FACT SHEET/RATIONALE
TECHNICAL REPORT

for

ORDER NO. R3-2012-00XX
NPDES PERMIT NO. CAXXXXX

WASTE DISCHARGE REQUIREMENTS

FOR

CITY OF SALINAS
MUNICIPAL STORM WATER DISCHARGES
Monterey County

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I. Contact Information

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This Order and other related documents can be downloaded from the Central Coast Water Board website at:
http://www.waterboards.ca.gov/centralcoast/public_notices/public_notices.shtml.

To receive notifications regarding this Order, sign up for the "Municipal Storm Water – Salinas" e-mail list at:
http://www.waterboards.ca.gov/resources/email_subscriptions/reg3_subscribe.shtml.

Comments can be electronically submitted to r3_stormwater@waterboards.ca.gov with a subject line that includes "Salinas MS4 Permit Comments".

All documents referenced in this Fact Sheet and in this Order are available for public review at the Central Coast Water Board office, located at the address listed above. Public records are available for inspection during regular business hours, from 9:00 am to 4:00 pm, Monday through Friday, 12:00 pm – 1:00 pm excluded. To schedule an appointment to inspect public records, contact Cyndee Jones at 805-549-3372.

II. Goals

The goals for this Municipal Stormwater Order (hereinafter, this Order) development process, include:

1. Receiving water quality and beneficial use protection from the impacts of urban stormwater discharges;
2. Increased specificity of Order language and requirements to improve understanding of expectations and Order enforceability;
3. Develop the foundation for, and initiate, watershed-based stormwater management; and
4. Emphasize Best Management Practice (BMP) assessment in combination with water quality monitoring for a balanced approach to determining program effectiveness and achieving tangible results.

III. Public Process

On January 28, 2010, Central Coast Water Board staff met with the Permittee to discuss the Permittee's stormwater management program and potential modifications to Order No. R3-2004-0135. Central Coast Water Board staff conducted follow-up telephone meetings with Permittee staff on February 22, 2010 and February 23, 2010.

On August 29, 2011, Central Coast Water Board staff met with the Permittee to provide an overview of the draft Order. On September 2, 2011, Central Coast Regional Water Board released the draft Order and notified all known interested parties of the opportunity to review and submit comments on the draft Order. Written comments will be accepted until October 31, 2011. Two public workshops will also be scheduled during this public review period.

[This section will be revised following the public review period.]

IV. Background

A. The City of Salinas in the Context of the Salinas Valley

1. Physical Setting of the Salinas River Watershed

The watershed of the Salinas River and its tributaries covers approximately 4,600 square miles (nearly 3 million acres) within San Luis Obispo and Monterey Counties. The Salinas River originates in the La Panza Range southeast of Santa Margarita Lake in San Luis Obispo County and flows northwesterly through the entire length of the Salinas Valley to Monterey Bay. In the vicinity of the Permit coverage area, the watershed is comprised of two major subwatersheds, identified here as the Salinas Reclamation Ditch watershed and the Lower Salinas River watershed. The Salinas Reclamation Ditch subwatershed drains to the Old Salinas River and contains Tembladero Slough and its tributaries: the Salinas Reclamation Ditch, Espinosa Slough/Santa Rita Creek, Gabilan Creek, Natividad Creek, Alisal Creek, and Towne Creek. The Lower Salinas River subwatershed drains to the Salinas River Lagoon, and contains the Salinas River and its tributaries: Blanco Drain, Toro Creek, Quail Creek, and Chualar Creek. Both the Old Salinas River and the Salinas River Lagoon empty into Monterey Bay. There is a limited hydrologic connection between the Salinas Reclamation Ditch subwatershed and the Lower Salinas River subwatershed where the Salinas River Lagoon (North) periodically drains into the Old Salinas River through a slide gate at the northwest end of the Salinas River Lagoon (North). In the winter, the slide gate is often closed to prevent flooding in low-lying agricultural lands surrounding the Old Salinas River.

Agriculture is the primary land use within the Salinas River Watershed. Grazing and pasture lands and dryland farming have historically been the dominant land uses in the upper watershed, but large areas in southern Monterey County and northern San Luis Obispo County are being converted into vineyards. Irrigated cropland is predominant in the lower watershed, primarily row crops such as lettuce, celery, broccoli, and cauliflower on the valley floor, with grazing and vineyards on the upland areas. The lower watershed is one of the most productive agricultural areas in the world, with a gross annual value of over $1.9 billion.[1]

Urban development occurs primarily in a corridor along the Salinas River. The City of Salinas (City) is the largest community in the Salinas River Watershed, with a population of 145,032 in an area of 23.2 square miles. Other communities in the Salinas River Valley include Santa Margarita, Atascadero, Templeton, Paso Robles, San Miguel, King City, Greenfield, Soledad, Gonzalez, and Castroville. The 2010 US Census records a total population of 287,997 for communities in the Salinas River Valley,[2] indicating that nearly 50 percent of the population in the valley resides in the City.

In addition to agriculture and urban development, other land uses in the Salinas River Watershed include two military facilities (Fort Hunter Liggett and Camp Roberts), exploitation of mineral and oil reserves in the San Ardo area and other locations throughout the watershed, public land, and open space.

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[1] "Salinas-Monterey Area Agriculture." *Vegetable Research & Information Center*. Division of Agriculture and Natural Resources, University of California. Web. 24 August 2011. <http://vric.ucdavis.edu/virtual_tour/salinas.htm>.

[2] Population data from the 2010 US Census for Salinas, Santa Margarita, Atascadero, Templeton, Paso Robles, San Miguel, Bradley, San Ardo, San Lucas, King City, Greenfield, Soledad, Gonzales, Chualar, Boronda, Castroville, and Moss Landing.

2. Beneficial Uses and Valuable Watershed Resources

a. Beneficial Uses

The Basin Plan identifies beneficial uses of water bodies in the vicinity of the Permit coverage area. These beneficial uses are shown in Table IV.A.1.

Table IV.A.1. Beneficial Uses[3]

	SALINAS RIVER From Chualar to Spreckles	SALINAS RIVER Downstream of Spreckles	SALINAS RIVER LAGOON (NORTH)	OLD SALINAS RIVER ESTUARY	TEMBLADERO SLOUGH	SALINAS RECLAMATION DITCH	GABILAN CR.	ALISAL CR
MUN	X	X					X	X
AGR	X	X					X	X
PRO	X							
IND	X							
GWR	X						X	X
REC1	X		X	X	X	X	X	X
REC2	X	X	X	X	X	X	X	X
WILD	X	X	X	X	X	X	X	X
COLD	X	X	X	X				X
WARM	X	X	X	X	X	X	X	X
MIGR	X	X	X	X				
SPWN			X	X	X		X	X
BIOL			X	X				
RARE			X	X	X			
EST			X	X	X			
FRESH		X						
COMM	X	X	X	X	X	X	X	X
SHELL			X	X	X			

b. Monterey Bay National Marine Sanctuary

Monterey Bay includes the Monterey Bay National Marine Sanctuary (MBNMS), a federally protected marine area established for the purpose of resource protection, research, education, and public use. The sanctuary's resources include the largest kelp forest in the United States, one of North America's deepest underwater canyons, and the closest-to-shore deep ocean environments in the continental United States. In addition, the MBNMS is home to one of the most diverse marine ecosystems in the world, including 33 species of marine mammals, 94 species of seabirds, 345 species of fishes, and numerous invertebrates and plants, in a remarkably productive coastal environment. The sanctuary's proximity to the coastline makes it vulnerable to pollution problems in the watershed areas that drain to Monterey Bay, including

[3] MUN: Municipal and domestic water supply; AGR: Agricultural supply; PRO: Industrial process supply; IND: Industrial service supply; GWR: Ground water recharge; REC1: Water contact recreation; REC2: Non-Contact water recreation; WILD: Wildlife habitat; COLD: Cold fresh water habitat; WARM: Warm fresh water habitat; MIGR: Migration of aquatic organisms; SPWN: Spawning, reproduction, and/or early development; BIOL: Preservation of biological habitats of special significance; RARE: Rare, threatened, or endangered species; EST: Estuarine habitat; FRESH: Freshwater replenishment; COMM: Commercial and sport fishing; SHELL: Shellfish harvesting.

contaminants such as sediments, nutrients, fecal bacteria, pesticides, oil, grease, metals, and detergents.[4]

c. Salinas River National Wildlife Refuge

The Salinas River National Wildlife Refuge (Refuge) encompasses 367 acres where the Salinas River empties into Monterey Bay. The Refuge was established in 1973 because of its particular value in carrying out the national migratory bird management program and for conservation and enhancement of native animal species and their habitats. Because it is within the Pacific Flyway, the Refuge is used by a variety of migratory birds during breeding, wintering, and migrating periods. Refuge lands include a range of terrestrial and aquatic habitats, including coastal dunes and beach, grasslands, wetlands, and riparian scrub. It also provides habitat for several threatened and endangered species, including western snowy plover, California brown pelican, Smith's blue butterfly, Monterey gilia, and Monterey spineflower. Approximately 40 species that live or are suspected to live in the Refuge are considered sensitive by Federal or State agencies. Current recreational uses in the Refuge include wildlife observation and photography and access to surf fishing and waterfowl hunting.[5]

d. Salinas River Fisheries

The Salinas River Watershed supports several populations of South-Central California Coast (SCCC) steelhead. According to a Biological Assessment issued by the National Marine Fisheries Service, SCCC steelhead are suffering a significant decline in overall abundance and productivity, with four sub-populations either already or nearly extirpated. Loss of these populations in the Salinas River Watershed would mean the removal of the largest area of streams currently occupied by any sub-population of SCCC steelhead. A major cause of the decline of steelhead is the loss or decrease in quality and function of essential habitat features. Most of this loss and degradation of habitat, including critical habitat, has resulted from anthropogenic watershed disturbances, including urbanization.[6]

e. Groundwater Recharge

The lower Salinas River watershed overlies the Salinas Ground Water Basin (Basin) within Monterey County. Groundwater is the source for most of the urban and agricultural water needs in the Salinas River Valley. An ongoing imbalance between the rate of groundwater withdrawal and recharge has resulted in overdraft conditions in the Basin that have allowed seawater from Monterey Bay to intrude inland approximately six miles in the 180-foot deep aquifer, and approximately two miles in the 400-foot deep aquifer. Aquifers intruded with seawater are largely unusable for either agricultural or municipal purposes. Historically, the stratified coastal aquifers were supplied freshwater by aquifer flows from the upper Salinas River Valley. At present, ground water recharge is accomplished primarily through infiltration through the bed of

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[4] "Overview of the MBNMS: A Message from the Superintendent." *Monterey Bay National Marine Sanctuary*. National Marine Sanctuaries; National Oceanic and Atmospheric Administration. Web. 24 August 2011. <http://montereybay.noaa.gov/intro/welcome.html>.

[5] *Salinas River National Wildlife Refuge Comprehensive Conservation Plan Summary.* Sacramento, CA: U.S. Fish and Wildlife Service, December 2002. Web. 24 August 2011. <http://www.fws.gov/cno/refuges/salinas/summary.pdf>.

[6] *Biological Opinion.* United States Department of Commerce; National Oceanic and Atmospheric Administration; National Marine Fisheries Service, Southwest Region. 21 June 2007. Web. 24 August 2011. <http://swr.nmfs.noaa.gov/recovery/Final_Biological_Opinion-Salinas_Valley_Water_Project_062107.pdf>.

the Salinas River.[7] As a result, pollutants in stormwater discharges from the Permittee's municipal separate storm sewer system (MS4) to the Salinas River have the potential to enter groundwater. In addition, flow regimes associated with development (e.g., higher flows of shorter duration than occur under predevelopment conditions) have the potential to reduce groundwater recharge and increase seawater intrusion. Streams and permeable upland portions of the City of Salinas were historically source areas for groundwater recharge. Urbanization has altered the hydrologic regime however, reducing recharge through the construction of impermeable surfaces and the alteration of surface water bodies (e.g., wetlands) and conveyances (e.g., creeks).

3. Watershed Water Quality Issues

a. Federal Clean Water Act (CWA) Section 303(d) Listed Impairments

The Central Coast Water Board has found that water quality and beneficial uses of water bodies in the vicinity of the Permit coverage area are impaired for various pollutants, including nitrate, ammonia (unionized), turbidity, enterococcus, E. coli, fecal coliform, pesticides, priority organics, PCBs, chlorpyrifos, diazinon, toxaphene, dieldrin, copper, low dissolved oxygen, temperature, pH, electrical conductivity, total dissolved solids, sodium, chloride, sediment toxicity, and unknown toxicity. CWA section 303(d) listed impairments for water bodies in the vicinity of the Permit coverage area are detailed in the discussion for Finding No. 24.

In addition, the CWA section 303(d) list of impaired water bodies indicates that water bodies in the Salinas River watershed downstream of the Permittee's stormwater discharges are impaired for the following pollutants: nutrients, nitrate, ammonia (unionized), chloryphyll-a, turbidity, total coliform, enterococcus, E. coli, fecal coliform, pesticides, chlorpyrifos; diazinon, low dissolved oxygen, pH, sediment toxicity, and unknown toxicity. CWA section 303(d) listed impairments for water bodies in the Salinas River watershed downstream of the Permittee's stormwater discharges are detailed in the discussion for Finding No. 25.

b. Agriculture

Agricultural practices impact watershed processes by altering runoff and flow characteristics of the landscape. Grading and vegetation removal affect the landscape's capacity to hold soil and capture runoff and release it through infiltration and evapotranspiration. Stream channel alterations and riparian vegetation removal impacts flow regimes, habitat functions, and the capacity of the watershed to attenuate pollutants. Irrigated agricultural practices further alter flow regimes through groundwater mining and release of excess irrigation water as non-stormwater discharge. Groundwater mining also depletes aquifers and contributes to salt water intrusion into groundwater.

Agricultural practices are severely degrading water quality, aquatic habitat, and several beneficial uses in the Salinas River Watershed. Stormwater and non-stormwater discharges from agricultural lands result in significant nitrate pollution in receiving waters and groundwater due to fertilizer use, as well as severe receiving water and sediment toxicity resulting from pesticide use and other practices. In addition, agricultural lands discharge sediment due to erosion.

c. Urban Development

[7] Ibid.

Urban development in the Salinas River Watershed creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, and other anthropogenic pollutants, which can either be washed or directly dumped into the MS4. As a result, the runoff leaving the developed urban area is significantly greater in pollutant load than the pre-development runoff from the same area. Impervious surfaces collect these pollutants, instead of allowing them to be filtered through vegetation or soil, and stormwater transports them to the MS4. Pollutants can then be discharged from the MS4 to receiving waters, and eventually transported in the receiving waters to downstream habitats and into Monterey Bay. These increased pollutant loads must therefore be controlled to protect downstream receiving water quality.

Municipal stormwater discharges have been found to contribute pollutants to receiving waters. The Central Coast Water Board has found that there is a reasonable potential that municipal stormwater discharges cause, or may cause or contribute to, an excursion above water quality standards. In addition, municipal runoff discharges often contain pollutants that cause toxicity in aquatic organisms (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). Toxic pollutants impact the overall quality of aquatic systems and beneficial uses of receiving waters. Pollutants in urban runoff can threaten human health. Human illnesses have been clearly linked to recreating near storm drains flowing to coastal waters. Also, urban runoff pollutants in receiving waters can bioaccumulate in the tissues of invertebrates and fish, which may be eventually consumed by humans.

Urban development generates water quality stressors in addition to conventional pollutants. Increased impervious surfaces and storm drainage improvements designed to remove stormwater as quickly as possible result in runoff flow rates, volumes, and durations that are elevated above pre-developed levels. Increased runoff flow rate, volume, and duration impact important watershed processes, such as downstream flow regimes, stream channel stability, and groundwater recharge.

4. The City of Salinas

a. Physical Situation in the Watershed

The City is situated in northern Salinas Valley in Monterey County, approximately ten miles east of the Pacific Ocean and adjacent to the Salinas River. Stormwater runoff is generated from various land uses in the Permit coverage area and discharges into the Salinas Reclamation Ditch and the Salinas River. Four major creeks and several minor tributaries pass through the Salinas area and receive stormwater discharges from the Permit coverage area northeast and adjacent to Highway 101. Santa Rita Creek carries stormwater discharges from a small portion of the Permit coverage area to the Espinosa Slough. Alisal Creek becomes the Salinas Reclamation Ditch. Natividad and Gabilan Creeks flow through the northeastern portion of the City to Carr Lake. Carr Lake has functioned historically to attenuate spring flood flows in Natividad and Gabilan Creeks, and continues to function as a large retention basin in the center of the City. Flows leaving Carr Lake discharge to the Salinas Reclamation Ditch. Stormwater from the southern portion of the City flows to a lift station which discharges to the Salinas River.

The City is surrounded by agricultural land uses, and is closely linked to these uses. Agricultural workers commute from the City to surrounding agricultural operations and

agriculture products are transported into the City for industrial processing. In addition, dry land farming occurs in the Carr Lake area when it is not inundated with flood waters.

b. Water Quality Issues

While it is clear that the agricultural practices surrounding the City are significant sources of impact to water quality and watershed processes, there is evidence that stormwater discharges from the Permit coverage area are also significant sources of the following pollutants that cause or may be causing or threatening to cause or contribute to water quality impairment in the Salinas Reclamation Ditch: nitrate/nitrite as N, ammonia as N (total and unionized), orthophosphate as P, fecal coliform, total coliform, E. coli, oxygen (dissolved and saturation), chloride, and sodium. In addition, there is evidence that stormwater discharges from the Permit coverage area are significant sources of the following pollutants that cause or may be causing or threatening to cause or contribute to water quality impairment in the Salinas River: nitrate/nitrite as N, orthophosphate as P, ammonia as N (total), chlorophyll *a*, fecal coliform, total coliform, E. coli, total dissolved solids, boron (dissolved), chloride, and Sodium.[8]

While Carr Lake is a naturally-occurring flood water control feature, its function within the watershed has been impacted by agricultural and development practices. Development has encroached on the area, reducing its retention capacity. In addition, channelization of Natividad and Gabilan Creeks has disconnected these creeks from their floodplains to a degree, and routes lower flows through Carr Lake without retaining them. Filling of wetland areas and removal of wetland vegetation has also reduced Carr Lake's capacity to retain, infiltrate, and evapotranspire runoff. As a result of these changes, the downstream watershed has experienced a reduction of these benefits.

This Order requires the Permittee to reduce the discharge of pollutants in stormwater discharges to the maximum extent practicable (MEP) and protect water quality and beneficial uses. This Order also contains effectiveness assessment measures, including water quality monitoring, detailed BMP assessment requirements, and water quality action levels, designed to provide information about the effectiveness of the Permittee's efforts to reduce pollutant discharges and protect water quality and beneficial uses. In addition, this Order contains requirements for identifying dominant watershed processes and developing control measures to protect and restore those processes. An emphasis of this Order is on acquiring an understanding of important watershed processes to inform development and stormwater management decisions, and identifying measures for protecting and restoring watershed processes that the Permittee will implement in subsequent permit terms.

c. Industrial Agriculture

The flow of vehicles from agricultural areas outside the Permit coverage area tracks sediment onto streets in the Permit coverage area. Absent controls to capture or remove this sediment, it continues to move through the MS4 to receiving waters. In addition, agricultural processing within the Permit coverage area brings with it the potential of pollutant and illicit discharges that are characteristic of agricultural processing activities.

This Order contains requirements and measures to reduce sediment discharges from the MS4 through stormwater management actions such as street sweeping and catch basin cleaning. In addition, this Order also requires the Permittee to assess the effectiveness of these measures

[8] See discussion for Finding No. 69.

at controlling discharge of sediment to the MS4, and to modify them or implement additional BMPs, as necessary, to achieve effective control of sediment discharges to the MS4. This Order also requires the Permittee to designate and enforce the implementation of BMPs designed to control discharge of pollutants and non-stormwater discharges from industrial facilities and operations.

d. Trash

Trash is a persistent pollutant in the Permittee's receiving waters, particularly in the Salinas Reclamation Ditch and at the discharge from the pump station to the Salinas River. Central Coast Ambient Monitoring Program (CCAMP) staff has documented trash deposits in these areas in all seasons. While the Permittee made trash reduction a primary emphasis during the term of the previous order, trash continues to be a noticeable problem in the MS4, particularly in the Salinas Reclamation Ditch. While the Permittee's Urban Watershed Management Program Annual Reports suggest that the Permittee's efforts are reducing the amount of trash and debris entering the MS4, the Permittee continues to document large volumes of trash removed from the MS4 and receiving waters.[9]

This Order includes trash reduction requirements. The trash reduction requirements contained in this Order include both structural and non-structural controls, including the implementation and enforcement of trash reduction ordinances, to reduce discharges of trash to the MS4 and remove trash from the MS4. This Order also identifies measures designed to assess the quantity of trash entering the MS4 and the effectiveness of the Permittee's trash reduction efforts.

B. Future Growth Area

On May 19, 2008 the Local Agency Formation Commission of Monterey County considered and approved annexation of land commonly called the Future Growth Area into the City of Salinas. Annexation did not automatically result in any development rights or entitlements for the Future Growth Area and development cannot occur until a thorough environmental review and planning process is completed. Therefore development within the Future Growth Area is subject to the requirements of this Order.

The Future Growth Area consists of approximately 2,388 gross acres and is planned for up to 11,485 total dwellings and 3.992 million square feet of commercial/retail/mixed use and public/semi-public uses. Urban development of this magnitude has the potential to cause changes in stormwater runoff conditions that can affect watershed processes, resulting in increased impacts to beneficial uses in receiving waters in the Salinas River watershed downstream of the Permit coverage area if adequate stormwater controls are not applied. Once land is developed, it is much more difficult to reduce impacts on watershed processes caused by development. This Order emphasizes requirements for new development that will shape development in the Future Growth Area in a way that minimizes impacts to water quality, beneficial uses, and watershed processes. This Order requires that development within the Future Growth Area be designed according to Low Impact Development (LID) principles. Therefore, to be consistent with this Order, specific plans and accompanying California Environmental Quality Act (CEQA) documents for Future Growth Area development must

[9] According to the Permittee's Urban Watershed Management Program Annual Reports, the Permittee removed a total of 40 cubic yards of trash and debris in 2006-07, 11 tons plus 20 cubic yards in 2007-08, 370 cubic yards in 2008-09, and 2.5 tons plus 26 cubic yards in 2009-10.

include a discussion and analysis of LID concepts to be implemented as part of the development. Each specific plan and CEQA document must also demonstrate consistency with the City of Salinas General Plan, which calls for Smart Growth and New Urbanism.[10] Water Board staff understands that the City is proceeding with the planning process for the Future Growth Areas and staff has therefore included in the Order an implementation schedule that ensures the City will condition Specific Plan approvals with requirements for LID implementation.

C. Historical Permitting Approach

The federal CWA was amended in 1987 to address urban stormwater runoff pollution of the nation's waters. One requirement of the amendment was that many municipalities throughout the United States were obligated for the first time to obtain National Pollutant Discharge Elimination System (NPDES) permits for discharges of urban runoff from their Municipal Separate Storm Sewer Systems (MS4s). The federal NPDES regulations require MS4s to develop stormwater management programs that include various components, including components to address stormwater runoff from commercial, residential, industrial, and construction sources. In response to the CWA amendment (and the federal NPDES regulations that implement the amendment), in 1999 the Central Coast Water Board issued municipal stormwater Phase I Order No. 99-087 (NPDES Permit No. CA0049981) to the City of Salinas, California. The Central Coast Water Board renewed the NPDES Permit with changes through adoption of Order No. R3-2004-0135 in March 2005.

During these previous two permitting cycles, the Permittee developed many of the implementation details and incorporated them into its Stormwater Management Plan (SWMP), which was then submitted to the Central Coast Water Board for review and approval. The Orders themselves were relatively simple documents that referred to the SWMPs for implementation details. Specific aspects of Order and SWMP implementation evolved during the previous two permit cycles, with relatively significant changes approved by the Central Coast Water Board with public review and comment. After multiple Central Coast Water Board meetings considering the Permittee's SWMP implementation, the Central Coast Water Board approved the Permittee's SWMP in July 2008, with conditions specifying amendments to the Permittee's Stormwater Development Standards (SWDS).

D. Current Permitting Approach

This Order represents the next iterative step in stormwater requirements and includes increased specificity; a blend of water quality monitoring and BMP assessment for evaluating program effectiveness; and commencement of a watershed-based approach to stormwater management. This iterative advance, beyond the current reliance on implementation of BMPs as presumptive evidence of compliance, is a reasonable and necessary step to achieve compliance with water quality standards and protection of beneficial uses over time.

1. Increased Specificity

In previous Orders, the majority of the detailed actions to be implemented by the Permittee were contained in the SWMP and the SWDS, which were separate from the Order and incorporated

[10] Smart Growth and New Urbanism are urban planning and transportation approaches that avoid urban sprawl and reduce environmental impacts by concentrating growth, preserving open space, and integrating transportation and land use decisions.

by reference. By contrast, this Order incorporates many of the details of the SWMP, including specific compliance milestones, directly into the language of the Order. This Order includes more specificity in the requirements to develop, perform, and track stormwater management actions at specific levels of implementation, and to determine if the effectiveness of each action is sufficient to achieve compliance with this Order.

The Permit includes requirements for the following components:

- Municipal Maintenance;
- Commercial and Industrial;
- Residential;
- Illicit Discharge Detection and Elimination;
- Agriculture and Livestock;
- New Development and Redevelopment;
- Construction Site Management
- Development Planning and Stormwater Retrofits;
- Public Education and Public Involvement;
- Trash Load Reduction;
- Total Maximum Daily Loads (TMDLs);
- Monitoring, Effectiveness Assessment, and Program Improvement; and
- Watershed Characterization.

The Permittee is required to update its SWMP and to submit specific components of the SWMP to the Central Coast Water Board Executive Officer for approval. In contrast with previous Orders, the entire SWMP is not required to be submitted for approval. This is because Central Coast Water Board staff improved the specificity of Order language to provide the Permittee with clear direction on necessary changes to the BMPs described in the SWMP. The Fact Sheet for Provision D, below, provides further discussion of the need for a SWMP.

The increased specificity of Order language addresses several problems that accompanied implementation of the previous Order. The previous approach, whereby Order language directed the Permittee to first develop and incorporate BMPs into a SWMP, then to submit the SWMP to the Central Coast Water Board for approval, required two distinct procedural efforts by both the Permittee and Central Coast Water Board staff. As a result, the effort and time expended on procedural matters associated with approving the SWMP (and SWDS) was cumbersome and hindered program implementation. By increasing specificity in the language describing what is required and how it is measured, this Order limits the number of program components that must be separately developed by the City and approved by the Central Coast Water Board Executive Officer.

Additionally, the previous Order language provided only limited performance criteria for BMPs. While selecting appropriate performance criteria (e.g., measurable goals, numeric targets, and action levels) remains a significant challenge in stormwater permitting, discrete information on outcomes is necessary to evaluate compliance of a technology-based standard such as Maximum Extent Practicable. In the absence of information about the degree and effectiveness of implementation, it is not reasonable to continue assuming compliance from implementation of management measures. The previous Order thus presented challenges in demonstrating compliance to both the Permittee and Central Coast Water Board staff.

To address this problem, this Order introduces significant improvements in requiring the use of performance criteria and provides specific performance measures in the language itself.

Though the majority of this language is in Provision P, Monitoring, Effectiveness Assessment, and Program Improvement, Central Coast Water Board staff included more specific language on what is required and how to demonstrate implementation in all other Order Provisions. Important improvements in specifying what to report will also greatly assist compliance determination.

2. Blend of Water Quality Monitoring and BMP Assessment for Evaluating Effectiveness

This Order is an iterative step beyond previous Orders in that it establishes a balanced approach to assessing stormwater management program effectiveness at achieving tangible results. Conventional effectiveness assessment has relied on water quality data obtained through receiving water monitoring to determine the effectiveness of stormwater management actions at protecting water quality. However, the link between stormwater management actions and receiving water quality is not fully understood. As a result, municipal stormwater program managers conduct actions they believe to be effective, but are challenged to demonstrate tangible results of these actions in terms of water quality improvements. Without quantitative information about the effectiveness of stormwater management actions, program managers have not been able to demonstrate the effectiveness of stormwater management efforts, invest resources in activities known to be most effective, or identify modifications that will improve program effectiveness. Nor have program managers been able to justify reductions in effort or expenditure on the basis of effectiveness evaluations (i.e., reducing effort and/or expenditure on activities shown to be ineffective). The Permittee has experienced the same challenges in the management of its own stormwater program.

This Order addresses the challenge of demonstrating tangible results and the incomplete understanding of the links between stormwater management actions and receiving water quality through a blend of detailed BMP effectiveness assessment measures, stormwater discharge action levels, and long-term water quality trend monitoring of stormwater discharges and receiving waters. This Order incorporates this range of effectiveness assessment methodologies for several reasons. First, since different BMPs lend themselves to different assessment methodologies, using a range of methodologies enables the Permittee to apply the appropriate methodology to different BMPs at the appropriate scale. Second, the effectiveness assessment requirements allow for quantitative measurement of a wider range of BMPs. Third, the range of methodologies will provide more information about the links between BMPs and receiving water quality that will be useful in designing requirements in subsequent orders.

This Order establishes detailed effectiveness measures for specific BMPs that are designed to quantify the results of stormwater management activities, assess their effectiveness at reducing pollutant loads, and identify modifications that can improve their effectiveness. This Order emphasizes measurement of pollutant load reduction because of the link between pollutant load reduction and water quality protection. The Order assumes that reducing pollutant loads has a positive effect on receiving water quality, and that quantitative demonstration of pollutant load reductions is a demonstration of water quality protection.

This Order also establishes stormwater discharge action levels for a limited number of pollutants. This Order requires the Permittee to monitor a limited number of stormwater discharges and compare the monitoring results with the established action levels, and take required actions in response to action level exceedances. The primary purpose of these action levels is to provide quantitative feedback on the cumulative effectiveness of stormwater management actions at reducing pollutant discharges at the Urban Catchment scale which can be used to evaluate and modify BMPs to increase their effectiveness. This level of feedback is

essential because many BMPs do not lend themselves to direct measurement or calculation of pollutant load reductions (e.g., public education). The secondary purpose of stormwater discharge action levels and associated stormwater discharge monitoring is to obtain more information about the link between stormwater management activities and receiving water quality. Assessing effectiveness at the Urban Catchment scale, rather than just at the receiving water scale, will better enable the Permittee to discern the cause-and-effect relationship between pollutant sources, BMPs, and stormwater management decisions over the long term by focusing on a limited management area over which the Permittee has a greater degree of control.

The third ingredient in this Order's blend of effectiveness assessment measures is long-term water quality trend monitoring of stormwater discharges and receiving waters. Extensive research has already been conducted on pollutants present in municipal stormwater discharges, so that the pollutant characterization of municipal stormwater discharges is generally known. Therefore this Order does not require extensive monitoring of stormwater discharges and receiving waters for the purpose of characterizing pollutants. Instead, the requirements contained in this Order focus on discerning long-term water quality trends that can be linked to stormwater management activities. This Order requires long-term trend monitoring in one municipal stormwater discharge and in one receiving water. In doing so, the Order assumes that stormwater management activities that are effective in affecting water quality in one receiving water will also be effective in affecting water quality in other receiving waters, provided the Permittee is conducting similar activities with a similar level of effort in all Urban Subwatersheds. This Order requires the Permittee to implement stormwater management activities with a similar level of effort in all Urban Subwatersheds during the term of this Order. In future terms, knowledge gained about the effectiveness of BMPs at improving water quality will be combined with the results of watershed characterization to allow the Permittee to focus effort where it is most effective and/or most needed.

Lastly, the blend of effectiveness assessment methodologies contained in this Order is designed to obtain the needed information in a manner that is efficient in terms of both effort and cost. Detailed BMP effectiveness measures have been included on the basis of their capacity to provide quantitative information simply and inexpensively. Monitoring sites have been limited to the number needed for obtaining needed information. Not only does this minimalist and results-based approach allow the Permittee to avoid expending funds and effort unnecessarily, it also allows the Permittee to focus effort and funds on stormwater activities identified as most effective and/or most needed.

3. Commencement of a Watershed-Based Approach to Stormwater Management

This Order includes requirements to begin the long-term process of watershed-based stormwater management. Watershed-based stormwater management is an iterative step forward and is necessary to more realistically assure compliance with water quality standards and protection of beneficial uses over time. This Order requires the initial step in this process, watershed characterization.

The process of watershed characterization is the identification and understanding of receiving water, urban infrastructure, and landscape conditions that affect how stormwater runoff interacts with watershed functions. The purpose of the watershed characterization is to help guide stormwater management decisions. This Order focuses on characterization of the most basic, useful, and important watershed processes relevant to stormwater.

Watershed processes include the following:

- Surface Runoff – Runoff volume, rate, duration, and surface storage;
- Groundwater Recharge and Discharge – Infiltration to support baseflow and interflow to wetlands and surface waters, and deep vertical infiltration to groundwater;
- Sediment Processes – Hillslope (rilling, gullying, sheetwash, creep, and other mass movements); riparian (bank erosion); and channel (fluvial transport and deposition) processes;
- Chemical Processes – Chemical attenuation through sequestration, degradation, and rate of chemical delivery to receiving waters; and
- Evapotranspiration – The return of water to the atmosphere from the soil and soil surface by direct drying and the respiration of plants.

This Order requires the initial steps for commencing a watershed-based approach in its requirements for Watershed Characterization in Provision Q. By delineating the Urban Subwatersheds throughout the permit coverage area, then collecting and managing information as indicated in all the Order Provisions on the basis of these subwatersheds, the Permittee will establish the foundation for watershed-based stormwater management.

Finally, at the conclusion of the term of this Order, the Permittee is required to conduct an analysis to determine necessary improvements to its stormwater management and development planning so that future stormwater management decisions and development practices protect and restore watershed processes and beneficial uses. The Permittee will rate its Urban Subwatersheds relative to the risk of impact and alteration of watershed processes, and then develop measurable goals for improving program implementation. These program improvements will be the foundation of a watershed-based approach to stormwater management in the subsequent Order.

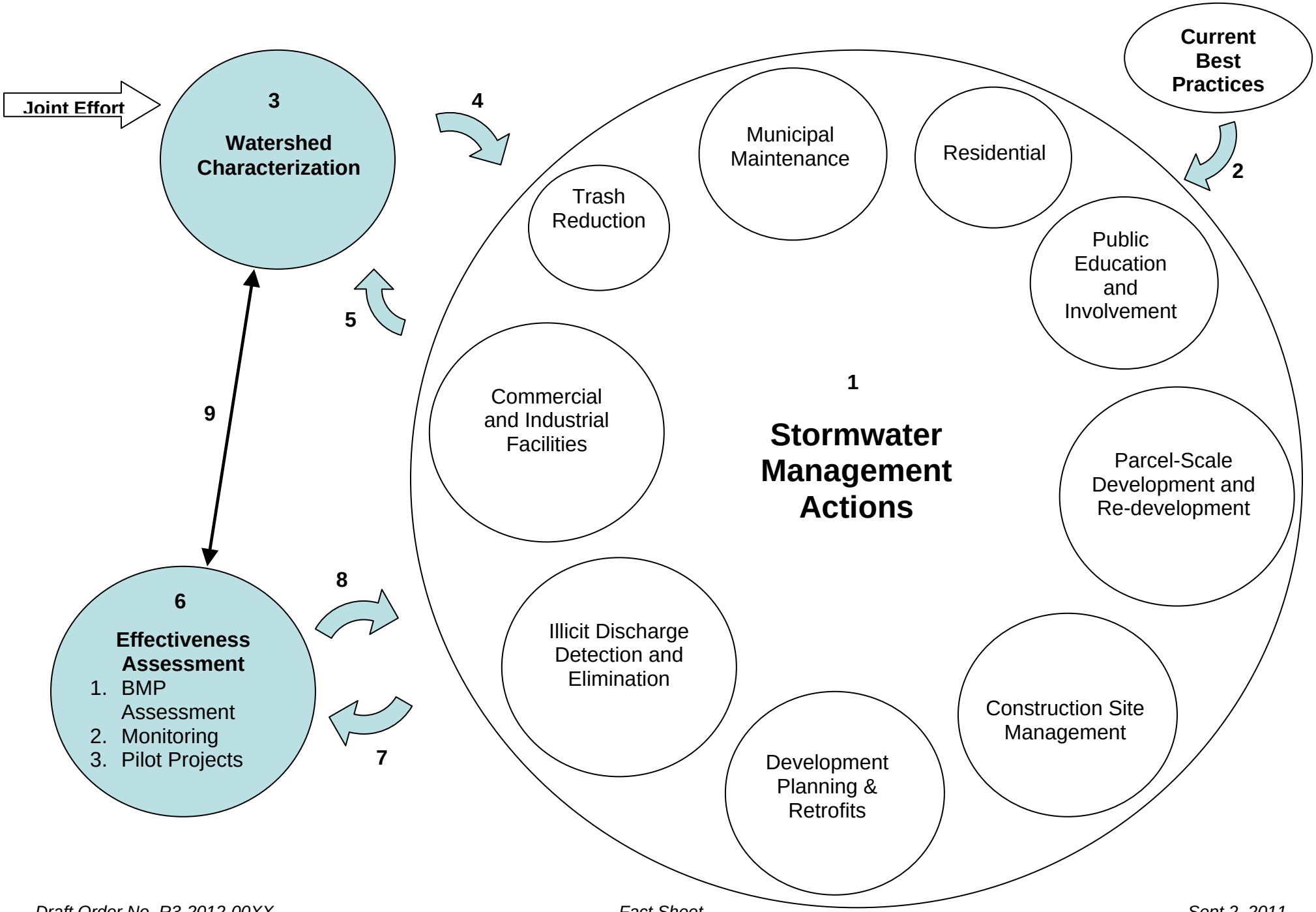
"Stormwater cannot be adequately managed on a piecemeal basis due to the complexity of both the hydrologic and pollutant processes and their effect on habitat and stream quality."

With this statement and many that follow, a recent report on managing stormwater in the United States prepared by the National Research Council (NRC) for the United States Environmental Protection Agency (USEPA)[11], argues for a comprehensive strategy to address stormwater impacts at a variety of scales and to curb the development patterns that create excess imperviousness and other anthropogenic disturbances to watershed processes. Beyond the site-level, stormwater impacts are linked to the overall pattern of development in a watershed, including its location and form. The NRC report promotes a watershed-based approach to stormwater management to move beyond the piecemeal approach and address both site and watershed scales.

Figure 1 illustrates how this Order's components fit together and effect and inform one another to result in a program that achieves watershed-based stormwater management objectives more effectively over time. The diagram demonstrates the iterative nature of this Order and a holistic approach to stormwater management. Each diagram component is identified numerically and described below.

[11] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 8. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.

Figure 1. Watershed-Based Stormwater Management



1. Stormwater Management Actions are actions taken by the Permittee to reduce pollutants in stormwater discharges and protect water quality. They encompass all the implementation portions of this Order (depicted by small circles in component 1). Over time, the watershed characterization and effectiveness assessment feedback loops will shift Stormwater Management Actions toward achieving the watershed process protection goals. This shift is important because it focuses stormwater management on actual conditions in Urban Subwatershed and allows the Water Board to evaluate compliance in terms of tangible outcomes on the ground.

2. Stormwater Management Actions in this Order are initially based on what the Permittee has been doing to date and on what is known about stormwater management throughout California and other states. Described in the diagram as "current best practices," this approach involves application of site-specific BMPs, in combination with program-wide BMPs (e.g., Publication Education). In the absence of extensive quantitative data indicating which of the Stormwater Management Actions are most effective at protecting watershed processes and beneficial uses, implementation of these actions has constituted presumptive evidence of permit compliance. Nevertheless, it is evident that this approach is not always effective. Central Coast Water Board staff has therefore assessed the effectiveness of the current approach used in the Permittee's current program and other stormwater management programs around the country to develop requirements that are most likely to be effective for the Permittee. Central Coast Water Board staff has also relied on information from scientific research related to stormwater management and guidance tools (e.g., EPA guidance tools for Permit writing) for writing this Order. Likewise, Central Coast Water Board staff has modified requirements to improve their likely effectiveness and developed new requirements where gaps exist. Over time, these updated current practice requirements will be further refined as the watershed characterization and effectiveness assessment feedback loops result in Stormwater Management Actions more capable of protecting watershed processes and meeting water quality objectives and protecting beneficial uses in receiving waters. While this process is expected to result in changes to implementation within each Stormwater Management Action category, it will not necessarily alter the major categories of Stormwater Management Actions now included in the Stormwater Management Program.

3. Figure 1 indicates the Central Coast Joint Effort for Hydromodification Control as an input to Watershed Characterization. Though conducted independently, the Central Coast Joint Effort for Hydromodification Control (described below) will provide relevant information about dominant watershed processes and will provide the Permittee guidance on managing stormwater to protect or restore those processes, water quality, and beneficial uses in receiving waters. The process of Watershed Characterization is the identification and understanding of receiving water, urban infrastructure, and landscape conditions that affect how stormwater runoff interacts with watershed processes. The purpose of the Watershed Characterization is to help guide stormwater management decisions. This Order focuses on characterization of the most basic, useful, and important watershed attributes relevant to stormwater. A critical first step is the delineation of Urban Subwatersheds throughout the entire Permit coverage area. Once delineated, these Urban Subwatersheds serve as the organizing unit for a full array of stormwater information collected and assessed in each stormwater management area (e.g., illicit discharge detection and elimination, Trash Reduction). The Watershed Characterization will support a broad suite of stormwater management objectives, including: improved development planning, prioritization of retrofit

opportunities, and prioritization and optimization of implementation of other urban stormwater management measures.

4. This portion of the feedback loop illustrates that knowledge gained from the Watershed Characterization process will inform specific aspects of the Permittee's stormwater management program. By the end of the term of this Order, the Permittee will develop and propose a strategy for restructuring its development planning decisions, revising its SWMP BMPs, and developing a retrofit program to meet water quality objectives and protect beneficial uses in receiving waters. In future Order terms, the Permittee will gain additional knowledge about the condition of its watersheds, as well as municipal MS4 system impacts, thus building its program on a watershed basis.

5. This portion of the feedback loop illustrates that on-the-ground change to watersheds, resulting from or affected by the Permittee's management actions, will inform updates to the watershed characterization.

6. Effectiveness Assessment involves analyzing the effectiveness data to determine the effectiveness of Stormwater Management Actions at achieving measurable outcomes and, where possible, performance targets. This aspect of this Order focuses primarily on supporting management decisions, such as program prioritization and optimization. The longer-term goal of Section P (Monitoring, Effectiveness Assessment, and Program Improvement) is to link Stormwater Management Actions to conditions of urban runoff and receiving waters in Urban Subwatersheds. Various assessment methodologies are planned and are described in detail in the Provision P.

7 and 8. This feedback loop illustrates that the results of the effectiveness assessment will inform specific modifications to Stormwater Management Actions to make them more effective, both in the current Order term and in future Order terms. This feedback loop is the principle means by which the Permittee can conduct adaptive management of its stormwater program. During this Order term the Permittee will collect data, refine the assessment methodologies, analyze the data, and begin making modifications to those Stormwater Management Actions that are readily assessed and modified. In the next Order term, the Permittee and Central Coast Water Board staff will use the results of the analysis to define Stormwater Management Actions that will be more effective at protecting watershed processes and beneficial uses. Collection and analysis of effectiveness data over time will also result in increasingly meaningful and comprehensive assessment methodologies.

9. Both the Watershed Characterization and Effectiveness Assessment Provisions are means of achieving tangible results to inform improvements to the Stormwater Management Actions and to indicate progress towards or achievement of water quality objectives and beneficial uses. Both of these provisions complement one another, and results from both Provisions will influence each other. For example, Watershed Characterization will provide an organizational platform to conduct effectiveness assessment and provide basic information about the risk of impact and alteration of watershed processes. The Permittee's assessment effort can then focus on those actions that most directly influence watershed processes in each Urban Subwatershed. Conversely, effectiveness assessment information needs are taken into account when determining which watershed features to characterize.

Consistent with the watershed approach, the Permittee is participating in the Central Coast Joint Effort for Hydromodification Control, and this Order requires the Permittee's continued participation. The Central Coast Joint Effort for Hydromodification Control is designed to: 1) create a methodology for developing hydromodification control criteria based on dominant watershed processes, 2) derive new or select appropriate existing criteria by applying the methodology, and 3) support implementation of the resulting criteria throughout the Central Coast for new development and redevelopment projects. The effort includes oversight by the Director of the Low Impact Development Initiative and Water Board staff; a team of subject area experts to execute the scope of work; and participating municipalities. This project is a key step in the Central Coast Water Board's progressive, stepwise process to protect beneficial uses from impacts caused by alteration of watershed processes resulting from stormwater management. The Joint Effort also supports State Water Board Strategic Plan goals for statewide healthy watersheds.

V. Economic Issues

Economic discussions of urban runoff management programs tend to focus on costs incurred by municipalities in developing and implementing the programs. This is appropriate, and these costs are significant and a major issue for the Permittees. When considering the cost of implementing stormwater management 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.

It is very difficult to ascertain the true cost of implementing stormwater management programs because of highly variable factors among different municipalities and inconsistencies in reporting by Permittees. Reported costs of compliance for the same program element can vary widely from Permittee to Permittee, often by a very wide margin that is not easily explained.[12] Despite these problems, efforts have been made to identify urban runoff management program costs, which can be helpful in understanding the costs of program implementation. In 1999, USEPA reported on multiple studies it conducted to determine the cost of urban 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 per year. USEPA also studied 35 Phase I municipalities, finding costs to be similar to those anticipated for Phase II municipalities, at $9.08 per household each year.[13]

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

The State Water Board also commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. Annual cost per household in the

[12] Radulescu, Dan, and Xavier Swamikannu. *Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003.* Los Angeles Regional Water Quality Control Board, January 2003. Web. 24 August 2011. p.2.

[13] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register* 64 (8 December 1999): p. 68791 – 68792. Web. 10 August 2011.

study ranged from $18-46, with the City of Encinitas representing the upper end of the range.[14] The cost of the City of Encinitas' program for the 2002/2003 fiscal year, as discussed in the study, is a reasonable approximation of the cost of the Permittee's program under this Order. During fiscal year 2002/2003, the City of Encinitas implemented its stormwater program in accordance with Order No. R9-2001-01. The basic requirements of Order No. R9-2001-01 and this Order are similar in many ways. For example, both Orders generally address stormwater discharges from municipal, commercial, industrial, construction, and residential areas and activities by requiring inventories of sources, prioritization of inventories, identification of BMP requirements, inspection frequencies according to prioritization, and enforcement of codes and ordinances. Likewise, both Orders require development and implementation of significant programs to control stormwater discharges from new development and redevelopment, at both the planning and individual project levels. In addition, both Orders require mapping and assessment of watershed conditions, and concomitant development of a plan to address stormwater impacts on a watershed basis. Further, while this Order contains more detail regarding effectiveness assessments, both Orders require the MS4s to assess the effectiveness of their BMP implementation.

While the City of Encinitas is a relatively small coastal city with a reliance on tourism, it is important to note that the study assessed program costs from fiscal year 2002/2003 when considering the relevance of the City of Encinitas' program to the Permittee's program. Stormwater permit requirements throughout the state have significantly evolved since that time as the significant impacts to receiving waters caused by stormwater discharges have become better understood. Moreover, the number of impairments to which the City of Encinitas contributed at that time was fewer than those currently contributed to by the Permittee. These factors indicate that a similar level of stormwater program implementation between the City of Encinitas in 2002/2003 and the Permittee in 2012 is appropriate, even though the Permittee may lack within its jurisdiction the coastal tourism economy of the City of Encinitas. It is also worth noting that while the Permittee does not heavily rely on water-based tourism directly within its jurisdiction, the surrounding communities downstream of the Permittee's stormwater discharges substantially depend on the healthy waters of the Monterey Bay National Marine Sanctuary. Other MS4s assessed in the study, which may have similar compositions to that of the Permittee, include the Cities of Corona and Santa Clarita. These MS4s were found to expend $32 and $39 annually per household on their stormwater programs, respectively.

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 issued. For example, street sweeping and trash collection costs cannot be solely or even principally attributable to MS4 permit compliance, since these practices have long been implemented by municipalities. 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 program costs was either pre-existing or resulted from enhancement of pre-exiting programs.[15] The County of Orange found that even lesser amounts of program costs are solely attributable to MS4 permit compliance, reporting that the cost attributable to implementation its Drainage Area Management Plan is less than 20 percent of the total budget. The remaining 80 percent is attributable to pre-existing programs.[16]

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[14] Currier, Brian K., et al. *NPDES Storm Water Cost Survey Final Report.* Office of Water Programs, California State University, Sacramento, January 2005. p.ii.
[15] Ibid, p.58.
[16] County of Orange. *A NPDES Annual Progress Report*, 2000. p. 60.

It is also important to acknowledge that the vast majority of costs that will be incurred as a result of implementing this Order are not new. Urban runoff management programs have been in place in the City of Salinas for over 10 years. Any increase in cost to the Permittee to implement this Order is expected to be incremental in nature.

Urban runoff management programs cannot be considered in terms of their costs alone. 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 to support fishing and boating has been estimated by USEPA to be $158-210.[17] 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 USEPA's estimates, reporting annual household willingness to pay for statewide clean water to be $180.[18] When viewed in comparison to household costs of existing urban runoff management programs, these household willingness to pay estimates exhibit that per household costs incurred by Permittees to implement their urban runoff management programs remain reasonable.

Another important way to consider urban runoff management program costs is to consider the implementation cost in terms of costs incurred by not improving the programs. Urban runoff in southern California has been found to cause illness in people swimming near storm drains.[19] A study of south Huntington Beach and north Newport Beach found that an illness rate of about 0.8 percent among bathers at those beaches resulted in about $3 million each year in health-related expenses.[20] Extrapolation of such numbers to the beaches and other water contact recreation in Monterey Bay and the tributary creeks of the region could result in huge expenses to the public.

Financing the stormwater management program offers a considerable challenge for municipalities. A proven successful financing mechanism is the establishment of a stormwater utility.[21] Utility fees, which are assessed on the property owner based on some estimate of stormwater runoff generated for the site, are a predictable and dedicated source of funds. Utility fees can also 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.

Finally, it is important to consider the benefits of urban runoff management programs in conjunction with their costs. A study conducted by USC/UCLA assessed the costs and benefits

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[17] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register* 64 (8 December 1999): p. 68793. Web. 10 August 2011.

[18] Currier, Brian K., et al. *NPDES Storm Water Cost Survey Final Report.* Office of Water Programs, California State University, Sacramento. p.iv.

[19] Haile, R.W., et al. *An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay*. Santa Monica Bay Restoration Project. 1996.

[20] Dwight, Ryan H., et al. "Estimating the economic burden from illnesses associated with recreational coastal water pollution—a case study in Orange County, California." Journal of Environmental Management. 76.2 (2005): 95-103. 24 August 2011. <http://www.sciencedirect.com>.

[21] USEPA. *Preliminary Data Summary of Urban Storm Water Best Management Practices*, *EPA 821-R99-012,* August 1999. Web. 24 August 2011. The document reviews municipal financing mechanisms and summarizes experience in the U.S. to date.

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. If structural systems were determined to be needed, the study found that total costs would be $5.7 to $7.4 billion, while benefits could reach $18 billion.[22]

Central Coast Water Board staff expects costs to be spread out over many years – probably ten years at least. As noted above from the literature, the benefits of the programs are expected to considerably exceed their costs. Such findings are corroborated by USEPA, which found that the benefits of implementation of its Phase II stormwater rule would also outweigh the costs.[23]

Many of the potential costs of specific components of this Order are difficult to estimate because the cost of implementing current requirements is unknown and the costs of this Order would represent incremental increases above current costs. However, for some entirely new requirements costs can be estimated. For example, the requirement to conduct rapid stream assessments [Section Q (Watershed Characterization)] can be estimated based on information provided by the Center for Watershed Protection (CWP) to conduct an Urban Stream Assessment (USA). According to the Center:

"Several factors come into play when budgeting and scoping a USA survey, including the number of stream miles to cover, available staff, equipment needed, and the density of impacts in the stream corridor. The desktop analysis step can help estimate the total stream mileage for delineated reaches that will be surveyed, so that you can estimate staff time needed. For example, in a moderately urban subwatershed with 30 stream miles, you should expect to expend five to seven staff weeks of effort to complete all four USA steps. Assuming minimal supply needs and professional rates of $25/hour, you should expect to spend approximately $15,000 on a full USA survey. Note that significant cost savings can be achieved by using volunteers. Table V.1 provides a generic budget breakdown for the cost of performing the USA on a 10 square mile subwatershed."

Water Board staff estimates that the stream miles requiring assessment per the Order is on the order of 10 miles, resulting in substantially less expense to implement an assessment following the entire USA protocol.

Table V.1. Generic Urban Stream Assessment Budget for Hypothetical Subwatershed

Salaries	
Task 1: General Prep for fieldwork Generating field maps Watershed Planner I @ $25/hr 40 hrs	$1,000
Task 2: Performing Urban Stream Assessment (3 staff @ 2 miles/day) Watershed Planner I@ $25/hr 120 hrs Watershed Planner II @ $25/hr 120 hrs Watershed Planner III @ $25/hr 120 hrs	$9,000
Task 3:Data processing (quality control, evaluation) Watershed Planner I @ $25/hr 80 hrs	$2,000

[22] Devinny, Joseph S., Sheldon Kamieniecki, and Michael Stenstrom. "Appendix H: Alternative Approaches to Stormwater Control." *NPDES Storm Water Cost Survey Final Report.* University of Southern California; University of California at Los Angeles, 2004. Web. 24 August 2011.
[23] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register* 64 (8 December 1999): p. 68791. Web. 10 August 2011.

Supplies and Equipment	
GPS unit (@ $150/unit) Waders (3 pairs @ $70/pair) Digital camera (@ $300) Street maps/orthos ($40)	$700
Copying and Reproduction	$500
Total Costs	**$13,200**
Estimate assumes 10 square mile subwatershed with 30 miles of walkable streams	

* Table V.1 reproduced from CWP USA, Table 8, p. 23.[24]

The potential cost of implementing the monitoring requirements contained in this Order can also be estimated and compared with the cost of implementing monitoring requirements contained in the current order (i.e., Order No. R3-2004-0135). Central Coast Water Board staff estimates that the cost of implementing the monitoring requirements contained in this Order, spread over the five-year permit term, at approximately $30,000 per year. This estimate is based on data from several analytical laboratories, and includes sampling, laboratory, and sampling equipment costs. The estimate assumes the Permittee will continue to use a consultant to collect samples for Stormwater Discharge Trend Monitoring and Receiving Water Monitoring, but that Permittee staff will install and maintain the automated sampling device used for Stormwater Discharge Trend Monitoring and will collect samples for Urban Catchment Action Level Pilot Projects Monitoring. The estimate constitutes a significant decrease in cost associated with monitoring requirements: In its annual report for the 2008-09 permit year, the Permittee estimated the cost of implementing the current monitoring program at $200,000 per year.[25]

VI. MEP

This Order requires the Permittee to establish and implement BMPs to the maximum extent practicable. MEP is the technology-based standard that operators of MS4s must meet established by Congress in CWA section 402(p)(3)(B)(iii). Technology-based standards establish the level of pollutant reductions dischargers must achieve, typically by treatment or by a combination of source control and treatment control BMPs. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional line of defense). MEP considers economics and is generally, but not necessarily, less stringent than the Best Available Technology (BAT). A definition for MEP is not provided either in the statute or in the regulations; therefore MEP has been defined in practice by the Cemtra; Coast Water Board using guidance from the State Water Board's Office of the Chief Counsel (see below). Achieving the MEP standard requires a dynamic and cumulative effect of implementing, evaluating, and making corresponding changes to a variety of technically appropriate and economically feasible BMPs, ensuring that the most appropriate controls are implemented in the most effective manner so that conditions progress towards achievement of water quality objectives and protection of beneficial uses. This process of implementing, evaluating, revising, or adding new BMPs is commonly referred to as the iterative process.

[24] Kitchell, Anne, and Tom Schueler. *Urban Subwatershed Restoration Manual No. 10: Unified Stream Assessment: A User's Manual Version 2.0.* Ellicott City, MD: Center for Watershed Protection, February 2005. Web. 24 August 2011. p.23. <http://www.cwp.org/>.
[25] City of Salinas. *City of Salinas 2008-2009 Annual Report for the Urban Watershed Management Program.* 30 September 2009.

In a memo dated February 11, 1993, entitled "Definition of Maximum Extent Practicable," Elizabeth Jennings, Senior Staff Counsel, State Water Board's Office of the Chief Counsel, addressed the achievement of the MEP standard as follows:

"To achieve the MEP standard, municipalities must employ whatever Best Management Practices (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:

- *Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?*
- *Regulatory Compliance: Is the BMP in compliance with stormwater regulations as well as other environmental regulations?*
- *Public Acceptance: Does the BMP have public support?*
- *Cost: Will the cost of implementing the BMP have a reasonable relationship to the pollution control benefits to be achieved?*
- *Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources?*

The final determination regarding whether a municipality has reduced pollutants to the maximum extent practicable can only be made by the Regional or SWRCBs, and not by the Permittee. If a municipality reviews a lengthy menu of BMPs and chooses to select only a few of the least expensive, it is likely that MEP has not been met. On the other hand, if a Permittee employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit derived, it would have met the standard. Where a choice may be made between two BMPs that should provide generally comparable effectiveness, the Permittee 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 base solely on cost, which would be clearly less effective. In selecting BMPs the municipality shall make a serious attempt to comply and practical solutions may not be lightly rejected. In any case, the burden would be on the Permittee to show compliance with its Order. After selecting a menu of BMPs, it is the responsibility of the Permittee to ensure that all BMPs are implemented."

This Order requires the Permittee to implement BMPs to reduce the discharge of pollutants to the maximum extent practicable and protect against violations of water quality standards. This Order requires that the Permittee not cause exceedances of water quality objectives nor cause certain conditions that cause a nuisance or water quality impairment in receiving waters. To the extent that discharges are causing or contributing to a violation of water quality standards, the Order requires implementation of an iterative process of BMP improvements until water quality standards are attained. Accordingly, the Central Coast Water Board is requiring that these standard requirements be addressed through the implementation of technically and economically feasible control measures to reduce pollutants in stormwater discharges to the maximum extent practicable as provided in the Order's Provisions and section 402(p) of the CWA. Compliance with the Discharge Prohibitions, Effluent Limitations, Receiving Water Limitations, and Provisions (including Attachments) of this Order is deemed compliance with the requirements of this Order.

VII. Legal Authority

The following statutes, regulations, and Water Quality Control Plans provide the basis for the requirements of this Order: California Water Code (CWC), CWA, 40 Code of Federal Regulations (CFR) Parts 122, 123, 124 (National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, Final Rule), 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), Water Quality Control Plan – Ocean Waters of California (California Ocean Plan), Water Quality Control Plan for the San Diego Basin (Basin Plan), 40 CFR 131Water 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 directives in this Order, and provide the Central Coast Water Board with ample underlying authority to require each of the directives of this Order. Legal authority citations are also provided with the discussion of each Order Provision in Section XII (Specific Permit Provisions) of this Fact Sheet.

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

CWA 402(p)(3)(B)(iii) – The CWA requires in section 402(p)(3)(B)(iii) 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 system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

40 CFR 122.26(d)(2)(i)(B,C,E, and F) – Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) provide that each Permittee's permit application "shall consist of: (i) 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: […] (B) Prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer; (C) 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; […] (E) Require compliance with condition in ordinances, permits, contracts or orders; and (F) Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal separate storm sewer."

40 CFR 122.26(d)(2)(iv) – Federal NPDES regulation 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) – Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A - D) require municipalities to implement controls to reduce pollutants in urban 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.

CWC 13377 – CWC 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 anymore stringent effluent standards or limitation necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance."

This Order is an essential mechanism for achieving the water quality objectives that have been established for protecting the beneficial uses of the water resources in the City of Salinas, California. 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 a water body's beneficial uses and the water quality objectives necessary to protect those beneficial uses, as established in the Basin Plan.

40 CFR 124.8(a), – Federal NPDES regulations 40 CFR 124.8(a) provides that "a fact sheet shall be prepared for every draft permit for a […] NPDES facility […]. The fact sheet shall briefly set forth the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit." This Fact Sheet has been made a part of the Administrative Record.

VIII. Training

USEPA recognizes a key element in the successful implementation of a stormwater management program is the training of the municipality's staff. [26] Throughout this Order, the Permittee is required to train municipal staff so they have the knowledge and understanding of the requirements of this Order and how to effectively contribute to stormwater management activities.

This Order requires the Permittee to train staff, who may come into contact or observe illicit discharges, on the identification and proper procedures for reporting illicit discharges. Staff to be trained may include, but are not limited to, municipal maintenance staff, inspectors, and other staff whose job responsibilities regularly take them out of the office and into areas within the MS4 area. Permittee staff members are out in the community every day and are in the best position to locate, report, and correct spills, illicit discharges, and potentially polluting activities. With proper training on how to recognize illicit discharges and information on reporting illicit discharges easily accessible, these staff can greatly expand the reach of the illicit discharge detection and elimination program.

This Order requires training for the Permittee staff whose job duties are related with the implementation of the construction site management program to ensure that the erosion and sediment control requirements are understood and consistently applied since all staff will have been trained on the same information. The training requirements vary by the type of staff. For

[26] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011.

example, erosion and sediment control inspectors must be trained each year on a range of topics, while other construction inspectors (such as building inspectors) can receive more general training.

This Order requires the training of municipal and contracted staff to ensure that everyone is knowledgeable and proficient in the newest and most effective approaches to minimizing pollutant discharges from municipal facilities and activities.

This Order requires street sweeper operators are trained to sweep in accordance with the requirements of this Order to protect water quality. Street sweeping effectiveness is influenced by the way in which the equipment is operated; therefore this Order requires that equipment is operated according to the manufacturers' operating instructions by trained operators.

The regulations found at 40 CFR 122.34(b)(6) specifically require that the Permittee develop a "training component" that trains employees "to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance." This Order requires employee training for existing and new employees who are involved in performing pollution prevention and good housekeeping practices. All training must include a general stormwater educational component, including an overview of the requirements with which the municipality needs to comply. The Permittee is responsible for identifying which staff must attend trainings based on their job duties.

This Order requires inspectors responsible for conducting inspections at industrial/commercial facilities be trained on the applicable stormwater requirements for the different types of facilities (i.e., industrial, commercial, other). Training must include a summary of federal, state, and local stormwater regulations that may apply to industrial/commercial facilities. Inspectors must be familiar with various types of stormwater control measures commonly used at the types of facilities typically found in the MS4 area and must be able to educate facility operators about such stormwater control measures. In addition, inspectors must understand and use the Permittee's Enforcement Response Plan to gain compliance as necessary. The inspection staff must be proficient in the enforcement escalation procedure and must properly document all enforcement actions accordingly per the Enforcement Response Plan. Inspections provide a direct opportunity to immediately address sources and causes of urban stormwater water quality impacts, but this opportunity is squandered when inspectors lack adequate training.

The Permittee can conduct trainings or the training can be provided by another entity. The most effective trainings are those that include classroom presentations, in-field training, and follow-up evaluations to determine whether the training was effective. This Order requires the Permittee to perform such follow-up-up evaluations to determine if staff has gained knowledge and understanding of the requirements of this Order and how to effectively contribute to stormwater management activities each year. The assessment should identify any gaps in knowledge and understanding so the training programs can be adjusted. These requirements are consistent with municipal stormwater program effectiveness assessment guidance.[27] Some staff may require more frequent and/or extensive training than others.

IX. Information Management System

[27] CASQA. *Municipal Stormwater Program Effectiveness Assessment Guidance*, May 2007. Web. 17 August 2011 <www.casqa.org>.

USEPA recognizes an important part of any municipal stormwater program is to document and track information on activities the Permittee undertakes to comply with the Order requirements.[28] Tracking should be integrated into each of the minimum measures. For example, tracking the location of illicit discharges may indicate that a specific area has a high incidence of motor oil being dumped into storm drains. Investigations may reveal that homeowners are changing the motor oil in their cars, but not properly disposing it. Therefore, the Permittee will need to educate the homeowners in that area regarding proper disposal.

The Permittee shall develop a tracking system to monitor implementation of its various stormwater management programs in order to document the Permittee's compliance with its Order requirements, such as the number of structural BMPs inspected. In addition, the tracking system will allow the Permittee to monitor the compliance status of those entities within its jurisdiction, such as construction sites and industrial facilities, and to ensure compliance of municipally-owned and operated facilities.

Any tracking system should be coordinated with the monitoring and evaluation programs developed by the Permittee to facilitate program effectiveness assessment. Ideally, a monitoring and evaluation program will link the "actions" (e.g., the inspections, maintenance, education, other activities the Permittee implements) with the "results" (e.g., water quality monitoring data, BMP rapid assessment results, improvements in environmental indicators, pollutant load reductions) of the effectiveness assessment and monitoring programs.

In addition, adequate tracking is necessary to generate and provide reports of program progress to the Central Coast Water Board. While multiple departments might implement various stormwater program components, it is helpful for a single person or department to gather and analyze applicable data. This can be accomplished in a number of ways and will vary based on existing data tracking mechanisms used by the Permittee, the data being captured, and the reporting requirements the Permittee shall comply with. A single tracking database accessible by all parties can allow coordination among all municipal staff involved in program implementation. The Permittee will need to ensure that responsible municipal staff populate all data necessary to adequately represent the stormwater management program effectiveness and Order compliance, and specify adequate internal reporting deadlines to guarantee that the data is available in a timely manner for stormwater management program planning, effectiveness assessments, and Order reporting. Some Permittees create reporting forms for stormwater management program component managers to complete and submit by internal deadlines. Regardless of how the Permittee coordinates the effort internally, without adequate tracking of data the Permittee will not be able to submit Annual Reports or adequate information sets during Permittee audits to the Central Coast Water Board that provide the necessary information to determine Order compliance.

X. Reporting

This Order requires that the Permittee submit information in each Annual Report detailing the level of implementation of the stormwater management program during the previous year. The goal of the reporting is to provide implementation updates to the Central Coast Water Board to identify strengths and weaknesses, new stormwater management program areas, management practices, and activities that may need to be modified in order to meet the goals of this Order. Another goal is to demonstrate compliance, including indications of improving or protecting watershed processes, beneficial uses, and water quality objectives.

[28] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011.

XI. Findings

A. Incorporation of the Fact Sheet

1. This Fact Sheet is for Order No. R3-2012-00XX, NPDES Permit No. CA0049981, Waste Discharge Requirements for City of Salinas Municipal Stormwater Discharges. It includes cited regulatory and legal references and additional explanatory information in support of the requirements of this Order.

B. Permit Background

2. This Order renews NPDES Permit No. CA0049981, which was first issued on October 22, 1999 (Order No. 99-087), and then renewed on February 13, 2002 (Order No. R3-2004-0135). On September 30, 2009, in accordance with Order No. R3-2004-0135, the City of Salinas, as the Principal Permittee, submitted a permit application (Report of Waste Discharge) for renewal of the MS4 Permit.

3. This Order supersedes and rescinds Order No. 99-087 and Order No. R3-2004-0135. This Order serves as a NPDES permit, pursuant to CWA section 402, or amendments thereto, and shall become effective February XX, 2012.

4. Section 402 of the CWA prohibits the discharge of any pollutant to Waters of the U.S. from a point source, unless that discharge is authorized by a NPDES permit. Though stormwater and non-stormwater may come 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, shall be required to obtain a NPDES permit. Federal NPDES regulation 40 CFR 122.26(a)(v) also provides that a NPDES permit is required for "A [stormwater] discharge which the Director, or in states with approved NPDES programs, either the Director or the USEPA 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.

   Other small MS4s, such as those serving colleges, also exist within the watersheds of City of Salinas in the Central Coast Region. While these MS4s are not subject to this Order, they are subject to the Phase II NPDES stormwater regulations. Over time, these MS4s will be designated for coverage under the State Water Board's statewide general stormwater permit for small MS4s.

5. The Permittee owns and operates a MS4 that serves drainage areas within the Permit coverage area. The Permittee's MS4 discharges into the surface water bodies listed in Finding No. 24 of this Order. This Order regulates the Permittee's MS4 discharges into these surface water bodies.

6. The Permit coverage area is the incorporated area of the City and defines the boundary of the Permittee's MS4. If the Permittee expands its incorporated area during the term of this Order, the boundary of the Permittee's MS4 shall expand to match the expanded incorporated area. Therefore, the Permittee is responsible for implementing the applicable requirements of this Order in newly incorporated areas.

C. Basis for the Order

7. In 1987, Congress established CWA Amendments to create requirements for stormwater discharges under the NPDES program, which provides for permit systems to regulate the discharge of pollutants. Under the Porter-Cologne Water Quality Control Act, the State Water Board and Regional Water Boards have primary responsibility for the coordination and control of water quality, including the authority to implement the CWA. Porter-Cologne (section 13240) directs the Regional Water Boards to set water quality standards via adoption of Basin Plans that conform to all state policies for water quality control. As a means for achieving those water quality standards, Porter-Cologne (section 13243) further authorizes the Regional Water Boards to establish waste discharge requirements (WDRs) to prohibit waste discharges in certain conditions or areas. Since 1999, the Central Coast Water Board has issued the City a MS4 NPDES permit. The Order will renew Order No. R3-2004-0135 to comply with the CWA and attain water quality standards in the Basin Plan by limiting the contributions of pollutants conveyed by urban runoff. Further discussions of the legal authority associated with the prohibitions and directives of this Order are provided in Section XII.S (Legal Authority) of this Fact Sheet.

8. See discussion for Finding No. 7.

9. The MEP requirement is analogous to a technology-based requirement in that it focuses on implementation of pollutant reduction measures to achieve improvements in the quality of the stormwater that is discharged. Compliance with the MEP requirement can range from implementation of structural and nonstructural BMPs to installation of end-of-pipe treatment systems. MEP does not define the limits of pollution control measures that may be required of MS4 operators, and the requirement to implement controls that reduce pollutants to the MEP is not limited by the goal of attaining water quality standards. In some circumstances, compliance with MEP may result in controls more stringent than applicable water quality standards, and in others, less stringent. The Central Coast Water Board may use its discretion to impose other provisions beyond MEP, as it determines appropriate for the control of pollutants, including ensuring strict compliance with water quality standards (Defenders of Wildlife v. Browner (1999) 191 F.3d 1159, 1168). Requirements in this Order that are more explicit than the federal stormwater regulations in 40 CFR 122.26 are prescribed in accordance with the CWA section 402(p)(3)(B)(iii) and are necessary to meet the MEP standard. The MEP standard is a dynamic performance standard which evolves over time as knowledge about stormwater management increases. Therefore the Permittee's SWMP must continually be assessed and modified in an adaptive management fashion to incorporate improved programs, control measures, and BMPs in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of SWMP implementation is expected to ultimately achieve compliance with water quality standards in the Central Coast Region.

10. Coastal states are required to develop programs to protect coastal waters from nonpoint source pollution, as mandated by the federal Coastal Zone Act Reauthorization Amendments. Coastal Zone Act Reauthorization Amendments section 6217 identifies polluted runoff as a significant factor in coastal water degradation, and requires implementation of management measures and enforceable policies to restore and protect coastal waters. In lieu of developing a separate non-point source program for the coastal zone, California's Non-Point Source Pollution Control Program was updated in 2000 to address the requirements of both the CWA section 319 and the Coastal Zone Act Reauthorization Amendments section 6217 on a statewide basis. The California Coastal

Commission (CCC), the State Water Board, and the nine Regional Water Boards are the lead State agencies for upgrading the program, although 20 other State agencies also participate. Pursuant to the Coastal Zone Act Reauthorization Amendments section 6217(g) guidance document, the development of runoff management programs pursuant to this NPDES permit fulfills the need for coastal cities to develop an runoff non-point source plan identified in the State's Non-point Source Program Strategy and Implementation Plan.[1]

11. The Receiving Water Limitations in this Order require stormwater compliance with water quality standards through an iterative approach for implementing improved and better-tailored BMPs over time. 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, assessment, and modification is needed to promote consistent compliance with receiving water quality objectives. If assessment of a given BMP confirms that the BMP is ineffective, the iterative process should be restarted, with development of a new BMP that is anticipated to result in compliance with receiving water quality objectives.

    The issue of whether stormwater 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 stormwater must meet water quality standards. On the issue of industrial discharges of stormwater, the statute clearly indicates that industrial dischargers must meet both (1) the technology-based standard of "best available technology economically achievable (BAT)" and (2) applicable water quality standards. On the issue of municipal discharges however, the statute states that municipal dischargers must meet (1) the technology-based standard of MEP and (2) "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 stormwater dischargers have argued that they do not have to meet water quality standards; and that they only are required to meet MEP for stormwater. 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, USEPA, the State Water Board, and the Regional Water Boards 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 limitations, USEPA, the State Water Board (in Orders WQ 91-03 and WQ 91-04), and the Regional Water Boards have maintained that MS4 permits can contain narrative requirements for the implementation of BMPs in place of numeric effluent limitations for stormwater discharges.[2]

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[1] State Water Resources Control Board/California Coastal Commission. *Volume I: Nonpoint Source Program Strategy and Implementation Plan, 1998-2013 (PROSIP),* January 2000. Web. 10 August 2011.

[2] For the most recent assessment, see California State Water Resources Control Board. *Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities,* 19 June 2006. Web. 17 August 2011 <http://cmua.org/Files/swpanel_final_report.pdf>.

In addition to relying on USEPA's legal opinion concluding that MS4s must meet MEP for stormwater 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 for stormwater discharges. To further support its conclusions that MS4 permit dischargers must meet water quality standards, the State Water Board relied on provisions of the CWC 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 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 BMPs, rather than by inserting numeric effluent limitations into MS4 permits. Later, in Order WQ 98-01, the State Water Board prescribed specific precedent setting Receiving Water Limitations 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 for stormwater discharges.

In Order WQ 99-05, the State Water Board modified its receiving water limitations language in Order WQ 98-01 to meet specific objections by USEPA (the modifications resulted in stricter compliance with water quality standards). State Water Board Order WQ 99-05 states:

> "In Order WQ 98-01, the State Water Board ordered that certain receiving water limitation language be included in future municipal stormwater permits. Following inclusion of that language in permits issued by the San Francisco Bay and San Diego Regional Water Boards for Vallejo and Riverside respectively, the USEPA objected to the permits. The USEPA objection was based on the receiving water limitation language. The USEPA has now issued those permits itself and has included receiving water limitation language it deems appropriate.
>
> In light of USEPA's objection to the receiving water limitation language in Order WQ 98-01 and its adoption of alternative language, the State Water Board is revising its instructions regarding receiving water limitation language for municipal stormwater permits. It is hereby ordered that Order WQ 98-01 will be amended to remove the receiving water limitation language contained therein and to substitute the USEPA language. Based on the reasons stated here, and as a precedent decision, the following receiving water limitation language shall be included in future municipal stormwater permits."
>
> In the 1999 case involving MS4 permits issued by USEPA 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 USEPA's requirement for MS4 dischargers to meet water quality standards, but it did so on the basis of USEPA's discretion rather than on the basis of strict compliance with the CWA. In other words, while holding that the CWA does not require all MS4 discharges to comply strictly with state water quality standards, the Court also held that USEPA 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 USEPA's use of iterative BMPs in place of numeric effluent limitations for stormwater discharges.

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 discretion of USEPA and the State to (continue to) issue stormwater 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 Receiving Water Limitations established in State Water Board Order WQ 99-05 in all future Orders.

The issue of the Receiving Water Limitations language was also central to the Building Industry Association's (and others') appeal of the San Diego Water Board's MS4 Permit Order No. 2001-01. The Building Industry Association contended that the stormwater MEP standard was a ceiling on what could be required of the Copermittees in implementing their runoff management programs, and that Order No. 2001-01's receiving water limitations requirements exceeded that ceiling. In other words, the Building Industry Association argued that the Copermittees 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 discretion to require compliance with water quality standards in municipal stormwater 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."[3] On further appeal by the Building Industry Association, the California State Supreme Court declined to hear the matter.

While implementation of the iterative BMP process is a means to achieve compliance with water quality objectives for stormwater MS4 discharges, it does not shield the Permittee from enforcement actions for continued non-compliance with water quality standards. 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 this Order.

12. The USEPA adopted the National Toxics Rule on December 22, 1992, which was amended on May 4, 1995, and November 9, 1999. The California Toxic Rule was adopted by USEPA on May 18, 2000, and amended on February 13, 2001. These rules include water quality criteria for priority pollutants and are applicable to non-stormwater discharges from the MS4. Criteria for 126 priority pollutants are established by the California Toxic Rule. USEPA promulgated this rule to fill a gap in California water quality standards that was created in 1994 when a California court overturned the State's water quality control plans containing criteria for priority toxic pollutants. The federal criteria are legally applicable in the State of California for inland surface waters, enclosed bays, and estuaries for all purposes and programs under the CWA.

[3] California Natural Resources Agency. *Building Industry Association of San Diego County, et al. v. State Water Resources Control Board, et al,* 7 December 2004. Web. 10 August 2011.

13. Section 131.12 of 40 CFR requires that the State water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Central Coast Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies.

14. Section 303(c) of the CWA requires the state to establish Water Quality Standards. Water Quality Standards define the water quality goals of a water body, or part thereof, by designating their use or uses to be made of the water and by setting criteria necessary to protect those uses.

    The Central Coast Water Quality Control Plan for the Central Coast Basin (Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the Basin Plan. The Basin Plan was adopted by the Central Coast Water Board on February 11, 1994, and was subsequently approved by the State Water Board on May 18, 1994. Subsequent revisions to the Basin Plan have also been adopted by the Central Coast Water Board and State Water Board.

15. Section 303(d) of the federal CWA (CWA, 33 USC 1250, et seq., at 1313(d)), requires States to identify waters that do not meet water quality standards ("impaired" water bodies). States are required to compile this information in a list and submit the list to USEPA for review and approval. This list is known as the section 303(d) list of impaired waters. As part of this listing process, States are required to prioritize waters/watersheds for future development of TMDLs. The State Water Board and Regional Water Boards have ongoing efforts to monitor and assess water quality, to prepare the section 303(d) list, and to subsequently develop TMDLs. The Central Coast Water Board has approved a 2010 section 303(d) list of impairments and potential urban sources in a regional analysis of impaired water body segments, which is currently under review by the USEPA and State Office of Administrative Law. Urban runoff that is discharged from the Permittee's MS4 contributes to receiving water quality impairment in the Central Coast Region.

16. 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.

    1) This Order implements federally mandated requirements under CWA section 402(p)(3)(B). While some requirements contained in this Order are more explicit than the federal stormwater regulations, this Order includes these requirements for the purpose of achieving compliance with the provision in CWA section 402(p)(3)(B)(iii) that MS4 permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable." This Order includes requirements to effectively prohibit non-stormwater discharges, to reduce the discharge of pollutants in stormwater 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, as required by the CWA. Federal cases have held the CWA 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. USEPA (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. section 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 MS4s. 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 Association of San Diego County v. State Water Resources Control Bd. (2004) 124 Cal.App.4th 866, 882-883.)

In Defenders of Wildlife v. Browner, the United States Court of Appeals, Ninth Circuit, found that "Although Congress did not require municipal storm-sewer discharges to comply strictly with [numerical effluent limitations], section 1342(p)(3)(B)(iii) states that '[p]ermits for discharges from municipal storm sewers … shall require … such other provisions as the Administrator … determines appropriate for the control of such pollutants.' That provision gives the EPA discretion to determine what pollution controls are appropriate." As exhibited in Defenders of Wildlife v. Browner, permit writers clearly have discretion to determine what pollution controls are appropriate, and therefore can include more detailed requirements than those specifically found in the federal NPDES stormwater regulations. By including such requirements in this Order, the Central Coast Water Board has not exceeded federal law, but instead has complied with CWA requirements that municipal storm water permits meet the MEP standard and shall include "such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

Use of permit writer discretion and the inclusion of more detailed requirements in this Order is also consistent with USEPA guidance. For example, the preamble to the Phase I NPDES storm water regulations states that "this rule sets out permit application requirements that are sufficiently flexible to allow the development of site-specific permit conditions" (FR 48038). In addition, in its review of a City of Irving, Texas NPDES municipal storm water permit, the USEPA Environmental Appeals Board stated that Congress "created the 'maximum extent practicable' ('MEP') standard and the requirement to 'effectively prohibit non-storm water discharges' into the MS4 in an effort to allow permit writers the flexibility necessary to tailor permits to the site-specific nature of MS4 discharges."[4]

In addition, broad legal authority for specific provisions contained in this Order which are more explicit than federal stormwater requirements is found in CWA sections 402(p)(3)(B)(ii-iii) and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F) and 40 CFR 122.26(d)(2)(iv). Evidence demonstrating that specific provisions do not exceed federal requirements is described below.

Street Sweeping – Specific legal authority for street sweeping requirements contained in this Order is as follows: Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A)(3). These regulations require MS4s to maintain streets and implement procedures to reduce

[4] Environmental Appeals Board, USEPA. *NPDES Appeal No. 00-18; Order Denying Review.* 16 July 2001.

the impact on receiving waters resulting from MS4s' discharges of runoff from streets. USEPA guidance also recommends that stormwater permits include street sweeping requirements.[5]

Riparian Protection Policies and Requirements – Federal regulation 40 CFR 122.34(b)(5) requires that MS4s implement non-structural BMPs, such as riparian area protections and buffers, to address post-construction stormwater runoff when it states that "non-structural BMPs are preventative actions that involve management and source controls such as policies and ordinances that provide requirements and standards to […] protect sensitive areas such as wetlands and riparian areas [… and] provide buffers along sensitive water bodies."

Stormwater Retrofits – Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) requires that the proposed management program shall be based on "a description of structural and source control measures to reduce pollutants in runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls." Structural and source control measures include retrofits. In addition, federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) intends that existing structural flood control devices be evaluated to determine if retrofitting the device to provide additional pollutant removal from storm water is feasible. Requiring stormwater retrofits for existing development is consistent with USEPA guidance, which states that "It is clear that we cannot protect the nation's waters without also addressing degradation caused by stormwater discharges from existing developed sites. For that reason stormwater programs must include substantive retrofit provisions."[6]

Specific Plan Conditions for Future Growth Areas – Federal regulation 40 CFR 122.34(b)(5)(iii) presumes that stormwater management programs that achieve the MEP standard will include planning-level requirements for development projects when it states, "If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. USEPA recommends that the BMPs chosen: be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions. […] When developing a program that is consistent with this measure's intent, USEPA recommends that you 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." Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that MS4s develop and implement a proposed 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

[5] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 77.
[6] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 65.

plan shall address controls to reduce pollutants in discharges from municipal separate storm sewers after construction is completed."

Watershed Characterization and Approach – USEPA guidance indicates the importance of watershed characterization when it recommends that stormwater permits include planning-level requirements that consider ecologically sensitive areas, ecosystem hydrology, and placement of development where it is most appropriate. The watershed characterization and approach included in this Order are designed to identify these and other watershed attributes with direct relationship to urban stormwater discharges. The long-term objective these requirements is stormwater management actions that are tailored to the particular watershed attributes and conditions of specific subwatersheds in the Permit coverage area. Specific legal authority for this objective is Federal NPDES regulation 40 CFR 122.26(a)(3)(v), which states: "Permits for all or a portion of all discharges from large or medium municipal separate storm sewer systems that are issued on a system-wide, jurisdiction-wide, watershed, or other basis may specify different conditions relating to different discharges covered by the permit, including different management programs for different drainage areas [watersheds] which contribute storm water to the system." USEPA recommends for municipal stormwater permit writers: "Examining stormwater on a watershed basis and including watershed principles is an important part of protecting waterways in a holistic manner. Climate change may increase the size and frequency of storms in some area of the nation. Including watershed-type assessments and considerations as Permit Requirements will help the permittee better focus their efforts to ensure the best water protection outcomes for existing conditions and those anticipated future conditions. Therefore, permit writers should consider including watershed protection principles."[7]

Information Management – USEPA guidance indicates the importance of a comprehensive information tracking and management system that is integrated into each of the minimum measures and coordinated with the monitoring and evaluation programs.[8] An effective and efficient information management system enables the Permittee and Central Coast Water Board staff to determine compliance with Order provisions, and aids the Permittee in developing annual reports.

2) The Permittee's obligations under this Order are similar to, and in many respects less stringent than, the obligations of non-governmental permittees who are issued NPDES permits for stormwater discharges. With a few inapplicable exceptions, the CWA regulates the discharge of pollutants from point sources (33 U.S.C. section 1342) and the Porter-Cologne Water Quality Control Act regulates the discharge of waste (CWC section 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 permittees. (See County of Los Angeles v. State of California (1987) 43 Cal.3d 46, 57-58 [finding comprehensive workers compensation scheme did not create a cost for local agencies that was subject to state subvention].)

[7] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 61.
[8] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011.

The CWA and the Porter-Cologne Water Quality Control Act largely regulate stormwater 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 permittees, including discharges of stormwater associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. section 1311(b)(1)(C), Defenders of Wildlife v. Browner (1999) 191 F.3d 1159, 1164-1165 [noting that industrial stormwater discharges must strictly comply with water quality standards].) This Order does not require strict compliance with water quality standards. This Order, then, regulates the discharge of waste in municipal stormwater more leniently than the discharge of waste from non-governmental sources.

3) The local agency Permittee has the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order. This 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. (e.g., see Apartment Association of Los Angeles County, Inc. v. City of Los Angeles (2001) 24 Cal.4th 830, 842 [upholding inspection fees associated with renting property].) 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.)

4) The Permittee has requested Order 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. section 1311(a)) and in lieu of numeric restrictions on its stormwater discharges. To the extent that the Permittee has voluntarily availed itself of the permit, its stormwater program is not a state mandate. (Accord County of San Diego v. State of California (1997) 15 Cal.4th 68, 107-108.) Likewise, the Permittee has voluntarily sought a program-based municipal stormwater permit in lieu of a numeric limitations approach on the Permittee's stormwater discharge. (See City of Abilene v. USEPA (5th Cir. 2003) 325 F.3d 657, 662-663 [noting that municipalities can choose between a management permit or a permit with numeric limitations].) The local Permittee's 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. USEPA (9th Cir. 2003) 344 F.3d 832, 845-848.)

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

17. <u>Permitting Framework</u> – The CWA employs the strategy of prohibiting the discharge of any pollutant from a point source into Waters of the U.S. unless the permittee of the pollutant(s) obtains a NPDES permit pursuant to section 402 of the CWA. The discharge of stormwater and/or non-stormwater from an MS4 system is considered a discharge from a point source. As discussed below, however, the CWA regulates stormwater and non-stormwater discharges under different standards.

In 1987 the CWA was amended to include provisions that specifically concerned NPDES permitting requirements for stormwater discharges from MS4 systems. Section 402(p) of the CWA regulates the discharge of stormwater from MS4s. Such discharges of stormwater

are subject to the MEP stormwater standard and the related iterative process. The MEP standard for stormwater discharges reflects Congress' recognition that the variability of flow and intensity of storm events render difficult strict compliance with water quality standards by MS4s. However, this standard was not considered applicable to non-stormwater discharges, which under 402(p) are required to be effectively prohibited from entering the MS4. Clearly, if non-stormwater discharges must be effectively prohibited from entering the MS4, the very next requirement (402(p)(3)(B)(iii)) requiring discharges from the MS4 be reduced to the MEP intends that the discharge of pollutants be limited to stormwater. Unless exempt or authorized under a separate NPDES permit, non-stormwater discharges are not authorized to enter the MS4 in the first instance and are considered to be illicit discharges.

The Federal Register further clarifies that such discharges through an MS4 are not authorized under the CWA (55 Fed. Reg. 47995):

> "Today's rule defines the term "illicit discharge" to describe any discharge through a municipal separate storm sewer system that is not composed entirely of stormwater and that is not covered by an NPDES permit. Such illicit discharges are not authorized under the CWA. Section 402(p(3)(B) requires that permits for discharges from municipal separate storm sewers require the municipality to "effectively prohibit" non-stormwater discharges from the municipal separate storm sewer…Ultimately, such non-stormwater discharges through a municipal separate storm sewer must either be removed from the system or become subject to an NPDES permit."

The federal regulations (40 CFR 122.26(d)(vi)(2)(B)) require that the Permittee prohibit "through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer." As owners and operators of the MS4, the Permittee cannot passively receive discharges from third parties (Federal Register 68766) and thus is responsible for the discharge of any non-stormwater from its MS4.

The State Water Board's precedential Order (Order WQ-2009-0008) affirming a Los Angeles County MS4 permit modification, consistent with USEPA's prior interpretations, recognizes that "[n]either the CWA nor the federal storm water regulations define 'non-storm water.' 'Illicit discharge' is defined as any discharge to an MS4 'not composed entirely of storm water.'[fn]. Thus, 'illicit discharge' is the most nearly applicable definition of 'non-storm water' found in federal law and is often used interchangeably with that term."[9]

<u>Stormwater and Non-stormwater Definitions</u> – By definition non-stormwater is not precipitation related. 40 CFR 122.26(b)(13) states that: "Storm water means storm water runoff, snowmelt runoff, and surface runoff and drainage." While "surface runoff and drainage" is not defined in federal law, it is related to precipitation events such as rain and/or snowmelt (see 55 Fed. Reg. 47995-96). The Federal Register (55, page 47995) includes an entire section on the definition of stormwater and non-stormwater. The term "surface runoff and drainage" does not include all incidental flows in the MS4 system, but consists of flows relating to precipitation events as clarified by the Federal Register, USEPA's documents and permitting, and other Regional Water Board Orders.

[9] State Water Resources Control Board. *Order WQ 2009-0008 In the Matter of the Petition of County of Los Angeles and Los Angeles County Flood Control District*, 4 August 2009. Web. 10 August 2011. p. 4.

The Federal Register (55 Fed. Reg. 47995-47996) provides clarification on the distinction between stormwater and non-stormwater discharges, including their regulation:

> "In response to the comments which requested EPA to define the term storm water broadly to include a number of classes of discharges which are not in any way related to precipitation events, EPA believes that this rulemaking is not an appropriate forum for addressing the appropriate regulation of such non-storm water discharges, even though some classes of non-storm water discharges may typically contain only minimal amounts of pollutants. Congress did not intend that the term storm water be used to describe any discharge that has a *de minimis* amount of pollutants, not did it intend for section 402(p) to be used to provide a moratorium from permitting other non-storm water discharges."

As recently recognized by the State Water Board in a precedential decision upholding an MS4 permit modification adopted by the Los Angeles Regional Water Board, "U.S. EPA has previously rejected the notion that 'storm water,' as defined at 40 CFR section 122.26(b)(13), includes dry weather flows. In U.S. EPA's preamble to the storm water regulations, U.S. EPA rejected an attempt to define storm water to include categories of discharges 'not in any way related to precipitation events.'[fn]."[10] Thus, USEPA has made it clear that it deems discharges unrelated to precipitation events to be non-stormwater discharges. 40 CFR 122.26(d)(iv)(B) itself provides specific examples of non-stormwater discharges:

> "…the following category of non-storm water discharges or flows shall only be addressed where such discharges are identified by the municipality as sources of pollutants to the United States: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated groundwater infiltration (as defined at 40 CFR 35.2005(20) to separate storm sewers, uncontaminated pumped groundwater,…"

USEPA also removed street wash waters from the definition of stormwater, as USEPA specifically identified this discharge as being non-stormwater (55 Fed. Reg. page 47996). Additionally, section 1.2.2.2. of USEPA's Multi-Sector General Permit for Industrial Activities (MSGP-2000) considers fire hydrant flushings, irrigation drainage, landscape watering, and foundation or footing drains to be non-stormwater discharges. USEPA's September 1999 Storm Water Management Fact Sheet for Non-Storm Water Discharges to MS4s states that non-stormwater discharges can include discharges of process water, air conditioning condensate, non-contact cooling water, vehicle wash water, or sanitary wastes.

While these types of non-stormwater discharges (or illicit discharges) may be regulated under stormwater permits because as a practical matter they can enter and be discharged from the MS4 systems, they are not regulated as stormwater discharges under the CWA because they are unrelated to precipitation events. As indicated above, the State Water Board recent discussion of this issue supports the conclusion that non-stormwater discharges are unrelated to precipitation events. In its Order affirming amendments to the Los Angeles County MS4 permit to implement a TMDL to control bacteria in dry weather flows, the State Water Board rejected petitioners' (County of Los Angeles and the Los Angeles County Flood Control District) implied assertion that the definition of "storm water" contained in the federal regulations (defined as "surface run-off and drainage") includes the run-off and drainage from non-storm events. The State Water Board notes that the

[10] Ibid., p. 7.

challenged permit provisions do not apply to storm water flows in that they apply only during dry weather conditions as defined in the permit. In upholding the challenged order, the State Water Board notes that the Los Angeles Water Board's permit language followed USEPA's approach, referring to USEPA's rejection of attempts to define storm water to include categories of discharges "not in any way related to precipitation events."[11]

Lastly, the Regional Water Boards and State Water Board have issued multiple permits for non-stormwater discharges, including, but not limited to, R9-2008-0002 (extracted groundwater), R9-2002-0020 (hydrostatic discharge) and 2006-008 DWQ (utility vaults), pursuant to section 402 of the CWA.

Permitting Non-stormwater Discharges – The USEPA's approach (and the Regional Water Board's under its approved program) for non-stormwater discharges from MS4s is to regulate these discharges under the existing 402 NPDES framework (Fed. Reg. 47995 and 48037 see below) for discharges to surface waters. The NPDES program (40 CFR 122.44(d)) utilizes discharge prohibitions and effluent limitations as regulatory mechanisms to regulate non-stormwater discharges, including the use of technology and water quality-based effluent limitations. Non-numerical effluent limitations, such as BMPs for non-stormwater discharges may only be authorized where numerical effluent limits are infeasible or where the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA (40 CFR 122.44(k) see below).

The Federal Register (55, page 48037) provides clarification that non-stormwater discharges from the MS4 are to be regulated under section 402, not 402(p):

> "Conveyances which continue to accept other "non-storm water" discharges (e.g. discharges without an NPDES permit) with the exceptions noted above (*exempted discharges that are not a source of pollutants*) do not meet the definition of municipal separate storm sewer and are not subject to 402(p)(3)(B) of the CWA unless such discharges are issued separate NPDES permits. Instead, conveyances which continue to accept non-storm water discharges which have not been issued separate NPDES permits are subject to sections 301 and 402 of the CWA."

This regulatory approach is consistent with the approach recently upheld by the State Water Board in a precedential Order adopted on August 4, 2009. In this Order, the State Water Board rejected a challenge to amendments to the Los Angeles County MS4 permit that require compliance with receiving water limitations and discharge prohibitions for dry weather, non-stormwater discharges. Petitioners there argued that the receiving water limits and discharge prohibitions for dry weather permittees were inappropriate and that the Los Angeles Water Board should instead have regulated the discharges with the maximum extent practicable standard, through an iterative process. The State Water Board concludes that dry weather discharges, as defined in the permit and in the underlying TMDL, "are more appropriately regarded as non-storm water discharges, which the CWA requires to be effectively prohibited."[12]

[11] Ibid., p. 7. (quoting 55 Fed. Reg. 47990. 47995).
[12] Ibid., p. 8.

As stated above, for NPDES permits under 402 of the CWA, the CFR (122.44(k)) clarify that a permittees may utilize BMPs to control or abate the discharge of pollutants when:

> "(1) Authorized under section 304(e) of the CWA for the control of toxic pollutants and hazardous substances from ancillary industrial activities;
> (2) Authorized under section 402(p) of the CWA for the control of storm water discharges;
> (3) Numeric limits are infeasible; or
> (4) The practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA."

For the last 12 years, the Permittee's NPDES permit for discharges of stormwater have regulated non-stormwater discharges from the MS4. This permit requires the Permittee to prohibit non-stormwater discharges into (thus also through and from) its MS4, implement a program to prevent illicit discharges, and monitor to identify illicit discharges and exempted discharges that are a source of pollution. These measures are considered BMPs, are required to be included in NPDES permits issued under section 402(p) of the CWA, and are considered by USEPA to be an interim approach to permitting non-stormwater discharges from the MS4 in accordance with section 402 of the CWA and CFR 122.44(k).

18. This Finding is a clarification regarding the potential for discharges of stormwater and non-stormwater to impact the Beneficial Uses as described in the Basin Plan. As such these point source discharges require Waste Discharge Requirements (WDRs) to ensure that water quality standards are met. Furthermore, since point source discharges require WDRs, the discharges are subject to the prohibitions, conditions and requirements of the Basin Plan.

    In addition, municipal discharges have been split into stormwater and non-stormwater discharges to represent the differing regulations applicable to stormwater and non-stormwater, though both types of discharges are likely to contain pollutants.

19. An MS4 is defined in the federal regulations as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains), owned or operated by the Permittee, and designed or used for collecting or conveying runoff.[13] Natural drainage patterns and urban streams are frequently used by municipalities to collect and convey runoff away from development within their jurisdiction. Therefore, the Central Coast Water Board considers natural drainages that are used for conveyances of runoff, regardless of whether or not they've been altered by the municipality, as both part of the MS4s and as receiving waters. To clarify, an unaltered natural drainage, which receives runoff from a point source (channeled by the Permittee to drain an area within their jurisdiction), which then conveys the runoff to an altered natural drainage or a man-made MS4, is both an MS4 and a receiving water.[14]

20. Runoff treatment and/or mitigation in accordance with any of the requirements in this Order must occur prior to the discharge of stormwater into receiving waters. Allowing stormwater

[13] USEPA. *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. 40 CFR Part 122*, 2000. Web. 10 August 2011.
[14] San Diego Regional Water Quality Control Board. *California Regional Water Quality Control Board San Diego Region Order No. 2001-01 – NPDES Permit No. CAS0108758*, 2001. Web. 10 August 2011. p. 3.

polluted runoff to enter receiving waters prior to treatment to the MEP will result in degradation of the water body and potential exceedances of water quality standards, from the discharge point to the point of dissipation, infiltration, or treatment. Furthermore, the construction, operation, and maintenance of a pollution control facility in a water body can negatively impact the physical, chemical, and biological integrity, as well as the beneficial uses, of the water body. This requirement is supported by federal regulation 40 CFR 131.10(a) and USEPA guidance. According to USEPA,[15] "To the extent possible, municipalities should avoid locating structural controls in natural wetlands. Before considering siting of controls in a natural wetland, the municipality should demonstrate that it is not possible or practicable to construct them in sites that do not contain natural wetlands… Practices should be used that settle solids, regulate flow, and remove contaminants prior to discharging storm water into a wetland."

Additional Federal guidance discusses the implementation of wetlands to treat municipal stormwater discharges. It states:

> "… Treatment wetlands should not be constructed in a waters of the U.S. unless you can sufficiently pretreat the stormwater flows to protect the values and functions of the waters of the U.S. Because storm water is an unpredictable effluent source and can contain high levels of toxic substances, nutrients, and pathogens, we strongly encourage that you construct the treatment wetland in uplands and use best management practices in these projects."[16]

Consistent with USEPA guidance, the conversion or use of Waters of the U.S./State into runoff treatment facilities or conveyance facilities for untreated stormwater discharges must be appropriately reviewed by both Federal and State resource agencies. Such projects may be subject to federal permitting pursuant to CWA section 404 if discharges of dredged or fill material is involved.

The placement of hydromodification controls within Waters of the U.S./State may also be subject to federal and/or state permitting, but would not necessarily be considered a pollutant treatment BMP. Provided the grade control structures are designed to re-establish a natural channel gradient and correct excessive changes to the sediment transport regime caused by urbanization, rather than to create a series of artificial hydrological impoundments for the purpose of treating pollution, this type of project is not considered an in-stream treatment BMP.

21. CWC section 13389 exempts the adoption of waste discharge requirements (such as NPDES permits) from CEQA requirements: "Neither the State Water Board nor the Regional Boards shall be required to comply with the provisions of Chapter 3 (commencing with section 21100) of Division 13 of the Public Resources Code prior to the adoption of any waste discharge requirement, except requirements for new sources as defined in the Federal Water Pollution Control Act or acts amendatory thereof or supplementary thereto."

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[15] USEPA. *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,* November 1992. Web. 10 August 2011. p. 6-21

[16] USEPA. *Guiding Principles for Constructed Treatment Wetlands: Providing for Water Quality and Wildlife Habitat, EPA 843-B-00-003,* October 2000. Web. 10 August 2011. p. 23.

This CEQA exemption was challenged during the Building Industry Association's (and others') appeal of the San Diego Water Board's MS4 Permit Order No. 2001-01. The Building Industry Association contended that the CEQA exemption did not apply to permit requirements where the San Diego Water Board utilized its discretion to craft permit requirements which were more prescriptive than required by federal law. The Court of Appeal, Fourth Appellate District disagreed with this argument, stating "we also reject Building Industry Association's argument to the extent it contends the statutory CEQA exemption in Water Code section 13389 is inapplicable to a particular NPDES permit provision that is discretionary, rather than mandatory, under the CWA."[17] On further appeal by the Building Industry Association, the California State Supreme Court declined to hear the matter.

In a decision, the Court of Appeal of the State of California, Second Appellate District, upheld the CEQA exemption for municipal stormwater NPDES permits (County of Los Angeles, et al. v. California State Water Resources Control Board, et al.).[18]

22. USEPA finds the control of pollutant discharges from industry and construction so important to receiving water quality that it has established a double system of regulation over industrial and construction sites. This double system of regulation consists of two parallel regulatory systems with the same common objective: to keep pollutants from industrial and construction sites out of the MS4. In this double system of regulation for runoff from industrial and construction sites, local governments must enforce their legal authorities (e.g., local ordinances, permits) while the Regional Water Boards must enforce its legal authority (e.g., statewide general industrial and construction stormwater permits). 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 prevent non-stormwater and address stormwater runoff from industrial and construction sites which enters their MS4s.

    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 Permittee is the lead permitting authority, the Central Coast Water Board will work with the municipality and provide support where needed. The Central Coast Water Board will assist the Permittee in enforcement against non-compliant sites after the Permittee has exhibited a good faith effort to bring the site into compliance.

    According to USEPA, the stormwater regulations envision that NPDES permitting authorities and municipal operators will cooperate to develop programs to monitor and control pollutants in stormwater discharges from industrial facilities.[19] USEPA discusses the "dual

[17] California Natural Resources Agency. *Building Industry Association of San Diego County et al., v. State Water Resources Control Board, et al,* 7 December 2004. Web. 10 August 2011.
[18] *County of Los Angeles et al., v. California State Water Resources Control Board, et al. No. BS080792,* 6 November 2006. *Lexis/Nexis.* Web. 10 August 2011.
[19] USEPA. *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,* November 1992. Web. 10 August 2011.

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." [20] While the Storm Water Phase II Compliance Assistance Guide applies to small municipalities, it is applicable to the Permittee, because they are similar in size and have the potential to discharge similar pollutant types as Phase II municipalities.

D. Nature of Discharge

23. No discussion.

24. See also discussion for Finding No. 27.

The 1992, 1994, and 1996 National Water Quality Inventory Reports to Congress prepared by USEPA showed a trend of impairment in the nation's waters from contaminated storm and non-stormwater runoff.[21,22] The 1998 National Water Quality Inventory Report showed that runoff discharges affect 11 percent of rivers, 12 percent of lakes, and 28 percent of estuaries. The report states that ocean shoreline impairment due to runoff increased from 55 percent in 1996 to 63 percent in 1998. The report notes that 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. Furthermore, the NURP study found that pollutant levels from illicit non-stormwater discharges were high enough to significantly degrade receiving water quality, and threaten aquatic life, wildlife, and human health.[23]

In addition, the Central Coast Water Board's CWA section 303(d) list, which identifies water bodies with impaired beneficial uses within the Central Coast Region, also indicates that the impacts of stormwater and non-stormwater runoff on receiving waters are significant. Many of the impaired water bodies on the 303(d) list are impaired by constituents that have been found at high levels within stormwater and non-stormwater runoff (see discussion for Finding No. 69). Examples of constituents frequently responsible for beneficial use impairment include indicator fecal bacteria, heavy metals, and sediment; these constituents have been found at high levels in runoff both regionally and nationwide.[24]

The 2010 CWA section 303(d) list of impaired water bodies includes changes to the 2006 CWA section 303(d) list. As delineated in the 2010 CWA section 303(d) list, the Central Coast Water Board has found that there is a reasonable potential that municipal stormwater discharges cause or may cause or contribute to an excursion above water quality standards for the impairments identified in Table XI.1 below.

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[20] USEPA. *Storm Water Phase II Compliance Assistance Guide, EPA 833-R-00-002,* March 2000. Web. 10 August 2011.
[21] USEPA. *The Quality of Our Nation's Waters: A Summary of the National Water Quality Inventory: 1998 Report to Congress, EPA 841-S-00-001,* June 2000. Web. 10 August 2011.
[22] USEPA. *Water Quality Conditions in the United States: A Profile from the 1998 National Water Quality Inventory Report to Congress, EPA 841-F-00-006,* June 2000. Web. 10 August 2011.
[23] USEPA. *Results of the Nationwide Urban Runoff Program: Volume 1 – Final Report, EPA 832-R-83-112,* December 1983. Web. 10 August 2011.
[24] Ibid.

Table XI.1. Receiving Water CWA Section 303(d) Listed Impairments

Receiving Water	**CWA Section 303(d) Listed Impairments**
Santa Rita Creek	Nitrate; Ammonia, unionized; E. coli; Fecal coliform; Low dissolved oxygen; Nitrate; Sodium; Turbidity
Gabilan Creek	Fecal coliform; Nitrate; Ammonia, unionized; Fecal coliform; Nitrate; Sediment toxicity; Turbidity; Unknown toxicity; pH
Natividad Creek	Nitrate; Ammonia, ununionized; E. coli; Low dissolved oxygen; Nitrate; Sediment toxicity; Temperature, water; Turbidity; Unknown toxicity; pH
Salinas Reclamation Ditch	Ammonia, unionized; Fecal coliform; Low dissolved oxygen; Pesticides; Priority organics; Chlorpyrifos; Copper; Diazinon; E. Coli; Nitrate; Sediment toxicity; Turbidity; Unknown toxicity; pH
Salinas River	Fecal coliform; Nitrate; Pesticides; Toxaphene; Chlordane; Chloride; Chlorpyrifos; DDD; Diazinon; Dieldrin; Electrical Conductivity; Enterococcus; E. coli; PCBs; Sodium; Total dissolved solids; Turbidity; Unknown toxicity; pH

25. This Finding is a clarification regarding the potential for discharges of stormwater and non-stormwater from the MS4 to impact the beneficial uses of downstream water bodies as well. The Permit coverage area and its receiving waters are part of a larger watershed extending from the headwaters of tributary streams to Monterey Bay. As a result, pollutants in stormwater and non-stormwater discharges from the MS4 have the potential to impact beneficial uses, or cause or contribute to an excursion above water quality standards, in downstream water bodies within the Salinas River watershed. As delineated in the 2010 CWA section 303(d) list, the Central Coast Water Board has identified Tembladero Slough, the Old Salinas River Estuary, the Old Salinas River, Salinas River Lagoon (North), and the Salinas River Refuge Lagoon (South) as impaired for the pollutants indicated in Table XI.2 below.

Table XI.2. Downstream Receiving Water CWA Section 303(d) Listed Impairments

Receiving Water	**CWA Section 303(d) Listed Impairments**
Tembladero Slough	Chloryphyll-a; Chlorpyrifos; Diazinon; Enterococcus; E. coli; Fecal coliform; Nitrate; Nutrients; Pesticides; pH, Sediment toxicity; Total coliform; Turbidity;Unknown toxicity
Old Salinas River Estuary	Nutrients; Pesticides
Old Salinas River	Chloryphyll-a; Chlorpyrifos; Diazinon; E. coli; Fecal coliform; Low dissolved oxygen; Nitrate; Sediment toxicity; Turbidity; Unknown toxicity; pH
Salinas River Lagoon (North)	Nutrients; Pesticides
Salinas River Refuge Lagoon (South)	Turbidity; pH

26. Section 13050(d) of the CWC defines "waste" as "sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal." 40 CFR 122.2 defines "point source" as "any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff." 40 CFR 122.2 defines "discharge of a pollutant" as "Any addition of any pollutant or combination of pollutants to waters of the U.S. from any point source." Also, the justification for control of pollution into Waters of the State can be found at CWC section 13260(a)(1). State Water Board Order WQ 2001-15 verifies that discharges from the MS4 contain waste.[25]

27. A National Urban Runoff Program (NURP) study showed 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 stormwater and non-stormwater discharges.[26] 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 urban runoff pollutants include sediments, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, viruses, and pesticides.[27] Runoff that flows over streets, parking lots, construction sites, and industrial, commercial, residential, and municipal areas carries these untreated pollutants through MS4s directly to receiving waters.

    The Natural Resources Defense Council (NRDC) 1999 Report, "*Stormwater Strategies, Community Responses to Runoff Pollution*" identifies concentration of pollutants in runoff to be one of the main causes of the stormwater pollution problem in developed areas. The report states that certain industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in stormwater 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.

    Studies show that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[28] One comprehensive study, which looked at numerous areas, variables, and methods, revealed that stream degradation occurs at levels of

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[25] State Water Resources Control Board. *Order WQ 2001-15, In the Matter of Petitions of Building Industry Association of San Diego County and Western States Petroleum Association,* 15 November 2001. Web. 11 August 2011.
[26] Ibid.
[27] State Water Resources Control Board. Nonpoint Source Pollution Control Program. *Urban Runoff Technical Advisory Committee Report,* November 1994. Web. 11 August 2011.
[28] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register 64* (8 December 1999): Web. 10 August 2011.

imperviousness as low as 10 – 20 percent.[29] 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 greater than or equal to 25 percent.[30] To provide some perspective, a medium density, single-family home area can be from 25 percent to 60 percent impervious (variation due to street and parking design).[31] More recently, a report on the effects of imperviousness in southern California streams found that local ephemeral and intermittent streams are more sensitive to such effects than streams in other parts of the country. This study, by the Southern California Coastal Water Research Program, estimated a threshold of response at a two to three percent change in percent of impervious cover in a watershed. [32]

According to the CWP, urbanization strongly shapes the quality of both surface and ground water in arid and semi-arid regions of the southwest. Since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Therefore, the pollutant concentrations of stormwater runoff from arid watersheds tends to be higher than that of humid watersheds.[33] The effect of antecedent rainfall events is demonstrated in a recent report from the California Department of Transportation (Caltrans) that found the concept of a seasonal first flush is applicable to the southern California climate.[34]

This Finding is supported by State Water Board Order No. 2003-0005-DWQ. State Water Board Order 2003-0005-DWQ also finds that pollutants of concern found in urban runoff include sediments, non-sediment solids, nutrients, pathogens, oxygen-demanding substances, petroleum hydrocarbons, heavy metals, floatables, polycyclic aromatic hydrocarbons (PAHs), trash, and pesticides and herbicides.

28. See discussion for Findings No. 24 through No. 27.

E. Implementation

General

29. Under CWA section 402(p), municipalities are required to reduce the discharge of stormwater pollutants from their MS4s to the MEP. MEP is the critical technology-based performance standard that permittees shall attain. The MEP standard is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. As

[29] Ibid.
[30] Ibid.
[31] Schueler, T.R., and Heather K. Holland, eds. "The Importance of Imperviousness (Article 1)." *Watershed Protection Techniques*. Ellicott City, MD: Center for Watershed Protection, 2000.
[32] Coleman, Derrick, Craig MacRae, and Eric D. Stein. *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams. Technical Report No. 450*. Southern California Coastal Water Research Project, April 2005. Web. 11 August 2011. p. iv.
[33] Schueler, T.R., and Heather K. Holland, eds. "Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66)." *Watershed Protection Techniques.* Ellicott City, MD: Center for Watershed Protection, 2000.
[34] Stenstrom, Michael K. and Masoud Kayhanian. *First Flush Phenomenon Characterization, Report No. CTSW-RT-05-073-02.6.* California Department of Transportation, August 2005. Web. 11 August 2011. <http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/>.

knowledge about controlling stormwater runoff continues to evolve, so does that which constitutes MEP. Reducing the discharge of stormwater pollutants to the MEP requires the Permittee to assess each program component and revise activities, control measures, BMPs, and measurable goals, as applicable to meet MEP.

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 stormwater 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:

1) Effectiveness: Will the BMPs address a pollutant (or pollutant source) of concern?
2) Regulatory Compliance: Is the BMP in compliance with stormwater regulations as well as other environmental regulations?
3) Public Acceptance: Does the BMP have public support?
4) Cost: Will the cost of implementing the BMP have a reasonable relationship to he pollution control benefits to be achieved?
5) Technical Feasibility: Is the BMP technically feasible considering soils, geography, water resources?

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 permittee 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 permittee 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, which would be clearly less effective. In selecting BMPs the Permittee shall make a serious attempt to comply and practical solutions may not be easily dismissed. In any case, the burden is on the Permittee to show compliance with its Order. After selecting BMPs, it is the responsibility of the permittee to ensure that all BMPs are implemented.[35]

A definition of MEP is not provided in either the federal statute or in the federal regulations. The final determination regarding whether a municipality has reduced stormwater pollutants to the MEP can only be made by the Central Coast Water Board or the State Water Board, and not by the Permittee. While the Central Coast Water Board or the State Water Board ultimately define MEP, it is the responsibility of the Permittee to initially propose actions that implement BMPs to reduce stormwater pollution to the MEP. In other words, the Permittee's SWMP developed under the Order is the Permittee's proposal of MEP. This Order provides a framework to guide the Permittee in meeting the MEP standard for stormwater.

It is the Central Coast 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, Central District of California. The federal court stated that a discharger must evaluate and

[35] Jennings, Elizabeth. *Definition of Maximum Extent Practicable*. State Water Resources Control Board Memorandum, 11 February 1993.

implement BMPs except where (1) other effective BMPs will achieve greater or substantially similar pollution control benefits; (2) the BMP is not technically feasible; or (3) the cost of BMP implementation greatly outweighs the pollution control benefits. Where the Permittee's proposal is not acceptable to the Central Coast Water Board, the Central Coast Water Board has defined MEP, and will continue to define MEP, by requiring implementation of additional measures by the Permittee.

30. Phase I municipalities have been implementing, assessing, and modifying stormwater management BMPs for over a decade. In addition, voluminous research conducted by USEPA, California Association of Stormwater Quality (CASQA), and others provides information on the technical feasibility, effectiveness, and cost of stormwater management BMPs. This wealth of knowledge and expertise identifies a variety of BMPs known to provide a measure of control over stormwater and non-stormwater discharges and pollutants in these discharges. While more quantitative information is needed about the effectiveness of some of these BMPs at achieving tangible results in receiving water conditions, this body of knowledge provides an initial approximation of what constitutes MEP, and is incorporated as such by this Order.

31. The federal regulations (40 CFR 122.26(d)(vi)(2)(B)) require that the Permittee prohibit "through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer." In addition, this finding is supported by the preamble to the Phase II municipal stormwater regulations.[36]

32. When rain falls and drains freeways, industries, construction sites, and neighborhoods, it picks up a multitude of pollutants. Gravity flow transports the pollutants to the MS4. Illicit discharges and connections also can contribute a significant amount of pollutants to MS4s. MS4s are commonly designed to convey their contents as quickly as possible. Due to the resulting typically high flow rates within the hardened conveyance systems of MS4s, pollutants which enter or are deposited in the MS4 and not removed are generally flushed unimpeded through the MS4 to Waters of the U.S. Since treatment generally does not occur within the MS4, in such cases reduction of stormwater pollutants to the MEP must occur prior to discharges entering the MS4.

33. The State Water Board finds in its Order No. WQ 98-01 that BMPs are effective in reducing pollutants in stormwater 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 practicable." A State Water Board TAC 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:
    1) Pollution Prevention – implementation of practices that use or promote pollution free alternatives;
    2) Source Control – implementation of control measures that focus on preventing or minimizing urban runoff from contacting pollution sources;

[36] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register 64* (8 December 1999): p. 68765 – 68766. Web. 10 August 2011.

3) Treatment Control – implementation of practices that require treatment of polluted runoff either onsite or offsite."[37]

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 developed areas when the generation of pollutants by activities is limited. Thus, pollutant loads in stormwater 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.[38,39]

In the Pollution Prevention Act of 1990, Congress established a national policy that emphasizes pollution prevention over control and treatment. CWC 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." Because of the overwhelming volume of stormwater and the enormous costs associated with pollutant removal, pollution prevention is sensible.

USEPA also supports the utilization of a combination of BMPs to address pollutants in runoff. For example, USEPA 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.[40] Structural BMP performance data has also been compiled and summarized by USEPA.[41]

The summary provides the performance ranges of various types of structural BMPs for removing suspended solids, nutrients, pathogens, and metals from stormwater flows. These pollutants are generally a concern in stormwater in the Central Coast Region. For suspended solids, the least effective structural BMP type was found to remove 30-65 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load. For nutrients, the least effective structural BMP type was found to remove 15-45 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load. For pathogens, the least effective structural BMP type was found to remove <30 percent of the pollutant load, while the most effective was found to

[37] State Water Resources Control Board. Nonpoint Source Pollution Control Program. *Urban Runoff Technical Advisory Committee Report,* November 1994. Web. 11 August 2011.
[38] Devinny, J.S. et al. *Alternative Approaches to Stormwater Quality Control (Appendix H), NPDES Stormwater Cost Survey.* Office of Water Programs. California State University, Sacramento, January 2005. Web. 11 August 11, 2011. <http://www.owp.csus.edu/research/papers/papers/NPDES_Stormwater_costsurvey.pdf>.
[39] Schueler, T.R., and Heather K. Holland, eds. "Assessing the Potential for Urban Watershed Restoration (Article 142)." *Watershed Protection Techniques.* Ellicott City, MD: Center for Watershed Protection, 2000.
[40] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register 64* (8 December 1999): p. 68728. Web. 10 August 2011.
[41] USEPA. *Preliminary Data Summary of Urban Storm Water Best Management Practices, EPA 821-R-99-012,* August 1999. Web. 11 August 2011.

remove 65-100 percent of the pollutant load. For metals, the least effective structural BMP type was found to remove 15-45 percent of the pollutant load, while the most effective was found to remove 65-100 percent of the pollutant load.

The San Diego Regional Water Quality Control Board found in its Order No. R9-2009-0002 that treatment control BMPs can, to varying degrees, remove pollutants from runoff, but that pollution prevention and source control BMPs are necessary to reduce stormwater pollutant discharges to the point of supporting water quality objectives in the receiving waters.[42] The San Diego Regional Water Quality Control Board based this finding on several studies conducted in recent years that measured the effectiveness of treatment BMPs in southern Orange County.

Results of these recent studies demonstrate that treatment at MS4 outfalls for pollutants that have already been discharged into the MS4 is generally unlikely to reduce pollutant concentrations to levels that would support water quality objectives.

It is important to note that the CWA and NPDES federal regulations clearly require control of discharges into the MS4. Section 402(p)(3)(B)(ii) of the CWA states that MS4 permits must "prohibit non-storm water discharges into the storm sewers." 40 CFR 122.26(d)(2)(iv)(B) requires Permittees to "detect and remove […] illicit discharges and improper disposal into the storm sewer" (see discussion for Finding No. 17). This Order's approach to regulating discharges into and from the MS4 is in accordance with State Water Board Order WQ 2001-15, which states: "It is important to emphasize that dischargers into MS4s continue to be required to implement a full range of BMPs, including source control."

The Fourth Appellate District Court of Appeals found that a similar approach to regulation of discharges into the MS4 taken in San Diego Water Board Order No. R9-2001-01 was appropriate. Therefore the court decision supports this Order's requirements.

34. MS4 permits are issued to municipalities because of their land use 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 and operated by the same local governments. In summary, the Permittee under this Order are responsible for discharges into and out of its MS4 because (1) the Permittee owns and operates the MS4; and (2) the Permittee has 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 Permittee has a built-in mechanism to ensure that all grading activities are protective of receiving water quality. The Permittee has the authority to withhold issuance of

[42] San Diego Regional Water Quality Control Board. *Order No. R9-2009-0002 NPDES NO. CAS0108740 Waste Discharge Requirements for Discharges of Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of Orange County, and the Orange County Flood Control District within the San Diego Region*. 16 December 2009.

the grading permit until the project proponent has demonstrated to the satisfaction of the Permittee that the project will not violate its ordinances or cause the Permittee to be in violation of this Order. Since the Permittee will ultimately be held responsible for any discharges from the grading project by the Central Coast Water Board, the Permittee will want to use its own permitting authority to ensure that whatever measures the 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 BMPs to reduce pollutant discharges and increased flow during 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 urban runoff pollutant loads to surface waters.[43] The Phase II regulations for small municipalities reflect the necessity of addressing urban runoff during the early planning phase. Due to the greater water quality concerns generally experienced by larger municipalities, Phase II requirements for small municipalities are also applicable to larger municipalities such as the Permittee. The Phase II regulations direct municipalities to develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The program must ensure that controls are in place that would prevent or minimize water quality impacts. This includes developing and implementing strategies which include a combination of structural and/or non-structural BMPs appropriate to the locality. The program must also ensure the adequate long-term operation and maintenance of BMPs.[44] USEPA expands on the Phase II regulations for urban development when it recommends that the Permittee:

> "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 quality."

Management of urban runoff during the construction phase is also essential. USEPA explains in the preamble to the Phase II regulations that stormwater 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

[43] USEPA. *Storm Water Phase II Compliance Assistance Guide, EPA 833-R-00-002,* March 2000. Web. 10 August 2011.
[44] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register 64* (8 December 1999): p. 68845. Web. 10 August 2011.

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.[45]

Finally, urban runoff from existing development must be addressed. Analysis of CCAMP monitoring data indicates that significant water quality problems exist in receiving waters which receive urban runoff from the Permit coverage area, and that the Permittee's stormwater discharges may be causing or contributing to water quality impairments in the Salinas Reclamation Ditch and the Salinas River (see discussion for Finding No. 69). Source identification, BMP requirements, inspections, and enforcement are all important measures which can be implemented to address urban runoff from existing development. USEPA supports inspections and 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."[46]

35. 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 runoff management. Source identification helps identify the location of potential sources of pollutants in runoff. Pollutants found to be present in stormwater discharges and 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 limited inspection, monitoring, and enforcement time to be most effective. USEPA supports source identification as a concept when it recommends construction, municipal, and industrial source identification in guidance and the federal regulations.[47,48]

    The development of BMPs for identified sources will help ensure that appropriate, consistent controls are implemented at all types of development and areas. The Permittee shall reduce the discharge of pollutants in stormwater runoff to the MEP. 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. USEPA requires development and implementation of BMPs for construction, municipal, commercial, industrial, and residential sources at 40 CFR 122.26(d)(2)(iv)(A-D).

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[45] Ibid., p. 68728.
[46] USEPA. *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,* November 1992. Web. 10 August 2011.
[47] Ibid.
[48] USEPA. "Section 122.26(d)(2)(ii) Storm Water Discharges." *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. 40 CFR Part 122,* 2000. Web. 10 August 2011.

Updating ordinances and approval processes is necessary in order for the Permittee to control discharges to its MS4. USEPA 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."[49]

Inspections provide a necessary means for the Permittee to evaluate compliance of pollutant sources with its municipal ordinances and minimum BMP requirements. USEPA supports inspections when it recommends inspections of construction, municipal, and industrial sources.[50] 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. USEPA 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."[51]

36. The Permittee is required to update and expand its SWMP in order to improve its efforts to reduce stormwater pollutants in runoff to the MEP and protect water quality, including beneficial uses and watershed processes. Changes to Order No. R3-2004-0135's requirements have been made to help ensure these standards are achieved by the Permittee.

    This Orders' requirements have changed based on findings by the Central Coast Water Board during typical compliance assurance activities or receipt of complaints. The Central Coast Water Board performed a program audit of the Permittee during the term of Order No. R3-2004-0135. Where the audit found common implementation problems, requirements have been altered to better ensure compliance. In addition, the Central Coast Water Board conducted reviews of SWMP Annual Reports submitted by the Permittee. Updates to the Permittee's programs are also based on the Permittee's Report of Waste Discharge. In some instances, the Permittee and the Central Coast Water Board have identified similar issues that merit program modifications.

37. The Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(A – D) are clear in placing responsibility on the Permittee for control of runoff from third party activities and land uses to its MS4.[52] In order for the Permittee to assume this responsibility, the Permittee must implement ordinances, permits, and plans addressing runoff from third parties. Assessments for compliance with the Permittee's ordinances, permits, and plans are

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[49] USEPA. *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,* November 1992. Web. 10 August 2011.
[50] Ibid.
[51] USEPA. *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,* November 1992. Web. 10 August 2011.
[52] USEPA. *EPA Administered Permit Programs: The National Pollutant Discharge Elimination System. 40 CFR Part 122,* 2000. Web. 10 August 2011.

essential for the Permittee to ensure that third parties are not causing it to be in violation of its municipal stormwater permit. When conditions of non-compliance are determined, enforcement is necessary to ensure that violations of municipality ordinances and permits are corrected. When the Permittee determines a violation of its stormwater regulations, the Permittee must pursue correction of the violation. Without enforcement, third parties do not have incentive to correct violations. USEPA 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."[53]

38. Development of a SWMP is a crucial runoff management measure and should be considered a BMP. The SWMP helps organize and focus the Permittee's programs and guide implementation. In its statewide assessment report to USEPA Region IX and the State Water Board, Tetra Tech, Inc. concluded that the lack of a master stormwater planning document must be considered a serious program deficiency.[54] When submitted to the Central Coast Water Board, the SWMP provides useful correspondence between the Permittee and the Central Coast Water Board. The SWMP also becomes available for review by the public, and thus facilitates public participation in runoff management decisions. Finally, the Central Coast Water Board is provided with a means to track the Permittee's implementation of this Order.

    The focus of the Order is on development and implementation of a stormwater program which meets MEP, rather than creation of a SWMP which exhibits MEP. While the Order does not rely upon the SWMP to ensure MEP and other standards are achieved, the SWMP still serves a useful purpose. As stated above, the SWMP serves to organize the Permittee's efforts to address runoff. As a practical matter, any program of the size required by the Order should be documented in writing. This serves to guide implementation of the program by the numerous individuals responsible for program implementation.

    A SWMP is not necessary for ensuring compliance with this Order because this Order itself contains sufficient detailed requirements to ensure that compliance with discharge prohibitions, receiving water limitations, and the narrative standard of MEP for stormwater are achieved. Implementation by the Permittee of a program in compliance with this Order's requirements, prohibitions, and receiving water limitations is the pertinent compliance standard to be used under the Order, as opposed to assessing compliance by reviewing the Permittee's implementation of its SWMP alone. The Central Coast Water Board ensures compliance with this Order by reviewing Annual Reports, conducting inspections, performing audits, and through other general program oversight.

    A SWMP is particularly important and useful for municipalities when program implementation is spread across several departments and/or when municipalities

[53] USEPA. *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,* November 1992. Web. 10 August 2011.
[54] Tetra Tech, Inc. *Assessment Report on Tetra Tech's Support of California's MS4 Stormwater Program,* 12 July 2006. Web. 11 August 2011. < http://www.epa.gov/region9/water/npdes/pdf/ms4/tetra-tech-ms4-stormwater-report.pdf>.

experience staff turnover.[55] The Permittee relies on multiple employees or contractors for program implementation. A written SWMP provides a tool for educating contractors and aids coordination between municipal employees and departments.

The Permittee's SWMP is simply a description of the Permittee's runoff management program required under this Order. The SWMP serves as procedural correspondence which guides program implementation and aids the Permittee and the Central Coast Water Board in tracking implementation of the program. In this manner, the SWMP is not a functional equivalent of the Order.

39. 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 of a 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: (1) The status of implementing the components of the stormwater management program that are established as permit conditions; (2) Proposed changes to the storm water management program that are established as permit condition, Such proposed changes shall be consistent with section 122.26(d)(2)iii) of this part; (3) Revisions, if necessary, to the assessment of controls and the fiscal analysis reported in the permit application under section 122.26(d)(2)iv) and (d)(2)(v) of this part; (4) A summary of data, including monitoring data, that is accumulated throughout the reporting year; (5) Annual expenditures and budget for year following each annual report; (6) A summary describing the number and nature of enforcement actions, inspections, and public education programs; and (7) Identification of water quality improvements or degradation."

CWC 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 Central Coast Water Board will review the reports to ensure that the Permittee's program is adequate to assess and protect water quality. The reporting requirements can also be useful tools for the Permittees to review, update, or revise its program. Areas or issues which have received insufficient efforts can also be identified and improved.

40. Education is a critical BMP and an important aspect of a SWMP. USEPA finds that "An informed and knowledgeable community is critical to the success of a storm water management program since it helps ensure the following: Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important, [and] greater compliance with the program as the public becomes aware of the

[55] Tetra Tech, Inc. *Program Evaluation Report. Orange County Storm Water Program: Cities of Laguna Beach, Laguna Hills, Lake Forest, and Rancho Santa Margarita,* 7 July 2006. Web. 11 August 2011. < http://epa.gov/Region9/water/npdes/pdf/ms4/orange-county-ms4-program-evauation-0505.pdf>.

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."[56]

Municipal Maintenance

41. Pesticides have been found to bioaccumulate and biomagnify in long-lived organisms at the higher trophic levels.[57] Since many aquatic species are utilized for human consumption, toxic substances accumulated in species' tissues can pose a significant threat to public health. USEPA 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, phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such and 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." Pesticides can also bond with sediment in receiving waters and contribute to sediment tocixity. Southern California studies have shown that stream sediments can exhibit significant levels of toxic metals and pesticides.[58]

42. Urban runoff from a significant portion of south Salinas is discharged through the Permittee's stormwater pump station to the Salinas River outfall. Runoff discharges are conveyed from the pump station to the Salinas River outfall through a pipe approximately one mile in length. The pipe passes beneath agricultural land, and the Permittee has detected groundwater intrusion into the pipe at several locations through video inspection of the pipe. It is likely that groundwater entering the pipe as it passes through agricultural land is contaminated with pollutants associated with agriculture (e.g., nitrates, pesticides).

    The stormwater pump station, discharge pipeline, and Salinas River outfall are part of the Permittee's MS4 because they are owned and operated by the Permittee and used by the Permittee to convey municipal stormwater. According to federal regulations, the Permittee is responsible for discharges from its MS4 to receiving waters. This Order includes requirements for the Permittee to control the discharge of pollutants into its MS4 in order to reduce pollutant discharges from its MS4 to receiving waters. In the same way, the Permittee is responsible for discharges from the Salinas River outfall, regardless of how flows enter the discharge pipeline (i.e., from the stormwater pump station or through groundwater intrusion from agricultural lands).

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[56] USEPA. *Storm Water Phase II Compliance Assistance Guide, EPA 833-R-00-002,* March 2000. Web. 10 August 2011.

[57] Lee, G. Fred, Jones-Lee, Anne. *Preliminary Assessment of the Bioaccumulation of PCBs and Organochlorine Pesticides in Lumbriculus variegatus from City of Stockton Smith Canal Sediemnts and Toxicity of City of Stockton Smith Canal Sediments to Hyalella azteca*. Report to the DeltaKeeper Stockton, California, and the Central Valley Regional Water Quality Control Board. Sacramento, California. 2002. Web <http://www.gfredlee.com/HazChemSites/SmithCanalReport.pdf>.

[58] Holmes, R.W., Anderson, B.S., Phillips, B.M., Hunt, J.W., Crane, D.B., Mekebri, A. and V. Connor. "Statewide Investigation of the Role of Pyrethroid Pesticides in Sediment Toxicity in California's Urban Waterways." *Environmental Science Technology.* Volume 42, 16 July 2008. p. 7003-7009.

Commercial and Industrial

43. Commercial and industrial sites can be a significant source of pollutants in stormwater runoff. In an extensive review of stormwater literature, the Los Angeles 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 found that "industrial and commercial areas were likely to be the most significant pollutant source areas" of heavy metals.[59] Likewise, stormwater runoff from heavy industry in the Santa Clara Valley has been found to be extremely toxic. [60] These Findings are corroborated by USEPA, which states in the preamble to the 1990 Phase I NPDES stormwater 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."

    USEPA finds the control of pollutant discharges from industry so important to receiving water quality that it has established a double system of regulation over industrial sites. This double system of regulation consists of two parallel regulatory systems with the same common objective: to keep pollutants from industrial sites out of the MS4. In this double system of regulation for runoff from industrial sites, permittees shall enforce their legal authorities (e.g., local ordinances, permits) while Regional Water Boards must enforce their legal authority (e.g., statewide general industrial stormwater permits). These two regulatory systems are designed to complement and support each other. According to USEPA, the stormwater regulations envision that NPDES permitting authorities and municipal operators will cooperate to develop programs to monitor and control pollutants in stormwater discharges from industrial facilities.[61] Municipalities are not required to enforce the State Water Board permit; however, they are required to enforce their ordinances and permits. The Federal regulations are clear that the Permittee has responsibility to prevent non-stormwater discharges and address stormwater runoff from industrial sites which enters the MS4.

44. The Carr Lake area of the Permit coverage area is actively farmed when not inundated by flood waters. The Central Coast Water Board has documented substantial empirical data demonstrating that water quality conditions in agricultural areas of the region continue to be severely impaired or polluted by waste discharges from irrigated agricultural operations and activities. The most serious water quality degradation is caused by fertilizer and pesticide use, which results in run off of chemicals from agricultural fields into surface waters and percolation into groundwater. Runoff and percolation includes both irrigation water and stormwater. In addition, agricultural use of pesticides in the Central Coast Region and

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[59] Los Angeles Regional Water Quality Control Board. *The Role of Municipal Operators In Controlling the Discharge of Pollutants in Storm Water Runoff from Industrial/Commercial Facilities,* November 2001. Web. 11 August 2011. p. 7.

[60] Schueler, T.R., and Heather K. Holland, eds. "Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66)." *Watershed Protection Techniques.* Ellicott City, MD: Center for Watershed Protection, 2000.

[61] USEPA. *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,* November 1992. Web. 10 August 2011.

associated toxicity is among the highest in the State.[62] Agriculture-related toxicity studies conducted on the Central Coast since 1999 indicate that toxicity resulting from agricultural discharges of pesticides has severely impacted aquatic life in Central Coast streams.[63,64,65] Some agricultural drains have shown toxicity nearly every time the drains are sampled. Twenty-two sites in the region – 13 of which are located in the lower Salinas/Tembladero watershed area – have been toxic in 95 percent of the samples evaluated.

Agriculture-related facilities and operations can also generate pollutants such as sediment, pesticides, and nutrients, that upon discharge to receiving waters can degrade water quality and impair beneficial uses.

45. CCAMP data from Franklin Creek (Santa Barbara County), a receiving water for runoff from greenhouses and nurseries, indicated high levels of nutrients and toxicity. Many greenhouse operations successfully reduced these levels when the Central Coast Water Board required them to eliminate surface water discharges. Irrigation runoff from large greenhouses and nurseries has been documented to be as much as 4,000,000 gallons per month. Greenhouse operations often leach crops to prevent salts build up in the root zone. Excessive leaching leads to greater runoff volumes and transport of waste.[66] Fertilizer usage in greenhouses and nurseries is intensive. A study conducted by University of California, Davis found that at least 60 percent of California greenhouses have more than 450 pounds of nitrogen per acre in the root zone at any given time. In many cases, more than half of the fertilizer nitrogen applied to ornamental crops is lost to leaching due, in part, to over application of fertilizers and poor irrigation efficiency, and is a significant source of surface water and groundwater pollution.[67] Pesticide use for ornamental plants grown in greenhouses and nurseries is also intensive. According to pesticide use reports submitted to Department of Pesticide Regulation, the greatest pesticide use at nurseries is with outdoor container nurseries and field-grown plants. Heavy pesticide use and fertilizer use, coupled with an intensive irrigation regime and leaching used by many nurseries may result in a discharge of waste in runoff and poses significant threat of pollution to surface water and groundwater.[68]

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[62] Starner, K., J. White, F. Spurlock and K. Kelley. *Pyrethroid Insecticides in California Surface Waters and Bed Sediments: Concentrations and Estimated Toxicities.* California Department of Pesticide Regulation, September 2006. Web. 16 August 2011.
[63] Anderson, B.S., J.W. Hunt, B.M. Phillips, P.A. Nicely, V. De Vlaming, V. Connor, N. Richard, R.S. Tjeerdema. *Integrated Assessment of the Impacts of Agricultural Drainwater in the Salinas River (California, USA).* Department of Environmental Toxicology, University of California, Davis, 2003. Web. 16 August 2011.
[64] Anderson B.S., B.M. Phillips, J.W. Hunt, V. Connor, N. Richard, R.S. Tjeerdema. *Identifying Primary Stressors Impacting Macroinvertebrates in the Salinas River (California, USA): Relative effects of Pesticides and Suspended Particles.* Department of Environmental Toxicology, University of California, Davis, 2006. Web. 16 August 2011.
[65] Anderson, B.S., B.M. Phillips, J.W. Hunt, N. Richard, V. Connor, K.R. Worcester, M.S. Adams, R.S. Tjeerdema. *Evidence of Pesticide Impacts in the Santa Maria River Watershed, California, USA.* Department of Environmental Toxicology, University of California, Davis, 2006. Web. 16 August 2011.
[66] Newman, Julie. *Greenhouse and Nursery Management Practices to Protect Water Quality*. Oakland, CA: University of California, Agriculture and Natural Resources, 2008. Print.
[67] Ibid.
[68] Ibid.

Parcel-Scale Development

46. The impact of urbanization on water quality is emphasized in the Order, since it is often linked to declines in watershed health. The NRC states, "Although the role of urban stormwater in degrading the nation's waters has been recognized for decades, reducing that role has been notoriously difficult. This difficulty arises from three basic attributes of what is commonly termed 'stormwater': 1) It is produced from literally everywhere in a developed landscape; 2) Its production and delivery are episodic, and these fluctuations are difficult to attenuate; and 3) It accumulates and transports much of the collective waste of the urban environment. Wherever grasslands and forest are replaced by urban development in general, and impervious surfaces in particular, the movement of water across the landscape is radically altered. Nearly all of the associated problems result from one underlying cause: loss of the water-retaining function of the soil and vegetation in the urban landscape."[69]

    This Order requires the Permittee to implement a program to maintain and restore watershed processes to protect beneficial uses. This can only be accomplished by addressing the variety of changes in watershed functions and processes (physical, chemical, and biological) that result from urban development. This aligns with CWA section 101(a) which states, "The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[70]

    To effectively protect beneficial uses, it is necessary to maintain and restore all the watershed processes that can be affected by: stormwater, actions to manage stormwater, and/or land uses that alter stormwater runoff patterns. These watershed processes include the following: surface runoff, groundwater recharge and discharge, sediment processes, chemical processes, and evapotranspiration. Different landscapes naturally support some watershed processes more than others. Varying landscape components related to such things as soil type, geology, land cover, topography, groundwater characteristics, rainfall, and proximity to receiving waters determine the dominant watershed processes in a particular landscape. These dominant watershed processes in turn play a critical role in water quality and beneficial use protection. The Central Coast Water Board Joint Effort for Hydromodification Control will identify dominant watershed processes within and surrounding the Permit coverage area.

    The traditional approach of focusing solely on receiving water conditions is reactive and does not focus on the source of short and long -term degradation of beneficial uses. There is a direct link between the condition of watershed processes and the status of beneficial uses. The following discussion explains the impacts anthropogenic watershed disturbances, and stormwater management actions directly related to those disturbances, have on each watershed process and the resulting impact to beneficial uses:

    1) Surface Runoff – NRC discusses the impact urbanization has on surface runoff. "This transformation of the hydrologic regime from one where subsurface flow once dominated to one where overland flow now dominates is not simply a readjustment of runoff flow

[69] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 23. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.
[70] Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), 2002. Web. 16 August 2011. p. 3. <http://www.epa.gov/lawsregs/laws/cwa.html>.

paths, and it does not just result in a modest increase in flow volumes. It is a wholesale reorganization of the processes of runoff generation, and it occurs throughout the developed landscape. As such, it can affect every aspect of that runoff—not only its rate of production, its volume, and its chemistry, but also what it indirectly affects farther downstream. This includes erosion of mobile channel boundaries, mobilization of once-static channel elements, scavenging of contaminants from the surface of the urban landscape, and efficient transfer of heat from warmed surfaces to receiving waterbodies."[71]

The USEPA MS4 permit improvement guidance document discusses the importance of addressing hydrologic modifications caused by urbanization, "Many traditional stormwater management practices, and the permit language that drives them, fail to address the hydrologic modifications that increase the quantity of stormwater discharges, and cause excessive erosion and stream channel degradation. Frequently the volume, duration, and velocity of stormwater discharges cause degradation to aquatic systems. Protecting and restoring the physical, chemical and biological integrity of receiving waters must be a central issue in stormwater permits."[72]

Surface runoff alterations include increased flows, volumes, and durations that intensify pollutant loading, carry runoff with higher temperatures, cause erosive impacts, and threaten the chemical, physical, and biological integrity of receiving waters. These impacts have the potential to negatively impact aquatic life beneficial uses.

2) Groundwater Recharge and Discharge – NRC explains how water enters subsurface layers and how urbanization affects these patterns. "In an undeveloped, vegetated landscape, soil structure and hydrologic behavior are strongly influenced by biological activities that increase soil porosity and the number and size of macropores, and thus the storage and conductivity of water as it moves through the soil. Leaf litter on the soil surface dissipates raindrop energy; the soil's organic content reduces detachment of small soil particles and maintains high surface infiltration rates. As a consequence, rainfall typically infiltrates into the ground surface or is evapotranspired by vegetation, except during particularly intense rainfall events.

   "In the urban landscape, these processes of evapotranspiration and water retention in the soil may be lost for the simple reason that the loose upper layers of the soil and vegetation are gone— stripped away to provide a better foundation for roads and buildings. Even if the soil still exists, it no longer functions if precipitation is denied access because of paving or rooftops. In either case, a stormwater runoff reservoir of tremendous volume is removed from the stormwater runoff system; water that may have lingered in this reservoir for a few days or many weeks, or been returned directly to the atmosphere by evaporation or transpiration by plants, now flows rapidly across the land surface and arrives at the stream channel in short, concentrated bursts of high discharge.

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[71] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 23. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.

[72] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 50.

"This transformation of the hydrologic regime from one where subsurface flow once dominated to one where overland flow now dominates is not simply a readjustment of runoff flow paths, and it does not just result in a modest increase in flow volumes..."[73]

NRC discusses a study by Line and White, which recently investigated runoff characteristics from two similar drainage areas in the Piedmont region of North Carolina. One of the drainage areas was being developed as part of a large residential subdivision during the course of the study, while the other remained forested or in agricultural field…baseflow as a percentage of overall discharge was approximately zero compared with 25 percent for the undeveloped area.[74]

Beneficial uses of water bodies rely on stormwater recharge of groundwater basins that supply interflow and baseflow to the water bodies, because flows are delivered at slower rates, over a longer duration, as opposed to all receiving water contributions coming during precipitation events via surface runoff. Maintaining the recharge of alluvial aquifers through stormwater infiltration and the discharge of subsurface water to surface water bodies through baseflow and seasonal flow supports vegetation, moderates temperature, and provides habitat for fish and wildlife. Various organisms depend on a diversity of habitat conditions for different life stages. Maintenance of natural soil moisture content and flow within receiving waters contributes to these habitat conditions. Depriving receiving waters of interflow and baseflow therefore results in stressors to aquatic habitat. Levels of hydrologic connectivity within watersheds need to be maintained and protected to produce the pattern and range of flows necessary to support aquatic life beneficial uses.

3) Sediment Processes – NRC explains how human activities lead to changes in channel morphology. "Changes to channel morphology are among the most common and readily visible effects of urban development on natural stream systems. The actions of deforestation, channelization, and paving of the uplands can produce tremendous changes in the delivery of water and sediment into the channel network. In channel reaches that are alluvial, the responses are commonly rapid and often dramatic… The clearest single determinant of urban channel change is the alteration of the hydrologic response of an urban watershed, notably the increase in stream-flow discharges… If the increase in sediment transport caused by the shift in the runoff regime is not matched by the sediment supply, channel bed entrenchment and bank erosion and collapse lead to a deeper, wider channel form."[75]

   Urbanization can cause both increases and decreases in sediment supply. Stormwater runoff from urban activities, especially construction activities, often results in upland sediment erosion delivering fine-grained material to receiving waters and can increase overall sediment supply. Conversely, increases in impervious surface cap landscapes that historically allowed stormwater runoff to deliver coarse-grained material to receiving waters and can decrease overall sediment supply.

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[73] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 23. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.
[74] Ibid. p. 155.
[75] Ibid. p. 148.

Modifications to sediment supply resulting from changes in stormwater runoff due to urbanization can affect channel stability. Excess sediment can lead to increased bank shear stress as flows are diverted around deposits. On the other hand, reducing sediment load can lead to channel degradation if the stream does not have a steady sediment supply to move in dynamic equilibrium.

The General Permit for Discharges of Storm Water Associated with Construction Activity (State Water Board Order 2009-0009 DWQ) states, "Under past practices, new and redevelopment construction activities have resulted in modified natural watershed and stream processes. This is caused by altering the terrain, modifying the vegetation and soil characteristics, introducing impervious surfaces such as pavement and buildings, increasing drainage density through pipes and channels, and altering the condition of stream channels through straightening, deepening, and armoring. These changes result in a drainage system where sediment transport capacity is increased and sediment supply is decreased. A receiving channel's response is dependent on dominant channel materials and its stage of adjustment."[76]

Modifications to sediment delivery, including grain size, volume, and delivery rate, change receiving water characteristics. NRC explains that enhanced sedimentation of receiving water bodies, caused by in-stream erosion and increased sediment delivery, reduces water clarity, decreases depth, and buries the benthic environment.[77] Modifications to sediment regimes threaten chemical, physical, and biological integrity of receiving waters and thereby have the potential to negatively impact aquatic life beneficial uses.

4) Chemical Processes – NRC explains how urbanization introduces new pollutants to watersheds. "As a watershed shifts from having mostly natural pervious surfaces to having heavily disturbed soils, new impervious surfaces, and activities characteristic of urbanization, the runoff quality shifts from relatively lower to higher concentrations of pollutants. Anthropogenic activities that can increase runoff pollutant concentrations in urban watersheds include application of chemicals for fertilization and pest control; leaching and corrosion of pollutants from exposed materials; exhaust emissions, leaks from, and wear of vehicles; atmospheric deposition of pollutants; and inappropriate discharges of wastes… Indeed, urban stormwater may actually have slightly lower pollutant concentrations than other nonpoint sources of pollution, especially for sediment and nutrients. The key difference is that urban watersheds produce a much larger annual volume of runoff waters, such that the mass of pollutants discharged is often greater following urbanization."[78]

   Areas adjacent to water bodies provide attenuation of pollutants in stormwater by supplying biologically active environments to break-down and sequester pollutants. Maintenance of riparian and aquatic habitat diversity and complexity in these areas supports various life stages of aquatic organisms with food, shelter, shade, flood refuge,

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[76] State Water Resources Control Board. *Construction General Permit, Fact Sheet, Order 2009-0009-DWQ,* 2010. Web. 16 August 2011. p. 37

[77] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 150. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.

[78] Ibid. p. 150-151.

substrate characteristics, and depth and velocity variability. Riparian areas also support natural enhancement or improvement of water quality by providing such functions as erosion control, filtration and purification of runoff and surface water, nutrient and organic matter cycling, temperature and microclimate control, input of organic debris and coarse sediments, interception of fine sediments, streambank stabilization, and maintenance of channel integrity.

Although riparian areas are the most pronounced pollutant attenuators, other areas within watersheds hold potential to sequester, degrade, and/or otherwise assimilate pollutants carried by stormwater. Stormwater pollutants may infiltrate and/or be degraded by organisms in soil. Pollutants carried by stormwater may settle out of runoff or never reach receiving waters, to be later broken down by other natural processes (e.g., vegetation, solar).

Modifications to landscapes that interrupt these processes threaten the chemical, physical, and biological integrity of receiving waters and have the potential to negatively impact aquatic life beneficial uses.

5) Evapotranspiration – In an undeveloped area, rainfall typically infiltrates into the ground surface or is evapotranspirated by vegetation (See NRC reference in 'Groundwater Recharge and Discharge' discussion above). In the urban landscape, vegetation is altered and/or replaced with impervious surfaces and the processes of evapotranspiration and water retention in the soil are diminished, resulting in stormwater that flows rapidly across the land surface and arrives at the stream channel in short, concentrated bursts of high discharge.

   The authors of the Santa Clara Valley Urban Runoff Pollution Prevention Program Hydromodification Management Plan report that changes in watershed vegetation, due to the effects of urbanization, affecting interception and evapotranspiration, is one of the factors having the greatest effect on stream stability.[79]

   By reducing evapotranspiration opportunities in a watershed, larger volumes of runoff accompany each rainfall event. In combination with alterations of surface water and subsurface flows, changes in evapotranspiration rates contribute to the wholesale reorganization of the processes of runoff generation described by the NRC, above. These changes in stormwater runoff threaten the chemical, physical, and biological integrity of receiving waters and thereby have the potential to negatively impact aquatic life beneficial uses.

The current scientific literature has documented the characteristics of stormwater runoff, including its quantity and quality from many different land cover types, as well as the characteristics of dry weather runoff. In addition, many correlative studies show how parameters co-vary in important but complex and poorly understood ways (e.g., changes in macroinvertebrate or fish communities associated with watershed road density or the percentage of impervious cover). Nonetheless, efforts to create mechanistic links between population growth, land-use change, hydrologic alteration, geomorphic adjustments, chemical contamination in stormwater, disrupted energy flows and biotic interactions, and

[79] Santa Clara Valley Urban Runoff Pollution Prevention Program. *Hydromodification Management Plan, Final Report,* 21 April 2005. Web. 16 August 2011.

changes in ecological communities are still in development. Despite NRC's assessment of urban stormwater management in the US, there are a number of overarching truths that remain poorly integrated into stormwater management decision-making, although they have been robustly characterized for more than a decade and have a strong scientific basis that reaches even farther back through the history of published investigations. These truths include the following: 1) there is a direct relationship between land cover and the biological condition of downstream receiving waters; 2) the protection of aquatic life in urban streams requires an approach that incorporates all stressors; 3) the full distribution and sequence of flows (i.e., the flow regime) should be taken into consideration when assessing the impacts of stormwater on streams; and 4) roads and parking lots can be the most significant type of land cover with respect to stormwater.[80]

To address the truths that NRC identifies above, this Order requires the Permittee to implement a program to maintain and restore watershed processes affected by stormwater management, by addressing the variety of changes in watershed functions and processes (physical, chemical, and biological) that result from urban development, in order to protect beneficial uses.

47. Development and urbanization increase pollutant loads, volume, and discharge velocity. Natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, and parking lots, and rooftops. Natural vegetated soil can both absorb rainwater and remove pollutants, providing an effective natural purification process. In contrast, impervious surfaces (such as pavement and concrete) can neither absorb water nor remove pollutants, and thus the volume, velocity, and discharge duration of stormwater runoff is increased and the natural purification characteristics are lost. The increased volume, increased velocity, and discharge duration, and increased pollutant loading of stormwater runoff from developed areas has the potential to accelerate downstream erosion and impair stream habitat in natural drainages. Studies have demonstrated a direct relationship between the degree of imperviousness of an area and water body degradation.[81] Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as 3-10 percent conversion from natural to impervious surfaces in a subwatershed. Recent studies conducted in California indicate that intermittent and ephemeral streams are even more susceptible to the effects of hydromodification than streams from other regions of the U.S. with stream degradation being recognized when the associated catchment's impervious cover is as little as 3-5 percent.[82,83] The percentage of impervious cover is one indicator and predictor of potential water quality degradation expected from new development.

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[80] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 4-5. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.

[81] *Watershed Protection Research Monograph No. 1, Impacts of Impervious Cover on Aquatic Systems.* Ellicott City, MD: Center for Watershed Protection, March 2003. Web. 16 August 2011.

[82] Stein, Eric and Susan Saleski. *Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. Technical Report No. 475.* Southern California Coastal Water Research Project, December 2005, Web. 16 August 2011.

[83] Coleman, Derrick, Craig MacRae, and Eric D. Stein. *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams. Technical Report No. 450*. Southern California Coastal Water Research Project, April 2005. Web. 11 August 2011.

The Natural Resources Defense Council (NRDC) 1999 Report, "*Stormwater Strategies, Community Responses to Runoff Pollution*" identifies two main causes of the stormwater pollution problem in developed areas. Both causes are directly related to development:

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 industrial, commercial, residential and construction activities are large contributors of pollutant concentrations in stormwater 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 areas is significantly greater in volume, velocity, and pollutant load than pre-development runoff from the same area.

By accommodating the traditional approach to stormwater management, development 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,[84] and exacerbated by physical alterations of the stream channel network. [85] This relationship between development and stream channel integrity has been documented nationally and in California.

Hydrologic changes from 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.[86] The CWP recently provided USEPA with a synthesis of more than 100 scientific studies on the direct and indirect impacts of development, particularly 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 to impact wetlands include: increased stormwater runoff; decreased groundwater recharge; and flow constriction.[87] Each of these changes can often be avoided or minimized by implementing LID BMPs.

Studies show that the level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.[88] One comprehensive study, which looked at numerous areas, variables, and methods, revealed that stream degradation occurs at levels of

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[84] Konrad, Christopher P. and Derek K. Booth. *Hydrologic Changes in Urban Streams and Their Ecological Significance.* American Fisheries Society Symposium Vol.47., 2005. Web. 16 August 2011. p.157-177.
[85] Poff. N.L. et al. *The Natural Flow Regime: A paradigm for river conservation and restoration.* Bioscience Vol. 47, No. 11, 1997. Web. 16 August 2011. p.769-784.
[86] Wright, Tiffany, et al. *Direct and Indirect Impacts of Urbanization on Wetland Quality, Wetlands & Watersheds Article #1.* Ellicott City, MD: Center for Watershed Protection, December 2006. Web. 16 August 2011.
[87] Ibid p.22
[88] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register 64* (8 December 1999): Web. 10 August 2011.

imperviousness as low as 10 – 20 percent.[89] 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 greater than or equal to 25 percent.[90] To provide some perspective, a medium density, single-family home area can be from 25 percent to 60 percent impervious (variation due to street and parking design).[91]

Even though the rainfall depths in arid watersheds are lower, watershed development can greatly increase peak discharge rates during rare flood events.[92] A study conducted in arid watersheds around Riverside, California showed that, over two decades, impervious cover increased from 9 percent to 22 percent, which resulted in an increase of more than 100 percent in the peak flow rate for the two-year storm event. The study also showed that the average stormwater runoff volume each year had increased by 115 percent to 130 percent over the same time span.[93]

Prior hydromodification studies in California have shown that the increase in impervious cover, and thus change in runoff volume, velocity, rate, and duration, results in a shift in the range of storms that produce geomorphically significant flows within receiving waters. Additionally, studies in California have determined that ninety percent of the geomorphic "work" done within channels receiving flows from developed areas now occurs from flows below the 10 year peak flow event.[94]

This increased volume, velocity, rate, and duration of runoff greatly accelerates the erosion of the beds and banks within downstream receiving waters. Additionally, stormwater flows which runoff directly from impervious surfaces into the MS4 and thus receiving waters prevent the associated runoff of natural sediments which would occur in pre-project conditions. This combined alteration of the physical condition of stormwater runoff results in accelerated downstream erosion of receiving water bed and banks. The excessive erosion of stream beds and banks releases pollutants found in soils into receiving waters, degrades macroinvertebrate habitat, eliminates spawning habitat, reduces associated wetland and riparian habitat, and threatens existing infrastructure adjacent to receiving waters. Bank sloughing within creeks and streams increases the pollutant loading to those receiving waters, particularly for turbidity and phosphorous.[95] In arid environments, accelerated channel erosion has been shown to have synergistic impacts within watersheds. Increased channel erosion within Las Vegas wash has resulted in the loss of over 1,000 acres of wetland and riparian habitat, released additional pollutants into downstream receiving

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[89] Ibid.
[90] Ibid.
[91] Schueler, T.R., and Heather K. Holland, eds. "The Importance of Imperviousness (Article 1)." *Watershed Protection Techniques*. Ellicott City, MD: Center for Watershed Protection. 2000.
[92] Schueler, T.R., and Heather K. Holland, eds. "Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66)." *Watershed Protection Techniques.* Ellicott City, MD: Center for Watershed Protection. 2000.
[93] Ibid.
[94] Santa Clara Valley Urban Runoff Pollution Prevention Program. *Hydromodification Management Plan, Final Report,* 21 April 2005. Web. 16 August 2011.
[95] Bauer, D.W., D.J. Mulla, and A.C. Sekely. "Streambank slumping and its contribution to the phosphorus and suspended sediment loads of the Blue Earth River, Minnesota." *Journal of Soil and Water Conservation* 57.5 (2002): 243-250. Expanded Academic ASAP. Web. 17 Aug. 2011. <http://www.jswconline.org/content/57/5/243.abstract>.

waters, and eliminated in-stream habitat and water quality conditions required for existing threatened and endangered species.[96]

According to the CWP, urbanization strongly shapes the quality of both surface and groundwater in arid and semi-arid regions of the southwest. Since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Therefore, the pollutant concentrations of stormwater runoff from arid watersheds tends to be higher than that of humid watersheds.[97] The effect of antecedent rainfall events is demonstrated in a recent report from the California Department of Transportation that found the concept of a seasonal first flush is applicable to the southern California climate.[98]

48. See discussion for Finding No. 47 above.

49. See discussion for Finding No. 47 above.

50. LID is an effective approach to minimizing the adverse effects of urbanization and development on watershed processes and beneficial uses that has been endorsed by California and other states. The California Ocean Protection Council, in a resolution adopted on May 15, 2008, found that LID is a practicable and superior approach that new development 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. In its Strategic Plan Update 2008-2012, the State Water Board reiterated sustainability as a key principle, stating its commitment to "enhancing and encouraging sustainability within the administration of Water Board programs and activities by promoting water management strategies such as low impact development…"[99]

    "LID is a comprehensive source control strategy first pioneered by Prince George's County, Maryland in 1997 to help address the growing economic and environmental limitations of conventional stormwater management practices. As LID was developed by a local government, it is sensitive to addressing local government's unique environmental and regulatory needs in the most economical manner possible by reducing costs associated with stormwater infrastructure design, construction, maintenance and enforcement. LID also provides for local government's need for economic vitality through reasonable and continued growth and redevelopment. LID allows for greater development potential with less environmental impacts through the use of smarter designs and advanced technologies to achieve a better balance between conservation, growth, ecosystem protection and public health/quality of life."[100]

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[96] Tuttle, P.L.. and E.L. Orsak. *Las Vegas Wash Water Quality and Implications to Fish and Wildlife.* U.S. Fish and Wildlife Service, 1 November 2002. Web. 16 August 2011.
[97] Schueler, T.R., and Heather K. Holland, eds. "Storm Water Strategies for Arid and Semi-Arid Watersheds (Article 66)." *Watershed Protection Techniques.* Ellicott City, MD: Center for Watershed Protection. 2000.
[98] Stenstrom, Michael and Masoud Kayhanian. *First Flush Phenomenon Characterization. Report No. CTSW-RT-05-73-02.6.* California Department of Transportation, August 25. Web. 16 August 2011.
[99] State Water Resources Control Board. *Strategic Plan Update 2008-2012*, 2 September 2008. Web. 16 August 2011. p. 7
[100] Coffman, Larry. *Low Impact Development: Smart Technology For Clean Water, Definitions, Issues, Roadblocks, and Next Steps.* American Society of Civil Engineers, 2004. Web. 16 August 2011. p. 1.

Use of LID techniques at new development, redevelopment, and retrofit projects is an effective approach to minimizing the adverse effects of urbanization and development on receiving waters and their beneficial uses. The implementation of LID techniques across the US and Canada has demonstrated that the proper implementation of LID techniques results in more benefits than single purpose stormwater and flood control infrastructure, including increased water quality protection, enhanced property values, improved aquatic and terrestrial habitat, aesthetic amenities, and improved quality of life.[101] Further, properly implemented LID techniques can help mimic the pre-project runoff volume and time of concentration, thus minimizing the adverse effects of hydromodification on stream habitat and biological condition.[102] The requirements of this Order facilitate the implementation of LID strategies to protect water quality, reduce runoff volume, and to garner additional benefits.

Specific LID strategies include bioretention and rainwater harvesting for reuse. Bioretention is a method of treating stormwater by pooling water on the surface and allowing filtering and settling of suspended solids and sediment at the mulch layer, prior to entering the plant/soil/microbe complex media for infiltration and pollutant removal. Rain gardens and bioretention techniques are used to accomplish water quality improvement and water quantity reduction. Prince George's County, Maryland, and Alexandria, Virginia have used this BMP since 1992 with success in many urban and suburban settings. Rain gardens can be integrated into a site with a high degree of flexibility and can balance nicely with other structural management systems, including porous asphalt parking lots, infiltration trenches, as well as non-structural stormwater BMPs. Rain gardens allow rain to be collected and seep naturally into the ground. This helps recharge groundwater supply and minimize the amount of polluted runoff.[103]

As an alternative to redirection of stormwater to functional landscape, rain gutter flows can be directed into rain barrels or cisterns for later use in irrigating lawns and gardens. Disconnections of rain gutters can effectively be implemented on existing properties with little change to present site designs. The benefits of urban area rainwater harvesting can be huge, providing supplemental water for many local uses, such as irrigating a vegetable garden and surrounding landscape, which also leaves more treated water in the municipal water supply to help cities through times of drought or other shortages. A number of cities in the Los Angeles Region, including Los Angeles, Long Beach and Santa Monica, have implemented successful rainwater harvesting incentive programs.

Traditional approaches to stormwater management involve conveying runoff off-site to receiving waters, to a combined sewer system, or to a regional facility that treats runoff from multiple sites. These designs typically include hard infrastructure, such as curbs, gutters, and piping. LID-based designs, in contrast, are designed to use natural drainage features or engineered swales and vegetated contours for runoff conveyance and treatment. In terms of

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[101] USEPA. *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*. *EPA 841-F-07-006*, December 2007. Web. 16 August 2011.

[102] *A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption.* Beltsville, Maryland: Low Impact Development Center; State Water Resources Control Board; The Water Board Academy, December 2007. Web. 16 August 2011.

[103] Obropta, Christopher, Sciarappa, William J. , Quinn, Vivian. "Rain Gardens." Rutgers Cooperative Research & Extension Fact Sheet No. 513. Rutgers Cook College Resource Center: 2006. Web. <http://water.rutgers.edu/Rain_Gardens/fs513.pdf>.

costs, LID techniques like conservation design can reduce the amount of materials needed for paving roads and driveways and for installing curbs and gutters. Conservation designs can be used to reduce the total amount of impervious surface, which results in reduced road and driveway lengths and reduced costs. Other LID techniques, such as grassed swales, can be used to infiltrate roadway runoff and eliminate or reduce the need for curbs and gutters, thereby reducing infrastructure costs. Also, by infiltrating or evaporating runoff, LID techniques can reduce the size and cost of flood-control structures.[104]

Some other potential economic benefits associated with LID strategies, include, but are not limited to, reduced need for flood control and increased property values.[105] LID can also provide the benefit of additional groundwater supplies.

The implementation of LID techniques has been associated with the following other environmental benefits: improved air quality due to the increased use of trees and vegetation, reduced urban temperatures due to the shade offered by increased vegetation and the reduction of heat absorbing materials (e.g., concrete), the moderation of climate change due to reduced urban temperatures, increased energy efficiency due to lower ambient temperatures when LID practices are implemented on and around buildings, and aesthetic benefits due to the increased use of trees and vegetation.[106]

Use of LID techniques at new development, redevelopment, and retrofit projects also enhances water supply. LID is consistent with and supports the Governor's 20 x 2020 Water Conservation Plan (February 2010); the State Water Board's 2008-2012 Strategic Plan Update (i.e. to promote sustainable local water supplies); the State Water Board's Recycled Water Policy (Resolution No. 2009-0011) objective to increase [beneficial] use of stormwater; requirements of the Water Conservation in Landscaping Act of 2006 (AB 1881, Laird), which requires cities and counties to adopt landscape water conservation ordinances by January 1, 2010; and the Department of Water Resources' Water Efficient Landscape Ordinance (Cal. Code of Regulations section 492.15).

There is a growing acceptance by stormwater professionals and local governments to integrate LID strategies that limit impervious area, and associated onsite retention criteria, into SWMPs and MS4 permits. For example, West Virginia's Small MS4 Permit No. WV0116025 requires the on-site retention of the volume of runoff produced from the first inch of a 24-hour storm; the USEPA's Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under section 438 of the Energy Independence and Security Act, requires the on-site retention of the volume of runoff produced from the 95th percentile storm event where technically feasible; the City of Philadelphia requires the onsite retention of the volume of runoff produced from the first inch of a 24-hour storm; and the City of Portland, Oregon requires the onsite infiltration of the runoff volume from a 10-year, 24-hour design storm.

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[104] USEPA. *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices. EPA 841-F-07-006*, December 2007. Web. 16 August 2011.
[105] MacMullan, Ed. "Assessing Low Impact Developments Using a Benefit-Cost Approach." *2nd National Low Impact Development Conference, March 12-14, 2007*. ECONorthwest. Web. 16 August 2011.
[106] USEPA. *Fact Sheet, Technical Guidance on Implementing the Storm Water Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act,* December 2009. Web. 16 August 2011.

51. Many end-of-pipe BMPs are designed for low flow conditions because their end-of-pipe location prevents them from being designed for large storm events. This results in the end-of-pipe BMPs being overwhelmed, bypassed, or ineffective during larger storm events more frequently than onsite BMPs designed for larger storms. BMPs are also frequently most effective for a particular type of pollutant (such as sediment). Such BMPs may be appropriate for small sites with a limited suite of pollutants generated; however, end-of-pipe BMPs must typically be able to address a wide range of pollutants generated by a subwatershed, limiting their effectiveness. Moreover, the location of some end-of-pipe BMPs allow for untreated pollutants to be discharged to and degrade receiving waters prior to their reaching the BMPs. This fails to protect receiving waters, which is the purpose of BMP implementation. Moreover, opportunities to educate the public regarding urban runoff pollution can be lost when end-of-pipe BMPs are located away from pollutant sources and out of sight. Onsite BMPs can lead to a better understanding of urban runoff issues since they demonstrate urban runoff processes.

52. Infiltration is an effective means for managing urban runoff. However, measures must be taken to protect groundwater quality when infiltration of urban runoff is implemented. In some circumstances, site specific conditions (i.e., historical soil contamination) and the type of development (i.e., urban infill) can limit the feasibility of retaining, infiltrating, and reusing stormwater at sites. USEPA supports urban runoff infiltration and provides guidance for protection of groundwater: "With a reasonable degree of site-specific design considerations to compensate for soil characteristics, infiltration may be very effective in controlling both urban runoff quality and quantity problems. This strategy encourages infiltration of urban runoff to replace the natural infiltration capacity lost through urbanization and to use the natural filtering and sorption capacity of soils to remove pollutants; however, the potential for some types of urban runoff to contaminate groundwater through infiltration requires some restrictions."[107]

53. See discussion for Finding No. 34.

54. Proper BMP design and maintenance can prevent the creation of vector habitat. Nuisances and public health impacts resulting from vector breeding can be prevented with close collaboration and cooperative effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of SWMPs.

55. The Permittee has significant plans for new development in the Permittee's coverage area as discussed in Section IV.B (Future Growth Area) of this Fact Sheet. Therefore, it is necessary to update the SWDS, which includes the Permittee's urban runoff-related design and maintenance requirements for new development and redevelopment projects, in a timely manner, so that the Permittee can manage changes in stormwater runoff conditions caused by development that can affect watershed processes that impact beneficial uses. In addition to managing changes in the future growth area, updates to the SWDS are also important for managing changes in new development and redevelopment in existing urban areas. This Order requires the Permittee to make changes to the content in the SWDS so that the Permittee's requirements for managing stormwater for new development and redevelopment projects meet MEP and are clearly stated. This Order also requires the

[107] Pitt, Robert, Shirley Clark, and Keith Parmer. *Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration, EPA 600 SR-94 051.* USEPA, May 1994. Web. 16 August 2011.

Permittee to reorganize its existing SWDS. The existing SWDS include a number of clear requirements; however, key portions of the SWDS are not written clearly enough to ensure effective implementation.

Development Planning and Stormwater Retrofits

56. See discussion for Findings No. 34 and No. 46. See discussion in Section IV.B (Future Growth Area) of this Fact Sheet for information about areas planned for future growth in the Permit coverage area.

57. Consideration of stormwater impacts from development is critical during the planning phases of development. Incorporating LID principles into the site design is easiest and most effective if done during preliminary project stages. LID site design is an iterative process; therefore, incorporating LID in the preliminary site design process minimizes major site design modifications, related to management of post-construction stormwater, at the end of the site design process. For these reasons, working with development project applicants at the earliest possible stage in the development review process of the requirements related to post-construction stormwater management is fundamental to optimizing LID at project sites. USEPA supports addressing stormwater management through planning when it states: "EPA recommends that you 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 quality."[108] See also discussion for Finding No. 34.

58. Conventional planning and zoning can be limited in its ability to protect the environmental quality of receiving waters. Watershed-based planning is often ignored, despite the fact that receiving waters unite land by collecting runoff from throughout the watershed. Since watersheds unite land, they can be used as an effective basis for planning. Watershed-based planning enables local and regional areas to realize economic, social, and other benefits associated with growth, while conserving the watershed resources needed to sustain such growth, including water quality.

    Performing planning analyses at the Urban Subwatershed scale is appropriate given the likelihood an MS4 is more likely to have an influence and can devote resources at that scale, as opposed to on a larger watershed scale. To most effectively maintain and protect beneficial uses, the Permittee must incorporate goals for watershed process maintenance and protection when making decisions about future urban growth areas. To the extent possible, stormwater management must be an integral part of higher level planning documents that determine where and how development, that will result in stormwater discharges to the MS4, should occur since these decisions affect water quality.

    USEPA explains why examining stormwater on a watershed basis and including watershed principles is an important part of protecting waterways in a holistic manner. Imperviousness

[108] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register 64* (8 December 1999): p. 68845. Web. 10 August 2011.

has been shown to correlate with water quality impacts. In order to minimize water quality impacts, the Permittee must examine their planning principles to manage the creation of impervious surfaces at the watershed level, such as reducing the footprint of streets and parking lots. Including watershed-type assessments and considerations as Permit Requirements will help the permittee better focus their efforts to ensure the best water protection outcomes for existing conditions and those anticipated future conditions.

Consideration of stormwater impacts from development is critical during the planning phases of development. This not only includes planning on the site-level, but also with respect to discharges from the MS4 on the watershed level. To the extent possible, stormwater management must be an integral part of higher level planning documents that determine where and how development that will result in stormwater discharges to the MS4 should occur since these decisions affect water quality. Using land efficiently can result in better stormwater management by putting development where it is most appropriate. For example, by directing and concentrating new development in areas targeted for growth, communities can reduce or remove development pressure on undeveloped parcels and protect sensitive natural lands and recharge areas. Another strategy is redeveloping already degraded sites such as abandoned shopping centers or underutilized parking lots. In this case, the net increase in discharges from developed sites would likely be zero, and it would likely decrease, depending on the on-site infiltration practices used. Also, by allowing or encouraging denser development, less land is converted overall, and less total impervious area created.[109]

USEPA explains the importance of using the smaller watershed scale for gaining useful information to inform site-level work. Where existing plans and strategies have been developed at a basin-wide or other large geographic scale, they usually need to be refined at the smaller watershed scale to provide the information needed to develop a watershed plan. The assessment, monitoring, and other data collection requirements for larger basin studies typically are not as detailed as those for watershed plans or assessments generated for site-level work plans.[110]

59. See discussions for Findings No. 46 and 58.

60. Riparian areas provide water quality functions that protect and restore the beneficial uses of receiving waters; therefore, activities within riparian areas and degradation of riparian areas impact water quality. It is important to maintain riparian areas of adequate width to accommodate natural stream meandering and provide water quality functions including, but not limited to, floodwater storage, water quality enhancement through stormwater filtration and pollutant sequestration, and maintenance of plant and animal communities to support aquatic life beneficial uses. It is also important to maintain buffers of adequate size outside of stream and wetland system environments to assimilate landscape influences and protect the water quality functions stream and wetland systems provide.

    Where riparian areas have been degraded (e.g., from encroachment, grading, placement of fill.), restoration of the natural conditions of characteristics including, but not limited to,

[109] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 60-61.
[110] USEPA. *Handbook for Developing Watershed Plans to Restore and Protect Our Waters*. EPA 841-B-002, March 2008. Web. 31 August 2011. p. 4-1. <http://water.epa.gov/polwaste/nps/handbook_index.cfm>.

widths, topographic complexity, and substrate characteristics is important to restore the function riparian areas play in improving the quality of stormwater runoff.

61. There is increasing awareness that, while site-based requirements are important to reduce impacts from urbanization, a site-based approach alone is unable to achieve a broader set of watershed goals, especially considering stormwater management impacts on regional issues such as water reuse, water preservation, groundwater management, and flood management. Stormwater, and the way in which stormwater is managed, can directly influence these watershed goals. Because water resources are shared and influenced by other stakeholders, MS4s, and other entities within the Permittee's watersheds, coordination with these other entities is important to manage stormwater in a manner that protects, enhances, and/or restores natural resources.

62. This Order establishes requirements for retrofitting existing development to improve runoff conditions from developed areas. Retrofitting existing development with stormwater treatment and flow controls is necessary to address stormwater discharges from existing development that may cause or contribute to a condition of pollution or a violation of water quality standards. Existing BMPs are not sufficient, as evidenced by CWA section 303(d) listings and the Permittee's monitoring reports. This is consistent with USEPA guidance, which states that "It is clear that we cannot protect the nation's waters without also addressing degradation caused by stormwater discharges from existing developed sites. For that reason stormwater programs must include substantive retrofit provisions.[111] While flow control and treatment BMPs are required for redevelopment, the current rate of redevelopment will not address water quality problems, including impaired watershed processes and impacts in receiving waters, in a timely manner. More advanced BMPs, including the retrofitting of existing development, are part of the iterative process. Retrofitting existing development is practicable for a municipality through a systematic evaluation, prioritization, and implementation plan. Retrofitting existing development is a widespread practice across the United States: Successful retrofitting programs have been implemented in such diverse locations as Seattle, Washington; Portland, Oregon; Santa Monica, California; Kansas City, Kansas; and Montgomery County, MD.

<u>Public Education and Public Involvement</u>

63. The vast majority of stormwater management activities necessary for reducing pollutants in stormwater discharges to the MEP and protecting water quality require participation by the public. Inspection and enforcement activities conducted by the Permittee provide a back-up for public education, but cannot replace activities designed to inform the public about watershed and water quality issues, the water quality impacts of behaviors, and steps the public can take to reduce pollutants in stormwater and protect water quality. In addition, a well-informed public can assist the Permittee in identifying water quality problems (e.g., illicit discharges, dumping), thus multiplying the Permittee's field screening resources. USEPA finds that "An informed and knowledgeable community is critical to the success of a stormwater management program since it helps ensure the following: Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important, [and] greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the

[111] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* April 2010. p. 65.

individual actions they can take to protect or improve the quality of area waters."[112] Regarding target audiences, USEPA also states "The public education program should use a mix of appropriate local strategies to address the viewpoints and concerns of a variety of audiences and communities, including minority and disadvantaged communities, as well as children." Therefore this Order identifies target audiences for public education in residential, commercial and industrial, construction, and development contexts.

The purpose of public education at all levels is to change behaviors that impact stormwater quality. Therefore it is not enough simply to convey information about stormwater quality issues. To be effective, the Permittee must also identify and remove obstacles to, and develop incentives for, desired behaviors. Community-based social marketing education techniques provide effective tools for achieving these objectives and designing public education programs that are effective at changing behaviors.

64. This Finding is supported by the Phase II Stormwater Regulations, which state "early and frequent public involvement can shorten implementation schedules and broaden public support for a program." USEPA goes on to explain, "Public participation is likely to ensure a more successful storm water program by providing valuable expertise and a conduit to other programs and governments."[113]

<u>Trash Load Reduction</u>

65. Trash is consistently found on and adjacent to roadways and in all geographical areas. A national litter study conducted by Keep America Beautiful found an average of 7,784 pieces of litter per mile on urban roads sampled across the nation.[114] The most common visible litter items detected on urban roads were paper (45.6 percent of all pieces) and plastics (34.5 percent of all pieces). In addition, a California Department of Transportation Litter Management Pilot Study found that 80 percent of the litter associated with roadways was floatable, indicating that, without capture, this litter would enter Waters of the State following a storm event.[115] High-density urban areas in Southern California have been shown to be responsible for up to 60 percent of the trash that enters receiving waters.[116,117] In addition, CCAMP staff has documented significant trash deposits in the Salinas Reclamation Ditch and at the discharge from the pump station to the Salinas River in all seasons.

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[112] USEPA. *Storm Water Phase II Compliance Assistance Guide, EPA 833-R-00-002.* March 2000. Web. 10 August 2011.

[113] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register 64 (*8 December 1999): p. 68755. Web. 10 August 2011

[114] *2009 National Visible Litter Survey and Litter Cost Study Final Report*. Stamford, CT: Keep America Beautiful, Inc.; Mid Atlantic Solid Waste Consultants, 18 September 2009. Web. 17 August 2011. p. ES-4.

[115] *Final Report, California Department Of Transportation District 7 Litter Management Pilot Study, Contract No. 43a0004c, Task Order No. 18, Caltrans Document No. Ct-Sw-Rt-00-013.* Sacremento, CA: California Department of Transportation, 26 June 2000. Web. 17 August 2011. p. 6-13.

[116] Sedrak, Morad. "The City of Los Angeles Meets Trash TMDLs Compliance with Catch Basin Inserts and Opening Covers." StormCon 2008. Orlando World Center Marriott Resort, Orlando, 6 August 2008. Conference Presentation.

[117] It is likely that both the Keep America Beautiful study and the Caltrans study underestimated the total contribution of plastics. The Keep America Beautiful study focused on visible litter, and the Caltrans study relied upon a mesh capture size of 0.25 inches (6.35 millimeters). Neither method is able to effectively capture plastic pre-production pellets (aka, "nurdles"), which are roughly 3 mm in size.

66. According to the Permittee's Urban Watershed Management Program Annual Reports, the Permittee removed a total of 40 cubic yards of trash and debris in 2006-07, 11 tons plus 20 cubic yards in 2007-08, 370 cubic yards in 2008-09, and 2.5 tons plus 26 cubic yards in 2009-10.

Total Maximum Daily Loads

67. This Order requires the Permittee to establish a Wasteload Allocation Attainment Plan for every TMDL approved by the Office of Administrative Law, where the Permittee is listed as a responsible party, to fulfill a component of any future TMDL Implementation Plan adopted by the Central Coast Water Board. A TMDL is the total amount of a particular pollutant that a water body can receive and still meet water quality standards, which are comprised of water quality objectives, beneficial uses and the States Policy on Maintaining High Quality Waters.[118] The water quality objectives serve as the primary basis for protecting the associated beneficial use. The numeric target of a TMDL interprets and applies the numeric and/or narrative water quality objectives of the water quality standards as the basis for the wasteload allocations.

Monitoring, Effectiveness Assessment, and Program Improvement

68. Previous Orders have relied on receiving water monitoring data to assess program effectiveness at protecting water quality. The Permittee has conducted water quality sampling since 1999. The Monitoring and Reporting Program for Order No. 99-087 required sampling at 20 receiving water sites within the Permit coverage area and one reference site located on Gabilan Creek upstream of the Permit coverage area. The Monitoring and Reporting Program for Order No. R3-2004-0135 required sampling at 3 receiving water sites within the Permit coverage area and one reference site upstream of the Permit coverage area. The high degree of variability in the data from these monitoring efforts and the influence of other water quality inputs have made it difficult to reliably discern the Permittee's contribution to water quality problems in receiving waters. The Permittee states: "Given the occurrence of exceedances of water quality objectives at background sites that confound the interpretation of impacts from Salinas stormwater at receiving water sites, few conclusions can be drawn regarding the influence of Salinas stormwater discharges on receiving water."[119] A corollary of this difficulty is that the monitoring data is also not able to show improvements in receiving water quality resulting from the Permittee's stormwater management actions.

69. The Central Coast Ambient Monitoring Program (CCAMP) conducts water quality monitoring at one of the Permittee's stormwater discharges to the Salinas Reclamation Ditch at Airport Road near U.S. Highway 101 (CCAMP station 309AXX), and in the Salinas Reclamation Ditch at Boronda Road (CCAMP station 309 ALD). A comparison of water quality criteria scores determined for sampled parameters at 309AXX with the receiving water data indicates that the Permittee's stormwater discharges may be causing or contributing to water quality impairments in the Salinas Reclamation Ditch for the following parameters:

[118] State Water Resources Control Board. *Resolution No. 68-16, Statement Of Policy With Respect To Maintaining High Quality Of Waters In California*, 28 October 1968. Web. 17 August 2011.
[119] City of Salinas. *2009-2010 Annual Report: Urban Watershed Management Program. Permit No: CA0049981, Order: R3-2004-0135*, 24 February 2011. Web. 23 August 2011.

Ammonia as N (total), Ammonia as N (unionized), Chloride, Fecal coliform, Total coliform, E. coli, Nitrate/Nitrite as N, Orthophosphate as P, Oxygen (dissolved), Oxygen (saturation), and Sodium. In addition, CCAMP conducts water quality monitoring at the Permittee's stormwater discharge to the Salinas River (CCAMP station 309SDR), and in the Salinas River 350 yards downstream of the discharge (CCAMP station 309DAV). A comparison of water quality criteria scores determined for sampled parameters at 309AXX with the receiving water data indicates that the Permittee's stormwater discharges may be causing or contributing to water quality impairments in the Salinas River for the following parameters: Ammonia as N (total), Boron (dissolved), Chloride, Chlorophyll *a*, Fecal coliform, Total coliform, E. coli, Dissolved solids (total), Nitrate/Nitrite as N, Orthophosphate as P, and Sodium.[120]

70. To date, the Permittee has assessed the effectiveness of its stormwater management actions through water quality monitoring, verification that the Permittee has completed required activities, and simple accounting of the results of some stormwater management actions. As stated above, the monitoring data has been inadequate for discerning the effectiveness of the Permittee's program. The Permittee's verification and accounting assessments have also not provided sufficient information about the effectiveness of the Permittee's stormwater management actions at reducing pollutants in stormwater discharges and protecting water quality. Verification and accounting largely correspond to a Level 1 assessment, as identified by CASQA.[121] As such, these assessments are inadequate for assessing effectiveness of activities at Level 6 (protection of receiving water quality).[122] Without reliable information on the link between stormwater management activities and receiving water quality, the Permittee has not been able to identify needed BMP modifications, program deficiencies, priorities for activities or expenditures, or justify reductions in effort or expenditure on activities that have been demonstrated to be ineffective or unnecessary.

    The monitoring requirements of this Order are designed to help fill the knowledge gap between the Permittee's stormwater management activities and their impact on receiving water quality. Stormwater discharge sampling in a limited number of Urban Catchments, associated with Stormwater Discharge Action Levels, will help the Permittee discern the cause-and-effect relationship between pollutant sources, BMPs, and stormwater management decisions over the long term by focusing on a limited management area over which the Permittee has a greater degree of control. Long-term trend monitoring of

[120] Threshold water quality criteria were developed using Basin Plan Water Quality Objectives (WQOs), CCAMP attention levels, and USEPA standards. CCAMP staff used the threshold water quality criteria to develop water quality criteria scores for sampled parameters based on the relevant water body's beneficial uses. Central Coast Water Board staff compared the scores determined for CCAMP station 309AXX to the receiving water data collected at CCAMP station 309ALD. Where both the water quality criteria score for a sampled parameter exceeded thresholds (i.e., a score of "impacted," "very impacted," or "severely impacted") and the receiving water data indicated an impairment for the same parameter, the Central Coast Water Board concludes that the Permittee's stormwater discharges may be causing or contributing to the water quality impairment.

[121] CASQA. *Municipal Stormwater Program Effectiveness Assessment Guidance*, May 2007. Web. 17 August 2011 <www.casqa.org>.

[122] Accounting is sometimes capable of providing limited Level 4 assessment (reduction of pollutant loads from sources), depending on the BMP and what is assessed (e.g., an accounting of the volume of trash removed from a drainage channel constitutes a direct reduction of pollutant load).

stormwater discharges and receiving waters focus on discerning long-term water quality trends that can be linked to stormwater management activities.

The monitoring and reporting program for this Order constitutes a change from previous monitoring and reporting programs. The change shifts resources away from extensive monitoring of receiving water conditions to a greater emphasis on stormwater discharge monitoring, and from monitoring at a multitude of sites to monitoring at a limited number of sites capable of providing information needed to understand the links between the Permittee's stormwater discharges and receiving water quality conditions. This change focuses the Permittee's efforts and expenditures on assessment actions that can produce tangible results.

71. This Order specifies requirements necessary for the Permittee to reduce the discharge of pollutants in stormwater discharges to the MEP. The Permittee's continual evolution in meeting the MEP standard is expected to achieve compliance with water quality standards. USEPA has consistently supported this expectation. In its Interim Permitting Approach for Water Quality-Based Effluent Limitations (WQBELs) in Storm Water Permits, USEPA states "the interim permitting approach uses 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."[123] USEPA 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 […]."[124]

    MEP is a dynamic performance standard, which evolves over time as stormwater management knowledge increases. The Permittee's SWMP must be continually assessed and modified in an adaptive management fashion to incorporate improved programs, control measures, and BMPs, in order to achieve the evolving MEP standard. Absent evidence to the contrary, this continual assessment, revision, and improvement of stormwater management program implementation is expected to ultimately achieve compliance with water quality standards in the Central Coast Region. This approach is consistent with the CWA and State Water Board guidance. In Defenders of Wildlife v. Browner (1999, 197 F. 3d 1035), the United States Court of Appeals for the Ninth Circuit states: "Under 33 U.S.C. section 1342 (p)(3)(B)(iii), the EPA's choice to include either management practices or numeric limitations in the permits was within its discretion." In addition, the approach is consistent with State Water Board Order WQ 99-05, which outlines an iterative approach for achieving compliance with water quality standards.

    Stormwater management is an evolving subject area that necessitates an adaptive management approach in which stormwater management actions are based on the current understanding of the science and program modifications result from new information. Adaptive management is predicated on the idea that in complex systems like urban

[123]"Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, Notices." *Federal Register 61* (26 August 1996): p. 43761. Web. 17 August 2011.
[124] "National Pollutant Discharge Elimination System – Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule." *Federal Register 64 (*8 December 1999): p. 68753-68754. Web. 10 August 2011.

watersheds, the information needed to fully inform management decisions is only partially available. Stressors like impervious cover interact with resource conditions, such as flow regimes, in sometimes unpredictable ways to produce varying effects on multiple beneficial uses. Basing stormwater management actions on poorly understood linkages is defensible when the results of the actions are systematically evaluated through monitoring and assessment, and the evaluation results in modification of subsequent actions. The adaptive management requirements contained in this Order take into account the complex nature of municipal stormwater management and the number and variety of factors affecting discharge and receiving water quality that make it difficult for stormwater managers to make clear cause-and-effect connections between discharge and receiving water conditions and BMP modifications that would influence those conditions. The requirements also take into account the amount of data needed to make reasonable adaptive management decisions; the length of time required to collect the necessary data; the cost of making modifications; and the potential that even reasonable management decisions may not reduce pollutant loads or affect water quality as anticipated, due to the variety of factors involved. Order requirements specify a level of effort in making adaptive management decisions and program modifications in line with these factors. Adaptive management is an on-going process that will span multiple permit cycles. Order requirements are based on the current understanding of the science, and new information (obtained from outside sources or the Permittee's own assessment activities) can improve understanding of stormwater management action efficiency and effectiveness, resulting in modifications to stormwater management actions.

72. Quantitative information about the effectiveness of the Permittee's stormwater management actions is required for adaptive management decisions that produce tangible results in increasing the SWMP's effectiveness. To date, the Permittee has not developed and implemented a sufficient number of quantitative BMP effectiveness measures capable of informing adaptive management decisions (see discussion for Finding No. 71). The Permittee needs more guidance on how to demonstrate protection of water quality, identify program modifications, and assess of the results of program modifications through program effectiveness assessment. The Permittee is one of many municipalities in the Central Coast Region that have expressed difficulty identifying useful effectiveness measures and have requested assistance from Central Coast Water Board staff in identifying useful effectiveness measures.

    Program effectiveness assessment requirements contained in this Order (including General and Focused BMP Assessment, Pollutant Load and Water Quality Stressor Quantification, Action Levels, Stormwater Discharge Quality Monitoring, and Receiving Water Monitoring) are designed to give the Permittee quantitative tools for assessing BMP effectiveness. The information obtained through these tools will provide the following benefits:
    1) The information will inform stormwater management decisions that will improve the stormwater management's effectiveness at protecting water quality;
    2) The information may enable the Permittee to justify reductions in effort and/or expenditure on BMPs identified as ineffective or unnecessary; and
    3) The information can be used to substitute prescriptive BMP requirements with more flexible performance-based BMP requirements in future terms of this Order.

73. Pollutant load reduction can be reasonably linked to water quality protection. While assessment of pollutant load reductions do not quantify the link between BMP performance and discharge or receiving water quality, it can reasonably be assumed that removing pollutants has a positive effect on water quality.

74. See discussion for Findings No. 24, 25, 27, 65, and 69.

75. This Order establishes Action Levels for turbidity, nitrate/nitrite, copper, and zinc based on USEPA Rain Zone 6 (arid southwest) Phase I MS4 monitoring data for pollutants in stormwater. The Action Levels are computed as the 90th percentile of the data set utilizing the statistical based population approach, one of three approaches recommended by the State Water Board's Storm Water Panel in its report, *The Feasibility of Numerical Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial and Construction Activities* (June 2006). Action Levels are identified in Section P.3 (Action Levels) of this Order. This Order requires the Permittee to implement a timely, comprehensive, and cost-effective stormwater pollution control program to reduce the discharge of pollutants in stormwater from the permitted areas so as not to exceed the Action Levels. Exceedance of Action Levels may indicate inadequacy of programmatic measures and BMPs required in this Order.

    This Order establishes an Action Level for fecal coliform indicator bacteria. In March 2010, Central Coast Water Board staff recommended that the Central Coast Water Board adopt a TMDL wasteload allocation for fecal coliform in stormwater discharges from the MS4. The recommended wasteload allocations are consistent with the Basin Plan water quality objective for water-contact recreation (REC-1); specifically, that fecal coliform concentration is not to exceed a log mean of 200 MPN/100 ml in receiving waters, based on a minimum of not less than five samples for any 30-day period; or exceed 400 MPN/100 ml in receiving waters in ten percent of total samples during any 30-day period. Though it is derived from a water quality objective, the Action Level for fecal coliform is not in itself an effluent limitation. Rather, it provides an interim action level until such time as there is an approved TMDL for fecal coliform applicable to the Permittee. Due to the unpredictable nature of rainfall events and stormwater runoff, and the limited stormwater discharge sampling required by this Order, it is impractical to base the Action Level for fecal coliform on a percentage of samples taken within a 30-day period.

    This Order establishes an Action Level for trash based on the Rapid Trash Assessment Methodology (RTAM) developed by the San Francisco Bay Water Board,[125] unless otherwise approved by the Central Coast Water Board Executive Officer. The Trash Action Level is set at the midpoint of the "suboptimal" condition category as defined by the RTAM. The Trash Action Level is a feasible and reasonable action level considering that this Order requires collection of all trash at each assessment site twice each year. This collection is in accordance with the RTAM and provides the necessary control condition for subsequent assessments. As a result of this requirement, the trash detected at each site during required assessments will be the result of recent accumulation.

<u>Legal Authority</u>

76. Updating ordinances and approval processes is necessary in order for the Permittee to control discharges to its MS4s. USEPA supports updating ordinances and approval processes when it states "A crucial requirement of the NPDES stormwater regulation is that a municipality must demonstrate that it has adequate legal authority to control the

[125] *Rapid Trash Assessment Protocol, Version 8.* San Francisco Bay Regional Water Quality Control Board; Surface Water Ambient Monitoring Program, 15 November 2004. Web. 17 August 2011.

contribution of pollutants in stormwater discharged to its MS4. […] In order to have an effective municipal stormwater 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 stormwater discharge to the MS4."[126] Section XII.S (Legal Authority) of this Fact Sheet includes further discussion related to legal authority.

Watershed Characterization

77. There is increasing awareness that, while site-based requirements are important to reduce impacts from urbanization, a site-based approach alone is unable to achieve a broader set of watershed goals, especially considering stormwater management impacts on regional issues such as water reuse, groundwater management, and maintaining instream flows. Consequently, a better understanding of stormwater management impacts on watershed conditions and processes has become increasingly important in the development of MS4 permits.

    To initiate an understanding of the Permittee's existing and future growth and stormwater management impacts on a watershed scale and prioritize modifications of SWMP BMPs, this Order requires a compilation of relevant watershed information. Performing analyses at the Urban Subwatershed scale is appropriate given the likelihood an MS4 is more likely to have an influence and can devote resources at this scale, as opposed to larger watersheds.

F. Public Process

78. Public notification of development of a draft permit is required under Federal regulation 40 CFR 124.10(a)(1)(ii). This regulation states "(a) Scope. (1) The Director shall give public notice that the following actions have occurred: (ii) A draft permit has been prepared under Sec. 124.6(d)." Public notifications "shall allow at least 30 days for public comment," as required under Federal regulation 40 CFR 124.10(b)(1).

79. Public hearings are required under CWC section 13378, which states "Waste discharge requirements and dredged or fill material permits shall be adopted only after notice and any necessary hearing." Federal regulation 40 CFR 124.12(a)(1) also requires public hearings for draft permits, stating "The Director shall hold a public hearing whenever he or she finds, on the basis of requests, a significant degree of public interest in a draft permit(s)." Regarding public notice of a public hearing, Federal regulation 40 CFR 124.10(b)(2) states that "Public notice of a public hearing shall be given at least 30 days before the hearing."

[126] USEPA. *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.* November 1992. Web. 10 August 2011.

XII. Specific Permit Provisions

A-D. Discharge Prohibitions, Effluent Limitations, Receiving Water Limitations, and General Requirements

1. Legal Authority

The following legal authority applies to Sections A, B, C, and D – Discharge Prohibitions, Effluent Limitations, Receiving Water Limitations and General Requirements:

2. Broad Legal Authority

CWA section 402, CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 122.26(d)(2)(iv), and 40 CFR 122.44.

3. Specific Legal Authority

CWC section 13050(l) states, "(1) 'Pollution' means an alteration of the quality of waters of the state by waste to a degree which unreasonably affects either of the following: (A) The water for beneficial uses. (B) Facilities which serve beneficial uses. (2) 'Pollution' may include "contamination."

CWC section 13050(k) states, "'Contamination' means an impairment of the quality of waters of the state by waste to a degree which creates a hazard to public health through poisoning or through the spread of disease. 'Contamination' includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected."

CWC section 13050(m) states, "'Nuisance' means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property. (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes."

CWC 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 […]."

CWC 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."

CWC section 13263(a) provides that waste discharge requirements prescribed by the Central Coast 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 stormwater 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 stormwater permits to include any requirements necessary to, “[a]cheive water quality standards established under section 303 of the CWA, 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.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv) requires MS4 operators develop a management program that covers the duration of their permit.

Federal NPDES regulation 40 CFR 122.34(a)) requires MS4 operators to develop, implement and enforce a stormwater management program.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires MS4 operators “to detect and remove (or require the discharger to the municipal separate storm sewer to obtain a separate NPDES permit for) illicit discharges and improper disposal into the storm sewer.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) provides that the Permittee shall prevent all types of illicit discharges into the MS4 except for certain non-stormwater discharges.

The Discharge Prohibitions and Effluent Limitations are required by the above regulations and have not substantially changed from Order No. R3-2004-0135.

The Receiving Water Limitations contained in this Order are based on State Water Board Order No. 99-05, which specifies language to be included in municipal stormwater permits.

USEPA stormwater regulations define "illicit discharge" as "any discharge to a municipal separate storm sewer that is not composed entirely of stormwater" except discharges resulting from fire fighting activities and discharges from NPDES permitted sources (40 CFR 122.26(b)(2)). The applicable regulations state that the following non-stormwater discharges may be allowed if they are not determined to be a significant source of pollutants to the MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)), uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water. If, however, these discharges are determined to be a significant source of pollution then they are to be prohibited.

The Permittee is required to develop a SWMP document that demonstrates how the Permittee will comply with each requirement of this Order. The SWMP document is a consolidation of all of the Permittee’s relevant documents developed for compliance with this Order (e.g., Enforcement Response Plan, inventories, checklists, inspection forms, BMPs developed to comply with this Order, BMPs required by this Order, documents submitted to the Central Coast Water Board, BMPs to achieve Wasteload Allocation Attainment Plans, developed assessment

methodologies) that will be implemented and enforced to comply with this Order. The Permittee is not required to submit all of the components of the SWMP to the Central Coast Water Board Executive Officer for approval. Components of the SWMP that are required to be submitted to Central Coast Water Board Executive Officer for approval are specified in the Order provisions. The Order also specifies other components of the SWMP that are required to be submitted to the Central Coast Water Board, however the Permittee does not have to obtain Central Coast Water Board Executive Officer approval before it begins to implement the provision. The Central Coast Water Board will notify the Permittee of required modifications to submitted documents. Notification may occur after Central Coast Water Board staff review of submitted documents or as a result of program evaluations.

40 CFR 122.26(d)(2)(iv) requires the management program to include a description of staff and equipment available to implement the program.

During the March 7, 2011 program evaluation, Central Coast Water Board staff found Permittee staff didn't know which version of the SWMP was the most current version. The Permittee's stormwater website also contained an out of date version of the SWMP. The website contained the SWMP as a whole document 26.8 MB in size, so a member of the public would have to download the entire file to learn about a component of interest. To address these issues, in this Order, the components of the SWMP are required to be made available to the public via the stormwater website. In order for members of the public or municipal staff to easily find and obtain the most current version of the SWMP components they are interested in, the website will be kept current and contain links to individual components. By breaking the SWMP into components that are kept up to date and more easily accessible, both the public and municipal staff can use the Permittee's stormwater website to make sure they are using the most current version.

The Permittee is also required to develop an information management system to track compliance with the requirements of this Order. During the March 7, 2011 program evaluation, Central Coast Water Board staff found the Permittee wasn't able to demonstrate compliance with Order No. R3-2004-0135 because the Permittee's information management wasn't adequate to track all of the components of the Permittee's activities. The Order specifies in many sections the types of information the Permittee needs to track to be able to demonstrate compliance with the Order.

The SWMP and the information management system are intended to contain different types of information. For example, the SWMP will contain documents that relate to policies, procedures, and legal authority. The information management system, on the other hand, will track the details of the Permittee's implementation of the SWMP. The Permittee will often be updating the information management system daily (e.g., to enter inspection data, illicit discharge complaints, resolutions). The Permittee will be updating the SWMP components less frequently (e.g., as plans, policies, procedures and legal mechanisms are modified), however the SWMP is intended to be a compilation of living documents that are useful tools for the Permittee and the public.

E. Municipal Maintenance

1. Legal Authority

The following legal authority applies to Section E - Municipal Maintenance:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) requires, "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) requires, "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, including pollutants discharged as a result of deicing activities."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) requires, "A description of procedures to assure that flood management projects assess the impacts on the 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) requires, "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) requires, "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."

4. Section E.1

Municipally-owned or operated facilities, operations, and events serve as hubs of activity for a variety of municipal staff from many different departments. A comprehensive list of municipal facilities, operations, and events will help staff responsible for stormwater compliance build a better awareness of their locations within the MS4 service area and their potential to contribute

stormwater pollutants. The municipal inventory will also serve as a basis for setting up minimum BMPs, assessing priorities, inspections, and developing facility stormwater pollution prevention plans (SWPPPs).

5. Section E.2

USEPA recommends a comprehensive assessment to identify which of the municipality's facilities, operations, and events are most likely to contribute stormwater pollutants and which are in need of stormwater controls[1]. The assessments performed by the Permittee will involve a detailed evaluation and prioritization of municipal facilities, operations and events. Prioritization will allow the Permittee to focus its efforts on the activities that pose a higher threat to water quality.

6. Sections E.3, E.4, and E.8

Each municipal facility, operation, and event will require a different set of control measures depending on the nature of activities that occur there and the types of materials that are stored and used. Developing and maintaining a site-specific SWPPP for each High Priority Facility will help to ensure that employees responsible for facility operation are aware of the stormwater controls required for the site.

There are a number of storage areas and activities that are common at municipal facilities that have a high potential for polluting stormwater. Fueling and vehicle maintenance and storage areas are prone to spills and drips of various automotive fluids. Equipment and vehicle washing areas are designed to mix water with dirt and hydrocarbons, requiring special treatment of the wastewater (including pretreatment and diversion to the sanitary sewer, if allowed) and protection of wash areas from rainfall and runoff.

USEPA recommends the best way to avoid pollutant discharges from sources of pollution is to keep precipitation and runoff from coming into contact with stored chemicals and activity areas that use chemicals and materials, which can become sources of stormwater pollutants[2].

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(6) requires a program to reduce to the maximum extent practicable, pollutants in discharges from MS4s associated with the application of pesticides, herbicides, and fertilizer. USEPA recommends a focus on requiring source controls to reduce the amount of chemicals used[3]. The Order specifies the use of integrated pest management; selection of native vegetation that is naturally adapted to local conditions and therefore requires fewer chemical and water inputs; reducing exposure of the chemicals to water by scheduling application according to weather forecasts and plant needs; and ensuring that municipal employees who are responsible for storing and handling these materials are educated about their use, disposal, and possible impacts.

Graffiti eradication is performed on a regular basis by the Permittee. Through the Graffiti Abatement Program, the Permittee works with residents and businesses to abate graffiti from public property and spaces that have public frontage such as sound walls and fences. The requirements of this Order will ensure graffiti is removed in a manner that will prevent non-stormwater and wash water discharges that may contain pollutants such as debris, cleaning

[1] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011.
[2] Ibid.
[3] Ibid.

compound waste, paint waste, wash water, or other pollutants from discharging into storm drains.

Bridge and structural maintenance activities performed over water or near storm drains have the potential to discharge pollutants into storm drains or water bodies. The requirements of this Order will ensure the prevention of debris such as structural materials and coating debris, or other debris and pollutants generated in bridge and structure maintenance, from entering storm drains or water bodies.

Pavement washing, mobile cleaning and pressure washing generate wastewater containing pollutants that if not managed properly, will likely enter storm drains. The requirements of this Order will ensure BMPs are implemented to prevent discharge of polluted wash water and non-stormwater from these activities to storm drains.

The Order requires weekly visual observations of Municipal Facilities, Maintenance Operations, and Events. The Order also requires quarterly comprehensive site inspections be conducted for High Priority Municipal Facilities, Maintenance Operations, and Events and annual inspections for those facilities, operations and events not designated as high priority. Weekly inspections are an appropriate frequency to look for spills and other debris to prevent their spread and minimize pollutant discharge potential. Quarterly comprehensive inspections are an appropriate frequency to ensure that material stockpiles that might be moved or utilized on a seasonal basis are protected from precipitation and runoff. Also, quarterly inspections will allow inspectors to observe different types of operations that occur at different times of the year (e.g., landscape maintenance crews are less active in the winter). Quarterly visual observations are required so that inspectors can see in real time the qualitative nature of the stormwater discharge and so that corrective action can be taken where necessary to improve on-site stormwater controls. Non-priority facilities, operations, and events will be inspected less frequently.

The Order requires the Permittee to determine the degree of compliance with provisions of the Order and risk of pollutant discharge for each High Priority Municipal Facility, Maintenance Operation, and Event, expressed as an Inspection Rating. Inspection Ratings are determined using a methodology contained in Attachment G – Inspection Ratings. The purpose of this requirement is to measure the effectiveness of the Permittee's efforts at reducing pollutants in stormwater discharges and protecting water quality at such facilities, operations, and events. Comparison of Inspection Ratings over time for each High Priority Municipal Facility, Maintenance Operation, and Event also provides a means for the Permittee to measure improvements in program effectiveness. The Order provides flexibility by allowing the Permittee to propose for approval by the Central Coast Water Board Executive Officer an alternative method for assessing the effectiveness of BMP selection, implementation, installation, and maintenance. The Order also requires the Permittee to perform repeat inspections of low-performing High Priority Municipal Facilities and Operations. The Order defines low-performing facilities and operations as sites with significant non-compliance with the provisions of the Order or with high risk of pollutant discharge. The Permittee is required to continue reinspecting low-performing facilities and operations at 30-day intervals until there is a demonstrable improvement in the Inspection Rating of the facility or operation (e.g., an increase in Inspection Rating from "E" to "D" through improved BMP selection, implementation, installation, and/or maintenance). The Permittee is also required to track and compare improvements in Inspection Rating achieved through reinspection over time. The purpose of this requirement is to measure the effectiveness of the Permittee's follow-up efforts at achieving improved conditions at low-performing facilities and operations. Thirty days is a reasonable amount of time for achieving BMP improvements capable of resulting in a demonstrable improvement in Inspection Rating.

High Priority Municipal Events are not included in the requirement for reinspections because the Order assumes that most events are not on-going.

The Order also specifies that inspection procedures, results, and controls for each facility be documented to ensure that the site inspections are consistent and that maintenance of stormwater controls remains part of the municipality's standard operating procedures. The requirement for documentation will allow the Central Coast Water Board or USEPA to verify that periodic site inspections have been performed. Inspections can identify improperly stored materials, activities that should not be performed outside (e.g., changing automotive fluids, vehicle washing), and poor housekeeping practices.

7. Section E.5

Traditional MS4s were designed to quickly collect and convey runoff to receiving waters. The purpose of catch basin, inlet, and storm drain cleanouts is to prevent the accumulation of pollutants that are later released during rain events, as well as blockages, backups, and flooding.

Fine particles and pollutants from run-on, atmospheric deposition, vehicle emissions, breakup of street surface materials, littering, and sanding can accumulate along the curbs of roads in between rainfall events. This results in the accumulation of pollutants such as sediment, nutrients, metals, hydrocarbons, bacteria, pesticides, trash and other toxic chemicals. Storm drain maintenance is often the last opportunity to remove pollutants before they enter the MS4. Because they effectively trap solids, they need to be cleaned out periodically to prevent those materials from being transported by high stormwater flows. By doing so the MS4 will prevent trash and litter from ultimately becoming sources of marine debris.

USEPA recommends establishing a tiered maintenance schedule for the entire MS4 system area, with the highest priority areas being maintained at the greatest frequency so that municipal resources are directed to the areas and structures that generate the most pollutants[4]. A priority ranking system is required because some catch basins will accumulate pollutants faster than others based on the nature of the drainage area and whether controls are present upstream of the catch basin. Catch basins with the highest accumulations will need to be cleaned more often than those with low accumulations. One study concludes that catch basins are effective at capturing sediments up to approximately 60 percent of the catch basin sump volume, at which time storm flows may bypass treatment or resuspend sediment already captured[5]. Therefore the Order requires the Permittee to assess and revise the priority ranking system for catch basin inspection and maintenance to ensure that all catch basins are cleaned before they are 60 percent full[6]. The Order language also includes a requirement that triggers catch basin cleaning when a catch basin is one-quarter full. MS4s need maintenance to ensure that structures within the MS4 that are meant to reduce pollutants do not become sources of pollution.

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[4] Ibid.
[5] Pitt, Robert. *Project Summary: Characterizing and Controlling Urban Runoff Through Street and Sewerage Cleaning, EPA/600/S2-85/038.* USEPA, June 1985. Web. 23 August 2011. p. 5.
[6] "Pollution Prevention Fact Sheet: Catch Basins." *The Stormwater Manager's Resource Center*. The Center for Watershed Protection. Web. 18 Aug. 2011. <http://www.stormwatercenter.net/Pollution_Prevention_Factsheets/CatchBasins.htm>.

Proper MS4 cleanout includes vacuuming or manually removing debris from catch basins; vacuuming or flushing pipes to increase capacity and remove clogs; removing sediment, debris, and overgrown vegetation from open channels; and repairing structures to ensure the integrity of the MS4. It is important to conduct regular inspections of all MS4 infrastructures and perform maintenance as applicable to ensure they are functioning properly and collected debris is removed before discharged to receiving waters. Though these activities are intended to ensure that the MS4 is properly maintained and that any accumulated pollutants are removed prior to discharge, if not properly executed, cleanout activities can result in pollutant discharges. In selecting maintenance practices, the Permittee must carefully evaluate each with an eye towards stormwater pollution potential to minimize unintended pollutant discharges, such as the use of flushing storm drain pipes to remove debris without recapturing the debris further down the pipe.

The materials removed from catch basins may not reenter the MS4. The material must be dewatered in a contained area and the water treated with an appropriate and approved control measure or discharged to the sanitary sewer. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Some materials removed from storm drains and open channels may require special handling and disposal, and may not be authorized to be disposed of in a landfill.

8. Section E.6

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(3) requires a program for operating and maintaining public streets, roads and highways and procedures for reducing the impact on receiving waters of discharges from MS4 systems.

Street and parking lot sweeping is a practice that some municipalities initially conducted for aesthetic purposes. However, the water quality benefits are now widely recognized. Street sweeping prevents particulate matter associated with road dust from accumulating on public streets and washing into storm drains.

The Order language addresses a number of important factors recognized by USEPA[7] and impacting the effectiveness of a street sweeping program. The first factor is the type of equipment used. The Order language stipulates that when equipment needs to be replaced, high-performance sweepers are purchased preferentially. Street sweeping has traditionally been more effective at removing large-sized particles, but new equipment has been developed to remove smaller, fine-grained particles. Mechanical sweepers (broom-type) are usually the least expensive and are better suited to pick up large-grained sediment. Vacuum and regenerative air sweepers are better at removing fine grained sediment particles, but they are more expensive. Removal efficiency can be improved through tandem sweeping (i.e., two sweepers sweeping the same route, with one following the other to pick up missed material), or if the street sweeper makes multiple passes on a street.

The second factor influencing street sweeping effectiveness is the way in which the equipment is operated. The Order specifies that equipment be operated according to the manufacturers' operating instructions by operators who have been trained to sweep in accordance with the Order requirements in order to protect water quality.

[7] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011.

The third determining factor is the degree to which parked cars block sweeper access to the curb. One of the best ways to ensure access to the curb is to establish parking restrictions based on sweeping schedules and to inform residents of the schedule so they can voluntarily move their cars. The Order requires that the Permittee institute parking restrictions and/or a public outreach campaign requesting that cars be parked elsewhere to accommodate sweeping schedules.

Because not all streets are suitable for sweeping (e.g., those that don't have a curb and gutter), increased implementation of other trash/litter and source control BMPs are needed in those areas.

The Permittee is required to maintain documentation of sweeping events and characterize the quantity and composition of pollutants removed from roadways. Street sweeping data are relatively easy to track and maintain, so the Order includes requirements for reporting and assessment of the effectiveness of the sweeping activities based on equipment used, miles swept, and the amount of materials collected.

The street sweeping material may not reenter the MS4. The material must be dewatered in a contained area and the water treated with an appropriate and approved control measure or discharged to the sanitary sewer. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Some materials may require special handling and disposal, and may not be authorized to be disposed of in a landfill.

9. Section E.7

The USEPA recognizes appropriate operation and maintenance are critical aspects to the function of structural BMPs. The effectiveness of structural BMPs depends on regular inspections. Inspection and maintenance helps prevent potential nuisances (e.g., odors, mosquitoes, weeds), reduces the need for repairs and reduces the chance of polluting stormwater runoff by finding and fixing problems before the next rain[8,9].

Some structural BMPs are located on private property and some are owned or operated by the Permittee. This Order requires the Permittee to ensure both public and private structural BMPs installed to comply with the previous Order (Order No. R3-2004-0135) and this Order are maintained so that they continue to achieve their intended function throughout their life.

The Order requires the Permittee to use the Lake Tahoe BMP Maintenance Rapid Assessment Methodology (BMP RAM), or equivalent, to determine when structural BMPs require maintenance in order to perform at their design efficiency. The BMP RAM was developed for use in the Lake Tahoe basin to provide stormwater managers with an effective tool for rapidly and inexpensively assessing the maintenance condition of structural BMPs. The BMP RAM tool is applicable to a wide variety of structural BMPs.

Although not required, including photographs will help the Permittee assess how the structural BMP has changed since it was first created and will likely aid in determining proper maintenance and/or retrofitting opportunities if the measure is no longer providing the water quality benefits it was originally designed.

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[8] Ibid.
[9] USEPA. *National Menu of Stormwater Best Management Practices.* Web. 18 August 2011 <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>.

Also see Fact Sheet discussion for Section J (Parcel-Scale Development).

10. Section E.9

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(4) requires procedures to assure that flood management projects assess the impacts on the water quality of receiving water bodies.

11. Section E.12

This Order requires the Permittee to develop a solution to improve water quality from the Permittee's Salinas River stormwater outfall. CCAMP monitoring has documented high values of nutrients, salts, pathogen indicators, and pesticides for over a decade from this outfall. CCAMP has also documented flows from this outfall year round, as well as high levels of trash between the outfall pipe and the Salinas River.

CCAMP data for nutrients, salts, pathogen indicators, and pesticides at the end of the pipe are exceeding water quality criteria, year round. CCAMP Monitoring was conducted monthly at the outfall between January 1999 and February 2000 and again between January 2006 and February 2007. Water samples were collected from the flow out of the drain pipe. Flow from the drain was sampled monthly with the exception of January 2006 and April 2006, when no flow was observed from the drain pipe. Monthly monitoring was also conducted in the Salinas River at Davis Road, downstream of the storm drain discharge location. CCAMP plans to collect data at the Salinas River Outfall in 2012.

The discharge point is approximately 400 meters upstream of the Davis Road crossing. The outfall is a 66 inch diameter pipeline with a flap gate on the end of the pipe that discharges into a ditch about 100 meters east of the Salinas River. Upstream of the discharge location is the Permittee's Urban Discharge Site #19 (309U19). Stormwater travels to the Salinas River in an underground pipeline from the Permittee's stormwater pump station for approximately a mile under agricultural fields.

12. Section E.13

The regulations found at 40 CFR 122.34(b)(6) specifically require that the Permittee develop a training component that trains municipal staff to prevent and reduce stormwater pollution from municipal activities.

13. Section E.14

Many municipalities use third-party contractors to conduct municipal maintenance activities in lieu of using municipal employees. USEPA recommends contractors performing activities that can affect stormwater quality to be held to the same standards as the Permittee[10]. For the Permittee to ensure that contractors are using stormwater controls and following standard operating procedures, these expectations must be defined in contracts between the Permittee and its contractors, and the Permittee shall conduct periodic site visits or other verification measures.

[10] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011.

F. Commercial and Industrial

1. Legal Authority

The following legal authority applies to Section F – Commercial and Industrial:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) requires, "A description of a program to monitor and control pollutants in stormwater 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)[1], and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Permittee shall develop and implement legal authority to "Control through ordinance, order or similar means, the contribution of pollutants to the municipal storm sewer by stormwater discharges associated with industrial activity and the quality of stormwater discharged from sites of industrial activity."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(C) requires that the Permittee shall "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."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(E) requires that the Permittee shall "Require compliance with conditions in ordinances, permits, contracts or orders."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(F) requires that the Permittee shall "Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions…"

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) requires that the Permittee 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)(C)(2) provides that the proposed management program shall "Describe a monitoring program for stormwater discharges associated with the industrial facilities identified in paragraph (d)(2)(iv)(C) of this section, to be implemented during the term of the permit, including the submission of quantitative data on the following constituents: any pollutants limited in effluent guidelines subcategories, where applicable; any pollutant listed in an existing NPDES permit for a facility; oil and grease, COD,

[1] Commonly known as SARA Title III

pH, BOD5 , TSS, total phosphorus, total Kjeldhal nitrogen, nitrate plus nitrite nitrogen, and any information on discharges required under 40 CFR 122.21(g)(7)(iii) and (iv)."

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."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Permittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) requires the Permittee "Provide an inventory, organized by watershed of the name and address, and a description (such as Standard Industrial Classification [SIC] codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, storm water associated with industrial activity."

4. Sections F.1, F.4, and F.8

This Order requires the Permittee to develop an inventory of all commercial and industrial facilities and operations that could likely contribute pollutants to the MS4. A list of specific commercial and industrial facilities and operations that are potential sources of pollutants is included in the Order, and additional facilities and operations must be added if they are likely to contribute a significant pollutant load to the MS4.

USEPA recommends commercial and industrial inventory development to provide the Permittee with information on potential pollutant sources that contribute pollutants to its MS4, and the MS4 locations into which they discharge[2]. This information will also allow the Permittee to prioritize inspections and tailor education and outreach efforts, which will best assist the facility or operation in implementing appropriate source control practices or other on-site stormwater controls. The information contained in the inventory will enable the Permittee to characterize these facilities and operations and prioritize them based on their potential impact on stormwater quality. By prioritizing facilities in such a manner, the Permittee may then establish a targeted approach towards conducting inspections. This allows for inspection resources to be most effective.

USEPA supports source identification as a concept when it recommends construction, municipal, and industrial source identification in its guidance for the federal regulations[3]. Source identification is necessary to characterize the nature and extent of pollutants in

[2] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 87.
[3] USEPA. *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,* November 1992. Web. 10 August 2011.

discharges and to develop appropriate BMPs. It is the first step in a targeted approach to urban runoff management. Source identification helps identify 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.

The Permittee's 2009 Report of Waste Discharge states, "Potential urban pollutants sources that have been identified that are responsible for the degradation of storm water quality include silt, detergents, oils, pesticides, sewage, trash, organic materials, metals and fertilizers. Specific constituents of concern include, sediment, pathogens, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, residual chlorine, nitrates, ammonia, orthophosphates, zinc, copper, E-Coli, fecal coliform, total coliform, organic carbon, and total dissolved solids." [4] The commercial and industrial facilities and operations identified in this Order have the potential to add to those pollutant discharges. For example, the commercial and industrial facilities and operations identified in this Order have the potential to add metals, nutrients (nitrates, nitrites, and orthophosphates), pesticides, fecal indicator bacterial, and other pollutants. The list of facilities also includes granite, marble, and tile cutting businesses that the Permittee proposed to revise in the "high-risk commercial facilities" [5].

Vehicle (auto, truck, airplane, boat, equipment) maintenance, repair, and refueling facilities are likely sources of metal contaminates such as zinc and copper that the Permittee identified as pollutants of concern. Pest control services, public and private landscaping services, nurseries, golf courses, parks, and cemeteries are some of the commercial activities that may release nutrients and pesticides. Animal care and veterinary facilities, mobile pet services, mobile laundry and diaper services, refuse haulers and recycling centers, and botanical and zoological gardens are potential sources if indicator fecal bacteria. Building material retailers and storage facilities are included because they are potential sources of pollutants to urban runoff. These facilities typically store and vend building materials in the outdoors exposed to storm water, often without implementing BMPs.

Refuse haulers, transfer stations, tallow rendering facilities and vehicles, and recycling centers were included in the inventory list based on enforcement history. Refuse haulers frequently have poorly maintained fluid containment measures on some vehicles and containers that travel or are transported over urban streets and roads. Additionally, solid waste transfer stations and recycling centers have become breeding grounds for fecal coliform and E.coli. These facilities must be inspected, tested by the owners, and required to properly maintain their equipment. The Central Coast Water Board has also received complaints about tallow rendering service providers' poor material control at pick up points and from collection vehicles.

The Permittee must develop a process for prioritizing all commercial and industrial facilities and operations for inspections. The prioritization for individual facilities may be adjusted after the first or subsequent inspections, based on the results of the inspection. The Permittee must design an inspection program that facilitates more frequent inspections of the highest priority facilities. This will help maximize use of the Permittee's existing inspection resources and ensure that the Permittee inspectors are the most visible and the most familiar with the facilities with the highest potential for water quality impact.

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[4] City of Salinas. "Volume II: Application/ Report of Waste Discharge for NPDES Permit-Attachments." *City of Salinas 2008-2009 Annual Report Urban Watershed Management Program Permit No: CA0049981 Order: R3-2004-0135*, 18 August 2011. 30 September 2009. p. 4.
[5] Ibid, p. 12.

It is important that inspections be conducted in a thorough and consistent manner in accordance with a formal protocol for conducting an inspection. This protocol should be the basis for inspector training as well. Inspections should include a thorough walk-through of the facility. These measures will help ensure the inspections are effective at identifying and correcting inadequate stormwater management at a facility or operation.

The documentation of inspections is very important, not only when tracking noncompliance, but also to facilitate effective enforcement action when needed. A timeline demonstrating noncompliance and subsequent enforcement action is critical when escalating measures to gain compliance. The use of inspection forms facilitates complete and consistent documentation among inspectors and over time.

This Order requires the Permittee to determine the degree of compliance with provisions of this Order and risk of pollutant discharge for each inspected commercial and industrial facility or operation each year, expressed as an Inspection Rating. Inspection Ratings are determined using a methodology contained in Attachment G – Inspection Ratings. The purpose of this requirement is to measure the effectiveness of the Permittee's efforts at reducing pollutants in stormwater discharges and protecting water quality at such facilities and operations. Comparison of Inspection Ratings over time also provides a means for the Permittee to measure improvements in program effectiveness. This Order provides flexibility by allowing the Permittee to propose for approval by the Central Coast Water Board Executive Officer an alternative method for assessing the effectiveness of BMP selection, implementation, installation, and maintenance. This Order also requires the Permittee to perform repeat inspections of low-performing commercial and industrial facilities and operations. This Order defines low-performing facilities and operations as sites with significant non-compliance with the provisions of this Order or with high risk of pollutant discharge. The Permittee is required to continue reinspecting low-performing facilities and operations at 30-day intervals until there is a demonstrable improvement in the Inspection Rating of the facility or operation (e.g., an increase in the Inspection Rating from "E" to "D" through improved BMP selection, implementation, installation, and/or maintenance). The Permittee is also required to track and compare improvements in Inspection Rating achieved through reinspection over time. The purpose of this requirement is to measure the effectiveness of the Permittee's follow-up efforts at achieving improved conditions at low-performing facilities and operations. Thirty days is a reasonable amount of time for achieving BMP improvements capable of resulting in a demonstrable improvement in Inspection Rating.

This Order requires the Permittee to determine an Inspection Rating related to trash and litter for fast food restaurants and commercial retail centers (see Attachment G – Inspection Ratings). This Order identifies trash as a priority pollutant, and requires the designation and enforcement of trash and litter control BMPs. In addition, fast food restaurants and commercial retail centers are readily identifiable commercial facilities that have been shown to be significant sources of trash.[6,7] The purpose of this requirement is therefore to measure the effectiveness of the

[6] A 2009 study conducted by Keep America Beautiful, Inc., found a correlation between litter generation and fast food restaurants, public areas, and transition areas (e.g., bus stations). In addition, the study found waste management areas (e.g., overfull garbage containers) to be a source of trash and litter, a strong correlation between pedestrian activity and litter in roadways. *2009 National Visible Litter Survey and Litter Cost Study Final Report*. Stamford, CT: Keep America Beautiful, Inc.; Mid Atlantic Solid Waste Consultants, 18 September 18, 2009. Web. 17 August 2011.

Permittee's efforts at reducing trash and litter at these sources and to measure improvements in trash and litter control efforts over time. This requirement results in the determination of two separate Inspection Ratings for each inspected fast food restaurant—one related to requirements for Food Facilities, and one related to trash and litter control requirements. The Permittee is required to track both Inspection Ratings for fast food restaurants and comply with all provisions of this Order related to both Inspection Ratings, including reinspection of low-performing facilities and comparison of results over time.

5. Sections F.2, F.3, and F.9

The Permittee is required to ensure that the minimum control measures are implemented, as applicable, at every industrial commercial facility and operation included in its inventory. The minimum measures outlined, when properly selected, designed and implemented, promote prevention and source control, before treatment.

The control measures in this Order are consistent with the control measure requirements found in EPA's 2008 Multi-Sector General Permit for stormwater discharges from industrial activities and the State Water Board General Industrial Permit. The control measures in this Order describe specific activities that the Permittee must require industrial and commercial facilities and operations to implement to minimize stormwater pollution. Control measures are required that prevent pollutants from coming into contact with precipitation in the first place, since this will ensure they are not carried into nearby waterways. General good housekeeping and maintenance procedures are also required. Additional control measures address spill prevention and response, erosion and sediment control, and runoff management.

The control measures must also include employee training, controlling non-stormwater discharges, addressing waste, garbage and floatable debris, and addressing dust generation and vehicle tracking.[8]

The Permittee is required to notify industrial and commercial facility and operation responsible parties of the control measure requirements and their responsibility to implement and comply with the requirements.

Facilities that discharge into impaired water bodies may be required to implement additional controls as necessary to prevent the discharge of the associated pollutants of concern.

6. Section F.5

Some of the facilities on the Permittee's inventory are also enrolled in the State Water Board General Industrial Permit. These facilities perform monitoring of stormwater runoff as it leaves the site. The Order does not contemplate that the Permittee is responsible for enforcing the

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[7] A study conducted by Los Angeles County in 2002-2003 found commercial areas to have consistently higher litter rates than other land uses. *Trash Baseline Monitoring Results Los Angeles River and Ballona Creek Watersheds.* County of Los Angeles Department of Public Works, Watershed Management Division, 17 February 2004. Web. 18 August 2011 <http://dpw.lacounty.gov/wmd/TrashBaseline/links.cfm>.

[8] USEPA. *Multi-Sector General Permit for Stormwater Discharges Associated With Industrial Activity (MSGP) – Fact Sheet,* 29 September 2008. Web. 18 August 2011 <http://www.epa.gov/npdes/pubs/msgp2008_finalfs.pdf>.

provisions of the General Industrial Permit. Rather, monitoring data reported under the General Industrial Permit constitutes an additional source of feedback on the effectiveness of the Permittee's own efforts to reduce pollutants in stormwater discharges, and non-stormwater discharges, from industrial facilities that discharge to the MS4.

7. Section F.6

Information management is required for the Permittee to track compliance with the requirements of this Order.

8. Section F.7

The Permittee is required to notify the Central Coast Water Board of industrial sites that have not filed for coverage under the General Industrial Permit, as well as commercial and industrial sites the Permittee cannot bring into compliance. This will enhance Central Coast Water Board and Permittee communication and coordination in regulating industrial sites.

9. Section F.10

Permittees often contract out to others (e.g., hire consultants) to implement some of the requirements of stormwater management programs. This Order requires the same level of performance regardless of who performs the work. Since the Permittee is responsible to ensure that work performed by others complies with the requirements of the Order, they are required to provide oversight of work not performed by municipal staff.

G. Residential

1. Legal Authority

The following legal authority applies to Section G – Residential:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) provides that the Permittee develop a proposed management program which includes "A description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls."

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."

4. Sections G.1 and G.2

These Sections require the Permittee to identify residential areas and activities that pose a high threat to water quality. Prioritization in terms of risk allows the Permittee to use resources and staff time most effectively.

The Permittee is required to develop and ensure that the minimum control measures are implemented, as applicable. The minimum BMPs will be area or activity specific.

5. Section G.4

This Section requires the Permittee to utilize its legal authority to enforce compliance with this Order. An enforcement program to back up the Order's requirements is a critical ingredient in creating the deterrence needed to encourage residents to maintain compliance with this Order. Appropriate penalties and other consequences for violations offer some assurance of equity between those who choose to comply with requirements and those who violate them. It also provides incentive for prompt correction of violations.

6. Section G.5

This Section outlines the implementation measures that the Permittee must implement within privately owned or operated areas that discharge to the MS4. This requirement is necessary to ensure that areas maintained by others do not contribute significant pollutants to the Permittee's MS4. Since the Permittee cannot passively receive and discharge pollutants from third parties, the Permittee must ensure discharges of storm water pollutants to the MS4 are reduced to the

MEP. In order to achieve this, the Permittee must be able to ensure that effective BMPs are being implemented in privately owned and operated areas. The Permittee may require documentation and reporting from third parties. USEPA states "municipalities should provide documentation of their authority to enter, sample, inspect, review, and copy records, etc., as well as demonstrate their authority to require regular reports."[1]

[1] USEPA. *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*, November 1992. Web. 10 August 2011.

H. Illicit Discharge Detection and Elimination

1. Legal Authority

The following legal authority applies to Section H – Illicit Discharge Detection and Elimination:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires stormwater management programs "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."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) requires "a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(2) requires "procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by such field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) requires "procedures to be followed to investigate portions of the separate storm sewer system that, based on the results of the field screen, or other appropriate information, indicate a reasonable potential of containing illicit discharges or other sources of non-stormwater."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(4) requires "procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(5) requires "a program to promote, publicize, and facilitate public reporting of the presence of illicit discharges or water quality impacts associated with discharges from municipal separate storm sewers."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(6) requires "educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(7) requires "controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary."

4. Section H.1

EPA stormwater regulations define "illicit discharge" as "any discharge to a municipal separate storm sewer that is not composed entirely of stormwater" except discharges resulting from fire fighting activities and discharges from NPDES permitted sources (see 40 CFR 122.26(b)(2)).

Examples of common sources of illicit discharges in urban areas include apartments and homes, car washes, restaurants, airports, landfills, and gas stations. These so called "generating sites" discharge sanitary wastewater, septic system effluent, vehicle wash water, washdown from grease traps, motor oil, antifreeze, gasoline and fuel spills, among other substances. Although these illicit discharges can enter the MS4 in various ways, they generally result from either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration into the MS4, spills, or "midnight dumping"). Illicit discharges can be further divided into those discharging continuously and those discharging intermittently.

USEPA recommends that permittees refer to the Center for Watershed Protection's Illicit Discharge Detection and Elimination Manual when developing an illicit discharge detection and elimination program[1].

5. Section H.2

In order to trace the origin of a suspected illicit discharge or connection, the Permittee must have an up-to-date map of its MS4. This is critical in order to isolate the potential source of the non-stormwater discharges and the areas of potential impact.

The Permittee's system map will contain the identified high priority areas and dry weather screening stations to facilitate the drive-by inspections and the dry weather screening.

6. Section H.3

Prioritization of the Permit coverage area into areas more likely to have illicit discharges or illicit connections allows the Permittee to use resources and staff time most effectively. The Order requires an evaluation of the Permittee's neighborhoods and land uses to identify areas that are more likely to have illicit discharges. These areas must be prioritized for more frequent screening and investigations. Newer areas with modern infrastructure are less likely to have sewer cross-connections and illegal connections to the MS4, whereas rural areas may necessitate an emphasis on illegal dumping and onsite sewage disposal systems. Prioritization must be based not only on land use but also on prior history and frequency of problems.

The identification of priority areas must include areas where dumping, spills, or other illicit discharges are a common occurrence. These priority areas will help identify potential field screening locations and may help target educational activities. For example, if evidence of motor oil dumping is found quite frequently and traced to the same apartment complex, information about motor oil disposal could be distributed to residents in response.

The Order requires a minimum percentage of the Permit coverage area to be designated as high priority. This is based on the Pareto principle that for many events, roughly 80 percent of the effects come from 20 percent of the causes. This measurable goal is necessary to ensure all stakeholders understand the scope of work required for compliance with this Section.

7. Section H.4

[1] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 24.

This provision serves to implement, in part, the statutory requirement that MS4 permits effectively prohibit non-stormwater discharges. Spills, leaks, sanitary sewer overflows, and illicit dumping or discharges can introduce a range of stormwater pollutants into the MS4. Prompt response to these occurrences is the best way to prevent or reduce negative impacts to water bodies. The Permittee must develop a written response procedure that includes an investigation procedure similar to or in conjunction with the illicit discharge detection and elimination source investigation and elimination procedures. Often, a different entity might be responsible for spill response in a community (i.e. fire department); therefore, it is imperative that adequate communication exists between stormwater and spill response staff to ensure that spills are documented and investigated in a timely manner.

The Permittee will use the stormwater reporting system (sometimes called a stormwater hotline) to help it become aware of and mitigate spills or dumping incidents. Spills can include everything from an overturned gasoline tanker to sediment leaving a construction site to a sanitary sewer overflow entering into a storm drain. The Permittee must maintain a stormwater reporting system and test it each year to ensure it is working effectively. The reporting system must accommodate the Permittee's Spanish speaking callers.

The Permittee must track reports made to the system to ensure that appropriate follow up actions are completed. This data will be used to identify areas where frequent illicit discharges occur which will provide the Permittee with information to inform their future actions (e.g. data showing illicit discharges occur frequently in a particular area can be used to focus future inspections, investigations and educational outreach in those areas).

8. Sections H.5 and H.6

Drive-by inspections are an inexpensive way to identify illicit discharges. For them to be effective, the drive-by inspections must be conducted at times that are likely to have illicit discharges. Focusing drive-by inspections to high priority areas that are the most likely sources of illicit discharges provides an efficient use of limited resources and staff time. For example, areas with Food Facilities should be a priority due to the likelihood of illicit discharges from these operations.

Another way of locating dry weather discharges is to perform field screening of outfalls. If no rain has occurred prior to the screening, then it is likely that any flow observed at an outfall is either groundwater or an illicit discharge. It is important to utilize resources effectively and to target field screening activities in priority areas that are the most common sources of illicit discharges. For example, older neighborhoods should be a priority due to the likelihood of cross connections with the sanitary sewer. Older parts of the MS4 may also be deteriorating and require repair or replacement.

The Order requires the development of a dry weather field screening protocol. The Permittee must identify stations (e.g., outfalls) where the field screening will be conducted. The Permittee must screen outfalls during dry weather and, if flow or ponded water is observed, perform field sampling.

Visually screening outfalls during dry weather and conducting field tests, where flow is occurring, of selected chemical parameters as indicators of the discharge source will assist the Permittee in determining the source of illicit discharges. For example, the presence of surfactants is an indicator that sewage could be present in the discharge (e.g., soaps being discharged into the MS4 as an indicator that wastewater is being discharged). Specific

conductivity, fluoride and/or hardness concentration, ammonia and/or potassium concentration, surfactant and/or fluorescence concentration, chlorine concentration, pH, and other constituents may similarly be indicative of industrial sources.

The Order requires the Permittee to develop benchmarks for dry weather screening. Benchmarks are necessary for the Permittee to identify when an investigation is necessary. An exceedance of the benchmark concentration level indicates the need to conduct a follow-up investigation. The results will help the Permittee narrow down the possible sources causing the benchmark to be exceeded so that they can then be eliminated. This is a common protocol to trigger additional monitoring and/or implementation of BMPs.

9. Section H.7

It is important that the Permittee establishes clear policies and procedures for tracing and eliminating illicit discharges to ensure that individual incidents are addressed consistently.

The CWA, section 402(p)(3)(B)(ii) requires MS4 permits to “effectively prohibit non-stormwater discharges into the storm sewers.” The Order implements this requirement in part by requiring the development of procedures to investigate and eliminate illicit discharges. The Permittee must develop a clear, step-by-step procedure for conducting the investigation of illicit discharges. The procedure must include an investigation protocol that clearly defines what constitutes an illicit discharge “case” and when a case is considered “closed.” In many circumstances, sources of intermittent, illicit discharges are very difficult to locate, and these cases may remain unresolved for extended time periods. The Order requires that each case be conducted in accordance with the investigation procedure developed to locate the source and conclude the investigation, after which the case may be considered closed. A written standard operating procedure document is required in order to provide investigators with guidance and any necessary forms to ensure that consistent investigations occur for every illicit discharge incident.

Physical observations and field testing can help narrow the identification of potential sources of a non-stormwater discharge; however it is unlikely that either will pinpoint the exact source. Therefore, the Permittee will need to perform investigations “upstream” to identify illicit discharges or connections to systems with identified problem outfalls.

Notifications of sewage spills will allow the Permittee to respond to the spills and reduce the volume of pollutants discharged to the MS4. Tracking where sewage spills occur will enable the Permittee to notice any trends and adjust priorities if needed.

10. Section H.8

Used oil, vehicle fluids, toxic materials, and other household hazardous wastes are common sources of illicit discharges. Public education and providing a mechanism for proper disposal will reduce the potential for these pollutants to reach the MS4.

11. Section H.9

USEPA recommends catch basin labeling as an effective mechanism for educating residents, since it involves a direct reminder that that water or other materials which flow into storm drains

are not treated in any way, but instead drain directly to nearby waterways[2]. There are many methods for labeling catch basins and the Order provides the Permittee with the flexibility to determine the most feasible and cost effective method of delivering the stormwater awareness message. In order to use resources most efficiently, the Order focuses the labeling in areas with foot traffic because those locations are most likely to be seen.

Similarly, the Order requires signs discouraging illegal dumping in areas where the public may have access to dump in or near water bodies.

12. Section H.10

Excessive water application provides a common mechanism to transport pollutants such as pesticides and fertilizers into the MS4. The Order requires the Permittee to prohibit over-watering such that water does not run off the site.

13. Section H.11

Once the source of the non-stormwater discharge is determined through investigation, corrective action is required to eliminate the problem source. Resulting enforcement actions must follow the Progressive Enforcement Policy. The Permittee may conduct remediation activities on its own, in which case the Permittee must require compensation for any and all costs related to eliminating the non-stormwater discharge.

14. Section H.13

Permittees often contract out to others (e.g., hire consultants) to implement some of the requirements of stormwater management programs. This Order requires the same level of performance regardless of who performs the work. Since the Permittee is responsible to ensure that work performed by others complies with the requirements of the Order, they are required to provide oversight of work not performed by municipal staff.

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[2] Ibid, p. 80.

J. Parcel-Scale Development

1. Legal Authority

The following legal authority applies to Section J – Parcel-Scale Development.

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWA section 402(a), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F), 40 CFR 131.12, and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that the Permittee 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 122.26(d)(2)(v) provides that the Permittee shall include the following in its permit application for discharges from its municipal storm sewer: "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water."

The following Phase II Final Rule Federal NPDES regulations and discussion directly apply to small MS4s. However, due to greater water quality impacts generally generated by large MS4s, Central Coast Water Board staff finds the Phase II Final Rule for small MS4s is applicable to larger MS4s such as the Permittee.

Federal NPDES regulation 40 CFR 122.34(b)(5)(i) requires regulated small MS4 operators to "develop, implement, and enforce a program to address stormwater discharges from new development and redevelopment sites that disturb greater than or equal to one acre to the MS4, including projects that disturb less than one acre that are part of a larger common plan of development or sale…" The regulations also require that the MS4 "ensure that controls are in place that would prevent or minimize water quality impacts."

Federal NPDES regulation 40 CFR 122.34(b)(5)(ii) requires regulated small MS4 operators to, "1) Develop and implement strategies which include a combination of structural and/or non-structural BMPs appropriate for your community; 2) Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law; and 3) Ensure adequate long-term operation and maintenance of BMPs."

Federal NPDES regulation 40 CFR 122.34(b)(5)(iii) provides the following guidance:

If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. EPA recommends that the BMPs chosen: be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions. In choosing appropriate BMPs, EPA encourages you to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders including interested citizens. When developing a program that is consistent with this measure's intent, EPA recommends that you 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 quality. In addition to assessing these existing documents and programs, you should provide opportunities to the public to participate in the development of the program. Non-structural BMPs are preventative actions that involve management and source controls such as: policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; policies or ordinances that encourage infill development in higher density urban areas, and areas with existing infrastructure; education programs for developers and the public about project designs that minimize water quality impacts; and measures such as minimization of percent impervious area after development and minimization of directly connected impervious areas. Structural BMPs include: storage practices such as wet ponds and extended-detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; and infiltration practices such as infiltration basins and infiltration trenches. EPA recommends that you ensure the appropriate implementation of the structural BMPs by considering some or all of the following: pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with design, construction or operation and maintenance. Storm water technologies are constantly being improved, and EPA recommends that your requirements be responsive to these changes, developments or improvements in control technologies.

4. Section J.1

This Order requires that the Permittee incorporate the standards outlined in Section J into development plan review and permitting procedures to impose conditions of approval or other enforceable mechanisms to ensure effective implementation of the requirements in Section J. USEPA states, “Specific standards are a critical component of a stormwater management program. However, even the best requirements need to be supported by a review program to ensure that the standards are met…The permittee must have the authority to withhold approvals when standards are not met.”[1]

[1] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 58.

This Order requires the Permittee to inform applicable project applicants of the requirements of Section J at the earliest possible stage in the development review process. Incorporating LID principles into the site design is easiest and most effective if done during preliminary project stages. LID site design is an iterative process; therefore, incorporating LID in the preliminary site design process minimizes major site design modifications, related to management of post-construction stormwater, at the end of the site design process. For these reasons, informing development project applicants at the earliest possible stage in the development review process of the requirements related to Section J is fundamental to optimizing LID at project sites.

5. Section J.2

The existing SWDS include a number of clear requirements; however, key portions of the SWDS are not written clearly enough to ensure effective implementation. This Order requires the Permittee to separate the SWDS into two separate sections to clearly identify, 1) which components are required for new development and redevelopment project applicants, and 2) which components of the SWDS are meant to provide support for SWDS implementation. The Central Coast Water Board recognizes the amount of resources invested in the development of the existing SWDS; therefore, this Order outlines SWDS restructuring, without eliminating the existing document.

6. Section J.3

This Order requires the Permittee to require small-scale new development and redevelopment projects that create and/or replace 2,000 square feet of impervious surface to incorporate some basic BMPs into project site designs. Small-scale projects can cumulatively cause impacts to watershed processes. These BMP requirements include source control measures that are recognized nationwide as basic, effective techniques to minimize the introduction of pollutants into stormwater runoff. This Order also requires the Permittee to require small-scale projects to include at least two site design elements that are basic, effective techniques to reduce the amount of runoff and pollutants being discharged from the project site. One of the options is to include amended soils, with compost, on the project site. Compost has been a component of many bioretention soil mixes because it has been shown to increase water holding capacity and attenuate pollutants from stormwater. These requirements present fewer technical challenges to implement than flow control requirements and offer water quality treatment benefits at a meaningful scale in the urban development context.

It is necessary for the Permittee to gain the legal authority to ensure small-scale projects maintain any installed BMPs in perpetuity in order to ensure any installed BMPs continue to function as originally designed. Such legal authority provides the Permittee the means to correct an ineffective BMP, if such correction is found to be necessary. Maintenance agreements and regular Permittee inspections are not required for Non-Priority Development Project BMPs.

7. Section J.4

This Order requires the Permittee to ensure that all new development and redevelopment projects that are considered Priority Development Projects adhere to the applicable requirements and operate and maintain any BMPs constructed pursuant to those requirements.

The CWA section 402(p)(3)(B)(iii) requires, in part, that pollutants in stormwater be reduced to the MEP. The USEPA'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. The State Water Board's Office of Chief Counsel has stated that 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 with the major emphasis on technical feasibility.[2] Because runoff rates can vary from storm to storm, the statistical probabilities of rainfall or runoff events become significant and are central to the control of pollutants through cost effective BMPs. Further, it is recommended that BMPs be designed to manage both flows and water quality for best performance[3]. The stormwater regulations require that an MS4 develop and implement a program to address post-construction discharges from all new development and redevelopment projects, and ensure the long-term operation and maintenance of these controls (see 40 CFR 122.34(b)(5)).

This Order requires the use of stormwater controls, with the aim of maintaining or restoring the pre-development stormwater runoff conditions at project sites. Many traditional stormwater management practices, and the permit language that drives them, fail to address modifications to watershed processes (such as increases in the quantity of stormwater discharges, decreases in groundwater recharge, alteration of sediment transport, decreases in pollutant attenuation, and decreases in evapotranspiration) that are caused by altered stormwater conditions resulting from development. Frequently these modifications to watershed processes cause degradation to receiving waters. Protecting and restoring the physical, chemical, and biological integrity of receiving waters must be a central issue in stormwater permits. In a recent report, NRC recommends that the NPDES stormwater program examine the impacts of stormwater flow, treat flow as a surrogate for other pollutants, and include the necessary control requirements in stormwater permits.[4] Specifically, the report recommends that the volume retention practices of infiltration, evapotranspiration, and rainwater harvesting be used as primary stormwater management mechanisms. With similar reasoning, USEPA recommends use of a permit condition that is based on maintaining or restoring predevelopment hydrology. Additional information on the development of a post-construction program for Phase II permittees can be found at the CWP.[5] Also, USEPA's green infrastructure website includes information on post-construction controls and programs[6].

Without the appropriate measures in place, land development causes higher discharge volumes and higher pollutant loads than pre-development landscapes, causing modifications to watershed processes. These changes can occur even at the parcel-scale. When development occurs in previously undeveloped areas, the resulting alterations to the land can dramatically change how water is transported and stored. Development creates impervious surfaces and compacted soils which increases surface runoff and decreases groundwater infiltration. These changes can increase the volume and velocity of runoff, the frequency and severity of flooding, and the magnitude of peak storm flows, as well as the type, concentration, and quantity of

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[2] Jennings, Elizabeth. *Memo Entitled Definition of Maximum Extent Practicable*. State Water Resources Control Board, 11 February 1993.

[3] Roesner, L.A. "Urban Runoff Pollution – Summary Thoughts – The State of Practice Today and For the 21st Century." *Water Science and Technology*. 39.12 (1999): 353-360.

[4] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 23. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.

[5] *Managing Stormwater in Your Community: A Guide for Building an Effective Post-Construction Program, EPA Publication No: 833-R-08-001.* Ellicott City, MD: Center for Watershed Protection, July 2008. Web. 18 August 2011 <www.cwp.org/postconstruction>.

[6] "Managing Wet Weather with Green Infrastructure." *National Pollutant Discharge Elimination System (NPDES).* USEPA. Web. 18 August 2011. <http://cfpub.epa.gov/npdes/home.cfm?program_id=298>.

pollutants in discharges. This Order includes requirements for the Permittee to require new development and redevelopment projects to manage stormwater to maintain, protect and, where necessary, restore watershed processes at the parcel-scale by having post-construction hydrology mimic the natural hydrology of the area.

USEPA recommends a simpler, but reasonably approximate 'mimicking the natural hydrograph' approach which can typically be accomplished by retaining (as opposed to detaining for later discharge) on a developed site, the volume of water that was retained prior to development, through the mechanisms of infiltration, evapotranspiration, and capture and use. By significantly reducing the volume of stormwater discharges, these mechanisms significantly reduce the discharge of pollutants in stormwater and maintain watershed processes, making discharge volumes the ideal all-around focus and metric for stormwater management. These provisions must be clear about the retention requirement (e.g., a rain garden with an under drain likely functions more as a detention and filtration system than an infiltration system).[7] The best way to mitigate stormwater impacts from new developments is to use practices to treat, store, and infiltrate runoff on-site to mimic more natural runoff patterns. Innovative site designs that reduce imperviousness and disperse smaller-scale LID practices throughout a site are effective ways to achieve the goals of reducing flows and improving water quality.

(a) Section J.4.a

This Order requires the Permittee to use, in the interim, the existing applicability criteria for designating Priority Development Projects, with a few modifications. These criteria establish the different categories of new development and redevelopment projects that the Permittee must regulate under this Order. These categories are defined on the basis of the land use and the amount of impervious surface created and/or replaced by the project because impervious surfaces increase flows and contribute pollutants to runoff and certain land uses are sources of pollutants. Impervious surfaces can neither absorb water nor remove pollutants as the natural, vegetated soil they replaced can. Also, urban development creates new pollution sources which can lead to increased pollutant discharges to receiving waters. This Order requires the Permittee to revise the SWDS to require all new development and redevelopment projects that create or replace 10,000 square feet or more of impervious surface to be considered a Priority Development Project. Water Board staff consider the 10,000-square foot threshold to be appropriate, since staff expects it will reduce the cumulative effect of many small projects that cause incremental flow rate increases. The threshold is also consistent with requirements in other Phase I NPDES stormwater regulations throughout California.

(b) Section J.4.b

This Order requires the Permittee to require Priority Development Project applicants to develop and submit for approval a plan to demonstrate the applicant has met the applicable stormwater management requirements. The purpose of this plan is for the Permittee to be able to verify project applicants incorporate the applicable stormwater management requirements prior to constructing the project. Additionally, this documentation is necessary so Central Coast Water Board staff can verify the Permittee is sufficiently applying the applicable stormwater management requirements to the applicable development projects.

[7] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 54.

(c) Section J.4.c

This Order requires the Permittee to require development project applicants to go through a process to maximize LID at project sites. This includes incorporating LID principles in the site design to minimize the project impact and using LID BMPs to manage stormwater that is generated post-development. Utilizing LID principles in the site design, such as preserving areas with permeable soils, minimizing the impervious footprint, and avoiding excess grading, will result in a smaller volume of water to manage post-development. USEPA explains that imperviousness has been shown to correlate with water quality impacts. Managing the creation of impervious surfaces, such as reducing the footprint of streets, parking lots, and driveways, will minimize water quality impacts. Protecting vegetation, native soils, and conserving water can also help ensure the hydrologic qualities of the site remain intact.[8]

(d) Section J.4.d

This Order includes source control measures that the Permittee must require to be included in all Priority Development Projects. These measures are recognized nationwide as basic, effective techniques to minimize the introduction of pollutants into stormwater runoff. This Order retains enough flexibility such that Priority Development Projects are not forced to include measures inappropriate, or impracticable, to the projects. This Order does not preclude the Permittee from requiring additional measures that may be applicable and appropriate.

(e) Section J.4.e

This Order requires the Permittee to require project applicants to manage rainfall using uniformly distributed decentralized controls, natural treatment, and volume reduction BMPs to achieve numeric criteria for stormwater management. LID BMPs are a solution to managing rainfall in this manner. The goal of LID is to mimic the pre-development natural hydrologic condition of the site, by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source, so that stormwater does what it would have done before development. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as preserving undeveloped open space, rain barrels and cisterns, green roofs, permeable pavement, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes. Additional community and environmental benefits may be achieved with the use of LID. LID is a cost-effective, beneficial, holistic, integrated stormwater management strategy.

USEPA finds that implementing LID strategies and practices can reduce stormwater management costs. In terms of costs, LID techniques can reduce the amount of materials needed for paving roads and driveways and for installing curbs and gutters. LID techniques can be used to reduce the total amount of impervious surface, which results in reduced road and driveway lengths and reduced costs. Other LID techniques, such as grass swales, can be used to infiltrate roadway runoff and eliminate or reduce the need for curbs and gutters, thereby reducing infrastructure costs. Also, by infiltrating or evaporating runoff, LID techniques can reduce the size and cost of flood-control structures.

[8] Ibid, p. 60.

USEPA reviewed and evaluated seventeen case studies to compare the projected or known costs of LID practices with those of conventional development approaches. USEPA concludes that applying LID techniques can reduce project costs and improve environmental performance. In most cases, LID practices were shown to be both fiscally and environmentally beneficial to communities. In a few cases, LID project costs were higher than those for conventional stormwater management projects. However, in the vast majority of cases, significant savings were realized due to reduced costs for site grading and preparation, stormwater infrastructure, site paving, and landscaping. Total capital cost savings ranged from 15 to 80 percent when LID methods were used, with a few exceptions in which LID project costs were higher than conventional stormwater management costs.[9]

This Order requires the Permittee to make interim modifications to the flow control numeric criteria that are included in the Permittee's existing SWDS. The purpose of these modifications is to improve clarity and remove ambiguity of the existing numeric criteria. These criteria will be used until they are replaced with the final flow control requirements.

(f) Section J.4.f

This Order requires the Permittee to develop flow control numeric criteria for Priority Development Projects, to replace the existing numeric criteria, in order to achieve desired conditions for primary watershed processes within the Permittee's Urban Subwatersheds. This Order explains the Permittee must use the methodology developed through the Central Coast Joint Effort for Hydromodification Control, to derive this numeric criteria. In addition to addressing the protection of watershed processes at the Urban Subwatershed and greater watershed scale, it is also important to address the protection of watershed processes at the parcel-scale. Cumulative impacts at the parcel-scale cause alterations to watershed processes; therefore, implementing measures to maintain, protect and, where necessary, restore watershed processes at the parcel-scale will result in maintenance and in some cases improvements to watershed processes. This Order also requires the Permittee to develop applicability thresholds to identify what projects will be required to adhere to the revised flow control requirements. The Central Coast Joint Effort for Hydromodification Control will provide guidance to the Permittee for development of the applicability thresholds. It is important for the Permittee to account for multiple project factors in establishing the applicability thresholds to account for the cumulative effects of urbanization and the diverse threats to watershed processes from all potential project types, sizes, and locations.

USEPA explains the importance of replicating the pre-development hydrology to protect and preserve both the water resources onsite and those downstream. For example, if prior to development, 25 percent of the annual rainfall runs directly into the stream and the remainder infiltrates into the ground or is evapotranspired into the air, then the post-development goal should be to limit runoff to 25 percent of the annual precipitation while maintaining the correct aquifer recharge rate. This has the benefit, in most cases, of delivering water to the stream at approximately the same rate, volume, duration and temperature as the stream had naturally evolved to receive prior to development. The result will be to eliminate or minimize the erosion of

[9] USEPA. *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices, EPA 841-F-07-006*. December 2007. Web. 18 August 2011. <http://www.epa.gov/owow/NPS/lid/costs07/>.

streambeds and streambanks, significantly reduce the delivery of many pollutants to water bodies, and retain historical instream temperatures.[10]

(g) Section J.4.g

This Order establishes the different categories of new development and redevelopment projects that the Permittee must require to adhere to the final treatment requirements. Similar to the Permittee's existing Priority Development Project applicability criteria, these categories are defined on the basis of the land use and the amount of impervious surface created and/or replaced by the project, because certain land uses and greater amounts of impervious surface contribute more pollutants. With the exception of sidewalks, bicycle lanes, and trail projects, the rest of the project categories for Priority Development Projects trigger adherence to the final treatment criteria at the lower impervious threshold of 5,000 square feet. This threshold is consistent with State Water Board guidance, court decisions, and other Water Quality Control Boards' requirements. In the precedential decision contained in the State Water Board Order WQ 2000-11, the State Water Board upheld the Standard Urban Stormwater Mitigation Plan requirements issued by the Los Angeles Water Quality Control Board's Executive Officer on March 8, 2000, and found that they constitute maximum extent practicable for addressing pollutant discharges resulting from Priority Development Projects. The State Water Board re-affirmed that Standard Urban Stormwater Mitigation Plan requirements constitute maximum extent practicable in State Water Board Order WQ 2001-15. This Order's requirement that new development or redevelopment projects creating and/or replacing 5,000 square feet or more of impervious and/or turf surface shall adhere to the final treatment requirements is consistent with the Standard Urban Stormwater Mitigation Plan provisions upheld by the State Water Board. This Order's applicability thresholds for the final treatment requirements are also consistent with Order No. R9-2007-0001 issued by the San Diego Water Quality Control Board, Order Nos. R4-2009-0057 and R4-2001-182 issued by the Los Angeles Water Quality Control Board, Order No. 2009-0030 issued by the Santa Ana Water Quality Control Board, and State Water Board's Order WQ 2003-0005 issued to Phase II MS4s. Under Order WQ 2003-0005, Phase II MS4s with populations of 50,000 and greater are required to apply the lower 5,000 square foot threshold for requiring stormwater treatment systems by April 2008. This Order includes a higher threshold of 10,000 square feet of impervious area for sidewalk, bicycle lane, and trail projects because of the greater stormwater benefit that bike lanes, sidewalks, and trails provide by encouraging less use of automobiles.

Although most roads and parking lots are not repaired, modified, or reconstructed with great frequency, most municipalities engage in these types of activities on a fairly regular basis. Since roads and parking lots are often a significant percentage of urban impervious areas, these are land uses with significant opportunity for implementation of better stormwater BMPs. Because road and parking lot work is a major investment of resources, it makes sense to incorporate stormwater controls when work is ongoing for another purpose. There are numerous stormwater management practices for streets, street rights-of-way, and parking lots including Portland, Oregon-style green streets planters and bump-outs[11], porous pavements[12], Seattle,

[10] USEPA. *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*, EPA 841-B-09-001. December 2009. Web. 18 August 2011. p. 9, <http://www.epa.gov/owow/NPS/lid/section438/pdf/final_sec438_eisa.pdf>.

[11] "Portland Green Street Program." *Portland Bureau of Environmental Services*. City of Portland, Oregon. Web. 18 August 2011. <http://www.portlandonline.com/bes/index.cfm?c=44407>.

Washington-style street edge alternatives bioretention cells[13], parking lot bioretention islands[14,15], and a variety of other BMPs[16].

This Order requires each Priority Development Project, meeting the final treatment applicability thresholds, to treat the total amount of runoff identified by the hydraulic sizing criteria for treatment systems with LID treatment measures onsite. This Order recognizes the benefits of harvesting and reuse, infiltration, and evapotranspiration and establishes these methods at the top of the LID treatment hierarchy. There are certain situations where biotreatment is a valid LID treatment measure and this Order allows the Permittee the flexibility to make this determination so that Priority Development Projects are not forced to include measures inappropriate or infeasible to the project sites. Section J specifies minimum specifications for biotreatment systems to be considered as LID treatment and requires the Permittee to develop model biotreatment soil media specifications. The Permittee may reference or directly use the Model Bioretention Soil Media Specifications, developed by San Francisco Bay municipalities, pursuant to the San Francisco Bay Regional Water Quality Control Board's requirements, for the Permittee's biotreatment soil media specifications.

In contrast with the traditional approaches, the guiding principle behind capturing the volume of water generated by smaller storm events is to control stormwater at the source. It is much easier and cost efficient to prevent polluted stormwater from entering water bodies than trying to remove pollution once it's in receiving water bodies. Capturing stormwater and managing it onsite by runoff reduction techniques seeks to maximize the area available for infiltration so that runoff volume and pollutant concentrations are reduced. This is achieved through a variety of site design and engineered infiltration techniques. In addition to the environmental benefits, many community value benefits are realized including increased aesthetics and land value.

This Order lists the hydraulic sizing design criteria that the stormwater treatment systems installed for Priority Development Projects, meeting the final treatment applicability thresholds, must achieve. These criteria ensure that stormwater treatment systems will be designed to treat the optimum amount of relatively smaller-sized runoff-generating storms each year. That is, the treatment systems will be sized to treat the majority of rainfall events generating polluted runoff but will not have to be sized to treat the few very large annual storms as well. For many projects, such large treatment systems become infeasible to incorporate into the projects. This Order also adds a combined flow and volume hydraulic design criteria to accommodate those situations where a combination approach is deemed most efficient.

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[12] "Post-Construction Stormwater Management in New Development and Redevelopment." *National Pollutant Discharge Elimination System (NPDES).* USEPA. Web. 18 August 2011. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure>.

[13]"Street Edge Alternatives." *Seattle Public Utilites*. City of Seattle. Web. 18 August 2011. <http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/GreenStormwaterInfrastructure/NaturalDrainageProjects/StreetEdgeAlternatives/index.htm>.

[14] "Bioretention - Commercial/Industrial/Institutional (Ultra Urban Retrofits)." *Urban Design Tools - Low Impact Development.* Low Impact Development Center, Inc. Web. 18 August 2011. <http://www.lid-stormwater.net/biocomind_home.htm>.

[15] "Bioretention - Bioretention Installations in Prince George's County, MD." *Department of Civil & Environmental Engineering*. University of Maryland, 21 July 2004. Web. 18 August 2011. <http://www.civil.umd.edu/~apdavis/Bioinstallations.htm>.

[16] "Green Infrastructure - Managing Wet Weather with Green Infrastructure." *National Pollutant Discharge Elimination System (NPDES).* USEPA. Web. 18 August 2011. < http://cfpub.epa.gov/npdes/home.cfm?program_id=298>.

(h) Section J.4.h

With the wide array of runoff reduction practices that can infiltrate, evapotranspire, and capture and use stormwater there should be very few situations where management of stormwater using combinations of those mechanisms to meet flow control and treatment numeric requirements is not possible. However, it is certainly reasonable to expect that a series of physical constraints may exist, particularly in redevelopment situations, making it infeasible to achieve flow control and treatment numeric requirements onsite. Therefore, this Order provides the Permittee the option of creating offsite mitigation and/or payment in-lieu fee programs. Appropriate schedules for payment and implementation of mitigation measures must be established to ensure stormwater impacts are mitigated in a timely manner.[17]

USEPA provides rationale for why redeveloping brownfield developments may justify alternative compliance options. Redeveloping already degraded sites can reduce regional land consumption and minimize new land disturbance. Minimizing land disturbance and impervious cover is critical to maintaining watershed health. In addition to water quality benefits, cleaning up and reinvesting in brownfield properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment. The effect of low-density urbanization on watersheds and the hydrologic cycle is substantial. High-density development, including vertical density, slows land consumption rates and accommodates more land uses on a smaller footprint. Finally, mixing land uses and promoting transit-oriented development can directly reduce runoff since mixed- use developments have the potential to use surface parking lots and transportation infrastructure more efficiently, requiring less pavement.[18]

(i) Section J.4.i

Appropriate operation and maintenance are critical aspects to the function of any suite of BMPs. In many cases, controls may be located on private property, and it is necessary to establish provisions to assure responsibility and accountability for the operation and maintenance of these controls.

This Order requires that the Permittee obligate the owners of long-term BMPs to properly operate and maintain the BMPs in perpetuity. This obligation can take the form of a maintenance agreement between the land owner and/or the developer, which would be transferred to subsequent owners, between the Permittee and a homeowner's association, covenants and restrictions on the property deed itself, or other types of contract requiring all owners of the property to properly maintain and operate management practices. The maintenance agreement shall allow the Permittee or the Permittee's designee to perform maintenance or corrective actions neglected by the property owner/operator, and bill or recoup costs from that owner/operator.

Certain control measures implemented or required by the Permittee for urban runoff management might create a habitat for vectors (e.g., mosquitoes, rodents) if not properly designed or maintained. Close collaboration and cooperative efforts among the Permittee, local vector control agencies, Central Coast Water Board staff, and the State Department of Public

[17] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 54.
[18] Ibid, p. 54.

Health are necessary to minimize potential nuisances and public health impacts resulting from vector breeding.

A recent NRC report discusses the importance of long-term maintenance and municipal oversight of stormwater BMPs.[19]

> One of the weakest parts of most stormwater management programs is the lack of information about, and funding to support, the long-term maintenance of structural BMPs. If structural BMPs are not inspected and maintained on a regular basis, the stormwater management program is likely to fail. This also negatively impacts the design process—if there is no inspection program and no accountability for maintenance, the designer has no incentive to build better, more maintenance- friendly structural BMPs. Finally, without an accurate assessment of the maintenance needs of a structural BMP, land owners and other responsible parties cannot anticipate their total costs over the lifetime of the device.
>
> Almost all structural BMPs require active long-term maintenance in order to continue to provide volume and water quality benefits (Hoyt and Brown, 2005; Hunt and Lord, 2006b). Furthermore, a typical municipality may contain hundreds or thousands of individual structural BMPs within its jurisdiction. Thus, the long-term obligations for maintenance are considerable. For example, the annual maintenance cost of 100 medium-sized wet ponds (one-half acre to 2 acres) is estimated to be a quarter of a million dollars (Hunt and Lord, 2006c). Currently, the majority of municipal stormwater programs do not have adequate plans or resources in place for the long-term maintenance of structural BMPs (GAO, 2007).
>
> A number of issues confront the long-term maintenance of structural BMPs. First, legal and financial responsibility for maintenance must be assigned. Historically stormwater ownership and responsibility have been poorly defined and implemented (Reese and Presler, 2005). If a party is an industrial facility that is required to obtain a permit, then responsibility for maintaining structural BMPs rests with the permittee. Other instances are more ambiguous. For residential developments, the responsibility for long-term maintenance could be assigned to the developer (e.g., establishing long-term financial accounts for maintenance), individual landowners, homeowners associations, or the municipality itself. Some cities, like Austin and Seattle, assume responsibility for long-term maintenance of structural BMPs in residential areas. Concerns over assigning responsibility to individual residential landowners or homeowners associations include insufficient technical and financial resources to conduct consistent maintenance and a lack of inspection to require maintenance. A recent survey of municipal stormwater programs found that less than one-third perform regular maintenance on stormwater detention ponds or water quality structural BMPs in general residential areas (Reese and Presler, 2005). To ensure that adequate maintenance will occur, municipalities can require performance securities (performance bonds, escrow accounts, letter of credit) that ensure adequate funds are available for maintenance and repair in the event of failure to maintain the structural BMP by the responsible party.

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[19] *Urban Stormwater Management in the United States.* Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 368. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.

An effective maintenance program also requires a system to inventory and track structural BMPs, inspection/monitoring, and enforcement against noncompliance. The large number of structural BMPs to track and manage creates management challenges. Municipal stormwater programs must administer their regulatory programs, perform inspection and enforcement activities, and maintain structural BMPs in public lands/rights-of-way and sometimes in residential areas. Municipal programs often do not have adequate staff to ensure that these maintenance responsibilities are adequately carried out. The lack of adequate staff for inspection and an inadequate system for prioritizing inspections have been repeatedly pointed out (Duke and Beswick, 1997; Duke, 2007; GAO, 2007).

Tracking and monitoring costs may also create disincentives for municipalities to adopt or encourage smaller-scale structural BMPs. For example, residential-scale rain gardens, porous driveways, rain barrels, and grass swales all have the potential to increase the cost and complexity of compliance monitoring because of the multitude of small infiltration devices that are located on private property as opposed to having fewer structural BMPs located in public rights-of-way or public lands. Small-scale distributed structural BMPs located on private property raise concerns of municipal willingness to inspect and enforce against noncompliance. Indeed, some municipalities have banned innovative structural BMPs like pervious pavement because the municipalities have no means to ensure their maintenance and continued operation.

At the present time, the maintenance schedule for many of the proprietary and non-proprietary structural BMPs is poorly defined. It will vary with the type of drainage area and the activities that are occurring within it and with the efficiency of the structural BMP. (For example, the city of Austin, Texas, has determined that the average lifespan of their sand filters ranges from 5 to 15 years, but can be as little as one year if there is construction in the drainage area.) In order to establish a maintenance schedule, an assessment protocol needs to be adopted by municipalities. The protocol, which is specific to the type of structural BMP, could consist of the following: each year municipalities would be required to collect data from a subset of their structural BMPs on public and private property, and then over a period of years these data could be used to determine maintenance schedules, predict performance based on age and sediment loading, and identify failed systems. A measurement of the depth of deposited sediment might be the only test needed for settling devices, such as hydrodynamic devices and wet detention ponds. Two levels of analysis could be performed for infiltration devices—one based on simple visual observations and the other using an instrument to check infiltration rates. These assessment methods for infiltration devices have been tested at the University of Minnesota (Gulliver and Anderson, 2007). Without an assessment protocol for structural BMPs, the chances for poor maintenance and outright failure are greatly increased, it is difficult if not impossible to determine the actual performance of a structural BMP, and there will be insufficient data to reduce the uncertainty in future structural BMP design.

K. Construction Site Management

1. Legal Authority

The following legal authority applies to Section K – Construction Site Management:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) requires 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 stormwater runoff from construction sites to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) requires 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) requires 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) requires 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)(i)(A) requires each Permittee to demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by stormwater discharges associated with industrial activity and the quality of stormwater discharged from site of industrial activity."

Federal NPDES regulation 40 CFR 122.26(b)(14) requires "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."

4. Section K.1

To effectively conduct a construction site management program, the Permittee must know where construction activity is occurring. A construction site inventory tracks information such as project size, disturbed area, distance to any water body or flow channel, when the SWPPP was

approved by the Permittee, and whether the project is covered by the General Construction Permit. This inventory will allow the Permittee to track and target its inspections.

5. Sections K.2, K.3, and K.4

Construction land disturbance exposes soil to erosion processes and increases the potential for sediment mobilization, runoff, and deposition in receiving waters. Construction sites without adequate BMP implementation result in sediment runoff rates that greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. In addition to sediment, stormwater discharges from construction sites generally include other pollutants such as phosphorus and nitrogen, petroleum derivatives, and other construction-related pollutants and solid wastes. The Order requires the Permittee to require construction site operators to meet certain minimum stormwater requirements relating to erosion and sediment control and source control. These minimum requirements specify the expectations for addressing erosion control, sediment control, and source control measures at construction sites.

EPA's Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category[1] require construction site owners and operators to implement a range of erosion and sediment control measures and source control practices to control pollutants in discharges from construction sites. These standards are broadly applicable to all construction activity disturbing one or more acres and are the basis for the Order's minimum requirements for larger sites. They provide an objective means of describing appropriate erosion and sediment control BMPs, source controls on construction site waste and storage of building materials, and other reasonable components of the Permittee's program to reduce pollutants to the maximum extent practicable in stormwater from construction sites.

Prioritization of construction sites in terms of risk allows the Permittee to use resources and staff time most effectively. The Permittee is required to identify priority sites based on the nature and extent of the construction activity, slope of the site, proximity to receiving waters, the characteristics of soils, and the water quality status of the receiving water. The State Water Board has identified that larger construction sites tend to be at increased risk for discharge of sediment and other pollutants and therefore requires larger sites to be enrolled in the General Construction Permit. The State Water Board allows some lower risk sites to qualify for an erosivity waiver. This Order uses this State Water Board established priority ranking for construction sites and has the Permittee designate as high priority sites that are required to enroll in the General Construction Permit and that do not qualify for an erosivity waiver.

6. Section K.5

The Order requires the review and prior approval of source control and erosion and sediment control plans for priority sites as well as review and approval of plans for non-priority sites to ensure that construction activities adhere to the Permittee's minimum stormwater control requirements. Review of source control and erosion and sediment control plans is necessary to verify the adequacy of proposed stormwater controls and to verify compliance with all applicable requirements in the Permittee's ordinance or other regulatory mechanisms, as well as compliance with control measure standards and specifications. A formalized review procedure ensures consistent review of plans by specifying the requirements for plans being submitted, the

[1] "Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category, Final Rule." *Federal Register* 74 (1 December 2009): 62996-63058. Web.

schedule for review, and general conditions for approval. The site plan review process also provides a way to track construction activities and enforce standards.

A good site plan review process provides the Permittee with the opportunity to comment – early and often – on a project's proposed number, type, location, and sizing of stormwater control measures that will be in place prior to, during, and at the conclusion of active construction. It is important to keep in mind that a site plan is a "living document" that may change during the life of the project; however, it is critical that the site plan be adequately reviewed and initially based on established policy, guidelines, and standards. The plan is the framework for stormwater control implementation and can serve as the basis for enforcement action on a project site.

The Order requires the Permittee to review plans before construction activity begins to ensure that the plans are consistent with the standards specified in Section K. The Order language also includes some key requirements during the plan review process. The plan must include the rationale used for selecting or rejecting control measures (for example, why a silt fence was selected or why a sediment trap was not included). Finally, plan reviewers must be trained and must document their review. Documentation of review can be done by using a checklist or similar process.

7. Sections K.6 and K.8

The Order requires inspections of construction sites based on a prioritized ranking of sites (see 40 CFR 122.26(d)(2)(iv)(D)(3). Larger construction sites and sites that discharge to a sediment impaired water body are inspected more frequently than small sites. In addition to inspections at a regular interval, inspections are required within a certain timeframe after a rain event.

Inspections are required before land disturbance to ensure erosion and sediment controls are in place and a plan has been developed, during active construction, and after the site has been stabilized. The Order language also contains specific requirements on what the inspection must include (such as a comparison of control measures in the approved plan to control measures installed in the field).

Without adequate implementation and maintenance, stormwater controls will not function as designed. In order to ensure proper implementation and maintenance by site operators, a rigorous inspection protocol is necessary. This protocol must include written procedures for site inspections and enforcement to ensure inspections and enforcement actions are conducted in a consistent manner. Documentation of inspections is critical to track noncompliance and enforcement. Regularly scheduled inspections, as well as post-storm event inspections, are necessary to be sure that regular maintenance occurs as well as repairs after storm events.

The Order requires the Permittee to determine the degree of compliance with provisions of the Order and risk of pollutant discharge for each High Priority Construction Site, expressed as an Inspection Rating. Inspection Ratings are determined using a methodology contained in Attachment G – Inspection Ratings. The purpose of this requirement is to measure the effectiveness of the Permittee's efforts at reducing erosion and sediment discharge at High Priority Construction Sites. Comparison of Inspection Ratings over time for High Priority Construction Sites also provides a means for the Permittee to measure improvements in program effectiveness. The Order provides flexibility by allowing the Permittee to propose for approval by the Central Coast Water Board Executive Officer an alternative method for assessing the effectiveness of BMP selection, implementation, installation, and maintenance.

The Order also requires the Permittee to determine the percentage of High Priority Construction Sites with Inspection Ratings of “B” or higher at the time of each rain event. The Order considers such sites to be “ready” for the rain event. The most important time for construction sites to be in compliance with the provisions of the Construction Site Management Program is during rainfall events capable of producing runoff. Therefore the purpose of this requirement is to assess the effectiveness of the Permittee’s efforts in terms of High Priority Construction Sites ready for a rain event. Since it is impracticable for the Permittee to inspect all High Priority Construction Sites during rain events, the Order considers a site to be ready for the rain event if the site had an Inspection Rating of “B” or higher at the last inspection prior to, but no more than 7 days prior to, the rain event. The Order intends that High Priority Construction Sites found to have Inspection Ratings of “C” or lower may be reinspected by the Permittee prior to the rain event, and that such reinspected sites found to have an Inspection Rating of “B” or higher may be considered ready for the rain event. For the purposes of this provision, the Order defines a rain event as one which results in at least ½ inch of rainfall as an approximation of an event likely to produce significant runoff.

While much is currently known about effective measures for controlling erosion and sediment discharges at construction sites, variations in site and storm conditions and the variety of BMPs available can make effective erosion and sediment control an iterative process at any particular construction site. Therefore the Order requires the Permittee to inspect High Priority Construction Sites within 48 hours after a ½-inch rain event. The purpose of this requirement is to assess the effectiveness of construction site BMPs. This information is useful to the Permittee as feedback about the proficiency of Permittee municipal staff at assessing the adequacy of BMP selection, implementation, installation, and maintenance.

A strong enforcement program to back up the Order’s requirements is a critical ingredient in creating the deterrence needed to encourage construction site operators to maintain compliance with this Order. Appropriate penalties and other consequences for violations offer some assurance of equity between those who choose to comply with requirements and those who violate them. It also provides incentive for prompt correction of violations.

8. Section K.7

The Order requires inspection of all structural BMPs both during and after construction. Inspections during and just after construction are important to ensure BMPs are installed correctly. If BMPs are not installed correctly they may not function as intended. This inspection shall also ensure appropriate safeguards are in place to prevent construction site pollutants and flows from compromising structural BMPs’ long-term performance. The Permittee is required to do post-construction inspections of structural BMPs prior to issuing final approval for the site. This will ensure the inspection occurs and any corrective actions are performed before the construction project is closed out.

9. Section K.9

Permittee is required to notify the Central Coast Water Board of construction sites that have suspected violations each year. This will enhance Central Coast Water Board and Permittee communication and coordination in regulating construction sites.

10. Section K.12

Permittees often contract out to others (e.g., hire consultants) to implement some of the requirements of stormwater management programs. This Order requires the same level of performance regardless of who performs the work. Since the Permittee is responsible to ensure that work performed by others complies with the requirements of the Order, they are required to provide oversight of work not performed by municipal staff.

L. Development Planning and Stormwater Retrofits

1. Legal Authority

The following legal authority applies to Section L - Development Planning and Stormwater Retrofits:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWA section 402(a), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F), 40 CFR 131.12, and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A) requires that the proposed management program shall be based on "a description of structural and source control measures to reduce pollutants in runoff from commercial and residential areas that are discharged from the municipal storm sewer system that are to be implemented during the life of the permit, accompanied with an estimate of the expected reduction of pollutant loads and a proposed schedule for implementing such controls." Structural and source control measures include retrofits.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that the Permittee 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 122.26(d)(2)(iv)(A)(4) requires that the description of structural and source control measures shall include, at a minimum, "a description of procedures to assure that flood management projects assess the impacts on the 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)(v) provides that the Permittee shall include the following in its permit application for discharges from its municipal storm sewer: "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water."

The following Phase II Final Rule Federal NPDES regulations and discussion directly apply to small MS4s. However, due to greater water quality impacts generally generated by large MS4s, Central Coast Water Board staff finds the Phase II Final Rule for small MS4s is applicable to larger MS4s such as the Permittee.

Federal NPDES regulation 40 CFR 122.34(b)(5)(iii) provides the following guidance:

If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. USEPA recommends that the BMPs chosen: be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions. In choosing appropriate BMPs, USEPA encourages you to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders including interested citizens. When developing a program that is consistent with this measure's intent, USEPA recommends that you 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 quality. In addition to assessing these existing documents and programs, you should provide opportunities to the public to participate in the development of the program. Non-structural BMPs are preventative actions that involve management and source controls such as: policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; policies or ordinances that encourage infill development in higher density urban areas, and areas with existing infrastructure; education programs for developers and the public about project designs that minimize water quality impacts; and measures such as minimization of percent impervious area after development and minimization of directly connected impervious areas. Structural BMPs include: storage practices such as wet ponds and extended-detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; and infiltration practices such as infiltration basins and infiltration trenches. USEPA recommends that you ensure the appropriate implementation of the structural BMPs by considering some or all of the following: pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with design, construction or operation and maintenance. Storm water technologies are constantly being improved, and USEPA recommends that your requirements be responsive to these changes, developments or improvements in control technologies.

4. Section L.1

This Order includes requirements for the Permittee to condition developments in future growth areas to control the impact of future development on beneficial uses caused by alteration of watershed processes due to stormwater management. The City of Salinas' General Plan indicates large areas of lands for future developments, primarily to the northeast of the City.

The Local Government Commission explains water resources are threatened as never before. Rapid population growth, climate change, drought, and water quality impairment pose tremendous challenges for the entire State of California. Today, reliable sources of clean water are no longer a given, forcing California to rethink not only water sources, but water use now and into the future. One water source often overlooked is rainfall. Rather, the built environment is designed to treat rain as a nuisance. Collection, conveyance, and disposal summarize the

engineering approach to conventional stormwater management. The conversion of absorbent land to pavement and other impervious surfaces led to larger collection and conveyance systems, with little connection made to increases in local flooding, polluted water, and degradation of famous beaches, bays, and estuaries. The water resource challenges presented above are intrinsically linked to local land use planning. Few decisions have greater impact on the quality, reliability, use, and overall sustainability of water resources than how and where we grow. Despite their integral nature, stormwater management and land use planning decisions are often disconnected.[1] Because the Permittee has plans for substantial future development, this Order emphasizes regulations for the stormwater component of land use planning decisions in order to maintain and restore beneficial uses and watershed health in new and existing urban areas.

This Order requires the Permittee to modify its land planning and building documents to control stormwater impacts to watershed processes that affect beneficial uses. The Local Government Commission provides rationale for not only including language to support watershed protection in larger community plans, but also incorporating watershed protection principles in local regulations. The Local Government Commission explains there are challenges and opportunities for aligning water and land use to support watershed protection, community design, and stormwater management goals. In California, General Plans translate a community's vision into preferred investment, land development, and land conservation options. Over the past decade, General Plans in California have included expanded language on sustainable development and resource protection. However, the vision for sustainability has proven difficult to implement. Entrenched local codes and ordinances continue to reflect and support sprawling, high-impact development. Most modern zoning regulations, which initially aimed to separate residences from harmful industrial areas, now work to separate nearly all aspects of day-to-day activities in a way that requires the use of an automobile to reach routine destinations. As a result, development standards have come to focus on designing communities for cars, which in turn create a landscape of expansive parking lots, larger roadways, and dispersed buildings and communities. For watersheds, the end effect is impaired water quality, increased flooding, reduced supplies, and degraded habitat.[2] The Permittee's existing General Plan includes specific environmental goals and objectives for future growth; however, as the Local Government Commission explains, often sustainable development and resource protection goals included in General Plans are not translated to actual development projects. This Order includes requirements for the Permittee to impose on Specific Plans or other master planning documents adopted for future growth areas in order to ensure development in future growth areas controls impacts to beneficial uses by protecting watershed processes through stormwater management.

This Order includes requirements for the Permittee to require Specific Plans or other master planning documents adopted for future growth areas to incorporate LID principles, which include minimizing development footprints. See Fact Sheet for Section J (Parcel-Scale Development) for justification for LID requirements. This Order requires the Permittee to require planning documents adopted for future growth areas to demonstrate how projects will maintain surface/groundwater interaction based on groundwater recharge areas, areas where interflow occurs, soil type, surface geology, and land cover type and condition. This is important so that

[1] Anderson, Clark, Lisa Nisenson, and Patrick Stoner. *Water Resources and Land Use Planning: Watershed-based Strategies for Ventura County.* Sacremento, CA: Local Government Commission, December 2008. Web. 18 August 2011. p. 1. <http://water.lgc.org/ventura/ventura%20watershed%20plan%201.pdf>.
[2] Ibid, p.2.

new urban areas support baseflow and interflow to wetlands and surface waters, and deep vertical infiltration to groundwater.

NRC explains, "As the percent of the landscape that is paved over or compacted is increased, the land area available for infiltration of precipitation is reduced, and the amount of stormwater available for direct surface runoff becomes greater, leading to increased frequency and severity of flooding. Reduced infiltration of precipitation leads to reduced recharge of the groundwater reservoir; absent new sources of recharge, this can lead to reduction in baseflow of streams (e.g., Simmons and Reynolds, 1982; Rose and Peters, 2001). Vegetation removal also results in a lower amount of evapotranspiration compared to undeveloped land."[3]

Seattle Public Utilities conducted a literature review that includes, "In an extensive stream research project in Wisconsin, the observed decrease in stream baseflow was strongly correlated with watershed imperviousness (Wang et al. 2001). Similarly, an urban stream study in Vancouver, British Columbia, Canada, monitored eleven urbanizing small-stream watersheds. Baseflow and groundwater recharge were consistently lower in watersheds with more than 40 percent impervious cover (Finkebine et al. 2000). Both of these studies found linkages between these shifts in hydrologic regime and both habitat degradation and the decline in biological integrity in the urbanizing streams."[4]

USEPA includes examples of water quality and watershed protection elements to consider in MS4 permit requirements. Many of the conditions in this Order that the Permittee must apply to development projects in future growth areas parallel these examples. For example, USEPA discusses the importance of minimizing development project impact by minimizing impervious surfaces, protecting native soils, preventing compaction, protecting vegetation with important evapotranspiration qualities, and preventing disturbances to natural water bodies; preserving, protecting, creating, and restoring ecologically sensitive areas that provide water quality benefits and serve critical watershed functions; and managing impacts close to the source. [5]

USEPA modeled the stormwater impact of new development at densities of one, four, and eight residential units per acre. The results revealed that, assuming communities continue to grow, it is better to concentrate development in a smaller land area using higher densities. "Lower-density development always requires more land than higher densities to accommodate the same amount of growth." When more land is disturbed, more of alteration of watershed processes occurs, impacting beneficial uses of receiving waters. The study found that as density increases, overall impervious cover in a watershed decreases.[6] This study supports Order requirements for compact development.

This Order includes requirements for the Permittee to revise planning and building requirements that affect parcel-scale development projects. This Order requires the Permittee to conduct an analysis of all applicable codes, regulations, standards, and/or specifications to identify

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[3] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 131. <www.epa.gov/npdes/pubs/nrc_stormwaterreport.pdf>.

[4] May, Christopher. *Watershed Processes and Aquatic Resources : A Literature Review.* Seattle, WA: Urban Watersheds, Drainage & Wastewater, Seattle Public Utilities. Web. 18 August 2011. p.7. <http://wdfw.wa.gov/publications/00034/wdfw00034.pdf>.

[5] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 60.

[6] Richards, Lynn. *Protecting Water Resources with Higher- Density Development, EPA 231R06001*. Washington, D.C.: USEPA, January 2006. Web. 18 August 2011.

modifications and/or additions necessary to remove gaps and impediments to effectively implement parcel-scale development requirements Section J (Parcel-Scale Development). The Permittee must modify its regulations to ensure that the Permittee's existing regulations do not prohibit effective implementation the parcel-scale development requirements. Phase II MS4s in the Central Coast Region, participating in the Central Coast Water Board Joint Effort for Hydromodification Control, are also required to conduct this same exercise to remove gaps and impediments to support implementation of the final flow control numeric criteria. The Central Coast Water Board supported a training titled, Municipal Regulatory Update Assistance Program for California's Central Coast Jurisdictions, which the Permittee attended, to provide guidance for local regulatory updates. Training materials are also available from this course.[7]

The Local Government Commission explains that few decisions have greater impact on the quality, reliability, and overall sustainability of water resources than how and where we grow. The built environment reflects the effect of those decisions over time, resulting in patterns of development that shape our neighborhoods, communities, and entire regions. How these patterns unfold affects the amount of land, water, and infrastructure needed and, consequently, the impacts that growth will have on the quality and reliability of water resources and the health of local watersheds and beneficial uses. Despite their integral nature, water management and land use planning decisions are often disconnected. To address this disconnect, the Local Government Commission developed the Ahwahnee Water Principles, which provide guidelines for aligning water management with local land use decisions and help communities protect valuable water resources as they grow. These principles can be tailored to meet local needs and conditions, allowing communities to translate appropriate BMPs into effective policies.[8] Central Coast Water Board staff finds that the Ahwahnee Water Principles may be a helpful resource for adhering to the requirements of this Order.

This Order includes requirements for the Permittee to determine impacts of significant expansions of the City and/or impervious area increases on watershed processes at the Urban Subwatershed-scale. This Order requires the Permittee to develop a plan to demonstrate numerically how the land use action will mitigate for the identified watershed process impacts. The purpose of this requirement is to steer land use decisions in a direction that maintains and restores watershed processes to protect beneficial uses, very early in the planning phases of development.

USEPA explains why examining stormwater on a watershed basis and including watershed principles is an important part of protecting waterways in a holistic manner. Imperviousness has been shown to correlate with water quality impacts. In order to minimize water quality impacts, the Permittee must examine their planning principles to manage the creation of impervious surfaces at the watershed level, such as reducing the footprint of streets and parking lots.

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[7] Central Coast Water Quality Control Board; AHBL; UC Davis Low Impact Development Initiative. *Central Coast Municipal Regulatory Update Assistance Program (MRUAP) Session One/Two. Web. 23 August 2011* <http://www.waterboards.ca.gov/centralcoast/water_issues/programs/stormwater/docs/lid/lid_hydromod_charette_index.shtml>.

[8] Anderson, Clark, Lisa Nisenson, and Patrick Stoner. *Water Resources and Land Use Planning: Watershed-based Strategies for Ventura County.* Sacramento, CA: Local Government Commission, December 2008. Web. 18 August 2011. p. 10. <http://water.lgc.org/ventura/ventura%20watershed%20plan%201.pdf>.

Consideration of stormwater impacts from development is critical during the planning phases of development. This not only includes planning on the site-level, but also with respect to discharges from the MS4 on the watershed level. To the extent possible, stormwater management must be an integral part of higher level planning documents that determine where and how development that will result in stormwater discharges to the MS4 should occur since these decisions affect water quality. Using land efficiently can result in better stormwater management by putting development where it is most appropriate. For example, by directing and concentrating new development in areas targeted for growth, communities can reduce or remove development pressure on undeveloped parcels and protect sensitive natural lands and recharge areas. Another strategy is redeveloping already degraded sites such as abandoned shopping centers or underutilized parking lots. In this case, the net increase in discharges from developed sites would likely be zero, and it would likely decrease, depending on the on-site infiltration practices used. Also, by allowing or encouraging denser development, less land is converted overall, and less total impervious area created.[9]

This Order requires the Permittee to require developers to adhere to waterway setback requirements. The Permittee addresses waterway setbacks in some of the Permittee's existing regulatory documents (e.g., General Plan Policy COS-17, SWMP Element 4); therefore, Central Coast Water Board staff does not anticipate that the planning and building requirement updates to address the initial requirements, due within 12 months of adoption of this Order, to require significant work by the Permittee.

This Order requires the Permittee to establish a 30-foot setback for all streams (except Gabilan and Natividad Creeks which must have a 100-foot setback) identified per Section Q.3 (Watershed Characterization: Water Body Identification). The Water Quality Control Plan, Central Coast Region (Basin Plan) mandates that, "specific actions can be taken to control water quality." The following specific actions are included: "A filter strip of appropriate width, and consisting of undisturbed soil and riparian vegetation or its equivalent, shall be maintained, wherever possible, between significant land disturbance activities and watercourses, lakes, bays, estuaries, marshes, and other water bodies. For construction activities, minimum width of the filter strip shall be thirty feet, wherever possible as measured along the ground surface to the highest anticipated water line."[10] The Basin Plan describes the importance of functioning filter strips between water bodies and areas with significant ground disturbance. Also, the Basin Plan indicates a 30-foot water body setback for construction activities; therefore, new development and redevelopment, which involve construction activities, cannot occur within 30-feet of a water body.

Ecologically functioning riparian environments provide aquatic and terrestrial habitat for fish, amphibians, reptiles, mammals, and birds, and recreational and open space opportunities for the public. Riparian areas also provide water quality treatment functions. They improve water quality by removing nutrients and degrading pollutants through chemical processes; improving dissolved oxygen; storing sediment; and regulating temperatures among other benefits. These benefits can be achieved by protecting existing healthy riparian environments, or by restoring degraded areas into functioning ecosystems.

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[9] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 60.

[10] Central Coast Water Quality Control Board. *Central Coast Region – Basin Plan*, 8 September 1994. Web. 23 August 2011. p. V-11 and V-13.

Also, ecologically sensitive areas can protect water quality by acting both as filters that reduce pollutants in stormwater discharges and as sponges to reduce the impact on the ecosystem's hydrology. Thermal pollution is also a concern that can impact biota in waterways. Stormwater discharges from impervious surfaces are often characterized by higher temperatures than natural, pervious surfaces. Reducing the chances of further increasing this temperature by preserving, protecting, and restoring natural features that provide shading for the waterway can further help reduce thermal pollution. Whenever possible natural waterways must be protected and not disturbed by stormwater from developed sites. Protecting vegetation, native soils, and conserving water can also help ensure the hydrologic qualities of the site remain intact.

This Order requires the Permittee to review its CEQA process and make revisions as applicable. The State Water Board Urban Runoff Technical Advisory Committee advises that the Permittee's CEQA initial study checklists be revised to include consideration of water quality effects from new development or redevelopment. The questions included in Section L.1.e (Development Planning and Stormwater Retrofits: CEQA Process Update) are questions to help the Permittee determine if the proposed project will manage stormwater to maintain and/or restore watershed processes and protect beneficial uses.

5. Section L.2

This Order requires the Permittee to develop and implement a program to retrofit existing development to restore degraded watershed processes affected by urban stormwater discharges. Retrofitting existing development is necessary for protecting water quality and beneficial uses. USEPA states, "It is clear that we cannot protect the nation's waters without also addressing degradation caused by stormwater discharges from existing developed sites. For that reason stormwater programs must include substantive retrofit provisions."[11] Existing BMPs are not sufficient to protect beneficial uses of receiving waters from MS4 stormwater discharges, as evidenced by 303(d) listings, CCAMP data, and the Permittee's monitoring reports. Based on the current rate of redevelopment, BMP requirements for redevelopment will not adequately address current impacts to watershed processes. To achieve actual improvement in watershed processes and the quality of receiving waters it is necessary to mitigate discharges from existing developed sites through implementation of measures which reduce stormwater runoff volume and rate, increase time of concentration, reduce pollutant loading, provide baseflow and interflow to wetlands and surface waters, provide deep vertical infiltration to groundwater, and restore receiving water hydraulic and habitat functions.

Retrofitting existing development is practicable and reasonable for the Permittee through a systematic evaluation, prioritization, and implementation plan focused on impaired watershed processes, specific pollutants (including trash), hydromodification impacts, feasibility, and effective communication and cooperation with private property owners. Retrofitting existing development is a widespread practice in the United States. Successful retrofitting programs have been implemented in such diverse locations as Seattle, Washington;[12] Portland, Oregon;[13]

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[11] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 65.

[12] "Street Edge Alternatives." *Seattle Public Utilites*. City of Seattle. Web. 18 August 2011. <http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/GreenStormwaterInfrastructure/NaturalDrainageProjects/StreetEdgeAlternatives/index.htm>.

[13] "Clean River Rewards: Contain the Rain." *Portland Bureau of Environmental Services*. City of Portland, Oregon. Web. 23 August 2011. <http://www.portlandonline.com/bes/index.cfm?c=41976>.

Santa Monica, California;[14] Kansas City, Kansas;[15] and Montgomery County, Maryland.[16] In addition, USEPA-approved guidance for developing retrofitting programs is available through the CWP.[17]

Retrofit requirements included in this Order are consistent with CWA section 402(p)(3)(B)(iii), which requires controls to "reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." Retrofit requirements are also consistent with USEPA guidance contained in the MS4 Permit Improvement Guide.[18]

This Order identifies retrofitting objectives the Permittee must emphasize when developing and implementing the retrofit program. The retrofitting objectives are consistent with water quality objectives and beneficial uses, the purpose of NPDES regulations, the CWC, the Basin Plan, and USEPA guidance.

The aim of retrofitting is to restore watershed processes and receiving water conditions to pre-development levels. Where constraints on retrofitting prevent achievement of pre-development levels, retrofitting can still lessen the impacts of development and restore receiving water conditions to a level approaching the natural condition.

This Order requires the Permittee to consider the full range of retrofitting project types in the development and implementation of the Permittee's retrofitting program. This is consistent with USEPA-approved retrofitting guidance prepared by the CWP.[19]

This Order requires the Permittee to develop and implement a Long-Term Retrofit Plan within five years of adoption of this Order. This requirement is consistent with USEPA guidance which states, "Permittees may need a term or two to adequately develop and implement a retrofit plan. …. It is up to the permit writer to make this determination based on the specific information they have available on current programs."[20] This Order includes specific requirements for what the Permittee must include in the Permittee's development of the Long-Term Retrofit Plan. The purpose of these requirements is to increase the scope, flexibility, and effectiveness of the Long-Term Retrofit Plan development process, and to increase the feasibility and effectiveness of the Long-Term Retrofit Plan itself.

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[14] "Urban Runoff Case Studies." *Office of Sustainability and the Environment*. City of Santa Monica. Web. 23 Aug. 2011. <http://www.smgov.net/Departments/OSE/categories/content.aspx?id=4007>.
[15] *Water the Future Is Clear*. 10,000 Rain Gardens. Web. 23 August 2011. <http://www.rainkc.com/>.
[16] "Rainscapes Program." Department of Environmental Protection. Montgomery County, Maryland. Web. 23 August 2011. <http://www.montgomerycountymd.gov/dectmpl.asp?url=%5Ccontent%5Cdep%5Cwater%5Crainscapes.asp>.
[17] Schueler, Tom, David Hirschman, Michael Novotney, and Jennifer Zielinski. *Urban Subwatershed Restoration Manual No. 3 Urban Stormwater Retrofit Practices Version 1.0*. Ellicott City, MD: Center for Watershed Protection, July 2007. Web. 23 August 2011.
[18] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 64.
[19] Schueler, Tom, David Hirschman, Michael Novotney, and Jennifer Zielinski. *Urban Subwatershed Restoration Manual No. 3 Urban Stormwater Retrofit Practices Version 1.0*. Ellicott City, MD: Center for Watershed Protection, July 2007. Web. 23 August 2011.
[20] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 65.

This Order requires the Permittee to inventory areas impacting watershed processes based on the Urban Subwatershed Program Effectiveness Rating, Section P.6 (Monitoring, Effectiveness Assessment, and Program Improvement: Program Effectiveness Rating). The Order requires the Permittee not to create an exhaustive list of all such areas in the Permit coverage area, but to develop a list of potential retrofit locations that considers the broad scope of impacts and opportunities for retrofitting present in the Permit coverage area. An inventory should contain a broad selection of potential retrofit locations, consider the scope of retrofitting opportunities identified in this Order, and address priority impacts to watershed processes present in the Permit coverage area.

The criteria for qualifying retrofit projects and the number of qualifying retrofit projects the Permittee must implement each year will be reviewed and updated at the end of every permit term. This Order requires the Permittee to complete the first Long-Term Retrofit Plan, including an implementation plan, within 5 years of adoption of this Order, and to implement the plan upon completion.

This Order requires the Permittee to derive a list of candidate retrofit projects, within 2 years of adoption of this Order, so in the event that a Priority Development Project qualifying for the offsite alternative compliance option pays an in-lieu fee, that fee can go towards a retrofit meeting the requirements of this Order. These projects will serve as pilot demonstration retrofit projects.

This Order establishes the types of retrofit projects the Permittee may implement to meet the requirements of this Order. Qualifying retrofit projects (Attachment H - Qualifying Retrofit Projects, Table H.1) fall under two headings: project type and performance goal(s). The project types are consistent with the retrofitting opportunities listed in Section L (Development Planning and Stormwater Retrofits), with retrofit project categories described by the CWP, and with other provisions of this Order. Central Coast Water Board staff, using best professional judgment, determined performance goal(s) for retrofit project types based on projects that would result in tangible improvements to watershed processes, while still being feasible, achievable, and consistent with other provisions of this Order.

This Order requires the Permittee to inspect, track, and maintain completed retrofits. Regular maintenance of BMPs is essential for prolonged effective performance.[21]

The Local Government Commission provides advice on a funding mechanism for stormwater retrofits of municipal facilities. Many local governments have established a Gas Tax Street Improvement Fund, which allows use of gas taxes for a variety of street construction, maintenance, and improvements on public highways and streets. This provides an opportunity for financing stormwater improvements. In 2004, the State Comptroller's Office issued Guidelines Relating to Gas Tax Expenditures for Cities and Counties to describe how funds collected for vehicles and gas may be used. Under California law, fuel taxes are allowed for "research, planning, construction, improvement, maintenance, and operation of public streets and highways (and their related public facilities for non-motorized traffic), including the

[21] CASQA. *California Stormwater Quality Association Stormwater Best Management Practice Handbook: Municipal*, January 2003. Web. 23 August 2011 <http://www.cabmphandbooks.com/documents/Municipal/Municipal.pdf>.

mitigation of their environmental effects, the payment for property taken or damaged for such purposes, and the administrative costs necessarily incurred in the foregoing purposes."[22]

6. Section L.3

It is important for the Permittee to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. The Permittee coordination with other watershed stakeholders, especially Monterey County, the State of California Department of Transportation, Monterey County Water Resources Agency, Non-Traditional Small MS4s, rail, United States Department of Defense, and water and sewer districts, is important. The Permittee boundary encompasses land in three different watersheds. There are different agencies with jurisdiction of land upstream and downstream of the Permittee's watersheds and within the Permit coverage area. To successfully maintain and restore watershed processes the Permittee must coordinate with other watershed contributors.

Additionally, if municipalities located in the same watershed work together and pool resources to define water quality and watershed scale issues, and assess watershed conditions, in a coordinated manner, this helps streamline their compliance efforts, minimize costs, and disseminate information among municipalities.

This Order requires the Permittee to coordinate with other stakeholders to pursue the Environmental Enhancement Objectives of the May 2006 Salinas Valley Integrated Regional Water Management Functionally Equivalent Plan Update. The Permittee is identified as a stakeholder in the May 2006 Salinas Valley Integrated Regional Water Management Functionally Equivalent Plan Update. The Salinas Valley Integrated Regional Water Management Functionally Equivalent Plan Update includes Environmental Enhancement Objectives, including: identifying opportunities to protect, enhance, and/or restore natural resources, including streams, groundwater, watersheds, and other resources. The Salinas Valley has several natural resources that have been affected by human activities in the region. Water related planning in the region should consider the effects of humans on these resources and identify opportunities to protect, enhance, and restore them.

This Order requires the Permittee to collaboratively work with others to prepare salt and nutrient management plans for groundwater basins underlying the Permit coverage area, per the State Water Board's Recycled Water Policy. The State Water Board recognizes that the local water and wastewater entities, together with local salt/nutrient contributing stakeholders, will fund locally driven and controlled, collaborative processes open to all stakeholders. These processes will prepare salt and nutrient management plans for each basin/sub-basin in California, including compliance with CEQA and participation by Regional Water Board staff. The Permittee is a member of the Joint Powers Authority that is the Monterey County Water Pollution Control Agency (MCWPCA). The MCWPCA will develop Salt and Nutrient Management Plans per the Recycled Water Policy.

It is the intent of the Recycled Water Policy for every groundwater basin/sub-basin in California to have a consistent salt/nutrient management plan. It is also the intent of the State Water Board that because stormwater is typically lower in nutrients and salts and can augment local water

[22] Anderson, Clark, Lisa Nisenson, and Patrick Stoner. *Water Resources and Land Use Planning: Watershed-based Strategies for Ventura County.* Sacremento, CA: Local Government Commission, December 2008. Web. 18 August 2011. p. 79. <http://water.lgc.org/ventura/ventura%20watershed%20plan%201.pdf>.

supplies, inclusion of a significant stormwater use and recharge component within the salt/nutrient management plans is critical to the long-term sustainable use of water in California. Inclusion of stormwater recharge objectives in salt/nutrient management plans is consistent with State Water Board Resolution No. 2005-06, which establishes sustainability as a core value for State Water Board programs and also assists in implementing Resolution No. 2008-30, which requires sustainable water resources management and is consistent with Objective 3.2 of the State Water Board Strategic Plan Update dated September 2, 2008.

This Order requires the Permittee to address flood management, in the context of integrating management practices to maintain and restore watershed processes to protect beneficial uses, in the next General Plan Housing Element revision. 2007 State legislation has amended Government Code section 65302 to now require cities and counties to review the land use, conservation, and safety elements of the general plan "for the consideration of flood hazards, flooding, and floodplains" to address flood risks. The review of the land use element entails a local jurisdiction assessing floodplain mapping, groundwater recharge, and/or stormwater management information and determining if any of the information is new and/or differs from what is included in the existing general plan land use element. If the new data is different, then the existing general plan's background information, maps, goals, policies, and implementation measures, as well as the land use diagram may need to be amended.

In cooperation with the Governor's Office of Planning and Research, Housing and Community Development, California Emergency Management Agency, Central Valley Flood Protection Board, and California Geological Survey, the California Department of Water Resources prepared a guidance document describing how the 2007 flood risk management legislation affects city and county responsibilities related to local planning requirements, including general plans, development agreements, zoning ordinances, tentative maps and other actions. The document explains the location and designation of land uses in a general plan conservation element now "need to consider the identification of land and natural resources" that are used "for purposes of groundwater recharge and stormwater management."[23]

Governor's Office of Planning and Research (OPR) California General Plan Guidelines[24] has references relating to planning and general plan preparation that may be helpful to the Permittee. The General Plan Guidelines contains a section with recommendations on how cities and counties can adopt optional elements within the general plan including a flood management element, which encompasses both floodwater management and floodplain management with discussions at the individual community level and the regional level. OPR's guidelines are equally useful in situations where a city or county has unilaterally included flood management in its general plan and where an individual jurisdiction's flood management element is a part of a larger regional strategy to be implemented by more than one agency.

NRC comments on the importance of a watershed approach to flood and stormwater management, "The urban water system is not solely designed to manage the quality of runoff. It also must be capable of safely handling flooding from extreme storms to protect life and property. Consequently, communities need to ensure that their stormwater infrastructure can prevent increased flooding caused by development (and possibly exacerbated by future climate

[23] California Department of Water Resources. *Implementing California Flood Legislation into Local Land Use Planning: A Handbook for Local Communities*, October 2010. Web. 23 August 2011. p. 28, <http://www.water.ca.gov/LocalFloodRiskPlanning>.
[24] *General Plan Guidelines Update*. Governor's Office of Planning and Research. Web. 23 August 2011. <http://www.opr.ca.gov/index.php?a=planning/gpg.html>.

change). In addition, many stormwater control measures must be designed to safely pass extreme storms when they do occur. This usually requires a watershed approach to stormwater management to ensure that quality and quantity control are integrated together, with an emphasis on the connection and effective use of conveyance channels, streams, riparian buffers, and floodplains."[25]

[25] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. pp. 355-356

M. Public Education and Public Involvement

1. Legal Authority

The following legal authority applies to Section M – Public Education and Public Involvement:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

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 122.26(d)(2)(iv)(B)(6) provides that the proposed management program include “A description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials.”

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.”

4. Section M.1

Implementation of a Public Education Program is a critical BMP and a necessary component of a stormwater 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."[1] The USEPA Phase II Fact Sheet 2.3 finds that "An informed and knowledgeable community is critical to the success of a stormwater 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."[2]

5. Section M.2

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[1] State Water Resources Control Board. Nonpoint Source Pollution Control Program. *Urban Runoff Technical Advisory Committee Report,* November 1994. Web. 11 August 2011.
[2] USEPA. *Stormwater Phase II Final Rule Fact Sheet Series, Public Education and Outreach Minimum Control Measure – Fact Sheet 2.3, EPA 833-F00-005,* January 2000. Web. 23 August 2011 <http://www.epa.gov/npdes/pubs/fact2-3.pdf>.

The Permittee is encouraged to collaborate with other entities on public education and involvement. Collaboration provides the opportunity for decreasing costs as well as sharing of ideas and resources.

6. Section M.3

The public education and involvement must be tailored and targeted to specific water quality issues of concern in the relevant community. These community-wide and targeted issues must then guide the development of the comprehensive outreach program, including the creation of appropriate education strategy. The Permittee will determine the highest priority issues to be addressed by public education. Prioritization will provide for the most efficient use of resources.

7. Section M.4

This Order requires outreach to ethnically and socioeconomically diverse communities as well as children. The USEPA, Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children Fact Sheet finds that, “many residents of ethnically and culturally diverse communities don't speak English”[3]. 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 stormwater to a portion of the population who might otherwise be overlooked.

8. Sections M.5, M.6, and M.7

This Order requires the Permittee to incorporate the use of Community-Based Social Marketing or equivalent strategies/methods into its educational program to effectively change the waste disposal and runoff pollution generation behavior of the identified target audiences. Community-Based Social Marketing is a systematic way to change the behavior of communities to reduce their impact on the environment. Simply providing information is usually not sufficient to initiate behavior change. Community-Based Social Marketing uses tools and findings from social psychology to discover the perceived barriers to behavior change and ways of overcoming these barriers.

The Permittee will perform assessments during the term of this Order to quantitatively determine if knowledge has increased and if behavior has changed in target audiences for the identified Priority Stormwater Issue.

9. Section M.8

This Order requires the Permittee to implement a program to educate project applicants, developers, contractors, property owners, and other responsible parties. In order for the new development and redevelopment stormwater requirements to be implemented effectively, the public needs to understand the relevant stormwater requirements.

10. Section M.9

[3] "Tailoring Outreach Programs to Minority and Disadvantaged Communities and Children." *National Pollutant Discharge Elimination System (NPDES)*. USEPA. Web. 23 August 2011. <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results>.

This Order requires the involvement of the public, which includes a citizen advisory group to solicit feedback on the stormwater program, and opportunities for citizens to participate in implementation of the stormwater program. Stormwater management programs can be greatly improved by involving the community throughout the entire process of developing and implementing the program. Involving the public benefits both the Permittee itself as well as the community. By listening to the public's concerns and coming up with solutions together, the Permittee will gain the public's support and the community will become invested in the program. The Permittee will likewise gain even more insight into the most effective ways to communicate their messages. Public participation in implementation of the stormwater program can include many different activities such as stream clean-ups, storm drain markings, and volunteer monitoring.

11. Section M.10

This Order requires the Permittee's stormwater website include information on public education and involvement. This will be a resource for the public on stormwater topics, provide the public with direct information on aspects of the stormwater program, as well as provide the public with the information it needs to get involved with the stormwater program.

N. Trash Load Reduction

1. Legal Authority

The following legal authority applies to Section N (Trash Load Reduction):

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii) and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B-C) and 40 CFR 122.26(d)(2)(iv)(A-B).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(B) requires Permittees to demonstrate adequate legal authority to "prohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer." Illicit discharge includes discharge of trash to the MS4, which includes streets, gutters, surface waters, floodplains, and areas where trash could eventually be conveyed to the MS4 or receiving waters.

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(C) requires Permittees to demonstrate adequate legal authority to "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." This includes trash.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(1) requires proposed management programs to include "a description of maintenance activities and a maintenance schedule for structural controls to reduce pollutants (including floatables) in discharges from municipal storm sewer systems."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(1) requires proposed management programs to include "a description of a program, including inspections, to implement and enforce an ordinance, orders or similar means to prevent illicit discharges to the municipal separate storm sewer system; this program description shall address all types of illicit discharges."

4. Sections N.1 and N.2

The Order requires the Permittee to develop and implement a program to reduce trash in stormwater discharges from the MS4 to the MEP and to protect water quality. Trash is a persistent and noticeable problem in the MS4. The Permittee made trash reduction a primary emphasis during the previous permit term. Despite this effort, trash continues to be a persistent and noticeable problem in the MS4, particularly in the Salinas Reclamation Ditch. In addition, the Permittee continues to document large volumes of trash removed from the MS4 and receiving waters. According to the Permittee's Urban Watershed Management Program Annual Reports, the Permittee removed a total of 40 cubic yards of trash and debris in 2006-07, 11 tons plus 20 cubic yards in 2007-08, 370 cubic yards in 2008-09, and 2.5 tons plus 26 cubic yards in 2009-10. The purpose of the trash load reduction requirements is to focus the Permittee on making tangible and measurable reductions in trash loads discharged to the MS4 and from the MS4 to receiving waters.

The Basin Plan specifies the following narrative Water Quality Objectives for all inland surface waters, enclosed bays, and estuaries (Section II.A.2.a. General Objectives):

- For floating material: "Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses."
- For suspended material: "Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses."
- For settleable material: "Waters shall not contain settleable material in concentrations that result in deposition of material that causes nuisance or adversely affects beneficial uses."

The Order requires the Permittee to designate and implement structural and non-structural BMPs, including trash reduction ordinances, to prevent trash from entering the MS4 and to remove trash that has entered the MS4. Studies indicate that schools, parks, public venues, commercial retail centers and shopping districts, garbage and waste handling and storage areas, and loading areas are potentially significant sources of trash and litter to the MS4.[1,2] Therefore the Order directs the Permittee to focus trash reduction activities on these sources and on municipally-owned and/or operated facilities.

5. Section N.3

This Permittee is expected to use information obtained through required Trash Assessments conducted according to Section P.3.b (Monitoring, Effectiveness Assessment, and Program Improvement: Trash Action Level), Trash Quantification conducted according to Section P.2.b (Monitoring, Effectiveness Assessment, and Program Improvement: Trash Quantification), and other data in the development and implementation of the Trash Reduction Plan. Trash assessments will provide the Permittee with information about potential sources of trash discharges and subwatersheds discharging potentially significant trash loads to the MS4.

The Order requires the Permittee to develop a Trash Reduction Plan to significantly reduce trash entering the MS4 and remove trash that has entered the MS4. Trash capture devices incorporated into the MS4 is a proven method for removing floating trash and debris from the MS4. In addition, downtown commercial and/or shopping districts heavily trafficked by pedestrians are a known source of trash and litter. Since it can be difficult for the Permittee to require business owners to maintain municipal streets and sidewalks free of trash, the Order requires the Permittee to take the lead in reducing trash and litter in these areas.

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[1] A 2009 study conducted by Keep America Beautiful, Inc., found a correlation between litter generation and fast food restaurants, public areas, and transition areas (e.g., bus stations). In addition, the study found waste management areas (e.g., overfull garbage containers) to be a source of trash and litter, a strong correlation between pedestrian activity and litter in roadways. *2009 National Visible Litter Survey and Litter Cost Study Final Report*. Stamford, CT: Keep America Beautiful, Inc.; Mid Atlantic Solid Waste Consultants, 18 September 18, 2009. Web. 17 August 2011.

[2] A study conducted by Los Angeles County in 2002-2003 found commercial areas to have consistently higher litter rates than other land uses. *Trash Baseline Monitoring Results Los Angeles River and Ballona Creek Watersheds.* County of Los Angeles Department of Public Works, Watershed Management Division, 17 February 2004. Web. 18 August 2011 <http://dpw.lacounty.gov/wmd/TrashBaseline/links.cfm>.

6. Section N.4

The Order also requires the Permittee to develop a method for tracking trash load reductions. The purpose of tracking trash load reductions is to compare reductions with estimated loads in order to assess the effectiveness of stormwater management activities targeting trash.

O. Total Maximum Daily Loads

1. Legal Authority

The following legal authority applies to Section O – Total Maximum Daily Loads:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.44(d)(1) requires municipal stormwater permits to include any requirements necessary to, "[a]chieve water quality standards established under section 303 of the CWA, 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 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."

4. Sections O.1 and O.2

The CWA section 303(d)(1)(A) requires each State to conduct a biennial assessment of its waters, and identify those waters that are not achieving water quality standards. The resulting list is referred to as the CWA section 303(d) list. The CWA also requires States to establish a priority ranking for waters on the CWA section 303(d) list of impaired waters and to develop and implement TMDLs for these waters. A TMDL specifies the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and allocates the acceptable pollutant load to point and nonpoint sources. The elements of a TMDL are described in 40 CFR 130.2 and 130.7. A TMDL is defined as "the sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background" (40 CFR 130.2). Regulations further require that TMDLs must be set at "levels necessary to attain and maintain the applicable narrative and numeric water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality" (40 CFR 130.7(c)(1)). The regulations in 40 CFR 130.7 also state that TMDLs shall take into account critical conditions for stream flow, loading, and water quality parameters. The USEPA has circulated guidance for establishing wasteload allocations for stormwater discharges in TMDLs and their incorporation as numerical limitations in MS4 Stormwater Permits[1].

Stormwater discharges from developed and developing areas in Salinas are significant sources of certain pollutants that cause, may be causing, threatening to cause, or contributing to water quality impairment in Salinas' waters. Furthermore, as delineated in the CWA section 303(d) list, the Central Coast Water Board has found that there is a reasonable potential that municipal

[1] Wayland, Robert H., and James A. Hanlon. *Memorandum: Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs*. Washington, D.C.: USEPA, 22 November 2002. Web. 18 August 2011.

stormwater and non-stormwater discharges from MS4s cause or may cause or contribute to levels above water quality standards. In accordance with CWA section 303(d), the Central Coast Water Board is required to establish TMDLs for discharge of these pollutants to these waters to eliminate impairment and attain water quality standards. Since provisions in NPDES permits must reflect the assumptions and requirements of available TMDLs (40 CFR 122.44 (d)(1)(vii)(B)), the NPDES permit must incorporate the wasteload allocations as either BMPs, under specified circumstances (40 CFR 122.44(k)(2) & (3)), or as a Water Quality Based Effluent Limitations expressed numerically. The Order incorporates wasteload allocations as BMP requirements once the Office of Administrative Law approves TMDLs where the Permittee is listed as a responsible party. The Order requires the Permittee to develop and append to the SWMP, Wasteload Allocation Attainment Plans, and to include BMPs that are reasonably expected to achieve the wasteload allocations when implemented and properly maintained.

P. Monitoring, Effectiveness Assessment, and Program Improvement

1. Legal Authority

The following legal authority applies to Section P (Monitoring, Effectiveness Assessment, and Program Improvement):

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(iii) and Federal NPDES regulations 40 CFR 122.44(d)(1)(i-ii), 40 CFR 122.26(d)(1)(iv)(B), 40 CFR 122.26(d)(1)(iv)(E), 40 CFR 122.26(d)(2)(iii)(A-D), and 40 CFR 122.26(d)(2)(iv)(A).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iii) require discharge characterization, field screening, and development of a monitoring program.

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B) requires management programs to include "a description of procedures to conduct on-going field screening activities during the life of the permit, including areas or locations that will be evaluated by field screens."

Federal NPDES regulation 40 CFR 122.26(d)(2)(v) provides that Permittees shall include "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water."

4. All Sections

Order requirements should focus on stormwater management actions known to be most effective at improving stormwater discharge water quality and protecting receiving water conditions. However, too little is understood about the links between BMPs and discharge and receiving water quality, and the links themselves are difficult to establish. The number of factors affecting discharge water quality[1] obscures the link between BMPs and discharge water quality, while the size of watersheds and the number and type of dischargers within them further obscures the link between BMPs and receiving water quality. In addition, obtaining meaningful discharge and receiving water quality monitoring results is costly and requires a significant length of time. More information is needed on the effectiveness of stormwater management actions, how to measure the effectiveness of those actions, how stormwater management actions affect stormwater discharge quality and receiving water conditions, and which combination of actions will be most effective and efficient for the Permittee at reducing pollutants in stormwater discharges and protecting water quality.

Therefore the Monitoring, Effectiveness Assessment, and Program Improvement requirements contained in this Order have a three-fold objective: 1) focus effort on assessing pollutant load reductions achieved by BMPs; 2) obtain additional information that can help the Permittee

[1] These factors include the variability of rainfall (frequency, intensity, and duration), the level of control a permittee has over all actions within its jurisdiction that can affect discharge water quality, and "fluke" events that can radically skew discharge water quality for a short period of time.

understand the links between stormwater management actions and discharge and receiving water quality; and 3) modify stormwater management actions through an adaptive management approach to increase their effectiveness at reducing pollutant loads, improving stormwater discharge water quality, and protecting receiving water conditions.

The short term objective of the Monitoring, Effectiveness Assessment, and Program Improvement requirements is to focus monitoring and effectiveness assessment efforts on assessing and optimizing BMP effectiveness, while laying the groundwork for understanding the links between BMP performance and discharge and receiving water quality. This Order incorporates a range of effectiveness assessment methodologies to assess BMP effectiveness since different BMPs lend themselves to different methodologies. This Order also applies these methodologies over a range of scales to make use of available effectiveness assessment tools where they are most appropriate and will obtain the most tangible and useful information. This Order emphasizes those methodologies which target pollutant load reduction, because such methodologies provide tangible results in the short term that can be linked qualitatively and quantitatively to discharge and receiving water quality.[2] The Monitoring, Effectiveness Assessment, and Program Improvement requirements will provide tangible, quantitative information about the effectiveness of the Permittee's stormwater management actions, as well as information the Permittee can use to guide stormwater management decisions during the term of this Order.

The long term objective of the Monitoring, Effectiveness Assessment, and Program Improvement is to provide information about the link between stormwater management actions and discharge and receiving water quality. This information will inform future permit requirements and the Permittee's stormwater management decisions in future permit terms. In future permit terms, requirements for BMP implementation, monitoring and effectiveness assessment, and adaptive management will be informed by data collected and lessons learned during the term of this Order about the links between stormwater management actions and discharge and receiving water quality.

Monitoring is a critical component in understanding the link between permit requirements, the benefits achieved due to those requirements, and the condition of receiving waters. Monitoring is also an essential link in the improvement of stormwater management actions. Data collected through monitoring provides information about the effectiveness of stormwater management actions, which is vital for the success of the iterative approach used to meet the MEP standard for stormwater. Specifically, when data indicates that a particular BMP or program component is not effective, improved efforts can be selected and implemented. Also, when water quality data indicate that water quality standards or objectives are being exceeded, particular pollutants, sources, and drainage areas can be identified and targeted for specific management efforts.

Regarding the assessment of the effectiveness of stormwater management programs, USEPA states that "At a minimum, applicants must submit estimated reductions in pollutant loads expected to result from implemented controls and describe known impacts of storm water

[2] Pollutant load reduction assessment methodologies quantify the amount of particular pollutants removed by BMPs. While such assessments do not quantify the link between BMP performance and discharge or receiving water quality, it can reasonably be assumed that removing pollutants has a positive effect on water quality.

controls on groundwater."[3] USEPA suggests that the assessments include direct and indirect measurements of effectiveness, stating that "Reductions in pollutant loads due to the implementation and maintenance of structural controls provide direct measurements of the effectiveness of the storm water management program." In addition, USEPA encourages stormwater program managers to go beyond the minimum requirement and assess the effectiveness of their programs through other direct measurements as well as indirect measurements."[4] USEPA also recommends that monitoring data be used to substantiate or refine the assessment, suggesting that "the estimated removal efficiencies can be refined through the monitoring program. … Throughout the permit term, the municipality must submit refinements to its assessment or additional direct measurements of program effectiveness in its annual report."[5] Finally, USEPA suggests that the assessment be used for long-term assessment of progress when it states, "The applicant should use direct measurements of program effectiveness as it begins to assess its long-term progress in improving water quality through storm water management practices. … [A]pplicants are encouraged to use direct measurements of program effectiveness, such as annual pollutant loads, event mean concentrations, and seasonal pollutant loadings, to begin to estimate long-term trends."[6]

Federal NPDES regulations require municipalities to reduce pollutants in their stormwater discharges and to protect water quality. The regulations intend that permittees apply improved knowledge regarding water quality impacts and protective measures, in an adaptive management fashion, to modify and improve their BMPs. Ongoing assessment of the effectiveness of BMPs is a critical piece of this adaptive management loop. Such assessment provides data that can be used to optimize program effectiveness and establish the link between BMP performance and receiving water conditions.

Section P (Monitoring, Effectiveness Assessment, and Program Improvement) establishes an adaptive management framework for this Order. The Section requires both specific activities and broader programs to be assessed since the effectiveness of watershed efforts may be evident only when considered at different scales. The Permittee shall evaluate the overall effectiveness of the municipal stormwater program using information from the monitoring program, progress toward meeting measurable goals, and other indicators. An assessment of the stormwater management program effectiveness provides the Permittee a means to modify portions of the program to protect and/or improve water quality. The goal of this Order and stated by USEPA "establish[es] a comprehensive monitoring and assessment program … to track progress in complying with permit provisions and implementing a program to protect water quality."[7] This Order requires the Permittee to implement a program of stormwater management through adaptive management. This Order does this by requiring the Permittee to: assess the effectiveness of BMPs at reducing pollutant loads (Section P.1); characterize baseline load and load reductions of pollutants and other water quality stressors (Section P.2); apply action levels related to stormwater discharge conditions and trash (Section P.3); conduct a monitoring program focused on action level monitoring and stormwater discharge long-term trend monitoring (Section P.4) and receiving water long-term trend monitoring (Section P.5);

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[3] USEPA. *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,* November 1992. Web. 10 August 2011.
[4] *ibid*.
[5] *ibid*.
[6] *ibid*.
[7] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p.95.

conduct effectiveness assessment evaluation of the entire stormwater program (Section P.6); and identify improvements to the stormwater program to be implemented in the subsequent permit term (Section P.7).

Stormwater management is an evolving subject area that necessitates an adaptive management approach in which stormwater management actions are based on the current understanding of the science and program modifications result from new information. Adaptive management is predicated on the idea that in complex systems like urban watersheds, the information needed to fully inform management decisions is only partially available. Stressors like impervious cover interact with resource conditions, such as flow regimes, in sometimes unpredictable ways to produce varying effects on multiple beneficial uses. Basing stormwater management actions on poorly understood linkages is defensible when the results of the actions are systematically evaluated through monitoring and assessment, and the evaluation results in modification of subsequent actions. The adaptive management requirements are designed to answer the following questions:

- Are BMPs reducing pollutants to the MEP and protecting water quality?
- How can/must BMPs be modified to reduce pollutants to the MEP?
- How can/must BMPs be modified to achieve water quality standards?

Adaptive management requirements in this Order take into account the complex nature of municipal stormwater management and the number and variety of factors affecting discharge and receiving water quality that make it difficult for stormwater managers to make clear cause-and-effect connections between discharge and receiving water conditions, and to determine appropriate BMP modifications that would influence those conditions. The requirements also take into account the amount of data needed to make reasonable adaptive management decisions; the length of time required to collect the necessary data; the cost of making modifications; and the potential that even reasonable management decisions may not reduce pollutant loads or affect water quality as anticipated, due to the variety of factors involved. Permit requirements specify a level of effort in making adaptive management decisions and program modifications in line with these factors.

Adaptive management is an on-going process that will span multiple permit cycles. Permit requirements are based on the current understanding of the science, and new information (obtained from outside sources or the Permittee's own assessment activities) can improve understanding of stormwater management action efficiency and effectiveness, resulting in modifications to stormwater management actions.

5. Section P.1

Federal regulations require the Permittee to reduce pollutants in stormwater discharges to the MEP and protect water quality. However, the cost and complexity of monitoring programs capable of isolating municipal stormwater contributions to receiving water conditions makes it difficult for stormwater managers to evaluate the effectiveness of stormwater management actions. In addition, the variability of rainfall, BMP performance, and stormwater discharge conditions hinders the development and implementation of stormwater discharge effluent limits and BMP performance targets. Therefore assessing BMP effectiveness is an efficient means for the Permittee to ensure its stormwater management efforts are resulting in tangible outcomes. This Order establishes BMP effectiveness assessment requirements that will help answer the following questions:

- Are BMPs effective?

- How can the effectiveness and efficiency of BMPs be improved?
- Are pollutant loads decreasing due to BMP implementation?
- What are the links between stormwater management actions, pollutant loads, and discharge water quality?

This Order requires the Permittee to modify BMPs to improve their performance and pollutant load reduction on the basis of effectiveness assessments. This Order establishes two types of BMP effectiveness assessment requirements:

- General effectiveness assessment requirements for BMPs that do not lend themselves easily to quantitative measurement of pollutant load reductions; and
- Focused effectiveness measures for BMPs that lend themselves to quantitative measurement of pollutant load reductions or proxies of pollutant load reductions.

The increased specificity of effectiveness assessment requirements for General and Focused BMP Effectiveness Assessment constitutes a change in this Order. The previous Order provided only limited performance criteria for BMPs. However, these criteria resulted in only limited quantitative information about BMP effectiveness. Discrete information on outcomes is necessary to evaluate compliance with the technology-based MEP standard and protection of water quality. In the absence of information about the degree and effectiveness of implementation, it is not reasonable to continue assuming compliance from implementation of management measures. The previous Order thus presented challenges in demonstrating compliance for both the Permittee and Central Coast Water Board staff. To address this, this Order introduces specific performance criteria and performance measures in the language itself.

This Order requires the Permittee to assess the effectiveness of public education and municipal staff training efforts. Such efforts are intended to achieve changes in the knowledge and behavior of identified target audiences so that desired behavior changes occur. Therefore the effectiveness of such efforts must be assessed through the use of measures capable of quantifying such changes. This Order provides guidance on the types of measures the Permittee may use to conduct this assessment. The requirements for assessing the effectiveness of public education and municipal staff training efforts are consistent with municipal stormwater program effectiveness assessment guidance.[8] The objective of the requirements is to focus the Permittee's assessment of BMP effectiveness on measureable changes in knowledge and behavior in specific target audiences that the Permittee can use to improve the effectiveness of public education and municipal staff training efforts at reducing pollutants in stormwater discharges to the MEP and protecting water quality.

This Order establishes specific requirements for Focused BMP Effectiveness Assessment designed to determine the effectiveness of identified BMPs at reducing pollutants in stormwater discharges to the MEP. This Order provides flexibility for the Permittee to propose alternative focused effectiveness measures for approval by the Central Coast Water Board Executive Officer. Assessment requirements included in this Order include science-based estimates, direct measurements, and visual comparisons (including the use of photographs). This Order also applies proxy measurements of pollutant removal based on behavior (e.g., inspections) for BMPs that do not lend themselves readily or inexpensively to direct measurement of pollutant

[8] California Stormwater Quality Association (CASQA). *Municipal Stormwater Program Effectiveness Assessment Guidance*, May 2007. Web. 17 August 2011 <www.casqa.org>. The guidance identifies the assessments contained in this Order as assessments of "Level 2" (changed knowledge) and "Level 3" (changed behavior) outcomes.

load reductions. Focused BMP effectiveness assessment requirements take into account the following factors:

- The level of effort required for assessment activities, adaptive management decisions, and program modifications, during the term of this Order and in future permit terms, is appropriate with regard to the precision, accuracy, and quantity of data that can be collected and the potential for management decisions and modifications to result in water quality improvements;
- The level of effort required for assessment activities, adaptive management decisions, and program modifications is appropriate with regard to the cost-effectiveness of assessment activities and the cost-effectiveness of making modifications to BMPs; and
- Requirements for the level of precision, accuracy, and quantity of assessment data collected is appropriate with regard to the assessment methodologies used.

This Order requires the Permittee to assess and modify BMPs to improve their effectiveness at reducing pollutants loads, or when the BMPs are found to be ineffective. Since development of quantitative assessment methodologies for BMP effectiveness is ongoing, this Order provides guidance on what to measure, how to measure it, and how to analyze the data obtained. The level of effort required for adaptive management is commensurate with the quality of data obtained through assessment activities and the time required for assessment activities to yield information that supports management decisions.

This Order requires the Permittee to evaluate the effectiveness of BMP implementation at High Priority Municipal Facilities, Operations, and Events; Commercial and Industrial facilities and operations; and High Priority Construction Sites. Inspections are an effective and efficient means of determining compliance with requirements of this Order when the inspections are specific, comprehensive, and can be quantified. Therefore this Order requires the Permittee to assess the effectiveness of the Permittee's efforts in these program areas in terms of achieving an Inspection Rating of "B" or higher at each inspection of each site, as defined in Attachment G, and in terms of achieving increasing Inspection Ratings over time. While this Order requires the Permittee to strive, through BMP implementation and modification, to achieve "A" Inspection Ratings at all High Priority Municipal Facilities, Operations, and Events; Commercial and Industrial facilities and operations; and High Priority Construction Sites; this Order recognizes the importance of risk level and prioritization in the enforcement of requirements. Therefore this Order identifies a "B" Inspection Rating (i.e., minor non-compliance or low risk of pollutant discharge) as a reasonable performance target for this permit term. This Order also requires the Permittee to assess the effectiveness of follow-up activities by tracking improvements in Inspection Rating achieved through reinspection of low-performing sites. This Order defines a low-performing site as one which receives an Inspection Rating of "E" or "F" during an inspection. This Order does not presume that sites with Inspection Ratings of "D" or higher are performing adequately; rather, it identifies a compliance level at which performance is considered low enough that focused follow-up is reasonable and expected. In addition, this Order requires the Permittee to evaluate the effectiveness of the construction site stormwater management program in terms of the percentage of High Priority Construction Sites with Inspection Ratings of "B" or higher at the time of a rain event. Lack of compliance with the requirements of this Order at a construction site is not necessarily a reliable indicator of the Permittee's efforts, because the Permittee has limited control over construction site operators prior to an inspection. However, the Permittee has more control of how construction site operators respond to the results of inspection, through the Permittee's enforcement efforts. This Order emphasizes the evaluation of the effectiveness of Permittee's enforcement efforts by allowing the Permittee to reinspect sites prior to rain events. In this way the Permittee may achieve, through follow-up efforts prior to the rain event, Inspection Ratings of "B" or higher at

sites originally found to have lower Inspection Ratings, and be able to count such sites as ready for the rain event.

This Order recognizes that it may not be reasonable to expect the Permittee to achieve Inspection Ratings of “B” or higher at all regulated sites. There are many unpredictable factors over which the Permittee has limited control that can cause small instances of non-compliance on any given day. Therefore this Order requires the Permittee to calculate the average Inspection Rating each year for each site category (i.e., High Priority Municipal Facilities, Operations, and Events; Commercial and Industrial facilities and operations; High Priority Construction Sites; and Fast Food Restaurants and Commercial Retail Centers), and to track improvements in the average Inspection Rating for each site category from year to year. This Order does not require the Permittee to achieve an increasing average Inspection Rating for a site category if the average Inspection Rating for the site category is “B” or higher. Where the average Inspection Rating for a site category is “B” or higher, , the Permittee’s compliance with the requirements of this Order will be based on the Permittee’s level of effort at improving Inspection Ratings, rather than on the Permittee’s success at achieving further increases in the average annual Inspection Rating for that site category.

This Order requires the Permittee to evaluate the effectiveness of catch basin cleaning efforts in terms of amount of sediment detected. According to a Stormwater Manager’s Resource Center fact sheet[9], catch basins are able to capture sediment only until they are approximately 60 percent full. Therefore this Order requires the Permittee to modify the catch basin cleaning schedule whenever a catch basin is found to be at least 60 percent full. This Order considers the Permittee’s catch basin cleaning efforts to be effective when all catch basins are cleaned before they are found to be 60 percent full. This Order also requires the Permittee to use data collected from catch basin cleaning to identify areas that are significant sources of sediment to the MS4. Catch basins are designed to capture sediment, and as such are an important element in the Permittee’s overall sediment removal efforts. At the same time, sediment in catch basins is an indication of sediment sources and provides information about the effectiveness of other BMPs at controlling sediment at those sources.

This Order requires the Permittee to evaluate the effectiveness structural BMP maintenance efforts in terms of the maintenance level over time. This Order considers the Permittee’s structural BMP maintenance efforts to be effective when all structural BMPs are maintained to at least an “acceptable” level at all times according to the Lake Tahoe BMP RAM, or equivalent method.

This Order requires the Permittee to evaluate the effectiveness of street sweeping efforts in terms of the volume of solid material collected. Measuring the volume of solid material collected allows the Permittee to compare street sweeping performance over time and between one Urban Subwatershed and another.

This Order requires the Permittee to evaluate the effectiveness of efforts to reduce pesticide, herbicide, and fertilizer use in close proximity to rain events. Pesticides, herbicides, and fertilizers are more vulnerable to being carried by stormwater runoff into the MS4 and receiving waters when they are used immediately prior to rain events. Therefore this Order requires the Permittee to record and track municipal use of these substances in the seven days prior to a

[9] "Pollution Prevention Fact Sheet: Catch Basins." *The Stormwater Manager's Resource Center*. The Center for Watershed Protection. Web. 18 Aug. 2011. <http://www.stormwatercenter.net/Pollution_Prevention_Factsheets/CatchBasins.htm>.

rain event. This Order considers the Permittee's efforts to reduce municipal pesticide, herbicide, and fertilizer use in close proximity to a rain event to be effective when the Permittee no longer uses any of these substances within seven days prior to a rain event.

This Order requires the Permittee to evaluate the effectiveness of efforts to reduce the discharge of pollutants to the MS4 from industrial sites through analysis of data submitted under the General Industrial Permit. This Order does not intend that the Permittee enforce the General Industrial Permit, but that the Permittee use the data reported under the General Industrial Permit to assess and improve the Permittee's program and focus the Permittee's efforts on the most significant problems. Information reported under the General Industrial Permit is submitted electronically and is available to the Permittee through the SMARTS reporting system.

This Order requires the Permittee to evaluate the effectiveness of riparian protection policies and requirements at protecting riparian areas. While losses in riparian area quantity and quality can occur in already-developed areas, riparian losses occur primarily through development. This Order includes riparian buffer requirements which the Permittee is required to apply to development projects. The Permittee is required to track exemptions, exceptions, and variances to riparian buffer requirements it permits for development projects, and to use this information to assess the Permittee's implementation of the riparian buffer requirements contained in this Order, and the effectiveness of the riparian buffer requirements themselves at providing adequate protection for riparian areas. In addition, this Order requires the Permittee to assess the quality of riparian areas created, enhanced, or restored as mitigation for development impacts. To adequately mitigate for impacts, mitigation areas must fully replace all water quality functions, beneficial uses, and watershed processes lost or damaged. This Order requires the Permittee to assess mitigation areas to ensure that its mitigation requirements effectively replace these values when they are lost or damaged due to development.

6. Section P.2

Federal NPDES regulation 40 CFR 122.26(d)(1)(iii)(E) requires the Permittee to characterize the quality of its stormwater discharges. In addition, Federal NPDES regulation 40 CFR 122.26(d)(2)(v) requires the Permittee to estimate reductions in pollutant loads in stormwater discharges resulting from stormwater management actions. USEPA identifies the need for stormwater management programs to address the increased quantity of stormwater discharges due to development, noting that the volume, duration, and velocity of stormwater discharges can cause degradation to aquatic systems. As a result, restoring the physical, chemical, and biological integrity of receiving waters must be a central issue in stormwater permits.[10]

This Order requires the Permittee to develop quantitative estimates of fundamental conditions useful for assessing impacts to water quality and beneficial uses from stormwater discharges at the Urban Subwatershed scale. Additional information is needed about current pollutant loads to help the Permittee establish priorities for BMP and program improvements. Therefore this Order requires the Permittee to determine loads of selected pollutants, as well as other stressors that are related to the Permittee's stormwater discharges. The requirements are intended to provide information that can help answer the following questions:

- Which Urban Subwatersheds are the biggest sources of priority pollutants and other stressors?

[10] USEPA. *MS4 Permit Improvement Guide. EPA 833-R-10-001,* 14 April 2010. Web. 16 August 2011. p. 50.

- To what extent are priority pollutants and other stressors being reduced by existing BMPs?

This Order identifies models and methods the Permittee shall use, unless otherwise approved by the Central Coast Water Board Executive Officer, to develop these estimates. The models and methods are simple, accessible, inexpensive, and sufficiently precise for comparative purposes between Urban Subwatersheds and over time. The requirements fulfill the purpose of Section P (Monitoring, Effectiveness Assessment, and Program Improvement) by providing quantitative information the Permittee can use to understand current conditions and impacts, track conditions over time, prioritize stormwater management efforts, and increase understanding of the links between stormwater management actions and water quality. This Order requires the Permittee to develop these estimates of fundamental conditions on an Urban Subwatershed scale, which will allow the Permittee to identify more heavily impacted Urban Subwatersheds within the Permit coverage area, gain information about the link between actions and water quality results at a usable scale, and prioritize individual Urban Subwatersheds for focused stormwater management efforts. These estimates of pollutant loads and load reductions associated with BMP implementation will also allow the Permittee to determine if its BMPs are significantly reducing pollutant loads, or if another BMP approach should be pursued. This Order provides flexibility by allowing the Permittee to propose alternative models and methods for approval by the Central Coast Water Board Executive Officer.

A variety of models and methods is available for developing quantitative estimate of pollutant loads in municipal stormwater discharges, ranging from simple spreadsheet calculations to complex and costly computer models requiring extensive calibration. The Pollutant Load Quantification method established in this Order is based on the Center for Watershed Protection's Watershed Treatment Model, which provides a quantitative estimate of pollutant loads that is sufficiently precise for comparative purposes but is simple and inexpensive to use. This Order identifies a suite of pollutants for quantification that are typical in municipal stormwater discharges. This Order requires the Permittee to quantify pollutant loads three times during the term of this Order: in Year 1, Year 3, and Year 5. This frequency will allow the Permittee to update the model to incorporate stormwater management activities implemented as required by this Order and determine the effect of these activities on pollutant loads over time.

The Trash Quantification method required in this Order is based on the method developed by Los Angeles County.[11] Los Angeles County conducted a trash baseline monitoring study in 2002-03 that determined average trash generation rates per acre for various urban land uses in the Los Angeles River and Ballona Creek watersheds. This Order assumes that unit trash generation rates do not vary significantly between Los Angeles County and the Permit coverage area, as suggested by the Keep America Beautiful trash study.[12] However, this Order allows the Permittee to propose alternative trash generation rates for approval by the Central Coast Water Board Executive Officer. This Order relates Salinas land uses to Los Angeles County land uses through comparison of land use descriptions contained in the Salinas General Plan

[11] As reported in Trash Baseline Monitoring Results: *Trash Baseline Monitoring Results Los Angeles River and Ballona Creek Watersheds.* County of Los Angeles Department of Public Works, Watershed Management Division, 17 February 2004. Web. 18 August 2011 <http://dpw.lacounty.gov/wmd/TrashBaseline/links.cfm>.

[12] *2009 National Visible Litter Survey and Litter Cost Study Final Report*. Stamford, CT: Keep America Beautiful, Inc.; Mid Atlantic Solid Waste Consultants, 18 September 18, 2009. Web. 17 August 2011. The study found that trash was present consistently in all geographical areas.

and in the Los Angeles River Watershed Trash TMDL.[13] The definition of trash used in this Order is consistent with the definition used in the Los Angeles County Trash Baseline Monitoring study.

This Order requires the Permittee to derive land areas from actual land uses, rather than proposed or generalized land uses, such as those associated with zoning categories. Zoning classifications indicate only allowed uses within a Zone, and furthermore do not consider uses which predate the adoption of the zoning code. A reliable determination of the Baseline Trash Load (BTL) requires more precise information about land uses within the area tributary to the MS4. This Order allows the Permittee to use the zoning classification for undeveloped parcels.

This Order allows the Permittee to propose areas for exclusion from the calculation of BTL provided the Permittee can demonstrate that the area proposed for exclusion is not a source of trash loads to the MS4 or receiving waters.

This Order requires the Permittee to quantify runoff from lands within the Permit coverage area. Increased runoff from development is a potential threat to water quality and beneficial uses. Therefore this Order requires the Permittee to quantify pre-developed and developed runoff, and use this information to assess current runoff conditions, identify increases in runoff resulting from development, identify areas for runoff reduction improvements, and determine the results of runoff reduction improvements. This Order also requires the Permittee to quantify the runoff from the 24-hour, 85th percentile storm event. The Permittee's Stormwater Development Standards establish the 24-hour, 85th percentile storm event as the design event for post-construction stormwater management requirements. Therefore it is essential that the Permittee understand runoff conditions associated with this event so that the Permittee can assess the adequacy of the design standard.

7. Section P.3

This Order establishes Action Levels related to selected pollutants and trash. The approach of using Action Levels is consistent with recommendations made by USEPA in its *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits*, dated August 26, 1996.[14] The State Water Board's Storm Water Panel[15] also recommends the use of stormwater discharge action levels, based on the 90th percentile of municipal stormwater monitoring data contained in the National Stormwater Quality Database, as a means of assessing municipal stormwater management program effectiveness.

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[13] Los Angeles Regional Water Quality Control Board. Trash Total Maximum Daily Loads for the Los Angeles River Watershed. Los Angeles, CA: 9 August 2007. Web. 23 August 2011 <http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/bpa_50_2007-012_td.shtml>.

[14] "Under the Clean Water Act (CWA) and NPDES Regulations, permitting authorities may employ a variety of conditions and limitations in storm water permits, including best management practices, performance objectives, narrative conditions, monitoring triggers, action levels (e.g., monitoring benchmarks, toxicity reduction evaluation action levels), etc., as the necessary water quality-based limitations, where numeric water quality-based effluent limitations are determined to be unnecessary or infeasible."

[15] State Water Resources Control Board. *Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities,* 19 June 2006. Web. 17 August 2011 <http://cmua.org/Files/swpanel_final_report.pdf>.

Action levels are measurable criteria designed to quantify the performance of BMPs. Action levels are not effluent limitations. CWA section 502(1) defines an effluent limitation as "any restriction established by a State or the Administrator on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources" into Waters of the U.S. Section 13385.1(c) defines an effluent limitation as a "numerically expressed narrative restriction, on the quantity, discharge rate, concentration, or toxicity units of a pollutant or pollutants that may be discharged from an authorized location." An Action Level is not a restriction on a quantity, rate, or concentration, but is a level at which actions that further reduce pollutants from that discharge point need to be evaluated in order to reduce stormwater pollutants to the MEP. Thus, Action Levels are not effluent limitations as defined by the CWA or CWC. The purpose of action levels is to provide quantitative results the Permittee can use to determine the effectiveness of BMPs. Through the iterative adaptive management process, Action Levels are designed to prevent stormwater discharges from causing or contributing to violations of receiving water quality standards. Neither exceedances of Stormwater Discharge Action Levels nor Trash Assessment Scores that fall below the Trash Action Level create a presumption that the Permittee is not achieving MEP. However, failure to take required actions in response to these events in an iterative manner creates a presumption that the Permittee has not complied with the MEP standard.

This Order establishes Action Levels as a means of measuring the effectiveness of BMPs that do not lend themselves easily to quantitative assessments of pollutant removal (e.g., public education activities). These requirements assess the cumulative effectiveness of the Permittee's stormwater management program as a whole, providing information on the effectiveness of those BMPs for which pollutant removal cannot easily be quantified.

This Order establishes specific actions the Permittee shall take in response to exceedances of Stormwater Discharge Action Levels and Trash Assessment Scores that fall below the Trash Action Level. These actions include conducting source analyses, reviewing current BMPs for compliance with the MEP standard, and modifying BMPs to achieve the MEP standard for relevant pollutants.

The Action Levels described in this Order will be reviewed and updated at the end of each permit cycle. The data collected pursuant to Section P.3 (Action Levels) will be used to update Action Levels and required responses based information collected during term of this Order.

This Order establishes Stormwater Discharge Action Levels for selected pollutants. Numeric action levels for pollutants in municipal stormwater discharges are consistent with the recommendations of the State Water Board's Storm Water Panel.[16] Stormwater Discharge Action Levels are measurable criteria which quantify the performance of BMPs for a particular urban catchment. Thus, the Permittee can utilize Stormwater Discharge Action Levels to determine the effectiveness of BMPs on the stormwater effluent from a particular area of the MS4.

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[16] "For catchments not treated by a structural or treatment BMP, setting a numeric effluent limit is basically not possible. However, the approach of setting an 'upset' value, which is clearly above normal observed variability, may be an interim approach that would allow "bad actor" catchments to receive additional attention." State Water Resources Control Board. *Storm Water Panel Recommendations to the California State Water Resources Control Board: The Feasibility of Numeric Effluent Limits Applicable to Discharges of Storm Water Associated with Municipal, Industrial, and Construction Activities,* 19 June 2006. Web. 17 August 2011 <http://cmua.org/Files/swpanel_final_report.pdf>.

This Order includes Stormwater Discharge Action Levels for turbidity, nitrate and nitrite, copper, zinc, fecal coliform, and selected pyrethroid pesticides. The Permittee has tentatively identified copper, zinc, and bacteria as pollutants of concern. In addition, Table XII.P.1 indicates the 2010 303(d) list impairments relevant to the Stormwater Discharge Action Levels:

Table XII.P.1. 2006 CWA 303(d) List Impaired Waters

Water Body	**Pollutant/Stressor**
Gabilan Creek	Fecal coliform, Nitrate, Turbidity, Toxicity
Natividad Creek	Nitrate, Turbidity, Toxicity
Salinas Reclamation Ditch	Fecal coliform, Pesticides, Copper, Nitrate, Turbidity, Toxicity
Salinas River	Fecal coliform, Nitrate, Pesticides, Turbidity, Toxicity
Santa Rita Creek	Fecal coliform, Nitrate, Turbidity

While neither pyrethroid pesticides nor sediment are listed as a cause of water quality impairment in the water bodies listed in above, pyrethroids are an emerging pollutant in municipal stormwater discharges. Pyrethroids and other classes of pesticides are also known to bond with sediment, so that reducing sediment in stormwater discharges can reduce pesticide and other pollutant discharges, as well.

Stormwater Discharge Action Levels for copper, zinc, nitrate and nitrite, and turbidity have been developed using Phase I stormwater effluent data for the arid west region (USEPA Rain Zone 6) contained in the National Storm Water Quality Database.[17,18] While the Permittee has accumulated a large monitoring dataset throughout its permit history, Central Coast Water Board staff has concluded that there is insufficient monitoring of stormwater discharges (discharges of stormwater from the MS4 to receiving waters) to determine Stormwater Discharge Action Levels from this monitoring data alone. Therefore Stormwater Discharge Action Levels established in this Order for these pollutants are derived from the National Storm Water Quality Database data using a straightforward percentile approach, with Stormwater Discharge Action Levels set at the 90th percentile of the dataset (i.e., exceedance of a threshold for a pollutant means that the stormwater discharge falls within the worst ten percent of discharges recorded in the dataset for that pollutant). Setting Action Levels at this threshold will focus the Permittee's response on the worst performing urban catchments and pollutant conditions. This approach is consistent with the 2006 State Board's Storm Water Panel Report.[19]

The Stormwater Discharge Action Level for fecal coliform is derived from a water quality objective rather than a statistical "outer limit" of observed urban stormwater effluent qualities. In September 2010, the Central Coast Control Board adopted the Lower Salinas River Fecal

[17] "National Stormwater Quality Database (NSQD) Version 3 Spreadsheet." *MS4 Project*. University of Alabama, 3 Feb. 2008. Web. 23 Aug. 2011. <http://rpitt.eng.ua.edu/Research/ms4/mainms4.shtml>.
[18] See Table XII.P.2.
[19] "The ranked percentile approach … relies on the average cumulative distribution of water quality data for each constituent developed from many water quality samples taken for many events at many locations. The Action Level would then be defined as those concentrations that consistently exceed some percentage of all water quality events (i.e. the 90th percentile). In this case, action would be required at those locations that were consistently in the outer limit (i.e. the uppermost 10th percentile) of the distribution of observed effluent quantities from urban runoff."

Coliform TMDL,[20] which identifies wasteload allocations for fecal coliform in municipal storm drain discharges. The recommended wasteload allocations are consistent with the Basin Plan water quality objective for water-contact recreation (REC-1); specifically, that fecal coliform concentration is not to exceed a log mean of 200 MPN/100 ml in receiving waters, based on a minimum of not less than five samples for any 30-day period; or exceed 400 MPN/100 ml in receiving waters in ten percent of total samples during any 30-day period. Though it is derived from a water quality objective, the Stormwater Discharge Action Level for fecal coliform is not in itself an effluent limitation. Rather, the Stormwater Discharge Action Level provides an interim action level until such time as there is an approved TMDL for fecal coliform applicable to the Permittee. Due to the unpredictable nature of rainfall events and stormwater runoff, and the limited stormwater discharge sampling required by this Order, Central Coast Water Board staff concluded that it is impractical to base the Stormwater Discharge Action Level for fecal coliform on a percentage of samples taken within a 30-day period.

The Stormwater Discharge Action Levels for pyrethroid pesticides are set at the LC50 threshold established by USEPA.[21] The severity of toxicity to invertebrate aquatic organisms associated with the LC50 threshold makes it appropriate for an action level intended to identify MS4 stormwater discharge points as definitive “bad actors” which the Permittee shall address.

This Order identifies actions the Permittee shall take in response to the second exceedance within the term of this Order of any Stormwater Discharge Action Level in any urban catchment monitored according to the requirements of this Order. This Order accounts for the variableness of stormwater discharges and stormwater discharge quality by requiring actions in response to the second exceedance rather than after the first exceedance. The exceedances must involve the same constituent and occur in the same urban catchment. Exceedance of a SAL does not create a presumption that MEP is not being met. However, failure to take required actions in response to Stormwater Discharge Action Level exceedances in an iterative manner does create a presumption that the Permittee has not complied with the MEP standard. This Order requires the Permittee to determine whether existing BMPs are sufficient to reduce pollutants in stormwater discharges to the MEP, identify and implement modifications to existing BMPs to improve their effectiveness, and identify and implement new BMPs as necessary to reduce pollutants in stormwater discharges to the MEP.

A second Stormwater Discharge Action Level exceedance is an indication that the MS4 stormwater discharge point is a definitive “bad actor” which the Permittee shall address. For the past 2 permit cycles (11 years), the Permittee has utilized non-numerical limitations (BMPs) to control and abate the discharge of pollutants in stormwater discharges to the MEP. The Permittee has had 11 years to research, develop, and deploy BMPs that are capable of reducing pollutants in stormwater discharges from the MS4 to levels represented in the Stormwater Discharge Action Levels. Stormwater Action Levels are set at such a level that any exceedance of a Stormwater Discharge Action Level will clearly indicate that BMPs implemented by the Permittee are insufficient to protect the beneficial uses of receiving waters.

This Order establishes a Trash Action Level. The purpose of the Trash Action Level is to assess the effectiveness of the Permittee’s stormwater actions targeting trash and litter. The Subwatershed Trash Action Level is based on the RTAM developed by the San Francisco Bay

[20] The Lower Salinas River Fecal Coliform TMDL currently awaits approval by the State Water Board and USEPA.

[21] LC50 stands for Lethal Concentration 50, the concentration of a chemical which kills 50 percent of the sample population.

Regional Water Quality Control Board,[22] unless approved by the Central Coast Water Board Executive Officer. The RTAM provides a rapid assessment methodology for assessing trash in natural or anthropogenic open channels. The methodology was developed in 2004 by SFBRWQCB as part of its Surface Water Monitoring Program. The methodology is in use by Phase I municipal stormwater Permittees in the San Francisco Bay Region, Los Angeles County, San Diego County, and Orange County. The first assessment event at each site will clean the trash from the site and provide a clean site as the baseline for subsequent assessments.

This Order establishes a Trash Action Level of 79 points calculated according to the scoring protocol of the RTAM. Any trash assessment score so determined according to RTAM that is equal to or less than 78 will require the Permittee to take the actions required by this Order. The Trash Action Level is set at the midpoint of the "suboptimal" condition category as defined by the RTAM. Central Coast Water Board staff concluded that this score is a feasible and reasonable action level considering that this Order requires collection of all trash at the assessment location twice each year. This collection is in accordance with RTAM and provides the necessary control condition for subsequent assessments. As a result of this requirement, the trash detected at each site during required assessments will be the result of recent accumulation.

This Order specifies locations within which the Permittee shall select assessment sites. The required locations provide a broad representation of trash conditions within the Permittee's MS4 and of trash in stormwater discharges. This Order requires the Permittee to isolate the assessment sites from other trash clean-up activities, which would interfere with the results of the assessments. The purpose of this requirement is to provide a good control condition for each site so that the Trash Assessment Score from each assessment represents the trash accumulation subsequent to the previous assessment event.

Beginning in Year 2 the Permittee shall take actions identified in this Order when any Trash Assessment at any Trash Assessment Site results in a Trash Assessment Score that falls below the Trash Action Level. This Order requires the Permittee to clean each Trash Assessment Site during Year 1 as part of trash collection activities associated with required assessments. Beginning in Year 2, Trash Assessment Scores will be representative of trash discharged or dumped from the permit area since the previous assessment event. The occurrence of a Trash Assessment Score that falls below the Trash Action Level does not create a presumption that MEP is not being met. However, failure to take required actions in response to such occurrences in an iterative manner does create a presumption that the Permittee has not complied with the MEP standard. This Order requires the Permittee to determine whether existing BMPs are sufficient to reduce trash in stormwater discharges to the MEP, identify and implement modifications to existing BMPs to improve their effectiveness, and identify and implement new BMPs necessary to reduce trash in stormwater discharges to the MEP.

8. Section P.4

It is crucial that the Permittee know the water quality conditions of its municipal stormwater discharges and understand the links between its stormwater management actions and stormwater discharge conditions. Discharge water quality information is an essential link between municipal stormwater management actions and receiving water conditions, particularly

[22] *Rapid Trash Assessment Protocol, Version 8.* San Francisco Bay Regional Water Quality Control Board; Surface Water Ambient Monitoring Program, 15 November 2004. Web. 17 August 2011.

since the Permittee has a greater degree of control over discharge conditions. Federal regulations require the Permittee to characterize stormwater discharges and determine the contribution to receiving water quality problems from the Permittee's municipal stormwater discharges. Therefore the Stormwater Discharge Quality Monitoring requirements are designed to help answer the following questions:

- Are municipal stormwater discharge conditions improving?
- What is the Permittee's contribution to receiving water quality problems, through its municipal stormwater discharges?
- What are the links between stormwater management actions and discharge water quality?

The Stormwater Discharge Quality Monitoring requirements are designed to provide information about the effectiveness of upstream stormwater management practices at reducing pollutant loads and protecting water quality. This information will help the Permittee understand its contribution to receiving water quality problems and inform stormwater management decisions during the term of this Order to some extent and in subsequent permit terms more extensively. Due to the difficult and costly nature of stormwater discharge monitoring, this Order will require monitoring that is selective rather than comprehensive (monitoring for a limited number of priority pollutants at a few sites). The Permittee indicates in the Report of Waste Discharge (Element 2) that the Permittee's contribution to receiving water conditions was "masked by pollutants in background waters." The Permittee also stated that "waterways entering the City have levels of nutrients, bacteria, solids that are already elevated and any additional load from the City does not result in obvious and consistent change in water quality." Stormwater Discharge Quality Monitoring requirements contained in this Order are designed to address these issues and will provide more information about the Permittee's contribution to receiving water conditions.

The requirements contained in this Order constitute a significant change from past and current monitoring programs. Stormwater Discharge Quality Monitoring is related to end-of-pipe stormwater discharges. The Permittee has sampled end-of-pipe discharges in the past, but not always during the rainy season or during storm events. In addition, past and current requirements have focused on characterizing stormwater discharge quality, but have not produced sufficient information the Permittee could use to evaluate the effectiveness of its stormwater management actions at reducing pollutants in stormwater discharges to the MEP. The requirements in this Order are intended to focus the Permittee's monitoring efforts on obtaining information the Permittee can use to help understand the link between stormwater management actions and stormwater discharge quality, and between stormwater management actions and receiving water quality. This Order accomplishes this by establishing requirements for monitoring associated with a limited number of urban catchment pilot projects and to identify long-term stormwater discharge trends.

Due to the expense and complexity associated with discharge water monitoring, the requirements for Urban Catchment Action Level Pilot Projects focus the Permittee's monitoring efforts on four urban catchments that are representative of the land uses in the Permit coverage area. This monitoring constitutes Pilot Projects that are designed to provide information the Permittee can use to determine the cumulative effectiveness of BMPs within the Pilot Project urban catchments, as well as information about the link between BMPs and discharge water quality. Setting these pilot projects at the urban catchment scale will better enable the Permittee to discern cause-and-effect relationships between pollutant sources, BMPs, and stormwater management decisions by focusing on a limited management area. The identified

urban catchments are based on the actual drainage areas of the MS4 and are derived from the City of Salinas Storm Water Master Plan.[23] This Order requires the Permittee to conduct monitoring at the same four Pilot Project sites throughout the term of this Order so that the Permittee can obtain information about the effects of program modifications.

This Order requires the Permittee to conduct Urban Catchment Action Level Pilot Projects Monitoring at the downstream end of each pilot project urban catchment where the MS4 discharges to the receiving water. However, it is not always possible to sample stormwater discharges at end-of-pipe discharge points during storm events due to elevated water levels in the receiving water. This Order provides for this by allowing the Permittee to sample from the nearest upstream accessible stormwater manhole or access point.

This Order identifies parameters for Urban Catchment Action Level Pilot Projects Monitoring. The identified parameters correspond to Stormwater Discharge Action Levels. A small number of additional parameters that are useful for interpreting monitoring data area also included.

This Order also establishes requirements for Stormwater Discharge Trend Monitoring. The purpose of this monitoring is to discern changes in stormwater discharge quality over time. Trends are expected to be statistically detectable over a five-year (or longer) time frame. Trend monitoring will best characterize effectiveness of ongoing improvements in upstream stormwater management practices. The monitoring is limited to a single urban catchment in order to obtain sufficient samples for statistical trend analysis while still limiting the cost of monitoring. This Order requires the Permittee to conduct Stormwater Discharge Trend Monitoring at the stormwater pump station to the Salinas River. The stormwater pump station is at the downstream end of the single largest urban catchment in the Permit coverage area. The area that drains to the pump station also contains a variety of the land uses extant in the Permit coverage area.

This Order requires the Permittee to use an automated stormwater sampling device with depth/flow sensor for Stormwater Discharge Quality Monitoring. The use of this instrumentation may require modifications to the pump station influent system. The expense of the instrumentation and structural modifications is justified by the value of the information. It is also justified by the fact that the monitoring is limited to a single sampling site.

This Order identifies parameters for Stormwater Discharge Quality Monitoring. The list of parameters is limited in size and includes only a few constituents in addition to those identified in this Order for Urban Catchment Action Level Pilot Projects Monitoring. This Order includes orthophosphate and ammonia (total and nonionized) because of their toxicity and the potential for agriculture-related industry and activity within the monitored urban catchment. This Order also includes requirements to measure runoff discharge and precipitation. This information is necessary for full understanding of stormwater discharge conditions and water quality trends.

9. Section P.5

This Order requires the Permittee to conduct Receiving Water Monitoring. The overall purpose of municipal stormwater regulations is to protect receiving water quality. Therefore it is essential that the Permittee understand the current condition of—and changes to—receiving waters over

[23] City of Salinas. *Stormwater Master Plan*, May 2004. Web. 23 August 23 2011. Existing MS4 drainage areas within the Permit coverage area are depicted on figure, “Modeled Existing Storm Drainage Subareas.”

the long term. Over the short term, receiving water monitoring has limited value for stormwater management decisions in the Permit coverage area due to the variety of inputs and the Permittee's limited power to control many of these inputs. Over the long term, however, receiving water trend information is a crucial linkage between stormwater management activities and receiving water conditions. The Permittee will be able to use this trend information to determine how stormwater management actions and stormwater discharge water quality are affecting receiving water quality. Therefore this Order establishes Receiving Water Monitoring requirements designed to help answer the following question:

- Are receiving water conditions improving, declining, or static?

Due to the cost of receiving water monitoring and the challenge of designing a monitoring program capable of improving understanding of the Permittee's contribution to receiving water conditions, the Receiving Water Monitoring requirements are designed to obtain statistically-reliable trend information at one location, and in cooperation with existing receiving water monitoring efforts in the Salinas area (such as CCAMP), if possible. The requirements do not attempt to characterize the full variability of the aquatic system (e.g., temporal, spatial, biological, physical, and chemical parameters), but instead provide baseline and long term trend information for limited parameters.

The requirements emphasize parameters that are key indicators of the biological health of receiving waters, including general water quality parameters, nutrients, biological communities, pesticides, and sediment toxicity. Receiving Water Monitoring parameters and methods reflect current accepted practices, based on the knowledge and experience of personnel responsible for water quality monitoring, including state and Regional Surface Water Ambient Monitoring Program (SWAMP) managers (including CCAMP) and the Permittee. Receiving Water Monitoring will be occur once each year for some parameters and monthly for others to evaluate trends for the relevant parameters. This Order does not presume any predetermined link between the Permittee's stormwater management actions and receiving water conditions or trends, but instead focuses on developing a record of receiving water conditions that will enable the Permittee and Central Coast Water Board staff to see trends over the long term. These trends will be used to modify requirements in future Orders, if applicable. In addition, the trend data will provide information on whether the Permittee's receiving waters are attaining future TMDLs according to timeframes established in TMDL implementation plans where the Permittee has been assigned an allocation.

The Permittee's stormwater discharges have the potential to impact three watersheds: the Salinas River, the Alisal Creek-Salinas Reclamation Ditch, and Santa Rita Creek. This Order requires Receiving Water Monitoring in the Alisal Creek-Salinas Reclamation Ditch because this creek system is the primary watershed in the Permit coverage area. This Order does not establish receiving water monitoring requirements for the Salinas River or Santa Rita Creek in order to reduce the cost of receiving water monitoring. In addition, the Permittee's stormwater discharges have a less significant influence on water quality in these two receiving waters due to the size of the Permit coverage area in each watershed compared to the size of the watersheds themselves. In particular, the size of the Salinas River watershed and the presence of other urban and non-urban water quality influences upstream of the Permit coverage area indicate that the water quality conditions in the Salinas River would be less responsive to the Permittee's stormwater management actions.

This Order requires the Permittee to identify a Receiving Water Monitoring station for the Salinas Reclamation Ditch downstream of the Permittee's stormwater discharges, and to use an existing monitoring site where doing so is possible and consistent with the requirements of this

Order. CCAMP sampling station 309ALD is on the Salinas Reclamation Ditch at the western limit of the Permit coverage area as serves as a location to monitor the cumulative contribution of urban sources as waters in the Salinas Reclamation Ditch leave the Permit coverage area. The Permittee has used CCAMP sampling station 309ALD in past monitoring programs.

10. Sections P.6 and P.7

This Order establishes a rating methodology for identifying Stormwater Management Program improvements needed to protect watershed processes, and priorities for Stormwater Management Program efforts in future permit terms. The rating methodology established by this Order evaluates data collected and lessons learned during term of this Order in the context of the watershed processes using the watershed approach established by this Order. It is feasible and practicable for the Permittee to perform this analysis because key watershed processes in the Permittee's Urban Subwatersheds will be identified through the Permittee's participation in the Central Coast Joint Effort for Hydromodification Criteria, a science-based effort within the Central Coast Region to identify key watershed processes throughout the Region.

The Program Effectiveness Rating system established in this Order requires the Permittee to grade each of its Urban Subwatersheds in terms of risk of impact to watershed processes and beneficial uses and the extent and degree of alteration of watershed processes and beneficial uses. This activity will allow the Permittee to rank and compare its Urban Subwatersheds for the purpose of establishing priorities for future stormwater management efforts. This Order requires the Permittee to incorporate a breadth of data, obtained through activities required by this Order, to develop a robust understanding of the condition and needs of each of the Permittee's Urban Subwatersheds.

This Order establishes a methodology for using Urban Subwatershed Program Effectiveness Ratings to identify and prioritize Stormwater Management Program improvements needed to effectively manage the effects of urban stormwater on beneficial uses and watershed processes. This Order requires the Permittee to identify measurable goals for improving targeted watershed processes that will shape future stormwater management actions and permit requirements. The requirements in this Order are intended to guide the Permittee through a robust process that will result in quantifiable Stormwater Management Program improvements that will achieve quantifiable improvements in watershed processes and beneficial uses in the Permittee's Urban Subwatersheds.

A similar ranking approach, which compares a rating of impairment to a rating of importance, is being used in the Puget Sound area to determine the potential for restoration, preservation, and development suitability in watersheds. The authors of that approach find it is "most effective when used in the comprehensive planning process applied at the county, subarea, or watershed scale, allowing communities to effectively plan for future development. This approach can identify the potential adverse changes in watershed processes resulting from different patterns and types of land use activities."[24] In this Order, Program Effectiveness Ratings are intended to focus stormwater program improvements in watersheds where those improvements will be most effective.

[24] Washington State Department of Ecology. *Puget Sound Watershed Characterization Project: Description of Methods, Models and Analysis.* March 2010, Version 2. p.4. Stephen Stanley, Susan Grigsby, Tom Hruby, Patricia Olson. Publication #10-06-005.

Table XII.P.2. Source Data for Stormwater Discharge Action Levels

(Derived from Phase I stormwater effluent data for the arid west region (USEPA Rain Zone 6) contained in the National Storm Water Quality Database.)

ug/l – micrograms per liter; mg/l – milligrams per liter; NTU – Nephelometric Turbidity Units

Copper Total (ug/l)	Zinc Total (ug/l)	N02+NO3 (mg/l)	Turbidity (NTU)
800.00	22500.00	4.70	590
340.00	18000.00	4.20	157.3
320.00	11000.00	3.90	150.7
270.00	9970.00	3.90	140
244.00	9100.00	3.60	111
230.00	8800.00	3.60	97
220.00	6500.00	3.60	84
220.00	5500.00	3.50	80
210.00	5000.00	3.30	72
210.00	4900.00	3.30	70
209.00	4600.00	3.10	69
209.00	4300.00	3.00	65.7
200.00	3800.00	2.96	65
200.00	3800.00	2.90	65
200.00	3400.00	2.70	62.3
200.00	3390.00	2.70	61
200.00	3100.00	2.60	60
180.00	2500.00	2.60	50
180.00	2200.00	2.60	50
166.00	2100.00	2.50	45
163.00	1829.00	2.50	39.8
160.00	1700.00	2.32	39.1
150.00	1500.00	2.30	36
140.00	1400.00	2.20	35.6
140.00	1300.00	2.20	32.8
140.00	1300.00	2.10	31.1
140.00	1285.00	2.10	30
140.00	1200.00	2.10	23.8
130.00	1100.00	2.10	23.6
130.00	1054.00	2.00	22.72
128.00	1000.00	2.00	22.7
120.00	980.00	2.00	22.1
120.00	960.00	2.00	16
120.00	850.00	1.90	15.1
120.00	850.00	1.90	15
120.00	850.00	1.90	10.2
111.00	850.00	1.90	
111.00	840.00	1.90	
110.00	780.00	1.80	
110.00	768.00	1.80	
110.00	760.00	1.70	

Copper Total (ug/l)	Zinc Total (ug/l)	N02+NO3 (mg/l)	
110.00	750.00	1.70	
110.00	740.00	1.70	
110.00	740.00	1.70	
100.00	730.00	1.70	
100.00	720.00	1.70	
100.00	710.00	1.70	
100.00	710.00	1.60	
100.00	700.00	1.60	
100.00	700.00	1.60	
99.00	690.00	1.60	
94.00	690.00	1.60	
91.00	680.00	1.60	
91.00	680.00	1.60	
90.00	670.00	1.53	
90.00	660.00	1.50	
89.00	660.00	1.50	
87.00	660.00	1.50	
87.00	650.00	1.50	
84.00	630.00	1.50	
83.00	610.00	1.50	
82.00	610.00	1.40	
81.00	597.00	1.40	
81.00	590.00	1.40	
77.00	590.00	1.40	
77.00	576.00	1.40	
76.00	570.00	1.40	
74.00	570.00	1.40	
72.00	560.00	1.32	
72.00	560.00	1.30	
72.00	540.00	1.30	
72.00	540.00	1.30	
72.00	520.00	1.30	
71.00	520.00	1.30	
70.00	520.00	1.30	
70.00	510.00	1.30	
67.00	500.00	1.29	
66.00	500.00	1.20	
66.00	490.00	1.20	
66.00	480.00	1.20	
65.00	475.00	1.20	
65.00	470.00	1.20	
63.00	470.00	1.20	
63.00	462.00	1.20	
62.00	460.00	1.20	
62.00	460.00	1.20	
60.00	450.00	1.20	

Copper Total (ug/l)	Zinc Total (ug/l)	N02+NO3 (mg/l)	
60.00	440.00	1.20	
59.00	440.00	1.10	
56.59	440.00	1.10	
55.00	430.00	1.10	
55.00	430.00	1.10	
54.00	430.00	1.10	
54.00	420.00	1.10	
54.00	420.00	1.10	
53.00	410.00	1.10	
53.00	409.00	1.10	
52.00	400.00	1.00	
51.00	400.00	1.00	
50.00	400.00	1.00	
50.00	390.00	1.00	
50.00	390.00	1.00	
50.00	390.00	1.00	
50.00	390.00	0.99	
50.00	390.00	0.99	
50.00	370.00	0.98	
50.00	370.00	0.97	
49.00	370.00	0.96	
49.00	360.00	0.96	
49.00	360.00	0.95	
48.00	360.00	0.95	
48.00	360.00	0.93	
47.00	350.00	0.93	
46.08	350.00	0.93	
46.00	350.00	0.93	
46.00	340.00	0.92	
44.25	340.00	0.90	
44.00	340.00	0.88	
44.00	340.00	0.87	
44.00	340.00	0.86	
44.00	340.00	0.85	
43.00	334.00	0.84	
43.00	330.00	0.83	
43.00	330.00	0.81	
42.00	330.00	0.81	
42.00	330.00	0.80	
42.00	330.00	0.80	
41.00	330.00	0.78	
40.00	330.00	0.78	
40.00	320.00	0.77	
40.00	320.00	0.77	
40.00	320.00	0.77	
40.00	320.00	0.74	

Copper Total (ug/l)	Zinc Total (ug/l)	N02+NO3 (mg/l)	
39.00	310.00	0.73	
39.00	310.00	0.72	
39.00	310.00	0.69	
39.00	308.00	0.69	
39.00	300.00	0.69	
39.00	300.00	0.67	
37.00	300.00	0.67	
37.00	300.00	0.66	
37.00	290.00	0.66	
37.00	285.00	0.65	
37.00	280.00	0.63	
36.00	280.00	0.62	
36.00	280.00	0.62	
36.00	280.00	0.62	
36.00	280.00	0.60	
35.00	280.00	0.59	
35.00	280.00	0.59	
34.00	280.00	0.58	
34.00	280.00	0.57	
33.40	270.00	0.57	
33.00	270.00	0.55	
33.00	270.00	0.52	
33.00	270.00	0.50	
33.00	270.00	0.50	
33.00	270.00	0.46	
32.26	260.00	0.42	
32.01	260.00	0.42	
32.00	260.00	0.35	
32.00	260.00	0.10	
32.00	260.00	0.06	
32.00	250.00		
32.00	250.00		
32.00	250.00		
31.00	250.00		
31.00	247.00		
31.00	242.13		
31.00	240.00		
30.00	240.00		
30.00	240.00		
30.00	240.00		
30.00	240.00		
30.00	230.00		
29.00	230.00		
29.00	220.00		
28.00	220.00		
28.00	220.00		

Copper Total (ug/l)	Zinc Total (ug/l)		
28.00	210.00		
28.00	210.00		
27.19	210.00		
27.00	210.00		
27.00	210.00		
27.00	210.00		
26.00	210.00		
26.00	205.00		
26.00	202.79		
25.00	202.00		
25.00	200.00		
25.00	200.00		
24.00	200.00		
24.00	200.00		
23.00	200.00		
23.00	200.00		
23.00	200.00		
23.00	194.49		
23.00	190.00		
22.00	190.00		
22.00	190.00		
21.00	190.00		
21.00	184.13		
21.00	180.00		
21.00	180.00		
20.36	180.00		
20.00	180.00		
20.00	180.00		
20.00	180.00		
20.00	180.00		
20.00	170.00		
19.00	170.00		
19.00	170.00		
18.00	170.00		
18.00	160.00		
18.00	160.00		
18.00	160.00		
18.00	160.00		
17.00	160.00		
17.00	160.00		
17.00	160.00		
17.00	160.00		
17.00	160.00		
17.00	160.00		
17.00	150.00		
17.00	150.00		

Copper Total (ug/l)	Zinc Total (ug/l)		
17.00	150.00		
16.00	150.00		
16.00	150.00		
16.00	146.00		
16.00	145.00		
16.00	140.00		
15.00	140.00		
15.00	140.00		
14.50	140.00		
14.00	140.00		
14.00	140.00		
14.00	140.00		
14.00	140.00		
14.00	140.00		
14.00	140.00		
13.00	136.55		
13.00	135.60		
13.00	130.00		
13.00	130.00		
13.00	130.00		
13.00	130.00		
12.00	130.00		
12.00	130.00		
12.00	130.00		
12.00	127.00		
11.00	124.00		
11.00	122.05		
10.00	120.00		
10.00	120.00		
10.00	120.00		
9.60	120.00		
9.60	112.11		
9.10	110.00		
9.10	110.00		
9.00	110.00		
8.30	110.00		
8.20	110.00		
8.00	110.00		
8.00	110.00		
7.70	110.00		
7.70	110.00		
7.00	108.00		
7.00	100.00		
6.80	100.00		
6.80	100.00		
6.80	100.00		

Copper Total (ug/l)	Zinc Total (ug/l)		
6.50	100.00		
6.50	100.00		
6.30	99.00		
6.30	98.00		
6.10	97.00		
5.60	93.40		
5.40	92.00		
5.20	92.00		
5.00	90.00		
4.90	90.00		
4.50	90.00		
4.10	86.00		
4.10	83.00		
3.90	81.00		
3.40	81.00		
2.60	80.00		
2.60	80.00		
2.60	80.00		
2.30	80.00		
2.00	80.00		
2.00	79.00		
1.70	73.00		
1.50	72.00		
1.50	70.00		
1.50	70.00		
1.40	70.00		
1.40	70.00		
	64.00		
	63.00		
	61.00		
	60.00		
	56.00		
	44.00		
	40.00		
	37.00		
	35.00		
	30.00		
	26.00		
	24.00		

Q. Watershed Characterization

1. Legal Authority

The following legal authority applies to Section Q – Watershed Characterization:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWA section 402(a), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B,C,E, and F), 40 CFR 131.12, and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(A)(2) provides that the Permittee 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 122.26(d)(2)(v) provides that the Permittee shall include the following in its permit application for discharges from its municipal storm sewer: "Estimated reductions in loadings of pollutants from discharges of municipal storm sewer constituents from municipal storm sewer systems expected as the result of the municipal storm water quality management program. The assessment shall also identify known impacts of storm water controls on ground water."

The following Phase II Final Rule Federal NPDES regulations and discussion directly apply to small MS4s. However, due to greater water quality impacts generally generated by large MS4s, Central Coast Water Board staff finds the Phase II Final Rule for small MS4s is applicable to larger MS4s such as the Permittee.

Federal NPDES regulation 40 CFR 122.34(b)(5)(iii) provides the following guidance:

> If water quality impacts are considered from the beginning stages of a project, new development and potentially redevelopment provide more opportunities for water quality protection. USEPA recommends that the BMPs chosen: be appropriate for the local community; minimize water quality impacts; and attempt to maintain pre-development runoff conditions. In choosing appropriate BMPs, USEPA encourages you to participate in locally-based watershed planning efforts which attempt to involve a diverse group of stakeholders including interested citizens. When developing a program that is consistent with this measure's intent, USEPA recommends that you 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 stormwater runoff quality. In addition to assessing these existing documents and programs, you should provide

opportunities to the public to participate in the development of the program. Non-structural BMPs are preventative actions that involve management and source controls such as: policies and ordinances that provide requirements and standards to direct growth to identified areas, protect sensitive areas such as wetlands and riparian areas, maintain and/or increase open space (including a dedicated funding source for open space acquisition), provide buffers along sensitive water bodies, minimize impervious surfaces, and minimize disturbance of soils and vegetation; policies or ordinances that encourage infill development in higher density urban areas, and areas with existing infrastructure; education programs for developers and the public about project designs that minimize water quality impacts; and measures such as minimization of percent impervious area after development and minimization of directly connected impervious areas. Structural BMPs include: storage practices such as wet ponds and extended-detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; and infiltration practices such as infiltration basins and infiltration trenches. USEPA recommends that you ensure the appropriate implementation of the structural BMPs by considering some or all of the following: pre-construction review of BMP designs; inspections during construction to verify BMPs are built as designed; post-construction inspection and maintenance of BMPs; and penalty provisions for the noncompliance with design, construction or operation and maintenance. Stormwater technologies are constantly being improved, and USEPA recommends that your requirements be responsive to these changes, developments or improvements in control technologies.

4. Section Q.1

Section Q (Watershed Characterization) establishes the foundation for watershed-based stormwater management by requiring the delineation of Urban Subwatersheds and the collection and management of information for each Urban Subwatershed. Within delineated Urban Subwatersheds and their receiving waters, only information that relates to stormwater management is to be collected, including:

- Physical condition of water bodies, and of their associated vegetation and habitat;
- Amount of imperviousness;
- Dominant watershed processes; and
- Meteorological data.

Section IX (Information Management System) of this Fact Sheet provides broad justification for requiring the Permittee to develop an information management system for stormwater management. Section Q.1 (Watershed Characterization: Watershed Data Information Management) requires the Permittee to develop that information system further by compiling and managing specific information, including spatial data, to support watershed characterization.

5. Section Q.2

The Permittee has delineated and mapped drainage areas for the Permittee's existing MS4. The current delineations are generally determined by topography and by drainage infrastructure, constructed over time, which in some cases has altered stormwater flow pathways. The current delineations support a variety of purposes, including flood control and stormwater management. This Order requires the Permittee to combine the drainage areas from the current delineation into Urban Subwatersheds that correspond to receiving waters, (see Attachment F – Salinas

Existing Urban Subwatersheds for the combined Urban Subwatersheds), and to also delineate subwatersheds in the Future Growth Areas and other portions of the City where no current delineations exist (e.g., areas that drain to the Reclamation Ditch). This Order also requires high resolution mapping of MS4 components, including conveyances, outfalls, inlets, and connections.

Subwatershed-scale delineations are preferred for assessment studies, stream classification, and stormwater management planning for several reasons, according to the Center for Watershed Protection:[1] "First, the influence of impervious cover on hydrology, water quality, and biodiversity is readily apparent at the subwatershed level. Second, subwatersheds are small enough that there is less chance for confounding pollutant sources (e.g., agricultural runoff, point sources, etc.) to confuse management decisions. Third, subwatersheds boundaries tend to be within just a few political jurisdictions where it is easier to establish a clear regulatory authority and incorporate the stakeholders into the management process. Lastly, the size of a subwatershed allows monitoring, mapping, and other watershed assessment steps in a rapid time frame. "

Echoing this last point concerning monitoring, the National Research Council[2] cautions: "Finally, better watershed area descriptions, especially accurate drainage-area delineations, are needed for all monitored sites."

This Order's requirements for watershed delineation are designed to provide a foundation for watershed-based stormwater management. All Urban Subwatersheds will be delineated at a scale that is relevant to protecting receiving water quality from the impacts of urban stormwater, while creating efficiencies for assessment and information management.

6. Section Q.3

To ensure an accurate and comprehensive depiction of Urban Subwatershed surface hydrology, this Order requires the Permittee to identify water bodies from multiple sources of information, including the National Hydrography Database and the National Wetlands Inventory. Both of these sources are standards that currently support the hydrologic foundation for implementing multiple CWA programs (e.g., sections 303(d), 401, 404, 402). The Permittee is also required to augment these sources with information from relevant environmental documents that may include more site-specific information on water bodies and their conditions.

This Order requires limited identification and mapping of subsurface hydrology because of the influence stormwater has on groundwater through infiltration. Understanding infiltration potential and the role of stormwater in the subsurface is critical to ensuring that surface water beneficial uses supported by groundwater are protected. The Permittee is required to assess available information and transfer it to maps to convey which portions of each Urban Subwatershed may possess the greatest potential for supporting surface water beneficial uses through infiltration. Central Coast Water Board staff anticipates that the Central Coast Joint Effort for Hydromodification Criteria will provide some of this information in spatial data coverages.

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[1] Zielinski, Jennifer. *Watershed Vulnerability Analysis*. Ellicott City, MD: Center for Watershed Protection, January 2002. Web. 25 August 2011.
[2] *Urban Stormwater Management in the United States*. Washington, D.C.: National Research Council, National Academies Press, 2008. Web. 16 August 2011. p. 232

7. Section Q.4

The Watershed Characterization requires assessment of physical conditions of only those watershed attributes with direct relationship to urban stormwater discharges. These attributes include: streams; riparian vegetation and habitat; imperviousness; and dominant watershed processes. The Order provides specific direction for how the Permittee should conduct the assessments and/or obtain assessment data, including: appropriate stream and riparian condition assessment methods; sources of imperviousness spatial data; and information on dominant watershed processes.

Site specific information on the condition of receiving waterbodies is essential for understanding beneficial use impacts resulting from stormwater management. The Order requires the Permittee to conduct a rapid assessment of all second and higher order streams in the Permit area. The assessment's "rapid" nature, and its limited application to second and higher order streams, are intended to optimize the level effort required and the information collected. Assessment data will directly inform the Permittee about the type and location of risks to beneficial uses from urban runoff impacts. The data can also identify where restoration may be necessary to address current impacts of urban stormwater discharges and allows the Permittee to prioritize such efforts, based on more complete knowledge of the severity and distribution of impacts. Stream condition, as assessed through this required assessment, will also provide a baseline condition to which future conditions can be compared. A baseline condition assessment is the basis for understanding trends in receiving water conditions.

The requirement for riparian assessment is phased to produce results for Gabilan and Natividad Creeks by the end of Year 2 – one year sooner than other water bodies – to allow for evaluation of the effectiveness of riparian protection BMPs during the term of the Order [See Section P (Monitoring, Effectiveness Assessment, and Program Improvement)]. For these two creeks, both stream and riparian assessments are required by the end of Year 2, to achieve the efficiency of going into the field once, rather than twice.

The requirements for assessment of riparian vegetation and habitat evaluate both existing and potential vegetation and habitat. Riparian areas potentially play a critical role in attenuating the beneficial use impacts from urban runoff. Where riparian areas once possessed vegetation and habitats to play that role, there is a basis for restoring them where they have been removed. The requirement to collect and maintain information on potential (historical) riparian vegetation and habitat condition will provide the basis for setting restoration goals in each Urban Subwatershed [as required in Section L (Development Planning and Stormwater Retrofits)].

Among the physical watershed attributes to be described is impervious cover. Impervious cover is a chief cause of stormwater runoff and its impacts. Many studies have shown that significant water quality impairment occurs when as little as 10 percent of a watershed is covered with impervious surfaces. Research in California suggests this threshold may be even lower, with impairment occurring at levels as low as 3 to 5 percent impervious cover.[3] These and other studies, as well as the availability of imperviousness spatial data and the relative understanding of its impacts, have made imperviousness a widely used indicator of water quality.

[3] Stein, Eric and Susan Saleski. *Managing Runoff to Protect Natural Streams: The Latest Development on Investigation and Management of Hydromodification in California. Technical Report No. 475.* Southern California Coastal Water Research Project, December 2005, Web. 16 August 2011.

The NRC Report also recommends considering impervious cover for use as a proxy for stormwater pollutant loading in part because it focuses regulation on the increased volume as well as increased pollutant loadings in stormwater runoff. This Order requires that imperviousness be used in combination with pollutant loading at a subwatershed scale to overcome expensive and potentially technically impossible attempts to determine pollutant loading from individual dischargers.

8. Section Q.5

Stormwater results from rainfall, so accurate rainfall data are needed for all efforts to manage stormwater, from construction site sediment and erosion control, to post-construction BMP design. This Order provides specific direction for the Permittee to maintain accurate information on meteorological conditions for all Urban Subwatersheds, and to obtain this information from specific sources, which are known to provide high resolution and time-series data for various applications.

R. Fiscal Analysis

1. Legal Authority

The following legal authority applies to Section R – Fiscal Analysis:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(vi) provides that "[The Permittee must submit] for each fiscal year to be covered by the permit, a fiscal analysis of the necessary capital and operation and maintenance expenditures necessary to accomplish the activities of the programs under paragraphs (d)(2)(iii) and (iv) of this Section. Such analysis shall include a description of the source of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds."

4. Sections R.1 and R.2

A fiscal analysis can be an important planning tool. The USEPA finds that "examining the levels of proposed spending and funding allows the permitting authority to gauge the ability of the applicant to implement the program and predict its effectiveness. The fiscal analysis also will help the [Central Coast Water Board] determine whether the applicant has met the statutory requirement of reducing the discharge of pollutants to the MS4 to the maximum extent practicable. Finally, the estimates help the applicant evaluate the feasibility and cost-effectiveness of its program".[1]

Section R requires the Permittee to clarify which expenditures are attributable to each stormwater management program component. The Permittee's previous Annual Reports did not provide a detailed enough budget to inform the Central Coast Water Board of the Permittee's current and forecasted expenditures for its stormwater management program. Additionally, Section R requires the Permittee to identify where the Permittee capitalizes on resource sharing opportunities. This analysis is necessary to help the Central Coast Water Board assess the Permittee's stormwater management program implementation and funding efficiency. Consistency and clarification of fiscal information are valuable for assessing program effectiveness and adapting programs to help ensure that they are efficient and effective, which is one important purpose of the fiscal analysis. Standardization and comparison of fiscal analysis reporting is supported by the State Board funded NPDES Stormwater Cost Survey, which finds that "standards for reporting costs and stormwater activities are needed to allow accurate cost comparisons to be made between stormwater activities."[2] This document also provides guidance regarding categorization of expenditures for tracking and reporting.

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[1] USEPA. *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,* November 1992. Web. 10 August 2011. p. 8-1.
[2] Currier, Brian K., et al. *NPDES Storm Water Cost Survey Final Report.* Office of Water Programs, California State University, Sacramento. p. 63.

S. Legal Authority

1. Legal Authority

The following legal authority applies to Section S – Legal Authority:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that the Copermittees shall develop and implement legal authority to "Control through ordinance, 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."

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(D) provides that the Copermittees shall develop and implement legal authority to "Control through interagency agreements among coapplicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system."

Illicit discharge is defined under Federal NPDES regulation 40 CFR 122.26(b)(2) as "any discharge to a municipal separate storm sewer system that is not composed entirely of storm water except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from fire fighting activities."

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 regulation 40 CFR 122.26(d)(1)(ii) requires from the Copermittee "A description of existing legal authority to control discharges to the municipal separate storm sewer system."

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."

4. Section S.1

The Permittee cannot passively receive and discharge pollutants from third parties. As USEPA states, "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 the waters of the United States, the municipal storm sewer system enables water quality impairment by third parties".[1]

[1] "National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, Final Rule; Report to Congress on the Phase II Storm Water Regulations, Notice." *Federal Register* 64 235 (8 December 1999): 68765-68766. Web.

Discharges of pollutants to the MS4 must therefore be controlled, and an important means for a municipality to achieve this is through development of municipal legal authority. USEPA 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".[2]

The requirement for municipal storm water dischargers to have, and exercise, local governmental authority in order to comply with water quality control obligations is analogous to the requirement for Publicly Owned Treatment Works to have and exercise legal authority to require pretreatment of industrial wastes being discharged to their sewage collections systems (CWA 402(b)(8)).

5. Section S.1.a

USEPA states "All construction sites, regardless of size, must be addressed by the municipality. […] A description of the local erosion and sediment control law or ordinance is needed to satisfy this program requirement. The description should include information that links the enforcement of the law or ordinance to the legal authority of the applicant".[3] USEPA further states "a municipality, to satisfy its permit conditions, 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. Therefore, a municipality should develop a mechanism to assure that all industrial facilities and construction sites that discharge to the MS4 know their obligation to comply with the applicable terms of the municipality's storm water ordinances".[4]

6. Section S.1.b

Illicit or non-storm water discharges can be a significant source of pollutants to the MS4. Pollutants which enter the MS4 are generally discharged to receiving waters, where they can impact receiving water quality. Illicit or non-storm water discharges must therefore be prohibited. In order to effectively prohibit illicit or non-storm water discharges, legal authority addressing the discharges must be developed and implemented by the Permittee.

6. Sections S.1.c and S.1.d

An illicit connection is a connection to the MS4 which carries illicit discharges to the MS4. Because illicit discharges to the MS4 are prohibited, illicit connections are also prohibited and must be eliminated. In order to effectively prohibit and eliminate illicit connections, legal authority addressing the discharges must be developed and implemented by the Permittee.

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[2] USEPA. *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,* November 1992. Web. 10 August 2011.p. 8-1.
[3] Ibid, pgs. 6-11 and 6-13.
[4] Ibid, p. 3-1.

Non-storm water discharges such as spills, dumping, and disposal of materials can be a significant source of pollutants to the MS4. Pollutants deposited in MS4s most likely will be discharged to receiving waters, where they can impact receiving water quality. Non-storm water discharges such as spills, dumping, or disposal of materials must therefore be prohibited. In order to effectively prohibit these non-storm water discharges, legal authority addressing the discharges must be developed and implemented by the Permittee.

7. Sections S.1.e and S.1.f

The Permittee cannot passively receive and discharge pollutants from third parties. The Permittee must implement ordinances, permits, contracts, and orders to hold discharges to MS4s accountable for their contributions of pollutants. In order for the ordinances to be effective, the Permittee must be able to require compliance with the ordinances. Lack of ordinance enforcement by the Permittee allows third parties to violate a municipality's ordinances with little fear of retribution, leading to receiving water quality degradation. USEPA recommends that a municipality in its urban runoff management program "identify the administrative and legal procedures available to mandate compliance with appropriate ordinances, and therefore, with permit conditions. [Programs] should contain descriptions of how ordinances are implemented and appealed. In particular, a municipality should indicate if it can issues administrative orders and injunctions or if it must go through the court system for enforcement actions".[5]

8. Section S.1.g

Discharges from MS4s which share systems eventually reach the same receiving water body. Each MS4 which discharges to the shared MS4 is therefore responsible for discharges from the shared MS4, and the impacts of those discharges on receiving waters. The MS4s of a shared system must demonstrate that together they can control the contribution of pollutants over the whole shared MS4. To this effect, the USEPA states each MS4 "individually possesses adequate legal authority over the entire municipal system it operates and owns. A coapplicant need not fulfill every component of legal authority specified in the regulations, as long as the combined legal authority of all coapplicants satisfies the regulatory criteria for every segment of the MS4 (including authority over all sources that discharge to the MS4). […] Coapplicants also may use interjurisdictional agreements to show legal authority and to ensure planning, coordination, and the sharing of the resource burden of permit compliance".[6]

8. Section S.1.h

The Permittee's ability to determine compliance and noncompliance with permit conditions is critical to control pollutant discharges to and from MS4s. Determination of compliance and noncompliance allows for significant sources of pollutants to be identified and addressed, thereby minimizing the discharge of pollutants from the MS4 and the resulting receiving water quality degradation. For this reason the Permittee must have legal authority to carry out the inspections, surveillance, and monitoring necessary to assess compliance. Regarding compliance determination, USEPA states "municipalities should provide documentation of their authority to enter, sample, inspect, review, and copy records, etc., as well as demonstrate their authority to require regular reports".[7]

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[5] Ibid, p. 3-3.
[6] Ibid, p. 3-2.
[7] Ibid, p. 3-4.

9. Section S.1.i

The Permittee cannot passively receive and discharge pollutants from third parties. The Permittee must ensure discharges of pollutants to the MS4 are reduced to the maximum extent practicable. In order to achieve this, and hold third party dischargers responsible for their contributions of pollutants, the Permittee must require the use of BMPs by third party dischargers.

10. Section S.1.j

Section S.1.j (Legal Authority) is in the Order to ensure that BMPs implemented by third parties are effective. Since the Permittee cannot passively receive and discharge pollutants from third parties, the Permittee must ensure discharges of stormwater pollutants to the MS4 are reduced to the MEP. In order to achieve this, the Permittee must be able to ensure that effective BMPs are being implemented by requiring the third parties to document BMP effectiveness. Regarding the Permittee's ability to require documentation and reporting from third parties, USEPA states "municipalities should provide documentation of their authority to enter, sample, inspect, review, and copy records, etc., as well as demonstrate their authority to require regular reports."[8]

9. Section S.2

The Order requires the Permittee to have an established, escalating enforcement policy that clearly describes the action to be taken for common violations. The policy must describe the procedures to ensure compliance with local ordinances and standards, including the sanctions and enforcement mechanisms that will be used to ensure compliance. (See 40 CFR 122.26(d)(2)(i)). It is critical that the MS4 have the authority to initiate a range of enforcement actions to address the variability and severity of noncompliance. Enforcement responses to individual violations must consider criteria such as magnitude and duration of the violation, effect of the violation on the receiving water, compliance history of the operator, and good faith of the operator in compliance efforts. Particularly for construction sites, enforcement actions must be timely in order to be effective.

10. Section S.3

This section is in the Order to ensure that the Permittee's enforcement tools are effective enough to ensure compliance with the Order. USEPA supports the need for adequate Permittee enforcement when it states that the Permittee's general counsels "should state that the applicant has the legal authority to apply and enforce the requirements of 40 CFR 122.26(d)(2)(i)(A-F)."[9]

[8] Ibid.
[9] Ibid.

Attachment G – Inspection Ratings

1. Legal Authority

The following legal authority applies to Attachment G - Inspection Ratings:

2. Broad Legal Authority

CWA sections 402(p)(3)(B)(iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(A, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(F) requires that the Permittee shall "Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions…"

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) requires that the Permittee 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)(D) requires 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 stormwater runoff from construction sites to the municipal storm sewer system."

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) requires 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."

4. All Sections

This Order contains requirements for inspecting High Priority Municipal Facilities, Operations, and Events; Commercial and Industrial Facilities and Operations; and High Priority Construction Sites (collectively, "Sites"). Attachment G provides a methodology for assessing the effectiveness of BMP selection, implementation, installation, and maintenance at these Sites through inspections, in way that produces concrete results that can be quantified and compared over time. The approach contained in Attachment G is detailed enough to provide such results in a way that is not overburdened with detail and allows the exercise of professional judgment by inspectors. This Order provides flexibility by allowing the Permittee to propose an alternative approach that is equivalent or better to the approach contained in Attachment G for approval by the Central Coast Water Board Executive Officer.

Attachment G establishes Inspection Ratings based on level of compliance with requirements of this Order and on the level of risk of pollutant discharge from a ½-inch rain event. The number of rating levels is sufficient to capture significant variations in these conditions between different Sites, while avoiding the level of detail which prevents the exercise of professional judgment.

The separate Site category for fast food restaurants and commercial retail centers reflects the fact that trash and litter are particular concerns at these Sites.[1,2] As a result, fast food restaurants will receive two Inspection Ratings at each inspection: one related to requirements contained in the Order for Food Facilities, and the second related to requirements in the Order for trash and litter control.

Attachment G identifies four levels of risk based on pollutant exposure to stormwater (e.g., fuel barrels stored outdoors) and potential for pollutant discharge in stormwater runoff from a ½-inch rain event. Therefore a Site with a risk level of "None" has no pollutant exposure (i.e., all pollutant sources are protected from rainfall and runoff) and no reasonable possibility of pollutant discharge in stormwater runoff from a ½-inch rain event (i.e., site and BMP conditions are such that pollutant discharge is extremely unlikely in the professional judgment of the inspector). Risk conditions also vary by Site category, based on the priority pollutants generally present at Sites in each category. Attachment G identifies trash and litter as the priority pollutant for fast food restaurants and commercial retail centers, and sediment as the priority pollutant for construction sites. The purpose of identifying priority pollutants at these Sites is to allow the Permittee to focus inspection efforts on pollutants of greatest concern. Priority pollutants are reflected in the definitions of risk levels for each Site category.

Attachment G identifies three levels of compliance with respect to the requirements contained in this Order. Therefore a Site is considered "in compliance" when all required BMPs are implemented, installed, and maintained as required by this Order. Minor and significant non-compliance must be determined using the inspector's professional judgment, based on the number, type, scope, size, pervasiveness, and persistence of the instances of non-compliance. Attachment G provides definitions for compliance levels specific to each Site category.

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[1] A 2009 study conducted by Keep America Beautiful, Inc., found a correlation between litter generation and fast food restaurants, public areas, and transition areas (e.g., bus stations). In addition, the study found waste management areas (e.g., overfull garbage containers) to be a source of trash and litter, a strong correlation between pedestrian activity and litter in roadways. *2009 National Visible Litter Survey and Litter Cost Study Final Report*. Stamford, CT: Keep America Beautiful, Inc.; Mid Atlantic Solid Waste Consultants, 18 September 18, 2009. Web. 17 August 2011.

[2] A study conducted by Los Angeles County in 2002-2003 found commercial areas to have consistently higher litter rates than other land uses. *Trash Baseline Monitoring Results Los Angeles River and Ballona Creek Watersheds.* County of Los Angeles Department of Public Works, Watershed Management Division, 17 February 2004. Web. 18 August 2011 <http://dpw.lacounty.gov/wmd/TrashBaseline/links.cfm>.

Attachment I – Standard Provisions

1. Legal Authority

The following legal authority applies to Attachment I – Standard Provisions:

2. Broad Legal Authority

CWA Sections 402(p)(3)(B)(ii-iii), CWC Section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

3. Specific Legal Authority

Standard provisions, reporting requirements, and notifications are consistent to all NPDES permits and are generally found in Federal NPDES regulation 40 CFR 122.41.

Attachment I includes Standard Provisions. These Standard Provisions ensure that NPDES permits are consistent and compatible with USEPA's federal regulations. Some Standard Provisions sections specific to publicly owned sewage treatment works are not included in Attachment I.