

ATTACHMENT A

MUNICIPAL REGIONAL STORMWATER PERMIT FACT SHEET

DRAFT

**FACT SHEET/RATIONALE
TECHNICAL REPORT**

for

ORDER NO. R2-2009-0074

NPDES Permit No. CAS612008

**Municipal Regional Stormwater NPDES Permit
and
Waste Discharge Requirements**

for

The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, Alameda County, the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District, which have joined together to form the Alameda Countywide Clean Water Program

The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek, the towns of Danville and Moraga, Contra Costa County, and the Contra Costa County Flood Control and Water Conservation District, which have joined together to form the Contra Costa Clean Water Program

The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, and Sunnyvale, the towns of Los Altos Hills and Los Gatos, the Santa Clara Valley Water District, and Santa Clara County, which have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program

The cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, and South San Francisco, the towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the San Mateo County Flood Control District, and San Mateo County, which have joined together to form the San Mateo Countywide Water Pollution Prevention Program

The cities of Fairfield and Suisun City, which have joined together to form the Fairfield-Suisun Urban Runoff Management Program

The City of Vallejo and the Vallejo Sanitation and Flood Control District

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I. CONTACT INFORMATION

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The Permit and other related documents can be downloaded from the Water Board website at:

http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/stormwater/Municipal/mrp_page4.shtml

Comments can be electronically submitted to mrp.reissuance@waterboards.ca.gov.

All documents referenced in this Fact Sheet and in the Order are available for public review at the 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 - 1 pm excluded. To schedule an appointment to inspect public records, contact Melinda Wong at 510-622-2430.

II. PERMIT GOALS AND PUBLIC PROCESS

Goals

The Goals for the Municipal Regional Stormwater Permit (hereinafter, the Permit) include:

1. Continue regulating six Phase I municipal stormwater NPDES permits in one consistent permit that is regional in scope.
2. Include more specificity in NPDES permit requirements than the pre-2009 permit which lacked concrete requirements and thus did not result in the desired improvement of water quality. Continue requiring (A) stormwater management actions, (B) a specific level of implementation for each action or set of actions, and (C) reporting and effectiveness evaluation requirements for each action sufficient to determine compliance.
3. Incorporate the Stormwater Management Plan level of detail and specificity into the Permit. Stormwater Management Plans have always been considered integral to the municipal stormwater NPDES permits, but have not received the level of public review in the adoption process necessary relative to their importance in adequate stormwater pollutant management implementation.
4. Implement and enhance actions to control 303(d) listed pollutants, pollutants of concern, and achieve Waste Load Allocations adopted under Total Maximum Daily Loads.
5. Implement more specific and comprehensive stormwater monitoring, including monitoring for 303(d) listed pollutants.

Public Process

Water Board staff conducted stakeholder meetings with the Permittees and other interested parties to develop this Permit. These meetings included Water Board staff, representatives of the Permittees, and representatives of environmental groups.

Implementation

It is the Water Board's intent that this Permit shall ensure attainment of applicable water quality objectives and protection of the beneficial uses of receiving waters and associated habitat. This Permit requires that discharges shall not cause exceedances of water quality objectives nor shall they cause certain conditions to occur that create a condition of nuisance or water quality impairment in receiving waters. Accordingly, the 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 section 402(p) of the CWA. In addition, this Permit contains water quality based effluent limitations to implement TMDLs. Compliance with the Discharge Prohibitions, Receiving Water Limitations, and Provisions of this Permit is deemed compliance with the requirements of this Permit. If these measures, in combination with controls on other point and nonpoint sources of pollutants, do not result in attainment of applicable water quality objectives, the Water Board may invoke Provision C.1. and C.18 to impose additional conditions that require implementation of additional control measures.

Each of the Permittees is individually responsible for adoption and enforcement of ordinances and policies, for implementation of assigned control measures or best management practices (BMPs) needed to prevent or reduce pollutants in stormwater, and for providing funds for the capital, operation, and maintenance expenditures necessary to implement such control measures/BMPs within its jurisdiction. Each Permittee is also responsible for its share of the costs of the area-wide component of the countywide program to which the Permittee belongs. Enforcement actions concerning non-compliance with the Permit will be pursued against individual Permittee(s) responsible for specific violations of the Permit.

III. BACKGROUND

Early Permitting Approach

The federal Clean Water Act (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). In response to the CWA amendment (and the pending federal NPDES regulations which would implement the amendment), the Water Board issued a municipal storm water Phase I permits in the early 1990s. These permits were issued to the entire county-wide urban areas of Santa Clara, Alameda, San Mateo and Contra Costa Counties, rather than to individual cities over 100,000 population threshold. The cities chose to collaborate in countywide groups, to

pool resources and expertise, and share information, public outreach and monitoring costs, among other tasks.

During the early permitting cycles, the county-wide programs developed many of the implementation specifics which were set forth in their Stormwater Pollution Prevention Management Plans (Plans). The permit orders were relatively simple documents that referred to the stormwater Plans for implementation details. Often specific aspects of permit and Plan implementation evolved during the five year permit cycle, with relatively significant changes approved at the Water Board staff level without significant public review and comment.

Merging Permit Requirements and Specific Requirements Previously Contained in Stormwater Management Plans

U.S. Environmental Protection Agency (U.S. EPA) stormwater rules for Phase I stormwater permits envisioned a process in which municipal stormwater management programs contained the detailed BMP and specific level of implementation information, and are reviewed and approved by the permitting agency before the municipal NPDES stormwater permits are adopted. The previous permits established a definition of a stormwater management program and required each Permittee to submit an urban runoff management plan and annual work plans for implementing its stormwater management program. An advantage to this approach was that it provided maximum flexibility for Permittees to tailor their stormwater management programs to reflect local priorities and needs. However, Water Board staff found it difficult to determine Permittees' compliance with the permits, due to the lack of specific requirements and measurable outcomes of some required actions in the plans.

Moreover, these stormwater management plans and amendments thereto made by the Permittees were not subject to public input, contrary to the U.S. Ninth Circuit Court's decision in the Phase II stormwater context that public participation is required for a stormwater management plan because the substantive information about how an operator will reduce pollutants to the maximum extent possible was found in the stormwater management plan rather than the permit itself. (*Environmental Defense Center v. EPA* (9th Cir. 2003) 344 F.3d 832, 857.)

This Permit continues a modification to these previous approaches by establishing the stormwater management program requirements and defining up front, as part of the Permit Development Process, the minimum acceptable elements of the municipal stormwater management program. The advantages of this approach are that it satisfies the public involvement requirements of both the federal Clean Water Act and the Water Code. An advantage for Permittees and the public of this approach is that the permit requirements are known at the time of permit issuance and not left to be determined later through an iterative review and approval of stormwater management plan process, during which time was spent more on getting an acceptable plan than on-the-ground actions. While it may still be necessary to amend the Permit prior to expiration where allowed, any need to do this should be minimized.

This Permit does not include approval of all Permittees' stormwater management programs or annual reports as part of the administration of the Permit. To do so would require

significantly increased staff resources. Instead, minimum measures have been established to simplify assessment of compliance and allow the public to more easily assess each Permittee's compliance. Each Permit provision and its reporting requirements are written with this in mind. That is, each provision establishes the required actions, minimum implementation levels (i.e., minimum percentage of facilities inspected annually, escalating enforcement, reporting requirements for tracking projects, number of monitoring sites, etc.), and specific reporting elements to substantiate that these implementation levels have been met. Water Board staff will evaluate each individual Permittee's compliance through annual report review and the audit process.

The challenge in drafting the Permit is to provide the flexibility described above considering the different sizes and resources while ensuring that the Permit is still enforceable. To achieve this, the Permit frequently prescribes minimum measurable outcomes, while providing Permittees with flexibility in the approaches they use to meet those outcomes. Enforceability has been found to be a critical aspect of the Permit. A balance between flexibility and enforceability has been crafted into the Permit.

Current Permit Approach

As stated above, because stormwater management plans were legally an integral part of the permits and were subject to complete public notice, review and comment, this permit reissuance continues to incorporate those plan level details in the permit, thus merging the Permittees' stormwater management plans into the permit in one document. This Permit specifies the actions necessary to reduce the discharge of pollutants in stormwater to the maximum extent practicable, in a manner designed to achieve compliance with water quality standards and objectives, and effectively prohibit non-stormwater discharges into municipal storm drain systems and watercourses within the Permittees' jurisdictions. The Permit includes requirements for the following components:

- Discharge Prohibitions and Receiving Water Limitations
- Municipal Operations
- New Development and Redevelopment
- Industrial and Commercial Site Controls
- Illicit Discharge and Elimination
- Construction Site Controls
- Public Information and Outreach
- Water Quality Monitoring
- Pesticides Toxicity Controls
- Trash Reduction
- Mercury Controls
- PCBs Controls
- Copper Controls
- Pacifica Bacteria Controls Exempt and Conditionally Exempt Discharges
- San Mateo County Discharges to ASBS

IV. ECONOMIC ISSUES

In 2000, the State Water Board issued a precedential order (Order WQ 2000-11 (Cities of Bellflower, et al.)) stating that cost of compliance with the programs and requirements of a municipal storm water permit is a relevant factor in determining MEP. The Order also explicitly stated that a cost benefit analysis is not required. The State Water Board discussed costs as follows:

While the standard of MEP is not defined in the storm water regulations or the Clean Water Act, the term has been defined in other federal rules.

These definitions focus mostly on technical feasibility, but cost is also a relevant factor. There must be a serious attempt to comply, and practical solutions may not be lightly rejected. If, from the list of BMPs, a permittee chooses only a few of the least expensive methods, 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 to be derived, it would have met the standard. MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive. Thus while cost is a factor, the Regional Water Board is not required to perform a cost-benefit analysis.

(State Water Board Order WQ 2000-11, supra, p.20.) The cost of complying with TMDL waste load allocations is not required to be considered since TMDLs are not subject to the MEP standard. Federal law requires that NPDES permits contain effluent limitations consistent with the assumptions of any applicable wasteload allocation in a TMDL. (40 C.F.R. §122.44(d)(1)(vii)(B).) With that background, we turn to economic considerations.

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. However, when considering the cost of implementing the urban runoff programs, it is also important to consider the alternative costs incurred by not fully implementing the programs, as well as the benefits which result from program implementation.

It is very difficult to ascertain the true cost of implementation of the Permittees' urban runoff management programs because of inconsistencies in reporting by the 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.¹ 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, U.S. EPA 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. U.S. EPA also

¹ LARWQCB, 2003. Review and Analysis of Budget Data Submitted by the Permittees for Fiscal Years 2000-2003.p.2

studied 35 Phase I municipalities, finding costs to be similar to those anticipated for Phase II municipalities, at \$9.08 per household annually.²

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

The State Water Resources Control Board (State Water Board) also commissioned a study by the California State University, Sacramento to assess costs of the Phase I MS4 program. This study is current and includes an assessment of costs incurred by the City of Encinitas in implementing its program. Annual cost per household in the study ranged from \$18-46, with the City of Encinitas representing the upper end of the range.³ The cost of the City of Encinitas' program is understandable, given the City's coastal location, reliance on tourism, and consent decree with environmental groups regarding its program. For these reasons, as well as the general recognition the City of Encinitas receives for implementing a superior program, the City's program cost can be considered as the high end of the spectrum for Permittee urban runoff management program costs.

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% of program costs are new costs fully attributable to MS4 permits. The remainder of program costs were either pre-existing or resulted from enhancement of pre-existing programs.⁴ The County of Orange found that even lesser amounts of program costs are solely attributable to MS4 permit compliance, reporting that the amount attributable to implement its Drainage Area Management Plan, its municipal stormwater permit requirements, is less than 20% of the total budget. The remaining 80% is attributable to pre-existing programs.⁵

It is also important to acknowledge that the vast majority of costs that will be incurred as a result of implementing the Order are not new. Urban runoff management programs have been in place in this region for over 15 years. Any increase in cost to the Permittees will be incremental in nature.

Urban runoff management programs cannot be considered in terms of their costs only. The programs must also be viewed in terms of their value to the public. For example, household willingness to pay for improvements in fresh water quality for fishing and boating has been estimated by U.S. EPA to be \$158-210.⁶ This estimate can be considered conservative,

² Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791-68792.

³ State Water Board, 2005. NPDES Stormwater Cost Survey. P. ii

⁴ Ibid. P. 58.

⁵ County of Orange, 2000. A NPDES Annual Progress Report. P. 60. More current data from the County of Orange is not used in this discussion because the County of Orange no longer reports such information.

⁶ Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68793.

since it does not include important considerations such as marine waters benefits, wildlife benefits, or flood control benefits. The California State University, Sacramento study corroborates U.S. EPA's estimates, reporting annual household willingness to pay for statewide clean water to be \$180.⁷ 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 bathing near storm drains.⁸ A study of south Huntington Beach and north Newport Beach found that an illness rate of about 0.8% among bathers at those beaches resulted in about \$3 million annually in health-related expenses.⁹ Extrapolation of such numbers to the beaches and other water contact recreation in San Francisco Bay and the tributary creeks of the region could result in huge expenses to the public.

Urban runoff and its impact on receiving waters also places a cost on tourism. The California Division of Tourism has estimated that each out-of-state visitor spends \$101.00 a day. The experience of Huntington Beach provides an example of the potential economic impact of poor water quality. Approximately 8 miles of Huntington Beach were closed for two months in the middle of summer of 1999, impacting beach visitation and the local economy.

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 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.¹⁰ Costs are anticipated to be borne over many years – probably ten years at least. As can be seen, the benefits of the programs are expected to considerably exceed their costs. Such findings are corroborated by U.S. EPA, which found that the benefits of implementation of its Phase II storm water rule would also outweigh the costs.¹¹

⁷ State Water Board, 2005. NPDES Stormwater Cost Survey. P. iv.

⁸ Haile, R.W., et al, 1996. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica Bay. Santa Monica Bay Restoration Project.

⁹ Los Angeles Times, May 2, 2005. Here's What Ocean Germs Cost You: A UC Irvine Study Tallies the Cost of Treatment and Lost Wages for Beachgoers Who Get Sick.

¹⁰ LARWQCB, 2004. Alternative Approaches to Stormwater Control.

¹¹ Federal Register / Vol. 64, No. 235 / Wednesday, December 8, 1999 / Rules and Regulations. P. 68791.

V. RELEVANT STATUTES, REGULATIONS, PLANS AND POLICIES

A. Legal Authorities.

This Order is issued pursuant to section 402 of the CWA and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the CWC (commencing with section 13370). This Order serves as an NPDES permit for point source discharges to surface waters. This Order also serves as waste discharge requirements pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

In addition to the legal authority citations below, they are also provided with each permit provision in 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,D,E, and F) require 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; (D) Control through interagency agreements among co-applicants the contribution of pollutants from one portion of the municipal system to another portion of the municipal system; (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) requires “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 requires that “[n]otwithstanding 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.”

B. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plan.** The CWA requires the Regional Water Board to establish water quality standards for each water body in its region. Water quality standards include beneficial uses, water quality objectives and criteria that are established at levels sufficient to protect beneficial uses, and an antidegradation policy to prevent degrading of waters. The Regional Water Board adopted the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), which designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. The Urban Runoff Management, Comprehensive Control Program section of the Basin Plan requires the Permittees to address existing water quality problems and prevent new problems associated with urban runoff through the development and implementation of a comprehensive control program focused on reducing current levels of pollutant loading to storm drains to the maximum extent practicable. The Basin Plan’s comprehensive program requirements are designed to be consistent with federal regulations (40 CFR Parts 122-124) and are implemented through issuance of NPDES permits to owners and operators of MS4s. Pursuant to Water Code sections 13263 and 13377, the requirements in this Order implement the Basin Plan.

2. **Water Quality Control Plan for Ocean Waters of California, California Ocean Plan**

In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amended Ocean Plan on October 16, 2012, and it was approved by the Office of Administrative Law and USEPA. The Ocean Plan is applicable, in its entirety, to ocean waters of the state. In order to protect beneficial uses, the Ocean Plan establishes water quality objectives and a program

of implementation. Pursuant to Water Code sections 13263 and 13377, the requirements of this Order implement the Ocean Plan.

The Ocean Plan prohibits the discharge of waste to designated Areas of Special Biological Significance (ASBS). ASBS are ocean areas designated by the State Water Board as requiring special protection through the maintenance of natural water quality. The California Ocean Plan states that the State Water Board may grant an exception to California Ocean Plan provisions where the State Water Board determines that the exception will not compromise protection of ocean waters for beneficial uses and the public interest will be served. In 2012, the State Water Board adopted Resolutions 2012-0012 and 2012-0031 (ASBS Exception), which grant an exception to the Ocean Plan prohibition on discharges to ASBS for a limited number of applicants, including San Mateo County for stormwater discharges into the James V. Fitzgerald Marine Reserve ASBS. The ASBS Exception contains “Special Protections” to maintain natural water quality and protect the beneficial uses of the ASBS. In order to legally discharge into an ASBS, San Mateo County must comply with the terms of the Special Protections and obtain coverage under this Order. This Order incorporates the terms of the Special Protections for San Mateo’s discharges into the ASBS.

3. National Toxics Rule (NTR) and California Toxics Rule (CTR). U.S. EPA adopted the NTR on December 22, 1992, and amended it on May 4, 1995 and November 9, 1999. About 40 criteria in the NTR apply in California. On May 18, 2000, U.S. EPA adopted the CTR. The CTR promulgated new toxics criteria for California and incorporated the previously adopted NTR criteria that applied in the State. U.S. EPA amended the CTR on February 13, 2001. These rules contain water quality criteria for priority pollutants.
4. Antidegradation Policy. Federal regulations (40 CFR 131.12) require that the state water quality standards include an antidegradation policy consistent with the federal antidegradation policy. The State Water Board established California’s antidegradation policy in State Water Board Resolution No. 68-16 (“Statement of Policy with Respect to Maintaining the Quality of the Waters of the State”). State Water Board Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law.

The Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. Resolution No. 68-16 and 40 CFR section 131.12 require the Regional Water Board to maintain high quality waters of the State unless degradation is justified based on specific findings. First, the Regional Water Board must ensure that “existing instream uses and the level of water quality necessary to protect the existing uses” are maintained and protected. Second, if the baseline quality of a water body for a given constituent exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected through the requirements of the Order unless the Regional Water Board makes findings that (1) any lowering of the water quality is necessary to accommodate important economic or social development in the area in which the waters are

located; (2) water quality adequate to protect existing uses fully is assured; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved.

The Regional Water Board must also comply with any requirements of State Water Board Resolution No. 68-16 beyond those imposed through incorporation of the federal antidegradation policy. In particular, the Regional Water Board must find that not only present, but also anticipated future uses of water are protected, and must ensure best practicable treatment or control of the discharges. The baseline quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of Resolution No. 68-16, or a lower level if that lower level was allowed through a permitting action that was consistent with the federal and state antidegradation policies. The discharges permitted in this Order are consistent with the antidegradation provisions of 40 CFR section 131.12 and Resolution 68-16 as set out below:

- a. Many of the waters within the area covered by this Order are impaired and for multiple pollutants discharged through MS4s and are not high quality waters with regard to these pollutants. In most cases, there are insufficient data to determine whether these water bodies were impaired as early as 1968, but the limited available data shows impairment dating back for more than two decades. Many such water bodies are listed on the State's CWA Section 303(d) List and the Board has established TMDLs to address the impairments (see V.6). This Order ensures that instream (beneficial) water uses and the level of water quality necessary to protect the existing uses is maintained and protected. This Order requires the Permittees to comply with permit provisions to implement the wasteload allocations set forth in the TMDLs in order to restore the beneficial uses of the impaired water bodies consistent with the assumptions and requirements of the TMDLs. This Order further requires compliance with receiving water limitations to meet water quality standards in the receiving water either by showing compliance or by implementing actions to comply with water-quality based requirements (limitations) set forth in specific pollutants of concern provisions.
- b. To the extent that some of the water bodies within the area covered by this Order are high quality waters with regard to some constituents, the Board finds as follows:

Allowing limited degradation of high quality water bodies through MS4 discharges is necessary to accommodate important economic or social development in the area and is consistent with the maximum benefit to the people of the state. The discharge of stormwater in certain circumstances is to the maximum benefit to the people of the State because it can assist with maintaining instream flows that support beneficial uses, may spur the development of multiple-benefit projects, and may be necessary for flood management, and public safety as well as to accommodate development in the area. The alternative – capturing all stormwater from all storm events –

would be an enormous opportunity cost that would preclude MS4 permittees from spending substantial funds on other important social needs. The Order ensures that any limited degradation does not affect existing and anticipated future uses of the water and does not result in water quality less than established standards. The Order requires compliance with receiving water limitations that act as a floor to any limited degradation.

The Order requires the highest statutory and regulatory requirements and requires that the Permittees meet best practicable treatment or control. The Order prohibits all non-stormwater discharges, with a few enumerated exceptions, through the MS4 to the receiving waters. As required by 40 CFR section 122.44(a), the Permittees must comply with the “maximum extent practicable” technology-based standard set forth in CWA section 402(p), and implement extensive minimum control measures in a storm water management program. Recognizing that best practicable treatment or control may evolve over time, the Order includes new and more specific requirements as compared to Order No. R2-2009-0074.

5. Anti-backsliding Regulations. Section 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. This Order contains limitations that are at least as stringent as the previous permit.
6. Impaired Waters on CWA 303(d) List. CWA section 303(d)(1) requires each State to identify specific water bodies within its boundaries where water quality standards are not being met or are not expected to be met after implementation of technology-based effluent limitations on point sources. Water bodies that do not meet water quality standards are considered impaired and are placed on the state’s “303(d) List.” Periodically, U.S. EPA approves the State’s 303(d) List. In October 2011, U.S. EPA approved a revised list of impaired waters prepared pursuant to CWA section 303(d), which requires identification of specific water bodies where it is expected that water quality standards will not be met after implementation of technology-based effluent limitations on point sources. Where it has not done so already, the Regional Water Board plans to adopt Total Maximum Daily Loads (TMDLs) for pollutants on the 303(d) list. TMDLs establish wasteload allocations for point sources and load allocations for non-point sources, and are established to achieve the water quality standards for the impaired waters.

The Regional Water Board has established TMDLs for pesticide-related toxicity, mercury, PCBs, pathogens, among others, to remedy water quality impairments in various water bodies in and around San Francisco Bay. These TMDLs identify MS4 discharges as a source of pollutants to these water bodies, and, as required establish wasteload allocations (WLAs) for MS4 discharges to reduce the amount of pollutant discharged to receiving waters. CWA section 402(p)(3)(B)(iii) requires the Regional Water Board to impose permit conditions, 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.” Federal regulations also require that NPDES permits contain WQBELs consistent with the assumptions and requirements of all available WLAs (40 CFR 122.44(d)(1)(vii)(B)). CWC sections 13263 and 13377 also require that permits include limitations necessary to implement water quality control plans. Therefore, this Order includes WQBELs and other provisions to implement the TMDL WLAs assigned to Permittees regulated by this Order.

7. California Environmental Quality Act. The action to adopt an NPDES Permit is exempt from the provisions of the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) (“CEQA”) pursuant to Water Code section 13389, since the adoption or modification of a NPDES permit for an existing source is statutorily exempt and this Order only serves to implement a NPDES permit (*Pacific Water Conditioning Assn, Inc. v. City Council of City of Riverside* (1977) 73 Cal.App.3d 546, 555-556.).
8. Endangered Species Act Requirements. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code §§ 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. §§ 1531 to 1544). This Order requires compliance with limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the State, including protecting rare, threatened, or endangered species. Each Permittee is responsible for meeting all applicable Endangered Species Act requirements.

C. State Mandates

Article XIII B, Section 6(a) of the California Constitution provides that whenever “any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse that local government for the costs of the program or increased level of service.” The requirements in this Order do not constitute an unfunded local government mandate subject to subvention under Article XIII B, Section (6) of the California Constitution for several reasons.

First, this Permit implements federally mandated requirements under CWA section 402, subdivision (p)(3)(B). (33 U.S.C. § 1342(p)(3)(B).) This includes federal requirements to effectively prohibit non-stormwater discharges, to reduce the discharge of pollutants to the maximum extent practicable, and to include such other provisions as the Administrator or the State determines appropriate for the control of such pollutants. Federal cases have held that these provisions require the development of permits and permit provisions on a case-by-case basis to satisfy federal requirements. (*Natural Resources Defense Council, Inc. v. USEPA* (9th Cir. 1992) 966 F.2d 1292, 1308, fn. 17.) The authority exercised under this Permit is not reserved state authority under the CWA’s savings clause (cf. *Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613, 627-628 [relying on 33 U.S.C. § 1370, which allows a state to develop requirements that are not less stringent than federal requirements]), but instead, is part

of a federal mandate to develop pollutant reduction requirements for MS4. 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.)

The requirements of this Order do not constitute a new program or a higher level of service as compared to the requirements contained in the previous permits. The overarching requirement to impose controls to reduce the pollutants in discharges from MS4s is dictated by the CWA and is not new to this permit cycle (33 USC section 1342(p)(3)(B)). The inclusion of new and advanced measures as the MS4 programs evolve and mature over time is anticipated under the CWA (55 FR 47990, 48052 (Nov. 16, 1990)), and to the extent requirements in this Order are interpreted as new advanced measures, they do not constitute a new program or higher level of service.

The maximum extent practicable standard under CWA section 402(p)(3)(B)(iii) is a flexible standard that balances a number of considerations, including technical feasibility, cost, public acceptance, regulatory compliance, and effectiveness. (*Building Ind. Ass'n. of San Diego v. State Water Resources Control Bd.* (2004) 124 Cal.App.4th 866, 873-874, 889.) Such considerations change over time with advances in technology and with experience gained in storm water management (55 FR 47990, 48052 (Nov. 16, 1990)). Accordingly, the determination of whether the Order conditions exceed the requirements of federal law cannot be based on a point by point comparison of the permit conditions and the six minimum measures that are required “at a minimum” to reduce pollutants to the maximum extent practicable and to protect water quality (40 C.F.R. §122.34). Likewise, individual permit provisions cannot be considered in isolation. When implementing the federal requirement to reduce pollutants to the maximum extent practicable, the entire permit must be evaluated as a whole. The Second Appellate District of the Court of Appeal has affirmed this approach in a case that is now pending before the California Supreme Court. (*State Department of Finance v. Commission on State Mandates* (2014) 316 P.3d 1218, review granted (2013) 220 Cal.App.4th 740.)

Furthermore, in the analogous Phase II MS4 context, U.S. EPA has issued an MS4 Permit Improvement Guide (April 2010, available at: http://www.epa.gov/npdes/pubs/ms4permit_improvement_guide.pdf) that recommends many provisions for Phase II MS4 permits not explicitly specified in the six minimum measures established at Code of Federal Regulations, title 40, section 122.34.

The requirements of the Order are necessary to reduce the discharge of pollutants to the MEP. The Regional Water Board finds that the requirements of the Order are practicable, do not exceed federal law, and thus do not constitute an unfunded mandate. These findings are the expert conclusions of the principal state agency charged with implementing the NPDES program in California (CWC sections 13001, 13370). The provisions in this Order to effectively prohibit non-storm water discharges are also mandated by the CWA (33 USC section 1342(p)(3)(B)(ii)). Likewise, the provisions of this Permit to implement total maximum daily loads (TMDLs) are federal mandates.

The CWA requires TMDLs to be developed for waterbodies that do not meet federal water quality standards. (33 U.S.C. § 1313(d).) Once U.S. EPA or a state develops a TMDL, federal law requires that permits must contain effluent limitations consistent with the assumptions of any applicable WLA. (40 CFR 122.44(d)(1)(vii)(B).)

Second, the Permittees' obligations under this Permit are similar to, and in many respects less stringent than, the obligations of nongovernmental dischargers 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. § 1342) and the Porter-Cologne regulates the discharge of waste (Water Code 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 dischargers. (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].)

The CWA and the Porter-Cologne Water Quality Control Act largely regulate stormwater with an even hand, but to the extent that there is any relaxation of this evenhanded regulation, it is in favor of the Permittees. Except for MS4s, the CWA requires point source dischargers, including discharges of stormwater associated with industrial or construction activity, to comply strictly with water quality standards. (33 U.S.C. § 1311(b)(1)(C), *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159, 1164-1165 [noting that industrial stormwater discharges must strictly comply with water quality standards].) As discussed in prior State Water Board decisions, this Permit does not require strict compliance with water quality standards. (SWRCB Order No. WQ 2001-15, p. 7.) The Permit, therefore, regulates the discharge of waste in municipal stormwater more leniently than the discharge of waste from nongovernmental sources.

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

Fourth, the Permittees' responsibility for preventing discharges of waste that can create conditions of pollution or nuisance from conveyances that are within their ownership or control under State law predates the enactment of Article XIII B, Section (6) of the California Constitution.

Finally, even if any of this Order's provisions could be considered unfunded mandates, under Government Code section 17556, subdivision (d), a state mandate is not subject to reimbursement if the local agency has the authority to charge a fee. The Permittees have the authority to levy service charges, fees, or assessments sufficient to pay for compliance with this Order, subject to certain voting requirements contained in the California Constitution. (See Cal. Const., Art. XIII D, section 6, subd. (c); see also *Howard Jarvis Taxpayers Ass'n v. City of Salinas* (2002) 98 Cal.App.4th 1351, 1358-1359.) The Fact Sheet demonstrates that numerous activities contribute to the pollutant loading in the MS4. Permittees can levy service charges, fees, or assessments on these activities, independent of real property ownership. (See, e.g., *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.)

D. Statewide General Industrial and Construction Stormwater Permits

The State Water Board has issued NPDES general permits for the regulation of stormwater discharges associated with industrial activities and construction activities. To effectively implement the New Development (and significant redevelopment) and Construction Controls, Illicit Discharge Controls, and Industrial and Commercial Discharge Controls components in this Permit, the Permittees will conduct investigations and local regulatory activities at industrial and construction sites covered by these general permits. However, under the CWA, the Water Board cannot delegate its own authority to enforce these general permits to the Permittees. Therefore, Water Board staff intends to work cooperatively with the Permittees to ensure that industries and construction sites within the Permittees' jurisdictions are in compliance with applicable general permit requirements and are not subject to uncoordinated stormwater regulatory activities.

E. Regulated Parties

Each of the Permittees listed in this Permit owns or operates a MS4, through which it discharges urban runoff into waters of the United States within the San Francisco Bay Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

F. Permit Coverage

The Permittees each have jurisdiction over and maintenance responsibility for their respective MS4s in the Region. Federal, state or regional entities within the Permittees' boundaries, not currently named in this Permit, operate storm drain facilities and/or discharge stormwater to the storm drains and watercourses covered by this Permit. The Permittees may lack jurisdiction over these entities. Consequently, the Water Board recognizes that the Permittees should not be held responsible for such facilities and/or discharges. The Water Board will consider such facilities for coverage under NPDES

permitting pursuant to U.S. EPA Phase II stormwater regulations. Under Phase II, the Water Board intends to permit these federal, State, and regional entities through use of a Statewide Phase II NPDES General Permit.

VI. PERMIT

A. Discharge Prohibitions

Prohibition A.1. Legal Authority – 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.”

Prohibition A.2. Legal Authority – San Francisco Bay Basin Plan, Chapter 4 Implementation, Table 4-1, Prohibition 7.

B. Receiving Water Limitations

Receiving Water Limitation B.1. Legal Authority – San Francisco Bay Basin Plan, Chapter 3, Water Quality Objectives.

Receiving Water Limitation B.2. Legal Authority – Federal regulations require each NPDES permit to include limitations necessary to achieve water quality standards. 40 CFR 122.44(d)(1)(i). The State Water Board has previously determined that limitations necessary to meet water quality standards are appropriate for the control of pollutants discharged by MS4s and must be included in MS4 permits. (State Water Board Orders WQ 91-03, 98-01, 99-05, and 2001-15.). This Order accordingly requires that discharges shall not cause or contribute to violations of water quality standards.

C. Provisions

C.1. Compliance with Discharge Prohibitions and Receiving Water Limitations

Legal Authority

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC sections 13377 and 13263, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: The Water Board’s Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) contains the following waste discharge prohibition: “The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination, or nuisance as defined in California Water Code Section 13050, is prohibited.”

California Water Code 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.”

California Water Code 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.”

California Water Code 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.”

California Water Code section 13241 requires each water 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 [...]”

California Water Code Section 13243 provides that a water 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.”

California Water Code Section 13263(a) provides that waste discharge requirements prescribed by the water board implement the Basin Plan.

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

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

Federal NPDES regulation 40 CFR 122.44(d)(1) requires NPDES 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 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.”

State Water Resources Control Board (“State Water Board”) Orders WQ 98-01 and 99-05 are precedential orders that require municipal stormwater permits to not cause or contribute to exceedances of water quality standards in the receiving water. State Water Board Order 95-01 specifically requires that

Provision C.1 include language that Permittees shall comply with discharge prohibitions and receiving water limitations through timely implementation of control measures and other actions to reduce pollutants in the discharges, whereby adopting an iterative approach to complying with receiving water limitations. Courts have held that compliance with the iterative process does not excuse liability for violations of water quality standards. (*Building Industry Assn. of San Diego v. State Water Resources Control Board* (2004) 124 Cal.App.4th 866; *City of Rancho Cucamonga v. Regional Water Quality Control Bd.* (2006) 135 Cal.App.4th 1377; *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2011) 673 F.3d. 880, rev'd on other grounds sub nom. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2013) 133 S.Ct. 710, mod. by *Natural Resources Defense Council v. County of Los Angeles* (9th Cir. 2013) 725 F.3d 1194, cert. den. *Los Angeles County Flood Control Dist. v. Natural Resources Defense Council* (2014) 134 S.Ct. 2135.)

Alternative Path to Compliance with Discharge Prohibitions and Receiving Water Limitations for Certain Pollutants

This Order, as did the previous Order, goes beyond requiring an open-ended iterative approach to compliance with water quality standards by including pollutant-specific provisions, C.9 through C.14, with numerical water quality based effluent limitations or narrative water quality based effluent limitations with milestones and deadlines. The provisions and limitations implement adopted TMDL wasteload allocations and the Basin Plan and specify what Permittees must do during the term of the Order to manage discharges of the specific pollutants that may cause or contribute to violations of water quality standards. If complied with, the Permittees will be deemed in compliance with Receiving Water Limitations B.1 and B.2 for these pollutants. This rigorous compliance alternative includes, where appropriate, use of watershed-based approaches, green infrastructure, and low impact development principles that address multiple pollutants and provide multiple benefits. It also contains concrete milestones and deadlines and is transparent because the requirements are expressly stated in this Order, which is subject to the public process.

The Order also includes monitoring requirements (Provision C.8) to assess water body and watershed conditions and effectiveness of control actions towards attainment of water quality standards and to inform selection and implementation of new control actions or adaptive improvements of control actions.

Consistent with the TMDLs, more time than the term of the Order will be necessary to attain water quality standards for mercury and PCBs. In these cases, the associated Order provision includes an additional requirement for the Permittees to submit a proposed plan of additional or improved control actions and schedule of implementation to attain water quality standards or TMDL wasteload allocations for the Water Board's consideration of numerical or narrative water quality based effluent limitations in the subsequent Order.

C.2. Municipal Operations

Legal Authority

The following legal authority applies to Provision C.2:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), California Water Code (CWC) sections 13377 and 13263, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

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 waterbodies 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.”

Fact Sheet Findings in Support of Provision C.2

- C.2-1** Municipal maintenance activities are potential sources of pollutants unless appropriate inspection, pollutant source control, and cleanup measures are implemented during routine maintenance works to minimize pollutant discharges to storm drainage facilities.

Sediment accumulated on paved surfaces, such as roads, parking lots, parks, sidewalks, landscaping, and corporation yards, is the major source of point source pollutants found in urban runoff. Thus, Provision C.2 requires the Permittees to designate minimum BMPs for all municipal facilities and activities as part of their ongoing pollution prevention efforts as set forth in this Permit. Such prevention measures include, but are not limited to, activities as described below. The work of municipal maintenance personnel is vital to minimize stormwater pollution, because personnel work directly on municipal storm drains and other municipal facilities. Through work such as inspecting and cleaning storm drain drop inlets and pipes and conducting municipal construction and maintenance activities upstream of the storm drain, municipal maintenance personnel are directly responsible for preventing and removing pollutants from the storm drain. Maintenance personnel also play an important role in educating the public and in reporting and cleaning up illicit discharges.

- C.2-2** Road construction and other activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. In particular, poorly designed roads can act as man-made drainages that carry runoff and sediment into natural streams, impacting water quality.

Provision C.2 also requires the Permittees to implement effective BMPs for the following rural works maintenance and support activities: (a) Road design, construction, maintenance, and repairs in rural areas that prevent and control road-related erosion and sediment transport; (b) Identification and prioritization of rural roads maintenance on the basis of soil erosion potential, slope steepness, and stream habitat resources; (c) Road and culvert construction designs that do not impact creek functions. New or replaced culverts shall not create a migratory fish passage barrier, where migratory fish are present, or lead to stream instability; (d) Development and implementation of an inspection program to maintain road structural integrity and prevent impacts to water quality; (e) Provide adequate maintenance of rural roads adjacent to streams and riparian habitat to reduce erosion, replace damaging shotgun culverts, re-grade roads to slope outward where consistent with road engineering safety standards, and install water bars; and (f) When replacing existing culverts or redesigning new culverts or bridge crossings use measures to reduce erosion, provide fish passage and maintain natural stream geomorphology in a stable manner.

Road construction, culvert installation, and other rural maintenance activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. Poorly designed roads can act as preferential drainage pathways that carry runoff and

sediment into natural streams, impacting water quality. In addition, other rural public works activities, including those the BMP approach would address, have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways. This Provision would help ensure that these impacts are appropriately controlled.

Specific Provision C.2 Requirements

Provision C.2.a-e. (Operation and Maintenance of Municipal Separate Storm Sewer Systems (MS4) facilities) requires that the Permittees implement appropriate pollution control measures during maintenance activities and to inspect and, if necessary, clean municipal facilities, such as conveyance systems, pump stations, and corporation yards, before the rainy season. The requirements will assist the Permittees to prioritize tasks, implement appropriate BMPs, evaluate the effectiveness of the implemented BMPs, and compile and submit annual reports.

Provision C.2.d. (Stormwater Pump Stations) In late 2005, Board staff investigated the occurrence of low salinity and dissolved oxygen (DO) conditions in Old Alameda Creek (Alameda County) and Alviso Slough (Santa Clara County) in September and October of 2005. Board staff became aware of this problem in their review of receiving water and discharge sampling conducted by the U.S. Geological Survey as part of its routine monitoring on discharges associated with the former salt ponds managed by the U.S. Fish and Wildlife Service in Santa Clara County and the California Department of Fish and Game in Alameda County.

Discharge of black-colored water from the Alvarado pump station to Old Alameda Creek was observed at the time of the data collection on September 7, 2005, confirming dry weather urban runoff as the source of the documented violations of the 5 mg/L (DO) water quality objective. Such conditions were measured again on September 21, 2005.

On October 17, 2005, waters in Alviso Slough were much less saline than the salt ponds and had the lowest documented dissolved oxygen of the summer, suggesting a dry weather urban runoff source. The (DO) sag was detected from surface to bottom at 2.3 mg/L at a salinity of less than 1 part per thousand (ppt), mid-day, when oxygen levels should be high at the surface. The sloughs have a typical depth of 6 feet.

Investigations of these incidents found that storm water pump stations, universally operated by automatic float triggers, have been confirmed as the cause in at least one instance and may represent an overlooked source of controllable pollution to the San Francisco Bay Estuary and its tidal sloughs; and the discharges of dry weather urban runoff from these pump stations were not being managed to protect water quality, and that surveillance monitoring has detected measurable negative water quality consequences of this current state of pump station management.

Pump station discharges are controllable point sources of pollution that are virtually unregulated causing violations of water quality objectives. Therefore, the Previous Permit required (1) an inventory of pump stations, (2) inspection of pump stations twice a year during the dry season to collect (DO) data and implement corrective actions for DO at or below 3 milligrams per liter (mg/l), and (3) inspection of pump stations after two

storm events during the wet season to collect data on the presence of trash and other water quality parameters.

The Permittees have submitted a list of all pump stations. DO data in annual reports shows that turning on the pumps aerates the water, thereby increasing the DO of the water to at least 3 (mg/l), the minimum DO requirement. It is important that Permittees continue to ensure that water discharged from pump stations have the minimum DO to protect the beneficial uses of the water bodies. This Permit removes the specific requirements for the monitoring of DO at pump stations and allows the Permittees greater flexibility to ensure that all water discharged from pumps stations is at least 3 mg/l. The reporting requirement has also been removed from this Permit but Permittees must maintain the records and make them available upon request

The Previous Permit also wanted to explore the use of the pump stations for trash capture to protect the beneficial uses of the receiving waters. Information collected shows that pump stations as trash capture devices are inefficient because their reservoirs are too small to contain trash. At the same time, many municipalities have installed full and partial trash capture devices at select storm drain inlets.

Provision C.2.f. (Corporation Yard BMP Implementation) requires Permittees to implement the Best Management Practices (BMPs) in site specific Stormwater Pollution Prevention Plans (SWPPPs) to minimize pollutant discharges in stormwater and non-stormwater discharges. SWPPPs should have specific BMPs for different functions of the corporation yard and provide guidance for frequent mini inspections to ensure that appropriate BMPs are implemented. During the Previous Permit term, Water Board staff inspected a few of the Permittees' corporation yard and evaluated the SWPPPs. All inspected corporation yards had actual and/or potential discharge issues. Most of the countywide programs developed templates for the SWPPPs. Individual Permittees were supposed to customize the template to fit their corporation yards. Some Permittees did not fully customize the SWPPP template. A few Permittees have comprehensive, site specific SWPPPs. Water Board staff also evaluated this Provision in annual reports. The Previous Permit required routine inspections in different areas of the corporation yard and at least one inspection prior to the start of the rainy season. The intent of the inspection requirement was to have regular mini inspections and one full corporation yard inspection sometime in late August or in September, right before the start of the rainy season in October, to make sure the corporation yard was clean and all issues were resolved before the start of the rainy season. Some Permittees inspected in the spring or early summer and documented that as the inspection for the year to comply with this Provision in the annual report due that September. Other Permittees did not inspect until late fall or winter. Some Permittees documented issues but the annual reports either did not document the corrective actions or corrective actions were implemented weeks or months later. Therefore, this Permit clearly identifies the timeframe of when the annual inspections must be done and requires corrective actions to be implemented before the next rain event, but no longer than 10 business days after the potential and/or actual discharges are discovered. This is consistent with the timeframe for implementation of corrective actions in provisions C.4. and C.5.

C.3. New Development and Redevelopment

Legal Authority

Broad Legal Authority: CWA Sections 402(p)(3)(B)(ii-iii), CWA Section 402(a), CWC Sections 13377 and 13263, 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).

Fact Sheet Findings in Support of Provision C.3

- C.3-1** Urban development begins at the land use planning phase; therefore, this phase provides the greatest cost-effective opportunities to protect water quality in new development and redevelopment. When a Permittee incorporates policies and principles designed to safeguard water resources into its General Plan and development project approval processes, it has taken a critical step toward the preservation of local water resources for current and future generations.
- C.3-2** Provision C.3. is based on the assumption that Permittees are responsible for considering potential stormwater impacts when making planning and land use decisions. The goal of Provision C.3. is for Permittees to use their planning authority to reduce pollutant discharges and runoff flow into the storm drain system primarily through the implementation of low impact development (LID) techniques.
- C.3-3** To accomplish this goal, Permittees shall require new development and redevelopment projects to implement appropriate source control, site design, and stormwater treatment measures to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flow from these projects. Permittees shall also complete and implement a Green Infrastructure Plan for the inclusion of low impact development drainage design into storm drain infrastructure on public and private lands, including streets, roads, storm drains, parking lots, building roofs and other storm drain infrastructure elements. Neither Provision C.3. nor any of its requirements are intended to restrict or control local land use decision-making authority.
- C.3-4** Certain control measures implemented or required by Permittees for urban runoff management might create a habitat for vectors (e.g., mosquitoes and rodents) if not properly designed or maintained. Close collaboration and cooperative efforts among Permittees, local vector control agencies, Water Board staff, and the State Department of Public Health are necessary to minimize potential nuisances and public health impacts resulting from vector breeding.
- C.3-5** The Water Board recognized in its Policy on the Use of Constructed Wetlands for Urban Runoff Pollution Control (Resolution No. 94-102) that urban runoff treatment wetlands that are constructed and operated pursuant to that Resolution and are constructed outside a creek or other receiving water are stormwater treatment systems and, as such, are not waters of the United States subject to

regulation pursuant to Sections 401 or 404 of the federal Clean Water Act. Water Board staff is working with the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS) to identify how maintenance for stormwater treatment controls required under permits such as this Permit can be appropriately streamlined, given CDFG and USFWS requirements, and particularly those that address special status species. This Permit requires Permittees to ensure that constructed wetlands installed by Regulated Projects are consistent with Resolution No. 94-102 and the operation and maintenance requirements contained therein.

- C.3-6** The Permit requires Permittees to ensure that pervious pavement systems of 3000 square feet or more, onsite, joint, and offsite stormwater treatment systems, and HM controls installed by Regulated Projects are properly operated and maintained for the life of the projects. In cases where the responsible parties for the treatment systems or HM controls have worked diligently and in good faith with the appropriate state and federal agencies to obtain approvals necessary to complete maintenance activities for the treatment systems or HM controls, but these approvals are not granted, the Permittees shall be considered by the Water Board to be in compliance with Provision C.3.h.iii. of the Permit.

Specific Provision C.3 Requirements

Provision C.3.a. (New Development and Redevelopment Performance Standard Implementation) sets forth essentially the same legal authority, development review and permitting, environmental review, training, and outreach requirements that are contained in the previous permit.

Provision C.3.b. (Regulated Projects) establishes the different categories of new development and redevelopment projects that Permittees must regulate under Provision C.3. 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 all impervious surfaces contribute pollutants to stormwater runoff and certain land uses contribute more pollutants. Impervious surfaces can neither absorb water nor remove pollutants as the natural, vegetated soil they replaced can. Also, urban development creates new pollution by bringing higher levels of car emissions that are aurally deposited, car maintenance wastes, pesticides, household hazardous wastes, pet wastes, and trash, which can all be washed into the storm sewer.

This permit is a 3rd generation permit containing stormwater treatment requirements for development projects. Past permits have grandfathered development projects approved prior to those permits' effective dates, essentially exempting the projects and allowing them to provide no or insufficient stormwater treatment. Board staff believe a small number of these development projects that were approved more than a decade ago have still not begun construction. A decade is sufficient time to justify requiring the Permittees to revise and update these stagnant development permits to include current LID treatment requirements. Therefore, this provision removes the grandfathering of development projects approved with no stormwater treatment requirements and that have not begun construction. However, Regulated Projects approved with non-LID stormwater treatment

measures in compliance with the hydraulic sizing criteria of Provision C.3.d. will continue to be grandfathered.

Provision C.3.c (Low Impact Development (LID)) recognizes LID as a cost-effective, beneficial, holistic, integrated stormwater management strategy.¹² The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source. 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, pervious pavement systems, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes.

This Provision sets forth a three-pronged approach to LID with source control, site design, and stormwater treatment requirements. The concepts and techniques for incorporating LID into development projects, particularly for site design, have been extensively discussed in BASMAA's Start at the Source manual (1999) and its companion document, Using Site Design Techniques to Meet Development Standards for Stormwater Quality (May 2003), as well as in various other LID reference documents.

Provision C.3.c.i.(1) lists source control measures that must be included in all Regulated Projects as well as some that are applicable only to certain types of businesses and facilities. These measures are recognized nationwide as basic, effective techniques to minimize the introduction of pollutants into stormwater runoff.

Provision C.3.c.i.(2)(a) lists site design elements that must be implemented at all Regulated Projects. These design elements are basic, effective techniques to minimize pollutant concentrations in stormwater runoff as well as the volume and frequency of discharge of the runoff. One design element requires all Regulated Projects to include at least one site design measure from a list of six that includes recycling of roof runoff, directing runoff into vegetated areas, and installation of pervious pavement systems instead of traditional paving. All these measures serve to reduce the amount of runoff and its associated pollutants being discharged from the Regulated Project.

This subprovision also requires the Permittees to collectively develop and adopt design specification for pervious pavement systems, subject to the Executive Officer's approval. This is necessary because improperly designed and engineered pervious pavement systems may cause flooding and the discharge of insufficiently treated stormwater runoff.

Provision C.3.c.i.(2)(b) requires each Regulated Project to treat 100% of the Provision C.3.d. runoff with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility.

¹² USEPA, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices* (Publication Number EPA 841-F-07-006, December 2007) <http://www.epa.gov/owow/nps/lid/costs07>

Provision C.3.c.i.(2)(b)(i) defines LID treatment measures as harvesting and use, infiltration, evapotranspiration, or biotreatment.

The Previous Permit required that a properly engineered and maintained biotreatment system may be considered only if it was infeasible to implement harvesting and use, infiltration, or evapotranspiration at a project site. Infeasibility may result from conditions including the following:

- Locations where seasonal high groundwater would be within 10 feet of the base of the LID treatment measure.
- Locations within 100 feet of a groundwater well used for drinking water.
- Development sites where pollutant mobilization in the soil or groundwater is a documented concern.
- Locations with potential geotechnical hazards.
- Smart growth and infill or redevelopment sites where the density and/or nature of the project would create significant difficulty for compliance with the onsite volume retention requirement.
- Locations with tight clay soils that significantly limit the infiltration of stormwater.

The Previous Permit also required the Permittees to produce two reports during the permit term. The first report¹³ established criteria and procedures for Permittees to follow to implement the hierarchy of LID treatment measures listed above (i.e., harvesting and use, infiltration, and evapotranspiration must be considered prior to biotreatment). The second report¹⁴ reviewed data from two years of the Permittees' Annual Reports to evaluate the results of applying the feasibility / infeasibility criteria. The conclusions of the second report were:

- Infiltration of some runoff is feasible on most projects, although in the clay soils typical of the Bay Area, the amount of runoff that can be infiltrated is unpredictable and highly variable.
- Very few development projects create the quantity and timing of non-potable water demand required to feasibly harvest and use the amount of runoff specified in Provision C.3.d.
- Bioretention facilities, when designed according to the criteria in current Permittee guidance, could infiltrate 40% - 80% of the total runoff, depending on rainfall patterns and facility size. However, the amount of runoff that would be infiltrated over the life of a particular project is variable and unpredictable because of uncertainty in the near-term and long-term infiltration performance of underlying soils. Infiltration can be maximized by ensuring project designs meet current design criteria and by ensuring treatment systems are constructed as designed.

¹³ *Harvest and Use, Infiltration and Evapotranspiration Feasibility/ Infeasibility Criteria Report (2011)*

¹⁴ *Status Report on the Application of Feasibility / Infeasibility Criteria for Low Impact Development (2013)*

The Permittees completed a “White Paper” on Provision C.3. on February 27, 2015.¹⁵ The White Paper concluded that the pollutant removal performance of biotreatment facilities, overall and on average, is equivalent or better than the likely real-world performance of harvest and use facilities and as good as the likely performance of infiltration facilities when considered over the long term. The White Paper also noted that biotreatment facilities require less maintenance and are less prone to failure than harvest and use facilities, and in some cases, are also preferable to direct infiltration facilities.

Based on the data provided by the above Permittee reports, this Permit removes the Previous Permit’s restriction on allowing properly engineered and maintained biotreatment systems only after an infeasibility analysis of harvesting and use, infiltration, or evapotranspiration treatment measures.

Provision C.3.c.i.(2)(b)(ii) requires biotreatment systems to meet minimum performance specifications in order to be considered as LID treatment. This subprovision also requires biotreatment soil media to meet the current minimum specifications developed and included in the previous permit.¹⁶ However, this subprovision recognizes that the current soil media specifications may need to be modified because of variability in climate, rainfall, and compost composition among the different counties. Therefore, this subprovision allows for the Permittees to collectively (on an all-Permittee scale or countywide scale) develop and adopt revisions to the current soil media minimum specifications, subject to the Executive Officer’s approval.

Provision C.3.d (Numeric Sizing Criteria for Stormwater Treatment Systems) lists the hydraulic sizing design criteria that the stormwater treatment systems installed for Regulated Projects must meet. The volume and flow hydraulic design criteria are the same as those required in the Previous Permit. 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.

Provision C.3.d.iv. defines infiltration devices and establishes limits on the use of stormwater treatment systems that function primarily as infiltration devices. The restriction that infiltration devices have to be deeper than wide has been removed to reflect current design practices. The intent of the Provision is to ensure that the use of infiltration devices, where feasible and safe from the standpoint of structural integrity, must also not cause or contribute to the degradation of groundwater quality at the project sites.

Provision C.3.e (Alternative or In-Lieu Compliance with Provision C.3.b.) recognizes that not all Regulated Projects may be able to install LID treatment systems onsite

¹⁵ BASMAA, February 27, 2015. “White Paper” on Provision C.3 in MRP 2.0: Final Report.

¹⁶ Attachment L of Board Order No. R2-2009-0074, adopted October 14, 2009 and revised November 27, 2011.

because of site conditions, such as existing underground utilities, right-of-way constraints, and limited space.

Provision C.3.e.i. This Provision allows any Regulated Project to provide LID treatment for up to 100% of the required Provision C.3.d. stormwater runoff at an offsite location or pay equivalent in-lieu fees to provide LID treatment at a Regional Project, as long as the offsite or Regional Project is in the same watershed as the Regulated Project and constructed within 3 years of the end of construction of the Regulated Project. The 3 years of additional time are allowed because more time may be required to complete construction of offsite and Regional projects because of administrative, legal, and/or construction delays. We acknowledge in some instances, an even longer time may be required to complete construction of Regional Projects because they may involve a variety of public agencies and stakeholder groups and a longer planning and construction phase. Therefore, the timeline for completion of a Regional Project may be extended to up to 5 years after the completion of the Regulated Project, with prior Executive Officer approval. Executive Officer approval will be granted contingent upon a demonstration of good faith efforts to implement the Regional Project, such as having funds encumbered and applying for the appropriate regulatory permits.

Provision C.3.e.ii. (Special Projects) When considered at the watershed scale, certain types of smart growth, high density, and transit-oriented development can either reduce existing impervious surfaces, or create less “accessory” impervious areas and auto-related pollutant impacts. Incentive LID Treatment Reduction Credits approved by the Water Board may be applied to these types of Special Projects.

This Provision includes specific criteria for determining which types of Regulated Projects may be considered Special Projects and establishes different categories of Special Projects based on size, land use type, and density. Except for Category A, which represents the smallest Special Projects, this Provision also uses location, density, and parking criteria to establish a tiered approach for determining the total LID Treatment Reduction Credit available for any given Special Project. The total available LID Treatment Reduction Credit may be used to reduce the amount of stormwater runoff that must be treated with LID stormwater treatment systems. The remaining amount of stormwater runoff must be treated with one or a combination of the following two specific non-LID treatment systems:

- Tree-box-type high flowrate biofilters
- Vault-based high flowrate media filters

This Provision is the same as in the previous permit except for the following three changes:

- Density LID Treatment Reduction Credits are allowed for mixed use development projects, which consist of a mix of residential and commercial land uses, based on density measured by either the dwelling units per acre or floor area ratio. This change acknowledges that mixed use development projects can vary from mostly commercial to mostly residential. The previous permit did not accommodate this variability and penalized dense mixed use projects that are mostly residential by

restricting density LID Treatment Reduction Credits to only floor area ratio criteria.

- Definitions of gross density and floor area ratio have been included to aid consistent implementation of this Provision by all Permittees.
- To reduce the burden of reporting, the semi-annual reporting of Special Projects that are being considered by Permittees prior to the Permittees granting final planning approval has been reduced to annual, within the Annual Report. Although the frequency of reporting has been reduced, the current reporting requirements for this Provision are unchanged because the data is necessary for Water Board staff to validate the Permittees' analysis of the number and size of potential Special Projects that may be approved during this permit term. Water Board Staff intends to use the data collected in the proposed reporting requirements to revise the Special Projects criteria as appropriate for the next MRP permit term.

Provision C.3.f (Alternative Certification of Stormwater Treatment Systems) allows Permittees to have a third-party review and certify a Regulated Project's compliance with the hydraulic design criteria in Provision C.3.d. Some municipalities do not have the staffing resources to perform these technical reviews. The third-party review option addresses this staffing issue. This Provision requires Permittees to make a reasonable effort to ensure that the third-party reviewer has no conflict of interest with regard to the Regulated Project being reviewed.

Provision C.3.g. (Hydromodification Management) requires that certain new development projects manage increases in stormwater runoff flow and volume so that post-project runoff shall not exceed estimated pre-project runoff rates and durations, where such increased flow and/or volume is likely to cause increased potential for erosion of creek beds and banks, silt pollutant generation, or other adverse impacts on beneficial uses due to increased erosive force.

Background for Provision C.3.g. Based on Hydrograph Modification Management Plans prepared by the Permittees, the Water Board adopted hydromodification management (HM) requirements for Alameda Permittees (March 2007), Contra Costa Permittees (July 2006), Fairfield-Suisun Permittees (March 2007), Santa Clara Permittees (July 2005), and San Mateo Permittees (March 2007). Those HM requirements are stated in Provision C.3.g., and Attachment C includes maps prepared by the Alameda, Santa Clara, San Mateo, and Fairfield-Suisun Permittees showing areas where HM requirements apply.

The Alameda, Santa Clara and San Mateo Permittees have adapted the Western Washington Hydrology Model¹⁷ for modeling runoff from development project sites, sizing flow duration control structures, and determining overall compliance of such structures and other HM control structures (HM controls) in controlling runoff from the project sites to manage hydromodification impacts as described in the Permit. The

¹⁷ http://www.ecy.wa.gov/programs/wq/stormwater/wwhm_training/wwhm/wwhm_v2/instructions_v2.html

adapted model is called the Bay Area Hydrology Model (BAHM).¹⁸ All Permittees may use the BAHM if its inputs reflect actual conditions at the project site and surrounding area, including receiving water conditions. As Permittees gain experience in designing and operating HM controls, the Programs may make adjustments in the BAHM to improve its function in controlling excess runoff and managing hydromodification impacts. Notification of all such changes shall be given to the Water Board and the public through such mechanism as an electronic email list.

The Contra Costa Permittees have developed sizing charts for the design of flow duration control devices. The Previous Permit allowed the Contra Costa Permittees to conduct a monitoring program to verify the performance of these devices and to identify whether streams to which Contra Costa Permittees discharge may have a different susceptibility to HM impacts, thus justifying a different threshold for control of flows resulting in those impacts. The Contra Costa Permittees submitted an IMP Monitoring Report,¹⁹ which found that Contra Costa HM measures generally, but not entirely, met the Previous Permit's HM requirements for the Alameda, Santa Clara, and San Mateo Permittees, and the City of Vallejo. The Contra Costa Permittees did not submit information showing that Contra Costa creeks had a different susceptibility to erosion. That is, they did not submit a justification for using erosion thresholds different than those accepted for the Alameda, Santa Clara, and San Mateo Permittees, and the City of Vallejo. Under the Previous Permit, the Water Board had accepted a higher threshold for control of HM effects (i.e., controlling the range of flows beginning at 20% of the 2-year pre-project peak flow, as opposed to 10% of the 2-year pre-project peak flow). Because this additional information was not submitted, and Contra Costa streams are generally similar to other Bay Area streams, the Permit extends the 10% standard to Contra Costa, and includes requirements for Contra Costa to complete modifications to its HM approach to ensure that projects implement that consistent approach within a specified time.

The Previous Permit Provision C.3.g.v required the City of Vallejo to complete a hydrograph modification management plan (HMP) by July 1, 2013, in lieu of complying with Previous Permit Provision C.3.g.i-iv. The City submitted its Final HMP on April 24, 2013,²⁰ and the HMP was subsequently accepted by Board staff. The Final HMP incorporates the same requirements as for the Alameda, Santa Clara, and San Mateo Permittees. The Permit requires the City to comply with those requirements.

The Fairfield-Suisun Permittees are required to comply with the HM criteria established in this Permit. However, they have a threshold for control of erosive flows that is greater than the other Permittees: 20 percent of the 2-year peak flow. This criterion, which is greater than the criterion allowed for other Bay Area Stormwater Countywide Programs, is based on data collected from Laurel and Ledgewood Creeks and technical analyses of these site-specific data.

¹⁸ See www.bayareahydrologymodel.org, Resources.

¹⁹ Contra Costa Clean Water Program, September 15, 2013. IMP Monitoring Report: IMP Model Calibration and Validation Project.

²⁰ City of Vallejo (Geosyntec), April 2013. Final Hydromodification Management Plan (HMP).

Provision C.3.g.i allows the Permittees to modify their HM Applicability Maps, acceptable to the Executive Officer, as long as they remain consistent with the requirements of Provision C.3.g. It also requires Permittees that have not previously submitted an HM Applicability Map or equivalent information to prepare and submit that information, acceptable to the Executive Officer, consistent with the requirements of Provision C.3.g. The Permittees' current maps are included as Attachment C to the Permit.

The Water Board recognizes that the collective knowledge of management of erosive flows and durations from new and redevelopment is evolving, and that the topics listed below are appropriate topics for further study. Such a study may be initiated by Water Board staff, or the Executive Officer may request that all Bay Region municipal stormwater Permittees jointly conduct investigations as appropriate. Any future proposed changes to the Permittees' HM provisions may reflect improved understanding of these issues:

- Potential incremental costs, and benefits to waterways, from controlling a range of flows up to the 35- or 50-year peak flow, versus controlling up to the 10-year peak flow, as required by this Permit;
- The allowable low-flow (also called Q_{cp} and currently specified as 10–20 percent of the pre-project 2-year runoff from the site) from HM controls;
- The effectiveness of self-retaining areas for management of post-project flows and durations; and/or
- The appropriate basis for determining cost-based impracticability of treating stormwater runoff and controlling excess runoff flows and durations.

This Provision allows for alternative HM compliance when on-site and regional HM controls and in-stream measures are not practicable. Alternative HM compliance includes contributing to or providing mitigation at other new or existing development projects that are not otherwise required by this Permit or other regulatory requirements to have HM controls. The Permit provides flexibility in the type, location, and timing of the mitigation measure. The Board recognizes that handling mitigation funds may be difficult for some municipalities because of administrative and legal constraints. The Board intends to allow flexibility for project proponents and/or Permittees to develop new or retrofit stormwater treatment or HM control projects within a broad area and reasonable time frame. The Previous Permit also allowed alternative HM compliance, but we are not aware of any Permittees that implemented alternative HM compliance projects. As a result, the Permit retains the Previous Permit's impracticability criteria and options.

Provision C.3.g.i. defines the subset of Regulated Projects that must install hydromodification controls (HM controls). This subset, called HM Projects, are Regulated Projects that create and/or replace one acre or more of impervious surface and are not specifically excluded by the conditions expressed in C.3.g.i. Those conditions identify areas where the potential for single-project and/or cumulative development impacts to creeks is minimal, and thus HM controls are not required. Such areas include creeks that are concrete-lined or significantly hardened (e.g., with concrete) from point of discharge and continuously downstream to their outfall into San Francisco Bay; underground storm drains discharging to the Bay; and

construction of infill projects in highly developed watersheds.²¹ The Alameda, Santa Clara, San Mateo, and Fairfield-Suisun Permittees have developed maps showing where HM controls are required (Attachment C).

Provision C.3.g.ii. establishes the standard HM controls must meet. The HM Standard is based largely on the standards proposed by Permittees in their Hydrograph Modification Management Plans. The method for calculating post-project runoff in regards to HM controls is standard practice in Washington State and is equally applicable in California.

Provision C.3.g.iii. provides a procedure for the Permittees to propose an additional method for demonstrating compliance with HM requirements. This method would directly simulate erosion potential, and would be required to ensure that projects implementing HM controls with this method, if accepted by the Executive Officer, meet the Permit's HM criteria. This provision requires submittal of appropriate analyses demonstrating that the method will substantively comply with HM requirements; it may not be implemented on projects until accepted by the Executive Officer.

Provision C.3.g.iv. identifies and defines three methods of hydromodification management.

Provision C.3.g.v. sets forth the information on hydromodification management to be submitted in the Permittees' Annual Reports.

Provision C.3.h (Operation and Maintenance of Stormwater Treatment Systems) establishes permitting requirements to ensure that proper maintenance for the life of the Regulated Project is provided for all pervious pavement systems of 3000 square feet or more, onsite, joint, and offsite stormwater treatment systems, and HM controls installed.

This Provision adds a requirement for Permittees to include pervious pavement systems of 3000 square feet or more in their Operation and Maintenance Agreements, database of Regulated Projects, and inspection checklists. Pervious pavement systems serve as site design measures that directly reduce the amount of impervious surface area and therefore, the size of the stormwater treatment system(s) required to comply with Provision C.3.d. Adequate routine maintenance of pervious pavement systems is essential because clogged systems become impervious and may result in untreated stormwater runoff or additional load on stormwater treatment systems that result in inadequately treated stormwater runoff. To lessen the burden of inspecting so many pervious pavement systems, only those of 3000 square feet or more are required to be inspected and patios for private-use at single-family homes, townhomes, or condominiums are specifically excluded. In the case of large subdivisions where the total pervious pavement system area is equal to or greater than 3000 square feet, but the pervious pavement installations are on individual driveways that are less than 3000 square feet, inspection of a representative number of driveways will suffice.

²¹ Within the context of Provision C.3.g., "highly developed watersheds; refer to catchments or sub-catchments that are 70 percent impervious or more.

The previous permit required Permittees to inspect at least 20% of all stormwater treatment systems annually, at least 20% of all vault-based systems annually, and every treatment system at least once every 5 years. Permittees have indicated that each inspection of a Regulated Project routinely includes inspection of pervious pavement systems, stormwater treatment systems and HM controls installed at the Project. Therefore, this permit revises the inspection frequency requirements such that the minimum number of inspections required annually is tied to a percentage of the total number of Regulated Projects, instead of the total number of individual treatment systems and HM controls. This lessens the tracking burden for the Permittees and better reflects the way actual inspections are conducted.

This Provision requires each Permittee to inspect all its Regulated Projects at least once every 5 years and inspect at least 20% of the total number of Regulated Projects annually. This requirement serves to prevent failed or improperly maintained pervious pavement systems, stormwater treatment systems, or HM controls from going undetected until the 5th year. Neither of these inspection frequency requirements interferes with the Permittees' current ability to prioritize their inspections based on factors such as types of maintenance agreements, owner or contractor maintained systems, maintenance history, etc.

This Provision also allows Permittees to accept 3rd party inspection reports for vault-based stormwater treatment systems in lieu of conducting Permittee inspections, but only if the third party inspections are conducted at least annually, which is the normal frequency for maintenance of these systems. Each 3rd party inspection must be included in the database or tabular format required in Provision C.3.h.ii.(5) and clearly identified as a 3rd party inspection. Each 3rd party inspection report must document the 3rd party inspection company, date of inspection, condition of the treatment unit(s) at the time of inspection, maintenance activities performed, and appearance of the inside of the vault units (with photos) before and after maintenance.

As the number of Regulated Projects grows, the Permittees' O&M inspection programs must grow as well. Therefore, this Provision requires each Permittee to develop and implement an Enforcement Response Plan (ERP) for O&M inspections. The ERP serves as a reference document for inspection staff so that consistent enforcement actions can be taken to bring development projects into compliance.

As in the previous permit, this Provision requires the Permittees to maintain a database or equivalent tabular format with detailed information on each O&M inspection and any necessary enforcement actions against Regulated Projects. To lessen the burden of reporting, this Provision only requires summary data on inspections conducted each fiscal year to be reported in the Annual Report, instead of detailed information on each O&M inspection. However, upon request by the Executive Officer, detailed information from the database or tabular format must be submitted.

Provision C.3.i. (Required Site Design Measures for Small Project and Detached Single-Family Homes Projects) contains requirements on single-family home projects that create and/or replace 2,500 square feet or more of impervious surface and small development projects that create and/or replace > 2,500 ft² to <10,000 ft² impervious surface (collectively over the entire project). A detached single-family home project is defined as

the building of one single new house or the addition and/or replacement of impervious surface to one single existing house, which is not part of a larger plan of development.

This Provision requires these projects to select and implement one or more stormwater site design measures from a list of six. These site design measures are basic methods to reduce the amount and flowrate of stormwater runoff from projects and provide some pollutant removal treatment of the runoff that does leave the projects. Under this Provision, only projects that already require approvals and/or permits under the Permittees' current planning, building, or other comparable authority are regulated. Hence this Provision does not require Permittees to regulate small development and single-family home projects that would not otherwise be regulated under the Permittees' current ordinances or authorities. Water Board staff recognizes that the stormwater runoff pollutant and volume contribution from each one of these projects may be small; however, the cumulative impacts could be significant. This Provision serves to address some of these cumulative impacts in a simple way that will not be too administratively burdensome on the Permittees.

Provision C.3.j. (Green Infrastructure Planning and Implementation) requires Permittees to complete and implement a Green Infrastructure Plan (Plan) for the inclusion of low impact development drainage design into storm drain infrastructure on public and private lands, including streets, roads, storm drains, parking lots, building roofs, and other storm drain infrastructure elements.

The plan is intended to serve as an implementation guide and reporting tool during this and subsequent Permit terms to provide reasonable assurance that urban runoff Total Maximum Daily Load (TMDL) wasteload allocations (e.g., for the San Francisco Bay mercury and PCBs TMDLs) will be met, and to set goals for reducing, over the long term, the adverse water quality impacts of urbanization and urban runoff on receiving waters. For this Permit term, the plan is in lieu of expanding the definition of Regulated Projects prescribed in Provision C.3.b to include all new and redevelopment projects that create or replace 5,000 square feet or more of impervious surface areas and road projects that just replace existing impervious surface area. However, subsequent permits may include different impervious surface thresholds or other criteria for Regulated Projects. The plan also provides a mechanism to establish and implement alternative or in lieu compliance options for Regulated Projects and to account for and justify Special Projects in accordance with Provision C.3.e.

Over the long term, the plan is intended to describe how the Permittees will shift their impervious surfaces and storm drain infrastructure from gray, or traditional storm drain infrastructure where runoff flows directly into the storm drain and then the receiving water, to green—that is, to a more-resilient, sustainable system that slows runoff by dispersing it to vegetated areas, harvests and uses runoff, promotes infiltration and evapotranspiration, and uses bioretention and other green infrastructure practices to clean stormwater runoff.

The plan shall also identify means and methods to prioritize particular areas and projects within each Permittee's jurisdiction, at appropriate geographic and time scales, for implementation of green infrastructure projects. Further, it shall include means and methods to track the area within each Permittee's jurisdiction that is treated by green

infrastructure controls and the amount of directly connected impervious area. As appropriate, it shall incorporate plans required elsewhere within this Permit, and specifically plans required for the monitoring of and to ensure appropriate reductions in trash and PCBs, mercury, and other pollutants.

In addition to development of the Plan, each Permittee shall prepare and maintain a list of green infrastructure projects that are already planned for implementation during the permit term and infrastructure projects planned for implementation that have potential for green infrastructure measures.

This Provision also requires the Permittees, individually or collectively, to track processes, assemble and submit information, and provide information, materials, and presentations as needed to assist relevant regional, state, and federal agencies to plan, design, and fund green infrastructure measures into local infrastructure projects, including transportation projects.

Lastly, this Provision requires the Permittees, individually or collectively, to develop and implement regionally-consistent methods to track and report implementation of green infrastructure measures including treated area and connected and disconnected impervious area on both public and private parcels within their jurisdictions. The methods shall also address tracking needed to provide reasonable assurance that wasteload allocations for TMDLs, including the San Francisco Bay PCBs and mercury TMDLs, and reductions for trash, are being met.

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C.4. Industrial and Commercial Site Controls

Legal Authority

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC sections 13377 and 13263, 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).

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 storm water discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system.” Other specific legal authority is cited below.

Specific Provision C.4. Requirements

Provision C.4. has been revised from the Previous Permit so that related topics are grouped together better. A new Provision C.4.d. – Inspections has been created. It essentially consolidates, from the Previous Permit, the inspection requirements in Provision C.4.d. – Inspection Plan and Provision C.4.c. – Enforcement Response Plan.

Provision C.4.a (Legal Authority)

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

Provision C.4.b (Inspection Plan)

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) provides that Permittees must “identify priorities and procedures for inspections and establishing and implementing control measures for such discharges.” The Permit continues to require Permittees to implement an industrial and commercial site controls program to reduce pollutants in runoff from all industrial and commercial sites/sources.

Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that Permittees “[p]rovide an inventory, organized by watershed of the name and address, and a description (such as 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.”

The Permit continues to require Permittees to identify various industrial sites and sources subject to the Industrial General Permit or other individual NPDES permit. U.S. EPA supports the municipalities regulating industrial sites and sources that are already covered by an NPDES permit:

Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on storm water discharges associated with industrial activity which discharge through the municipal system. It is anticipated that general or individual permits covering industrial storm water discharges to these municipal separate storm sewer systems will require industries to comply with the terms of the permit issued to the municipality, as well as other terms specific to the Permittee.²²

And:

Although today's rule will require industrial discharges through municipal storm sewers to be covered by separate permit, USEPA still believes that municipal operators of large and medium municipal systems have an important role in source identification and the development of pollutant controls for industries that discharge storm water through municipal separate storm sewer systems is appropriate. Under the CWA, large and medium municipalities are responsible for reducing pollutants in discharges from municipal separate storm sewers to the maximum extent practicable. 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.²³

This Permit does not require the Permittees to submit the list of facilities scheduled for inspection each year with annual reports. Instead, Permittees are to add each year's inspection list to the Inspection Plan as part of the annual update to the Inspection Plan. Permittees may choose to keep their annual lists in their databases or in electronic form. The annual lists must be made readily available to Water Board staff or its representatives upon request.

Water Board staff reviewed about 20% of the Permittees' Inspection Plans during the Previous Permit term. A few of those Inspection Plans also provide detailed flow charts or instructions on how to conduct inspections, fill out the inspect forms, execute enforcement actions, conduct follow-up, and fulfill tracking and reporting for the MRP. These comprehensive Inspection Plans help ensure inspection consistency and serve as excellent training documents for new inspection staff.

Provision C.4.c (Enforcement Response Plan) requires the Permittees to implement and update, as needed, their Enforcement Response Plan (ERP) that serves as a reference for inspection staff to take consistent and timely responses to actual or potential stormwater pollution problems discovered in the course of industrial/commercial stormwater inspections. The ERP provides guidance on (1) progressively stricter enforcement to achieve timely compliance, (2) enforcement scenarios, (3) follow-up

²² *Federal Register*. Vol. 55, No. 222, Friday, November 16, 1990, Rules and Regulations. P. 48056

²³ *Ibid*

inspections, (4) referral to another agency, (5) appropriate time periods for implementation of corrective actions, and (6) the roles and responsibilities of staff responsible for implementing the ERP. ERPs are unique to each Permittee. As such, this Permit continues to have broad requirements for the ERP. This allows the individual Permittee maximum flexibility to customize the ERP to fit its legal authority and the way it does business. Corrective actions must be implemented before the next rain event, but no longer than 10 business days after the potential and/or actual discharges are discovered. Short timeframes for implementing corrective actions encourage businesses to take care of the issues promptly, thus prevent mobilizing potential discharges. Permittees must also require immediate cessation of active non-stormwater discharges, timely implementation of corrective actions to clean up the discharge, and implementation of measures to prevent future active discharges.

This Permit standardizes and clarifies the ERP requirements in provisions C.4., C.5, and C.6. to eliminate any ambiguity in the requirements.

Provision C.4.d (Inspections) takes the inspection requirements from the Previous Permit's Provision C.4.b. Inspection Plan and C.4.c. ERP and consolidates them together into this Provision. Inspection frequencies are determined by each Permittee in its Inspection and Enforcement Response Plans.

U.S. EPA guidance says, "management programs should address minimum frequency for routine inspections." The U.S. EPA Fact Sheet—Visual Inspection says, "To be effective, inspections must be carried out routinely."²⁴

Permittees have asked that this Permit reduce the record keeping and reporting requirements. The specific record keeping requirements are minimal information that needs to be recorded for each inspection and it is essential to document each inspection to develop a history for the facility. Water Board staff evaluations of MS4 programs showed many Permittees that have very comprehensive inspection database records. Annual reports need to provide enough information to show compliance. During the Previous Permit term, annual reports showed few violations for the corresponding number of inspections completed. This did not match with the field inspection experience of Water Board staff. Further investigation showed that some Permittees do not consider potential discharges to be violations.

The Previous Permit exempted verbal warnings from being reported in the annual reports. Water Board staff expected verbal warnings to have very limited use and only given for very minor issues that do not warrant anything in writing. However, from Water Board inspections, and annual report and ERP reviews, we concluded that many Permittees report zero violations because only actual non-stormwater discharges were considered violations and issued some type of written enforcement action. Potential discharges were all given verbal warnings and it was unclear if these potential discharges were corrected in a timely manner because there was no written documentation on the potential discharges or verbal warnings issued. Therefore, this Permit now requires reporting of all potential and actual non-stormwater discharges based on the enforcement levels in each

²⁴ USEPA.1999. 832-F-99-046, "Storm Water Management Fact Sheet – Visual Inspection".

Permittee's ERP, so that Water Board staff can evaluate whether Permittees are conducting appropriate follow-up.

Provision C.4.f (Staff Training) section of the Permit requires the Permittees to conduct annual staff trainings for inspectors. Trainings are necessary to keep inspectors current on enforcement policies and current MEP BMPs for industrial and commercial stormwater runoff discharges.

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C.5. Illicit Discharge Detection and Elimination

Legal Authority

The following legal authority applies to section C.5:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC sections 13377 and 13263, 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)..

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(1)(iii)(B)(1) provides that the Permittee shall include in their application “the location of known municipal storm sewer system outfalls discharging to waters of the United States.”

Federal NPDES regulations 40 CFR 122.26(d)(1)(iii)(B)(5) provides that the Permittee shall include in their application “[t]he location of major structural controls for storm water discharge (retention basins, detention basins, major infiltration devices, etc.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B) provides that the Permittee shall have adequate legal authority to “[p]rohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(F) provides that the Permittee shall have adequate legal authority to “[c]arry 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.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) requires that the Permittee have 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 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 such field screens.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) requires a “description of 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-storm water.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) requires a “description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(5) requires a “description of 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 regulations 40 CFR 122.26(d)(2)(iv)(B)(7) requires a “description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary.” Federal NPDES regulations 40 CFR 122.26(d)(1)(iii)(B)(5) provides that the Permittee shall include in their application “[t]he location of major structural controls for storm water discharge (retention basins, detention basins, major infiltration devices, etc.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B) provides that the Permittee shall have adequate legal authority to “[p]rohibit through ordinance, order or similar means, illicit discharges to the municipal separate storm sewer.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(F) provides that the Permittee shall have adequate legal authority to “[c]arry 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.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B) requires that the Permittee have 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 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 such field screens.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) requires a “description of 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-storm water.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) requires a “description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(5) requires a “description of 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 regulations 40 CFR 122.26(d)(2)(iv)(B)(7) requires a “description of controls to limit infiltration of seepage from municipal sanitary sewers to municipal separate storm sewer systems where necessary.”

Fact Sheet Findings in Support of Provision C.5

- C.5-1** Illicit and inadvertent connections to MS4 systems result in the discharge of waste and chemical pollutants to receiving waters. Every Permittee must have the ability to discover, track, and clean up stormwater pollution discharges by illicit connections and other illegal discharges to the MS4 system.
- C.5-2** Illicit discharges to the storm drain system can be detected in several ways. Permittee staff can detect discharges during their course of other tasks, and business owners and other aware citizens can observe and report suspect discharges. The Permittee must have a direct means for these reports of suspected polluted discharges to receive adequate documentation, tracking, and response through problem resolution.

Removal of Routine Collection System Screening Requirement

The Previous Permit required the Permittees to perform routine surveys for illicit discharges and illegal dumping in above ground check points in the collection system including elements that are typically inspected for maintenance purposes, such as end of pipes, creeks, flood conveyances, storm drain inlets, and catch basins, to seek and eliminate illicit connections and discharges. The results of the screenings were reported in annual reports. No illicit connections were reported. However, Permittees have found illicit discharges during the screenings and they were cleaned up. It is unclear if personnel conducting the screenings reported these illicit discharges to the illicit discharge staff for investigation and tracking. We have added language to C.5.c. – Spill and Dumping Complaint Response Program to ensure that illicit discharges found by municipal staff conducting routine maintenance and inspection activities on the collection system are reported to the illicit discharge staff for investigation and tracking. This is based on the federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3), which 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-storm water.”

Specific Provision C.5 Requirements

Provision C.5.a (Legal Authority) requires each Permittee have adequate legal authority to prohibit illicit discharges to storm sewers as required by federal regulations at 40 CFR 122.26(d)(2)(i)(B). Illicit and inadvertent connections to MS4 systems result in the discharge of waste and chemical pollutants to receiving waters. Every Permittee must

have the ability to discover, track, and clean up stormwater pollution discharges by illicit connections and other illegal discharges to the MS4 system.

All municipalities, counties, district, and other public entities that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in California are required to report sanitary sewer overflows to the California Integrated Water Quality System Project pursuant to the State Water Resources Control Board's Order No. 2006-003-DWQ (Statewide General Waste Discharge Requirements for Sanitary Sewer Systems) and Order WQ 2013-0058-EXEC (Adopting Amended Monitoring Requirements for Statewide General Waste Discharge Requirements for Sanitary Sewer Systems order. Sewage discharges that are reported to the California Integrated Water Quality System Project do not need to be tracked and reported in Provision C.5.

Provision C.5.b (ERP) requires Permittees to implement and update, as needed, their ERP to ensure consistent and timely response to illicit discharges and connections to the MS4. The ERP provides guidance on (1) progressively stricter enforcement to achieve timely compliance, (2) follow-up inspection, (3) referral to another agency, (3) appropriate time periods for implementation of corrective actions, and (4) the roles and responsibilities of staff responsible for implementing the ERP. Corrective actions must be implemented before the next rain event, but no longer than 10 business days after the potential and/or actual discharges are discovered. Permittees must also require immediate cessation of active discharges, and timely implementation of corrective actions to clean up the discharge and implementation of measures to prevent future active discharges.

Water Board staff reviewed more than half of the Permittees' ERPs during the Previous Permit term. Almost all of those Permittees have one ERP to satisfy the ERP requirements in provisions C.4., C5., and C.6. While a couple of Permittees have detailed, comprehensive plans, more than half of the ERPs reviewed did not comply with the ERP requirements in the Previous Permit. Therefore, the ERP requirements in this Permit are standardized in provisions C.4., C5., and C.6.

Provision C.5.c (Spill and Dumping Complaint Response Program) Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) requires "a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer." This Provision of the Permit requires the Permittees to establish and maintain a central point of contact including phone numbers for spill and complaint reporting. Reports from the public and other Permittee staff are an essential tool in discovering and investigating illicit discharge activities. Maintaining contact points will help ensure that there is effective reporting to assist with the discovery of prohibited discharges. Each Permittee must have a means to adequately track the suspected polluted discharges from reporting through problem resolution.

Provision C.5.d (Tracking and Case Follow-up) section of the Permit requires Permittees to track and monitor follow-up for all incidents and discharges reported to the complaint/spill response system that could pose a threat to water quality. This requirement is included so Permittees can demonstrate compliance with the ERP requirements of Section C.5.b and to ensure that illicit discharge reports receive adequate follow up through to resolution.

Provision C.5.e (Control of Mobile Sources) requires each Permittee to implement a program to reduce the discharge of pollutants from mobile businesses. The purpose of this section is to establish oversight and control of pollutants associated with mobile business sources to the MEP.

Provision C.5.f (Municipal Separate Storm Sewer System (MS4) Map) As part of the permit application process, federal NPDES regulations 40 CFR 122.26(d)(1)(iii)(B)(1) and 40 CFR 122.26(d)(1)(iii)(B)(5) specify that dischargers must identify the location of any major outfall that discharges to waters of the United States, as well as the location of major structural controls for stormwater discharges. A major outfall is any outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than a circular pipe which is associated with a drainage area of more than 50 acres) or; for areas zoned for industrial activities, any pipe with a diameter of 12 inches or more or its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more). The permitting agency may not process a permit until the applicant has fully complied with the application requirements.²⁵ If, at the time of application, the information is unavailable, the Permit must require implementation of a program to meet the application requirements.²⁶ All Permittees have complied with this requirement. This Permit continues to require the Permittees to advertise the availability of the maps of their MS4 system and to make available these maps to the public upon request.

²⁵ 40 CFR 124.3 (applicable to state programs, see section 123.25).

²⁶ 40 CFR 122.26(d)(1)(iv)(E).

C.6. Construction Site Control

Legal Authority

The following legal authority applies to section C.6:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC sections 13377 and 13263, 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))

Specific Legal Authority: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D) requires “[a] description of a program to implement and maintain structural and non-structural best management practices to reduce pollutants in storm water run

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(1) requires “[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 “[a] description of requirements for nonstructural and structural best management practices.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(3) requires “[a] description of procedures for identifying priorities for inspecting sites and enforcing control measures which consider the nature of the construction activity, topography, and the characteristics of soils and receiving water quality.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(D)(4) requires “[a] description of appropriate educational and training measures for construction site operators.”

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

Federal NPDES regulation 40 CFR 122.26(b)(14) provides that “[t]he 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, non-conventional, 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.”

Fact Sheet Findings in Support of Provision C.6.

- C.6-1** Vegetation clearing, mass grading, lot leveling, and excavation expose soil to erosion processes and increase 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 the natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters.
- C.6-2** Excess sediment can cloud the water, reducing the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants, such as nutrients, metals, and oils and grease. Permittees are on-site at local construction sites for grading and building permit inspections, and also have in many cases dedicated construction stormwater inspectors with training in verifying that effective BMPs are in place and maintained. Permittees also have effective tools available to achieve compliance with adequate erosion control, such as *stop work* orders and citations.
- C.6-3** Mobilized sediment from construction sites can flow into receiving waters. According to the 2004 National Water Quality Inventory,²⁷ States and Tribes report that sediment is one of the top 10 causes of impairment of assessed rivers and streams, next to pathogens, habitat alteration, organic enrichment or oxygen depletion, nutrients, metals, etc. Sediment impairs 35,177 river and stream miles (14% of the impaired river and stream miles). Sources of sedimentation include agriculture, urban runoff, construction, and forestry. Sediment runoff rates from construction sites, however, are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades.²⁸

Specific Provision C.6 Requirements

Provision C.6.a. Legal Authority for Effective Site Management. Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) requires that each Permittee demonstrate that it can control “through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from site of industrial activity.” This section of the Permit requires each Permittee to have the authority to require year-round, seasonally and phase appropriate effective erosion control, run-on and runoff control, sediment control, active treatment systems, good site management, and non stormwater management through all phases of site grading, building, and finishing of lots. All Permittees should already have this authority.

²⁷ http://www.epa.gov/owow/305b/2004report/2004_305Breport.pdf

²⁸ U.S. EPA. December 2005. *Stormwater Phase II Final Rule Fact Sheet Series – Construction Site Runoff Control Minimum Control Measure*. EPA 833-F-00-008. Fact Sheet 2.6.

In its Phase II Compliance Assistance Guidance, U.S. EPA says that “[i]nspections give the MS4 operator an opportunity to provide additional guidance and education, issue warnings, or assess penalties.”²⁹ To issue warnings and assess penalties during inspections to achieve timely corrective actions from sites, inspectors must have the legal authority to conduct enforcement.

Provision C.6.b. Enforcement Response Plan (ERP). This section requires each Permittee to implement and update, as needed, its Enforcement Response Plan (ERP), which serves as a reference for inspection staff to take consistent actions and timely response to achieve effective, timely corrective compliance from all public and private construction site owners/operators.

U.S. EPA supports enforcement of ordinances and permits at construction sites, stating “[e]ffective inspection and enforcement requires [...] penalties to deter infractions and intervention by the municipal authority to correct violations.”³⁰ In addition, U.S. EPA expects permits issued to municipalities to address “weak inspection and enforcement.”³¹ For these reasons, the enforcement requirements in this section have been established, while providing sufficient flexibility for each Permittee’s unique stormwater program. Prior to the issuance of the Previous Permit, Water Board staff had noted deficiencies in the Permittees’ enforcement procedures and implementation during inspections. The most common issues found were that enforcement was not firm and appropriate to correct the violation, and that repeat violations did not result in escalated enforcement procedures. Therefore, the Previous Permit required Permittees to develop ERPs.

The ERP provides guidance on (1) progressively stricter enforcement to achieve timely compliance, (2) enforcement scenarios, (3) follow-up inspections, (4) referral to another agency, (5) appropriate time periods for implementation of corrective actions, and (6) the roles and responsibilities of staff responsible for implementing the ERP. ERPs are unique to each Permittee. As such, this Permit continues to have broad requirements for the ERP. This allows the individual Permittee maximum flexibility to customize the ERP to fit its legal authority and the way it does business. Permittees must require immediate cessation of active non-stormwater discharges, timely implementation of corrective actions to clean up the discharge, and implementation of measures to prevent future active discharges. Corrective actions must be implemented before the next rain event, but no longer than 10 business days after the potential and/or actual discharges are discovered. Construction sites are required by the Statewide NPDES General Permit for Stormwater Discharges Associated with Construction Activities to keep supplies on hand to address BMP issues rapidly. In a few cases, such as slope inaccessibility, it may require longer than 10 days before crews can safely access an eroded area. Corrective actions can be temporary and more time can be allowed for permanent corrective actions. The Permittees’ tracking data needs to provide a rationale for the longer compliance timeframe.

²⁹ U.S. EPA. 2000. 833-R-00-002, Storm Water Phase II Compliance Assistance Guide, P.4-31

³⁰ U.S. EPA. 1992. Guidance 833-8-92-002. Section 6.3.2.3.

³¹ *Federal Register*. Vol. 55, No. 222, Friday, November 16, 1990. Rules and Regulations. p. 48058.

Water Board staff reviewed more than half of the Permittees' ERPs during the Previous Permit term. While a couple of Permittees have detailed, comprehensive plans, more than half of the ERPs reviewed did not comply with the ERP requirements in the Previous Permit. Therefore, this Permit standardizes and clarifies the ERP requirements in provisions C.4., C.5., and C.6. to eliminate any ambiguity in the requirements.

Provision C.6.c. Best Management Practices Categories. This section requires all Permittees to require all construction sites to have year-round seasonally appropriate effective Best Management Practices (BMPs) in the following six categories: (1) erosion control, (2) run-on and runoff control, (3) sediment control, (4) active treatment systems, (5) good site management, and (6) non stormwater management. These BMP categories are listed in the State General NPDES Permit for Stormwater Discharges Associated with Construction Activities (Construction General Permit). The Water Board decided it was too prescriptive and inappropriate to require a specific set of BMPs that are to be applicable to all sites. Every site is different with regards to terrain, soil type, soil disturbance, and proximity to a waterbody. The Construction General Permit recognizes these different factors and requires site specific BMPs through the Storm Water Pollution Prevention Plan, which addresses the six specified BMP categories. This Permit allows Permittees the flexibility to determine if the BMPs for each construction site are effective and appropriate. This Permit also allows the Permittees and the project proponents the necessary flexibility to make immediate decisions on appropriate, cutting-edge technology to prevent the discharge of construction pollutants into storm drains, waterways, and rights-of-way. Appropriate BMPs for the different site conditions can be found in different handbooks and manuals. Therefore, this Permit is consistent with the Construction General Permit in its requirements for BMPs in the six specified categories.

Vegetation clearing, mass grading, lot leveling, and excavation expose soil to erosion processes and increase 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 the natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters. This can even occur in conjunction with unexpected rain events during the so-called *dry season*. Although rare, significant rains can occur in the San Francisco Bay Region during the dry season. Therefore, Permittees should ensure that construction sites have materials on hand for rapid rain response during the whole year, including during the dry season.

Normally, stormwater restrictions on grading should be implemented during the wet season from October 1 through April 30. Section C.6.c.ii.(1).d of the Permit requires "project proponents to minimize grading during the wet season and scheduling of grading with seasonal dry weather periods to the extent feasible." If grading does occur during the wet season, Permittees shall require project proponents to (1) implement additional BMPs as necessary, (2) keep supplies available for rapid response to storm events, and (3) minimize wet-season, exposed, and graded areas to the absolute minimum necessary.

Slope stabilization is necessary on all active and inactive slopes during rain events regardless of the season, except in areas implementing advanced treatment. Slope stabilization is also required on inactive slopes throughout the rainy season. These requirements are needed because unstabilized slopes at construction sites are significant

sources of erosion and sediment discharges during rainstorms. “Steep slopes are the most highly erodible surface of a construction site, and require special attention.”³² U.S. EPA emphasizes the importance of slope stabilization when it states “slope length and steepness are key influences on both the volume and velocity of surface runoff. Long slopes deliver more runoff to the base of slopes and steep slopes increase runoff velocity; both conditions enhance the potential for erosion to occur.”³³ In lieu of vegetation preservation or replanting, soil stabilization is the most effective measure in preventing erosion on slopes. Research has shown that effective soil stabilization can reduce sediment discharge concentrations up to six times, as compared to soils without stabilization.³⁴ Slope stabilization at construction sites for erosion control is already the consensus among the regulatory community and is found throughout construction BMP manuals and permits. For these reasons, Permittees must ensure that slope stabilization is implemented on sites, as appropriate.

It is also necessary that Permittees ensure that construction sites are revegetated as early as feasible. Implementation of revegetation reduces the threat of polluted stormwater discharges from construction sites. Construction sites should permanently stabilize disturbed soils with vegetation at the conclusion of each phase of construction.³⁵ A survey of grading and clearing programs found one-third of the programs without a time limit for permanent revegetation, “thereby increasing the chances for soil erosion to occur.”³⁶ U.S. EPA states “the establishment and maintenance of vegetation are the most important factors to minimizing erosion during development.”³⁷

To ensure the MEP standard and water quality standards are met, active treatment systems may be necessary at some construction sites. Requirements for active system requirements are located in the Statewide NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, Attachment F.

Provision C.6.d. Plan Approval Process. This section of the Permit requires the Permittees to review project proponents’ stormwater management plans for compliance with local regulations, policies, and procedures. U.S. EPA states that it is often easier and more effective to incorporate stormwater quality controls during the site plan review process or earlier.³⁸ In the Phase I stormwater regulations, U.S. EPA states that a primary control technique is good site planning.³⁹ U.S. EPA goes on to say that the most efficient controls result when a comprehensive stormwater management system is in place.⁴⁰ To determine if a construction site is in compliance with construction and grading ordinances and permits, U.S. EPA states that the “MS4 operator should review the site plans

³² Schueler, T., and H. Holland. 2000. *Muddy Water In—Muddy Water Out?* The Practice of Watershed Protection. p. 6.

³³ U.S. EPA. 1990. *Sediment and Erosion Control: An Inventory of Current Practices*. p. II-1.

³⁴ Schueler, T., and H. Holland. 2000. “Muddy Water In—Muddy Water Out?” *The Practice of Watershed Protection*. p. 5.

³⁵ Ibid.

³⁶ Ibid. p. 11.

³⁷ U.S. EPA. 1990. *Sediment and Erosion Control: An Inventory of Current Practices*. p. II-1.

³⁸ U.S. EPA. 2000. *Storm Water Phase II Compliance Assistance Guide*. EPA 833-R-00-002. Section 6.3.2.1.

³⁹ *Federal Register*. Vol. 55, No. 222, Friday, November 16, 1990. Rules and Regulations. p. 48034.

⁴⁰ Ibid.

submitted by the construction site operator before ground is broken.”⁴¹ Site plan review aids in compliance and enforcement efforts since it alerts the “MS4 operator early in the process to the planned use or non-use of proper BMPs and provides a way to track new construction activities.”⁴²

Provision C.6.e. (Inspections) The Water Board allows flexibility on the legal authority language, ERP, and BMPs required on a site. This section of the Permit pulls together the accountability of the whole Provision through regular inspections, consistent enforcement, and meaningful tracking. These three elements will help ensure that effective construction pollutant controls are in place in order to minimize construction polluted runoff to the storm drain and waterbodies.

This section clearly identifies the level of effort necessary by Permittees to minimize construction pollutant runoff into storm drains and ultimately, waterbodies, including tracking and reporting sufficient to demonstrate and document Permittee compliance.

This section requires monthly inspections during the wet season of all construction sites disturbing one or more acre of land, all hillside projects, and all high priority sites determined by the Permittee or the Water Board to be significant threats to water quality. Inspections must focus on the adequacy and effectiveness of the site specific BMPs implemented for the six BMP categories. Each Permittee must implement its ERP and require timely corrections of all actual and potential problems observed. All corrective actions must be implemented before the next rain event, but no longer than 10 business days after the violations are discovered. A longer time period to implement corrective actions is allowed with a reasonable rationale. All inspections must be recorded on a written or electronic inspection form, and also tracked in an electronic database or tabular format. An example tabular format is included as Construction Inspection Data in Fact Sheet Attachment 6.

Ideally, all construction sites with a grading permit from a Permittee should have stormwater inspections during the rainy season to ensure adequate BMPs are implemented and construction pollutants are not entering the storm drain. However, this is a great burden to the Permittees. This Permit adds a requirement to inspect all hillside projects disturbing greater than or equal to 5,000 square feet of soil. Hillside development is defined as a development project occurring on slopes of between 15% and 20%, depending on the community. For those Permittees that do not have a hillside development map or definition, this Permit defines hillside development as development occurring on land with a slope greater than or equal to 15%.

The Permittees asked that this Permit reduce the reporting since all of the tracking data are available to Water Board staff. This Permit reduces the reporting to what is minimally necessary to provide meaningful data and demonstrate permit compliance.

Provision C.6.f. Staff Training. This section of the Permit requires Permittees to conduct annual staff trainings for municipal staff. These trainings have been found to be

⁴¹ U.S. EPA. 2000. *Storm Water Phase II Compliance Assistance Guide*. EPA 833-R-00-002. Section 4.6.2.4, pp. 4–30.

⁴² *Ibid.* pp. 4–31.

extremely effective means to educate inspectors and to inform them of any changes to local ordinances and state laws. Trainings provide valuable opportunity for Permittees to network and share strategies used for effective enforcement and management of erosion control practices.

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C.7. Public Information and Outreach

Legal Authority

The following legal authority applies to section C.7:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC sections 13377 and 13263, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: 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 122.26(d)(2)(iv)(B)(5) requires, “a description of 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, “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.”

Fact Sheet Finding in Support of Provision C.7.

- C.7-1** An informed and knowledgeable community is critical to the success of a stormwater program since it helps ensure greater support for the program as the public gains a greater understanding of stormwater pollution issues.
- C.7-2** An informed community also ensures 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.
- C.7-3** The public education programs 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.⁴³
- C.7-4** Target audiences should include (1) government agencies and official to achieve better communication, consistency, collaboration, and coordination at the federal, state, and local levels and (2) K-12/Youth Groups.

⁴³ USEPA. 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

C.7-5 Citizen involvement events should make every effort to reach out and engage all economic and ethnic groups.⁴⁴

Specific Provision C.7 Requirements

Provision C.7.a. Storm Drain Inlet Marking. Storm drain inlet marking is a long-established program of outreach to the public on the nature of the storm drain system, providing the information that the storm drain system connects directly to creeks and the Bay and does not receive treatment. Past public awareness surveys have demonstrated that this BMP has achieved significant impact in raising awareness in the general public and meets the MEP standard as a required action. Therefore, it is important to set a goal of ensuring that all municipally-maintained inlets are legible labeled with a no dumping message. If storm drain marking can be conducted as a volunteer activity, it has additional public involvement value.

Provision C.7.b. Advertising Campaigns. Use of various electronic and/or print media on trash/litter in waterways and pesticides. Advertising campaigns are long-established outreach management practices. Specifically, the Bay Area Management Agencies Association (BASMAA) already implements an advertising campaign on behalf of the Permittees. Permittees must continue to increase public awareness of specific stormwater issues. This Permit requires post-campaign surveys which will help identify and quantify the audiences' knowledge, trends, and attitudes and/or practices; and to measure the overall population awareness of the messages and behavioral changes.

Provision C.7.c. Media. Public service media time and social media are available and allow the Permittees to leverage expensive media purchases to achieve broader outreach goals. Social media provides an abundance of opportunities to reach a broad audience with minimal expense.

Provision C.7.d. Stormwater Pollution Prevention Education. As the public becomes more aware of water quality issues and how certain behaviors negatively impact stormwater runoff, they will need more information on how to minimize stormwater pollution. The Previous Permit already required Permittees to have and publicize a centralized stormwater point of contact to provide the public with information on watershed characteristics and stormwater pollution prevention alternatives. The Permittees already disseminate numerous brochures, pamphlets, and fact sheets on a number of different stormwater pollution prevention messages which have a stormwater point of contact on them. Many Permittees have also placed these pollution prevention materials on their websites. Since citizens are increasing using the internet to search for information, this Permit goes further to require all Permittees to place information on watershed characteristics and stormwater pollution prevention materials on their websites.

Provision C.7.e. Public Outreach and Citizen Involvement Events. This Permit combines back Public Outreach and Citizen Involvement. Permittees need informed citizens to influence positive stormwater pollution behavior. Therefore, Permittees need

⁴⁴ USEPA. 2000. Storm Water Phase II Compliance Assistance Guide. EPA 833-R-00-002.

to continue reaching a broad spectrum of citizens with stormwater pollution prevention information through long-established outreach mechanism such as staffing tables or booths at fairs, street fairs, and other community events. Permittees shall continue utilizing appropriate outreach materials, such as printed materials, newsletter/journal articles, and videos. Permittees shall also utilize existing community outreach events such as the Bringing Back the Natives Garden Tour. Combining Citizen Involvement Event back with Public Outreach in this Permit does not minimize the importance of Citizen Involvement in events such as creek cleanups and restorations. It is important to provide opportunities for citizens to actively practice being good stewards of our environment. This Permit requires that the number of Citizen Involvement Events be equal or greater than the number of Public Education Events. The combined specified number of events for Public Outreach and Citizen Involvement in this Permit are, for the most part, slightly less than the combined specified number in the Previous Permit. However, many Permittees claimed credit for both public outreach and citizen involvement for a number of events each year. In addition, this Permit has new requirements for each Permittee to have and maintain information on stormwater issues, watershed characteristics, and stormwater pollution prevention alternatives on its website and to advertise this website. It is anticipated that this website will provide the needed stormwater pollution prevention information to citizens when needed.

Provision C.7.f. Watershed Stewardship Collaborative Efforts. Watershed and Creek groups are comprised of active citizens, but they often need support from the local jurisdiction and certainly need to coordinate actions with Permittees such as flood districts and cities.

Provision C.7.i. School-Age Children Outreach. Outreach to school children has proven to be a particularly successful program with an enthusiastic audience who are efficient to reach. School children also take the message home to their parents, neighbors, and friends. In addition, they are the next generation of decision makers and consumers.

Provision C.7.h. Outreach to Municipal Officials. It is important for Permittee staff to periodically inform Municipal Officials of the permit requirements and also future planning and resource needs driven by the permit and stormwater regulations.

C.8. Water Quality Monitoring

Legal Authority

Broad Legal Authority: CWA Section 308; Federal NPDES regulations 40 CFR 122.26(d)(2)(iv), 122.41(h), (j)-(l), 122.44(i), and 122.48.

Specific Legal Authority: Permittees must conduct a comprehensive monitoring program as required under Federal NPDES regulations 40 CFR 122.48, 40 CFR 122.44(i), 40 CFR 122.26.(d)(1)(iv)(D), and 40 CFR 122.26(d)(2)(ii)-(iv). CWC Section 13383 further authorizes the Regional Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements.

Fact Sheet Findings in Support of Provision C.8

C.8-1 In response to questions regarding the type of water quality-based effluent limitations that are most appropriate for NPDES stormwater permits, and because of the nature of stormwater discharges, U.S. EPA established the following approach to stormwater monitoring:

Each storm water permit should include a coordinated and cost-effective monitoring program to gather necessary information to determine the extent to which the permit provides for attainment of applicable water quality standards and to determine the appropriate conditions or limitations for subsequent permits. Such a monitoring program may include ambient monitoring, receiving water assessment, discharge monitoring (as needed), or a combination of monitoring procedures designed to gather necessary information.⁴⁵

According to U.S. EPA, the benefits of stormwater runoff monitoring include, but are not limited to, the following:

- Providing a means for evaluating the environmental risk of stormwater discharges by identifying types and amounts of pollutants present;
- Determining the relative potential for stormwater discharges to contribute to water quality impacts or water quality standard violations;
- Identifying potential sources of pollutants; and
- Eliminating or controlling identified sources more specifically through permit conditions.⁴⁶

C.8-2 Provision C.8 requires Permittees to conduct water quality monitoring, including ambient monitoring and monitoring of receiving waters, in accordance with 40 CFR 122.44(i) and 122.48. One purpose of water quality

⁴⁵ U.S. EPA. 1996. Interim Permitting Approach for Water Quality-Based Effluent Limitations in Stormwater Permits. Sept. 1, 1996. <http://www.epa.gov/npdes/pubs/swpol.pdf>

⁴⁶ U.S. EPA. 1992. NPDES Storm Water Sampling Guidance Document. EPA/833-B-92-001.

monitoring is to demonstrate the effectiveness of the Permittees' stormwater management actions pursuant to this Permit and, accordingly, demonstrate compliance with the conditions of the Permit. Other water quality monitoring objectives under this Permit include:

- Assess the chemical, physical, and biological impacts of urban runoff on receiving waters;
- Characterize stormwater discharges;
- Assess compliance with Total Maximum Daily Loads (TMDLs) and Wasteload Allocations (WLAs) in impaired waterbodies;
- Assess progress toward reducing receiving water concentrations of impairing pollutants;
- Assess compliance with numeric and narrative water quality objectives and standards;
- Identify sources of pollutants;
- Assess stream channel function and condition, as related to urban stormwater discharges;
- Assess the overall health and evaluate long-term trends in receiving water quality; and
- Measure and improve the effectiveness of the Permittees' urban runoff control programs and the Permittees' implemented BMPs.

C.8-3 Monitoring programs are an essential element in the improvement of urban runoff management efforts. Data collected from monitoring programs can be assessed to determine the effectiveness of management programs and practices, which is vital for the success of the iterative approach, also called the "continuous improvement" approach, used to meet the MEP standard. When water quality data indicate that water quality standards or objectives are not being met, particular pollutants, sources, and drainage areas can be identified and targeted for urban runoff management efforts. The iterative process in Provision C.1, Water Quality Standards Exceedances, could potentially be triggered by monitoring results. Ultimately, the results of the monitoring program must be used to focus actions to reduce pollutant loadings to comply with applicable WLAs, and protect and enhance the beneficial uses of the receiving waters in the Permittees' jurisdictions and the San Francisco Bay.

C.8-4 MS4 permits issued before 2009 contained less detailed water quality monitoring requirements and instead required an annual monitoring plan in which Permittees designed their own monitoring program. A decision by the California Superior Court⁴⁷ regarding two of the programs' permits stated:
Federal law requires that all NPDES permits specify "[r]equired monitoring including type, intervals, and frequency sufficient to yield

⁴⁷ San Francisco Baykeeper vs. Regional Water Quality Control Board, San Francisco Bay Region, Consolidated Case No. 500527, filed Nov. 14, 2003.

data which are representative of the monitored activity” 40 CFR § 122.48(b).

The water quality monitoring requirements in Provision C.8 comply with 40 CFR 122.44(i) and 122.48(b) and the Superior Court decision.

C.8-5 The Water Quality Monitoring Provision is intended to provide answers to fundamental management questions, outlined below. Monitoring is intended to progress as iterative steps toward ensuring that the Permittees’ can fully answer, through progressive monitoring actions, management questions that include the following:

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

C.8-6 On April 15, 1992, the Water Board adopted Resolution No. 92-043 directing the Executive Officer to implement the Regional Monitoring Program for San Francisco Bay. Subsequent to a public hearing and various meetings, Board staff requested major permit holders in the Region, under authority of CWC section 13267, to report on the water quality of the Estuary. These permit holders, including the Permittees, responded to this request by participating in a collaborative effort through the San Francisco Estuary Institute. This effort has come to be known as the San Francisco Estuary Regional Monitoring Program (RMP). The RMP involves collection and analysis of data on pollutants and toxicity in water, sediment and biota of the Estuary. The Permittees are required to continue to report on the water quality of the Estuary, as presently required. Compliance with the requirement through participation in the RMP is considered to be adequate compliance.

C.8-7 The Surface Water Ambient Monitoring Program (SWAMP) is a statewide monitoring effort, administered by the State Water Board, designed to assess the conditions of surface waters throughout California. One purpose of SWAMP is to integrate existing water quality monitoring activities of the State Water Board and the Regional Water Quality Control Boards, and to coordinate with other monitoring programs. Provision C.8 contains a framework, referred to as a regional monitoring collaborative, within which Permittees can elect to work cooperatively with SWAMP to maximize the value and utility of both the Permittees’ and SWAMP’s monitoring resources.

C.8-8 In 1998 BASMAA published *Support Document for Development of the Regional Stormwater Monitoring Strategy*,⁴⁸ a document describing a possible strategy for coordinating the monitoring activities of BASMAA member agencies. The document states:

BASMAA's member agencies are connected not only by geography but also by an overlapping set of environmental issues and processes and a common regulatory structure. It is only natural that the evolution of their individual stormwater management programs has led toward increasing amounts of information sharing, cooperation, and coordination.

In the 2009 Municipal Regional Permit, Permittees were given the option to implement this same concept by forming a regional monitoring collaborative, which they did. The Regional Monitoring Collaborative (RMC) provides efficiencies and economies of scale by performing certain tasks (e.g., planning, contracting, data quality assurance, data management and analysis, and reporting) at the regional level. Further benefits are expected as more monitoring tasks are conducted by the RMC.

C.8-9 This Permit includes monitoring requirements to verify compliance with adopted TMDL WLAs and to provide data needed for TMDL development and/or implementation. This Permit incorporates the TMDLs' WLAs adopted by the Water Board as required under CWA section 303(d).

C.8-10 SB1070 (California Legislative year 2005/2006) found that there is no single place where the public can go to get a look at the health of local water bodies. SB1070 also states that all information available to agencies shall be made readily available to the public via the Internet. This Permit requires water quality data to be submitted in a specified format and uploaded to a centralized Internet site so that the public has ready access to the data.

Specific Provision C.8 Requirements

Each of the components of the monitoring provision is necessary to meet the objectives and answer the questions listed in the findings above. Justifications for each monitoring component are discussed below.

Provision C.8.a. Compliance Options. Provision C.8.a. provides Permittees options for obtaining monitoring data through various organizational structures, including use of data obtained by other parties. This is intended to achieve the following:

- Promote cost savings through economies of scale and eliminate redundant monitoring by various entities;
- Promote consistency in monitoring methods and data quality; and
- Simplify reporting.

⁴⁸ EcoAnalysis, Inc. & Michael Drennan Assoc., Inc., *Support Document for Development of the Regional Stormwater Monitoring Strategy*, prepared for Bay Area Stormwater Management Agencies Association, March 2, 1998.

In this Permit, all the Stormwater Countywide Programs are encouraged to work collaboratively to conduct all or most of the required monitoring and reporting on a region-wide basis. For each monitoring component that is conducted collaboratively, one report would be prepared on behalf of all contributing Permittees; separate reports would not be required from each Program. Cost savings could result also from reduced contract and oversight hours, fewer quality assurance/quality control samples, shared sampling labor costs, and laboratory efficiencies.

Provision C.8.b. Monitoring Protocols and Data Quality. Clean Water Act regulations (40 CFR 122.41(j)(1)) require that data submitted pursuant to a NPDES permit meet certain quality standards. To achieve this, and to obtain data of known quality that can be compared to data collected in other California urban creeks, the permit requires monitoring data be collected and analyzed in accordance with the SWAMP Quality Assurance Project Plan and Standard Operating Procedures or U.S. EPA methods. The BASMAA Regional Monitoring Coalition's Creek Status Monitoring Program Quality Assurance Project Plan (January 2014) and Standard Operating Procedures (January 2014) have been deemed to be SWAMP comparable. These two BASMAA documents may be updated to reflect the changing state-of-the-science with Executive Officer's approval.

Provision C.8.c. San Francisco Estuary Receiving Water Monitoring. The San Francisco Estuary is the ultimate receiving water for most of the urban runoff in this region. For this reason and because of the high value of its beneficial uses, Provision C.8.c requires focused monitoring on the Estuary to continue. Since the mid-1990s, Permittees have caused this monitoring to be conducted by contributing financially and with technical expertise, to the San Francisco Estuary Regional Monitoring Program. Provision C.8.c requires such monitoring to continue.

Provisions C.8.d. Creek Status Monitoring. Based on the stated goals of the CWA, Creek Status Monitoring employs a three-prong approach to monitoring water quality which includes chemical-specific monitoring, toxicity testing, and bioassessments (U.S. EPA 1991a). Each of the three elements has distinct advantages and all three work together to ensure that the physical, chemical and biological integrity of our waters are protected. Creek Status Monitoring includes probabilistic and targeted sampling of urban creeks and serves as a surrogate to monitoring the discharge from all major outfalls. Sampling the Permittees' numerous outfalls is impractical due to costs and safety factors and the resulting data would not provide commensurately better information. By sampling the sediment, biota and water column in urban creeks, the Permittees can determine where water quality problems are occurring in the creeks, then work to identify which outfalls and land uses are causing or contributing to the problem. In short, Creek Status Monitoring is needed and useful for identifying water quality problems and assessing the health of streams; it is the first step in identifying sources of pollutants and an important component in evaluating the effectiveness of an urban runoff management program. Requirements for number, frequency and general locations of samples are established to sufficiently indicate whether water quality is supportive, or likely to be supportive, of beneficial uses and whether water quality objectives are being met, at a minimum.

Provision C.8.d.i. Biological Assessment including Nutrients and General Water Quality Parameters. Biological Assessment is needed to provide site-specific information about the health and diversity of freshwater benthic communities within a specific reach of a creek, using standard procedures developed and/or used by the State Water Resources Control Board Surface Water Ambient Monitoring Program. It consists of collecting samples of benthic communities and conducting a taxonomic identification to measure community abundance and diversity. Urban creek sampling can be directly compared to a non-urban or reference creek to assess benthic community health. Biological indicators, including the California Stream Condition Index (CSCI), are developed using reference streams, so the calculation of a CSCI score at an urban site already takes comparison to reference conditions into account. This monitoring can also provide information on cumulative pollutant exposure/impacts because pollutant impacts to the benthic community accumulate and occur over time. Nutrient monitoring is necessary because recent monitoring data indicate nutrients, which can increase algal growth and decrease dissolved oxygen concentrations, are present in significant concentrations in Bay area creeks. The sampling timeframe (generally between April 15 and June 30) is when invertebrates are developed enough to be captured in the sampling equipment but not developed enough to have emerged (flown off), and thus is the timeframe in which necessary information concerning biological integrity can be obtained.

Provision C.8.d.ii. Chlorine monitoring is needed to detect a release of potable water or other chlorinated water sources, which are toxic to aquatic life.

Provision C.8.d.iii. Temperature monitoring is needed to determine if conditions in creeks to which urban runoff is discharged are supportive of cold-water and warm-water beneficial uses, as appropriate.

Provision C.8.d.iv. Continuous monitoring of dissolved oxygen, temperature, and pH is required because these parameters are fundamental to supporting aquatic life beneficial uses and they impact the effect of pollutants in freshwater (e.g., ammonia toxicity is dependent on pH and temperature).

Provisions C.8.d.v. Toxicity in Water Column and C.8.d.vi. Toxicity and Pollutants in Bedded Sediment. Toxicity testing provides a tool for assessing toxic effects (acute and chronic) of all the chemicals in aqueous samples of storm water, receiving waters or sediments. This testing allows the cumulative effect of the pollutants present in the sample to be evaluated, rather than the toxic responses to individual chemicals. Toxicity in water and on sediment also are monitored in order to determine whether the numeric targets of the Diazinon and Pesticide-Related Toxicity in Urban Creeks TMDL are being achieved, and to help provide evidence on whether pesticide-related toxicity is decreasing in urban creek waters. Creek Status Monitoring measures toxicity related to dry weather flows from MS4s; wet weather toxicity is measured as a requirement of Pollutants of Concern Monitoring. This Order requires Permittee(s) to conduct chronic toxicity tests by methods specified in Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/821/R-02/013, 2002; Table IA, 40 CFR Part 136) or a more recent edition. As with all the parameters in Creek Status Monitoring, this method is SWAMP comparable, i.e., this is the method used by

the statewide SWAMP. The test species are selected as the most sensitive species to pollutants currently known or suspected to be present in stormwater discharges and are consistent with test species used by the SWAMP. This method is also required in other California MS4 permits, including the statewide Caltrans permit.

Provision C.8.d.vii. Pathogen Indicator monitoring is needed to detect pathogens in waterbodies that could be sources of impairment to recreational uses at or near the sampling location.

Provision C.8.d. Monitoring Frequency, Duration, and Location. Creek Status Monitoring continues to be an annual requirement for the Permittees, except for two much smaller Permittees, Fairfield-Suisun and Vallejo. For each of the Creek Status Monitoring parameters, the number or frequency of samples required is based on the relative population within the countywide stormwater program. Costs are minimized while data necessary for successful stormwater management are obtained. Monitoring durations are based on the amount of data needed to understand the potential effects related to each Creek Status Monitoring parameter. Monitoring frequencies and durations are specified with each parameter.

Creek Status Monitoring locations are to be selected on a probabilistic (random) or targeted basis, depending on the parameter, in similar fashion to the statewide SWAMP. If correctly sited, sampling stations are expected to be very useful in answering the monitoring program's management questions and meeting its goals. For this reason, Provision C.8.d. requires sample locations to be based on surrounding land use, likelihood of urban runoff impacts, existing data gaps, and similar considerations. This will help maximize the utility of the sample locations, while also providing the Permittees with adequate flexibility to ultimately choose practical Creek Status Monitoring locations.

Provision C.8.e. Stressor/Source Identification (SSID) Projects are necessary to identify sources of pollutants; identify new or emerging pollutants; and improve stormwater management actions. When Creek Status Monitoring results indicate an exceedance of a water quality objective, toxicity threshold, or other "trigger," Permittees must identify the source of the problem and take steps to reduce any pollutants discharged from or through their municipal storm sewer systems. This requirement conforms to the process, outlined in Provision C.1., of complying with the Discharge Prohibition and Receiving Water Limitations. The timeframes for initiating and completing follow up actions acknowledge the realities of budgeting for these studies, some, but not all, of which could require funding above the level available in a given fiscal year. If multiple "triggers" are identified through monitoring, Permittees must focus on the highest priority problems; a cap on the total number of source identification projects conducted within the Permit term is provided to cap Permittees' potential costs.

C.8.f. Pollutants of Concern⁴⁹ Monitoring. Federal CWA section 303(d) TMDL requirements, as implemented under the CWC, require a monitoring plan designed to measure the effectiveness of the TMDL point and nonpoint source control measures and

⁴⁹ See sections C.9, C.11, C.12, and C.13 of this Fact Sheet for more information on Pollutants of Concern.

the progress the water body is making toward attaining water quality objectives. Such a plan necessarily includes collection of water quality data. Provision C.8.f. Pollutants of Concern (POC) monitoring is intended to assess inputs of Pollutants of Concern to the Bay from local tributaries and urban runoff; provide information to support implementation of TMDLs and other pollutant control strategies; assess progress toward achieving wasteload allocations (WLAs) for TMDLs; and help resolve uncertainties in loading estimates and impairments associated with these pollutants.

In particular, POC monitoring addresses five priority POC management information needs:

- 1) Source Identification - identifying which sources or watershed source areas provide the greatest opportunities for reductions of POCs in urban stormwater runoff;
- 2) Contributions to Bay Impairment - identifying which watershed source areas contribute most to the impairment of San Francisco Bay beneficial uses (due to source intensity and sensitivity of discharge location);
- 3) Management Action Effectiveness - providing support for planning future management actions or evaluating the effectiveness or impacts of existing management actions;
- 4) Loads and Status - providing information on POC loads, concentrations, and presence in local tributaries or urban stormwater discharges; and
- 5) Trends - evaluating trends in POC loading to the Bay and POC concentrations in urban stormwater discharges or local tributaries over time.

The permit specifies monitoring methods that can be used to address these information needs and which information needs apply to each pollutant of concern. The permit provides flexibility in the number of samples, or level of effort, but requires minimums to be met annually and over the permit term. The level of effort (expressed as required number of samples collected and analyzed) is similar to the level of sampling and analysis effort for pollutants of concern monitoring required in the previous permit term.

The approach for POC monitoring does not specify specific monitoring locations or monitoring frequencies at those specific locations. Rather, the permit requires that monitoring be intelligently and flexibly directed toward answering the management information needs (that apply to a given pollutant), and this flexibility allows the monitoring strategy to be adapted and improved based on information obtained from monitoring conducted early in the permit term. The flexibility also allows the Permittees to continue collecting useful information even during drought years in which conditions limit some types of data collection (e.g., storm even sampling) but not others (e.g., collection of bed sediment). As is true of Creek Status Monitoring, it is impractical to sample all of the urban runoff outfalls in the region, and these outfall data (obtained at great expense) would not provide commensurately better information relative to the management information needs for pollutants of concern. By strategically sampling the sediment and water column in urban creeks and conveyances, the Permittees can better address the five information needs stated above.

To some extent, POC monitoring builds on what we already know about pollutants in creeks (also referred to as tributaries to the Bay) and leads to more effective actions to

control those pollutants. For example, we know that pesticide-related toxicity has been widespread and results from approved pesticide uses. POC monitoring for toxicity therefore is tailored to provide information on which pesticides are currently a concern to water quality; a limited number of toxicity samples provides adequate information. Other requirements for number, frequency and general locations of samples are similarly tailored to information needs.

C.8.g. Reporting. CWC section 13267 provides authority for the Water Board to require technical water quality reports. Provision C.8.g. requires Permittees to submit electronic and comprehensive reports on their water quality monitoring activities to (1) determine compliance with monitoring requirements; (2) provide information useful in evaluating compliance with all Permit requirements; (3) enhance public awareness of the water quality in local streams and the Bay; and (4) standardize reporting to better facilitate analyses of the data, including for the CWA section 303(d) listing process.

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C.9. – C.14. Pollutants of Concern including Total Maximum Daily Loads

Provisions C.9 through C.14 pertain to pollutants of concern, including those for which TMDLs are being developed or implemented.

Legal Authority

The following legal authority applies to provisions C.9 through C.14:

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).

Specific Legal Authority: The TMDL-based requirements for pesticides, mercury, PCBs and bacteria have been imposed in accordance with 40 Code of Federal Regulations section 122.44(d)(1)(vii)(B). Pursuant to 40 Code of Federal Regulations section 122.44(d)(1)(vii)(B), the effluent limitations for NPDES permits must be consistent with the assumptions and requirements of any available Waste Load Allocation (WLA) for the discharge prepared by the state and approved by U.S. EPA, or established by U.S. EPA. In addition, Water Code section 13263, subdivision (a), requires that waste discharge requirements implement any relevant water quality control plans (basin plans), including TMDL requirements that have been incorporated into the basin plans. In addition, under CWA section 402(p)(3)(B)(iii), MS4 discharges “shall require controls to reduce the discharge of pollutants to the maximum extent practicable . . . and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.” (33 U.S.C. § 1342(p)(3)(B)(iii).) Under this provision, the Water Board may include requirements for reducing pollutants in stormwater discharges as necessary for compliance with water quality standards. (*See Defenders of Wildlife v. Browner* (9th Cir. 1999) 191 F.3d 1159, 1166.) This includes requirements to meet TMDLs since TMDL targets are an interpretation of water quality standards.

The Board may impose effluent limitations that are best management practices (BMPs) or numeric effluent limitations. (33 U.S.C. §1342(p)(3)(B)(iii); 40 C.F.R. §122.44(k)(2)&(3) and § 122.44(d)(1)(vii)(B).) This is consistent with U.S. EPA’s November 26, 2014, “Revision to the November 22, 2002, Memorandum ‘Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs’” (2014 U.S. EPA Memo.) This memorandum, while not binding authority, states “[w]here the TMDL includes WLAs for stormwater sources that provide numeric pollutant loads, the WLA should, where feasible, be translated into effective, measurable WQBELs that will achieve this objective. This could take the form of a numeric limit, or of a measurable, objective BMP-based limit that is projected to achieve the WLA.” The 2014 U.S. EPA Memo further acknowledges that the permitting authority should consider the schedules in the TMDL as it decides whether and how to establish enforceable interim requirement and interim dates in the permit. The

interim deadlines in the Provisions are consistent with and in furtherance of the deadlines in the TMDLs.

For requirements of other pollutants of concern such as trash and copper, the Water Board is authorized to impose effluent limitations under 40 CFR 122.44(d)(1)(i), which 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.” In addition, as stated above, Water Code section 13263 requires that waste discharge requirements implement the Basin Plan.

Basin Plan Requirements: Section 4.8 of the Region’s Water Quality Control Plan (Basin Plan) states that NPDES stormwater permits issued to municipalities will include requirements to prevent or reduce discharges of pollutants that cause or contribute to violations of water quality objectives. The Basin Plan also contains urban stormwater TMDL implementation requirements at sections 7.1.1, 7.2.2, 7.7.1, 7.2.3, and 7.4.1 for pesticide-related toxicity, mercury, PCBs, and bacteria. The Basin Plan also requires urban stormwater requirements for copper in section 7.2.1. Finally, the Basin Plan Table 4-1 includes Prohibition 7, which prohibits the discharge of “rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas.”

General Strategy for Sediment-Bound Pollutants (Mercury and PCBs)

The control measures for mercury are intended to implement the urban runoff requirements stemming from TMDLs for these pollutants. The control measures required for PCBs are intended to implement those that are consistent with control measures in the PCBs TMDL implementation plan. The urban runoff management requirements in the PCBs TMDL implementation plan call for permit-term requirements based on an implementation of controls to reduce PCBs, and that is the intended approach of the required provisions for all pollutants of concern. Many of the control actions addressing PCBs and mercury will result in reductions of a host of sediment-bound pollutants, including legacy pesticides, PBDEs, and others. The strategy for these pollutants is to use PCBs control to guide decisions concerning where to focus effort, but implementation of the control efforts would take into account the benefits for controlling other pollutants of concern. The POC strategy also includes a phased approach that provides for pilot scale testing (in the 2009 issuance of this permit) and for identifying areas with POC sources. The overall strategy for addressing sediment bound POCs includes the following modes:

1. Pilot-testing in a few specific locations.
2. Focused implementation in areas where benefits are most likely to accrue.
3. Full-scale implementation throughout the region.
4. Other: This may refer to experimental control measures, Research and Development, desktop analysis, laboratory studies, and/or literature review.

The logic of such categorization is that, as actions are tested and confidence is gained regarding the control measure's effectiveness, the control measure may be implemented with a greater scope. For example, an untested control measure for which the effectiveness is uncertain may be implemented as a pilot project in a few locations during a permit term. If benefits result, and the action is deemed effective, it will be implemented in subsequent permit terms in a focused fashion in more locations or perhaps fully implemented throughout the Region, depending upon the nature of the measure. Conversely, the benefits of other control measures may be well known, and these control measures should be implemented in all applicable locations and/or situations. By conducting actions in this way and gathering information about effectiveness and cost, we will advance our understanding and be able to perform an updated assessment of the suite of actions.

During the previous permit term, a large part of the effort was focused on gathering necessary information about control measure effectiveness. In effect, most of the control measures were implemented at the pilot scale. In this permit term, the emphasis will shift toward focused and perhaps full-scale implementation of the most effective control measures, and progress will be measured through accounting for specific load reductions. In subsequent permit terms control measures will be implemented on the basis of what we learn in this term, and we will, thus, achieve iterative refinement and improvement through time.

Background on Specific Provisions: Provisions C.9 through C.14 contain technology-based requirements to control pollutants to the MEP and water quality based requirements consistent with the assumptions and requirements of any WLAs in the applicable TMDLs. Provision C.9 contains requirements to implement the TMDL for pesticide-related toxicity in urban creeks. Provision C.10 contains requirements to implement narrative water quality objectives for trash in all receiving water. Provision C.11 contains requirements to implement the San Francisco Bay mercury TMDL WLAs and the TMDL WLAs for mercury in the Guadalupe River Watershed. Provision C.12 contains requirements to implement the San Francisco Bay PCBs TMDL WLAs. Provision C.13 contains requirements to implement the copper site-specific objectives for San Francisco Bay. Provision C.14 contains requirements to implement the TMDL WLAs for San Pedro Creek and Pacifica State Beach Bacteria.

C.9. Pesticides Toxicity Control

Fact Sheet Findings in Support of Provision C.9.

- C.9-1** This Permit implements the Basin Plan amendments adopted by the Water Board that establish a Water Quality Containment Strategy and TMDL for diazinon and pesticide-related toxicity for Bay Area urban creeks on November 16, 2005, and approved by the State Water Board on November 15, 2006. The Water Quality Containment Strategy requires urban runoff management agencies to minimize their own pesticide use, conduct outreach to others, lead monitoring efforts, and take actions related to pesticide regulatory programs. Control measures implemented by urban runoff management agencies and other entities (except construction and industrial sites) shall reduce pesticides in urban runoff.
- C.9-2** The TMDL is allocated to all urban runoff, including urban runoff associated with MS4s, Caltrans facilities, and industrial, construction, and institutional sites. The allocations are expressed in terms of toxic units and diazinon concentrations.
- C.9-3** This provision is consistent with a recent U.S. EPA memorandum⁵⁰ providing guidance on implementing TMDL WLAs in NPDES storm water permits. Specifically, this provision establishes clear actions to achieve pesticide load reductions as well as other requirements (see C.9.f) necessary to achieve receiving water limits. The timeline for achieving the TMDL is not a fixed date for the following reasons. Pesticide-related toxicity continues to occur because state and federal pesticide regulatory programs, as currently implemented, allow pesticides to be used in ways that cause or contribute to aquatic toxicity. The TMDL implementation plan recognizes that (1) Permittees must control their own use of pesticides, but Permittees are not solely responsible for attaining the allocations, because their authority to regulate others' pesticide use is constrained by federal and state law; and (2) because a realistic date for achieving allocations cannot be discerned given the current pesticide regulatory framework, reviewing the implementation strategy every five years, at permit reissuance, is the appropriate timeline.

Specific Provision C.9 Requirements

C.9 provisions implement the TMDL for Urban Creeks Pesticide Toxicity. All C.9 provisions are stated explicitly in the implementation plan for this TMDL. Permittees are encouraged to coordinate activities with the Urban Pesticide Committee and other agencies and organizations. The Urban Pesticides Committee has served as an information clearinghouse and as a forum for coordinating pesticide TMDL implementation. The list of urban-use pesticides of concern to water quality includes

⁵⁰ U.S. EPA. November 26, 2014. Revisions to the November 22, 2002 Memorandum "Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs"

pesticides for which local area monitoring data exceed or approach benchmarks and pesticides currently linked to toxicity in surface waters.

Provisions C.9.a through C.9.d are designed to insure that integrated pest management (IPM) is adopted and implemented as policy by all municipalities. IPM is a pest control strategy that uses an array of complementary methods: natural predators and parasites, pest-resistant varieties, cultural practices, biological controls, various physical techniques, and pesticides as a last resort. If implemented properly, it is an approach that can significantly reduce or eliminate the use of pesticides. The implementation of IPM will be assured through training of municipal employees and contractor requirements.

Provision C.9.e directs the municipalities to conduct outreach to consumers at point of purchase, to residents who contract for pest control, and to pest control professionals. Such targeted outreach is often intended to make the public and pest control professionals aware of the water quality impacts of current-use pesticides that are impacting or have potential to negatively impact urban creeks.

Provision C.9.f requires that municipalities (through cooperation or participation with BASMAA and the California Association of Storm Water Quality Agencies) track and participate in pesticide regulatory processes like the U.S. EPA pesticide evaluation and registration activities related to surface water quality, and the California Department of Pesticide Regulation pesticide evaluation activities. The goal of these efforts is to provide pertinent water quality data and encourage both the state and federal pesticide regulatory agencies to fully evaluate aquatic impacts and to mitigate for impacts to urban water bodies within the pesticide regulation or registration process. Accomplishing this goal would represent the most efficient and effective means to prevent pesticide-related water quality problems in the future.

Provision C.9.g requires Permittees to evaluate the effectiveness of their pesticide source control actions and is critical to the success of municipal efforts to control pesticide-related toxicity. Future permits must be based on an updated assessment of what is working and what is not. With every provision comes the responsibility to assess its effectiveness and report on these findings through the permit. The particulars of assessment will depend on the nature of the control measure.

C.10. Trash Load Reduction

Legal Authority

The following legal authority applies to section C.10:

Broad Legal Authority: CWA sections 402(p)(3)(B)(ii-iii), CWC sections 13377 and 13263, 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).

Specific Legal Authority: Federal NPDES regulations 40 CFR 122.26(d)(2)(i) requires “a demonstration that the [Permittee] can operate pursuant to legal authority established by statute, ordinance or series of contracts which authorizes or enables the [Permittee] 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”

Federal NPDES regulations 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)(B) requires “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)(2) requires “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 such field screens.”

Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(B)(3) requires “a description of 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-storm water.”

Federal NPDES regulations 40 CFR 122.26(d)(2)(iv)(B)(4) requires “a description of procedures to prevent, contain, and respond to spills that may discharge into the municipal separate storm sewer.” San Francisco Bay Basin Plan, Chapter 4 – Implementation, Table 4-1 Prohibitions, Prohibition 7, which prohibits the discharge of rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas. This prohibition was adopted by the Water Board in the 1975 Basin Plan, primarily to protect recreational uses such as boating.

In addition to the foregoing, it should be noted that the State Water Board on April 7, 2015, adopted amendments to the Ocean Plan and the Inland Surface

Waters and Inland Bays and Estuaries Plans that establish a narrative water quality objective for trash; establish a prohibition on the discharge of trash; provide implementation requirements for permitted storm water and other dischargers; set a time schedule for compliance, and provide a framework for monitoring and reporting requirements (collectively, Trash Amendments). These Trash Amendments are subject to review by the Office of Administrative Law and U.S. EPA and are not yet effective. Nonetheless, the C.10 requirements of this Permit are consistent with the Trash Amendments.

Fact Sheet Findings in Support of Provision C.10

C.10-1 Trash is a pervasive problem near and in creeks and in San Francisco Bay. Controlling trash continues to be one of the priorities for this Permit reissuance not only because of the trash discharge prohibition, but also because trash causes particularly major impacts on our enjoyment of creeks and the Bay. There are also significant impacts on aquatic life and habitat in those waters and eventually to the global ocean ecosystem, where plastic often floats, persists in the environment for hundreds of years, if not forever, concentrates organic toxins, and is ingested by aquatic life. There are also physical impacts, as aquatic species can become entangled and ensnared and can ingest plastic that looks like prey, losing the ability to feed properly.

For the purposes of this provision, trash is defined to consist of litter and particles of litter. Manmade litter is defined in California Government Code section 68055.1 (g): *Litter* means all improperly discarded waste material, including, but not limited to, convenience food, beverage, and other product packages or containers constructed of steel, aluminum, glass, paper, plastic, and other natural and synthetic materials, thrown or deposited on the lands and waters of the state, but not including the properly discarded waste of the primary processing of agriculture, mining, logging, sawmilling, or manufacturing.

C.10-2 Data collected by Water Board staff using the SWAMP Rapid Trash Assessment (RTA) Protocol,⁵¹ over the 2003–2005 period,⁵² suggested that the approach to managing trash in waterbodies was not reducing the adverse impact on beneficial uses. The levels of trash in the waters of the San Francisco Bay Region were and are alarmingly high, considering the Basin Plan prohibits discharge of trash and that littering is illegal with potentially large fines. Even during dry weather conditions, a significant quantity of trash, particularly plastic, is making its way into waters and being transported downstream to San Francisco Bay and the Pacific Ocean. On the basis of 85 surveys conducted at 26 sites throughout the Bay Area, staff have found an average of 2.93 pieces of trash for every foot of stream, and all the trash was removed when it was surveyed, indicating high return rates of trash over the 2003–2005 study period.

⁵¹ SWAMP Rapid Trash Assessment Protocol, Version 8

⁵² SWAMP S.F. Bay Region Trash Report, January 23, 2007

There did not appear to be one county within the Region with higher trash in waters—the highest wet weather deposition rates were found in western Contra Costa County, and the highest dry weather deposition was found in Sonoma County. Results of the trash in waterbodies assessment work by staff show that rather than adjacent neighborhoods polluting the sites at the bottom of the watershed, these areas, which tend to have lower property values, are subject to trash washing off with urban stormwater runoff cumulatively from the entire watershed.

C.10-3 A number of key conclusions can be made on the basis of the trash measurement in streams:

- Lower watershed sites have higher densities of trash.
- All watersheds studied in the San Francisco Bay Region have high levels of trash.
- There are trash source hotspots, usually associated with parks, schools, or poorly kept commercial facilities, near creek channels, that appear to contribute a significant portion of the trash deposition at lower watershed sites.
- Homeless encampments and creekside litter from a variety of sources is a significant contribution of trash directly dumped and placed in the riparian zone where it can be swept into receiving waters by storm flows.
- Dry season deposition of trash, associated with wind and dry season runoff, contributes measurable levels of trash to downstream locations.
- The majority of trash is plastic at lower watershed sites where trash accumulates in the wet season. This suggests that urban runoff is a major source of floatable plastic found in the ocean and on beaches as marine debris. While much of the initial trash deposited and washed into receiving waters is paper, the plastic trash, both floatable and non-floatable is the most persistent trash that survives to have a major impact on the Bay and Ocean.
- Parks that have more evident management of trash by city staff and local volunteers, including cleanup within the creek channel, have measurably less trash pieces and higher RTA scores.

C.10-4 The ubiquitous, unacceptable levels of trash in waters of the San Francisco Bay Region warrant a comprehensive and progressive program of education, warning, and enforcement, and certain areas warrant consideration of structural controls and treatment.

C.10-5 Trash in urban waterways of coastal areas can become *marine debris*, known to harm fish and wildlife and cause adverse economic impacts.⁵³ Trash is a regulated water pollutant that has many characteristics of concern to water

⁵³ Moore, S.L., and M.J. Allen. 2000. Distribution of anthropogenic and natural debris on the mainland shelf of the Southern California Bight. *Mar. Poll. Bull.* 40:83-88.

quality. It accumulates in streams, rivers, bays, and ocean beaches throughout the San Francisco Bay Region, particularly in urban areas.

- C.10-6** Trash adversely affects numerous beneficial uses of waters, particularly recreation and aquatic habitat. Not all trash and debris delivered to streams are of equal concern with regards to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to wildlife in the form of entanglement or ingestion.^{54,55} Some elements of trash exhibit significant threats to human health, such as discarded medical waste, human or pet waste, and broken glass.⁵⁶ Also, some household and industrial wastes can contain toxic batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Large trash items such as discarded appliances can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistent accumulation of trash in a waterbody is of particular concern, and signifies a priority for prevention of trash discharges. Also of concern are trash hotspots where illegal dumping, littering, and/or accumulation of trash occur.
- C.10-7** The narrative water quality objectives applicable to trash are Floating Material (Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses), Settleable Material (Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses), and Suspended Material (Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses).
- C.10-8** The Water Board, at its February 11, 2009 hearing, adopted a resolution proposing that 26 waterbodies in the region be added to the 303(d) list for the pollutant trash. The adopted Resolution and supporting documents are contained in Attachment 10.1 – 303(d) Trash Resolution and Staff Report Feb 2009.

Specific Provision C.10 Requirements

C.10.a. Trash Reduction Requirements

C.10.a.i. Trash Reduction Schedule – This provision includes the 70 percent trash load reduction by 2017 and 100 percent trash load reduction (or no adverse trash impact) by 2022, requirements from the previous permit. To provide assurance that Permittees are making timely progress towards meeting the 2017 and 2022 deadlines, this provision includes performance guidelines of 60 percent trash load reduction by 2016 and 80 percent trash load reduction by 2019. These performance guidelines are

⁵⁴ Laist, D. W. and M. Liffmann. 2000. *Impacts of marine debris: research and management needs*. Issue papers of the International Marine Debris Conference, Aug. 6-11, 2000. Honolulu, HI, pp. 16–29.

⁵⁵ McCauley, S.J. and K.A. Bjorndahl. 1998. Conservation implications of dietary dilution from debris ingestion: sublethal effects in post-hatchling loggerhead sea turtles. *Conserv. Biol.* 13(4):925-929.

⁵⁶ Sheavly, S.B. 2004. *Marine Debris: an Overview of a Critical Issue for our Oceans*. 2004 International Coastal Cleanup Conference, San Juan, Puerto Rico. The Ocean Conservancy.

reporting requirements, but they are not enforceable end points. Rather, they are benchmarks for assessing progress, and Permittees that do not attain these performance guidelines are required to provide documentation in a report to the Water Board that adequate trash management actions to attain the forthcoming 2017 or 2022 mandatory deadline are underway or scheduled.

C.10.a.ii. Trash Generation Area Management – The overarching strategy for reducing trash involves mapping trash generation areas within a Permittee’s jurisdiction, then applying effective trash reduction actions to the areas of trash generation and assessing the effectiveness of those actions in delineated trash generation areas, until trash generation is reduced to the no impact level over a Permittee’s entire jurisdiction. The Permittees reported these trash generation maps with their Long Term Trash Reduction Plans February, 2014, and these maps provide the 2009 trash generation levels, which were required by the previous permit. Permittees that find inaccuracies in their submitted maps may submit corrected 2009 trash generation maps with their 2016 Annual Reports. Permittees developed their 2009 generation maps by dividing their jurisdiction into Very High, High, Moderate, and Low trash generation areas based on the following ranges of trash generation rates:

Low = less than 5 gal/acre/yr;
Moderate = 5-10 gal/acre/yr;
High = 10-50 gal/acre/yr; and
Very High = greater than 50 gal/acre/yr.

C.10.a.ii.a. Actual trash loading values, particularly in areas of high and very high trash generation areas, may vary significantly, but these delineated ranges provide a frame of reference for tracking and demonstrating trash load reductions and provide relative trash generation weight of these four categories. Permittees will likely need to reduce trash generation to at least Low to attain the ultimate required water quality based outcome of no trash loads that cause or contribute to adverse trash impacts in receiving waters, i.e., the 2022 deadline requirement. Whether attainment of Low trash generation rates are sufficient will be evaluated and considered in the development of requirements in the next permit. Demonstration that trash management actions reduce trash generation from Very High, High, or Moderate to a Low trash generation rate during this permit term provides a practicable means of demonstrating trash load reduction and attainment of the 2017, 70 percent trash load reduction deadline requirement and consideration of the 2016 and 2019, performance guidelines.

C.10.a.ii.b. Permittees are responsible for trash discharges from their storm drain systems. Permittees have direct control over their properties and right of way, but must also exert control over other lands such as commercial parking lots that are plumbed directly into their storm drain system, since trash washed into such conveyance by stormwater will then directly impact receiving waters without encountering trash control actions on public right of way. Therefore, Permittees, using a variety of means, must ensure that either full trash capture devices are installed on such conveyances prior to intersection with the public storm drain system or that other control actions equivalent to full trash capture are implemented on those

private lands and such actions are verified through assessment, similar to the on-land visual assessment.

C.10.a.iii. Minimum Full Trash Capture - This provision requirement is carried forward from the previous permit. which most, if not all, Permittees have currently met or exceeded. Full trash capture systems provide a direct and effective mean to control trash discharges to and from storm drain systems. Commercial retail/wholesale land use area is a simple surrogate of trash generation area, and the minimum amount of area that was required to be treated with full trash capture systems and was considered reasonable and achievable. Most, if not all, Permittees have already met or exceeded the minimum full trash capture requirement. Full trash capture system screening and treatment flow capacity specifications are the same as those specified in the previous permit. They are also the same as the full trash capture specifications in the Trash Amendments adopted by the State Water Board.

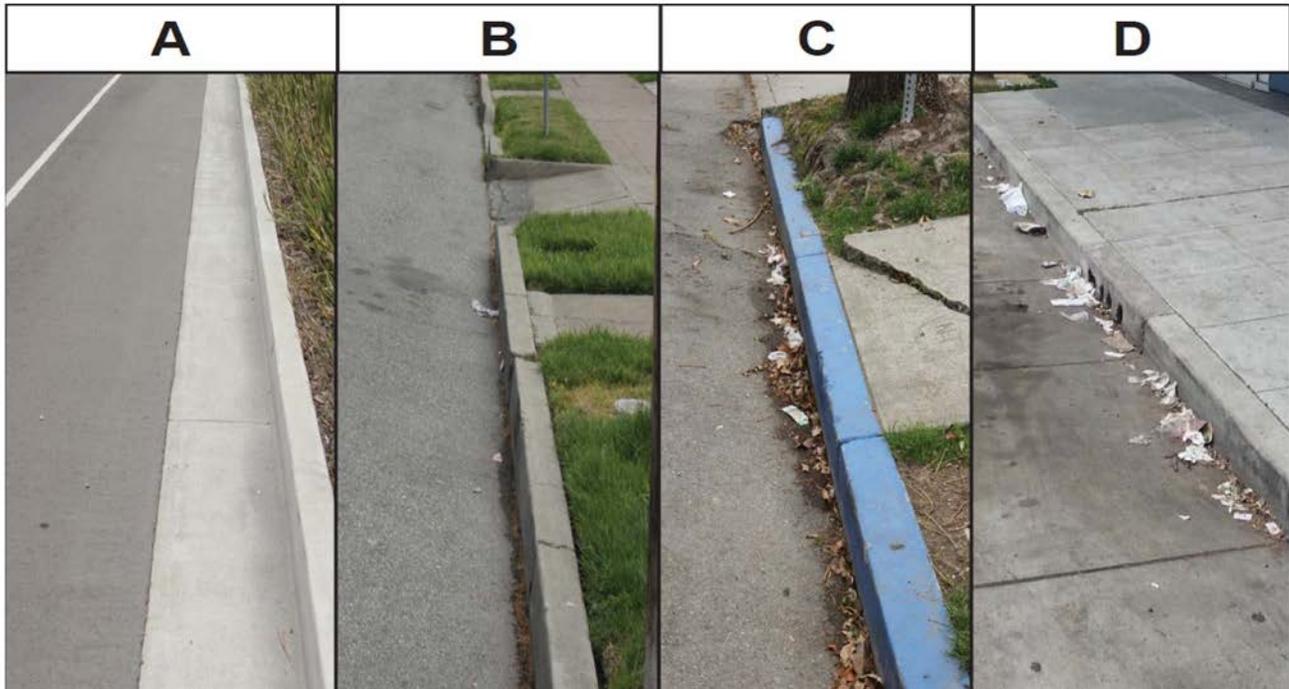
C.10.b Demonstration of Trash Reduction Outcomes

C.10.b.i.(a.-c.) Full Trash Capture Systems - Full trash capture systems to be maintained to be effective. If a full trash capture systems enters a rain period with a full trash reservoir, or is clogged with leaves or trash, it may bypass trash and otherwise not function as a full trash capture device. Therefore these devices must be frequently inspected and maintained at a sufficient level. These requirements allow for this in a flexible, as needed, manner.

C.10.b.ii. Other Trash Management Actions

C.10.b.ii.a. Implementation Documentation – Documentation of trash management or control actions implemented and areas of implementation is essential to support demonstration trash reduction effectiveness and trash condition improvement.

C.10.b.ii.b.(i)-(iv)) Visual Assessment of Outcomes of Other Trash Management Actions – The primary tool currently available for determining trash reduction action success and positive outcomes is visual assessment, with photo documentation of trash generation and conditions in areas that drain to storm drains. Visual assessment involves observing a sufficient portion of each, e.g., sidewalk and curb area, at a frequency that adequately represents the trash management area condition relative to the type(s) of management actions implemented in the area. This graphic demonstrates four trash visual conditions that correspond to the four trash generation categories of Very High (D), High (C), Moderate (B) and Low (A) moderate (B) and Low (A).



It is also possible to assess trash reduction outcome by documenting and verifying that trash management actions in a trash management area are equivalent to trash management actions implemented in an equivalent trash management area, wherein the actions have been assessed to be effective in accordance with a specified performance standard. If this evidence is proposed by Permittees and accepted by the Executive Officer, Permittees may claim a similar trash reduction outcome by demonstrating that they have performed these trash reduction actions within similar trash management areas to the same performance standard.

C.10.b.iii. Percentage Discharge Reduction – Demonstration that trash management actions reduce trash generation from Very High, High, or Moderate to lower trash generation categories and the Low generation status during this permit term provides a practicable means of demonstrating trash load reduction and attainment of the 70 percent trash load reduction deadline and consideration of the 2016 and 2019 performance guidelines (C.10.a.ii.a). However, trash management actions in Very High and High trash generation areas will result in more trash load reduction than actions in Moderate trash generation. Accordingly, a trash reduction demonstration methodology that provides relative benefit weight to actions in Very High and High areas is preferable to one that just considers percentage change in Very High, High, and Moderate trash generation area. The trash generation rates used by Permittees to delineate and map their 2009 trash generation area maps provide a means to provide a relative benefit weight to demonstrated reductions in the areas of Very High and High trash generation, even if they are not reduced all the way to Low generation.

The delineation of trash generation areas were based on ranges of trash generation rates (C.10.a.ii.). Therefore, the ratios of the approximate midpoints of the categorical trash generation ranges provides a means of weighing relative benefit to actions in Very High and High areas compared to actions in Moderate areas. The Moderate range is 5-10 gal/acre/yr, with a midpoint of 7.5 gal/acre/yr. The High range is 10-50 gal/acre/yr with a midpoint of 30 gal/acre/yr. Therefore, the weighed ratio of High to Moderate is $30/7.5 = 4$. The Very High range, greater than 50 gal/acre/yr, does not have a specified upper bound that allows calculation of a midpoint. An alternative that provides reasonable weighing of Very High is 90 gal/acre/yr, which is 40 percent higher than the low end of the Very High range. This results in a weighed ratio of Very High to Moderate of $90/7.5 = 12$.

The following formula provides a means of demonstrating attainment of the percent trash load reduction deadline and performance guidelines with weighted benefit of Very High and High trash generation area percent reductions relative to Moderate trash generation area percent reductions:

$$\% \text{ Reduction} = 100 [(12 A_{\text{VH}(2009)} + 4 A_{\text{H}(2009)} + A_{\text{M}(2009)}) - (12 A_{\text{VH}} + 4 A_{\text{H}} + A_{\text{M}})] / (12 A_{\text{VH}2009} + 4 A_{\text{H}2009} + A_{\text{M}2009})$$

where:

$A_{\text{VH}(2009)}$ = total amount of the 2009 very high trash generation category jurisdictional area

$A_{\text{H}(2009)}$ = total amount of the 2009 high trash generation category jurisdictional area

$A_{\text{M}(2009)}$ = total amount of the 2009 moderate trash generation category jurisdictional area

A_{VH} = total amount of very high trash generation category jurisdictional area in the reporting year

A_{H} = total amount of high trash generation category jurisdictional area in the reporting year

A_{M} = total amount of moderate trash generation category jurisdictional area in the reporting year

12 = Very High to Moderate weighing ratio

4 = High to Moderate weighing ratio

100 = fraction to percentage conversion factor

C.10.b.iv. Source Control – Jurisdiction-wide source control actions will have trash generation and load reduction benefit beyond what can be accounted for in trash management area specific assessment-based percentage discharge reduction (C.10.b.iii). These include Permittee efforts to adopt and implement source control on certain types of trash, particularly persistent, floating litter and other particularly difficult types of trash that are easily blown by the wind or clog full trash capture devices. This type of trash has been documented to be a significant percentage of the trash collected in full trash capture devices, and

Permittees that have implemented such source control have documented significantly less such litter types in their hand collection of trash and litter on land. Permittee will be allowed to claim load reduction compliance value of up to five percent load reduction total for all such actions. This would be added to the % Reduction amount calculated by the C.10.b.iii - Percentage Discharge Reduction formula in demonstrating attainment of the percent trash load reduction deadline requirements and performance guidelines. To claim a load percentage reduction value, Permittees must provide substantial evidence that these actions reduce trash by the claimed value. A Permittee may reference studies in other jurisdictions if it provides evidence that the implementation of source control in its jurisdiction is similarly implemented as the source control assessed in the reference studies.

C.10.b.v. Receiving Water Observations – Receiving water observations for trash during this permit term provide additional evidence and can verify that full trash capture systems and other trash management actions are preventing trash from discharging into receiving waters and whether additional actions may be necessary associated with sources within a Permittee’s jurisdiction. They can also show whether there are ongoing sources outside of the Permittee’s jurisdiction that are causing or contributing to adverse trash impacts in the receiving water(s). There currently are no standard monitoring methods for trash in receiving waters. However, observation of trash in receiving waters or on shorelines or creek banks provides a practicable means of monitoring trash in receiving waters until standard methods are established. These observations will not be used for compliance determinations during this permit term.

C.10.c. Trash Hot Spot Selection and Clean Up

The previous permit included a requirement for Permittees to cleanup a minimum number of Trash Hot Spots in receiving waters or on shorelines or creek banks associated with their jurisdictions. Trash Hot Spot cleanups remove trash discharged from a Permittee’s jurisdiction and lessen the adverse impacts from the discharges until they are abated by a Permittee’s trash management actions. Trash Hot Spot cleanups have an added benefit in that they may also remove discharges of trash from non-storm drain sources, e.g., direct dumping or homeless encampments. They also provide an additional means of assessing the effectiveness of Permittees’ trash management actions and identification of the types and sources of trash. The required Trash Hot Spot assessment is based on the SWAMP Rapid Trash Assessment Protocol.

C.10.d. Trash Load Reduction Plans

The previous permit required Permittees to prepare a Plan to achieve the 2017 and 2022 trash reduction deadline requirements. A Trash Load Reduction Plan provides a means for Permittees to determine and account for appropriate trash management actions in their trash management areas and their schedule of implementation, and it provides documentation of planned actions that can be referenced if annual performance guidelines are not met. It also provides a basis for justifying and accounting for the types

and locations of Permittees' assessments of trash management actions, and for optional trash load offset opportunities allowed by C.10e.

C.10.e. Optional Trash Load Reduction Offset Opportunities

C.10.e.i. Additional Creek and Shoreline Cleanup - Some Permittees cleanup more than the minimum required C.10.c Trash Hot Spot cleanups. These additional creek and shoreline cleanups are of value in removing trash from shorelines and creeks or creek banks that are causing or may cause adverse impacts to receiving waters. Permittees conduct some of these additional cleanups with community volunteers, which creates additional public outreach and participation benefits.

The volume of trash removed in these cleanups tends to be high compared to the estimated volume rate loads calculated using the average (nominal midpoint) trash generation rates (C.10.a.ii). This is due in part to Trash Hot Spot locations, which are often downstream of Very High and High trash generation areas with actual generation rates at the upper end of those category ranges. Another reason may be that these cleanups likely remove trash from direct discharges other than from Permittees' storm drain systems. Also, these cleanups sometimes occur just one-time so the volume of trash removed cannot be directly compared with required trash reduction rate volumes.

One way to recognize the value of these additional cleanups and to account for the short-term benefit (volume) of cleanups compared to ongoing trash load discharges (average volume /time) is to use an offset ratio of ten to one when comparing additional cleanup volumes with 2009 trash load estimates based on using average trash generation category values and to cap the offset amount. The following formula generates a Permittee-specific trash volume amount, based on its 2009 categorical trash generation areas and a ten to one offset ratio, which may be used to offset one percent of a required percent load reduction value:

$$1\% \text{ Reduction Offset (volume)} = (12 A_{\text{VH}(2009)} + 4 A_{\text{H}(2009)} + A_{\text{M}(2009)}) OF$$

where:

$A_{\text{VH}(2009)}$ = total amount of 2009 very high trash generation category jurisdictional area

$A_{\text{H}(2009)}$ = total amount of 2009 high trash generation category jurisdictional area

$A_{\text{M}(2009)}$ = total amount of 2009 moderate trash generation category jurisdictional area

12 = Very High to Moderate weighing ratio

4 = High to Moderate weighing ratio

OF = offset factor equal to (7.5 x 0.1), where 7.5 is the conversion from acres to gallons based on trash generation rates and 0.1 is the ten to one offset ratio.

Permittee can compare trash volumes collected from additional cleanups to this calculated offset volume and apply one percent offset to a C.10.a.i percent load reduction requirement for each collected volume that equals the 1% Reduction Offset (volume). However, the total offset that can be claimed to avoid over-compensation

associated with the short-term benefit (volume) of cleanups compared to ongoing trash load discharges (average volume/time) is limited to 5%. Furthermore, to justify the offset the associated cleanups must occur more than once per year and preferably at a frequency sufficient to demonstrate sustained improvement of a creek or shoreline area.

C.10.e.ii. Direct Discharge Controls - Some Permittees are faced with the challenge that large amounts of trash are discharged to receiving waters in their jurisdiction from homeless encampments and direct dumping. These trash discharges are separate from and in addition to discharges from Permittee storm drain systems. Elimination and prevention of adverse water quality impacts due to trash and attainment of water quality standards in receiving waters will require management of these non-storm drain system discharges in addition to control of storm drain system trash discharges by Permittees. Accordingly, some Permittees are taking or are willing to take actions to control these other sources by implementing a comprehensive plan to control all sources of trash discharged to receiving waters in their jurisdiction. Accordingly, Permittees should be allowed to offset some of their percent load reduction requirements if they control these other sources.

Permittees have and likely will continue to demonstrate the benefit of controlling these additional sources by accounting for the volume of trash collected. As with additional creek and shoreline cleanups, the volume of trash removed cannot be compared directly with trash load discharge rate (volume/time). The simplest, and possibly only way to account for these additional control actions until more rigorous assessment and accountability methods are developed, is to allow a Permittee to offset part of its C.10.a trash load percent reduction requirement using the C.10.e.i formula to determine an offset from additional creek and shoreline cleanup. However, since control of these other sources by Permittees will be through implementation of a comprehensive and sustained program, Permittees that implement a comprehensive plan approved by the Executive Officer merit a higher offset cap than that allowed by C.10.e.i for additional creek and shoreline cleanup. A ten percent offset-cap based on the C.10.e.i formula provides a balance between incentive and reward for control of these non-storm drain system sources and the uncertainties associated with the simple formula.

C.10.f. Reporting

The reporting requirements reflect the minimum amount of information needed to demonstrate compliance with all Provision C.10 requirements.

Costs of Trash Control

With the assistance of a \$5 million grant from ARAR obtained and distributed by the San Francisco Estuary Partnership, the Permittees cumulatively exceeded the full trash capture permit requirement acreage by over a factor of four.

Costs for either enhanced trash management measure implementation or installation and maintenance of trash capture devices are significant, but when spread over several years, and when viewed on a per-capita basis, are reasonable.

Trash is costly to remove from our aquatic resource environments. Staff from the California Coastal Commission report that the Coastal Cleanup Day budget statewide: \$200,000-250,000 for Coastal Commission staff, and much more from participating local agencies. The main component of this event is the 18,000 volunteer-hours which translates to \$3,247,200 in labor, and so is equivalent to \$3,250,000-3,500,000 per year to clean up 903,566 pounds of trash and recyclables at \$3.60 to \$3.90 per pound. This is one of the most cost-effective events because of volunteer labor and donations. The County of Los Angeles spends \$20 million per year to sweep beaches for trash, according to Coastal Commission staff.

Mr. Morad Sedrak, the TMDL Implementation Program Manager, Bureau of Sanitation, Department of Public Works, City of Los Angeles, reports that the City plans to invest \$72 million dollars for storm drain catch basin based capture device installation primarily, for a City of 4 million population, for a per-capita cost of \$18 dollars. This effort is occurring over a span of over five years, for an annual per-capita cost of under \$4.

Mr. Sedrak reports that O&M costs are not anticipated to increase, as the City of L.A. is already budgeted for 3 catch basin cleanings per year. He also states that catch basin inserts installed inside the catch basin in front of the lateral pipe, which have been certified by the Los Angeles Regional Water Board as total capture trash control devices, cost approximately \$800 to \$3,000 depending on the depth of the catch basin. The price quoted includes installation and the insert is made of Stainless Steel 316.

Furthermore, the price for catch basin opening screen covers, which are designed to retain trash at the street level for removal by sweepers, and also to open if there is a potential flooding blockage, ranges roughly from \$800 to \$4,500, depending on the opening size of the catch basin.

The City of Los Angeles has currently spent 27 million dollars on a retrofit program to install catch basin devices in approximately 30% of its area, with either inserts or screens or both. Mr. Sedrak states that Los Angeles plans to spend \$45 million over the next 3 years to retrofit the remaining catch basins within the City. The total number of catch basins within the City is approximately 52,000.

The following are links to information about the Los Angeles trash control approach:

<http://www.lastormwater.org/Siteorg/program/TMDLs/trashtmdl.htm>

http://www.lastormwater.org/Siteorg/download/pdfs/general_info/Request-Certification-10-06.pdf

http://www.lastormwater.org/Siteorg/download/pdfs/general_info/Request-Certification-10-06.pdf
http://www.lastormwater.org/Siteorg/program/poll_abate/cbscreens.htm

http://www.lastormwater.org/Siteorg/program/poll_abate/cbinserts.htm

http://www.lastormwater.org/Siteorg/program/poll_abate/cbscreens.htm

In Oakland, the Lake Merritt Institute is currently budgeted at \$160,000 per year, with trash and litter removal from the Lake as a major task. The budget has increased from about \$45,000 in 1996 to current levels. In the period of 1996-2005 the Lake Merritt

Institute staff, utilizing significant volunteer resources, and accomplishing other education tasks, removed 410,859 pounds of trash from the Lake at cost of \$951,725 at \$2.3 per pound.

The City of Oakland reports that installation of two vortex and screen separators, titled by their brand name of CDS units, which cost, according to the table below, \$821,000 for installations that treat tributary catchments of 192 acres before discharge to Lake Merritt at \$4,276 per acre.

City of Oakland—CDS Unit Overview 9-07

Existing CDS unit location	Outfall number	Treatment area (acres)	Cost of implementation	Sizing	Maintenance requirements	Comments
Intersection of 27 th and Valdez Streets	56*	71	\$203,000 to contractor; plus ~\$100,000 City costs	73 cfs peak flow; 36" stormdrain; Unit sizing: 18'6"6" box with 10'11"diam x 9'6" long cylinder	Visually inspect CDS Unit; remove trash and debris with Hydro Flusher bi-monthly	Installed in 2006. Required relocation of electrical conduit. Water main and gas line were also in the way; the box was adjusted to accommodate these conflicts.
Intersection of 22 nd and Valley Streets	56*	121	\$368,000 to contractor; plus ~\$150,000 City costs	115 cfs peak flow; 54" stormdrain; Unit sizing: 18'8.5"6" box with 12'diam x 9'6" long cylinder	Visually inspect CDS Unit; remove trash and debris with Hydro Flusher bi-monthly	Installed in 2006. Installation costs were higher than anticipated. Sewer lines and PGE facilities were exposed that were not known before. Unit had to be modified and poured-in-place.

* The City is treating 192 acres or 72 percent of the 252 acres draining to outfall 56.

Additional cost information on various trash capture devices is included in the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) BMP Trash Toolbox (July 2007). The Toolbox contains cost information for both trash capture devices and enhanced trash management measure implementation, covers a broad range of options and also discusses operation and maintenance costs. Catch basin screens are included with an earlier estimate by the City of Los Angeles of \$44 million over 10 years to install devices in 34,000 inlets.

Trash booms are also discussed with an example from the City of Oakland. The Damon Slough trash boom or sea curtain cost \$36,000 for purchase and installation, including slough side access improvements for maintenance and trash removal. Annual

maintenance costs have been \$77,000 for weekly maintenance, which includes use of a crane for floating trash removal.

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C.11. Mercury Controls

The purpose of this provision is to implement the urban runoff requirements of the San Francisco Bay and Guadalupe River Watershed mercury TMDLs and reduce mercury loads to make substantial progress toward achieving the urban runoff mercury wasteload allocations established for the TMDLs.

The C.11 provisions follow the general approach for sediment-bound pollutants discussed above (General Strategy for Sediment-Bound Pollutants (Mercury and PCBs)) and accordingly, build on understanding gained from pilot testing many control measures during the previous permit term. During this permit term Permittees are expected to continue to improve the level of certainty concerning control measure benefit and effectiveness by implementing actions in a phased approach, and then expand implementation of those actions that prove effective, and perhaps scale back or discontinue those that are not effective.

However in contrast to the previous permit term, this permit does not specify control measures to implement to achieve load reductions. Rather, the permit requires development and implementation of a load reduction accounting scheme along with a quantitative demonstration of the load reductions that result from implementation of all relevant control measures. The Permittees may comply with any requirement of this provision through a collaborative effort. Many of the control measures may be chosen primarily for the purpose of achieving PCBs load reductions, but substantial mercury load reductions may result as a tangential benefit and should be accounted for.

Fact Sheet Findings in Support of Provision C.11

- C.11-1** On August 9, 2006, the Water Board adopted a Basin Plan amendment including a revised TMDL for mercury in San Francisco Bay, two new water quality objectives, and an implementation plan to achieve the TMDL. The State Water Board and U.S. EPA have also approved this Basin Plan amendment. C.11-3 through C.11-7 are components of the Mercury TMDL implementation plan relevant to implementation through the municipal stormwater permit.
- C.11-2** On October 8, 2008, the Water Board adopted a Basin Plan amendment including a TMDL for mercury in the Guadalupe River Watershed (GRW) and an implementation plan to achieve the TMDL. The State Water Board and U.S. EPA have also approved this Basin Plan amendment. The GRW mercury TMDL assigns an urban stormwater runoff allocation proportionally equivalent to the mass allocation in the San Francisco Bay mercury TMDL. Accordingly, the GRW urban stormwater runoff mercury allocation is simply the fraction of the Santa Clara Valley Urban Runoff Pollution Prevention Program allocation attributed to the Guadalupe River watershed. The urban stormwater runoff allocation implicitly includes all current and future permitted discharges within the geographic boundaries of municipalities and unincorporated areas including, but not limited to, California Department of Transportation (Caltrans) roadways and non-roadway facilities and rights-of-way, atmospheric deposition, public

facilities, properties proximate to stream banks, industrial facilities, and construction sites.

- C.11-3** The 2003 load of mercury from urban runoff was estimated to be 160 kg/yr, and the aggregate WLAs for urban runoff is 82 kg/yr and shall be implemented through the NPDES stormwater permits issued to urban runoff management agencies and Caltrans. The urban stormwater runoff allocations implicitly include all current and future permitted discharges, not otherwise addressed by another allocation, and unpermitted discharges within the geographic boundaries of urban runoff management agencies (collectively, *source category*) including, but not limited to, Caltrans roadway and non-roadway facilities and rights-of-way, atmospheric deposition, public facilities, properties proximate to stream banks, industrial facilities, and construction sites.
- C.11-4** The allocations for this source category shall be achieved within 20 years, and, as a way to measure progress, an interim loading milestone of 120 kg/yr, halfway between the current load and the allocation, should be achieved within 10 years. If the interim loading milestone is not achieved, NPDES-permitted entities shall demonstrate reasonable and measurable progress toward achieving the 10-year loading milestone.
- C.11-5** The NPDES permits for urban runoff management agencies shall require the implementation of BMPs and control measures designed to achieve the allocations or accomplish the load reductions derived from the allocations. In addition to controlling mercury loads, BMPs or control measures shall include actions to reduce mercury-related risks to humans and wildlife. Requirements in the permit issued or reissued and applicable for the term of the permit shall be based on an updated assessment of control measures intended to reduce pollutants in stormwater runoff and remain consistent with the section of the Basin Plan chapter titled, *Surface Water Protection and Management—Point Source Control—Stormwater Discharges*.
- C.11-6** The following additional requirements are or shall be incorporated into NPDES permits issued or reissued by the Water Board for urban runoff management agencies.
- a. Evaluate and report on the spatial extent, magnitude, and cause of contamination for locations where elevated mercury concentrations exist;
 - b. Continue to develop and implement a mercury source control program;
 - c. Implement a monitoring system to quantify either mercury loads or loads reduced through treatment, source control, and other management efforts;
 - d. Monitor levels of methylmercury in discharges. This requirement was satisfactorily accomplished during the last permit term and will not be included in the permit during this permit term;
 - e. Conduct or cause to be conducted studies aimed at better understanding mercury fate, transport, and biological uptake in San Francisco Bay and tidal areas. This requirement is not necessary at the moment and will not be included in the permit during this permit term;

- f. Develop an equitable allocation-sharing scheme in consultation with Caltrans to address Caltrans roadway and non-roadway facilities in the program area, and report the details to the Water Board (This was satisfactorily accomplished during the last permit term);
- g. Prepare an Annual Report that documents compliance with the above requirements and documents either mercury loads discharged, or loads reduced through ongoing pollution prevention and control activities; and
- h. Demonstrate progress toward (a) the interim loading milestone, or (b) attainment of the allocations shown in Individual WLAs (see Table 4-w of the Basin Plan amendment), by using one of the following methods:
 - (1) Quantify the annual average mercury load reduced by implementing
 - i. Pollution prevention activities, and
 - ii. Source and treatment controls. The benefit of efforts to reduce mercury-related risk to wildlife and humans should also be quantified. The Water Board will recognize such efforts as progress toward achieving the interim milestone and the mercury-related water quality standards upon which the allocations and corresponding load reductions are based. Loads reduced as a result of actions implemented after 2001 (or earlier if actions taken are not reflected in the 2001 load estimate) may be used to estimate load reductions.
 - (2) Quantify the mercury load as a rolling 5-year annual average using data on flow and water column mercury concentrations.
 - (3) Quantitatively demonstrate that the mercury concentration of suspended sediment that best represents sediment discharged with urban runoff is below the suspended sediment target.

C.11-7 Urban runoff management agencies have a responsibility to oversee various discharges within the agencies' geographic boundaries. However, if it is determined that a source is substantially contributing to mercury loads to the Bay or is outside the jurisdiction or authority of an agency, the Water Board will consider a request from an urban runoff management agency that may include an allocation, load reduction, and/or other regulatory requirements for the source in question.

C.11-8 Recent estimates using the latest available data suggest that the urban runoff mercury loading to San Francisco Bay is on the order of 115 kg/yr (McKee and Yee 2015⁵⁷). While this figure is based on environmental data and thus has inherent uncertainty associated with it, it suggests that current mercury loading is approximately equal to the interim TMDL loading milestone (to be reached at the half-way point of TMDL implementation, 2017) of 120 kg/yr. If mercury

⁵⁷ McKee, L.J. and Yee, D., 2015. Sources, Pathways and Loadings: Multi-Year Synthesis. A technical report prepared for the Regional Monitoring Program for Water Quality in San Francisco Bay (RMP), Sources, Pathways and Loadings Workgroup (SPLWG), Small Tributaries Loading Strategy (STLS). San Francisco Estuary Institute, Richmond, California.

loads can be reduced by approximately 35 additional kg/yr, urban runoff loading would meet the TMDL wasteload allocation.

- C.11-9** Mercury is distributed more uniformly throughout the urban landscape than PCBs. For example, loading from older industrial and other polluted source areas accounts for only 6% of the average annual mercury load, but these areas account for over 50% of the average annual PCBs load (McKee and Yee 2015). The likely stronger role of atmospheric deposition in the case of mercury, which may account for up to 50% of the mercury found in urban runoff, is part of the reason for the more uniform mercury distribution in the landscape (McKee and Yee 2015).
- C.11-10** Monitoring data indicate that, while not always the case, watersheds with high PCBs concentrations often contain high or moderately high mercury concentrations (McKee and Yee 2015). Therefore, control strategies focused on finding and managing PCBs-contaminated drainages will often yield mercury load reduction benefits as well.
- C.11-11** This provision is consistent with a recent U.S. EPA memorandum⁵⁸ providing guidance on implementing TMDL WLAs in NPDES storm water permits. Specifically, this provision establishes clear and concrete milestones and deadlines (see C.11.a.iii) for the activities associated with achieving mercury load reductions as well as other requirements (see C.11.b-h.iii), necessary to achieve receiving water limits of this permit term relative to the mercury TMDL WLA.

Specific Provision C.11 Requirements

Provision C.11.a. requires Permittees to implement control measures to achieve mercury load reductions. In order to comply with this requirement, Permittees must identify the mercury control measures and the watersheds in which these measures will be implemented and a time schedule for implementation. Moreover, Permittees must demonstrate quantitatively the load reductions achieved through use of the accounting scheme developed through C.11.b.

This provision is critical to the successful implementation of the urban runoff requirements from the mercury TMDL. The accountability mechanism for control measure implementation consists of three parts: 1) the identification of control measures and associated watersheds, 2) a commitment to an implementation schedule, and 3) the quantification of benefit resulting from control measure implementation. Many or most of the control measures that will generate mercury reduction benefits will be chosen based on the benefit for PCBs load reductions. Available data indicate that this strategy of focusing on PCBs will yield mercury reduction benefits in many circumstances. However, there are conceivable control measures that are unique to mercury, like those

⁵⁸ U.S. EPA. November 26, 2014. Revisions to the November 22, 2002 Memorandum “Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs”

addressing collection and recycling of mercury-containing devices, and these are, in fact, required by household hazardous waste and producer responsibility laws.

Recent loading estimates suggest that current mercury loading to the Bay is at or below the interim loading milestone established in the TMDL. Moreover, mercury is more evenly distributed in the landscape than PCBs so there are fewer opportunities to find and address heavily contaminated (with mercury) sites to achieve substantial, short-term load reductions. Instead, much of the additional benefit to reduce mercury urban runoff loads will come from a combination of proper disposal and management of mercury containing products as well as much more extensive treatment elements (e.g., green infrastructure) incorporated into the stormwater infrastructure. For these reasons, short-term load reduction performance criteria are not included in C.11.a (in contrast to C.12.a for PCBs).

Provision C.11.b. requires Permittees to develop and implement an assessment methodology and data collection program to quantify mercury loads reduced through implementation of any and all pollution prevention, source control and treatment control efforts required by the provisions of this permit or load reductions achieved through other relevant efforts not explicitly required by the provisions of this permit. Permittees can build on the framework accomplished in response to a permit requirement and submitted by Permittees in December 2013 in the Integrated Monitoring Report (IMR) for the previous permit. This provision consists of updating and in some cases extending the framework presented in the IMR, justifying assumptions and parameters used to quantify the load reduction benefit for each type of control measure, and indicating what information will be collected to confirm the load reduction benefit for each unit of activity. This accounting framework must be submitted for Executive Officer approval.

To encourage control measure implementation during the term of the permit, where a control measure becomes operational during the final year of the permit, the estimated load reduction credited to the Permittee for this control measure will be the estimated mercury load removed during one full year of operation. For control measures requiring construction or installation of new infrastructure that are under construction but not fully operational as of the end of the permit term, one-half (50%) of the estimated mercury yearly load reduction will be counted in year 5 with the remaining 50% load reduction credited during the future year that the infrastructure element is fully operational.

Provision C.11.c Available information suggests that mercury is distributed more uniformly throughout the Bay Area landscape than is the case for PCBs. Therefore, a focus on highly contaminated areas (with mercury) may not be enough to achieve the TMDL-required load reductions. A critical part of the strategy to reduce urban runoff mercury loads will be the widespread implementation of green infrastructure control measures to intercept mercury-containing sediment and stormwater before it is discharged to receiving water. Provision C.11.c requires Permittees to implement green infrastructure projects during the term of the permit to achieve mercury load reductions of 48 g/year over the final three years of the permit term. County-specific load reductions are derived from the allocations and load reductions stated in the mercury TMDL. Namely, the TMDL-required load reduction for a county was divided by the total TMDL-required load reduction for the permit area and this fraction was multiplied by 48 g/yr to

derive the county-specific green infrastructure load reduction requirement. While not required in the permit, it will be essential to develop effective and easy-to-use tracking and visualization tools so permittees, regulators, and stakeholders can monitor progress of green infrastructure implementation and its water quality impacts.

Because mercury is distributed throughout the urban landscape, extensive implementation of green infrastructure elements is going to be necessary to achieve the load reductions required by the TMDL. However, the planning, financing and implementation of green infrastructure is going to take a long time, perhaps as much as 25 years or more. This also means that the load reduction benefits of such implementation will also be realized over an extended time frame. To ensure that Bay Area municipalities are working effectively and expeditiously in implementing appropriate green infrastructure controls to reduce loads of mercury, PCBs and other pollutants of concern, the permit requires Permittees to prepare a reasonable assurance analysis to rigorously and quantitatively demonstrate that mercury load reductions of at least 10 kg/yr throughout the Permit area will be achieved over the course of the next 25 years (i.e., by 2040) through implementation of green infrastructure plans required by provision C.3.j.

Preparing the reasonable assurance analysis will be a step-wise process. Permittees must: establish the relationship between areal extent of green infrastructure implementation and mercury load reductions, estimate the amount and characteristics of land area that will be treated through green infrastructure in future years, and estimate the amount of mercury load reductions that will result from green infrastructure implementation by specific future years. Ultimately, the reasonable assurance analysis will require the use of one or more models. Permittees must therefore ensure that the calculation methods, models, model inputs and modeling assumptions used to make the demonstration have been validated through a peer review process.

Fortunately, the permittees in the Bay Area can take advantage of related (reasonable assurance analysis) efforts already underway in Southern California. The Los Angeles Regional Water Quality Control Board has produced a useful set of guidelines for conducting a Reasonable Assurance Analysis (RAA) for the watershed management programs that are required through their MS4 permits.⁵⁹ These guidelines provide an excellent reference and starting point for the RAA required through C.11/12.c in terms of the mechanics of the analysis, BMP identification, critical condition selection, choice of models, model calibration criteria, modeling inputs, and model outputs. The crucial feature of the Southern California RAAs is that they must demonstrate with sufficient analytical rigor that the suite of foreseeable control measures to reduce loads will result in compliance with final WLAs. The RAA performed for PCBs and mercury for the San Francisco Bay Area will be similar in many respects to the type of analysis described in the Southern California guidance document, but they must also account for the local watershed characteristics as well as what has been learned about the distribution, fate, and transport characteristics of PCBs and mercury.

⁵⁹ Los Angeles Regional Water Quality Control Board (LARWQCB) 2015. *Guidelines for Conducting Reasonable Assurance Analysis in a Watershed Management Program, Including an Enhanced Watershed Management Program.*

Provisions C.11.d requires Permittees to prepare a long-term plan and schedule for mercury control measure implementation and corresponding reasonable assurance analysis quantitatively demonstrating that sufficient control measures will be implemented to attain the mercury TMDL wasteload allocations. The type of analysis for this provision shares many features with the one conducted as part of C.11.c.

The mercury TMDL anticipated the challenge of achieving the urban runoff mercury load reductions required to meet the TMDL allocations within the twenty-year implementation time frame. The TMDL implementation plan states that

“the Water Board will consider modifying the schedule for achievement of the load allocations for a source category or individual discharger provided that they have complied with all applicable permit requirements and all of the following have been accomplished relative to that source category or discharger:”

- *A diligent effort has been made to quantify mercury loads and the sources of mercury and potential bioavailability of mercury in the discharge;*
- *Documentation has been prepared that demonstrates that all technically and economically feasible and cost effective control measures recognized by the Water Board as applicable for that source category or discharger have been fully implemented, and evaluates and quantifies the comprehensive water quality benefit of such measures;*
- *A demonstration has been made that achievement of the allocation will require more than the remaining 10 years originally envisioned; and*
- *A plan has been prepared that includes a schedule for evaluating the effectiveness and feasibility of additional control measures and implementing additional controls as appropriate.*

Provision C.11.d provides the opportunity for Permittees to describe the full suite of actions that will be required to achieve the TMDL along with realistic timelines for this achievement. For example, as explained previously the load reductions for mercury are going to depend heavily on long-term implementation of control strategies (like green infrastructure) that extend beyond the current implementation timeframe of the mercury TMDL. The long-term plan and schedule required as part of this provision will lay the foundation for a formal recognition of an implementation timeframe that is longer than originally conceived in the TMDL.

Provision C.11.e requires actions that manage human health risk due to mercury and PCBs. These may include efforts to communicate the health risks of eating Bay fish and other efforts aimed at high risk-communities such as subsistence fishers and their families. The risk reduction framework developed in the previous permit term, which funded community based organizations to develop and deliver appropriate communications to appropriately targeted individuals and communities, is an appropriate approach.

C.12. PCBs Controls

The purpose of this provision is to implement the urban runoff requirements of the San Francisco Bay PCBs TMDL and reduce PCBs loads to make substantial progress toward achieving the urban runoff PCBs load allocations established for the TMDL. During the Previous Permit, Permittees were required to test a variety of control measures in a limited number of watersheds. Building on knowledge gained over the last five years, this provision requires Permittees to implement PCBs control measures (source control, treatment control or pollution prevention strategies) in areas where benefits are most likely to accrue (focused implementation) and to report on the loads reduced through implementation of those control measures.

In contrast to the Previous Permit, this permit does not require implementation of specific control measures. Rather, the Permit requires development and implementation of a load reduction accounting scheme along with a quantitative demonstration of the load reductions that result from implementation of all relevant control measures. The Permittees must use their judgment and knowledge of their watersheds to choose the optimum suite of control measures them in order to optimize PCBs load reductions. Permittees are required to reduce PCBs loads incrementally during the permit term in order to make meaningful progress toward achieving the TMDL wasteload allocation. As discussed below, based on information gained during pilot testing this reduction is achievable, and it is necessary to begin achieving the regionwide urban runoff wasteload allocation of 2 kg/yr (representing a load reduction from all urban runoff sources of approximately 18 kg/yr compared to loads estimated using data collected in 2003) within the 20-year TMDL timeframe.

The C.12 requirements follow the general approach for sediment-bound pollutants discussed above (General Strategy for Sediment-Bound Pollutants (Mercury and PCBs)) and accordingly, build on understanding gained during the previous permit term when many control measures were pilot tested. During this Permit term, Permittees are expected to continue to improve the level of certainty concerning control measure benefit and effectiveness by implementing actions in a phased approach. Permittees similarly are expected to expand implementation of actions that prove effective, and scale back or discontinue actions that yield less load reduction. Permittees will be allowed to comply with the requirements of this provision through a collaborative effort in order to most cost-effectively achieve PCBs load reductions.

Fact Sheet Findings in Support of Provision C.12

- C.12-1** On February 13, 2008, the Water Board adopted a Basin Plan amendment establishing a TMDL for PCBs in San Francisco Bay and an implementation plan to achieve the TMDL. The U.S. EPA approved the TMDL on March 29, 2010.

- C.12-2** The following excerpts from the TMDL implementation plan are relevant to implementation of the municipal stormwater permit.

“The 2003 load of PCBs from urban runoff is 20 kg/yr, and the aggregate WLAs for urban runoff total 2 kg/yr. Stormwater runoff wasteload allocations shall be achieved within 20 years and shall be implemented through the NPDES stormwater permits issued to stormwater runoff management agencies and the California Department of Transportation (Caltrans). The urban stormwater runoff wasteload allocations implicitly include all current and future permitted discharges, not otherwise addressed by another allocation, and unpermitted discharges within the geographic boundaries of stormwater runoff management agencies including, but not limited to, Caltrans roadway and non-roadway facilities and rights-of-way, atmospheric deposition, public facilities, properties proximate to stream banks, industrial facilities, and construction sites.

Requirements in each NPDES permit issued or reissued shall be based on an updated assessment of best management practices and control measures intended to reduce PCBs in urban stormwater runoff. Control measures implemented by stormwater runoff management agencies and other entities ... shall reduce PCBs in stormwater runoff to the maximum extent practicable....

In the first five-year permit term, stormwater Permittees will be required to implement control measures on a pilot scale to determine their effectiveness and technical feasibility. In the second permit term, stormwater Permittees will be required to implement effective control measures, that will not cause significant adverse environmental impacts, in strategic locations, and to develop a plan to fully implement control measures that will result in attainment of allocations, including an analysis of costs, efficiency of control measures and an identification of any significant environmental impacts. Subsequent permits will include requirements and a schedule to implement technically feasible, effective and cost efficient control measures to attain allocations. If, as a consequence, allocations cannot be attained, the Water Board will take action to review and revise the allocations and these implementation requirements as part of adaptive implementation.

In addition, stormwater Permittees will be required to develop and implement a monitoring system to quantify PCBs urban stormwater runoff loads and the load reductions achieved through treatment, source control and other actions; support actions to reduce the health risks of people who consume PCBs-contaminated San Francisco Bay fish; and conduct or cause to be conducted monitoring, and studies to fill critical data needs identified in the adaptive implementation section.”

- C.12-3** Urban runoff management agencies have a responsibility to oversee various discharges within the agencies’ geographic boundaries. However, if it is determined that a source is substantially contributing to PCBs loads to the Bay or is outside the jurisdiction or authority of an agency, the Water Board will consider a request from an urban runoff management agency that may include an allocation, load reduction, and/or other regulatory requirements for the source in

question. If these sources are contributing to urban runoff loads (as opposed to direct Bay discharge), load reductions from these sources will count toward meeting the urban runoff load allocations.

- C.12-4** Some PCB congeners have dioxin-like properties. Dioxins are persistent, bioaccumulative, toxic compounds that are produced from the combustion of organic materials in the presence of chlorine. Dioxins enter the air through fuel and waste emissions, including diesel and other motor vehicle exhaust fumes and trash incineration, and are carried in rain and contaminate soil. Dioxins bioaccumulate in fat, and most human exposure occurs through the consumption of animal fats, including those from fish. Therefore, the actions targeting PCBs will likely have the simultaneous benefit of addressing a portion of the dioxin impairment resulting from dioxin-like PCBs.
- C.12-5** Recent estimates using the latest available data suggest that the urban runoff PCBs loading to San Francisco Bay is on the order of 19 kg/yr (McKee and Yee 2015). While this figure is based on environmental data and thus has inherent uncertainty associated with it, it agrees very well with the regional urban runoff load estimate of 20 kg/yr provided in the TMDL report.
- C.12-6** Studies suggest that PCBs load reductions of approximately 6 kg/yr are possible by 2030 through control measures like street sweeping, control of PCBs during building demolition and renovation, drop inlet cleaning, treatment retrofits, redevelopment of contaminated areas, pump station diversion, and street flushing (McKee and Yee 2015). While there are substantial uncertainties associated with these estimates, these results suggest that a substantial portion of the additional load reductions (~ 12 kg/yr) necessary to achieve the PCBs TMDL may need to come from identification and cleanup of PCBs-contaminated properties.
- C.12-7** The distribution of PCBs in the urban landscape is much more variable than it is for mercury. For example, data indicate that PCBs-contaminated land uses yield perhaps 800 times more PCBs per unit area compared to the least contaminated land uses. By contrast, there is a 70-fold difference between the highest and lowest yielding land uses for mercury (McKee and Yee 2015). A large proportion of annual average urban runoff PCB loading is likely coming from old industrial or other contaminated areas (53%, McKee and Yee 2015).
- C.12-8** A significant recent accomplishment of the Sources, Pathways, and Loadings workgroup of the Regional Monitoring Program has been the development and refinement of a regional watershed spreadsheet model (RWSM). This GIS-based model estimates relative land use and source area yields, and integrates them to provide a transparent, mutually accepted, and peer-reviewed analysis of relative watershed scale yield. Outputs from model runs to date suggest yields for the most polluted watershed in excess of 1000 g/km² for PCBs and Hg and a variation between watersheds of ~100,000-fold for PCBs and ~200-fold for Hg. To date, modeling results have a large amount of uncertainty in terms of absolute magnitude, but the results are capturing the patterns of contaminant distribution and transport. The model output is generally consistent with what is known about the distribution of these contaminants in the landscape from stormwater and

bedded sediment data. The results are also consistent with what monitoring data tell us about the relative mercury and PCBs loads from land use and source area categories. The predictive power of this modeling tool will be improved as more data are available to characterize PCBs and mercury concentrations in the watersheds and will be useful in predicting regional and sub-regional scale loads of PCBs and other contaminants under a variety of management scenarios (McKee and Yee 2015).

- C.12-9** Sufficient information is available to establish default factors for PCBs load reduction credit resulting from foreseeable control measures implemented during this permit term (see information under C.12.b below). For treatment controls, the stipulated load reduction benefit can be calculated by multiplying the assumed land-use PCB yearly mass yield by the treated area and by a treatment efficiency factor. The load reduction benefit of cleaning up contaminated properties can be estimated by recognizing that the yield of the contaminated property will be reduced to an assumed background level over the course of site cleanup. The load reduction benefit of controlling PCBs in building materials during demolition can be estimated by estimating the amount of PCBs in the building, the fraction of those PCBs that would enter the storm drain system in the absence of controls, and the efficiency of control measures applied to the demolished building to prevent such PCBs release.
- C.12-10** Limited sampling data from Bay Area structures built between 1950 and 1980 suggest that PCB concentrations in caulks here are similar to those in other parts of North America and Europe. Samples collected in about 1350 buildings in Switzerland constructed between 1950 and 1980 found almost half the buildings contained PCBs in caulk, with most samples containing >100 ppm and 20% containing 10,000 ppm or more. In Bay Area samples, 40% contained > 50 ppm PCBs and 20% contained > 10,000 ppm PCBs. The study estimates that certain types of Bay Area structures built 1950-1980 contain a mid-range average of 4.7 kg PCBs per building. An estimated 6300 currently standing non-residential buildings in the MRP area were built between 1954 & 1974. The mid-range estimate of the total PCB mass in caulk in these buildings is 10,500 kg⁶⁰.
- C.12-11** This provision is consistent with a recent U.S. EPA memorandum⁶¹ providing guidance on implementing TMDL WLAs in NPDES storm water permits. Specifically, this provision establishes clear and concrete milestones and deadlines (see C.12.a.iii) for the achievement of specific PCBs load reductions as well as other requirements (see C.12.b-h.iii), necessary to achieve receiving water limits of this permit term relative to the PCBs TMDL WLAs.

⁶⁰ Klosterhaus S. and McKee L. et al. 2014. *Polychlorinated Biphenyls in the exterior caulk of San Francisco Bay Area buildings, California, USA*. Environment International 66 (2014) 38–43.

⁶¹ U.S. EPA. November 26, 2014. Revisions to the November 22, 2002 Memorandum “Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs.”

Specific Provision C.12 Requirements

Provision C.12.a. requires Permittees to implement control measures to achieve specific PCBs load reductions. In order to comply with this requirement, Permittees must identify the PCBs control measures and the watersheds in which these measures will be implemented and a time schedule for implementation. Moreover, Permittees must quantitatively demonstrate the load reductions achieved through use of the load reduction accounting scheme described below and/or further developed through the actions required under C.12.b. This provision element is critical to the successful implementation of the urban runoff requirements of the PCBs TMDL. The accountability mechanism for control measure implementation consists of three parts: 1) the identification of control measures and associated watersheds, 2) a commitment to an implementation schedule, and 3) the quantification of benefit resulting from control measure implementation.

This provision requires that Permittees achieve county-specific average annual PCBs load reductions totaling 0.5 kg/yr during each of the first two years of the permit and 3.0 kg/yr during each of the final three years of the permit.

The PCBs load reductions achieved through implementation of Provision C.12.a can be estimated for a unit of activity for a number of anticipated control measures. The effectiveness and benefits of control measures remain uncertain because of limited implementation experience and relatively scarce data on control measure effectiveness for a range of conditions. However, there are sufficient data to develop a starting point for a reasonable system of estimating load reductions as a function of the scale and intensity of control measure implementation.

A simple approach for estimating the load reductions associated with certain control measures involves use of a land-use pollutant yield. A land-use yield is an estimate of the mass of a contaminant contributed by an area of a particular land-use per unit time. Essentially, different types of land uses yield different amounts of pollutants because land use types differ in their degree of contamination resulting from differing intensities of historical or ongoing use of pollutants in those land uses. PCBs were more heavily used in older industrial areas so older industrial land use area yield a much higher mass of PCBs per unit area than newer urban land use area where PCBs were never intensively used.

Land-use mass yields of PCBs were presented in the 2013 Integrated Monitoring Report. When these yields were multiplied by the total area of various land-use categories, the estimated region-wide PCBs load was lower than the load estimated in the PCBs TMDL by approximately a factor of 1.9. Therefore, the land-use yields were multiplied by a factor of 1.9 in order to normalize to the estimated baseline mercury load in the PCBs TMDL and to agree with recent load estimates from runoff. The resultant (adjusted) mass yields for three specific types of land-use are:

- Old Industrial Land Use = 95 mg PCBs/acre/year
- Old Urban Land Use = 33.3 mg PCBs/acre/year
- New Urban areas and Other = 3.8 mg PCBs/acre/year

The land-use yield provides a convenient way to estimate the load reduction benefit of various sorts of control measure strategies. For example, when contaminated areas are **newly or redeveloped**, the pollutant yield of the area will be reduced through a variety of mechanisms (i.e., removal, capping, paving of contaminated sediment). So, the amount of PCBs load reduction can be obtained by multiplying the area of new/redevelopment by the difference in yield (either old industrial minus new urban or old urban minus new urban, whichever pre-development landuse is applicable).

The PCBs load reductions for **retrofits or other treatment controls** (including green infrastructure) can be calculated by multiplying the area treated by the assumed land-use yield of the treated area multiplied by the efficiency factor of the treatment method (using a default value of 70% or an efficiency established through documentation of implemented method and reported in annual reports).

For **contaminated private properties** that are referred to the Water Board or other agencies for subsequent remediation, the estimated load reduction can be derived by assuming that the PCBs yield of the source area is reduced over the course of site cleanup. Source areas identified for the purpose of referral tend to have much higher areal yields, based on an analysis of the Ettie Street pump station watershed in Oakland. Information in the IMR suggests that 3,800 mg PCBs/acre/year is a reasonable interim estimate for the yield of such contaminated sites. The cleanups will be assumed to take ten years from the date of referral to the Water Board. The assumed result of the cleanup is that the PCBs yield will be reduced over the course of ten years from 3800 mg PCBs/acre/year to the old urban yield of 33.3 mg PCBs/acre/year, or 3,768 mg PCBs/acre/yr.

Fifty percent of this load reduction will be credited during this permit term for properties that are referred to the Water Board during the first three years of the permit term and for which Permittees implement enhanced operation and maintenance measures in the vicinity of the referred property. Often, contaminated properties have a “halo” of contamination, and contaminated sediments in this halo can be transported to receiving waters through the stormwater conveyance system. Further, pollutants from the source area may continue to be transported offsite while remediation occurs. Therefore, enhancing operation and maintenance measures in areas immediately adjacent to the source area while the source property is being remediated is a priority to prevent PCBs transport to receiving waters. If enhanced maintenance measures are not implemented in the immediate vicinity of the referred property, the load reduction benefit will be credited upon completion of the cleanup project.

PCBs load reductions resulting from implementing control measures to prevent discharge to storm drains of **PCBs in building materials during demolition** will be computed as: the mass of PCBs contained in a building multiplied by the fraction of PCBs entering stormwater conveyances in the absence of controls multiplied by the effectiveness of controls preventing PCBs from entering stormwater conveyances. Permittees are responsible for submitting documentation and analysis by April 2016 to support the selection of each term in this calculation. PCBs load reduction from other activities can be similarly established and documented through quantification of the amount of material (e.g., sediment or water or other waste) prevented from entering receiving waters

multiplied by the concentration of PCBs in that material. The load reduction benefit for all implemented measures shall be summed and compared to the load reduction requirements in Tables 12.1 and 12.2. Permittees will be in compliance with the numeric load reduction requirements if they implement sufficient control measures such that the total stipulated benefit of the implemented control measures equals or exceeds the numeric load reduction requirement. This method of demonstrating compliance will also be applied to the green infrastructure load reduction requirements in Provisions C.11.c and C.12.c.

Permittees will also likely employ **enhanced operation and maintenance control measures** to reduce loads of mercury and PCBs. These strategies include: street sweeping, drain inlet cleaning, pump station maintenance, etc. It is not possible to state, in advance, specific parameters to allow for load reduction estimates. However, the load reduction calculation is straightforward. The pollutant load reduction (either baseline or enhanced) is the product of the volume of material collected by the control measure multiplied by the percent of the collected material that is sediment multiplied by the density of that sediment multiplied by the concentration of the pollutant in that sediment. The load reduction credit is then simply the difference between the load reductions achieved with enhanced effort and those achieved with a baseline level of effort (which may be zero if the control measure is new rather than an increased intensity of an existing measure).

Because loads and opportunities to reduce loads vary due to climate variability and other factors, it is reasonable to consider average load reductions when assessing compliance with numeric performance requirements rather than year-by-year performance. Therefore, the interim allocation of 500 g/yr for the first two years will be assessed at the end of year 2 and taken as the average load reductions of years 1 and 2. The final PCBs load reduction requirements (3 kg/yr total and 120 g/yr via green infrastructure implementation) will be assessed at the end of year 4 (year 5 load reductions will be estimated according to the predicted benefit of control measures which Permittees have made a commitment to implement in year 5 and whose load reduction benefits Permittees can subsequently confirm in year 5) and compared to the average load reduction achieved through control measure implementation for years 3-5.

County-specific expected load reductions allocate responsibility for load reductions to individual county programs according to the same proportions used to establish county-specific load allocations in the PCBs TMDL. For example, the load allocation for Alameda County in the PCBs TMDL is 0.5 kg/yr. The estimated baseline load is 5 kg/yr. This represents an implied load reduction required over 20 years of 4.5 kg/yr (of the 18 kg/yr reduction from urban runoff programs overall). However, the Permittees' jurisdictions have an estimated total load of 14.4 kg/yr, because some of the urban runoff load comes from areas not under the Permittees' jurisdiction. Therefore, Alameda County is responsible for 4.5/14.4 (~ 31.25 %) of the load reductions from the MRP area. Applying this same fraction to the required 3,000 g/yr load reduction results in a load reduction for Alameda County of 940 g/yr for years 3-5 of the permit. The load reduction for other countywide programs (Contra Costa, Santa Clara, San Mateo, and Solano) can be derived similarly by subtracting the TMDL load allocations from the baseline load estimates and then dividing by 14.4 and then multiplying by either 500 g/yr (for year 1-2

load reductions) or 3,000 g/yr (for year 3-5 load reductions). Load reduction opportunities almost certainly vary by region. Some jurisdictions (e.g., those with a higher proportion of old industrial land use) may have more PCBs-contaminated sites and, hence, greater potential opportunities to implement control measures to reduce loads. Further, the total PCBs load reduction across the entire area covered under this permit is relevant to the recovery of San Francisco Bay. Therefore, as long as the total load reductions (500 g/yr for years 1-2 and 3 kg/yr for years 3-5) are achieved, the load reduction distribution among the county Programs is much less of a concern.

However, if the area-wide total load reduction performance criteria are not achieved, the Permittees in counties meeting the county-level load reduction criteria in the Permit will be deemed in compliance with the performance criteria. If both the area-wide total load reduction criterion and county-specific load reduction criterion are not achieved, those Permittees will be deemed in compliance if they have achieved load reductions consistent with their proportion of the county total established under C.12.b.ii(1).

Provision C.12.b. requires Permittees to develop and implement an assessment methodology and data collection program to quantify PCBs loads reduced through implementation of any and all pollution prevention, source control and treatment control efforts required by the provisions of this permit or load reductions achieved through other relevant efforts not explicitly required by the provisions of this Permit. The default approach for establishing load reductions for various implementation activities is described above. Early in the Permit term (2016), Permittees will submit documentation supporting this default approach along with a description of the data to be collected to establish load reduction credit. As Permittees gain implementation experience and collect information on this implementation, they may need to refine the accounting system for use in subsequent Permit terms.

Permittees can build on the framework developed in response to a permit requirement and submitted by Permittees in December 2013 in the Integrated Monitoring Report. This requirement includes updating and in some cases extending the framework presented in that document, justifying assumptions and selected parameters used for each type of control measure, and indicating what information will be collected and submitted to confirm the load reduction benefit for each unit of activity. The accounting scheme for use in this Permit term and summarized above along with the refined accounting scheme submitted near the end of the Permit term (for use in subsequent Permits) must both be submitted for Executive Officer approval.

To encourage control measure implementation during the term of the Permit, where a control measure becomes operational during the final year of the Permit, the credited load reduction will be the estimated PCBs load removed during one full year of operation. For control measures that are under construction, but not fully operational as of the end of the Permit term, one-half (50%) of the estimated PCBs yearly load reduction will be counted in year 5 with the remaining 50% load reduction credited during the year the control measure is fully operational.

Many of the legacy sources of PCBs are found in Bay margins contaminated by historical industrial activity. These legacy sources may be contributing to storm drain runoff conveyances, but Permittees may have jurisdictional challenges in addressing the sources

in private property. Permittees are responsible for contamination in public rights of way, but it recognizes that addressing legacy sources of contamination on private property may require regulatory oversight from state and federal agencies. Permittees are expected to make diligent efforts both to address contamination on public property and to refer source properties to the Water Board for possible cleanup and abatement.

Provision C.12.c. requires Permittees to implement green infrastructure projects during the term of the Permit to achieve PCBs load reductions of 120 g/year over the final three years of the Permit term. The county-specific responsibilities for this load reduction are shown in Table 12.2 of the Permit. These county-specific load green infrastructure load reduction requirements were derived using the same methodology described above for Provision C.12.a.

There are many known Bay Area drainages that contain notably elevated PCBs concentrations in suspended or bedded sediment (e.g., > 500 ppb in bedded sediment). A recent analysis of soil PCBs and mercury data collected in the Bay Area identifies 15 sites where maximum concentrations exceed 3.8 mg/kg for PCBs and 1.6 mg/kg for total mercury. Concentrations could be greater, where the small number of samples precluded detecting the highest concentrations. Areas with moderately high PCBs concentrations (e.g., 100-500 ppb) were found throughout areas where historical industrial activity involved use of PCBs. Placing green infrastructure in highly- and moderately-contaminated areas will form an important element in achieving the PCBs TMDL-required load reductions. However, green infrastructure implementation is a long-term proposition and the value of placing green infrastructure across the broader landscape to intercept PCBs before they are discharged to receiving water.

To ensure that Bay Area municipalities are working effectively and expeditiously in implementing appropriate green infrastructure controls to reduce loads of mercury, PCBs, and other pollutants of concern, the Permit requires Permittees to prepare a reasonable assurance analysis that rigorously and quantitatively demonstrates PCBs load reductions of at least 3 kg/yr throughout the Permit area will be achieved by 2040 through implementation of green infrastructure plans required by provision C.3.j. The effort to prepare a reasonable assurance analysis is described above under C.11.c.

Provision C.12.d. requires Permittees to prepare a plan and schedule for PCBs control measure implementation and corresponding reasonable assurance analysis to quantitatively demonstrate that sufficient control measures will be implemented to attain the PCBs TMDL wasteload allocations. The Permit requires that this plan must: identify all technically and economically feasible PCBs control measures (including green infrastructure projects) to be implemented; include a schedule according to which these technically and economically feasible control measures will be fully implemented; and provide an evaluation and quantification of the PCBs load reduction of such measures as well as an evaluation of costs, control measure efficiency, and significant environmental impacts resulting from their implementation.

The PCBs TMDL anticipated the challenge of achieving the urban runoff load reductions required to meet the TMDL allocations within the twenty-year implementation time frame. The TMDL implementation plan states that

“.. achievement of the allocations for stormwater runoff, which is projected to take 20 years, will be challenging. Consequently, the Water Board will consider modifying the schedule for achievement of the load allocations for stormwater runoff provided that dischargers have complied with all applicable permit requirements and accomplished all of the following:

- *A diligent effort has been made to quantify PCBs loads and the sources of PCBs in the discharge;*
- *Documentation has been prepared that demonstrates that all technically and economically feasible and cost-effective control measures recognized by the Water Board have been fully implemented, and evaluates and quantifies the PCBs load reduction of such measures;*
- *A demonstration has been made that achievement of the allocation will require more than the remaining 10 years originally envisioned; and*
- *A plan has been prepared that includes a schedule for evaluating the effectiveness and feasibility of additional control measures and implementing additional controls as appropriate.*

Provision C.12.d provides the opportunity for Permittees to describe the full suite of actions that will be required to achieve the TMDL along with realistic timelines for this achievement. The load reductions for PCBs are difficult and time-consuming to achieve because of the distribution of sources in the landscape and the challenges associated with finding and reducing these existing sources. Progress will be slow because the load reduction opportunities associated with demolition of PCBs containing structures, as a practical matter, must coincide with such demolitions over time. Further, some part of the expected PCB load reduction will come from long-term implementation of control strategies (like green infrastructure) that extend beyond the current implementation timeframe of the TMDL. The long-term plan and schedule required as part of this provision will lay the foundation for a formal recognition of an implementation timeframe that is longer than originally conceived in the TMDL.

Provision C.12.e. requires that Permittees collect samples of caulk and other sealants used in storm drains and between concrete curbs and street pavement and investigate whether PCBs are present in such material and in what concentrations. PCBs are most likely present in material applied during the 1970s, so the focus of the investigations should be on structures installed during this era. The Washington Department of Ecology discovered that PCBs-containing caulk (sealant) was used inside the City of Tacoma’s storm drains during a 1970s repair. There is reason to believe that such use was not isolated to this one location. The sampling and analysis required by this Provision C.12 element will count toward partial fulfillment of the monitoring effort aimed at finding PCBs sources (see management information need in C.8.f).

Provision C.12.f. requires Permittees to develop a framework for controlling PCBs during building demolition, so that PCBs are not transmitted to stormwater runoff via vehicle trackout, airborne releases, or soil erosion. Because this is a new management practice, three years are allotted to working with entities, such as the Bay Air Quality Management District, U.S. EPA, and waste management entities, to coordinate oversight functions and otherwise develop a coordinated program. After the development period,

Permittees shall implement the framework such that PCBs are controlled during demolition of applicable structures. During this Permit term, applicable structures are limited to potential PCB-containing industrial and commercial structures; in the future, renovations may be included in the framework. Single-family residential and wood frame structures are excluded.

The Integrated Monitoring Report (IMR)⁶² presents estimates of the mass of PCBs per building (constructed or renovated prior to 1979) ranging from 0.6-16 kg and contribution to stormwater ranging from 0.8 to 4000 grams/year. This is one of the largest known sources of PCBs, although it is distributed throughout the region. For a building with 4.7 kg of PCBs and current control measures of medium effectiveness, there may be 280 grams of PCBs released to stormwater during demolition, assuming control measures are only moderately effective. If only control measures of low effectiveness were in place, such a building would release 560 grams PCBs during demolition.

Despite the large mass of PCBs contained in buildings of this vintage and the large potential load reduction benefits from attacking this source, Water Board staff is not aware of any Bay Area municipality having an ordinance in place to address it or having required enhanced material management to reduce the PCBs entering stormwater from this source. Improved material management could involve measures implemented prior to the start of renovation or demolition activities (e.g., physical removal of PCB-containing material) and measures implemented during the renovation/demolition activities (e.g., wind erosion control, storm drain inlet protection, stockpile management, hazardous waste management, concrete waste management, etc.).

Provision C.12.g. There are still uncertainties surrounding the magnitude and nature of PCBs reaching the Bay in urban runoff and the ultimate fate of such PCBs, including biological uptake. Provision C.12.g requires that Permittees ensure that fate and transport studies of PCBs in urban runoff are completed. The specific information needs include understanding the in-Bay transport of PCBs discharged in urban runoff, the sediment and food web PCBs concentrations in margin areas receiving urban runoff, the influence of urban runoff on the patterns of food web PCBs accumulation, especially in Bay margins, and the identification of drainages where urban runoff PCBs are particularly important in food web accumulation.

Provision C.12.h. requires actions that manage human health risk due to mercury and PCBs. These may include efforts to communicate the health risks of eating Bay fish and other efforts aimed at high risk-communities such as subsistence fishers and their families. The risk reduction framework developed in the previous permit term, which funded community based organizations to develop and deliver appropriate communications to appropriately targeted individuals and communities, is an appropriate approach.

⁶² Integrated Monitoring Report Part B: PCB and Mercury Loads Avoided and Reduced via Stormwater (IMR). Prepared by Geosyntec Consultants for the Bay Area Stormwater Management Agencies Association. 2013.

C.13. Copper Controls

Chronic and acute site-specific objectives (SSOs) for dissolved copper have been established in all segments of San Francisco Bay. The plan to implement the SSOs and ensure the achievement and ongoing maintenance of the SSOs in the entire Bay includes two types of actions for urban runoff management agencies. These actions are implemented through this Permit as provisions to control urban runoff sources of copper.

The control measures for urban runoff target significant sources of copper identified in a report produced in 2004 for the Clean Estuary Partnership.⁶³ This report updated information on sources of copper in urban runoff, loading estimates and associated level of uncertainty, and summarized feasible control measures and priorities for further investigation. Accordingly, the Permit provisions target major sources of copper including architectural copper, copper pesticides, and industrial copper use.

Fact Sheet Findings in Support of Provision C.13.

- C.13-1** Urban runoff is a conveyance mechanism by which copper reaches San Francisco Bay.
- C.13-2** Copper has the reasonable potential to cause or contribute to exceedances of copper water quality standards in San Francisco Bay.
- C.13-3** Site specific water quality objectives for dissolved copper have been adopted for all segments of San Francisco Bay.
- C.13-4** The Permit requirements to control copper to the MEP are necessary to implement and support ongoing achievement of the site-specific water quality objectives.
- C.13-5** One of the major sources of copper to urban runoff has been addressed through passage of Senate Bill 346 in 2010, which requires brake pad manufacturers to reduce the use of copper in brake pads sold in California to no more than 5% by weight by 2021, and no more than 0.5% by 2025. The law also provides an objective process to ensure that any new brake materials meet all applicable safety and performance standards. To make sure that new materials won't cause future environmental problems, the law requires brake manufacturers to screen potential alternatives for their impacts on human health and the environment using the Toxic Information Clearinghouse, and to select less hazardous options.
- C.13-6** A scientific uncertainty regarding the olfactory impairment of salmonids was identified during development of Bay-specific water quality objectives for copper. Exposure to dissolved copper has been shown to cause olfactory impairment at relatively low concentrations in freshwater fish, resulting in an

⁶³ TDC (TDC Environmental), 2004. *Copper Sources in Urban Runoff and Shoreline Activities*. Prepared for the Clean Estuary Partnership.

impaired avoidance response to predators. When the site-specific objectives were established, studies were planned to address whether or not this phenomenon occurred in estuarine water. The studies⁶⁴ were supported in part through requirements in the Previous Permit and were conducted by David Baldwin of NOAA's Northwest Fisheries Science Center. Dr. Baldwin measured the firing of neurons in response to exposure to odorant chemicals. The studies indicate that salmon in saline or moderately saline water are much less sensitive than salmon in freshwater, and that the potential effect of copper on salmon olfaction is not a concern in the Bay.

Specific Provision C.13. Requirements

Provision C.13.a. Copper is used as an architectural feature in roofs, gutters and downspouts. When these roofs are cleaned with aggressive cleaning solutions, substantial amounts of copper can be liberated. Provision C.13.a for architectural copper involves a variety of strategies ranging from BMPs to prohibition against discharge of these cleaning wastes to the storm drain.

Provision C.13.b. Copper is commonly used as an algacide in pools, spas, and fountains. Provision C.13.b prohibits discharge to the storm drain of copper-containing wastewater from such amenities.

Provision C.13.c. Some industrial facilities likely use copper or have sources of copper (e.g., plating facilities, metal finishers, and auto dismantlers). This control measure requires municipalities to include these facilities in their inspection program plans.

⁶⁴ David Baldwin, NOAA Fisheries, Northwest Fisheries Science Center, 2015. *Impact of dissolved copper on the olfactory system of juvenile salmon, Phase II: Effect of estuarine salinity on olfactory toxicity.*

C.14. Bacteria Controls

The purpose of this provision is to implement the stormwater runoff and dry weather flow (urban runoff) requirements of the San Pedro Creek and Pacifica State Beach Bacteria TMDL (TMDL) and reduce bacteria loads to make substantial progress toward achieving the urban runoff bacteria wasteload allocations established for the TMDL.

Fact Sheet Findings in Support of Provision C.14

- C.14-1** This Permit implements the Basin Plan amendment adopted by the Water Board on November 14, 2012, that establishes a TMDL and an Implementation Plan for bacteria in San Pedro Creek and at Pacifica State Beach. The State Water Board and U.S. EPA have also approved this Basin Plan amendment.
- C.14-2** The implementation plan requires City of Pacifica and San Mateo County (the Pacifica and San Mateo Permittees) to implement bacteria control measures, conduct education and outreach to others, and conduct water quality monitoring efforts. Control measures implemented by the Pacifica and San Mateo Permittees shall reduce bacteria in urban runoff to achieve TMDL wasteload allocations.
- C.14-3** The TMDL is allocated to all urban runoff, including urban runoff associated with MS4s and Caltrans facilities. The allocations are expressed in terms of allowable exceedances of single sample bacteria water quality objectives for the water contact recreation beneficial use and shall be achieved by August 2021 for Pacifica State Beach and August 2028 for San Pedro Creek.
- C.14-4** The Pacifica and San Mateo Permittees may comply with any requirement of this provision through a collaborative effort.

Specific Provision C.14 Requirements

Provision C.14.a. requires the Pacifica and San Mateo Permittees to implement various control measures and education and outreach activities to achieve bacteria load reductions. In order to comply with this requirement, the Pacifica and San Mateo Permittees must implement measures such as: address potential illicit discharges to the storm drain from the sanitary sewer collection system; address bacteria discharges from existing and future commercial horse facilities; install dog waste-clean-up signs, waste bag dispensers, and trash receptacles at high priority areas; develop and implement a visual inspection and clean-up plan for high dog waste accumulation areas; and develop and implement an enhanced public outreach and education campaign for managing pet waste. This provision also requires the Pacifica and San Mateo Permittees to modify or refocus control measure implementation efforts as appropriate.

This provision is critical to the successful implementation of the urban runoff requirements for the TMDL. The accountability mechanism for control measure implementation consists of three parts: 1) the identification of control measures and associated watersheds or locations, 2) a commitment to an implementation schedule, and 3) the quantification of the benefit resulting from control measure implementation.

Provision C.14.b. requires the Pacifica and San Mateo Permittees to conduct a water quality monitoring program to assess attainment of wasteload allocations. In order to comply with this requirement, the Pacifica and San Mateo Permittees are required to monitor bacteria levels in San Pedro Creek and at Pacifica State Beach and analyze, summarize, and report the results of the monitoring to the Water Board. Further, they must provide an annual report of the quantitative analysis of trends in bacteria densities and exceedances of applicable water quality objectives. This provision is necessary to determine whether or not wasteload allocations are being attained, so additional or enhanced measures are implemented, if necessary.

Provision C.14.c. requires the Pacifica and San Mateo Permittees to conduct a water quality monitoring program to 1) better characterize bacteria sources and 2) evaluate the effectiveness of the bacteria control measures. The results of the monitoring shall be reported to the Water Board on an annual basis. The findings from these assessments will be used throughout this and future Permit terms to revise, refocus, and enhance bacteria control measures to make them as effective and efficient as possible. Future permits will be based on an updated assessment of bacteria sources and control measure effectiveness. This provision is necessary to allow the Pacifica and San Mateo Permittees to identify and implement effective BMPs in an efficient manner.

C.15. Exempted and Conditionally Exempted Discharges

Legal Authority

Broad Legal Authority: CWA section 402(p)(3)(B)(ii-iii), CWC sections 13377 and 13263, and Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: 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 Permittees shall prevent all types of illicit discharges into the MS4 except for certain non-stormwater discharges. Illicit discharge means “any discharge to a municipal separate storm sewer 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” (40 CFR 122.26(b)(2)).

Fact Sheet Findings in Support of Provision C.15.

Prohibition A.1. effectively prohibits the discharge of non-stormwater discharges into the storm sewer system. However, certain types of non-stormwater discharges may be exempted from this prohibition if they are unpolluted and do not violate water quality standards. Other types of non-stormwater discharges may be conditionally exempted from Prohibition A.1. if the discharger employs appropriate control measures and BMPs prior to discharge, and monitors and reports on the discharge.

Removal of Conditional Exemption for Planned and Unplanned Discharges of the Potable Water System

The Previous Permit, Order No. R2-2009-0074, contained requirements for planned and unplanned discharges from the potable water systems owned and/or operated by Permittees who are water purveyors. The discharges were conditionally exempted provided the Permittees complied with the BMP, monitoring, and reporting requirements in the Previous Permit. The requirements were necessary because potable water discharges contain chlorine and chloramines, two very toxic chemicals to aquatic life, and can cause erosion, scouring of stream and creek banks, and sedimentation. The conditional exemption and requirements were included as an interim measure until such time an NPDES permit regulating potable water discharges was adopted. The State Water Resource Control Board has since adopted the Statewide National Pollutant Discharge Elimination System Permit for Drinking Water System Discharges to Waters of the United States, Order WQ 2014-0194-DWQ (Potable Water General Permit) on November 18, 2014. Therefore, the conditional exemption and requirements for planned and unplanned discharges from the Permittees’ potable water systems is no longer necessary. The Permittees should seek coverage under the Potable Water General Permit

for their potable water system discharges. NPDES-permitted discharges, such as those permitted by the Potable Water General Permit, are exempt from Discharge Prohibition A.1.

Specific Provision C.15. Requirements

Provision C.15.a. Exempted Non-Stormwater Discharges. This section of the Permit identifies the types of non-stormwater discharges that are exempted from Discharge Prohibition A.1. if such discharges are unpolluted and do not violate water quality standards. If any exempted non-stormwater discharge is identified as a source of pollutants to receiving waters, the discharge shall be addressed as a conditionally exempted discharge and must meet the requirements of Provision C.15.b.

Provision C.15.b. Conditionally Exempted Non-Stormwater Discharges. This section of the Permit identifies the types of non-stormwater discharges that are conditionally exempted from Discharge Prohibition A.1. if they are identified by Permittees or the Executive Officer as not being sources of pollutants to receiving waters. To eliminate adverse impacts from such discharges, project proponents shall implement appropriate pollutant control measures and BMPs, and where applicable, shall monitor and report on the discharges in accordance with the requirements specified in Provision C.15.b. The intent of Provision C.15.b.'s requirements is to facilitate Permittees in regulating these non-stormwater discharges to the storm drains since the Permittees have ultimate responsibility for what flows in those storm drains to receiving waters. For all planned discharges, the nature and characteristic of the discharge must be verified prior to the discharge so that effective pollution control measures are implemented, if deemed necessary. Such preventative measures are cheaper by far than post-discharge cleanup efforts.

Provision C.15.b.i.(1). Pumped Groundwater from Non Drinking Water Aquifers. These aquifers tend to be shallower than drinking water aquifers and more subject to contamination. The wells must be purged prior to sample collection. Since wells are purged regularly, this section of the Permit requires twice a year monitoring of these aquifers. Discharges of pumped groundwater from nondrinking water aquifers, which are owned and/or operated by Permittees who pump groundwater as drinking water, are conditionally exempted as long as the discharges meet the requirements in this section of the Permit.

Provision C.15.b.i.(2). Pumped Groundwater, Foundation Drains, and Water from Crawl Space Pumps and Footing Drains. This section of the Permit encourages these types of discharges to be directed to landscaped areas or bioretention units, when feasible. If the discharges cannot be directed to vegetated areas, it requires testing to determine if the discharge is uncontaminated. Uncontaminated discharges shall be treated, if necessary, to meet specified discharge limits for turbidity and pH.

Provision C.15.b.ii. Air Conditioning Condensate. Small air conditioning units are usually operated during the warm weather months. The condensate from these units is uncontaminated and unlikely to reach a storm drain or waters of the State because it tends to be low in volume and tends to evaporate or percolate readily. Therefore, condensate from small air conditioning units should be discharged to landscaped areas or the ground.

Commercial and industrial air conditioning units tend to produce year-round continuous flows of condensate. It may be difficult to direct a continuous flow to a landscaped area large enough to accommodate the volume. While the condensate tends to be uncontaminated, it picks up contaminants on its way to the storm drain and/or waters of the State and can contribute to unnecessary dry weather flows. Therefore, discharges from new commercial and industrial air conditioning units should be discharged to landscaped areas, if they can accommodate the continuous volume, or to the sanitary sewer, with the local sanitary sewer agency's approval. If none of these options are feasible, air conditioning condensate can be directly discharged into the storm drain. If descaling or anti-algal agents are used to treat the air conditioning units, residues from these agents must be properly disposed of.

Provision C.15.b.iii. Emergency Discharges of the Potable Water. Potable water discharges contribute pollution to water quality in receiving waters because they contain chlorine or chloramines, two very toxic chemicals to aquatic life. Potable water discharges can cause erosion and scouring of stream and creek banks, and sedimentation can result if effective BMPs are not implemented. This section of the Permit acknowledges that in cases of emergency discharge, such as from firefighting and disasters, priority of efforts shall be directed toward life, property, and the environment, in that order. Therefore, Permittees are required to implement BMPs that do not interfere with immediate emergency response operations or impact public health and safety. Reporting requirements for such events shall be determined by Water Board staff on a case-by-case basis.

Provision C.15.b.iv. Individual Residential Car Washing. Soaps and automotive pollutants such as oil and metals can be discharged into storm drains and waterbodies from individual residential car washing activities. However, it is not feasible to prohibit individual residential car washing because it would require too much resources for the Permittees to regulate the prohibition. This section of the Permit requires Permittees to encourage residents to implement BMPs such as directing car washwaters to landscaped areas, using as little detergent as possible, and washing cars at commercial car washing facilities.

Provision C.15.b.v. Swimming Pool, Hot tub, Spa, and Fountain Water Discharges. These types of discharges can contain high levels of chlorine and copper. Permittees shall prohibit the discharge of such waters that contain chlorine residual, copper algaecide, filter backwash, or other pollutants to the storm drains or to waterbodies. High flow rates into the storm drain or a waterbody could cause erosion and scouring of the stream or creek banks. These types of discharges should be directed to landscaped areas large enough to accommodate the volume or to the sanitary sewer, with the local sanitary sewer's approval. If these discharge options are not feasible and the swimming pool, hot tub, spa, or fountain water discharges must enter the storm drain, they must be dechlorinated to non-detectable levels of chlorine and they must not contain copper algaecide. Flow rate should be regulated to minimize downstream erosion and scouring. We strongly encourage local sanitary sewer agencies to accept these types of non-stormwater discharges, especially for new and rebuilt ones where a connection could be achieved with marginal effort. This Provision also requires Permittees to coordinate with local sanitary agencies in these efforts.

Provision C.15.b.v.i. Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering. Fertilizers and pesticides can be washed off of landscaping and discharged into storm drains and waterbodies. However, it is not feasible to prohibit excessive irrigation because it would require too much resource for the Permittees to regulate such a prohibition. It is also not feasible for individual Permittees to ban the use fertilizers and pesticides. This section of the Permit requires Permittees to promote and/or work with potable water purveyors to promote measures that minimize runoff and pollutant loading from excess irrigation, such as conservation programs, outreach regarding overwatering and less toxic options for pest control and landscape management, the use of drought tolerant and native vegetation, and to implement appropriate illicit discharge response and enforcement for ongoing, large-volume landscape irrigation runoff to the storm drains

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C.16. Discharges to Areas of Special Biological Significance

Legal Authority

Broad Legal Authority: CWA section 402(p)(3)(B)(ii-iii), CWC sections 13377 and 13263, and Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(B, C, D, E, and F) and 40 CFR 122.26(d)(2)(iv).

Specific Legal Authority: In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California, California Ocean Plan (Ocean Plan). The State Water Board adopted the most recent amendment to the Ocean Plan on October 16, 2012, and the plan was subsequently approved by the State Office of Administrative Law and U.S. EPA. The State Water Board is responsible for reviewing the Ocean Plan water quality standards and for modifying and adopting standards in accordance with CWA section 303(c)(1) and CWC section 13170.2. Pursuant to California Water Code sections 13263 and 13377, this Permit implements the Ocean Plan. In accordance with the Ocean Plan, the State Water Board granted an exception to the prohibition of stormwater discharges to Areas of Special Biological Significance (ASBSs), as discussed further below.

Fact Sheet Findings in Support of Provision C.16.

The Ocean Plan prohibits the discharge of waste to designated ASBSs. ASBSs are designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. On March 20, 2012, the State Water Board approved Resolution No. 2012-0012, approving a general exception to the Ocean Plan prohibition against discharges to ASBSs for certain nonpoint source discharges and NPDES-permitted municipal storm water discharges (ASBS Exception), as long as those discharges are covered under an appropriate authorization to discharge, such as this Order and comply with the Special Protections contained in Attachment B (Special Protections) to that resolution, among other requirements. The ASBS Exception was subsequently amended by State Water Board Resolution No. 2012-0031, which required pollutant reductions to be achieved within six years, in accordance with ASBS Compliance Plans. This Provision applies to discharges from the County of San Mateo into the James V. Fitzgerald Marine Reserve ASBS. The Provision authorizes the County of San Mateo's stormwater discharge as set forth in the Provision and implements the Ocean Plan and the exceptions granted under it by the State Water Board to allow the County of San Mateo to discharge stormwater into the ASBS. The requirements of the Provision are from the ASBS Exception and its Special Protections, which are incorporated into the Order as Attachment E.

Attachment G: Standard NPDES Stormwater Permit Provisions

The following legal authority applies to Attachment J:

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).

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 G includes Standard Provisions. These Standard Provisions ensure that NPDES stormwater permits are consistent and compatible with USEPA's federal regulations. Some Standard Provision sections specific to publicly owned sewage treatment works are not included in Attachment G.

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Fact Sheet Attachment C10

303(d) Trash Resolution and Staff Report February 2009

Available at

http://www.waterboards.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2009/R2-2009-0008.pdf