, collected at mid-depth, in mid-stream of the receiving water. Receiving water sampling may be postponed or eliminated if hazardous weather and/or river flow conditions prevent safe access to sampling location. Receiving water monitoring shall be taken after discharges from MS-14, SC-1, CR-46, and DC-65 have occurred and shall be consistent with the frequency and schedule shown on Table 1. Attachment A shows the approximate locations of the receiving water sampling stations. Sample collection and analysis shall follow

standard U.S. Environmental Protection Agency (US EPA) protocol. Each year, samples shall be collected **during two storm events** and **two during the dry season,** at a minimum.

The proposed Order includes a new requirement to monitor representative upstream receiving water to identify pollutants of concern that flow into the Stockton Urbanized Area from outside sources. The new sampling locations are included on Attachment A.

C. **Method Detection Monitoring**

The Minimum Levels (MLs) listed in Appendix 4 of the State Board Policy for Implementation of Toxics Standards for Inland Surface Water, Enclosed Bays, and Estuaries of California, 2000 (SIP) represent the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and the absence of any matrix interferences.[33] These MLs must be incorporated into all water quality monitoring programs to detect priority toxic pollutants. The MLs are the only established criteria that take into consideration recent improvements in chemical analytical methods. If they are not used in the storm water program, concentrations of concern for priority toxic pollutants may not be detected. Detection and control of toxic pollutants in surface waters is necessary to achieve the CWA's goals and objectives.[34] Numeric criteria for toxic pollutants are necessary to evaluate the adequacy of existing and potential control measures to protect aquatic ecosystems and human health.[35] Also, using MLs will provide quantifiable data that is necessary to better assess water quality and to develop Waste Load Allocations (WLA) and Load Allocations (LA) for TMDLs. Furthermore, non-detects cannot be used to accurately determine mass loadings. The criteria established in the CTR are legally applicable in the State of California for inland surface waters, enclosed bays and estuaries for all purposes and programs under the CWA.[36] Section 402(p)(3)(B)(iii) gives U.S. EPA and states the authority to incorporate appropriate water quality-based effluent limitations in NPDES permits for discharges from MS4s.[37]

D. **Water Column Toxicity Monitoring**

Studies conducted by Regional Water Board staff and Delta Keeper from 1994 to 2001 found toxicity in the Calaveras River, Duck Creek, Five-Mile

[33] SIP
[34] 65 Fed. Reg. 31683
[35] *Ibid.*
[36] 65 Fed. Reg. 31682
[37] 65 Fed. Reg. 31703

Slough, Mosher Slough, and Smith Canal. Therefore, short-term chronic toxicity monitoring is required by this Order.[38]

Toxicity testing is used to assess the impact of storm water pollutants on the overall quality of aquatic systems.[39] It can be a very useful tool for storm water managers. The Center for Watershed Protection rated toxicity testing as a "very useful" indicator for assessing municipal storm water programs. Toxicity testing can also be used to evaluate the effectiveness of storm water BMPs and other storm water pollution reduction measures.[40] Managers can use the results of toxicity testing to identify areas of high concern and to establish priority locations for BMPs. Furthermore, Toxicity Identification Evaluations (TIEs) and Toxicity Reduction Evaluations (TREs) can be used to identify specific pollutants and their sources so that management actions can be more specifically prioritized.

Overall, the toxicity monitoring program will assess the impact of storm water on the overall quality of aquatic systems and implement measures to ensure that those impacts are eliminated or reduced. Chemical monitoring does not necessarily reveal the impacts of storm water on aquatic life or beneficial uses of water bodies. Therefore, toxicity monitoring is a necessary component of a storm water monitoring program.

Water monitoring will take place at each receiving water and urban discharge stations and in accordance with the specific plans required for TMDL development within the proposed permit, as well as the Pollutants of Concern (POCs) identified below. Grab samples shall be used for receiving water monitoring.

The water column monitoring shall include all pollutants including constituents and identified waterways pursuant to the: (1) Mercury Plan; (2) Pesticide Plan; (3) Low DO Plan; (4) Pathogen Plan; and (5) Detention Basin monitoring Special Studies.

The Delta is impaired because of elevated levels of methylmercury in fish. The Delta is on the Clean Water Act 303(d) list for mercury and the State Board has designated the Delta as a toxic hot spot under the Bay Protection and Toxic Hot Spot Cleanup Program.

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[38] Review of the City of Stockton Urban Stormwater Runoff, Aquatic Life Toxicity Studies Conducted by the CVRWQCB, DeltaKeeper and the University of California, Davis, Aquatic Toxicology Laboratory, between 1994 and 2000. G. Fred Lee, PhD, DEE and Anne Jones-Lee, PhD.
[39] Center for Watershed Protection, Environmental Indicators to Assess Stormwater Control Programs and Practices (1996).
[40] *Ibid*.

A Delta mercury control program will be in effect after the Central Valley Water Board adopts Basin Plan amendments to establish a Delta mercury control program. The goal of the mercury control program is to reduce methylmercury exposure to humans and wildlife in the Delta.

Urban runoff is a source of methylmercury. Urban runoff from four Stockton pump outfalls sampled during the 2003/2004 wet season - Calaveras River Pump Station CR-46, Duck Creek Pump Station DC-65, Mosher Slough Pump Station MS-14, and Smith Canal Pump Station SC-57 - averaged 0.167, 0.103, 0.125, and 0.263 ng/l methylmercury, respectively (Wood et al., 2006a[41]). The methylmercury concentrations ranged from 0.084 to 0.533 ng/l; (Wood et al., 2006b[42]).

Monitoring is needed to characterize the concentrations and loads of methylmercury entering the Delta from Stockton area urban runoff and to evaluate options for controlling methylmercury discharges. Characterization studies should include evaluation of methylmercury and total mercury concentrations and loads in receiving waters and discharges, including discharges from detention basins and other management practices. Control Studies should identify variables that control methylmercury production and propose best management practices and implementation schedules. The Sacramento-San Joaquin Delta Methylmercury TMDL became effective on 20 October 2011, which specified monitoring and assessment requirements that must be implemented for control and characterization studies.

E. Bioassessment

Monitoring and Reporting Program Order No. R5-2002-0181 required the Permittees to perform bioassessment at selected sites upstream and downstream of major discharge points from 2003 through 2007. The purpose of the bioassessment requirement was to assess the biological integrity of receiving waters, detect biological responses to pollution, identify probable causes of impairment not detected by chemical and physical water quality analysis, and provide a more holistic approach to evaluating processes of the waterways for designing effective BMPs. Two years of collected data have been fully evaluated and provide a limited assessment of overall biological response. Additional time is needed in order to fully evaluate biological

[41] 2006a. Wood, M., C. Foe and J. Cooke. Sacramento - San Joaquin Delta Estuary TMDL for Methylmercury, Draft Report for Scientific Peer Review. June 2006. Available at: http://www.waterboards.ca.gov/centralvalley/programs/tmdl/deltahg.html#SReports

[42] 2006b. Wood, M., M. Medina-Metzger, J. Cooke and P. Morris. Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for The Control of Methylmercury in the Sacramento-San Joaquin Delta Estuary, Draft Staff Report for Scientific Peer Review. June 2006. Available at: http://www.waterboards.ca.gov/centralvalley/programs/tmdl/deltahg.html#SReports

information collected to date, so that future monitoring can be adapted to continue assessment of biological integrity of receiving water, while linking more directly with the statewide Surface Water Ambient Monitoring Program's (SWAMP's), long term goal of utilizing bioassessment to develop biocriteria for a variety of eco-regions and land-use dominated areas in California. Further bioassessment monitoring activities were not required under the Permittee's current permit (Order No. R5-2007-0142) until the evaluation of the existing data was complete, and the monitoring effort was adapted in consultation with SWAMP's bioassessment workgroup. Bioassessment monitoring activities will not be required under this Order.

F. Sediment Toxicity

Ambient water and sediment quality monitoring by the Surface Water Ambient Monitoring Program (SWAMP - Sacramento Basin) identified a high incidence of sediment toxicity in several urban creeks that drain the suburbs of Roseville (Weston et al., 2005).[43] Nearly all creek sediments sampled caused toxicity to the resident aquatic amphipod *Hyalella azteca*, and about half the samples (10 of 21) caused nearly complete mortality (>90%). Another study by the Sacramento River Watershed Program (SRWP) observed sediment toxicity in almost every Sacramento area urban creek that was tested (Amweg et al., 2006).[44] Several pyrethroid pesticides were present in sediment samples from both studies at acutely toxic concentrations. Pyrethroid pesticides are persistent, hydrophobic, and rapidly sorb to sediments in aquatic environments. The sediment toxicity observed was localized to within tens to hundreds of meters downstream of storm water outfalls draining residential areas.

The phase-out of the sale of diazinon and chlorpyrifos for most residential and commercial uses resulted in an increase in the use of pyrethroid pesticide use in urban and residential areas. Monitoring of sediment quality (sediment toxicity testing) and urban runoff/discharges is needed to characterize sediment/water quality conditions, determine the significance of the increase in urban pyrethroid usage, and assess management practice effectiveness.

VII. Program Effectiveness Assessment

The proposed permit requires the Permittees provide an analysis of the effectiveness of their SWMP in their Annual Reports. The assessment shall

[43] Weston, D.P., R.W. Holmes, J. You, and M.J. Lydy. 2005. Aquatic toxicity due to residential use of pyrethroid insecticides. *Environ. Sci. & Technol*. 39: 9778-9784.
[44] Amweg, E.L., D.P. Weston, J. You, and M.J. Lydy. 2006. Pyrethroid insecticides and sediment toxicity in urban creeks from California and Tennessee. *Environ. Sci. & Technol*. Published on web 1/31/2006.

identify the direct and indirect measurements that the Permittees used to track the effectiveness of their programs as well as the outcome levels at which the assessment is occurring consistent with the proposed permit. Direct and indirect measurements shall include, but not limited to, conformance with established Performance Standards, quantitative monitoring to assess the effectiveness of Program Elements, measurements or estimates of pollutant load reductions or increases from identified sources, raising awareness of the public, and/or detailed accounting/ documentation of SWMP accomplishments.

a. The Permittees will be required to track the long-term progress of their SWMP towards achieving improvements in receiving water quality.

b. The Permittees will be required to use the information gained from the program effectiveness assessment to improve their SWMPs and identify new BMPs, or modification of existing BMPs. This information shall be reported within the Annual Reports consistent with this Order.