Proposed Final ~~Draft~~ Staff Report

Including the ~~Draft~~ Substitute Environmental Documentation

# ~~Draft~~ Amendment~~s~~ to the ~~Statewide~~ Water Quality Control Plan~~s~~ for the Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California ~~to Control Trash~~

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EDITORIAL NOTE:
Revisions made to the Draft Staff Report, including the Draft Substitute Environmental Documentation, are shown in red font and single-strikeout/single-underline. Revisions made to the proposed Trash Amendments (Appendices D and E) are shown in red font and single-strikeout/double -underline.

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| AB | Assembly Bill |
| ASBS | Areas of Special Biological Significance |
| Basin Plans | Regional Water Quality Control Plan |
| BASMAA | Bay Area Stormwater Management Agencies Association |
| BMP | Best Management Practices |
| Caltrans | California Department of Transportation |
| CASQA | California Stormwater Quality Association |
| CCR | California Code of Regulations |
| CEQA | California Environment Quality Act |
| CGP | Construction General Permit |
| Colorado River Basin Water Board | Colorado River Basin Regional Water Resource Control Board |
| CWA | Clean Water Act |
| GIS | Geographic Information System |
| LID | Low-Impact Development Controls |
| Los Angeles Water Board | Los Angeles Regional Water Quality Control Board |
| IGP | Industrial Storm Water General Permit |
| ISWEBE Plan | Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California |
| MFAC | Minimum Frequency of Assessment and Collection |
| MRP | San Francisco Bay Municipal Regional Stormwater Permit |
| MS4 | Municipal Separate Storm Sewer System |
| NOAA | National Oceanic and Atmospheric Administration |
| North Coast Water Board | North Coast Regional Water Quality Control Board |
| NPDES | National Pollutant Discharge Elimination System |
| Ocean Plan | Water Quality Control Plan for Ocean Waters of California |
| Porter-Cologne | Porter-Cologne Water Quality Control Act |
| Regional Water Board | Regional Water Quality Control Board |
| San Francisco Bay Water Board | San Francisco Bay Regional Water Quality Control Board |
| SB | Senate Bill |
| SED | Substitute Environmental Documentation |
| State Water Board | State Water Resources Control Board |
| TMDLs | Total Maximum Daily Loads |
| Trash Amendments | ~~Amendments to Statewide Water Quality Control Plans to Control Trash~~ Amendment to the Water Quality Control Plan for Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California |
| U.S. EPA | United States Environmental Protection Agency |
| Wat. Code | California Water Code |
| Water Boards | State and Regional Water Quality Control Boards |
| WDR | Waste Discharge Requirements |

# 1 INTRODUCTION

Trash is junk or rubbish generated by human activity that frequently ends up in waterways. Trash is items such as cigarette butts, paper, fast food containers, plastic grocery bags, cans and bottles, used diapers, construction site debris, industrial preproduction plastic pellets, old tires, and appliances. Trash discarded on land frequently ends up in waterways and the ocean as rainstorms wash it into gutters and storm drains, and then into creeks and rivers. The presence of trash in waterways adversely affects beneficial uses, including but not limited to threats to aquatic life, wildlife, and public health.

The State Water Resources Control Board and Regional Water Quality Control Boards (collectively, the Water Boards) are controlling trash primarily through Total Maximum Daily Loads (TMDLs) and permits. The Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) led the way with effective trash management strategies with the Los Angeles River Watershed Trash TMDL. The San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board) is following this lead with trash components to their Municipal Regional Storm Water National Pollutant Discharge Elimination System (NPDES) Permit. These approaches are not entirely consistent, and there are still ongoing trash problems across the state waterways. There is a strong need for a statewide consistency within the Water Boards regarding trash control.

The State Water Resources Control Board (State Water Board) is proposing ~~Amendments to Statewide Water Quality Control Plans to Control Trash (Trash Amendments)~~ an Amendment to the Water Quality Control Plan for Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. This Staff Report shall collectively refer to the amendment to control trash and Part 1 Trash Provisions as "Trash Amendments".[2] The provisions proposed in the Trash Amendments include six elements: (1) water quality objective, (2) applicability, (~~2~~3) prohibition of discharge, (~~3~~4) implementation provisions, (~~4~~5) time schedule, ~~(5) a time extension option for State Water Board consideration,~~ and (6) monitoring and reporting requirements. The proposed provisions would apply to all surface waters of the state, with the exception of those waters within the jurisdiction of the Los Angeles Water Board with trash or debris TMDLs that are in effect prior to the effective date of the Trash Amendments.

This ~~Draft~~ proposed Final Staff Report analyzes the need for the proposed final Trash Amendments and alternative options to the Trash Amendments considered by the State Water Board. This document also serves as the State Water Board's Substitute Environmental Documentation (SED) required to meet the requirements of the

[2] The State Water Board intends to amend the Water Quality Control Plan for Enclosed Bays and Estuaries of California to create the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California Plan (ISWEBE Plan). The State Water Board intends that the Part 1 Trash Provisions will be incorporated into the ISWEBE Plan, once it is adopted.

California Environmental Quality Act (CEQA)[3], pursuant to Public Resources Code ~~S~~sections 21080.5, 21159 and CEQA Guidelines ~~S~~sections 15250 – 15253; and the State Water Board's Regulations for Implementation of the Environmental Quality Act of 1970, 23 California Code of Regulations (CCR) sections 3720 – 3781.

## 1.1 Purpose of the Staff Report

The purpose of this ~~Draft~~ proposed Final Staff Report is to present the State Water Board's analysis of the need for and the effects of the proposed final Trash Amendments and meet the State Water Board's requirement to comply with CEQA.

CEQA authorizes the Secretary for Natural Resources to certify that state regulatory programs meeting certain environmental standards are exempt from many of the procedural requirements of CEQA (CCR, Title 14, § 15251(g)). The Secretary for Natural Resources has certified the State Water Board regulations for adoption or approval of standards, rules, regulations, or plans to be used in the Basin/208 Planning program for the protection, maintenance, and enhancement of water quality in California (23 CCR § 3775 – 3781). Therefore, this ~~Draft~~ proposed Final Staff Report includes the documentation (i.e., draft SED) required for compliance with CEQA, and a separate CEQA document will not be prepared.

According to the State Water Board regulations for the implementation of CEQA (23 CCR ~~Section~~ § 3777), the ~~draft~~ SED shall consist of a written report prepared for the Board containing an environmental analysis of the project; a completed environmental checklist (where the issues identified in the checklist must be evaluated in the checklist or elsewhere in the SED); and other documentation as the board may include. The ~~draft~~ SED is required to include, at a minimum, the following information:

1) A brief description of the proposed project;
2) An identification of any significant or potentially significant adverse environmental impacts of the proposed project;
3) An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and
4) An environmental analysis of the reasonably foreseeable methods of compliance. The environmental analysis shall include, at a minimum, all of the following:
    a) An identification of the reasonably foreseeable methods of compliance with the project;

[3] CEQA provides that certain regulatory programs of state agencies may be certified by the Secretary for Natural Resources as being exempt from the requirements for preparing Environmental Impact Reports (EIR), Negative Declarations, and Initial Studies if the Secretary finds that the program meets certain criteria. A certified program remains subject to other provisions in CEQA such as the policy of avoiding significant adverse effects on the environment where feasible. The Secretary has certified the State Water Resource Control Board regulatory program for adoption or approval of standards, rules, regulations, or plans to be used in the Basin/208 Planning program for the protection, maintenance, and enhancement of water quality in California as an exempt certified state regulatory program (Pub. Res. Code § 21080.5; Cal. Code Regs., tit.14, § 15251, subd. (g)).

b) An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;
c) An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and,
d) An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance.

In the preparation of this ~~Draft~~ proposed Final Staff Report, the State Water Board utilizes numerical ranges or averages to assess the potential environmental impacts over a broad range of geographic areas within the state covering all nine regional water board jurisdictions. Per the direction of CEQA and the State Water Board regulations, however, the analysis contained in this ~~Draft~~ proposed Final Staff Report does not engage in speculation or conjecture and the environmental analysis does not attempt to provide a site-specific project level analysis of the methods of compliance (which CEQA may otherwise require of those agencies who are responsible for complying with the plan or policy when they determine the manner in which they comply). The analysis does take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites. (Pub Res Code ~~Section~~ § 21159; 14 CCR ~~Sections~~ § 15144, 15145; 23 CCR ~~Section~~ § 3777(c). Responses to comments and consequent revisions to the information in the Draft Staff Report will be subsequently presented in a ~~draft~~ proposed Final Staff Report for consideration by the State Water Board. After the State Water Board has certified the document as adequate, the title of the document becomes the Final Staff Report.

## 1.2 Regulatory Framework

In 1969, the Porter-Cologne Water Quality Control Act (Porter-Cologne) (California Water Code (Wat. Code § 13000 et seq.) was adopted as the principal law governing water quality in California. Porter-Cologne institutes a comprehensive program to protect the quality and "beneficial uses" (or "designated uses" under federal parlance) of the state's water bodies. Beneficial uses include, but are not limited to, "domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Wat. Code § 13050, subd. (f)). Regulatory protection of beneficial uses is carried out, in part, through water quality objectives established in each regional water quality control plan (basin plan) (Wat. Code § 13241). Under Porter-Cologne, the regional water quality control boards (regional water boards) adopt basin plans in which they designate the beneficial uses of the waters of the region and establish water quality objectives to protect those beneficial uses. Basin plans are required to include a plan of implementation to ensure that waters achieve the water quality objectives.

As proposed, the Trash Amendments would apply to all surface waters of the state, including: ocean waters, enclosed bays and estuaries, and inland surface waters. "Waters of the state" are defined under Porter-Cologne as any surface water or groundwater, including saline waters, within the boundaries of the state (Wat. Code § 13050(e)). Under California state law, territorial boundaries extend three nautical miles

beyond the outermost islands, reefs, and rocks and include all waters between the islands and the coast (Cal. Gov. Code § 170).

In 1972, Congress enacted the federal Clean Water Act (CWA) with the goal to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (33 U.S. Code § 1251(a)). The CWA directs states, with oversight by the U.S. Environmental Protection Agency (U.S. EPA), to adopt water quality standards to protect the public health and welfare, enhance the quality of water, and serve the purposes of the CWA. Ultimately, states must provide comprehensive protection of their waters through the application of water quality standards. State standards must include: (1) designated uses for all water bodies within their jurisdictions, and (2) water quality criteria (referred to as objectives under California law) sufficient to protect the most sensitive of the uses. The CWA established the NPDES Permit Program to regulate point source discharges of pollutants to waters of the United States (33 U.S. Code § 1342). In California, the Water Boards issue and administer NPDES permits under a program approved by the U.S. EPA (Wat. Code § 13377), and in conjunction with the requirements of Porter-Cologne.

NPDES permits are required to contain effluent limitations reflecting pollution reduction achievable through technological means, as well as more stringent limitations necessary to ensure that receiving waters meet state water quality standards (33 U.S. Code § 1311(b)(1)(A)-(C)). Section 303, subdivision (c)(2)(B) of the CWA requires states to adopt water quality criteria for all priority pollutants established in section 307(a). As part of its efforts to comply with section 303, subdivision (c)(2)(B), the State Water Board adopted two statewide plans in accordance with Water Code section 13170: the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) in 1972 and the Enclosed Bays and Estuaries Plan in 2008. These statewide plans supersede basin plans to the extent that any conflict exists (Wat. Code § 13170).

The CWA and Porter-Cologne direct the Water Boards to regulate the discharge of pollutants into waters of the United States and waters of the State. Trash is considered a pollutant and where runoff and storm water transport trash into these waters, it is considered discharge of waste subject to Water Board authority.

~~As proposed, the Trash Amendments would apply to all surface waters of the state, including: ocean waters, enclosed bays and estuaries, and inland surface waters. The proposed Trash Amendments would amend the Ocean Plan and the forthcoming water quality control plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (ISWEBE Plan).~~[4]

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[4] ~~The State Water Board intends to expand the existing Enclosed Bays and Estuaries Plan to create the ISWEBE Plan. The State Water Board anticipates creating the ISWEBE Plan through the adoption of amendments for Toxicity Assessment and Control. The analysis contained within this Staff Report presumes that the consolidated ISWEBE Plan will be adopted prior to the adoption of the Trash Amendments. If that turns out not to be the case, then minor, non-substantive amendments may be proposed to the Trash Amendments prior to adoption so that the Trash Amendments will become the vehicle to create the consolidated ISWEBE Plan.~~

## 1.3 Effect on Existing Basin Plans, Trash-Related TMDLs and Permits

### Antidegradation

Any relaxation of water quality standards that may occur as a result of the proposed final Trash Amendments must comply with federal and state antidegradation policies, which require the protection of all existing beneficial uses (40 CFR § 131.12, State Water Board Resolution No. 68-16). If the initial water quality exceeds that which is necessary to protect every beneficial use, the water quality can be lowered, as long as certain criteria are met. Dischargers are not allowed to degrade water bodies to levels below that which is necessary to protect existing beneficial uses. The antidegradation analysis for the proposed final Trash Amendments is found in Section 9.

### Basin Plans

Following adoption by the State Water Board, the proposed final Trash Amendments would supersede basin plans to the extent that any conflict exists (Wat. Code § 13170).

### TMDLs

The proposed final Trash Amendments would apply to all surface waters in the state, with the exception of those waters with the jurisdiction of the Los Angeles Water Board that have trash TMDLs in effect prior to the Trash Amendments. As the fifteen trash TMDLs in the Los Angeles Region have more stringent provisions than the proposed final Trash Amendments, the proposed final Trash Amendments would not result in a degradation of water quality standards in those waters. While the proposed final Trash Amendments do not apply to existing trash TMDLs in the Los Angeles Region, the proposed Trash Amendments direct the Los Angeles Water Board to reconsider the scope of its trash TMDLs within one year of the Trash Amendments' effective date and focus its permittees' trash control efforts on high trash generation areas rather than all areas within each permittee's jurisdiction. The reconsideration would occur for all existing trash TMDLs, except for the Los Angeles River Watershed and Ballona Creek and Wetland Trash TMDLs, because those two TMDLs are approaching final compliance deadlines of September 30, 2016 and July 1, ~~2014 and~~ 2015, respectively.

### Permits

The proposed final Trash Amendments would require permitting authorities to re-open, re-issue, or newly adopt NPDES permits for Municipal Separate Storm Sewer System (MS4) Phase I permittees, MS4 Phase II permittees, and California Department of Transportation (Caltrans) permittees, as well as Industrial Storm Water General Permit (IGP) and Construction General Permit (CGP) permittees, to incorporate the prohibition of discharge and implementation requirements of the proposed final Trash Amendments within those permits. Until such permits are amended, the proposed final Trash Amendments would not apply to dischargers covered under those permits.

A Water Board could, however, adopt storm water NPDES permits with stricter trash-discharge provisions, such as broadening the scope of regulated land uses.

## 1.4 Beneficial Uses Impacted by Trash

The proposed final Trash Amendments are directed toward achieving the highest water quality consistent with maximum benefit to the people of the state. Beneficial uses, as defined by Porter-Cologne section 13050, are the uses of surface water and groundwater that may be protected against water quality degradation. The Water Boards are charged with protecting all beneficial uses from pollution and nuisance that may occur as a result of waste discharges in the region. Beneficial uses of surface waters, ground waters, marshes, and wetlands serve as a basis for establishing water quality objectives and discharge prohibitions to attain these goals and are defined in the basin plans for each regional water board and the Ocean Plan.

There are many beneficial uses in California that can be affected by trash. This section discusses the impacts of trash on beneficial uses associated with aquatic life and public health.

Trash is a threat to aquatic habitat and life as soon as it enters state waters. Mammals, turtles, birds, fish, and crustaceans are threatened following the ingestion of or entanglement by trash (Moore et al. 2001, U.S. EPA 2002). Ingestion and entanglement can be fatal for freshwater, estuarine, and marine life. Similarly, habitat alteration and degradation due to trash can make natural habitats unsuitable for spawning, migration, and preservation of aquatic life. These negative effects of trash to aquatic life can impact twelve beneficial uses. A summary of specific impacts associated with each aquatic life beneficial use is presented in Table 13, Appendix A.

Trash in state waters can impact humans by means of jeopardizing public health and safety and posing harm and hindrance in recreational, navigational, and commercial activities. Trash can also affect the traditional and cultural rights of indigenous people or subsistence fishers to waters of the state. Specific impacts associated with each public health beneficial use is presented in Table 14, Appendix A.

## 1.5 Trash in the Environment

The presence of trash in surface waters, especially coastal and marine waters, is a serious issue in California. Trash discarded on land is frequently transported through storm drains and to waterways, shorelines, the seafloor, and the ocean. Statewide and local studies have documented the presence of trash in state waters and the accumulation of land-based trash in the ocean. Street and storm drain trash studies conducted in regions across California have provided insight into the composition and quantity of trash that flows from urban streets into the storm drain system and out to adjacent waters.

Trash in state waters is related to the direct and indirect activities of inhabitants inland, along coastal shorelines, and offshore (NOAA 2008a). A major source of trash is either intentionally or accidentally improperly discarded waste, thrown or deposited on land and in water bodies. If trash occurs on land, it is commonly transported to nearby water bodies by wind and/or rain or dry ~~season~~ weather runoff. The five primary sources and transport mechanisms for trash to reach state waters are:

1. Littering by the public on or adjacent to waterways;

2. Storm events draining watersheds and carrying trash originating from littering, inadequate waste handling or illegal dumping via the storm drain system to receiving waters;
3. Wind-blown trash, also originating from littering, inadequate waste handling or illegal dumping;
4. Illegal dumping into or adjacent to water bodies, and;
5. Direct disposal (overboard disposal and/or dumping) of trash into water bodies from vessels involved in commercial, military, fishing or recreational activities.

Studies show that trash is predominantly generated on land and then transported to a receiving water body. The main transport pathway of trash to receiving water bodies is through storm water transport. Several studies have been conducted to determine the sources of land-based trash generation and the rates of trash generation areas. The land areas evaluated in these studies typically included the following: high density residential, low density residential, commercial services, industrial, public facilities, education institutions, military institution, transportation, utilities, mixed urban, open space, agriculture, water, and recreation land uses (City of Los Angeles 2002, County of Los Angeles Department of Public Works 2004a; 2004b, City of Cupertino 2012, City of San Jose 2012, EOA, Inc. 2012a; 2012b).

Additional details about the composition of trash, the transport of transport of trash in the environmental, and trash assessment studies can be found in Appendix A.

## 1.6 Current Efforts to Address Concerns Related to Trash in California Waters

Regulations and policies are currently implemented in California to address trash in state waters. These efforts are discussed in the following sections and in greater detail in Appendix A.

### State Laws and Local Ordinances

Numerous statewide laws and local ordinances have been adopted in California to address trash. For instance, California prohibits littering where such litter “creates a public health and safety hazard, a public nuisance, or a fire hazard” (Penal Code ~~section~~ § 374.4). The California Vehicle Code provides that no one may throw or trash, including cigarettes onto highways and adjacent areas (~~sections~~ § 23111 and 23112).

California is the leader in implementing local ordinances with goals of reducing trash, specifically plastics. At least 65 jurisdictions have either banned expanded polystyrene foam food containers completely or have prohibited use by government agencies or at public events (Clean Water Action 2011b). In 2006, the City of San Francisco passed a ban on single-use carryout bags in grocery stores and pharmacies. Since then, at least 72 local jurisdictions have adopted city and county ordinances for single-use carryout bags (Environment California Research and Policy Center 2011). Statewide, several attempts have been made to pass single-use plastic bag ban bills over the past several years, including Assembly Bill (AB) 1998 in 2010 and Senate Bill (SB) 405 in 2013, although none have been passed in the State Legislature (West Coast Governors’ Alliance on Ocean Health 2013).

On September 30, 2014, Governor Edmund G. Brown Jr. signed the nation's first statewide ban on single-use plastic bags—Senate Bill 270 (Sen. Padilla)(2014 Stat. Ch. 850)(adding Chapter 5.3 to Part 3 of Division 30 of the Public Resources Code). Senate Bill 270 aligns state law with the ordinances passed by local governments in California to reduce plastic waste. The new law prohibits grocery stores and pharmacies that have a specified amount of sales in dollars or retail floor space from providing single-use carry-out plastic bags as of July 1, 2015, and enacts the same ban for convenience stores and liquor stores on or after the following year. The legislation prohibits stores from selling or distributing a recycled paper bag or compostable bags at the point of sale for at a cost of less than $0.10.

**No Existing Trash-Specific Water Quality Objectives**

Each regional water board has adopted narrative objective(s) for pollutants in its basin plan. These narrative objectives refer to trash-related pollutants and other pollutants such as foam and sediment in general terms (i.e., floatable, suspended, and settleable material), but do not specifically refer to trash as a specific pollutant. The Ocean Plan also has similar floatable, suspended, and settleable material objectives, but no specific mention of trash as a pollutant. ~~Additionally, the ISWEBE Plan lacks a trash-related water quality objective.~~

**Current NPDES Permits and Existing Trash TMDLs**

The CWA establishes the NPDES permit as the primary mechanism for achieving water quality standards in navigable waters. NPDES permits are issued to point source dischargers and include effluent and receiving water limitations. Existing NPDES permits, such as Phase I, Phase II, and Caltrans, have some existing requirements for trash reduction in the form of institutional controls, such as street sweeping and educational programs (Gordon and Zamist 2003). These existing requirements can be applicable to multiple types of urban storm water pollutants, including trash.

For those waters that do not attain water quality standards even after NPDES permits are issued to point sources with the effluent limitations described above, the CWA requires states to adopt TMDLs for the pollutants causing the impairment in a water body. TMDLs are designed to restore water quality by controlling the pollutants that cause or contribute to such impairments.

The presence of trash in California waters has resulted in a number of waters listed as impaired on the CWA ~~S~~section 303(d) list of Water Quality Limited Segments over the past several listing cycles. According to California's 2008-2010 ~~S~~section 303(d) list of impaired waters, there are 73 listings due to trash in California waters. Although listings occur in four regions (San Francisco Bay, Los Angeles, Colorado River Basin, and San Diego), TMDLs have only been developed to date in the Los Angeles Region and the Colorado River Basin Region. In the Colorado River Basin, a TMDL for trash was adopted for the New River (at the international boundary) that included a numeric target of zero trash (Colorado River Basin Water Board 2006). In the Los Angeles Region, fifteen TMDLs were adopted for trash and debris by either the Los Angeles Water Board or U.S. EPA: East Fork San Gabriel River, Ballona Creek and Wetland, Los Angeles River Watershed, Revolon Slough~~,~~ and Beardsley Wash, Ventura River Estuary, Malibu Creek ~~Watershed~~, Lake Elizabeth, Munz Lake, Lake Hughes, Legg Lake, Machado

Lake, Santa Monica Bay Nearshore and Offshore, Peck Road Park Lake, Echo Park Lake, and Lincoln Park ~~Lake~~ (Table 16; Los Angeles Water Board 2000; 2004; 2007a; 2007b; 2007c; 2007d; 2007e; 2007f; 2008g; 2010, U.S. EPA 2012a).

The Los Angeles Water Board's trash and debris TMDLs set the numeric target for trash in the applicable water bodies to zero, as derived from the water quality objective in the basin plans. The TMDLs have all also defined trash to be "man-made litter," as defined by the California Government Code (§ 68055.1(g)). Implementation plans vary slightly but are mostly based on phased percent reduction goals that can be achieved through discharge permits, best management practices (BMPs), and structural controls.

The San Francisco Bay Water Board uses provisions in the San Francisco Bay ~~Area~~ Municipal Regional Stormwater Permit (MRP) to address trash in the 27 303(d) listed water bodies in the Region (Order No. R2-2009-0074). The San Francisco Bay MRP applies to 76 large, medium and small municipalities and flood control agencies in the San Francisco Bay Region. The San Francisco Bay ~~Area~~ MRP 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." The trash-related receiving water limitations identified in the San Francisco Bay ~~Area~~ MRP do not place numeric targets on trash but uses narrative language to prohibit trash discharges. The San Francisco Bay ~~Area~~ MRP requires that permittees reduce trash from their storm sewer systems by 40 percent by July 1, 2014. The San Francisco Bay MRP permittees are developing and implementing a Short-Term Trash Load Reduction Plan to attain the 40 percent (City of Cupertino 2012, City of San Jose 2012).

**State Policy Efforts**

In response to the increasing problem of trash within California, particularly plastic trash, policymakers have initiated efforts such as the California Ocean Protection Council's Resolution on Reducing and Preventing Marine Debris (2007) and subsequent Implementation Strategy for Reducing Marine Litter (2008). These policies respectively proposed targeted reductions of trash within a set timeline, and prioritize state efforts for source reduction of the "worst offenders" of trash, such as cigarette butts, plastic bottle caps, plastic bags, and polystyrene. In 2013, the West Coast Governor's Alliance on Ocean Health introduced a Marine Debris Strategy. The Strategy provides a toolbox of key actions that may be implemented collaboratively or individually by western states at its discretion and allows for the successful achievement of target milestones through various reduction methods.

## 1.7 Current Trash Cleanup Costs

A report, commissioned by U.S. EPA Region 9, estimated that West Coast communities (California, Oregon, and Washington) are spending approximately $13 per resident per year to combat and clean up trash that would otherwise end up as marine debris. The report conservatively suggested that West Coast coastal communities are spending more than $520 million to combat trash and marine debris. Cost information was sought for six different trash management activities: beach and waterway cleanup, street sweeping, installation of storm water capture devices, storm drain cleaning and

maintenance, manual cleanup of trash, and public anti-trash campaigns. Data was collected from 90 different communities ranging in size from 200 to over four million residents (Stickel et al. 2012). A follow-up study conducted by the Natural Resources Defense Council and Kier Associates focused on the cost of current trash abatement activities for 95 California communities. The study found that California communities annually spend approximately $428 million ($10.5 per resident) to reduce trash and prevent trash from entering state waters. The study found that the average annual reported per capita cost ranged from $8.94 for large communities to $18.33 for small communities (fewer than 15,000 people) with the largest of communities (over 250,000 people) averaging $11.24 (Stickel et al. 2013).

# 2 PROJECT DESCRIPTION

The Water Board's regulations for implementation of CEQA require the SED to include a brief description of the proposed project (23 CCR 3777(b)(1)). The following section: (1) describes the proposed final Trash Amendments; (2) provides an overview of the objectives of the proposed Plan; and (3) contains non-exclusive lists of: (a) the agencies that are expected to use this SED in their decision making and permits, (b) other approvals required to implement the project, and (c) related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies.

The complete texts of the proposed final Trash Amendments are included in this ~~Draft~~ proposed Final Staff Report as Appendix D for the Ocean Plan and Appendix E for the ISWEBE Plan.

## 2.1 Trash Amendments' Description and Project Objective[5]

The State Water Board proposes to adopt the Trash Amendments into both the Ocean Plan and the ISWEBE Plan. The provisions proposed in the Trash Amendments include six elements: (1) water quality objective, (2) applicability, (~~2~~3) prohibition of discharge, (~~3~~4) implementation provisions, (~~4~~5) time schedule, ~~(5) a time extension option for State Water Board consideration,~~ and (6) monitoring and reporting requirements. The proposed provisions would apply to all surface waters of the state, with the exception of those waters within the jurisdiction of the Los Angeles Water Board with trash or debris TMDLs that are in effect prior to the effective date of the Trash Amendments.

The State Water Board's project objective for the proposed final Trash Amendments is to address the impacts of trash to the surface waters in California (with the exception of those waters within the jurisdiction of the Los Angeles Water Board with trash or debris TMDLs that are in effect prior to the effective date of the Trash Amendments) through development of a statewide plan to control trash. The project objective for the proposed final Trash Amendments is to provide statewide consistency for the Water Boards' regulatory approach to protect aquatic life and public health beneficial uses, and reduce environmental issues associated with trash in state waters, while focusing limited resources on high trash generating areas.

A central element of the proposed final Trash Amendments is a land-use based compliance approach to focus trash controls to the areas with high trash generation rates. Within this land-use based approach, a dual alternative compliance Track approach is proposed for permitted storm water dischargers (i.e., MS4 Phase I, MS4 Phase II, Caltrans, IGP, and CGP) to implement a prohibition of discharge for trash. Table 1 outlines the proposed dual alternative compliance Tracks for permitted storm water dischargers.

[5] The State CEQA Guidelines state that a project description should include "a statement of the objectives sought by the proposed project....[And] should include the underlying purpose of the project" (14 CCR 15124(b)).

**Table 1.** Overview of Proposed Compliance Tracks for NPDES Storm Water Permits.

| | Track 1 | Track 2 |
|---|---|---|
| **NPDES Storm Water Permit** | MS4 Phase I and II<br><br>IGP/CGP* | MS4 Phase I and II<br>Caltrans<br>IGP/CGP* |
| **Plan of Implementation** | Install, operate and maintain full capture systems in storm drains that capture runoff from one or more of the priority land uses/facility/site. | Implement a plan with a combination of full capture systems, multi-benefit projects, institutional controls, and/or other treatment controls to achieve full capture system equivalency. ~~institutional controls, and/or multi-benefit projects with same performance results of Track 1 with the MS4 jurisdiction/significant trash generating areas/facility/site.~~ |
| **Time Schedule** | 10 years from first implementing permit but no later than 15 years from the effective date of the ~~proposed~~ Trash Amendments.** | 10 years from first implementing permit but no later than 15 years from the effective date of the ~~proposed~~ Trash Amendments.** |
| **Monitoring and Reporting** | Demonstrate installation, operation, and maintenance of full capture systems and provide mapped location and drainage area served by ~~of~~ full capture systems.*** | Develop and implement set of monitoring objectives that demonstrate ~~mandated performance results,~~ effectiveness of the selected combination of ~~treatment and institutional~~ controls~~,~~ and compliance with full capture system equivalency ~~the equivalency to Track 1~~.*** |

* IGP/CGP permittees would first demonstrate inability to comply with the outright prohibition of discharge of trash.

** Any new development within the MS4 permittee's jurisdiction must be built to immediately comply with Track 1 or Track 2. MS4 permittees designated after the effective date of the implementing permit would be in full compliance ten years after the date of designation. Where a permitting authority makes a determination that a specific land use or location generates a substantial amount of trash, the permitting authority has the discretion to determine a time schedule with a maximum of ten years. IGP/CGP permittees would demonstrate full compliance with deadlines contained in the first implementing permit.

*** No trash monitoring requirements for IGP/CGP, however, IGP/CGP permittees would be required to report trash controls.

## 2.2 Water Quality Objective

To provide consistency statewide with a water quality objective, the Trash Amendments ~~propose~~ would establish the following narrative water quality objective:

~~no trash~~ Trash shall not ~~accumulate~~ be present in state waters (or in areas adjacent to state waters) in amounts that would either adversely affect beneficial uses, or cause nuisance.

### 2.3 Prohibition of Discharge

The Trash Amendments propose to implement the water quality objective for trash through a conditional prohibition of discharge of trash directly into waters of the state or where trash may ultimately be deposited into waters of the state. The prohibition of discharge applies to both permitted and non-permitted dischargers. Dischargers with NPDES permits~~, Waste Discharge Requirements (WDRs), and Waivers of WDRs~~ would comply with the prohibition as outlined with the plan of implementation when such implementation plan is incorporated into the dischargers' NPDES permits~~, WDRs, and Waivers of WDRs (as the case may be)~~. The Final Trash Amendments clarify that dischargers with non-NPDES WDRs or waivers of WDRs that contain specific requirements for the control of trash shall be determined to be in compliance with the prohibition of discharge if the dischargers are in full compliance with such requirements. Under the original language, a discharger subject to an existing non-NPDES WDR or waiver of WDR could have been potentially in compliance with the requirements of the WDR, or Waiver of WDR, yet simultaneously out of compliance with prohibition of discharge included in the Draft Trash Amendments. Non-permitted dischargers must comply with the prohibition of discharge or be subject to direct enforcement action.

In addition, the prohibition of discharge specifically applies to the discharge to surface waters of the state of preproduction plastic by all manufacturers and transporters of preproduction plastics~~,~~ and manufacturers that use preproduction plastics in the manufacture of other products, or the deposition of preproduction plastic where it may be discharged into surface waters of the State. To ensure that the Trash Amendments do not interfere with existing permits requirements, the proposed Final Trash Amendments have been clarified to state that for dischargers subject to NPDES permits for discharges associated with industrial activity (e.g., IGP), those permittees would continue to comply with the "Preproduction Plastic Debris Program" under Water Code section 13367(a) and the requirements in the IGP (Order No. 2014-0057-DWQ) to comply with the prohibition concerning preproduction plastics.

### 2.4 Plan of Implementation

#### 2.4.1 Permitted Storm Water Dischargers

One of the main transport mechanisms of trash to receiving waters is through the storm water system. The proposed final Trash Amendments therefore focus on trash discharge reduction by requiring that NPDES storm water permits, specifically the MS4 Phase I and Phase II Permits, Caltrans Permit, the CGP, and the IGP, contain provisions that require permittees to comply with the prohibition of discharge. These provisions focus on trash control in the locations with high trash generation rates, in order to maximize the value of limited resources spent on addressing the discharge of trash into state waters.

**MS4 Phase I and Phase II Permits**

Municipalities are a source of trash generation, especially in areas with urban land uses and large population densities. MS4 Phase I and Phase II NPDES permits, which regulate discharges of storm water from MS4 systems throughout the state, have existing requirements for trash reduction in the form of institutional controls such as street sweeping and educational programs. Even with these existing provisions, municipalities, however, continue to be significant dischargers of trash to waters of the state.

Under the proposed final Trash Amendments, MS4 Phase I and Phase II NPDES permittees with regulatory authority over land uses can comply with the prohibition of discharge of trash under a dual alternative compliance approach or "Tracks". The Track requirements would be inserted into NPDES permits. Both Tracks have permittees focus their trash control efforts on priority land uses (i.e., those land uses that studies have shown generate significant sources of trash) (City of Los Angeles 2002, County of Los Angeles Department of Public Works 2004a; 2004b, City and County of San Francisco 2007, Moore et al. 2011, City of Cupertino 2012, City of San Jose 2012, EOA, Inc. 2012a). The proposed final Trash Amendments define priority land uses as land uses that are actually developed (i.e., not simply zoned) as high density residential, industrial, commercial, mixed urban, and public transportation stations[6]. In addition, the proposed final Trash Amendments provide that an MS4 may request that its permitting authority approve an equivalent alternative land use (i.e., an alternative to the land uses listed above) if that MS4 has land use(s) within its jurisdiction that generate trash at rates that are equivalent to or greater than one or more of the priority land uses listed. This alternative option would help MS4s and their permitting authorities focus on controlling trash in each MS4's highest trash generating areas. The intent of this prioritization of land uses is to allow MS4s to allocate trash-control resources to the developed areas that generate the highest sources of trash.

Under Track 1, a permittee would install, operate and maintain full capture systems[7] for storm drains that capture runoff from priority land uses in their respective jurisdictions. Under Track 2, a permittee would develop and ~~execute an~~ implement~~ation~~ a plan that uses ~~of~~ any combination of controls, such as full capture systems, other treatment controls (e.g., partial capture devices and green infrastructure and low impact development controls (LID)), institutional controls, and/or multi-benefit projects[8] to

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[6] The proposed final Trash Amendments specifically define each of these five regulated land uses for purposes of implementation of the water quality objective and the prohibition of discharge; so, these definitions may differ substantially from an MS4's own local definition of those land uses in its ordinances, general plan, etc.

[7] Full capture systems for storm drains are defined in the proposed final Trash Amendments as treatment controls (either a single device or a series of devices) that traps all particles that are 5 mm or greater, and has a design treatment capacity that is either: a) of not less than the peak flow rate, Q, resulting from a one-year, one-hour, storm in the subdrainage area, or b) appropriately sized to, and designed to carry at least the same flows as, the corresponding storm drain. Examples of full capture systems are described in greater detail in Section 5.2 of this document.

[8] Multi-benefit projects are treatment control projects that achieve any ~~some or all~~ of the benefits set forth in Section 10562, subdivision (d) of Division 6 of the Water Code (the Watershed, Clean Beaches, and Water Quality Act). These projects could be designed to infiltrate, recharge or store storm water for

achieve the same performance results as Track 1 would achieve, referred to as, and defined as "full capture system equivalency".[9] Due to particular site conditions, types of trash, and the available resources for maintenance and operation within a municipality, the combination of full capture systems, multi-benefit projects, other treatment controls, and institutional controls used to comply with the prohibition of discharge will vary by permittee. However, it is the State Water Board's expectation that full capture systems should be preferentially selected by a permittee in executing the implementation plan to control the discharge of trash and achieve compliance with full capture system equivalency so long as such installation is not cost prohibitive.

MS4 storm water permittees that opt to comply under Track 2 would have to submit implementation plans to their permitting authority, which is the Water Board that issues the permit ~~respective Water Board~~. The implementation plans must: (a) describe the combination of controls selected by each MS4, and the rationale for the selection, ~~and;~~ (b) describe how the combination of selected controls is designed to achieve full capture system equivalency, and (c) how the full capture system equivalency will be demonstrated. The implementation plans are subject to the approval by the permitting authority. The intention for the implementation plans is to assist in long term plan efforts and provide specifics on the trash controls effort to be incorporated into the implementing permit. ~~the same performance results as Track 1~~

**Non-Traditional Small MS4s or Other ~~Non-Priority~~ Land Uses or Areas within an MS4**

The proposed final Trash Amendments allow for the Water Boards to determine that at the local or regional level, areas outside of the scope of the priority land uses within an MS4 may generate substantial amounts of trash. Possible areas may include locations such parks, stadia, schools, campuses, and roads leading to landfills. Some Non-Traditional Small MS4s[10] maybe outside or lack jurisdictional authority over priority land uses. After reaching that determination in consultation with the applicable MS4, the appropriate Water Board may require the MS4 to adopt Track 1 or Track 2 control measures over such land uses or locations. The proposed final Trash Amendments have been modified to more accurately reflect this intent.

**California Department of Transportation**

Caltrans designs and operates California's state highway system. Caltrans' operation of this linear transportation system requires that it have its own MS4 permit distinct from the MS4 permits for Phase I and Phase II municipalities with regulatory authority over

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beneficial reuse, to develop or enhance habitat and open space through storm water management, ~~to prevent storm water pollution,~~ and/or reduce storm water runoff volume while removing the transport of trash. Multi-benefit projects can be implemented between contiguous permittees within a watershed for increased effectiveness and cost-sharing to reduce trash and improve storm water.

[9] See section 2.4.1 for Full Capture System Equivalency discussion.

[10] Federal and State operated facilities that can include universities, prisons, hospitals, and military bases (e.g., State Army National Guard barracks, parks and office building complexes).

land uses. For example, the locations of high trash generating areas within Caltrans' jurisdiction are different than the priority land uses within municipalities' jurisdictions. Based on information from Caltrans' trash studies (Caltrans 2000, Caltrans 2004~~2~~), coordination with Caltrans, Adopt-A-Highway program, and Keep California Beautiful program (Mid Atlantic Solid Waste Consultants 2009), the proposed final Trash Amendments focus Caltrans' compliance efforts on the significant trash generating areas within the state's linear transportation system. Significant trash generating areas may include areas such as: (1) highway on- and off- ramps in high-density residential, commercial, mixed urban, and industrial land uses; (2) rest areas and park-and-rides; and (3) state highways in commercial and industrial land uses. Additionally, the proposed final Trash Amendments give Caltrans the opportunity to identify other significant trash generating areas (i.e., mainline highway segments) by conducting pilot studies and/or surveys.

To comply with the prohibition of discharge of trash, Caltrans must comply with requirements in all significant trash generating areas, similar to Track 2 for MS4 Phase I and II permittees, by installing, operating, and maintaining any combination of full capture systems, multi-benefit projects, other treatment controls, and/or institutional controls. ~~with regulatory authority over land uses (i.e., develop and execute an implementation plan to install, operate, and maintain full capture systems, other treatment controls [e.g., partial capture devices, green infrastructure, and LID], or institutional controls, and/or multi-benefit projects)~~. Caltrans must demonstrate that such combination of controls achieves full capture system equivalency. Furthermore, in areas where Caltrans' operations overlap with the jurisdiction of an MS4 Phase I or II permittee with regulatory authority over priority land uses, the proposed final Trash Amendments direct the applicable parties ~~are directed~~ to coordinate efforts to install, operate, and maintain treatment and institutional controls.

Similar to MS4 Phase I and Phase II permittees, the proposed final Trash Amendments require Caltrans to submit an implementation plan that: (a) describes the specific locations of its significant trash generating areas, (b) the combination of controls selected and the rationale for the selection, and (c) how the combination of controls will achieve full capture system equivalency.

**Industrial and Construction Permittees**

Under the proposed final Trash Amendments, dischargers with industrial or construction NPDES permits (e.g., IGP or CGP) would be required to eliminate trash from all storm water discharges and authorized non-storm water discharges. This outright prohibition includes discharges associated with the site or facility, as well as any additional space such as a parking lot. If the industrial or construction permittee, however, demonstrates to the Water Board that it is unable to comply with the outright prohibition, then the permittee, through the discretion of the Water Board, may require the discharger to comply with one of two options. Under the first option, the permittee would install, operate, and maintain full capture systems for storm drains that service the facility or site. As a second option, the permittee could develop and execute an implementation plan that committed to any combination of controls, such as full capture systems, other treatment controls (e.g. partial capture devices and green infrastructure and low impact development controls), institutional controls, and/or multi-benefit

projects to achieve full capture system equivalency. ~~the same performance results as installation, operation and maintenance of full capture systems would achieve~~ As specified in Section 2.3, IGP permittees would continue to comply with the preproduction plastic provisions as specified by the "Preproduction Plastic Debris Program" under Water Code section 13367(a) and the requirements in the IGP (Order No. 2014-0057-DWQ).

**Full Capture System Equivalency**

The following entities must establish full capture system equivalency: (1) MS4 Phase I and Phase II permittees that elect Track 2, (2) Caltrans, and (3) IGP permittees that elect implementation provisions similar to Track 2. The proposed final Trash Amendments define full capture system equivalency as:

> [T]he trash load that would be reduced if full capture systems were installed, operated, and maintained for all storm drains that capture runoff from the relevant areas of land (priority land uses, significant trash generating areas, facilities or sites regulated by NPDES permits for discharges of storm water associated with industrial activity, or specific land uses or areas that generate substantial amounts of trash, as applicable). The full capture system equivalency is a trash load reduction target that the permittee quantifies by using an approach, and technically acceptable and defensible assumptions and methods for applying the approach, subject to the approval of permitting authority.

During the public participation process for the Trash Amendments, many commenters requested clarification as to how Track 1 equivalency could be determined. While the permittee is responsible for determining the trash load reduction target, the proposed final Trash Amendments provide two examples of approaches that a permittee could use to determine full capture system equivalency: a trash capture rate approach and a reference approach. Other approaches may be more appropriate for any individual permittee's situation. The two methods identified in the amendment include:

> (1) Trash Capture Rate Approach. Directly measure or otherwise determine the amount of Trash captured by full capture systems for representative samples of all similar types of land uses, facilities, or areas within the relevant areas of land over time to identify specific trash capture rates. Apply each specific trash capture rate across all similar types of land uses, facilities, or areas to determine full capture system equivalency. Trash capture rates may be determined either through a pilot study or literature review. Full capture systems selected to evaluate trash capture rates may cover entire types of land uses, facilities, or areas, or a representative subset of types of land uses, facilities, or areas. With this approach, full capture system equivalency is the sum of the products of each type of land use, facility, or area multiplied by trash capture rates for that type of land use, facility, or area.

(2) Reference Approach. Determine the amount of trash in a reference receiving water in a reference watershed where full capture systems have been installed for all storm drains that capture runoff from all relevant areas of land. The reference watershed must be comprised of similar types and extent of land uses (including priority land uses and all other land uses), facilities, or areas as the permittee's watershed. With this approach, full capture system equivalency would be demonstrated when the amount of trash in the receiving water is equivalent to the amount of trash in the reference receiving water.

As an example, an MS4 Phase I or Phase II permittee could determine trash capture rates for representative types of priority land uses where full capture devices had already been installed (e.g. for high density residential, commercial, industrial, mixed urban, and transportation station land uses). The trash capture rate should be expressed as an amount of trash captured per time per area (e.g., pounds of trash per day per acre). The permittee could determine these trash capture rates by directly measuring the amount of trash collected by full capture systems over a defined period of time, such as 6 months, in each of the representative priority land use types. The representative land use types could be either the entire land use or a subset of a land use. The permittee could also utilize trash capture rates for similar land uses in other jurisdictions that have conducted trash capture rate studies, such as through a trash or debris TMDL.

Once the permittee has determined representative trash capture rates, those representative trash capture rates are applied to all similar priority land uses, where for instance the trash capture rate for high density residential is multiplied by the total area of all high density residential land uses in the permittee's jurisdiction. The full capture system equivalency would be determined by summing the trash capture loads for all priority land uses. The trash reduction target should be expressed as the amount of trash captured per time, e.g., pounds of trash per day or tons of trash per year.

The Trash Capture Rate Approach is focused on quantifying the amount of trash capture in particular land uses or location. Alternatively, the Reference Approach is focused on the condition of the receiving water by assessing and comparing the trash conditions of a reference receiving water with the receiving water from the permittee's jurisdiction. The permittee determines the amount of trash in a reference receiving water within a reference watershed where full capture systems have been installed for all storm drains that capture runoff from all relevant areas of land (e.g., priority land uses, significant trash generating areas, or facilities or sites). This means the reference watershed must be comprised of similar types and extent of land uses (including priority land uses and all other land uses), facilities, or areas as the permittee's watershed. The Reference Approach would be best executed using a reference receiving water that has a fully or nearly full implemented trash or debris TMDL.

Within the scope of the Trash Amendments, full capture system equivalency must be established after the permittee elects Track 2 or implementation provisions similar to Track 2 prior to implementation of trash controls. The details of how the selected controls are designed to achieve full capture system equivalency and how full capture system equivalency will be demonstrated are to be included in the permittee's

implementation plan. The implementation plan is subject to the approval of the permitting authority. Therefore, the permitting authority has the discretion to require changes to the quantification of full capture system equivalency. As trash controls are implemented, the focus of monitoring program is to assess and monitor the progress towards achievement of the full capture system equivalency, and thus the prohibition of discharge.

### 2.4.2 Nonpoint Source Dischargers

Under the proposed final Trash Amendments, nonpoint source dischargers subject to WDRs or waivers of WDRs, and not covered under an NPDES permit, may-be required, at the discretion of the Water Board, to implement any appropriate trash controls in areas or facilities that generate substantial amounts of trash (e.g., high usage campgrounds, picnic areas, or beach recreation areas). Trash control requirements for such nonpoint dischargers would be discharger specific, varying from treatment controls to institutional controls.

## 2.5 Time Schedule

Compliance with the water quality objective and plan for implementing the prohibition of discharge would be demonstrated by permittees in accordance with a time schedule set forth in the proposed final Trash Amendments. The time schedule would be contingent on the effective date of the first implementing permit (whether such permit is ~~re-opened modified,~~ re-issued, or newly adopted). MS4 Phase I and II permittees with regulatory authority over land uses complying under Track 1 or Track 2 would have ten years from the effective date of the implementing permit to demonstrate full compliance with Track 1 or Track 2, as the case may be. New development within a MS4 Phase I and Phase II permittee's jurisdiction must be built to immediately comply with Track 1 or Track 2, whichever Track was selected by the permittee.

For MS4 Phase I and Phase II permittees that are newly designated as part of an existing MS4 it may not be feasible to expect compliance within ten years from the effective date of the first implementing permit (e.g., where designation occurs nine years after the first implementing permit). To address this, the proposed final Trash Amendments have been clarified so that for MS4 Phase I and Phase II permittees that are designated after the effective date of the Trash Amendments, full compliance must be demonstrated within ten years of the effective date of the designation.

The time schedule in the proposed final Trash Amendments does not apply to MS4 permittees subject to the San Francisco Bay MRP, because that permit already requires control requirements substantially equivalent to Track 2. As a result, those MS4 permittees need not elect whether they will proceed with Track 1 or Track 2. Additionally, many of those MS4 permittees have already submitted a Short-Term Trash Load Reduction Plan and Long-Term Trash Load Reduction Plan that may be equivalent to the implementation plan required by the Trash Amendments. In order to reduce duplicative efforts, the Trash Amendments' requirement that MS4 permittees submit implementation plans does not apply to a San Francisco Bay MRP permittee if the San Francisco Bay Water Board determines that the Short-Term Trash Load Reduction Plan and Long-Term Trash Load Reduction Plan for that permittee are equivalent to the implementation plan required by the Trash Amendments.

For Non-Traditional Small MS4s permittees or other land uses or areas within an MS4 that determined by the Water Boards to generate substantial amounts of trash and require trash controls, the Water Boards has the discretion to determine the time schedule for compliance with a maximum allotment of ten years from the determination. The determined time schedules for these areas should be relative to the size of the area and type of trash controls.

Caltrans, too, would have ten years from the effective date of its implementing permit to demonstrate compliance. For MS4 Phase I and II permittees with regulatory authority over land uses and Caltrans, in no case would their final compliance date be later than fifteen years from the effective date of the proposed final Trash Amendments. Within the ten-year compliance periods discussed above, the Water Board can set interim compliance milestones within a specific permit. These interim milestones could be set, for example, as a percent reduction or percent installation per year.

Industrial and construction permittees would need to demonstrate full compliance within the deadlines specified in their respective implementing permits. Such deadlines may not exceed the terms of the first implementing permits (whether such permits are ~~re-opened~~ modified, re-issued or newly adopted).

Reaching full compliance with the prohibition of discharge would require planning efforts on the part of MS4 Phase I, MS4 Phase II, and Caltrans permittees. To assist in effective planning, within 18 months of the effective date of the proposed final Trash Amendments the applicable Water Board would issue a Water Code section 13267 or 13383 order to its MS4 Phase I and MS4 Phase II permittees requesting notification within three months of each permittees' elected compliance track (i.e., either Track 1 or Track 2). If a permittee elects to comply under Track 2, then such a permittee needs to submit an implementation plan to the applicable Water Board within 18 months of receiving the 13267 or 13383 order.

To assist Caltrans with its planning efforts, the State Water Board would issue a Water Code section 13267 or 13383 order within 18 months of the effective date of the proposed final Trash Amendments requesting an implementation plan.

### 2.6 Time Extension for Achieving Full Compliance ~~(Option for Board Consideration)~~

~~As drafted, the proposed Trash Amendments provide an option for State Water Board consideration of a time extension for MS4 Phase I and II permittees with regulatory authority over land uses to achieve final compliance with either Track 1 or Track 2. The time extension option is proposed for State Water Board consideration in order to receive public comment and feedback on the pros and cons of this approach.~~

~~As currently drafted, the Water Board could, at its discretion, provide no more than three-years' worth of time extensions for final compliance, with up to one-years' worth of time extension for each regulatory source control adopted by a MS4 Phase I or II permittees with regulatory authority over land uses. To be eligible for the proposed time extension, the regulatory source control must take effect prior to or within three years of the effective date of the proposed Trash Amendments. Regulatory source control efforts~~

~~could consist of bans of single-use consumer products such single-use carryout bags and expanded polystyrene foam.~~

The proposed draft Trash Amendments provided a time extension to MS4 Phase I and II permittees with regulatory authority over land uses for each regulatory source control adopted by a MS4 Phase I or II permittee. Each regulatory source control adopted by a permittee could provide such permittee with a one-year time extension to achieve final compliance with either Track 1 or Track 2. The time extension option was proposed to receive public input on the potential advantages and disadvantages to this approach.

However, subsequent to the State Water Board's public workshop and the public hearing on the proposed Trash Amendments, Senate Bill 270 (2014 Stats. Ch. 850) was enacted. That new law enacts a state-wide plastic bag carry-out ban pertaining to grocery stores and pharmacies that have a specified amount of sales in dollars or retail floor space, which goes into effect July 1, 2015, and imposes the same ban on convenience stores and liquor stores a year later. The new law will implement a product ban, which was generally the type of regulatory source control contemplated by the State Water Board and discussed with the public with regard to consideration of the time extension option. Essentially, enactment of Senate Bill 270 removed the need for regulatory source controls, particularly product bans that would reduce trash, in the proposed Trash Amendments. As a result, the proposed final Trash Amendments omit "regulatory source controls" from a method to comply with Track 2 and omit any corresponding allowance of time extensions.

### 2.7 Monitoring and Reporting Requirements

Under the proposed final Trash Amendments, the Water Boards would require monitoring and reporting requirements (with monitoring objectives) in MS4 Phase I, MS4 Phase II, and Caltrans permits to ensure adequate trash control. The requirements in the proposed final Trash Amendments represent the minimum requirements to be included in such permits.

The proposed monitoring requirements vary among NPDES storm water permits and tailored to the type of compliance option and permittee. For example, MS4 permittees complying under Track 1 (by installing, maintaining, and operating a network of full capture systems in the priority land uses) would not have minimum monitoring requirements. Instead, permittees would need to provide an annual report to the applicable Water Board demonstrating installation, operation, and maintenance of full capture systems. The annual report would include a Geographic Information System (GIS) based map depicting the locations of each installed full capture system and the drainage area that serves each full capture system. The reporting requirements could be included into annual reports requested by the Water Board.

MS4 permittees complying under Track 2, on the other hand, do have minimum monitoring requirements. They would develop and implement annual monitoring that demonstrate the ~~mandated performance results,~~ effectiveness of the selected combination of treatment and institutional controls~~,~~ and compliance with full capture system equivalency ~~the equivalency to Track 1~~. Such permittees would be required to submit~~The annual~~ a monitoring report ~~would be provided~~ to the applicable Water Board on an annual basis. The monitoring ~~and the~~ reports ~~would~~must include a GIS map

depicting with the locations and drainage area served by of each treatment control, institutional control, and/or multi-benefit project. In addition to the GIS map, the annual monitoring report would should consider a number of questions designed to demonstrate the effectiveness of the selected controls and compliance with full capture system equivalency. The monitoring objectives address the types of controls utilized and the effectiveness of the selected controls. Additionally, monitoring would address whether the amount of trash discharged from the MS4 has decreased from the previous year. The monitoring objectives are intended to Using a questions-based approach provides flexibility to the permit writers to select the most relevant monitoring techniques and expectations for their respective permits.

The proposed final Trash Amendments would require the Caltrans permit to contain monitoring requirements that Caltrans develop and implement annual monitoring reportsplans that demonstrate the mandated performance results, effectiveness of the selected combination of treatment and institutional controls, and compliance with full capture system equivalency the performance standard. The annual monitoring reports would be provided to the State Water Board and the reports wouldmust include a GIS map with the locations of each of the treatment controls and multi-benefit projects institutional controls. In addition to the GIS map, each annual monitoring report should consider a number of questions designed to demonstrate the effectiveness of the selected controls and compliance with full capture system equivalency. would address at set of monitoring objectives. The monitoring objectives address the types of controls utilized and the effectiveness of the selected controls. Additionally, monitoring should address whether the amount of trash discharged by Caltrans' MS4 has decreased from the previous year.

The IGP and CGP are statewide permits that regulate discharges of storm water and authorized non-storm water discharges associated with very specific industrial activities. These permits apply to thousands of projects with diverse features and characteristics between facilities and sites. As such, prescribing appropriate and consistent trash monitoring and reporting requirements for all permittees poses significant challenges. While the proposed final Trash Amendments do not contain trash monitoring requirements for IGP and CGP permits, permittees would could, however, be required to report the measures used to either (1) achieve the outright prohibition or (2) achieve equivalent trash control through alternative methods. The reporting would occur in reissuances or through regional water board actions aimed at adding monitoring and requirements to permittees. Additional trash monitoring and reporting can be required through existing authorities in the California Water Code, and in some cases directly through language in the IGP and CGP.

### 2.8 Full Capture System Certification

At present, the Los Angeles Water Board oversees a full capture system certification process (Bishop 2004, 2005, 2007, Dickerson 2004, Smith 2007, Unger 2011). In addition, the San Francisco Water Board evaluated effectiveness of full capture systems listed in Appendix I of the Bay Area-wide Trash Capture Demonstration Project (Demonstration Project), Final Project Report (San Francisco Estuary Partnership 2014). For statewide consistency, the State Water Board would take responsibility for the certification process for new full capture systems. The process for the certification

would follow a similar process established by the Los Angeles Water Board (Yang 2004). Prior to installation, the full capture systems must be certified by the Executive Director, or designee, of the State Water Board. Uncertified systems will not satisfy the Trash Amendments. To request certification, the permittee would submit a certification request letter, including supporting documentation, to the State Water Board's Executive Director. The Executive Director or designee will issue a written response either approving or denying the proposed certification. ~~but~~ However, to ensure efficient use of resources and prevent municipalities from having to remove properly functioning capture systems, ~~those~~ full capture systems previously certified by the Los Angeles Water Board or identified by the Demonstration Project would ~~remain~~ be considered certified for use by permittees ~~as a compliance method.(Bishop 2004, 2005, 2007, Dickerson 2004, Smith 2007, Unger 2011). Full capture systems listed Appendix I of the Bay Area-wide Trash Capture Demonstration Project, Final Project Report (San Francisco Estuary Partnership 2014) prior to the effective date of the Trash Provisions willbe considered as certified full capture systems.~~

### 2.9 Reasonably Foreseeable Methods of Compliance

The State Water Board's SED for the proposed project is required to include an analysis of the reasonably foreseeable methods of compliance with the project (see 23 CCR 3777; Pub. Res Code ~~Section~~ § 21159). Although the State Water Board is not required to conduct a site-specific project level analysis of the methods of compliance (23 CCR 3777(c); Pub. Res Code ~~Section~~ § 21159(d)), a general description of the reasonably foreseeable methods of compliance is contained in Section 5 of the ~~Draft~~ proposed Final Staff Report.

### 2.10 Location and Boundaries of the Proposed Project

The State CEQA Guidelines require identification of "the precise location and boundaries of the proposed project [to be] shown on a detailed map" (14 CCR 15124(d)). The location of the State Water Board's proposed project to adopt the Trash Amendments is all surface waters of the State, with the exception of waters within the jurisdiction of the Los Angeles Water Board for which trash TMDLs are in effect prior to the effective date of the Trash Amendments. This necessarily includes the geographies of the nine regional water boards within California, as set forth in the Environmental Setting section and the maps located therein (Section 3) of the ~~Draft~~ proposed Final Staff Report.

### 2.11 Agencies Expected to use this Staff Report in their Decision Making and Permits

The State CEQA Guidelines require that the project description include, among other things, "a statement briefly describing the intended uses of the EIR" (14 CCR 15124(d)). The State Water Board will use this ~~Draft~~ proposed Final Staff Report in determining whether to adopt the proposed final Trash Amendments. A Water Board may use the information contained within this ~~Draft~~ proposed Final Staff Report for future decision making and/or permitting. Furthermore, in order to achieve the water quality objective, all NPDES permits would contain provisions to implement the proposed final Trash Amendments. Therefore, if the proposed project is approved, the following entities,

where they are considered public agencies for purposes of CEQA, may be considered Responsible Agencies and may use the Final SED adopted by the State Water Board in their decision making actions to comply with the proposed final Trash Amendments:

- NPDES permitted storm water dischargers
- Dischargers with WDRS or ~~W~~waivers of WDRs
- Water Boards

### 2.12 Other Approvals Required to Implement the Trash Amendments

Except as may be required by other environmental review and consultation requirements as described below, no other agency approvals are expected to be required to implement the proposed final Trash Amendments. However, governing bodies of NPDES permittees may determine that separate approval actions are necessary to formally approve the approach they would take to comply with permits that implement the proposed final Trash Amendments (e.g., whether to comply under Track 1 or Track 2). Beyond analyzing the reasonably foreseeable methods of compliance, the ~~Draft~~ proposed Final Staff Report is not required to, and therefore does not analyze the detail related to the project specific actions that might be implemented by any particular permittee as a result of the State Water Board's proposed project (see 23 CCR 3777(c); Pub. Res Code ~~Section~~ § 21159(d)).

After adoption by the State Water Board, the Trash Amendments must be submitted to the California Office of Administrative Law for review and approval. Because the Trash Amendments include the adoption of a new water quality standard, they must also be approved by U.S. EPA.

### 2.13 Environmental Review and Consultation Requirements

As described in other portions of the ~~Draft~~ proposed Final Staff Report, depending on the location, size, and particular compliance method, reasonably foreseeable methods of compliance could involve impacts to specific environmental resources that may trigger related environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies. Since the ~~Draft~~ proposed Final Staff Report does not conduct a project-level analysis of the reasonably foreseeable methods of compliance, it is not possible to determine the specific environmental review and consultation requirements required by federal, state, or local laws, regulations, or policies (nor the particular magnitude of any specific environmental impact). Compliance with any specific environmental review and consultations would need to be conducted by the MS4s or NPDES permittees complying with the provisions in their permits that incorporate the requirements of the proposed final Trash Amendments.

### 2.14 Public Process

#### Initial Scoping Meetings

In July 2007, the first scoping meeting was held in San Francisco to provide opportunity for public comment on several proposed Ocean Plan projects, including trash in ocean waters. Oral and written comments were received, but development of a trash project was delayed due to shifting resources to other priority plans and policies.

A subsequent scoping meeting was conducted to provide an additional forum for public comment on the preparation of ~~this~~ the Draft Staff Report for breadth of a Statewide Policy for Trash Control in Waters of the State. State Water Board staff held scoping meetings on October 7, 2010, at Central Valley Water Quality Control Board Headquarters in Rancho Cordova, California, and on October 14, 2010, at Inland Empire Utility Agency Headquarters in Chino, California. Comments were provided by stakeholders regarding the scope and content of the environmental information required by federal and state regulations. Additionally, information was submitted on the range of actions, alternatives, mitigation measures, and possible significant effects to be analyzed within this document. Since that time, the scope of the project has transition from a statewide policy to amendments to statewide water quality control plans.

On March 15, 2011, in Resolution 2011-0013, the State Water Board adopted the Ocean Plan Triennial Review Workplan for the period 2011-2013. In the Triennial Review Workplan, the State Water Board made the regulation of plastic debris and other trash a very high priority.

**Public Advisory Group**

As part of the scoping process and in response to the Scoping Meeting, State Water Board staff convened a Public Advisory Group to assist with the initial development of the Trash Amendments. The Public Advisory Group consisted of a diverse group of stakeholders representing municipalities, Caltrans, industry, and environmental groups. The Public Advisory Group included:

- Sean Bothwell, California Coastkeeper Alliance
- Geoff Brosseau, The California Stormwater Quality Association
- Miriam Gordon, Clean Water Action
- Gary Hildebrand, Los Angeles County
- Kirsten James, Heal the Bay
- Scott McGowen, Caltrans
- Charles Moore, Algalita Marine Research Institute
- Tom Reeves, City of Monterey
- Tim Shestek, American Chemistry Council
- Leslie Tamminen, Seventh Generation Advisors

The Public Advisory Group held six meetings closed to the public to discuss the proposed Trash Amendments (Table 2). At these meetings, the Public Advisory Group provided comments and feedback to the development of the proposed Trash Amendments and the Draft Staff Report.

**Table 2.** Public Advisory Group.

| Date | Location |
|---|---|
| March 6, 2013 | CalEPA Bldg, Sacramento |
| August 13, 2012 | CalEPA Bldg, Sacramento |

| | |
|---|---|
| May 22, 2012 | CalEPA Bldg, Sacramento |
| October 12 & 13, 2011 | Cabrillo Aquarium, San Pedro |
| August 30, 2011 | CalEPA Bldg, Sacramento |
| July 26, 2011 | CalEPA Bldg, Sacramento |

**Focused Stakeholder Outreach Meetings**

In March, April, and May 2013, State Water Board staff held fourteen focused meetings with stakeholders from industry, municipal governments, environmental interest groups, and staff from the San Francisco Water Board, Los Angeles Water Board, Caltrans, and CalRecycle (Table 3). The objective of the meetings was to provide an overview of the development of the proposed Trash Amendments and to receive feedback on key issues before the public release of the Draft Staff Report for the proposed Trash Amendments from focused sets of stakeholders. Selected meeting participants were provided an issue paper that provided an overview of the fundamentals of the proposed Trash Amendments and five key unresolved options to discuss regarding the content of the proposed Trash Amendments. The five unresolved options included:

1) Options to address the existing trash TMDLs and the San Francisco Bay Region Municipal Regional Storm Water Permit.
2) Options regarding the level of specificity to include in the Track 2 monitoring plan requirements.
3) Options for full capture system definition.
4) Options for incentivizing regulatory source controls.
5) Considerations regarding preproduction plastics.

**Table 3.** Focused Stakeholder Meetings.

| Stakeholder Group | Meeting Date and Location |
|---|---|
| Caltrans | 3/13/13 Sacramento, CA |
| Industrial Permittees | 4/3/13 Sacramento, CA |
| Environmental Groups | 4/3/13 Sacramento, CA |
| Los Angeles Water Board | 4/5/13 Los Angeles, CA |
| MS4 Permittees | 4/8/13 Sacramento, CA |
| MS4 Permittees | 4/10/13 Santa Rosa, CA |
| MS4 Permittees | 4/15/13 San Jose, CA |

| | |
|---|---|
| MS4 Permittees | 4/16/13 San Luis Obispo, CA |
| MS4 Permittees | 4/19/13 Santa Clarita, CA |
| MS4 Permittees | 4/22/13 Costa Mesa, CA |
| CalRecycle | 5/15/13 Sacramento, CA |
| Industrial Permittees | 5/17/13 Riverside, CA |
| San Francisco Bay & Los Angeles Water Board MS4 Permittees | 5/24/13 Sacramento, CA |
| San Francisco Bay Water Board | 5/24/13 Sacramento, CA |

**Public Workshop and Public Hearing**

On June 10, 2014, the State Water Board provided the Draft Staff Report, including the Draft SED for the proposed Trash Amendments to the public and public with an accompanying notice of the dates the State Water Board would hold a public workshop and a public hearing.

On July 16, 2014, State Water Board held a public workshop at the Cal/EPA Headquarters Building in Sacramento. The purpose of the public workshop was to provide information and answer questions from the public on the proposed Trash Amendments; no action was taken by the State Water Board. At the public workshop, State Water Board staff presented an overview of the proposed Trash Amendments. The staff presentation was followed by three presentations from PAG members: 1) Algalita Marine Research Institute, California Coastkeeper Alliance, Heal the Bay, and Seventh Generation Advisors, 2) American Chemistry Council, and 3) CASQA. In addition to presentations, fourteen groups provided public comment.

The State Water Board held a public hearing on the proposed Trash Amendments on August 5, 2014 at the Cal/EPA Headquarters Building in Sacramento, the date of which coincided with the close of the written comment period. The purpose of the public hearing was to receive oral comments and testimony on the proposed Trash Amendments, Draft Staff Report, including the Draft SED. Participants were given an opportunity to supplement their written comments with oral statements. No action was taken by the State Water Board. At the public hearing, there was a staff presentation and twenty-three groups provided public comment. At the close of the comment period at noon on August 5th, a total of seventy-six written comment letters were received. The State Water Board shall develop complete written response to the written comments timely received within the August 5th deadline.

### 2.15 Project Contact

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# 3 ENVIRONMENTAL SETTING[11]

A variety of environmental conditions exist in California. For water quality management, ~~S~~section 13200 of Porter-Cologne divides the state into nine different hydrologic regions. Brief descriptions of the regions and the water bodies addressed by this ~~Draft~~ proposed Final Staff Report are presented below. The information provided in this section is extracted from the ten basin plans created by each of the nine regional water boards. In addition to a description of each region, the land coverage of each region is addressed. This analysis provides an estimate of the area across California where NPDES permittees, specifically land uses for MS4 Phase I and MS4 Phase II permittees, with the exception of waters with existing trash and debris TMDLs within the jurisdiction of the Los Angeles Water Board, would have to comply with the prohibition of discharge for trash and the implementation provisions.

## 3.1 Trash in California

Throughout California, trash is found in streams, rivers, lakes, estuaries, beaches, and the ocean. The continued presence of trash in state waters is shown through data from the California Coastal Commission and Ocean Conservancy organized Coastal Cleanup Day. Since 1986, volunteers have collected trash from beaches, inland waterways, coastal waters, and underwater. Volunteers have removed approximately 690,322 pieces of trash from up to 2,023 miles of Coastal Cleanup sites. The top ten items collected from 1989-2012, which represented nearly 90 percent of the items removed, were: (1) cigarette butts; (2) bags (paper and plastic); (3) food wrappers and containers; (4) caps and lids; (5) cups, plates, forks, knives, and spoons; (6) straws and stirrers; (7) glass beverage bottles; (8) plastic beverage bottles; (9) beverage cans; and (10) building materials. The snapshot of the trash collected from Coastal Cleanup Day provides a clear baseline of trash pollution throughout the surface waters in California.

To address trash pollution, municipalities across California spend about half a billion dollars each year to combat, clean up, and prevent trash from entering state waters (Stickel et. al 2013). There are six main trash-control strategies employed by a municipality: waterway and beach cleanup, street sweeping, installation of full capture devices, storm drain cleaning and maintenance, manual cleanup of trash, and public education.

While municipalities employ at least a minimal amount of trash management, there are several regions with comparatively more extensive management strategies. In the Los Angeles and San Francisco Bay regions, municipalities have extensive trash control measures in response to 303(d) listed water bodies for trash and debris. The Los Angeles Water Board has adopted fifteen TMDLs with a numeric target of zero trash.

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[11] CEQA directs that the environmental setting normally be used as the baseline for determining significant impacts of a proposed project (Cal. Code Regs., tit.14, §15125, subd. (a)). This section presents a broad overview of the environmental setting for the state of California related to the proposed final Trash Amendments. The section presenting the impact analysis in this ~~Draft~~ proposed Final Staff Report, including ~~Draft~~ SED will identify, where relevant, any specific setting information relevant to the detailed assessment of environmental impacts of the proposed action.

While the San Francisco Bay ~~Area~~ MRP applies trash provisions to 76 municipalities to address the 27 303(d) listed water bodies in the region. Caltrans has multiple trash management strategies such as installation of gross separation systems, street sweeping, manual collection of trash with the Adopt-A-Highway Program, and public education with Don't Trash California. The CGP (2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ) prohibits the discharge of any debris from construction sites and encourages the uses of more environmentally safe, biodegradable materials on construction sites. Facilities enrolled under the IGP must comply with the "Preproduction Plastic Debris Program" (Wat. Code § 13367(a)) by following the BMPs in the manufacturing, handling, and transporting of preproduction plastics.

The presence of trash and efforts to address trash in California are described in further detail in Appendix A.

### 3.2 Developed Land by Land Cover and Regional Water Board

The proposed final Trash Amendments focus on areas with high trash generation rates, i.e., priority land uses for MS4 Phase I and Phase II permittees and significant trash generating areas for Caltrans. There is no existing data on the location of priority land uses are. A GIS analysis was used to determine the possible geographic scope of the proposed final Trash Amendments. Land cover data within census designated places and regional water board boundaries were used to provide an estimate the area covered under the proposed final Trash Amendments. These estimates do not represent exact locations for trash controls, but provide an approximate area. The U.S. Census Bureau uses census designated places to delineate settled concentrations of population that are identifiable by name but are not legal designations incorporated under the laws of the state. Census designated places are delineated cooperatively by state and local officials and the Census Bureau before each Decennial Census. The 2012 Census Designated Places boundary (the legal boundary designation as of January 1, 2012) shapefile can be accessed at: http://www.census.gov/geo/maps-data/data/tiger-line.html. The 2012 California Census Designated Place category identified 1517 cities, with a total area of 9,621,423 acres (Figure 1).

Since counties do not have a uniform classification of land cover codes or divisions, urban land cover data was extracted from USGS Multi-Resolution Land Characteristics Consortium Land Cover Data 2006. The data can be accessed at: http://www.mrlc.gov/nlcd2006.php. To estimate the area covered under the proposed final Trash Amendments, Land Use/Land Cover categories for developed low intensity, medium intensity, and high intensity were identified:

- Land Use (LU) 22 or "Developed, Low Intensity". This is defined as developed low intensity includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-49 percent of total cover. These areas most commonly include single-family housing units.

- Land Use (LU) 23 or "Developed, Medium Intensity". This is defined as developed medium intensity includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-79 percent of

the total cover. These areas most commonly include single-family housing units.

- Land Use (LU) 24 is “Developed, High Intensity”. This is defined as developed high intensity includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80-100 percent total cover.

Although there was a lack of statewide consistency in land use planning and GIS data from individual municipalities, “Developed, High Intensity” was assumed to be analogous proxy to the priority land uses of the proposed final Trash Amendments: high density residential, industrial, commercial, mixed urban, and public transportation stations. A representative estimate for Caltrans’ significant trash generating areas was not included in the estimate. Additionally, the priority land uses does not include low density residential, as represented by “Developed, Low Intensity”.

The number of acres for the three developed land cover classes was calculated for each regional water board (Figure 2,

Table 4). Distribution of land cover classes varies by regional water board. The Central Valley Water Board has the most total acreage, but a very low percentage of Central Valley Region total area is highly developed (2.38 percent). Higher coverage of developed land is generally seen in the southern coastal regions. The Los Angeles Water Board has the most acres of high intensity developed area (4.09 percent), while the Santa Ana Water Board has the highest number of total developed acres (28.74 percent) (Table 5). The number of acres for the three classes was also calculated within census designated place boundaries (Table 5). As with the total regional water board area, distribution of land cover classes with census designated places varies by a regional water board. When only considering areas with concentrated populations (i.e., within census designated places), Los Angeles Water Board has the most developed acres as well as the highest percentage of medium intensity, high intensity, and total developed land, followed closely by Santa Ana Water Board (Table 6). As previously noted, many of the priority land uses with the Los Angeles Water Board have waste load allocations for trash or debris TMDLs, and thus not applicable to the proposed final Trash Amendments.

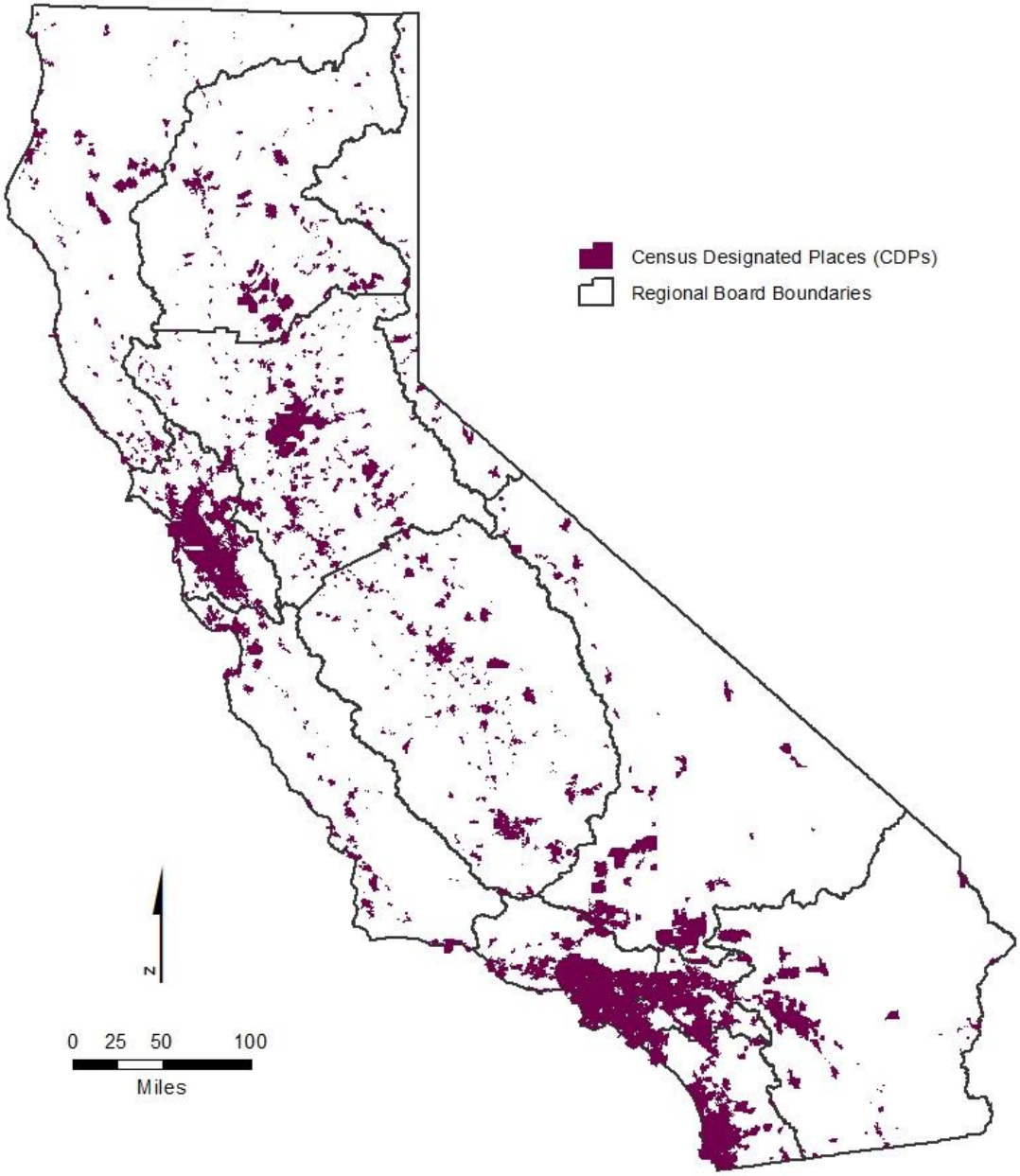



**Figure 1.** 2012 California Census Designated Places.

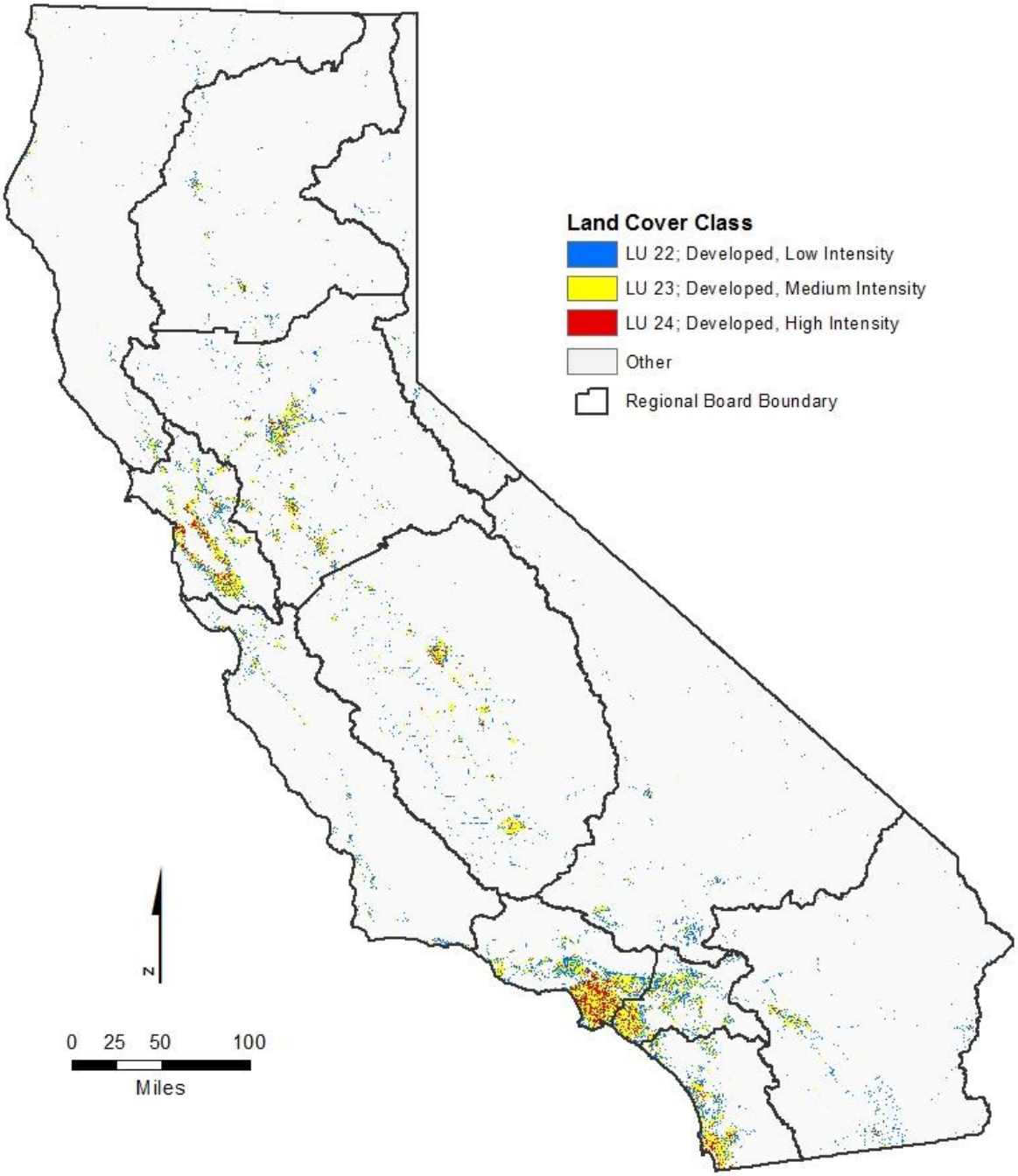



**Figure 2.** Developed Land Coverage by Regional Water Boards.

**Table 4.** Acres of Developed Land by Land Cover and Regional Water Board.

| Regional Water Board | Developed, Low Intensity (acres) | Developed, Medium Intensity (acres) | Developed High Intensity (acres) | Other (acres) | Total (acres) |
|---|---|---|---|---|---|
| North Coast | 53,897 | 28,435 | 3,362 | 12,355,869 | 12,441,564 |
| San Francisco Bay | 189,894 | 283,806 | 79,220 | 2,339,394 | 2,892,314 |
| Central Coast | 96,760 | 65,716 | 7,371 | 7,183,662 | 7,353,509 |
| Los Angeles | 234,649 | 369,182 | 116,470 | 2,127,311 | 2,847,612 |
| Central Valley | 422,468 | 394,517 | 88,186 | 37,075,180 | 37,980,350 |
| Lahontan | 124,387 | 38,374 | 5,517 | 20,818,762 | 20,987,040 |
| Colorado River | 119,633 | 56,414 | 6,829 | 12,528,939 | 12,711,815 |
| Santa Ana | 216,149 | 256,567 | 42,048 | 1,276,620 | 1,791,384 |
| San Diego | 153,175 | 196,314 | 41,780 | 2,092,315 | 2,483,584 |
| Total (acres) | 1,611,012 | 1,689,325 | 390,782 | 97,798,052 | 101,489,172 |

**Table 5.** Percent of Regional Water Board Designated as Developed Land by Land Cover Type.

| Regional Water Board | Developed, Low Intensity (%) | Developed, Medium Intensity (%) | Developed High Intensity (%) | Total Developed (%) |
|---|---|---|---|---|
| North Coast | 0.43% | 0.23% | 0.03% | 0.69% |
| San Francisco Bay | 6.57% | 9.81% | 2.74% | 19.12% |
| Central Coast | 1.32% | 0.89% | 0.10% | 2.31% |
| Los Angeles | 8.24% | 12.96% | 4.09% | 25.29% |
| Central Valley | 1.11% | 1.04% | 0.23% | 2.38% |
| Lahontan | 0.59% | 0.18% | 0.03% | 0.80% |
| Colorado River | 0.94% | 0.44% | 0.05% | 1.44% |
| Santa Ana | 12.07% | 14.32% | 2.35% | 28.74% |
| San Diego | 6.17% | 7.90% | 1.68% | 15.75% |

**Table 6.** Percent of Census Designated Places as Developed Land by Land Cover Type and Regional Water Board.

| Regional Board | Developed, Low Intensity (%) | Developed, Medium Intensity (%) | Developed High Intensity (%) | Total Developed (%) |
|---|---|---|---|---|
| 1 | 5.60% | 4.67% | 0.51% | 10.78% |
| 2 | 14.35% | 23.98% | 6.48% | 44.82% |
| 3 | 12.90% | 11.77% | 1.39% | 26.06% |
| 4 | 18.88% | 30.55% | 9.39% | 58.82% |
| 5R | 4.13% | 2.75% | 0.65% | 7.53% |
| 5S | 11.68% | 14.66% | 3.51% | 29.85% |
| 5F | 7.78% | 13.78% | 2.58% | 24.14% |
| 5 All | 8.50% | 11.33% | 2.48% | 22.31% |
| 6SLT | 8.26% | 1.92% | 0.55% | 10.73% |
| 6V | 7.06% | 2.89% | 0.35% | 10.30% |
| 6 All | 7.22% | 2.76% | 0.38% | 10.35% |
| 7 | 8.37% | 6.94% | 0.85% | 16.16% |
| 8 | 20.58% | 25.12% | 3.87% | 49.57% |
| 9 | 15.84% | 23.43% | 5.21% | 44.48% |

## 3.3 Permitted Storm Water Dischargers in California

The proposed final Trash Amendments includes implementation provisions for permitted storm water dischargers, specifically MS4 Phase I and II, Caltrans, IGP, and CGP permittees. In 2012-2013 Annual Performance Report[12], the Water Boards reported16,996 Storm Water facilities regulated under the Storm Water Construction, Storm Water Industrial and Storm Water Municipal Permits. The number of facilities and municipalities, separated by regional water board, are presented in Table 7.

**Table 7.** Facilities Regulated Under the California Water Board's Storm Water Program.

| Regional Water Board | Construction General Permittees | Industrial General Permittees | Municipal Storm Water Permittees (Phase I and II) | Total |
|---|---|---|---|---|
| North Coast | 179 | 337 | 14 | 538 |
| San Francisco Bay | 1,069 | 1,316 | 109 | 2,494 |
| Central Coast | 457 | 401 | 45 | 903 |
| Los Angeles | 1,193 | 2,683 | 100 | 3,976 |

[12] The California Water Boards' Annual Performance Report - Fiscal Year 2012-13 released on September 2013. http://www.waterboards.ca.gov/about_us/performance_report_1213/regulate/21200_npdes_sw_facilities.shtml

| | | | | |
|---|---|---|---|---|
| Central Valley | 1,614 | 1,745 | 95 | 3,454 |
| Lahontan | 379 | 230 | 10 | 619 |
| Colorado River | 253 | 172 | 19 | 444 |
| Santa Ana | 1,136 | 1,583 | 62 | 2,781 |
| San Diego | 924 | 784 | 79 | 1,787 |
| Total | 7,204 | 9,251 | 532 | 16,996 |

### 3.4 North Coast Region

The North Coast Region comprises all watershed basins, including Lower Klamath Lake and Lost River Basins, draining into the Pacific Ocean from the California-Oregon State line southern boundary and includes the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma Counties (Figure 3, Figure 4). Two natural drainage basins, the Klamath River Basin and the North Coastal Basin, divide the region. The region covers all of Del Norte, Humboldt, Trinity, and Mendocino Counties, major portions of Siskiyou and Sonoma Counties, and small portions of Glenn, Lake, and Marin Counties. It encompasses a total area of approximately 19,390 square miles, including 340 miles of coastline and remote wilderness areas, as well as urbanized and agricultural areas.

Beginning at the Smith River in northern Del Norte County and heading south to the Estero de San Antonio in northern Marin County, the region encompasses a large number of major river estuaries. Other North Coast streams and rivers with significant estuaries include the Klamath River, Redwood Creek, Little River, Mad River, Eel River, Noyo River, Navarro River, Elk Creek, Gualala River, Russian River, and Salmon Creek (this creek mouth also forms a lagoon). Northern Humboldt County coastal lagoons include Big Lagoon and Stone Lagoon. The two largest enclosed bays in the North Coast Region are Humboldt Bay and Arcata Bay (both in Humboldt County). Another enclosed bay, Bodega Bay, is located in Sonoma County near the southern border of the region. Distinct temperature zones characterize the North Coast Region. Precipitation is greater than for any other part of California, and damaging floods are a fairly frequent hazard. Ample precipitation in combination with the mild climate found over most of the North Coast Region has provided a wealth of fish, wildlife, and scenic resources. The numerous streams and rivers of the region contain anadromous fish and the reservoirs, although few in number, support both cold and warm water fish.

Tidelands and marshes are extremely important to many species of waterfowl and shore birds, both for feeding and nesting. Cultivated land and pasturelands also provide supplemental food for many birds, including small pheasant populations. Tideland areas along the north coast provide important habitat for marine invertebrates and nursery areas for forage fish, game fish, and crustaceans. Offshore coastal rocks are used by many species of seabirds as nesting areas.

Major land uses in the region are tourism and recreation; logging and timber milling; aggregate mining; commercial and sport fisheries; sheep, beef and dairy production; and vineyards and wineries. Approximately two percent of California's total population

resides in the North Coast region. The largest urban centers are Eureka in Humboldt County and Santa Rosa in Sonoma County.

Eight Areas of Special Biological Significance (ASBS) are located in the North Coast Region: Jughandle Cove (#1), Del Mar Landing (#2), Gerstle Cove (#3), Bodega (#4), Saunders Reef (#5), Trinidad Head (#6), King Range (#7), and Redwoods National Park (#8).

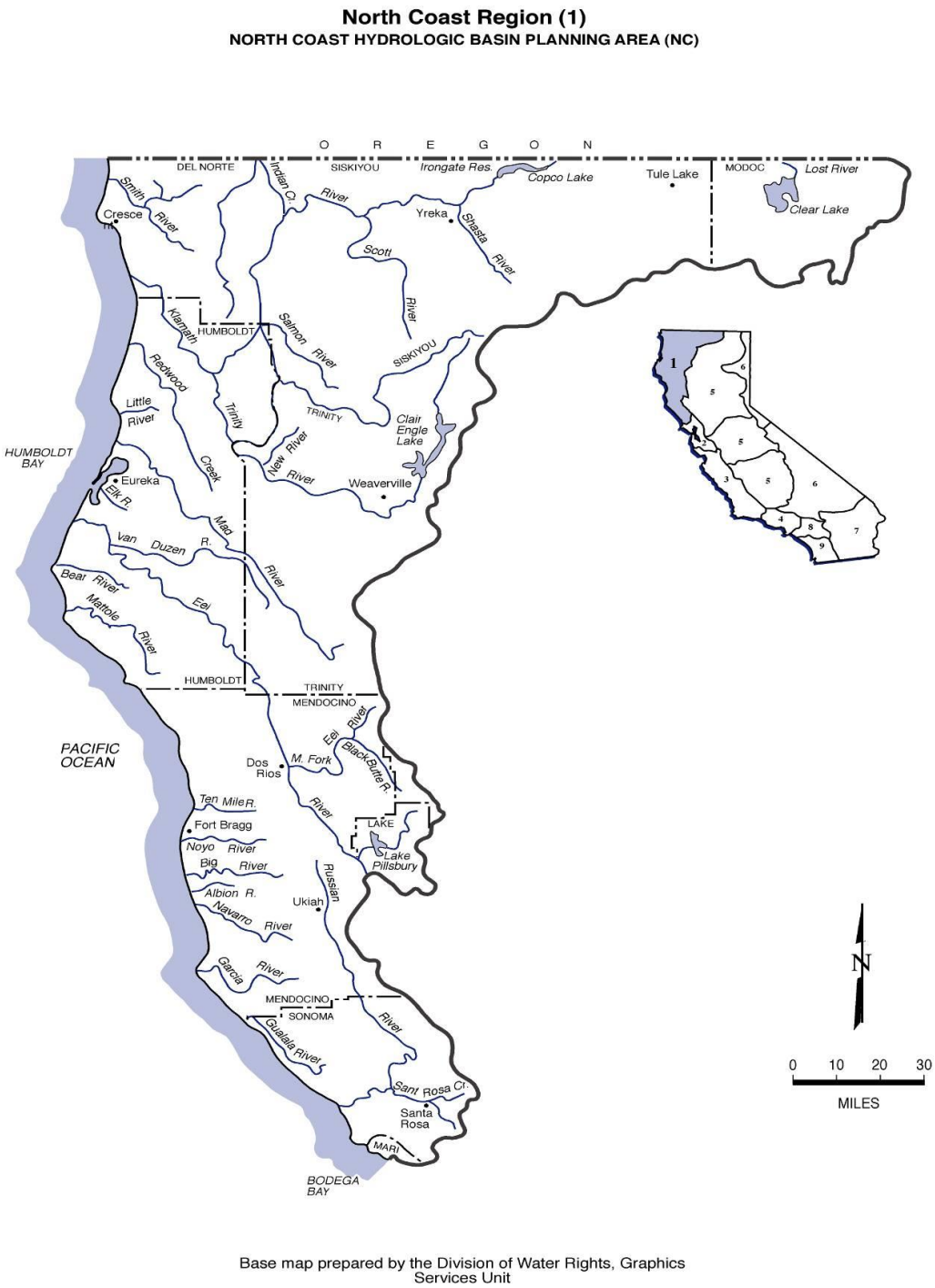



**Figure 3.** North Coast Region Hydrologic Basin.

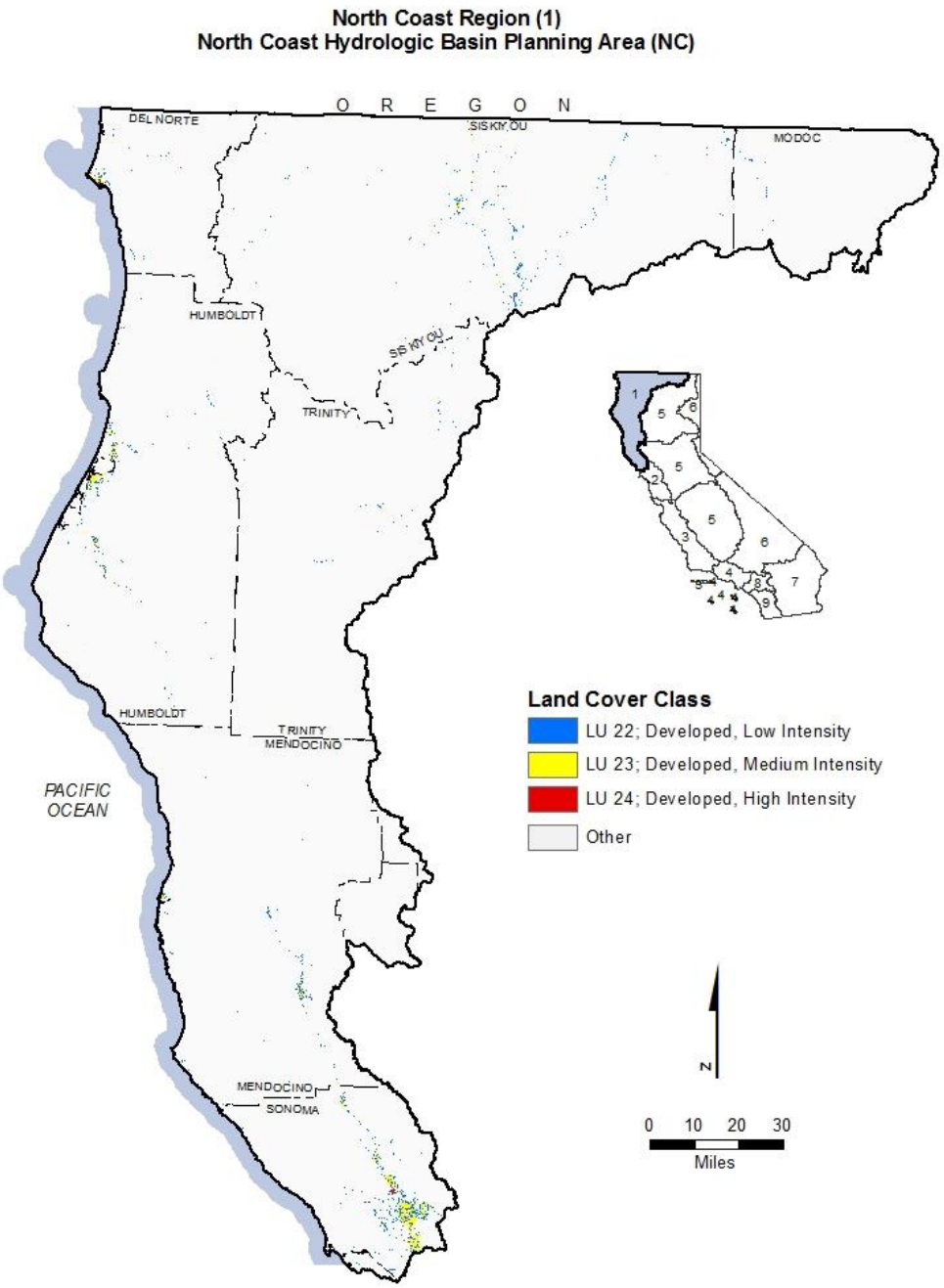



**Figure 4.** North Coast Region Developed Land Coverage.

### 3.5 San Francisco Region

The San Francisco Bay Region comprises San Francisco Bay, Suisun Bay beginning at the Sacramento River, and San Joaquin River westerly, from a line which passes between Collinsville and Montezuma Island (Figure 5, Figure 6). The region's boundary follows the borders common to Sacramento and Solano counties, and Sacramento and Contra Costa counties west of the Markely Canyon watershed in Contra Costa County. All basins west of the boundary and all basins draining into the Pacific Ocean between

the southern boundary of the North Coast Region and the southern boundary of the watershed of Pescadero Creek in San Mateo and Santa Cruz counties are included in the region.

The region comprises most of the San Francisco Estuary to the mouth of the Sacramento-San Joaquin Delta. The San Francisco Estuary conveys the waters of the Sacramento and San Joaquin Rivers to the Pacific Ocean. Located on the central coast of California, the San Francisco Bay system functions as the only drainage outlet for waters of the Central Valley. The region includes the fourth largest metropolitan area in the United States, including all or major portions of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties.

The San Francisco Water Board has jurisdiction over the part of the San Francisco Estuary, which includes all of the San Francisco Bay segments extending east to the Delta (Winter Island near Pittsburg). Within each section of the San Francisco Bay system lie deepwater areas that are adjacent to large expanses of very shallow water. Salinity levels range from hypersaline to fresh water and water temperature varies widely. The San Francisco Bay system's deepwater channels, tidelands, marshlands, fresh water streams, and rivers provide a wide variety of habitats within the Region. Coastal embayments including Tomales Bay and Bolinas Lagoon are also located in this Region.

The Sacramento and San Joaquin Rivers enter the San Francisco Bay system through the Delta at the eastern end of Suisun Bay and contribute almost all of the fresh water inflow into the Bay. Many smaller rivers and streams also convey fresh water to the Bay system. The rate and timing of these fresh water flows influence the physical, chemical and biological conditions in the Bay. Flows in the region are highly seasonal, with more than 90 percent of the annual runoff occurring during the winter rainy season between November and April.

The San Francisco Estuary is made up of many different types of aquatic habitats that support a great diversity of organisms. Suisun Marsh in Suisun Bay is the largest brackish water marsh in the United States. San Pablo Bay is a shallow embayment strongly influenced by runoff from the Sacramento and San Joaquin Rivers. The Central Bay is the portion of the Bay most influenced by oceanic conditions. The South Bay, with less freshwater inflow than the other portions of the Bay, acts more like a tidal lagoon. Together these areas sustain rich communities of aquatic life and serve as important wintering sites for migrating waterfowl and spawning areas for anadromous fish.

Six ASBS are located in the San Francisco Bay Region: James V. Fitzgerald (#9), Farallon Islands (#10), Duxbury Reef (#11), Point Reyes Headlands (#12), Double Point (#13), and Bird Rock (#14).

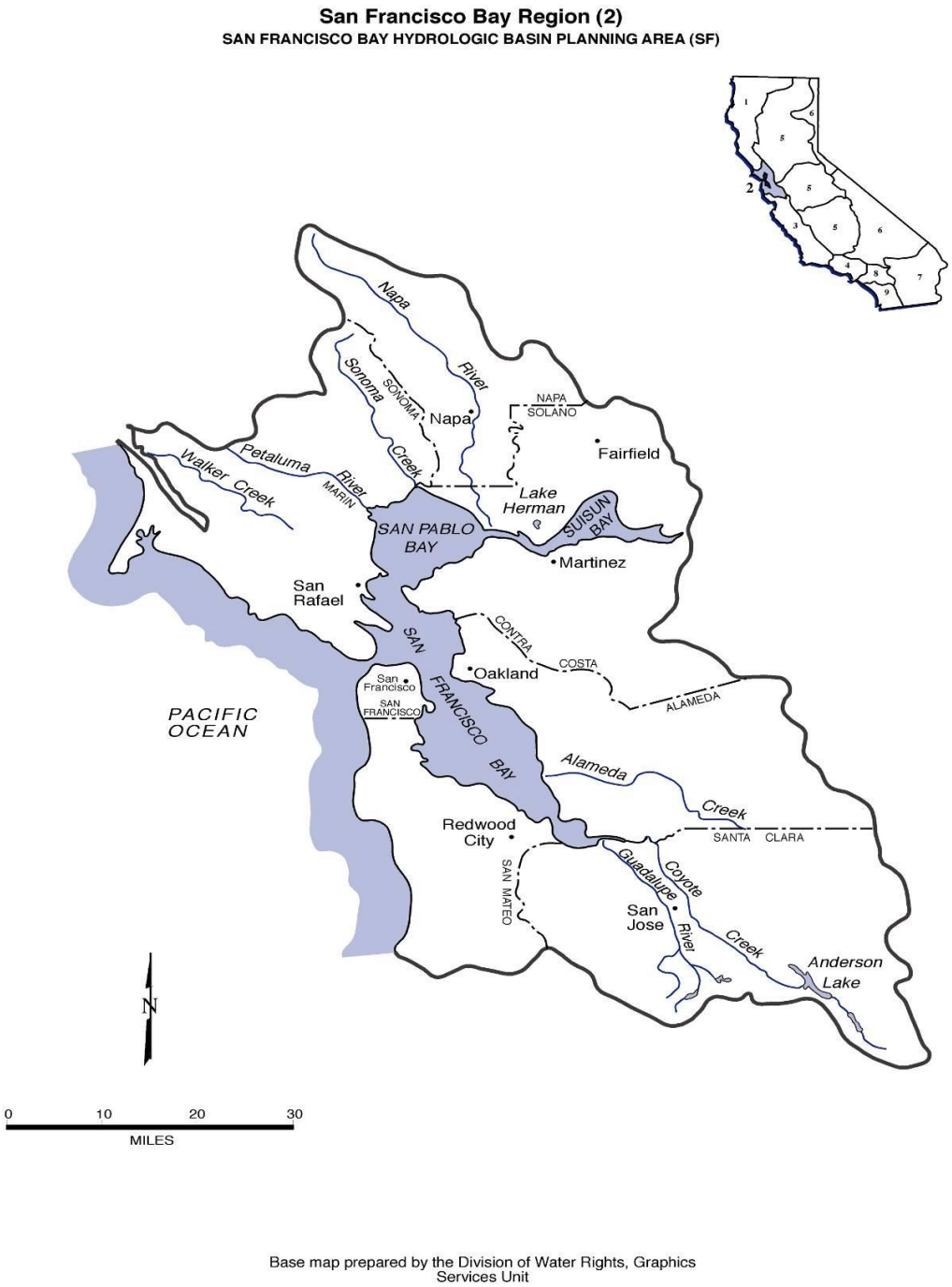



**Figure 5.** San Francisco Bay Region Hydrologic Basin.

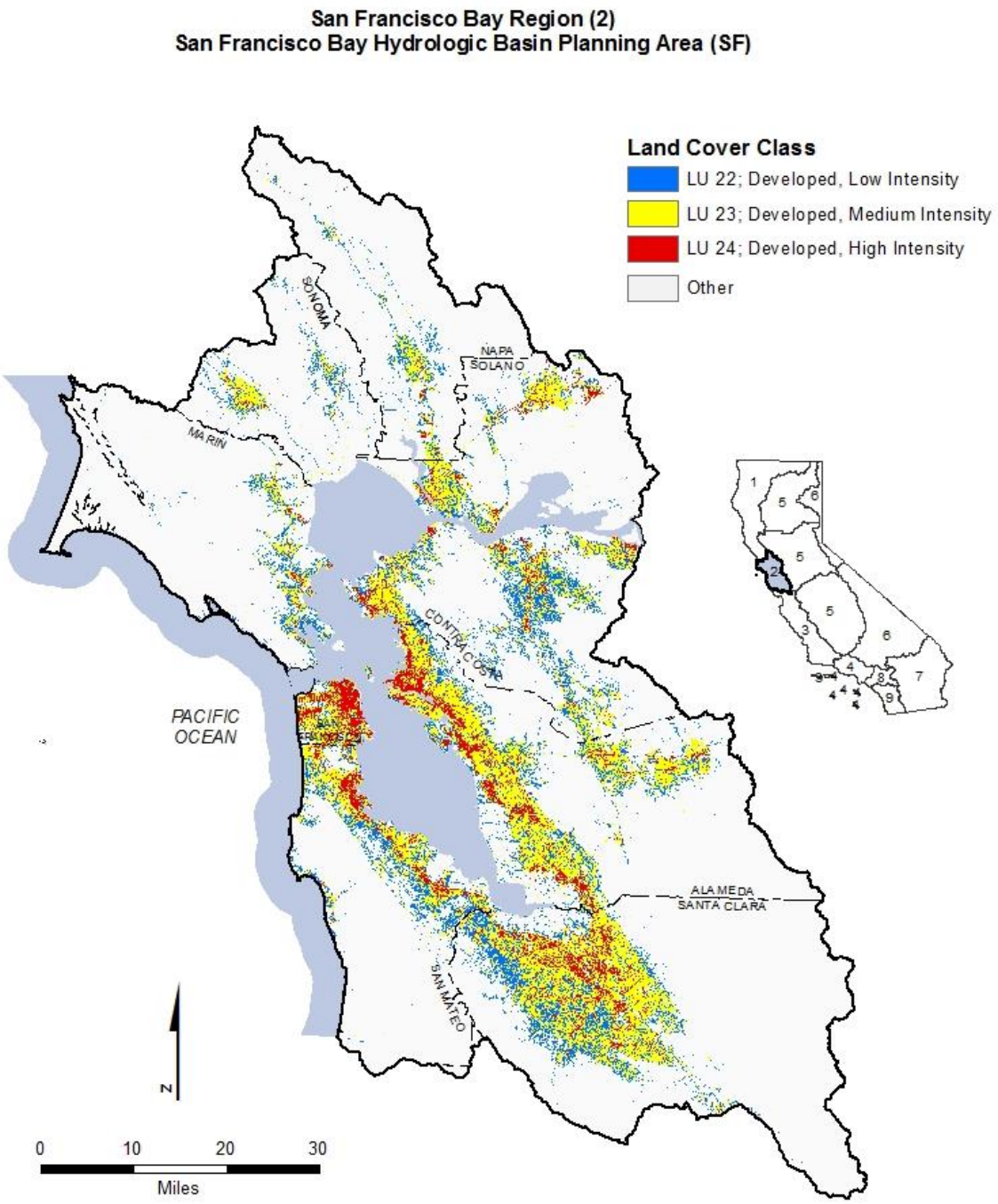



**Figure 6.** San Francisco Bay Region Developed Land Coverage.

## 3.6 Central Coast Region

The Central Coast Region comprises all basins (including Carrizo Plain in San Luis Obispo and Kern Counties) draining into the Pacific Ocean from the southern boundary of the Pescadero Creek watershed in San Mateo and Santa Cruz Counties; to the southeastern boundary of the Rincon Creek watershed, located in western Ventura County (Figure 7, Figure 8). The region extends over a 300-mile long by 40-mile wide section of the state's central coast. Its geographic area encompasses all of Santa Cruz, San Benito, Monterey, San Luis Obispo, and Santa Barbara Counties as well as the southern one-third of Santa Clara County, and small portions of San Mateo, Kern, and Ventura Counties. Included in the region are urban areas such as the Monterey Peninsula and the Santa Barbara coastal plain; prime agricultural lands such as the Salinas, Santa Maria, and Lompoc Valleys; National Forest lands; extremely wet areas such as the Santa Cruz Mountains; and arid areas such as the Carrizo Plain.

Water bodies in the Central Coast Region are varied. Enclosed bays and harbors in the region include Morro Bay, Elkhorn Slough, Tembladero Slough, Santa Cruz Harbor, Moss Landing Harbor, San Luis Harbor, and Santa Barbara Harbor. Several small estuaries also characterize the region, including the Santa Maria River Estuary, San Lorenzo River Estuary, Big Sur River Estuary, and many others. Major rivers, streams, and lakes include San Lorenzo River, Santa Cruz River, San Benito River, Pajaro River, Salinas River, Santa Maria River, Cuyama River, Estrella River and Santa Ynez River, San Antonio Reservoir, Nacimiento Reservoir, Twitchel Reservoir, and Cuchuma Reservoir.

Located in the Central Coast Region are 7 ASBS: Año Nuevo (#15); Pacific Grove (#19); Carmel Bay (#34); Point Lobos (#16); Julia Pfeiffer Burns (#18); San Miguel, Santa Rosa, and Santa Cruz Islands (#17); and Salmon Creek Coast (#20).

The land use activities in the basin have been primarily agrarian. While agriculture and related food processing activities are major industries in the region, land uses also include oil production, tourism, and manufacturing. Total population of the region is estimated at 1.22 million people.

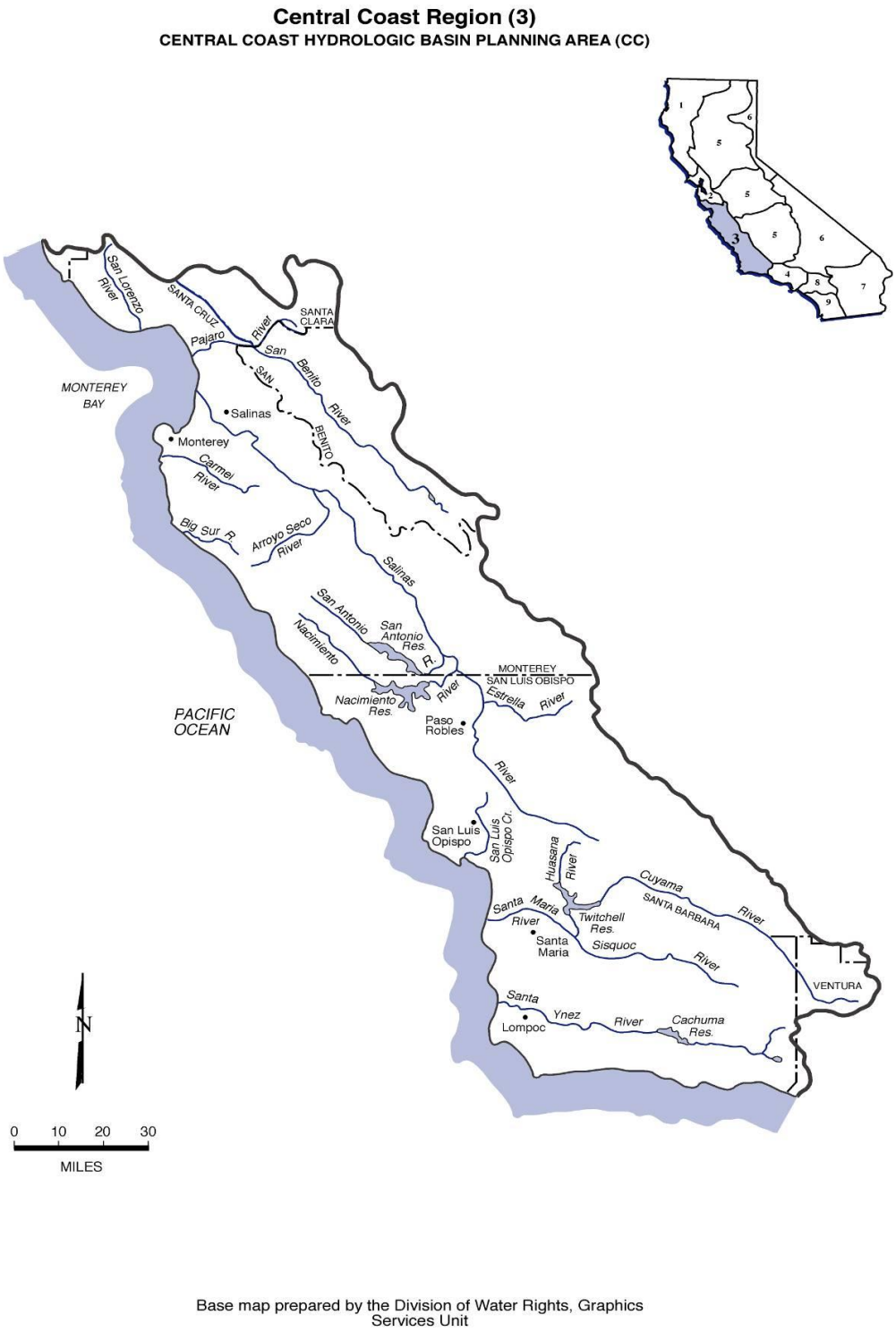



**Figure 7.** Central Coast Region Hydrologic Basin.

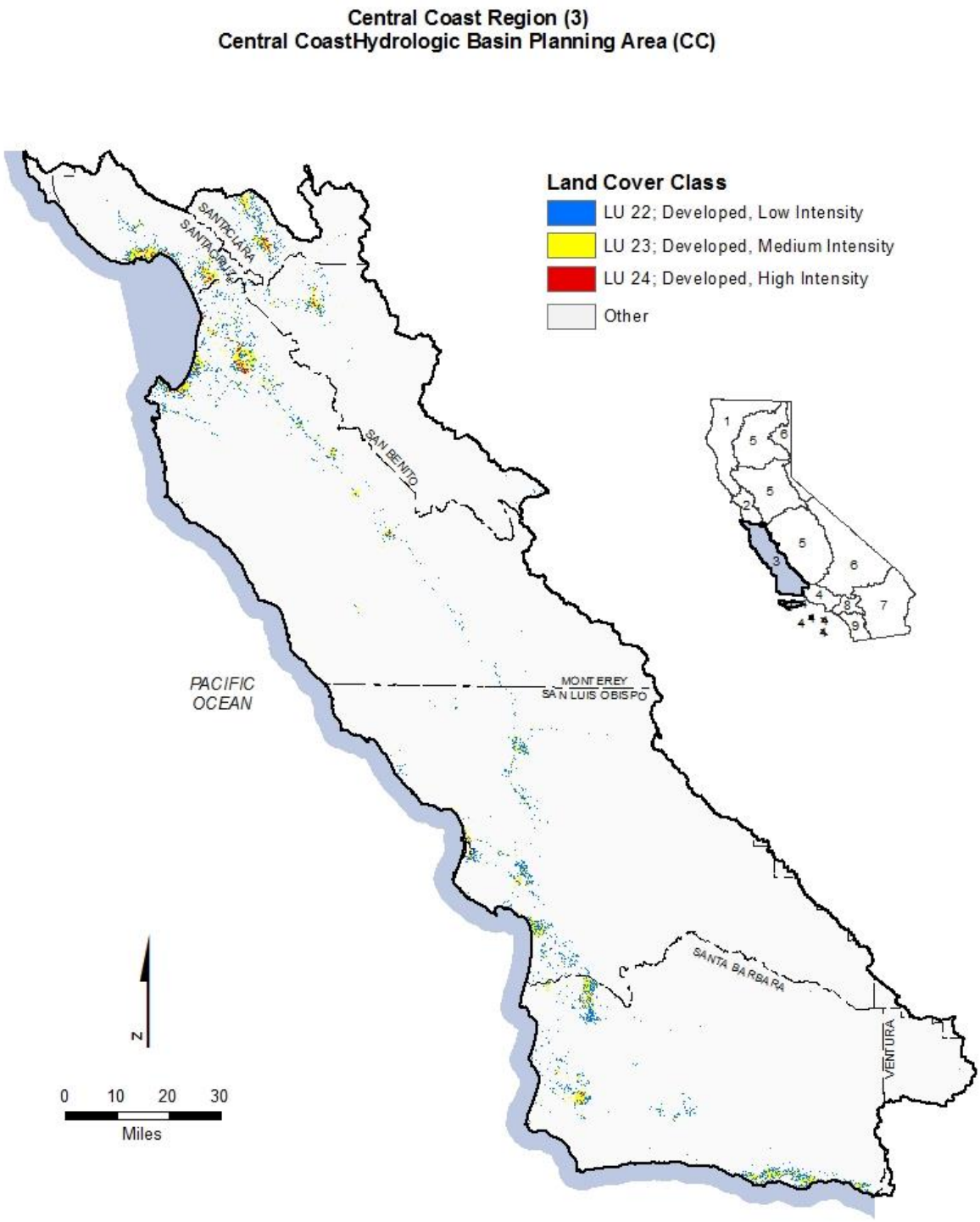



**Figure 8.** Central Coast Region Developed Land Coverage.

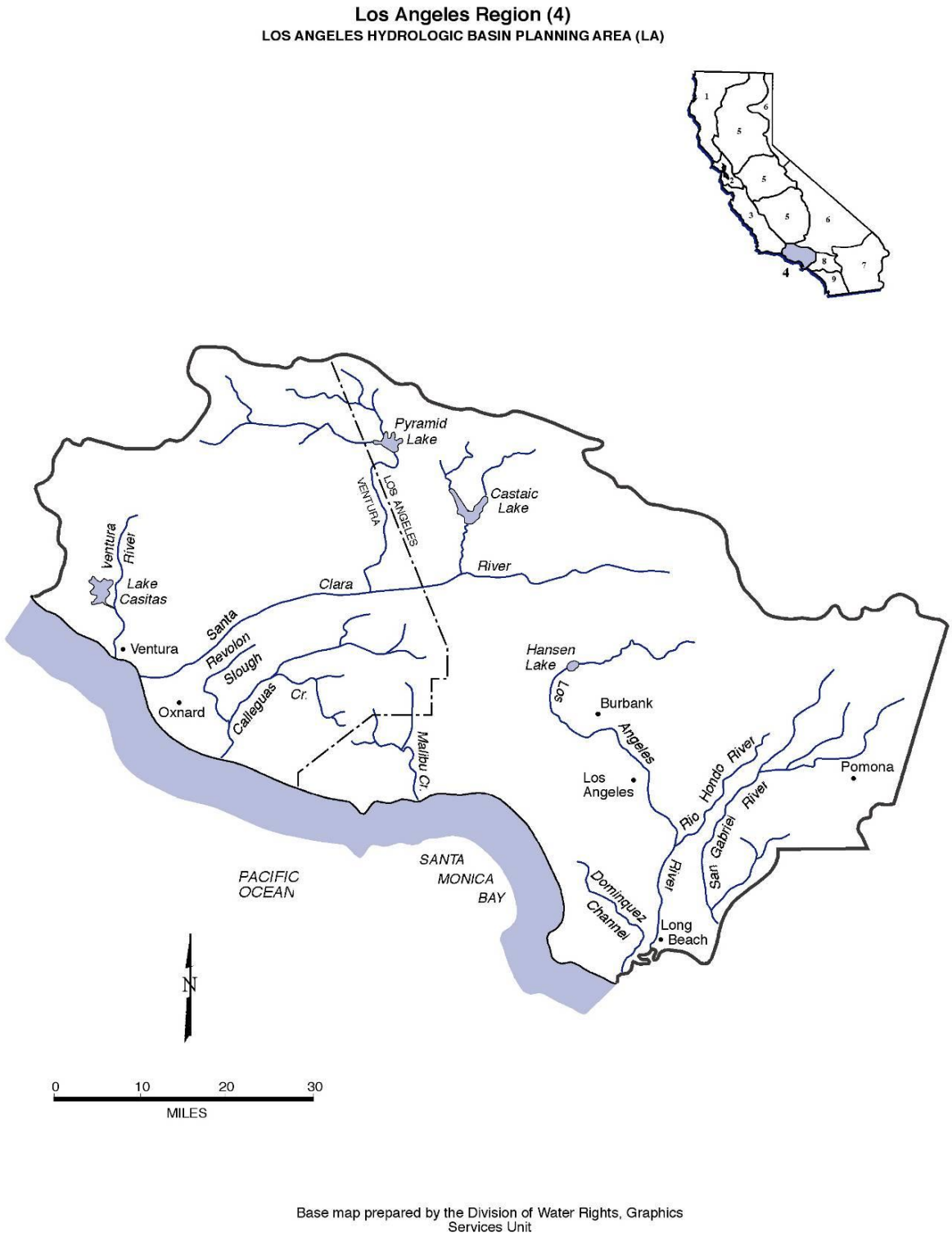
## 3.7 Los Angeles Region

The Los Angeles Region comprises all basins draining into the Pacific Ocean between the southeastern boundary of the watershed of Rincon Creek, located in western Ventura County, and a line which coincides with the southeastern boundary of Los Angeles County, from the Pacific Ocean to San Antonio Peak, and follows the divide, between the San Gabriel River and Lytle Creek drainages to the divide between Sheep Creek and San Gabriel River drainages (Figure 9, Figure 10).

The region encompasses all coastal drainages flowing into the Pacific Ocean between Rincon Point (on the coast of western Ventura County) and the eastern Los Angeles County line, as well as the drainages of five coastal islands (Anacapa, San Nicolas, Santa Barbara, Santa Catalina and San Clemente). In addition, the region includes all coastal waters within three miles of the continental and island coastlines. Two large deepwater harbors (Los Angeles and Long Beach Harbors) and one smaller deepwater harbor (Port Hueneme) are contained in the region. There are small craft marinas within the harbors, as well as tank farms, naval facilities, fish processing plants, boatyards, and container terminals. Several small-craft marinas also exist along the coast (Marina del Ray, King Harbor, and Ventura Harbor); these contain boatyards, other small businesses and dense residential development.

Several large, primarily concrete-lined rivers (Los Angeles River and San Gabriel River) lead to unlined tidal prisms which are influenced by marine waters. Salinity may be greatly reduced following rains since these rivers drain large urban areas composed of mostly impermeable surfaces. Some of these tidal prisms receive a considerable amount of freshwater throughout the year from publicly owned treatment works discharging tertiary-treated effluent. Lagoons are located at the mouths of other rivers draining relatively undeveloped areas (Mugu Lagoon, Malibu Lagoon, Ventura River Estuary, and Santa Clara River Estuary). There are also a few isolated coastal brackish water bodies receiving runoff from agricultural or residential areas.

Santa Monica Bay, which includes the Palos Verdes Shelf, dominates a large portion of the open coastal water bodies in the region. Eight ASBS are located in the Los Angeles Region: San Nicolas Island and Begg Rock (#21), Santa Barbara and Anacapa Islands (#22), San Clemente Island (#23), Laguna Point to Latigo Point (#24), Northwest Santa Catalina Island (#25), Western Santa Catalina Island (#26), Farnsworth Bank (#27), and Southeast Santa Catalina (#28).




Base map prepared by the Division of Water Rights, Graphics Services Unit

**Figure 9.** Los Angeles Region Hydrologic Basin.

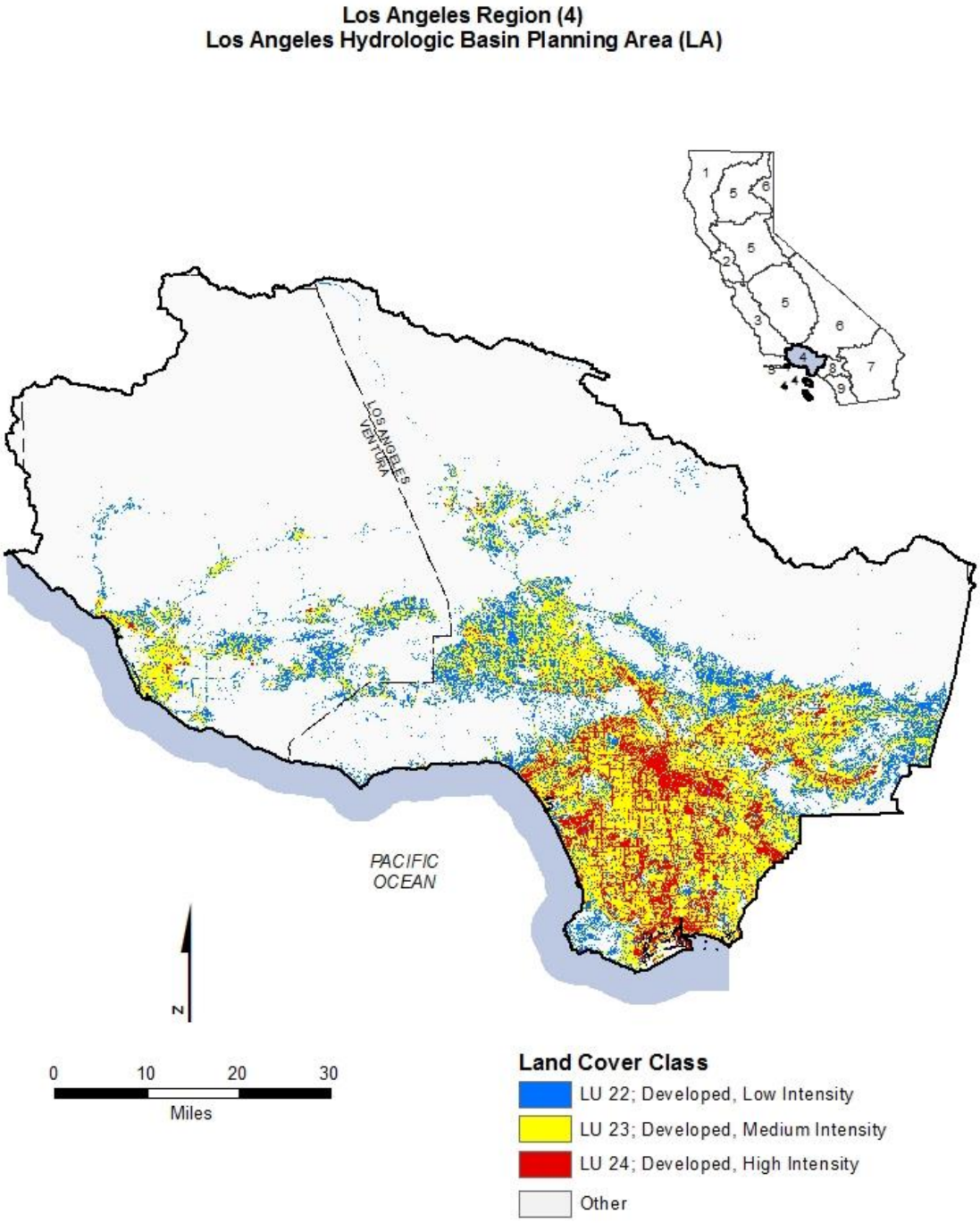



**Figure 10.** Los Angeles Region Developed Land Coverage.

## 3.8 Central Valley Region

The Central Valley Region includes approximately 40 percent of the land in California stretching from the Oregon border to the Kern County-Los Angeles County line. The region is divided into three basins. For planning purposes, the Sacramento River and the San Joaquin River Basins are covered under one basin plan, and the Tulare Lake Basin is covered under a separate basin plan.

The Sacramento River Basin covers 27,210 square miles and includes the entire area drained by the Sacramento River (Figure 11, Figure 12). The principal streams are the Sacramento River and its larger tributaries: the Pitt, Feather, Yuba, Bear, and American Rivers to the East; and Cottonwood, Stony, Cache, and Putah Creek to the west. Major reservoirs and lakes include Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa.

The San Joaquin River Basin covers 15,880 square miles and includes the entire area drained by the San Joaquin River (Figure 13, Figure 14). Principal streams in the basin are the San Joaquin River and its larger tributaries: the Consumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Major reservoirs and lakes include Pardee, New Hogan, Millerton, McClure, Don Pedro, and New Melones.

The Tulare Lake Basin covers approximately 16,406 square miles and comprises the drainage area of the San Joaquin Valley south of the San Joaquin River (Figure 15, Figure 16). The planning boundary between the San Joaquin River Basin and the Tulare Lake Basin is defined by the northern boundary of Little Pinoche Creek basin eastward along the channel of the San Joaquin River to Millerton Lake in the Sierra Nevada foothills, and then along the southern boundary of the San Joaquin River drainage basin. Main Rivers within the basin include the King, Kaweah, Tule, and Kern Rivers, which drain to the west face of the Sierra Nevada Mountains. Imported surface water supplies enter the basin through the San Luis Drain-California Aqueduct System, Friant-Kern Channel, and the Delta Mendota Canal.

The two northern most basins are bound by the crests of the Sierra Nevada on the east and the Coast Range and Klamath Mountains on the west. They extend about 400 miles from the California-Oregon border southward to the headwaters of the San Joaquin River. These two river basins cover about one fourth of the total area of the state and over 30 percent of the state's irrigable land. The Sacramento and San Joaquin Rivers furnish roughly 50 percent of the state's water supply. Surface water from the two drainage basins meets and forms the Delta, which ultimately drains into the San Francisco Bay.

The Delta is a maze of river channels and diked islands covering roughly 1,150 square miles, including 78 square miles of water area. Two major water projects located in the South Delta, the Federal Central Valley Project and the State Water Project, deliver water from the Delta to Southern California, the San Joaquin Valley, Tulare Lake Basin, the San Francisco Bay Area, as well as within the Delta boundaries.

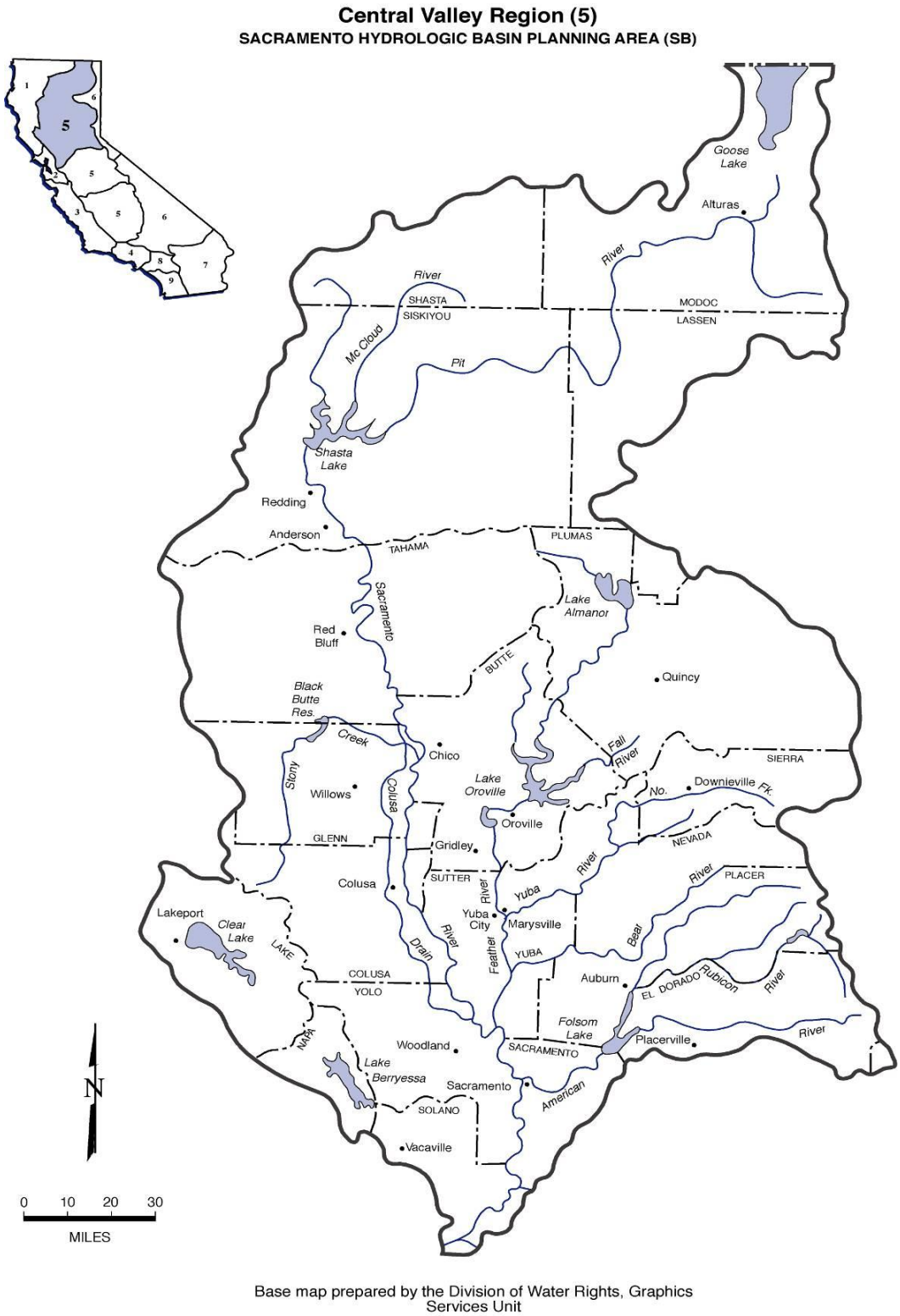



**Figure 11.** Central Valley Region, Sacramento Region Hydrologic Basin.

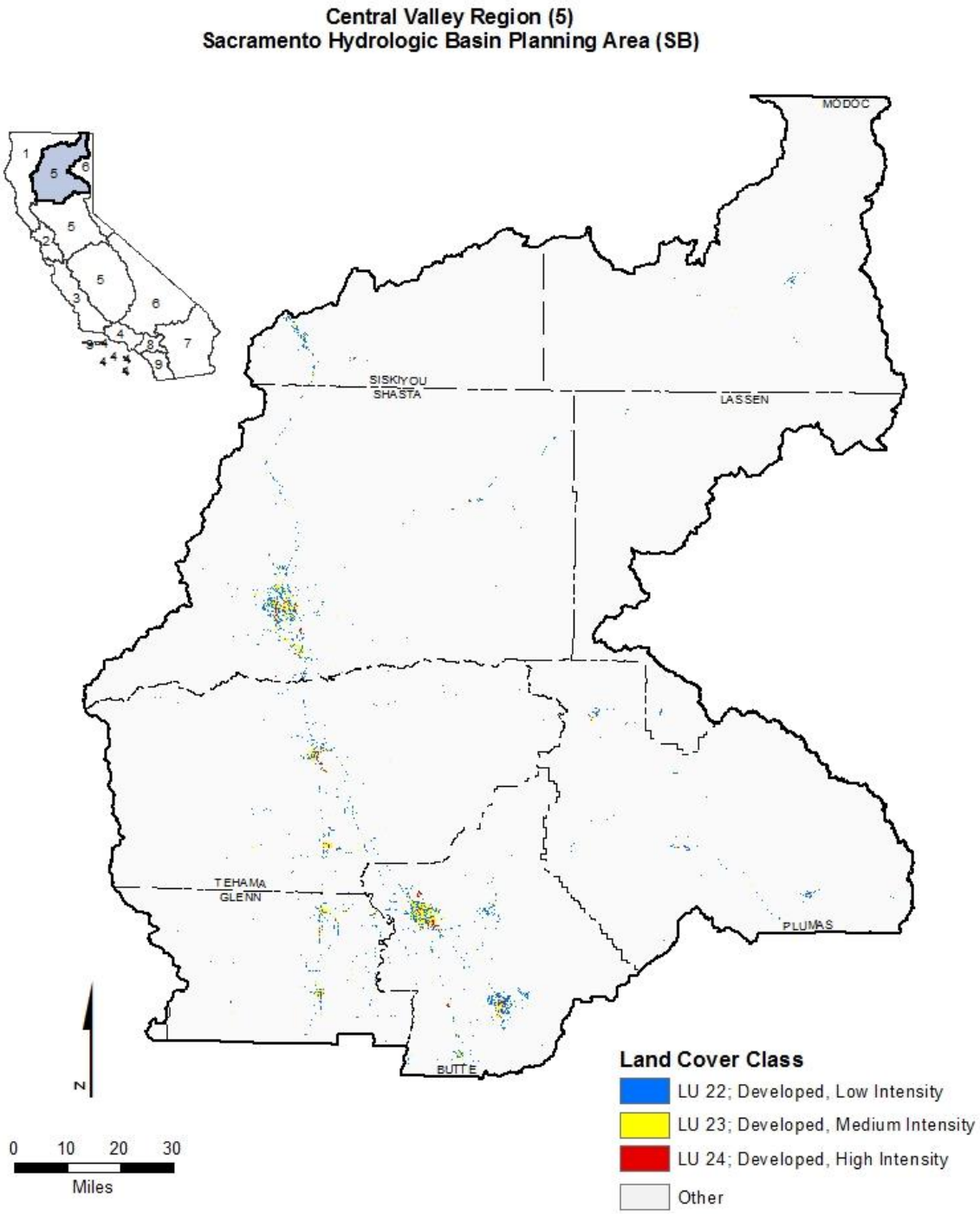



**Figure 12.** Central Valley Region, Sacramento Region Developed Land Coverage.

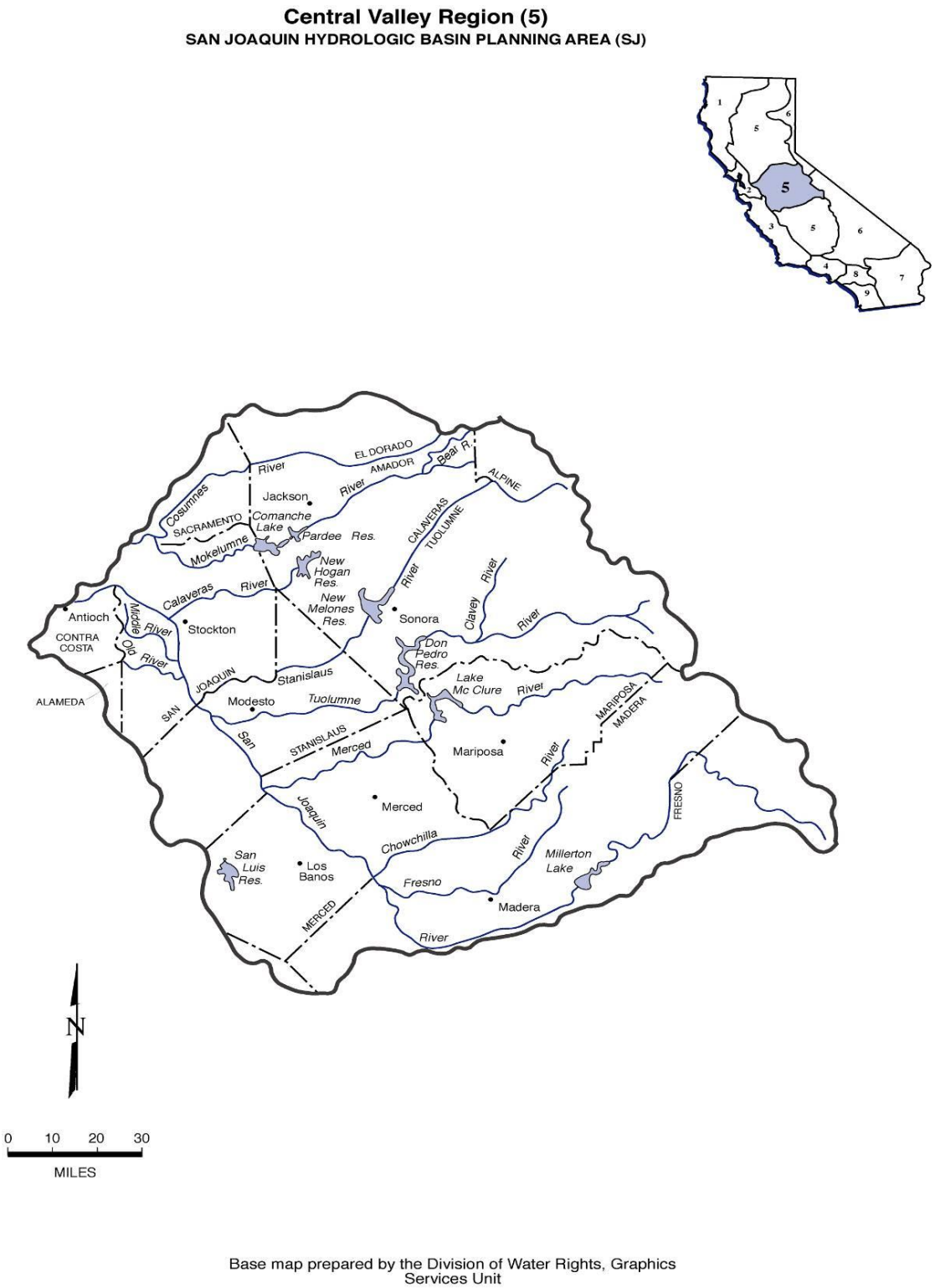



**Figure 13.** Central Valley Region, San Joaquin Hydrologic Basin.

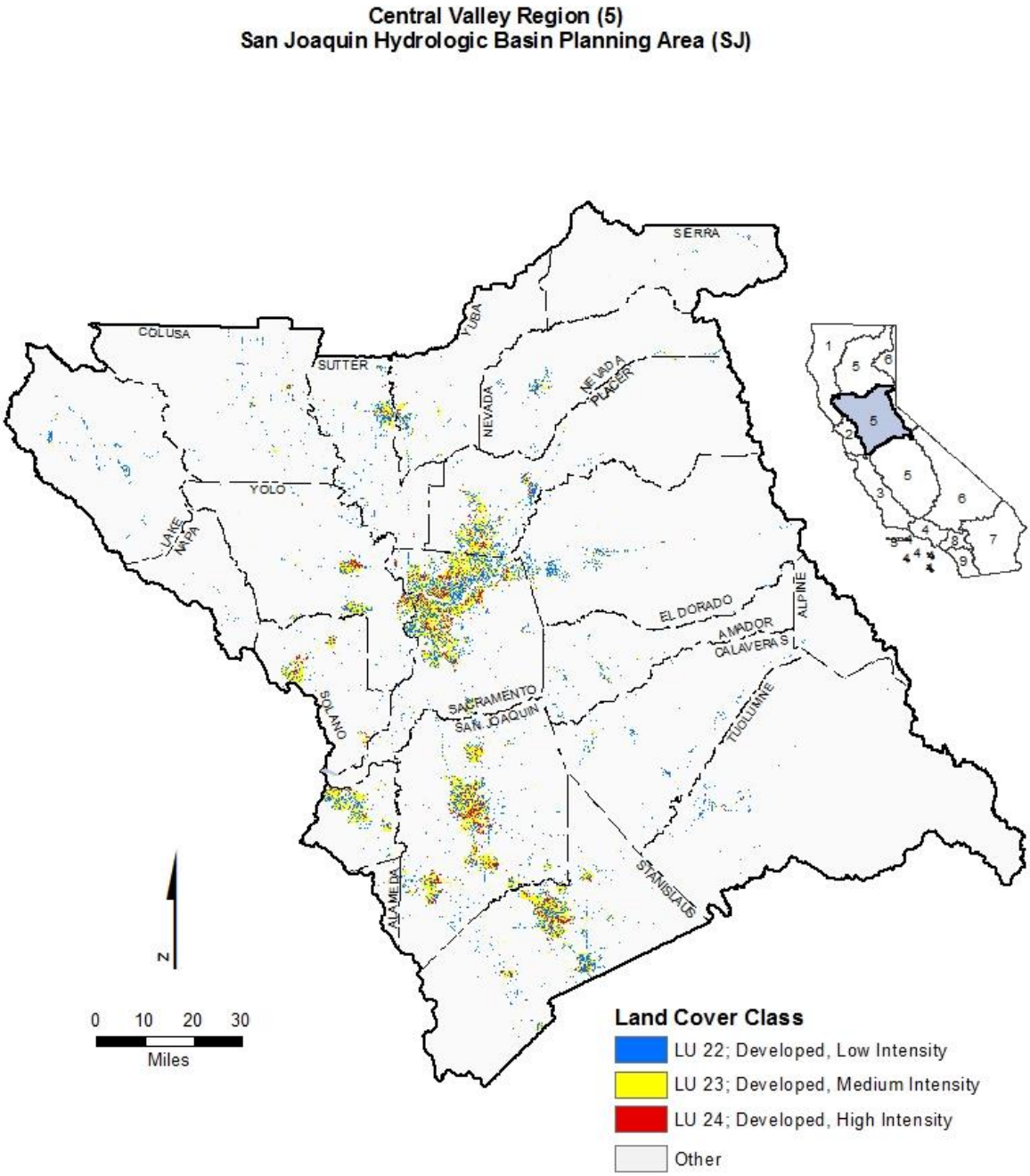



**Figure 14.** Central Valley Region, San Joaquin Developed Land Coverage.

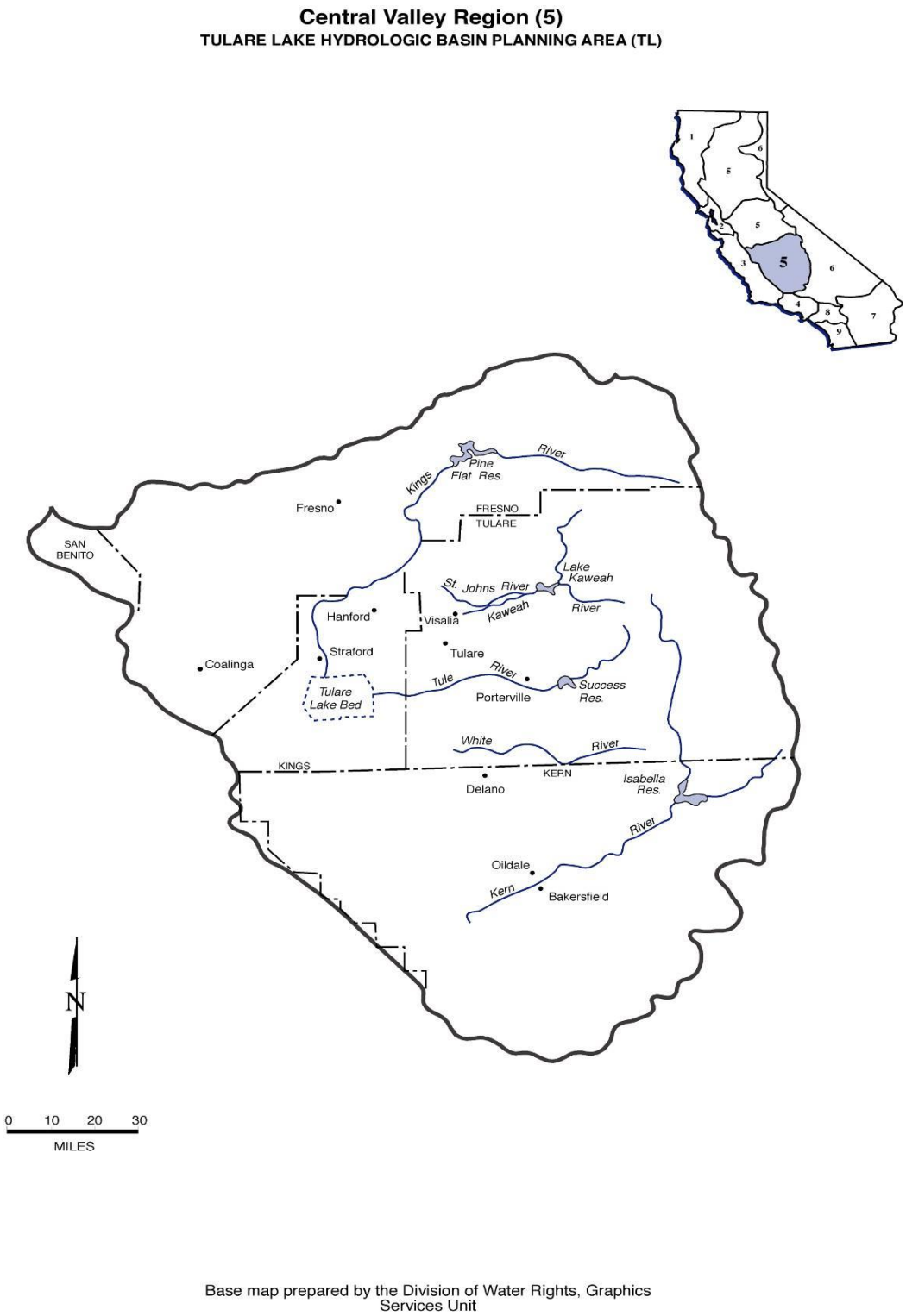



**Figure 15.** Central Valley Region, Tulare Lake Hydrologic Basin.

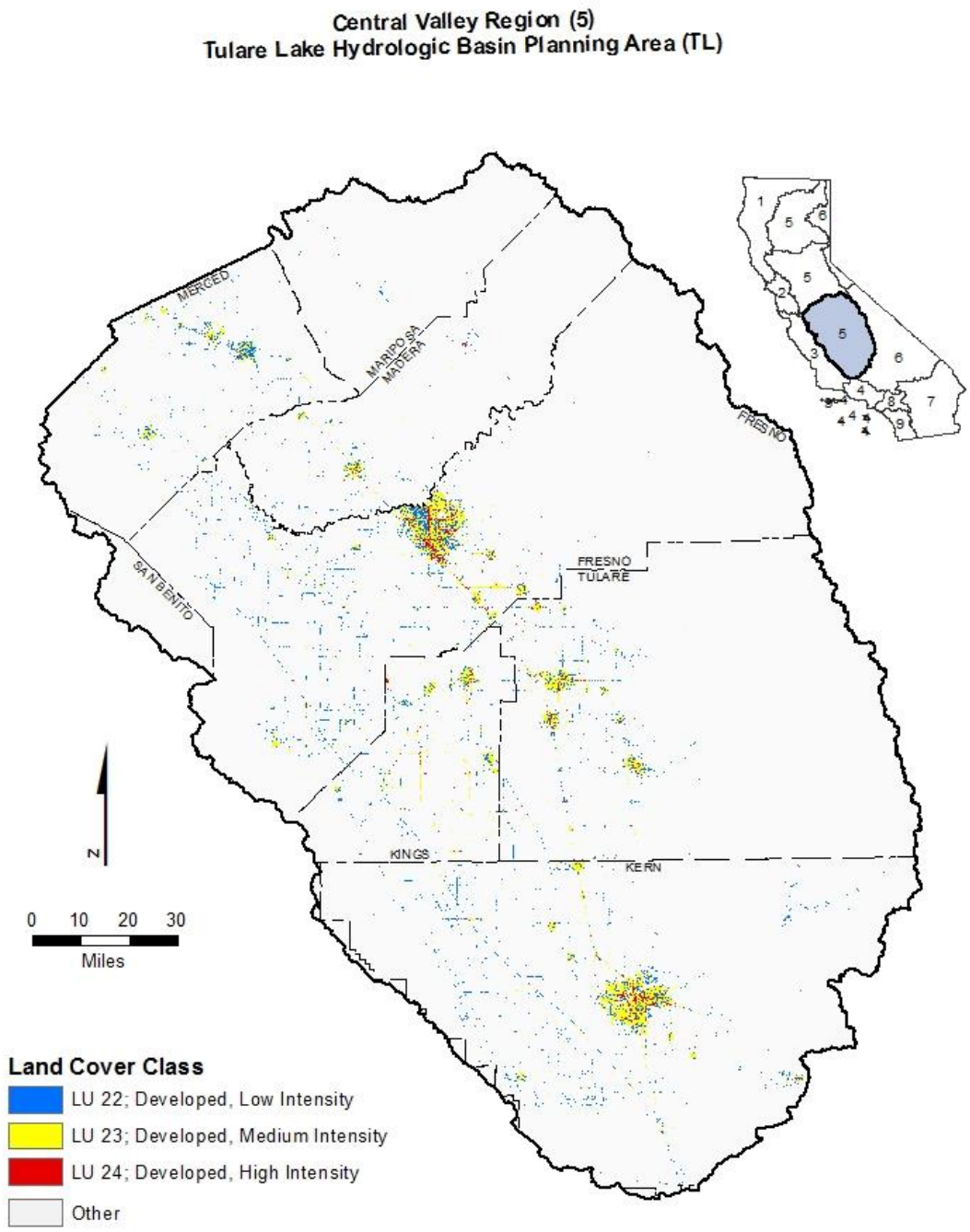



**Figure 16.** Central Valley Region, Tulare Lake Developed Land Coverage.

## 3.9 Lahontan Region

The Lahontan Region is divided into North and South Lahontan Basins at the boundary between the Mono Lake and East Walker River watersheds (Figure 17, Figure 18, Figure 19, Figure 20). It is about 570 miles long and has a total area of 33,131 square miles. The Lahontan Region includes the highest (Mount Whitney) and lowest (Death Valley) points in the contiguous United States. The region includes the eastern slopes of the Warner, Sierra Nevada, San Bernardino, Tehachapi and San Gabriel Mountains, and all or part of other ranges including the White, Providence, and Granite Mountains. Topographic depressions include the Madeline Plains, Surprise, Honey Lake, Bridgeport, Owens, Antelope, and Victor Valleys.

The region includes over 700 lakes, 3,170 miles of streams, and 1,581 square miles of groundwater basins. There are 12 major watersheds in the North Lahontan Basin. Among these are the Eagle Lake, Susan River/Honey Lake, Truckee, Carson, and Walker River watersheds. The South Lahontan Basin includes three major surface water systems (the Mono Lake, Owens River, and Mojave River watersheds) and a number of separate closed groundwater basins.

Although annual precipitation amounts can be high (up to 70 inches) at higher elevations, most precipitation in the mountainous areas falls as snow. Desert areas receive relatively little annual precipitation (less than two inches in some locations) but this can be concentrated and lead to flash flooding. The varied topography, soils, and microclimates of the Lahontan Region support a corresponding variety of plant and animal communities. Wetland and riparian plant communities, including marshes, meadows, sphagnum bogs, riparian deciduous forest, and desert washes, are particularly important for wildlife, given the general scarcity of water in the region.

Both developed (e.g., camping, skiing, and day use) and undeveloped (e.g., hiking, fishing) recreation are important land uses in the region. In addition to tourism, other land uses include resource extraction (mining, energy production, and silviculture), agriculture (mostly livestock grazing), and defense-related activities.

Much of the Lahontan Region is in public ownership, with land use controlled by agencies, such as the U.S. Forest Service, National Park Service, and Bureau of Land Management, various branches of the military, the California State Department of Parks and Recreation, and the City of Los Angeles Department of Water and Power. While the permanent resident population (about 500,000 in 1990) of the Region is low, most of it is concentrated in high-density communities in the South Lahontan Basin. In addition, millions of visitors use the Lahontan Region for recreation each year. Rapid population growth has occurred in the Victor and Antelope Valleys, and within commuting distance of Reno, Nevada. Principal communities of the North Lahontan Basin include Susanville, Truckee, Tahoe City, South Lake Tahoe, Markleeville, and Bridgeport. The South Lahontan Basin includes the communities of Mammoth Lakes, Bishop, Ridgecrest, Mojave, Adelanto, Palmdale, Lancaster, Victorville, and Barstow.

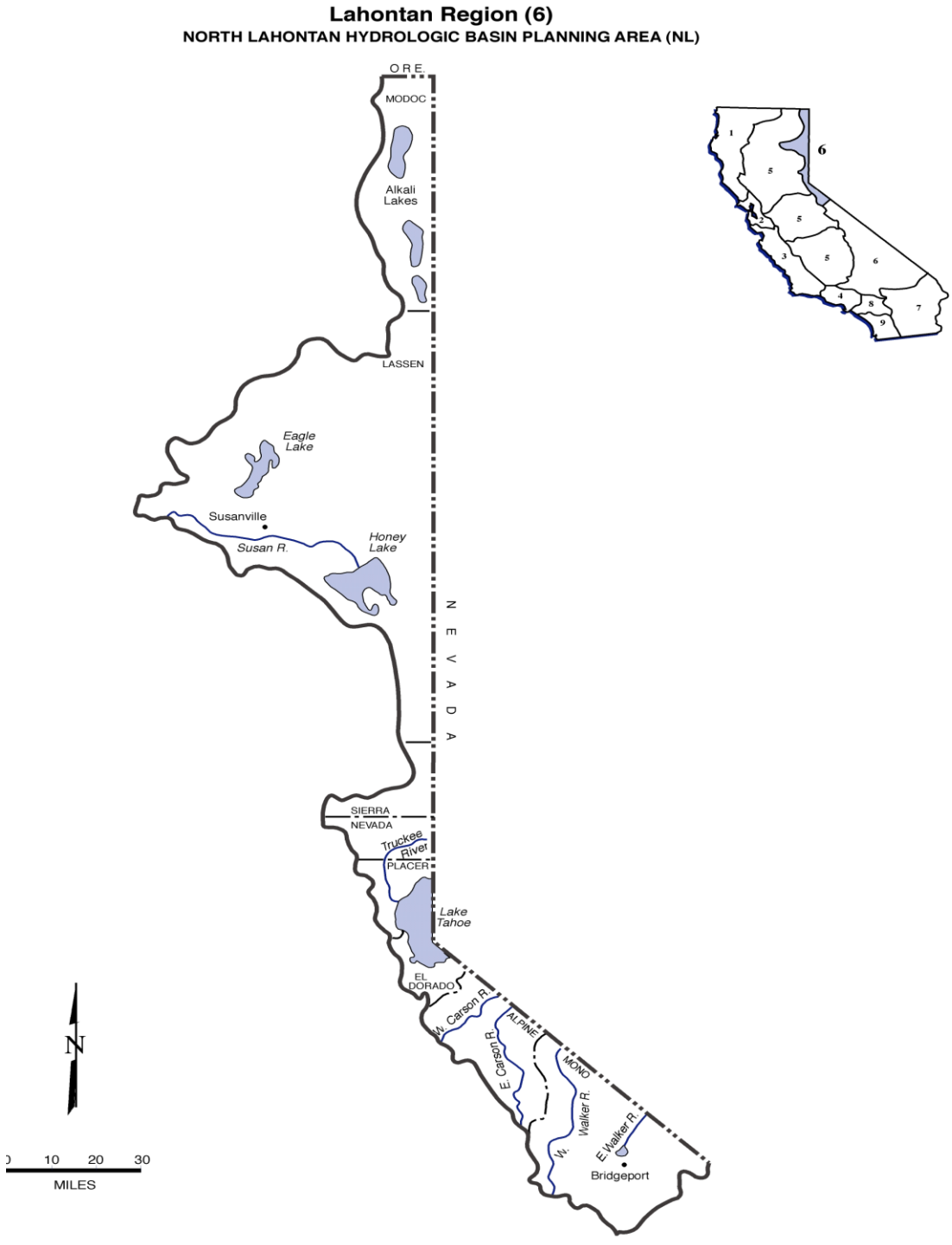



**Figure 17.** Lahontan Region, North Lahontan Hydrologic Basin.

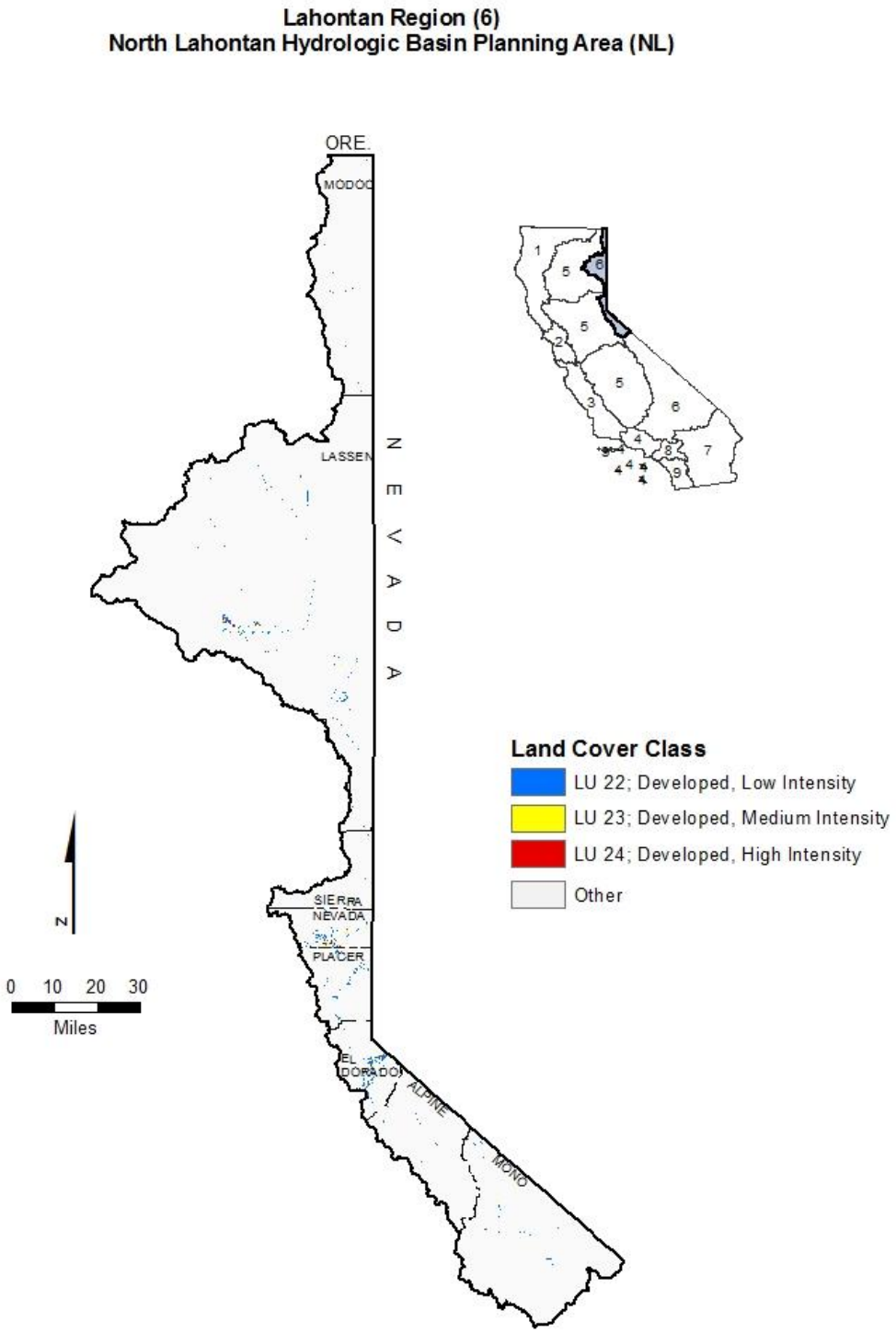



**Figure 18.** Lahontan Region, North Lahontan Developed Land Coverage.

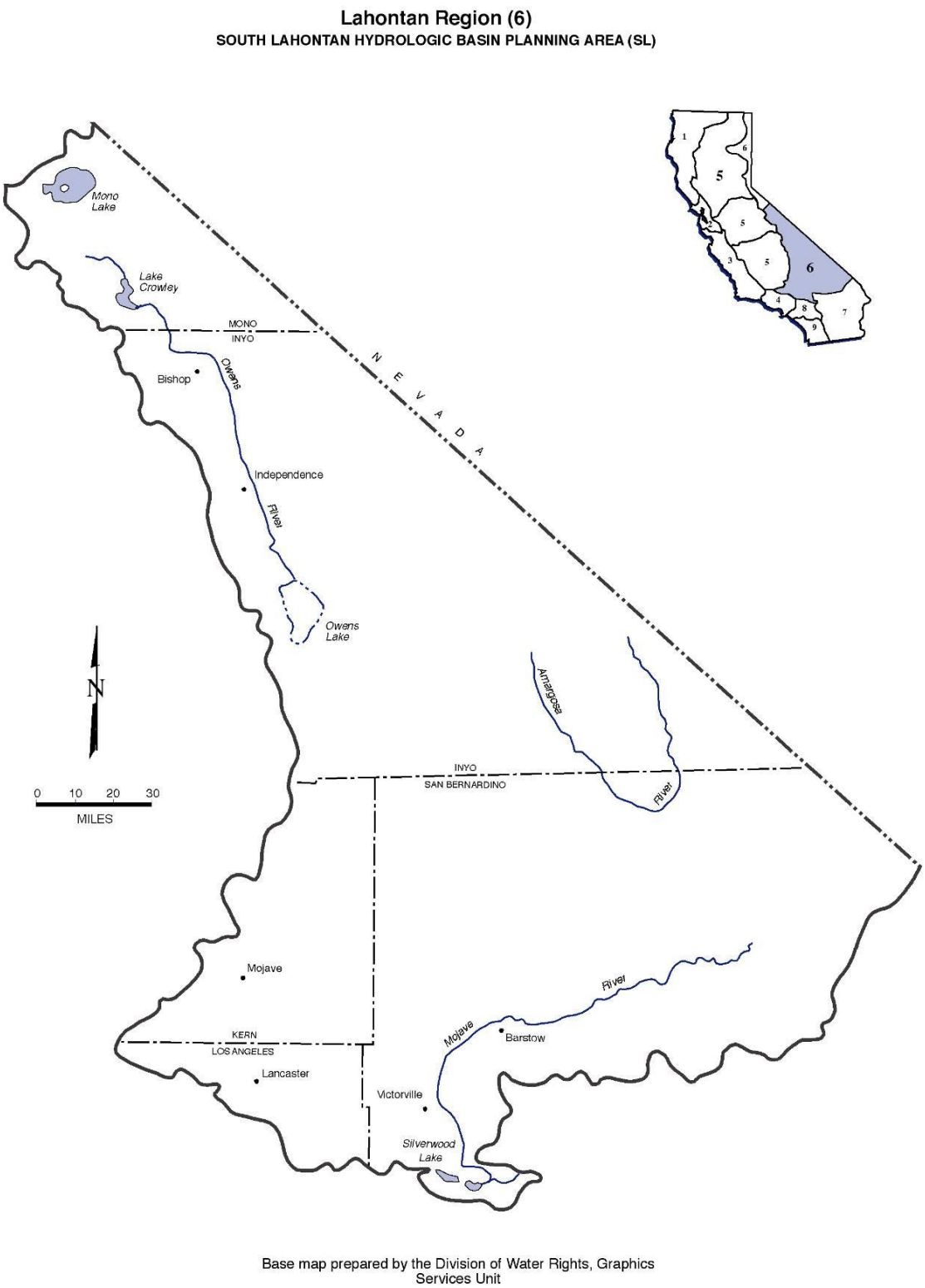



**Figure 19.** Lahontan Region, South Lahontan Hydrologic Basin.

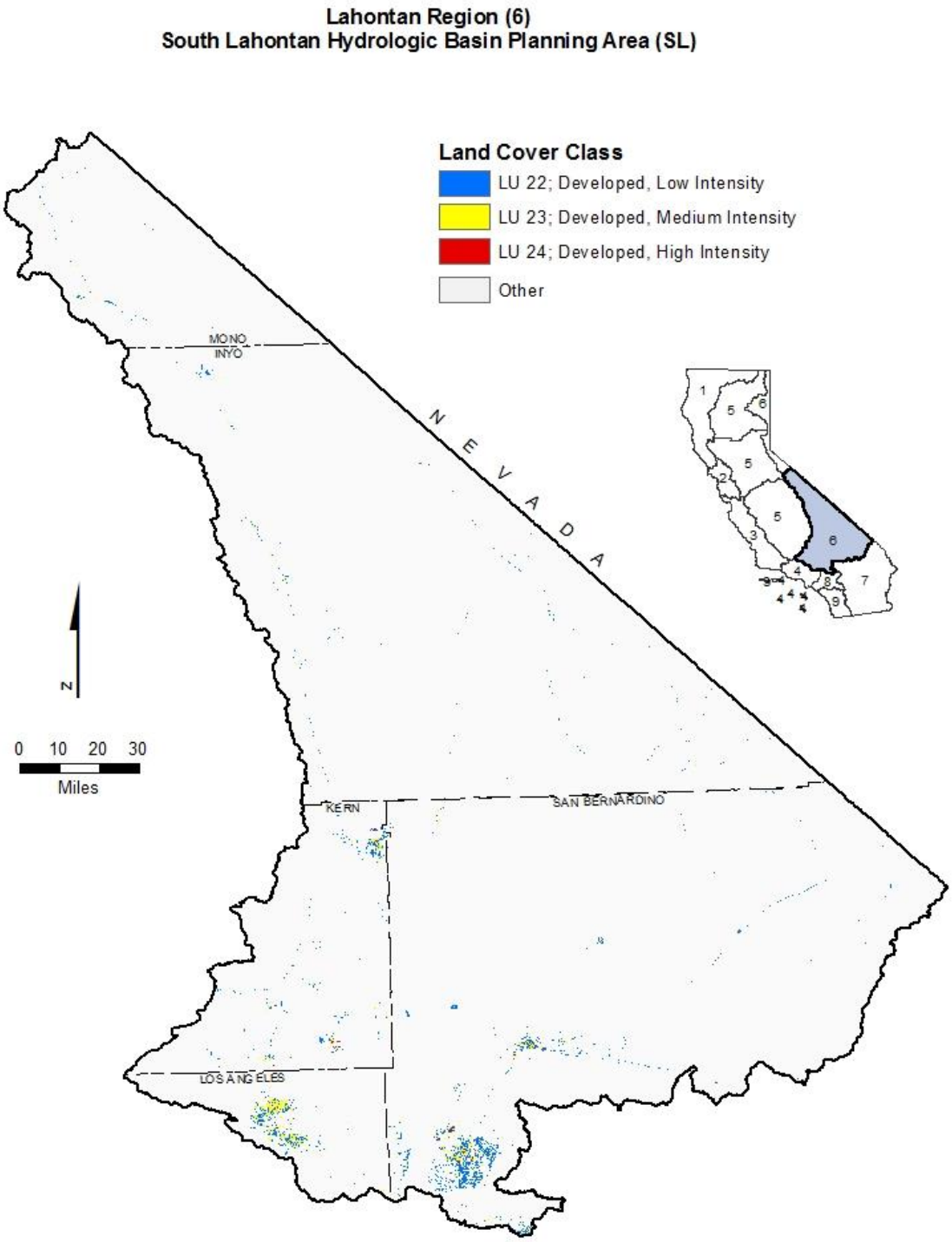



**Figure 20.** Lahontan Region, South Lahontan Developed Land Coverage.

### 3.10 Colorado River Basin Region

The Colorado River Basin Region covers approximately 13 million acres (20,000 square miles) in the southeastern portion of California (Figure 21, Figure 22). It includes all of Imperial County and portions of San Bernardino, Riverside, and San Diego Counties. It shares a boundary for 40 miles on the northeast with the State of Nevada. The New York, Providence, Granite, Old Dad, Bristol, Rodman, and Ord Mountain ranges border the region to the north, the San Bernardino, San Jacinto, and Laguna Mountain ranges border the region to the west, the Republic of Mexico borders the Region to the south, and the Colorado River and State of Arizona border the region to the east. Geographically the region represents only a small portion of the total Colorado River drainage area, which includes portions of Arizona, Nevada, Utah, Wyoming, Colorado, New Mexico, and Mexico. A significant geographical feature of the region is the Salton Trough, which contains the Salton Sea and the Coachella and Imperial Valleys. The two valleys are separated by the Salton Sea, which covers the lowest area of the depression. The Salton Sea is California's largest inland body of water and provides wildlife habitat and sport fishery.

Much of the agricultural economy and industry of the region is located in the Salton Trough. There are also industries associated with agriculture, such as sugar refining as well as increasing development of geothermal industries. The Salton Sea serves as a drainage reservoir for irrigation return water and storm water from the Coachella Valley, Imperial Valley, and Borrego Valley, and also receives drainage water from the Mexicali Valley in Mexico. Development along California's 230 mile reach of the Colorado River, which flows along the eastern boundary of the Region, include agricultural areas in Palo Verde Valley and Bard Valley, urban centers at Needles, Blythe, and Winterhaven, several transcontinental gas compressor stations, and numerous small recreational communities. Some mining operations are located in the surrounding mountains. Also the Fort Mojave, Chemehuevi, Colorado River, and Yuma Indian Reservations are located along the River.

The region has the driest climate in California. Snow falls in the region's higher elevations, with mean seasonal precipitation ranging from 30 to 40 inches in the upper San Jacinto and San Bernardino Mountains. The lower elevations receive relatively little rainfall. An average of four inches of precipitation occurs along the Colorado River, with much of this coming from late summer thunderstorms moving north from Mexico. Typical mean seasonal precipitation in the desert valleys is 3.6 inches at Indio and 3.2 inches at El Centro. Precipitation over the entire area occurs mostly from November through April, and August through September, but its distribution and intensity are often sporadic. Local thunderstorms may contribute all the average seasonal precipitation at one time or only a trace of precipitation may be recorded at any locale for the entire season.

The region provides habitat for a variety of native and introduced species of wildlife. Animals tolerant of arid conditions, including small rodents, coyotes, foxes, birds, and a variety of reptiles, inhabit large areas within the region. Along the Colorado River and in the higher elevations of the San Bernardino and San Jacinto Mountains, where water is more abundant, and where deer, bighorn sheep, and a diversity of small animals exist. Practically all of the fishes inhabiting the region are introduced species. The Salton Sea

National Wildlife Refuge and state waterfowl management areas are located in or near the Salton Sea. The refuge supports large numbers of waterfowl in addition to other types of birds. Located along the Colorado River are the Havasu, Cibola and Imperial National Wildlife Refuges. The region provides habitat for certain endangered/threatened species of wildlife including desert pupfish, razorback sucker, Yuma clapper rail, black rail, least Bell's vireo, yellow billed cuckoo, desert tortoise, and peninsular bighorn sheep.

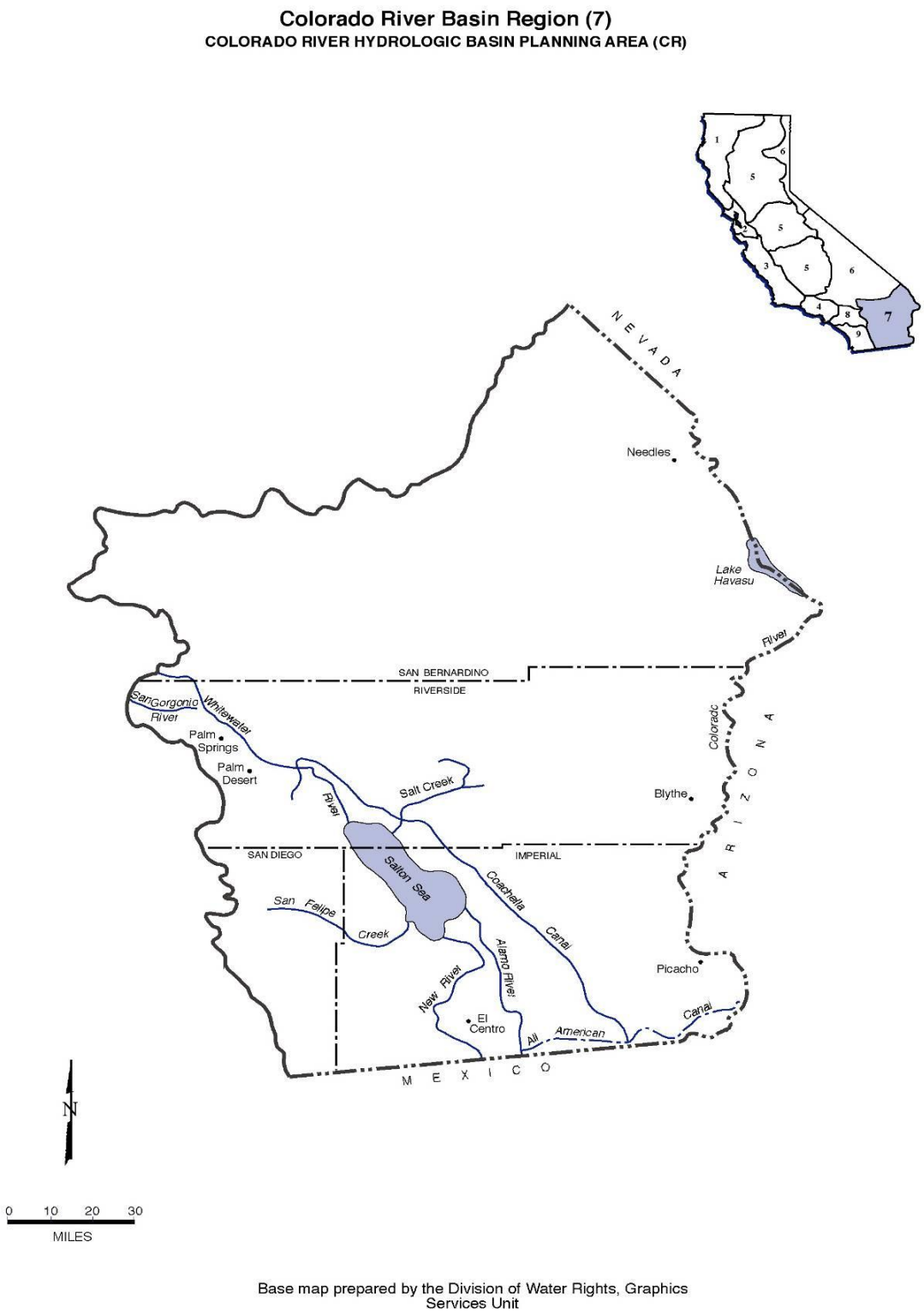



**Figure 21.** Colorado River Region Hydrologic Basin.

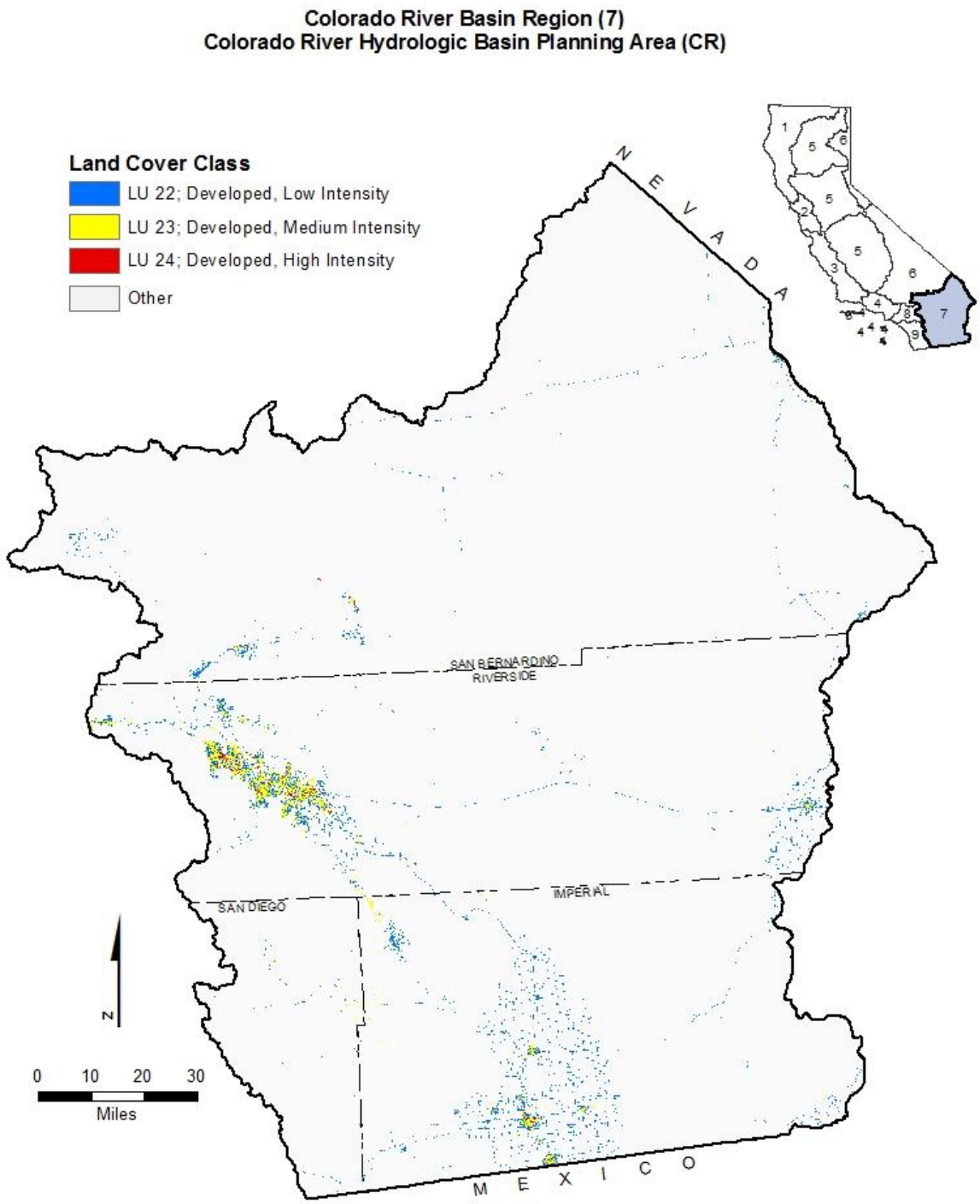



**Figure 22.** Colorado River Region Developed Land Coverage.

### 3.11 Santa Ana Region

The Santa Ana Region comprises all basins draining into the Pacific Ocean between the southern boundary of the Los Angeles Region and the drainage divide between Muddy and Moro Canyons, from the ocean to the summit of San Joaquin Hills; along the divide between lands draining into Newport Bay and Laguna Canyon to Niguel Road; along

Niguel Road and Los Aliso Avenue to the divide between Newport Bay and Aliso Creek drainages; and along the divide and the southeastern boundary of the Santa Ana River drainage to the divide between Baldwin Lake and Mojave Desert drainages; to the divide between the Pacific Ocean and Mojave Desert drainages (Figure 23, Figure 24). The Santa Ana Region is the smallest of the nine regions in the state (2,800 square miles) and is located in southern California, roughly between Los Angeles and San Diego. Although small geographically, the region's four million-plus residents (1993 estimate) make it one of the most densely populated regions.

The climate of the Santa Ana Region is generally dry in the summer with mild, wet winters). The average annual rainfall in the region is about 15 inches, most of it occurring between November and March. The enclosed bays in the region include Newport Bay, Bolsa Bay (including Bolsa Chica Marsh), and Anaheim Bay. Principal rivers include Santa Ana, San Jacinto and San Diego. Lakes and reservoirs include Big Bear, Hemet, Mathews, Canyon Lake, Lake Elsinore, Santiago Reservoir, and Perris Reservoir. Two ASBS are located in the Santa Ana Region: Robert E. Badham (#32) and Irvine Coast (also located in the San Diego Region) (#33).

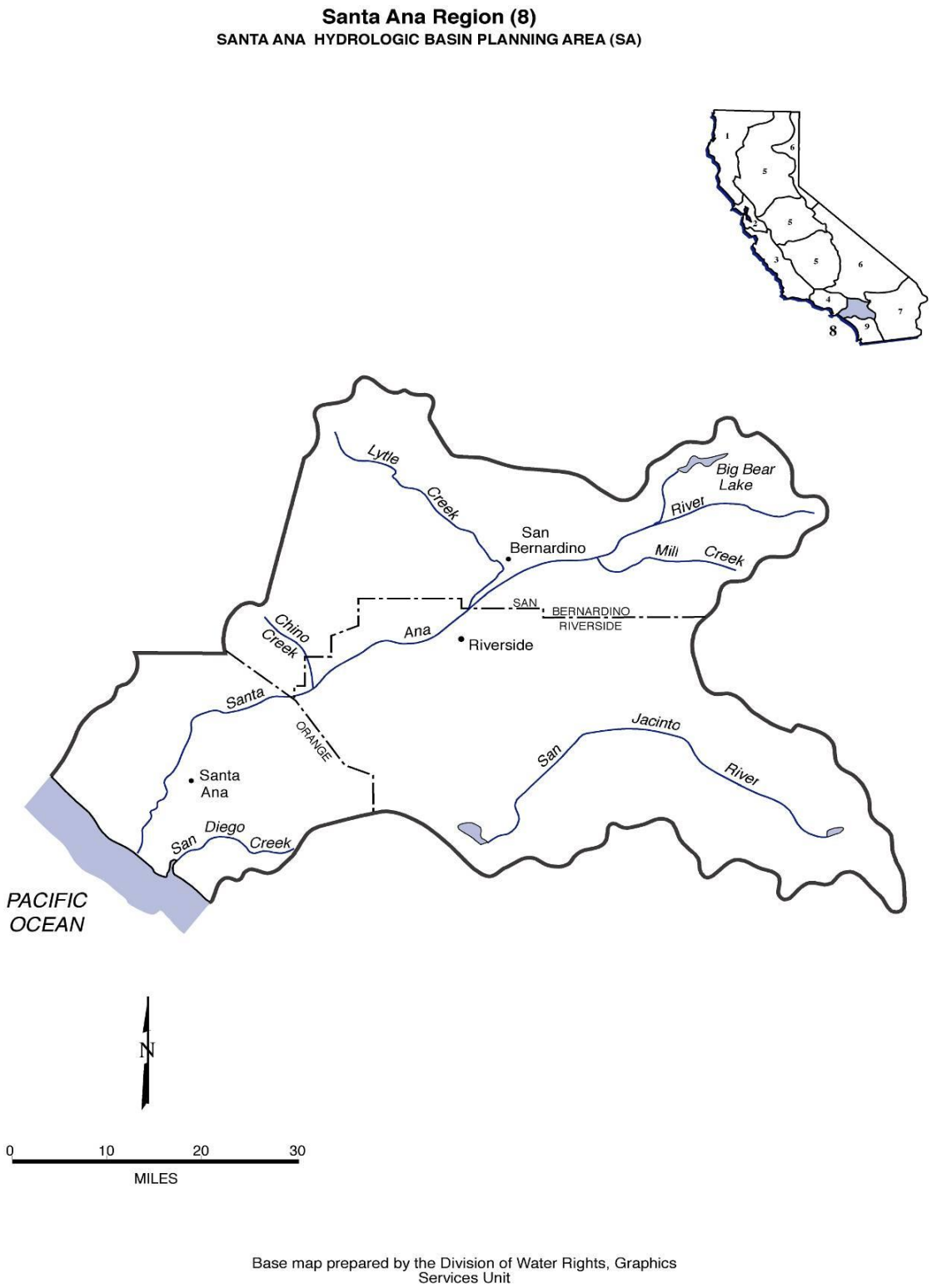



**Figure 23.** Santa Ana Region Hydrologic Basin.

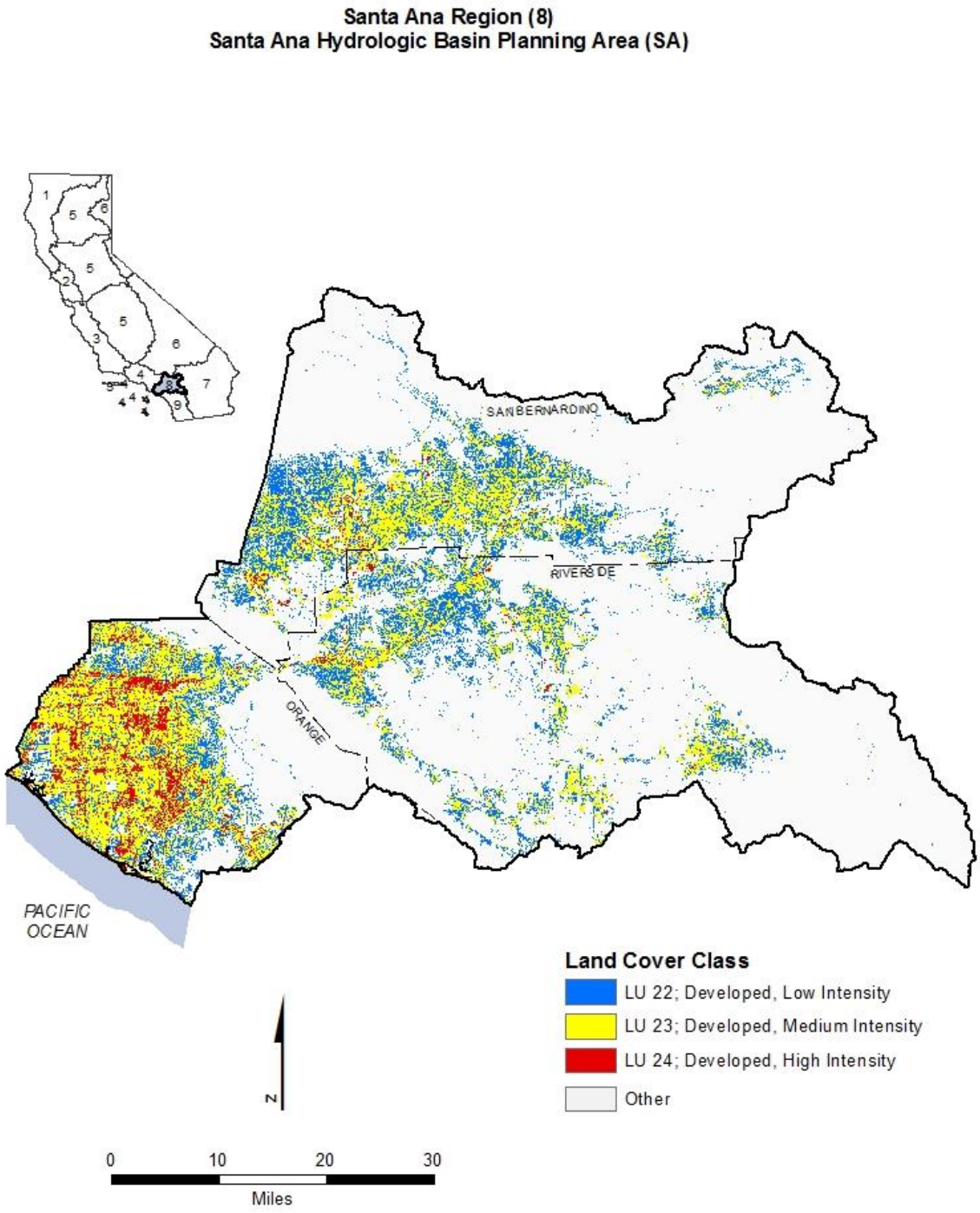



**Figure 24.** Santa Ana Region Developed Land Coverage.

### 3.12 San Diego Region

The San Diego Region comprises all basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary (Figure 25, Figure 26). The San Diego Region is located along the coast of the Pacific Ocean from the Mexican border to north of Laguna Beach. The Region is rectangular in shape and extends approximately 80 miles along the coastline and 40 miles east to the crest of the mountains. The Region includes portions of San Diego, Orange, and Riverside Counties. The cities of San Diego, National City, Chula Vista, Coronado, and Imperial Beach surround San Diego Bay in the southern portion of the Region.

The population of the region is heavily concentrated along the coastal strip. Six deep water sewage outfalls and one across the beach from the new border plant at the Tijuana River empty into the ocean. Two harbors, Mission Bay and San Diego Bay, support major recreational and commercial boat traffic. Coastal lagoons are found along the San Diego County coast at the mouths of creeks and rivers.

San Diego Bay is long and narrow, 15 miles in length and approximately one mile across. A deep-water harbor, San Diego Bay has experienced waste discharge from former sewage outfalls, industries, and urban runoff. Up to 9,000 vessels may be moored there. San Diego Bay also hosts four major U.S. Navy bases with approximately 80 surface ships and submarines. Coastal waters include bays, harbors, estuaries, beaches, and open ocean.

Weather patterns are generally dry in the summer with mild, wet winters, with an average rainfall of approximately ten inches per year occurring along the coast.

Deep draft commercial harbors include San Diego Bay and Oceanside Harbor and shallower harbors include Mission Bay and Dana Point Harbor. Tijuana Estuary, Sweetwater Marsh, San Diego River Flood Control Channel, Kendal-Frost Wildlife Reserve, San Dieguito River Estuary, San Elijo Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Buena Vista Lagoon, San Luis Rey Estuary, and Santa Margarita River Estuary are the important estuaries of the region. There are 13 principal stream systems in the region originating in the western highlands and flowing to the Pacific Ocean. From north to south these are Aliso Creek, San Juan Creek, San Mateo Creek, San Onofre Creek, Santa Margarita River, San Luis Ray River, San Marcos Creek, Escondido Creek, San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River. Most of these streams are interrupted in character having both perennial and ephemeral components due to the rainfall pattern in the region. Surface water impoundments capture flow from almost all the major stream. Four ASBS are located in the San Diego Region: Irvine Coast (also located in the Santa Ana Region) (#33), La Jolla (#29), Heisler Park (#30), and San Diego-Scripps (#31).

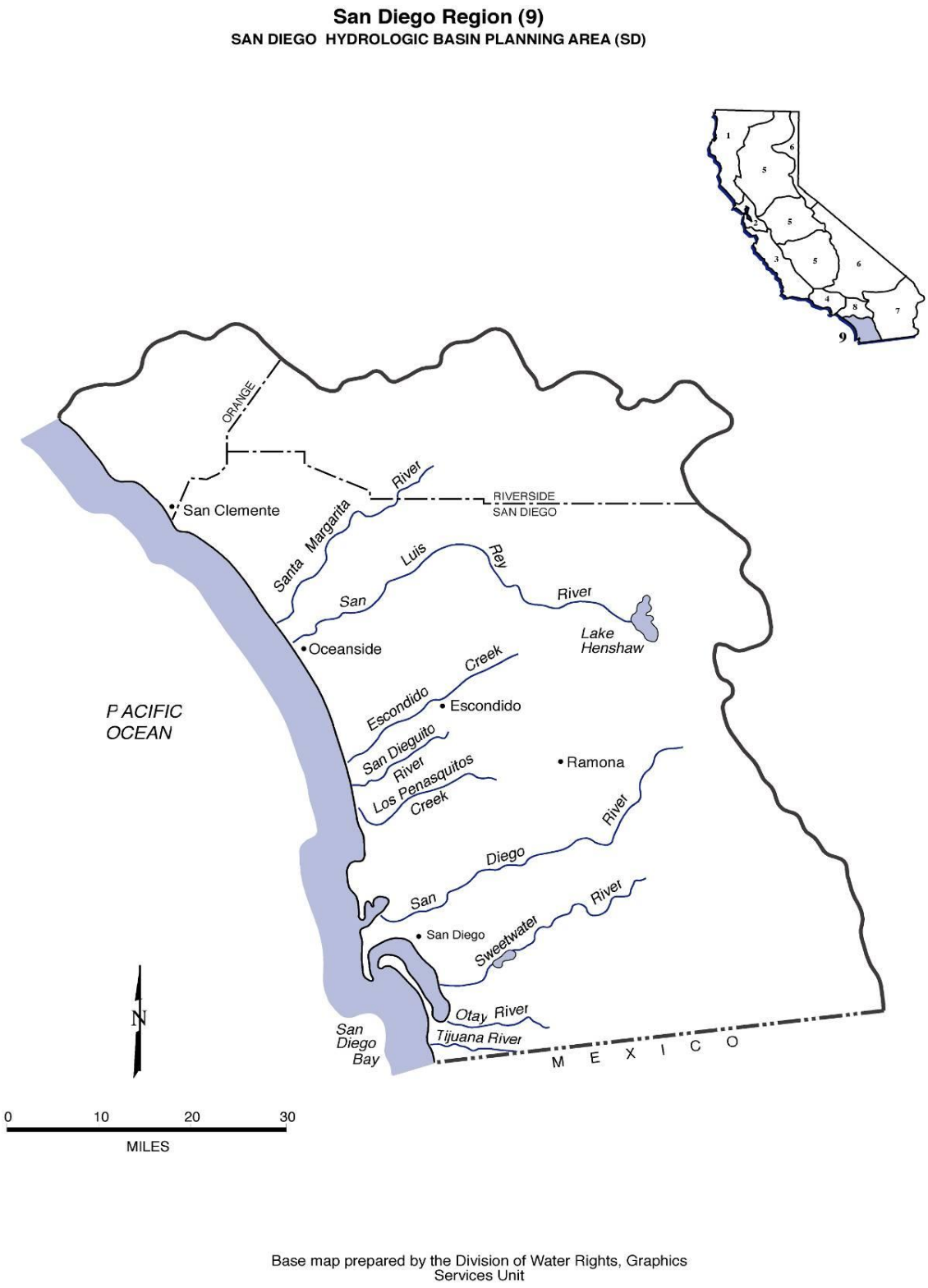



**Figure 25.** San Diego Region Hydrologic Basin.

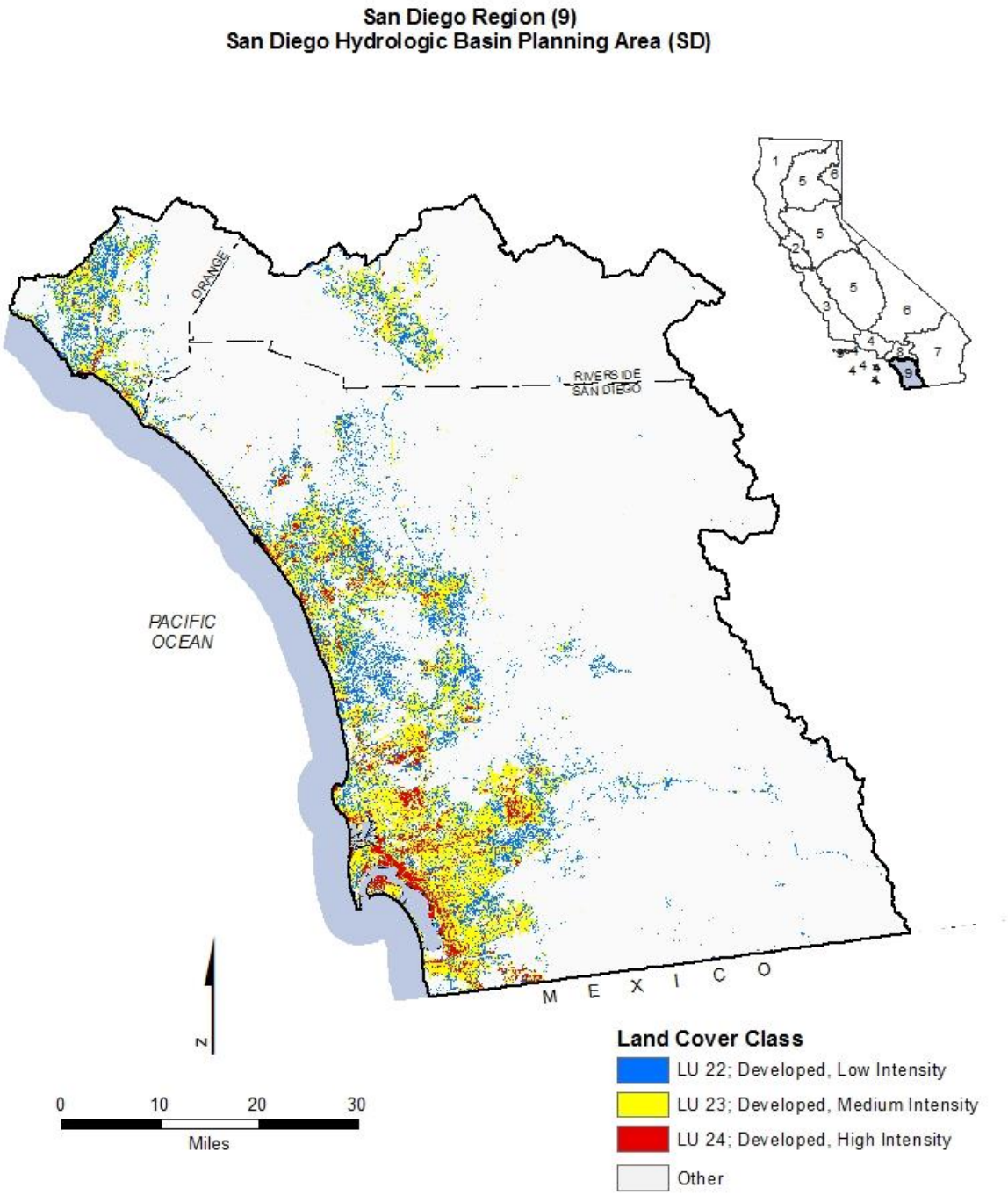



**Figure 26.** San Diego Region Developed Land Coverage.

# 4 ANALYSIS OF ISSUES AND CONSIDERATIONS

This section describes the major amendment-related issues identified during the scoping and development process, and provides a discussion of the State Water Board's rationale for the proposed final Trash Amendments as currently proposed in this ~~Draft~~ proposed Final Staff Report. Each issue discussion is organized as follows:

**Issue:** A brief question framing the issue.

**Current Conditions:** A description of how the Water Boards currently act on the issue, where applicable.

**Considerations:** For each issue or topic, at least two considerations are provided. Each consideration is evaluated with respect to the program needs and the appropriate sections within Division 7 of the California Water Code. The considerations presented here also inform the requirement to analyze the reasonable range of alternatives to the project to avoid or reduce any potentially significant adverse environmental impacts, as described in Section 8.

**Recommendation:** In this section, State Water Board's recommended consideration (or combination of considerations) is identified and proposed for adoption.

## 4.1 Issue 1: How should the Trash Amendments define "trash"?

**Current Conditions:**

Waste and litter are currently defined in California law. As defined by the California Water Code, "waste" includes:

> "Sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal." (§ 13050(d))

The California Government Code defines "litter" as:

> "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." (§ 68055.1(g))

**Considerations:**

1. **No Project: No definition.** Each Water Board would define "trash" for itself in its respective basin plans. This option potentially would result in a wide variety of definitions, and result in a failure to achieve statewide consistency. Therefore, this approach is not recommended.

2. **Define "trash" by using Basin Plans, California Government Code, and the California Water Code.** This definition would combine the definitions of "litter" in the California Government Code and "waste" in the California Water Code to include litter, waste, and types of trash including but not limited to plastic, expanded styrene, cigarette butts, wood, glass, cardboard, metal, and green waste. The resulting definition would read as follows:

   ***Trash*** *means all improperly discarded solid material from any production, manufacturing, or processing operation including, but not limited to, products, product packaging, or containers constructed of plastic, steel, aluminum, glass, paper, or other synthetic or natural materials.*

   This definition includes smaller trash, such as preproduction plastics and other materials. These small forms of trash have an impact on beneficial uses and should be addressed by the objective. This approach is recommended.

3. **Define "trash" by using the California Government Code and the California Water Code, and include size limitation to definition consistent with current technology.** This definition would combine the definitions of "litter" in the California Government Code, with "waste" in the California Water Code to include litter, waste, and other debris of concern such as plastic, expanded styrene, cigarette butts, wood, cardboard, metal, and green waste. The definition would state that it only applies to trash greater than 5 mm in size, consistent with full capture systems.

   ***Trash*** *means all improperly discarded solid material over 5 mm in size from any production, manufacturing, or processing operation including, but not limited to, products, product packaging, or containers constructed of plastic, steel, aluminum, glass, paper, or other synthetic or natural materials.*

   The drawback to including a size limitation is that it does not effectively address smaller trash, such as preproduction plastic and other materials that have an impact on beneficial uses. Therefore this approach is not recommended.

**Recommendation:** Adopt a definition of "trash" with no size limitation (Consideration 2).

### 4.2 Issue 2: What type of water quality objective for trash should be considered?

The U.S. EPA must approve objectives in statewide water quality control plans. Once the objectives have been approved, they become federally mandated and enforceable. Water quality objectives can be narrative or numeric with discrete targets. A narrative objective is as enforceable as a numeric objective.

**Current Conditions:**

Although language varies by each regional water board, in general, the basin plans contain narrative water quality objectives that prohibit the presence of floatable, solid, suspended, and settleable materials in amounts that adversely affect beneficial uses. There are currently 33 existing narrative objectives in the eleven different water quality control plans that apply to the discharge of trash to state waters.

In addition to the water quality standard, as discussed above, the 303(d) listing methodology defines trash as a "nuisance"[13] and states that water segments may be listed as impaired if there is a "significant nuisance condition compared to reference conditions." The existing trash TMDLs establish numeric targets of zero trash based on the interpretation of the narrative water quality objectives in the Los Angeles and Colorado River Basin Plans. Thus, the water bodies with 303(d) listings for trash are found to lack an assimilative capacity for any amount of trash (Los Angeles Water Board 2000; 2004; 2007a; 2007b; 2007c; 2007d; 2007e; 2007f; 2008g; 2010).

Furthermore, multiple assessment methods, using varying objectives, have been implemented by the Regional Water Boards. Assessment parameters presented in the *Rapid Trash Assessment Method Applied to Waters of the San Francisco Bay Region: Trash Measurements in Streams* included: level of trash, actual number of trash items found, threat to aquatic life, threat to public health, illegal dumping and littering, and accumulation of trash (Surface Water Ambient Monitoring Program 2007).

**Considerations:**

1. **No Project: No new objective.** The Water Boards would have to continue to rely on existing basin plans and Ocean Plan, which do not contain trash-specific narratives; instead the objectives refer to trash-related pollutants and other pollutants such as foam and sediment in general terms (i.e., floatable, suspended, and settleable material). Similarly, there currently is no water quality objective specifically for trash in the Ocean Plan and ISWEBE Plan. In addition, the existing regional water boards' basin plan narrative objectives lack consistency. Therefore, this approach is not recommended.

2. **Create a statewide numeric water quality objective of "zero trash."** This objective would create a new statewide numeric water quality objective of "zero trash." The numeric objective could be adopted in individual basin plans by regional water boards or by the State Water Board in statewide water quality control plans (i.e., the Ocean Plan and ISWEBE Plan).

   Specifically, this objective would require that all surface waters not contain trash. Effectively, this performance-based numeric objective would result in an absolute trash discharge prohibition. Such a discharge prohibition could be implemented in phases to address high trash generating areas first. These areas would be

[13] According to California Water Code (§ 13050(m)), nuisance is defined as 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.

determined by either: (1) state-defined categorical areas or, (2) municipalities or responsible jurisdictions.

A numeric objective of "zero trash" could be an efficient regulatory tool because the measurement of compliance is clearly defined. This option would establish a quantitative objective as a statewide numeric standard. While zero trash is the desirable goal, it may not be a feasible numeric objective. On a feasible level, a single piece of trash found in a water body may or may not constitute impairment, and it may or may not be aesthetically unpleasing. Therefore, this approach is not recommended.

3. **Standardize the existing narrative objectives that vary among the water quality control plans.** Individual regional water boards have existing narrative objectives in their basin plans associated with trash. The standardized narrative objective would reflect the concept that the waters of the state shall be *free from floatable, settleable, and suspended materials.*

   Under this alternative, the State Water Board would adopt an order directing each Regional Water Board to adopt a standardized narrative objective in each basin plan through individual amendments. This would be a complex and resource intensive activity, and there is no guarantee that the narrative objectives ultimately adopted would be consistent from region to region. Therefore, this approach is not recommended.

4. **Establish a new statewide narrative objective specifically for trash in the Ocean Plan and ISWEBE Plan.** This option would create a new statewide narrative objective specifically addressing trash with standardized language in all statewide water quality control plans. The objective would be amended into the Ocean Plan and ISWEBE Plan. Statewide water quality control plans supersede basin plans, thereby eliminating the necessity of adopting a narrative objective in each basin plan. This would make more efficient use of Water Board resources. Therefore, this approach is recommended.

**Recommendation:** Adopt a statewide narrative water quality objective specifically for trash in the Ocean and ISWEBE Plan (Consideration 4).

### 4.3 Issue 3: Which surface waters should the Trash Amendments be applicable to?

**Current Conditions:**

There are 73 listed impairments for trash in California waters. TMDLs have been developed to date in the Los Angeles Region and the Colorado River Basin Region. In the Colorado River Basin, a TMDL for trash was adopted for the New River (at the international boundary) that included a numeric target of zero trash (Colorado River Basin Water Board 2006). In the Los Angeles Region, fifteen TMDLs were adopted for trash and debris by either the Los Angeles Water Board or U.S. EPA (Los Angeles Water Board 2000; 2004; 2007a; 2007b; 2007c; 2007d; 2007e; 2007f; 2008g; 2010, U.S. EPA 2012a).

**Considerations:**

1. **No Project.** Water Boards may address trash control through a mixture of regional planning efforts and water body specific TMDLs. Because No Project would not meet the trash objectives to provide a consistent statewide program to address trash in state waters, this approach is not recommended.
2. **Applicable to all surface waters.** In this option, the Trash Amendments would apply to all surface waters covered by the Ocean Plan and the ISWEBE Plan. This would provide statewide consistency for trash control. However, permittees within the Los Angeles Region have made much progress towards compliance with the existing trash and debris TMDLs, so superseding the Los Angeles Water Board's Basin Plan could be counter-productive. Therefore, this approach is not recommended.
3. **Applicable to all surface waters with the exception to those covered by an existing trash and debris TMDL within the jurisdiction of the Los Angeles Water Board.** In this option, the Trash Amendments would apply to all surface waters covered by the Ocean Plan and the ISWEBE Plan with the exception of those covered by an existing trash and debris TMDLs within the Los Angeles Region. The fifteen trash TMDLs in the Los Angeles Region would continue to have more stringent provisions than the proposed final Trash Amendments. This option is not intended to reduce statewide consistency for trash controls, as the Trash Amendments would propose similar set of compliance measures as the trash and debris TMDLs. Instead, the proposed final Trash Amendments would build on lessons learned from the extensive trash control efforts in the Los Angeles Region. However, the proposed final Trash Amendments would direct the Los Angeles Water Board to reconsider the scope of its trash TMDLs within one year of the Trash Amendments' effective date to consider focusing its permittees' trash control efforts on high trash generation areas rather than all areas within each permittee's jurisdiction. The reconsideration would occur for all existing trash TMDLs, except for the Los Angeles River Watershed and Ballona Creek and Wetland Trash TMDLs, because those two TMDLs are approaching final compliance deadlines of September 30, 2016 and July 1, ~~2014 and~~ 2015, respectively. Because this approach creates statewide consistency regarding the concept of trash controls in state water while acknowledging the progress made in the Los Angeles Region, this approach is recommended.

**Recommendation:** The Trash Amendments should apply to all surface waters in the state with the exception of those waters within the jurisdiction of the Los Angeles Water Board that have existing trash and debris TMDLs. The Los Angeles Water Board should reconsider the scope of all existing trash TMDLs, except for the Los Angeles River Watershed and Ballona Creek and Wetland Trash TMDLs (Consideration 3).

## 4.4 Issue 4: What should the scope of a discharge of prohibition for trash, including preproduction plastic[14], be?

**Current Conditions:**

There is no statewide prohibition of discharge of trash to state waters. Instead, various programs exist in parts of the state to address the elimination of trash from state waters. Region-specific NPDES permits, such as in the San Francisco Bay Region, have existing requirements to minimize trash, and trash and debris TMDLs in the Los Angeles Region have similar implementation measures. Trash control measures can range from structural controls (e.g., partial capture systems and full capture systems) to institutional controls (e.g., increased street sweeping, enforcement of litter laws, and adoption of municipal ordinances prohibiting specific products), and combinations of controls.

Through AB 258, the "Preproduction Plastic Debris Program" became effective in the California Water Code (~~section~~ § 13367) on January 1, 2008. This tasks the Water Boards to implement a program to control discharges of preproduction plastics from point and nonpoint sources. Preproduction plastic can be improperly discharged during transport, packaging, and processing when proper housekeeping practices are not employed. Once spilled or released into the environment, their small size of 5 mm or less can preclude effective cleanup. In compliance with Water Code ~~S~~section 13367(d), the IGP contains minimum BMPs to regulate plastic manufacturing, handling, or transportation facilities.

**Considerations:**

1. **No Project.** The Water Boards would continue to regulate trash through either TMDLs and/or region-specific NPDES permit requirements. For preproduction plastics, the Water Boards would continue to implement AB 258 through the IGP permit, which does not cover discharges from locations such as railroad trans-loading stations. Because No Project would not meet the trash objectives to provide a consistent statewide program to address trash in state waters, this approach is not recommended.

2. **Implement the water quality objective through a conditional prohibition of discharge.** Under this option, the water quality objective for trash would be implemented through a conditional prohibition of discharge of trash directly into waters of the state or where trash may ultimately be deposited into waters of the state. The prohibition of discharge would apply to both permitted and non-permitted dischargers. Non-permitted dischargers would either apply with prohibition of discharge or be subject to direct enforcement action. Dischargers with NPDES storm water permits (i.e., MS4 Phase I, MS4 Phase II, Caltrans, IGP, and CGP), WDRs, and ~~W~~waivers of WDRs would comply with the prohibition through a plan of implementation contained in the respective permits. The plan of implementation

[14] California Water Code section 13367 states that "preproduction plastic includes plastic resin pellets and powdered coloring for plastics."

would provide options for permittees to choose from a variety of treatment and institutional controls to minimize the discharge of trash.

There are a wide variety of treatment and institutional controls that have been found to be effective in reducing or eliminating trash in waters. Treatment control options include full capture systems, partial capture systems, LID, and multi-benefit projects. Institutional controls are non-structural BMPs, such as street sweeping, trash collection, anti-litter educational outreach programs, and regulatory source controls.

In addition, the prohibition of discharge would specifically apply to the discharge of preproduction plastic by all manufacturers and transporters of preproduction plastics, and manufacturers that use preproduction plastics.

The conditional prohibition of discharge allows for the implementation of the water quality objective for trash through Water Board permits or through direct enforcement of non-permitted dischargers. Additionally, this option provides flexibility to permittees to determine the most effective means of trash control in light of site conditions, types of trash, and the resources available for maintenance and operation. Therefore, this approach is recommended.

3. **Outright prohibition of discharge for preproduction plastic.** This option would prohibit the discharge of preproduction plastic to waters of the state. Preproduction plastic can be as small as one millimeter, and as such it would not be caught by full capture system. Once released into the environment, drainage system, or waterway, their small size prevents effective cleanup. Because this approach does not build upon implementation efforts achieved in the IGP, a stronger alternative is recommended below.

4. **Use both the existing Industrial General Permit and an outright prohibition of discharge for preproduction plastic.** In this option, the prohibition of discharge for preproduction plastic could continue to be implemented through the IGP, as well as directly through the enforcement of the prohibition of discharge on facilities and industrial activities that are not subject to the IGP. This provides the widest and most efficient approach to controlling the discharge of preproduction plastic, and is therefore recommended.

**Recommendation:** The Trash Amendments should implement the water quality objective through a conditional prohibition of discharge of trash (Consideration 2). The existing IGP and an outright prohibition of discharge should be used to address the prohibition of discharge of preproduction plastic (Consideration 4).

### 4.5 Issue 5: Where should trash control measures be employed?

**Current Considerations:**

In the Los Angeles Region, fifteen TMDLs were adopted for trash and debris by either the Los Angeles Water Board and/or U.S. EPA (Table 16). The existing trash and debris TMDLs targets all land uses within the scope of the TMDL, regardless of the trash generations rates within those land uses. In 2001, the City of Los Angeles Watershed

Protection Division performed a geographical analysis of trash generation in the City of Los Angeles. The study showed that trash is most severe in Downtown LA and nearby communities where commercial, industrial, and residential land uses are predominant (City of Los Angeles 2002). According to the 2004 Trash Baseline Monitoring results in Los Angeles County, the highest trash-generating land-uses were high-density residential, mixed use urban, commercial, and industrial land uses in the Ballona Creek Watershed and Wetland and Los Angeles River Watershed, respectively (County of Los Angeles Department of Public Works 2004a; 2004b).

Under the San Francisco Bay ~~Area~~ MRP, permittees are developing and implementing Short-Term Trash Load Reduction Plans. The Bay Area Stormwater Management Agencies Association (BASMAA) worked collaboratively with the San Francisco Bay MRP permittees to develop a regionally consistent method to establish baseline trash loads from their municipality. The resulting BASMAA Baseline Trash Generation Rates Project assisted the permittees in establishing a baseline by which to demonstrate progress towards trash load reduction goals. The project determined that the four land uses with the highest trash generation rates are (1) retail and wholesale, (2) high-density residential, (3) K-12 schools, and (4) commercial/services and industrial. It also developed a conceptual model for trash generation rates (EOA, Inc. 2012a). The project focused on developing baseline generation rates and categorizing the permittees' jurisdictions as high, medium, and low trash generation rates. This allows the San Francisco Bay MRP permittees to strategize and focus trash controls to effectively achieve trash load reductions. The results of the Los Angeles and San Francisco studies indicate that trash is generated at higher rates in highly populated and/or highly visited areas that attract high volumes of vehicular and pedestrian traffic.

**Considerations:**

1. **No Project: No prioritization regarding the location of trash controls.** In this option, there is no prioritization regarding of the location of trash control for permitted storm water dischargers. This option lacks statewide clarity and consistency for the permitting authority and permittees. Therefore, this approach is not recommended.
2. **All storm drains in all land uses regardless of trash generation rates.** In this option, all areas under the jurisdiction of the permitted storm water dischargers would require trash controls. This option would provide statewide consistency, specifically with the trash and debris TMDLs in the Los Angeles Region. However, trash reduction measures would be required in locations with low trash generation rates, and therefore very little negative impact. This option would be resource intensive when compared to the benefit derived. Therefore, this approach is not recommended.
3. **Focus trash controls on areas with high trash generation rates.** In this option, implementation of the prohibition of discharge would be focused on areas with high trash generation rates.

   The studies from the development and implementation of the trash and debris TMDLs in the Los Angeles Region found that the land uses of highest trash generation are high density residential, commercial, and industrial land uses

(County of Los Angeles Department of Public Works 2004a, Los Angeles Regional Water Board 2007f). While each municipality and country has different land use definitions and codes, an approximate 15-30 dwelling units per acre definition for high density residential is offered as an example of the dwelling unit standards used in local general plans by the Governor's Office of Planning and Research in its 2003 General Plan Guidelines (Governor's Office of Planning and Research 2003). For MS4 Phase I and Phase II permittees high trash generating land use areas or what the proposed final Trash Amendments refer to as "priority land uses" would include: high density residential, commercial, industrial, mixed urban, and public transportation areas. Additionally, a permittee would have the ability to propose alternative equivalent land uses to continue to focus limited resources to the areas with the highest trash generation rates.

Caltrans has jurisdiction over a linear system, and the high trash generating areas under its jurisdiction are different than the priority land uses for a municipality. Based on Caltrans trash studies and consultation (Caltrans 2000, Caltrans 2004~~2~~), the Adopt-A-Highway program, and the Keep California Beautiful program, the "significant trash generating areas" for Caltrans could include areas such as: (1) highway on- and off- ramps in high-density residential, commercial, mixed urban, and industrial land uses; (2) rest areas and park-and-rides; (3) state highways in commercial and industrial land uses; and (4) other mainline highway segments that can be identified by Caltrans through pilot studies and/or surveys.

In comparison to MS4 Phase I, MS4 Phase II, and Caltrans permittees, industrial facilities or construction sites with NPDES permits are substantially smaller in size. Thus, IGP and CGP permittees would have the ability to control trash for all storm water discharges and authorized non-storm water discharges in their jurisdiction.

Because the Los Angeles and San Francisco studies teach that prioritization of the areas with the highest trash generation rates will substantially reduce the discharge of trash to surface waters while maximizing the allocation of trash control resources, this approach is recommended.

**Recommendation:** Focus trash controls to areas with high trash generation rates (Consideration 3).

### 4.6 Issue 6: What implementation measures should be employed for trash control in NPDES storm water permits (i.e., point sources)?

**Current Considerations:**

Trash is currently addressed through the water quality objectives in basin plans and water body specific TMDLs (Table 15). There is a lack of statewide consistency regarding how the water quality objectives are implemented in NPDES permits. Each NPDES storm water permit has a varying set of requirements, ranging from minimal institutional controls, such as street sweeping and education, to control of the entire jurisdiction's discharge of trash through treatment and institutional controls.

For example, in the Los Angeles Region, fifteen TMDLs were adopted for trash and debris by either the Los Angeles Water Board and/or U.S. EPA (Table 16). Implementation plans for point source responsible parties to achieve waste load allocations vary slightly but are based on phased percent reduction goals that can be achieved either implementing full capture systems within all land uses or implementing other treatment and/or non-structural BMPs to comply with the TMDL. Under the San Francisco Bay ~~Area~~ MRP, compliance with the discharge prohibition and trash-related receiving water limitations is met through a timely implementation of control measures, BMPs and any trash reduction ordinances or mandatory full trash capture systems to reduce trash loads from MS4s by set percent reductions over three phases.

State Water Board MS4 Phase II (Order No. 2013-001) and Caltrans (Order No. 2012-0011) permits have street sweeping and education requirements. The CGP prohibits the discharge of any debris from construction sites, and encourages the use of more environmentally safe, biodegradable materials on construction sites to minimize the potential risk to water quality. The IGP contains minimum BMP provisions to regulate the discharge of preproduction plastic from manufacturing, handling, or transportation facilities.

**Considerations:**

1. **No Project: No establishment of implementation measures for NPDES storm water permits.** An absence of implementation measures in the proposed final Trash Amendments would mean that no trash control guidance would be provided to the Water Boards when reissuing their NPDES storm water permits. MS4 Phase I and MS4 Phase II permits could require the reduction of trash in their storm water discharges to the Maximum Extent Practicable. IGP and CGP permittees would be left to a myriad of different standards depending on the site, receiving waters, listing and TMDL status, and basin plan language, resulting in unclear permitting requirements and the potential for trash discharges to not be effectively prohibited.

   This approach is not recommended because of the potential lack of consistency regarding trash control across NPDES storm water permits.

2. **Require the sole use of full capture systems.** Under this option, all permitted storm water dischargers would implement the use of full capture systems to reduce and eliminate trash discharged into the water bodies of California. The definition of full capture systems could mirror the same definition as provided in the Los Angeles River Watershed trash TMDL (Los Angeles 2007f). The definition is as follows:

   > *"A full capture system is treatment control (either a single device or a series of devices) that traps all particles that are 5 mm or greater, and has a design treatment capacity that is either: a) of not less than the peak flow rate, Q, resulting from a one-year, one-hour, storm in the subdrainage area, or b) appropriately sized to, and designed to carry at least the same flows as, the corresponding storm drain."*

Installation of full capture systems would demonstrate compliance for the relevant drainage area, provided that the full capture systems were adequately designed, sized, installed, and maintained. The installation of a full capture system by a permittee would not establish any presumption that the system was adequately sized, and the Water Boards would reserve the right to review sizing or other data in the future to validate that a system would satisfy the definition of a full capture system. Maintenance records indicating trash loads removed and overall system efficiency would be reported regularly and made available for inspection by the regional water boards and public viewing.

The maintenance of such systems on private properties, especially those which have been demonstrated to have extensive internal drainage systems with multiple storm drain inlets (e.g., schools, sports complexes, residential/ industrial/ commercial developments) would also be addressed in this option.

This option would require that all NPDES storm water permittees to install full capture systems without other options to control trash. This option does not take into consideration particular conditions within jurisdictions or sites. This could cause an undue burden on areas and communities that would better benefit from focusing their resources on more cost-effective methods of trash control. Therefore, this approach is not recommended.

3. **Require the sole use of institutional controls.** In this option, NPDES storm water permits would contain requirements that permittees comply with the prohibition of discharge through the sole use of institutional controls (such as street sweeping, clean-up events, education programs, additional public trash cans and increased collection frequency expanded recycling and composting efforts, and adoption of regulatory source controls). This option would meet the goal of preventing trash from entering state waters and provide statewide consistency. However, permittees should have flexibility to determine the most effective means of controlling trash because of particular conditions of sites, types of trash, and the resources available for maintenance and operation. Therefore, this approach is not recommended.

4. **Establish a dual alternative "compliance Track" approach.**

In this option, implementation of the prohibition of discharge would be tailored for each NPDES storm water permit category.

MS4 Phase I and Phase II Permits

For MS4 Phase I and Phase II permits, implementation of the prohibition of discharge would focus on areas with high trash generation rates. Based on Los Angeles and San Francisco studies, the municipal areas with high trash generation rates are identified as "priority land uses". The "priority land uses" would consist of high density residential, industrial, commercial, mixed urban and public transportation stations or equivalent alternative land uses.

As each Phase I and Phase II MS4 has individual site-specific characteristics, permittees could comply with the prohibition of discharge of trash through one of two compliance Tracks.

Under Track 1, permittees would install a network of full capture systems for all storm drains that capture runoff from one or more "priority land uses".

Under Track 2, permittees would install, operate, and maintain a combination of controls (structural and institutional), as long as the combination of controls achieves the same performance results as compliance under Track 1, namely full capture system equivalency. Structural controls could include any combination of full capture systems, other treatment controls, such as LID, and multi-benefit projects.

Caltrans

For the Caltrans permit, implementation of the prohibition of discharge world focus on "significant trash generating areas", which may include area such as: on- and off-ramps in "priority land uses", rest areas and park-and-rides, state highways in commercial and industrial land uses and other segments identified by Caltrans. As Caltrans is a linear system, exclusive use of full capture systems might not be appropriate to achieve the water quality objective for trash. Caltrans would comply with requirements similar to Track 2 to develop and execute an implementation plan to install, operate, and maintain full capture systems, other treatment controls (e.g., partial capture systems and LID), or institutional controls, and/or multi-benefit projects.

IGP/CGP

In comparison to jurisdictions under MS4 Phase I, Phase II and Caltrans permits, industrial facilities or construction sites with NPDES permits are substantially smaller in size. Thus, IGP and CGP permittees would comply with an outright prohibition of discharge trash from all storm water discharges and authorized non-storm water discharges. If the industrial or construction permittee, however, can demonstrate that it is unable to comply with the outright prohibition of discharge, then the permittee may comply through one of two Tracks.

Under Track 1, the permittee would install, operate, and maintain full capture systems for storm drains that service the facility or site.

Under Track 2, the permittee would develop and execute an implementation plan that committed to any combination of controls, such as full capture systems, other treatment controls (e.g. partial capture systems and LID), institutional controls, and/or multi-benefit projects to achieve the same performance results as installation, operation and maintenance of full capture systems would achieve.

A dual alternative "compliance Track" approach tailored to each NPDES storm water permit category would provide flexibility to permittees to determine the

most effective means of controlling trash while taking into consideration particular site conditions, types of trash, and the available resources for maintenance and operation. This option is therefore recommended.

**Recommendation:** Implement the water quality objective and prohibition of discharge with a dual alternative "compliance Track" approach tailored to each NPDES storm water permit category (Consideration 4).

### 4.7 Issue 7: What implementation measures should be employed for trash from nonpoint sources (such as open space recreational areas)?

**Current Conditions:**

Currently, many open space recreational land uses, such as beaches, marinas, campgrounds, and picnic areas experience intensive use and littering. These are often not covered by MS4 permits.

In the Los Angeles Region, the fifteen trash and debris TMDLs address discharges from nonpoint sources through load allocations. The load allocations are implemented through either a conditional waiver from waste discharge requirements or waste discharge requirements. Nonpoint source dischargers may achieve compliance with the load allocations by implementing a minimum frequency of assessment and collection/best management practice (MFAC/BMP) program. The MFAC/BMP Program includes an initial minimum frequency of trash assessment and collection and suite of structural and/or non-structural BMPs.

**Considerations:**

1. **No Project: No establishment of implementation measures for nonpoint sources.** Without statewide implementation measures for trash control for nonpoint sources, nonpoint sources of trash would continue to either lack implementation provisions or contain load allocation within individual water body TMDLs. Because No Project would not meet the trash objectives to provide a consistent statewide program to address trash in state waters, this approach is not recommended.

2. **Assessment, collection and management practices for trash control would be required of all nonpoint source dischargers.** Nonpoint source dischargers would be required to develop and implement a program of management practices for control of trash within a WDR or a waiver of WDR. Management practices could include enforcement of litter laws, education, recycling programs, more or better trash receptacles, and/or more frequent servicing of trash receptacles. Assessment, collection and management practices may include initial and annual assessments of trash generation, a determination of collection frequency necessary to meet the water quality objective, and a suite of structural and/or nonstructural management practices that prevent trash from entering or accumulating in waters of the state.

   The discharger would be required within a WDR or a Waiver of a WDR to facilitate the initial annual assessment collection and disposal of all trash found in or adjacent to surface waters, including along shorelines, channels, or

river/stream banks, and would implement an initial suite of BMPs based on current trash management practices in land areas that are found to be sources of trash to a water body.

Considering regions with large publicly owned rural areas, it may be most appropriate to address nonpoint source trash on federal and state-owned lands through State Water Board Management Agency Agreements or Memoranda of Understanding with the corresponding land management agencies and/or through statewide waivers or discharge permits.

In regards to responsible jurisdictions, the responsibility of collection and disposal of trash extends to upstream land owners as well as shoreline owners.

One drawback to requiring this approach in all jurisdictions is that most open space land usage is not a significant generator of trash. Requiring this level of effort for large swaths of public land would not be cost-effective or result in significant trash reductions. Certain high usage nonpoint source areas, however, such as beaches, marinas, campgrounds, and picnic areas, often experience substantial littering. Therefore, this approach is not recommended.

3. **Trash control measures for nonpoint source dischargers would be each Water Boards' discretion.** Statewide, nonpoint source discharges of trash cause less of an impact to state water than do point sources; however, at the local or regional level nonpoint sources can be a substantial source of trash. These areas may include high usage campgrounds, picnic areas, beach recreation areas, and marinas, which can be subject to WDRs or conditional waivers of WDRs. These types of areas would be assessed by the Water Boards to determine if trash controls are necessary. For such areas determined to require trash controls within a WDR or waiver of a WDR, management practices could include enforcement of litter laws, education, recycling programs, more or better trash receptacles, and/or more frequent servicing of trash receptacles. This approach is recommended as it targets regional regulation of the discharge of trash from locations with high trash generating rates.

**Recommendation:** Trash control measures for nonpoint sources that generate large amounts of trash at the local or regional level would be at the Water Boards' discretion (Consideration 3).

### 4.8 Issue 8: How should the Trash Amendments address time schedules?

**Current Conditions:**

In accordance with the California Water Code section 13242, implementation programs for achieving water quality objectives shall include a description of necessary actions, a time schedule for actions to be taken, and a description of surveillance to be undertaken to determine compliance with the water quality objectives. All compliance schedules in NPDES storm water permits (i.e., MS4 Phase I, MS4 Phase II, Caltrans, IGP, and CGP) need to follow the Policy for Compliance Schedules in NPDES Permits as adopted by the State Water Board on April 15, 2008 (Resolution No. 2008-0025). TMDL compliance schedules are adopted by the applicable regional water board.

**Considerations:**

1. **No Project: No time schedule.** This option would leave policies and practices as they are currently under permits and TMDLs. If this option is selected, then compliance schedules would continue to vary among regions, resulting in statewide inconsistency. Therefore, this approach is not recommended.

2. **Require immediate compliance.** Immediate compliance could be required for all permittees except those operating under existing trash and debris TMDLs in the Los Angeles Region. This alternative may be unpopular with permittees that are unfamiliar with trash monitoring and implementation and may find immediate compliance difficult to achieve; their inability to meet the proposed objective may result in enforcement actions that might otherwise have been avoided through the adoption of compliance schedules. Therefore, this approach is not recommended for existing developments. However, this alternative is appropriate for new developments in priority land uses where it would be unreasonable to design and construct a development out of compliance with the Trash Amendments and subsequently need to develop a plan to come into compliance.

3. **Adopt a single statewide time schedule for all categories of permits.** This alternative would designate a single specific time schedule during which all permittees, regardless of category, would be required to implement necessary controls in order to achieve compliance. For example, all permittees may be required to come into full compliance within a single permit cycle. This might require a planning and funding burden for municipalities committing to the installation of certified full capture systems. Due to the differences in the size and scope of the jurisdiction of storm water permittees, this approach is not recommended.

4. **Adopt different statewide time schedules for different categories of permits.** This alternative would designate specific amounts of time during which different categories of NPDES permittees would be required to achieve compliance. For MS4 permittees with regulatory authority over priority land uses, compliance schedules would be set at ten years of the effective date of the first implementing permit with a cap of fifteen years from the effective date of the Trash Amendments for achieving full compliance. Ten years would allow for up to two permitting cycles. The second permit could build on the first permit with lessons learned from permittees' trash control efforts. The fifteen year cap provides certainty of a full-compliance end date, and also gives Water Boards up to five years to incorporate trash requirements into their respective permits. For Caltrans, the time schedule would be based on the effective date of the implementing NPDES permit with a ten-year compliance schedule. For permittees under the IGP and CGP, full compliance would be accomplished as specified by the time schedule set in the first implementing permit. To allow for differences in NPDES permit types, this approach is recommended.

**Staff Recommendation:** Require immediate compliance for new developments in priority land uses (Consideration 2). Adopt different statewide time schedules for different categories of permits (Consideration 4).

### 4.9 Issue 9: Should time extensions be provided for employing regulatory source controls?

**Current Conditions:**

California is the leader in implementing local ordinances with goals of reducing trash. The two types of local government ordinances focus on single-use disposable items, such as expanded polystyrene foam and single-use carryout bags. At least 65 jurisdictions have either banned extended polystyrene foam food containers completely or have prohibited use by government agencies or at public events. A few jurisdictions that have banned or partially banned polystyrene for takeout food packaging, which includes the City and County of San Francisco, Los Angeles County, Sonoma County, the City of Malibu, and the City of Berkeley. In 2006, the City and County of San Francisco passed a ban on single-use carryout bags in grocery stores and pharmacies. Since then, at least 72 local jurisdictions adopted city and county ordinances for single-use carryout bags. Most ordinances have a paper bag fee (10-25 cents) as well as a ban on plastic due to the desire to promote reusable bags as the bag of choice.

**Considerations:**

1. **No Project: No allowance for time extensions to create incentives for employing regulatory source controls.** Regulatory source controls are a subset of the suite of institutional controls that a MS4 permittee may utilize to control trash under Track 2. Therefore, additional time for final compliance may not be warranted to create an incentive for adoption of an ordinance that may also be employed for final compliance with the prohibition of discharge.

2. **Provide a time extension for new regulatory source control ordinances.** The aim of adopting regulatory source controls is to remove a specific type of item from the waste stream. Regulatory source controls require intensive collaboration and support among local governments, public, and retailers. This process can take several years to adopt and become effective. Providing a time extension for final compliance would provide an additional incentive for a local government to pass regulatory source control ordinances. Under this consideration, the time extension would only be afforded to municipal permittees that pass an ordinance following the effective date of the Trash Amendments. Limiting the time extension to only new regulatory source controls would have the effect of penalizing municipalities that have already adopted regulatory source control ordinances to control trash.

3. **Provide a time extension for regulatory source control ordinances enacted up to three years prior to the effective date of the Trash Amendments.** Because regulatory source controls require intensive collaboration and support among local governments, public, and retailers, and can take several years to adopt and become effective, providing a time extension for final compliance

would provide an additional incentive for a local governments to adopt regulatory source control ordinances. Extending the time extension to municipalities that have passed regulatory source controls prior to the effective date of the Trash Amendments provides statewide consistency and equal benefits to all municipal permittees who have taken effort to reduce trash with regulatory source controls. For the time extension to be granted, however, a regulatory source control would need to take effect with three years of the effective date of the Trash Amendments in order to achieve performance results with the compliance schedule.

**Recommendation:** ~~This Issue is being proposed as an option for State Water Board consideration in order to receive public comment and feedback on the pros and cons of this Issue~~ In the Draft Staff Report and proposed Trash Amendments, a time extension for a permittee's adoption of regulatory source control was proposed to the allow the State Water Board to consider that option after receiving public input on the potential advantages and disadvantages to this approach. Subsequent to the State Water Board's public workshop and the public hearing on the proposed Trash Amendments, Senate Bill 270 (2014 Stats. Ch. 850) was enacted. That new law enacts a state-wide plastic bag carry-out ban pertaining to grocery stores and pharmacies that have a specified amount of sales in dollars or retail floor space, which goes into effect July 1, 2015, and imposes the same ban on convenience stores and liquor stores a year later. Such product ban was generally the type of regulatory source control contemplated and discussed with regard to consideration of the time extension option. Effectively enactment of Senate Bill 270 removed the need for the regulatory source controls in the proposed Trash Amendments. As a result, the recommendation is to not allow time extensions for a MS4 permittee's adoption of regulatory source controls (Consideration 1).

### 4.10 Issue 10: How should the Trash Amendments structure monitoring and reporting of trash control efforts?

**Current Conditions:**

In accordance with the California Water Code section 13242, implementation programs for achieving water quality objectives shall include a description of necessary actions, a time schedule for actions to be taken, and a description of surveillance to be undertaken to determine compliance with the water quality objectives.

**Considerations:**

1. **No Project: No monitoring or reporting required above what is already required.** This approach would be consistent with any monitoring or reporting that is currently required by regional water boards. Although it would not cost permittees any additional resources, it would be insufficient to evaluate compliance with the proposed final Trash Amendments and would run counter to California Water Code section 13242. Therefore, this approach is not recommended.

2. **Monitoring and cleanup in receiving waters by all permittees, regardless of method of compliance.** There are several approaches to monitoring that may be employed:

    a. **Minimum frequency of assessment and collection (MFAC).** The MFAC program includes an initial minimum frequency of trash assessment and collection. The MFAC program would include collection and disposal of all trash found in the receiving waters and shoreline. The initial minimum frequency may be established based on seasonal use of the area, regionally-specified storm sizes, and after major public events at certain locations, such as the county fairgrounds.

    b. **Establishment of Daily Generation Rate.** An area's trash discharges may be estimated using a mass balance approach, based on the daily generation rate for the specific area. The daily generation rate is the average amount of trash deposited within a specified drainage area over 24-hour period. The daily generation rate can be used in a mass balance to estimate the amount of trash discharged during a rain event.

    The daily generation rate may be determined by local jurisdictions from direct measurement of trash deposited in the drainage area during any 30-day period from June 22nd to September 22nd of a given year and recalculated every year thereafter. This three-month period is assumed to encompass high outdoor activity when trash is most likely to be deposited on the ground.

    Accounting of daily generation rate as well as trash removal via street sweeping, catch basin clean outs, garbage and cigarette butt receptacles, etc. would be tracked in a central spreadsheet or database to facilitate the calculation of discharge for each rain event. The spreadsheet and/or database would be available to the Water Boards for inspection during normal working hours. The database/spreadsheet system would allow for the computation of calculated discharges and could be coordinated with enforcement.

    c. **Alternate compliance monitoring programs.** Water Boards could approve, at their discretion, alternative compliance monitoring programs upon finding that an alternative program would provide a scientifically-based estimate of the amount of trash discharged from the storm drain system.

    These approaches are not prescriptive as each permittee will have a unique implementation strategy, and the monitoring approach needs to be suited for each strategy.

3. **Monitoring and reporting ~~should be~~ tailored to the type of compliance.**

    As the compliance options vary among NPDES permits for storm water discharges, the monitoring and reporting options could be tailored to the type of compliance. Within this option under consideration, the balance between the

need for consistency and flexibility would be achieved through standardized objectives in the monitoring program. The proposed final Trash Amendments could establish minimum monitoring and reporting provisions, and Water Boards could include more extensive provision in implementing permits.

MS4 permittees complying under Track 1 would provide a report to the applicable Water Board demonstrating installation, operation, and maintenance of full capture systems on an annual basis. MS4 permittees complying under Track 2 would develop and implement annual monitoring plans to demonstrate ~~implementation, performance results, and~~ effectiveness of the ~~institutional~~ controls and compliance with full capture system equivalency. This requires that permittees collect monitoring data about existing trash levels prior to implementation of institutional controls to set a baseline for comparison to trash levels after implementation of controls. ~~At a minimum, the m~~Monitoring reports ~~shall~~ developed by MS4 Permittees should consider ~~address and answer~~ the following questions:

1) What type of and how many treatment controls, institutional controls, and/or multi-benefit projects have been used, and in what locations?
2) How many full capture systems have been installed (if any), and in what locations have they been installed, and what is the individual and cumulative area served by them?
3) What is the effectiveness of the total combination of treatment controls, institutional controls, and/or multi-benefit projects employed by the permittee?
4) Has the amount of trash discharged from the MS4 decreased from the previous year? If so, by how much? If not, explain why.
5) Has the amount of trash in the MS4's receiving water(s) decreased from the previous year? If so, by how much? If not, explain why.

Caltrans should develop and implement annual monitoring plans to demonstrate ~~performance results and to assess~~ effectiveness of the ~~institutional~~ controls and compliance with full capture system equivalency. ~~At a minimum, the m~~Monitoring reports developed by Caltrans ~~shall~~ should consider ~~address and answer~~ the following questions:

1) What type of and how many treatment controls, institutional controls, and/or multi-benefit projects have been used, and in what locations?
2) How many full capture systems have been installed (if any), and in what locations have they been installed, and what is the individual and cumulative area served by them?
3) What is the effectiveness of the total combination of treatment controls, institutional controls, and multi-benefit projects employed by Caltrans?
4) Has the amount of trash discharged from Caltrans' MS4 decreased from the previous year? If so, by how much? If not, explain why.

5) Has the amount of trash in the receiving waters decreased from the previous year? If so, by how much? If not, explain why.

Industrial and construction permittees would not have specific monitoring requirements. The controls and measures used to comply with the prohibition of discharge can be required to be reported and included in the Storm Water Pollution Prevention Plan.

The tailored approach would provide flexibility to Water Board permit writers to design monitoring programs that reflect the compliance methods elected by permittees along with regional characteristics. For statewide consistency, all monitoring programs would be striving to answers the same fundamental questions. Therefore, this approach is recommended.

**Recommendation:** Monitoring and reporting should be tailored to the type of compliance (Consideration 3).

# 5 REASONABLY FORESEEABLE METHODS OF COMPLIANCE

The proposed final Trash Amendments do not specify a manner of compliance and accordingly, the actual compliance strategies would be selected by the local agencies and other permittees. Although the proposed final Trash Amendments do not mandate the manner of compliance, the State Water Board's SED for the proposed project is required to include an analysis of the reasonably foreseeable methods of compliance with the project (see 23 CCR 3777; Pub. Res Code ~~Section~~ § 21159). Several of the reasonably foreseeable methods of compliance are well known, and a discussion of a reasonable range of these methods of compliance and design parameters is presented below. In addition, the possible environmental effects that could be caused by these compliance methods are presented in Section 6.

During the development of the proposed final Trash Amendments, numerous stakeholder and public meetings were held during which the manner of compliance was discussed. Some of the most likely measures discussed included treatment controls (e.g., partial capture systems and full capture systems) and institutional controls (e.g., increased street sweeping, enforcement of litter laws, and development of municipal ordinances prohibiting food packaging with polystyrene materials). This section provides a description of storm water systems and of sites where treatment controls might be placed to comply with the proposed final Trash Amendments. In addition, this section discusses treatment control alternatives, such as catch basin inserts and vortex separators, and institutional control alternatives, such as street sweeping, ~~and~~ public education, and ordinance.

## 5.1 Treatment Controls - Storm Drain Systems

Underground storm drains are typically designed to carry the runoff from up to a ten-year storm event. Open channels are typically designed to carry the runoff from up to a 50-year storm event, and in some cases, this design flow rate is increased to accommodate debris laden flows. The rate of runoff a drain can safely convey, expressed in cubic feet per second, is called its peak capacity. While a drain's capacity would not diminish over the years, the amount of runoff generated by a given storm event can increase over the years. This potential increase could be due to a number of factors including: an increase in the amount of development and impervious surfaces within the tributary area, and the addition of smaller upstream tributary drains that deliver runoff more quickly to the collecting drain. The potential for such increases at a particular site is a consideration in the applicability of a particular treatment control method of compliance with the proposed final Trash Amendments.

Storms are commonly referred to by their "frequency." For example: a one-year storm event, having a long-term probability of happening at least once a year is a very common occurrence. On the other hand, a 50-year storm event is a much rarer occurrence, with a long-term probability of occurring only once in 50 years. The actual rate of runoff from storms of a given size or frequency depends on a number of factors, including the intensity and duration of the rainfall, the size of the tributary area, the topography, the soil types within the tributary drainage area, and the overall connected imperviousness of the tributary area.

### 5.1.1 Reasonably Foreseeable Methods of Compliance: Design and Installation of Devices for Trash Removal

The treatment controls likely to be used for compliance with the proposed final Trash Amendments are devices that would be installed in existing storm drains. Older storm drains may be physically limited in expansion capability and maintenance right-of-way and the complying permittees must consider these factors when designing and siting new trash devices within existing facilities.

A factor to consider when designing and siting devices is drain capacity. For instance, if a treatment control is to be installed mid-drain, the storm drain system must have sufficient capacity, or the storm drain must be modified to maintain sufficient capacity. Start-of-pipe devices such as catch basin opening screens and excluders or end-of-pipe devices such as trash racks, fabric mesh socks and wire screens, may have less impact on hydraulic drain capacity under certain hydraulic conditions than devices installed mid-pipe. The smaller the amount of flow a retrofitted device or system must treat; the less hydraulic impact it will have on the storm drain system as a whole.

In addition, the definition of "full capture system" in the proposed final Trash Amendments includes reference to capturing trash particles that are the size of 5 mm or greater. The 5 mm size limit is approximately the diameter of a pencil or cigarette butt. A smaller particle size implies a smaller filtering mesh or screen size, and a smaller mesh or screen size implies more resistance to the flow passing through it. When designing and siting controls, assuming that a certain percentage of a screen would be blocked by trash during a storm event, the total area of the screen openings would have to be larger than the area of the drain's cross section by that percentage.

In addition to the requirement of removing litter with a size of 5 mm, the design of a full capture system should take into account reliability and performance sensitivity under varying loads. Based on current industry standards for existing facilities, a typical full capture system is expected to meet the following minimum criteria:

- It must not adversely affect the level of flood protection provided by the drainage system;
- It should be vector-resistant, or not pond water for more than 48 hours after the end of a storm;
- It should not worsen water quality by re-suspending trash, sediments, or bacteria, or by leaching heavy metals or semi-volatile organic compounds;
- It should have no plastic or fiberglass interior parts that would break or shatter in the path of direct flow;
- Its pipes, conduits and vaults should not be more than 32 feet below ground, and should be easily accessible by a vacuum truck hose for clean-out, be reasonably accessible by a qualified maintenance worker, have provisions for confined space entry and safety guard rails around the rim; and
- It should provide means to block off the inflow and tail water backflow to isolate the device for safe maintenance and repair of the unit.

### 5.1.2 Catch Basins and Catch Basin Inserts

Treatment controls likely to be used for compliance with the proposed final Trash Amendments may include installation of catch basins or inserts within existing catch basins. A catch basin or storm drain inlet is an inlet to the storm drain system that typically includes a grate or curb opening where storm water enters the catch basin, and a sump to capture sediment, debris and associated pollutants. They are also used in combined sewer watersheds to capture floatables and settle some solids. Catch basins act as pretreatment for other treatment practices by capturing large particles. The performance of catch basins at removing sediment and other pollutants depends on the design of the catch basin (e.g., the size of the sump), and routine maintenance to retain the storage available in the sump to capture sediment.

Catch basins are used in drainage systems throughout the United States. Many catch basins, however, are not designed for trash capture. Ideal application of catch basins as a reasonably foreseeable method of compliance with the proposed final Trash Amendments is as pretreatment to another storm water management practice. Retrofitting existing catch basins may help to improve their performance substantially. A reasonably foreseeable method of compliance may include a simple retrofit of catch basins to ensure that all catch basins have a hooded outlet to prevent floatable materials, such as trash and debris, from entering the storm drain system.

The performance of catch basins is related to the volume in the sump (i.e., the storage in the catch basin below the outlet). Optimal catch basin sizing criteria which relates all catch basin dimensions to the diameter of the outlet pipe.

Maintenance of the installed catch basins is expected to include trash removal if a screen or other debris capturing device is used, and removal of sediment using a vactor truck. Operators will need to be properly trained in catch basin maintenance. When sediment fills greater than 60 percent of their volume, catch basins reach steady state. Therefore, storm flows may then bypass treatment and may also re-suspend sediments trapped in the catch basin. Regular clean-outs will typically be required to retain the volume in the catch basin sump available for treatment of storm water flows.

At a minimum, catch basins would be expected to be cleaned once or twice per year to maintain effectiveness (Aronson et al. 1993). Two studies suggest that increasing the frequency of maintenance can improve the performance of catch basins, particularly in industrial or commercial areas. One study of 60 catch basins in Alameda County, California, found that increasing the maintenance frequency from once per year to twice per year could increase the total sediment removed by catch basins on an annual basis (Mineart and Singh 1994). These results suggest that, at least for industrial uses, more frequent cleaning of catch basins would improve removal efficiency. The cost of operation and maintenance would, however, be expected to increase with installation of catch basins (or inserts).

Within a catch basin, a "catch basin insert" may also be perforated metal screens placed horizontally or vertically within a catch basin. There are a multitude of inserts of various shapes and configurations. One device suitable for compliance with the proposed final Trash Amendments is a grated plastic box or metal screen that fits

directly into the curbside catch basin. As the storm water passes through the box, trash, rubbish, and sediment remain in the box while storm water exits.

Metal screening inserts may be deployed in a vertical or horizontal configuration within the catch basin for the retention of trash. These inserts would be expected to maximize much of the existing catch basin volume and concurrently pass through flow.

Catch basin screens design is expected to be open to curb flow in order to reduce the potential for flooding during wet weather. For example, American Storm Water has a catch basin screen with an automatic retractable screen gate design which can be adjusted to "un-lock" and open up to storm water curb flow from 20 percent to 60 percent of curb height. This device which is termed the “Surf Gate” is also designed with a special "locking" application, which keeps children safe and large debris from getting into the catch basin.

Grate inserts may also be utilized as a compliance method and are typically found in parking lots, alleys, and sloping streets. Inserts installed in these basins mainly capture trash smaller than an inch due to the standardized grating spacing. Inserts designed for curb opening basins would be best suited for capturing larger debris like water bottles and plastics bags, as the opening under the curb may range from four to eight inches.

### 5.1.3 Vortex Separation Systems

The treatment controls likely to be used for compliance with the proposed final Trash Amendments may include installation of vortex separation system units. Vortex separation systems units are designed to capture almost all trash deposited into a storm drain system. A vortex separation system unit diverts the incoming flow of storm water and pollutants into a pollutant separation and containment chamber. Solids within the separation chamber are kept in continuous motion, and are prevented from blocking the screen so that water can pass through the screen and flow downstream. Solid pollutants including trash, debris and coarse sediments are retained in a centrally located solids catchment chamber with the heavier solids ultimately settling into the base of the unit or sump. This would be expected to be a permanent device that would be retrofitted for oil separation as necessary. Outfitting a large drainage with a number of large vortex separation system units may be less costly than using a larger number of small vortex separation system units.

An example of vortex separation system technology is the Continuous Deflective Separation unit, developed by Continuous Deflective Separation Technologies, Inc. When applied to storm water, the Continuous Deflective Separation unit is designed to capture and retain sediments, floatable and settleable trash and debris over a wide range of flow conditions (up to 300 cubic feet per second). The fine screens used in storm water applications vary in size from 1.2 – 4.7 millimeter (0.048 - 0.185 inches). The Continuous Deflective Separation units are placed underground and would be expected to be utilized in highly urbanized areas where space is limited. In general, a Continuous Deflective Separation unit typically occupies about 4-1/2 square feet of surface area for each cubic feet per second that it treats, with the bulk of the installation being well below grade. The solids would be removed using a vactor truck, a removable basket, or a clam shell depending on the user's preference and size of the unit. For new installations, it is expected that continued monitoring of the condition of the unit would

be required after every runoff event for the first 30 days. Based on the behavior of the unit relative to storm events, inspections may be scheduled on projections using storm events vs. pollutant buildup. For ongoing operation, unit inspections are expected to occur at least once every 30 days during the wet weather season. As part of the expected maintenance, floatables would be removed and the sump cleaned when the sump is above 85 percent full. Also, at least once a year, it is expected that the unit would be pumped down and the screen carefully inspected for damage and to ensure that the screen is properly fastened.

The City of San Jose analyzed the relative capital and operation/maintenance cost of small devices (connector pipe screens and automatic retractable screens at the curb) and the hydrodynamic separator capturing trash from an area of 1000 acres, over 10 and 20-year time frames, accounting for repair and replacement of small units and increases in labor costs. The City of San Jose found that small devices were more economical in the first decade, but the cost advantage disappears in the second decade (San Francisco Estuary Partnership 2014).

### 5.1.4 Trash Nets

A treatment control likely to be used for compliance with the proposed final Trash Amendments may include installation of trash nets. These are devices that use the natural energy of the flow to trap trash, floatables and solids in disposable mesh nets. One type of trash net, developed by Fresh Creek Technologies, Inc. may be reasonably foreseeable as a method of compliance because it was certified by the Los Angeles Water Board on April 29, 2004 for use on the Los Angeles River Watershed TMDL (Dickerson 2004). Currently, three modular models are available from Fresh Creek Technologies, Inc.:

- The *In-Line Netting* TrashTrap® model is a modular chamber containing the capture apparatus for holding the disposable nets. The system is installed in-line with the outfall pipe. A prefabricated chamber minimizes site work and cost. Inline units are underground and out of sight, particularly well-suited for densely populated locations.
- The *End-of-Pipe Netting* TrashTrap® model is installed at the end of the pipe. These units are often installed as a retrofit to an existing outfall structure. When this opportunity exists, the End-of-Pipe system is highly cost effective.
- The *Floating Netting* TrashTrap® model is a modular pontoon structure that floats at the end of the outfall. Floating units are an economical solution where site conditions (minimum water depth of two feet and a relatively sheltered site) permit its use. They are often installed with only minor modifications to the existing site.

Model selection and sizing of trash nets would be based on site-specific criteria including peak volume, peak velocity, and trash/floatables volume. Modularity and capacity of the installation would be achieved by varying the number of nets in the system. Installations, consistent with current practice, are expected to range from single net units to systems with 10 nets handling flows above 3,000 cubic feet per second. The standard mesh net would handle flows up to 30 cubic feet per second or 22 million

gallons per day and velocities up to five feet per second at the mouth of the net. A truck with a hoist for changing the nets, and a container for holding the full nets would be expected for servicing trash nets. A crew of two accomplishes the net change out in a matter of a few minutes. Road access to the site would be required for the service vehicle.

The *End-of-Pipe* nets are another control that is reasonably foreseeable as a method of satisfying the proposed final Trash Amendments because of the low cost, the ease of maintenance, and also because the devices can be relocated after a set period at one location (provided the pipe diameters are the same). With limited funding, installation could be spread over several land uses and lead to valuable monitoring results. For smaller systems the total installation time can be as short as one day. Since the devices require attachment to the end of a pipe, this can severely reduce the number of locations within a drainage system that can be monitored. In addition, these nets cannot be installed on very large channels (seven feet in diameter is the maximum).

### 5.1.5 Gross Solids Removal Devices

A treatment control likely to be used for compliance with the proposed final Trash Amendments may include installation of Gross Solids Removal Devices. Several types of these devices were developed by Caltrans to be retrofitted into existing highway drainage systems or implemented in future highway drainage systems. Gross Solids Removal Devices are structures that would remove litter and solids five millimeters (0.25 inches nominal) and larger from the storm water runoff using various screening technologies. Overflow devices would be expected to be incorporated; usual design of the overflow release device is based upon the design storm for the roadway. Though designed to capture litter, the devices would also be expected to capture vegetation debris. The devices described below are generally limited to accept flows from pipes 30 inches in diameter and smaller.

To assess the feasibility of utilizing Gross Solids Removal Devices, Caltrans developed a Pilot Program with multiple phase pilot studies. A pilot study generally consisted of one or more devices that were developed from concept, advanced through design and installation, and placed in service for two years of testing to evaluate overall performance (Caltrans 2003). Based on the Pilot Program, three types of Gross Solids Removal Devices have been shown the most promising and are therefore considered within the reasonably foreseeable methods of compliance: linear radial and two versions using an inclined screen. On October 7, 2004, the Los Angeles Water Board certified two Caltrans' Gross Solids Removal Devices, Linear Radial – Configuration 1 (LR1 I-10) and Inclined Screen – Configuration 1 (IS1 SR-170), to comply with the Ballona Creek and Los Angeles River Trash TMDLs (Bishop 2004).

#### Linear Radial Device

This device is relatively long and narrow, with flow entering one end and exiting the other end. It is suited for narrow and flat rights-of-way with limited space. It utilizes modular well screen casings with 5 mm (0.25-inch nominal) louvers and is contained in a concrete vault, although it also could be attached to a headwall at a pipe outfall. While runoff flows enter into the screens, they pass radially through the louvers and trap litter in the casing. A smooth bottom to convey litter to the end of the screen sections is

required, so a segment of the circumference of each screen is uncovered. The louvered sections have access doors for cleaning with vacuum truck or other equipment. Under most placement conditions the goal would be to capture within the casing one year's volume of litter. This device has been configured with an overflow/bypass for larger storm events and if the unit becomes plugged.

**Inclined Screen Devices**

Two Inclined Screen Devices have been developed. Each device requires about one meter (three feet) of hydraulic head and is better suited for fill sections. In the Type 1 device, the storm water runoff flows over the weir and falls through the inclined bar rack. The screen has five millimeter maximum spacing between the bars. Flow passes through the screen and exits via the discharge pipe. The trough distributes influent over the inclined screen. Storm water pushes captured litter toward the litter storage area. The gross solids storage area is sloped to drain to prevent standing water. This device has been configured with an overflow/bypass for larger storm events and if the unit becomes plugged. It has a goal of litter capture and storage for one year. The Type 2 Inclined Screen only comes in a sloped sidewall version.

## 5.2 Institutional Controls

The non-structural actions likely to be used for compliance with the proposed final Trash Amendments include institutional controls. These types of actions are methods to control trash loading to state waters and may include enforcement of existing litter laws, increased street sweeping, cleaning of storm water conveyance structures, such as catch basins and storm drain inlets, and ~~regulatory source controls~~ ordinances.

Institutional controls may also offer ~~other~~ societal benefits that are associated with reducing litter in our city streets, parks and other public areas. For example, institutional controls employed by the City of Los Angeles for the Los Angeles River Watershed trash TMDL have demonstrated a 12.5 percent reduction in the total WLA (Black & Veatch 2012). Institutional controls can typically be implemented in a relatively short period of time. The capital investment required to implement institutional controls is generally less than for full capture systems.

The proposed final Trash Amendments' define "institutional controls" as follows:

> Institutional controls are non-structural best management practices (i.e., no structures are involved) that may include, but not be limited to, street sweeping, sidewalk trash bins, collection of the trash, anti-litter educational and outreach programs, producer take-back for packaging, and

ordinances.

"Regulatory source controls" was previously included within the definition of institutional controls in the proposed Trash Amendments as one of the several treatment controls that could be utilized by MS4 permittees with regulatory authority over priority land uses to comply with the prohibition of trash under Track 2. In turn, "regulatory source controls" was previously defined in the proposed Trash Amendments as:

> Institutional controls that are enforced by an ordinance of the municipality to stop and/or reduce pollutants at their point of generation so that they do not come into contact with storm water. Regulatory source controls could consist of, but not be limited to, bans of single use consumer products.

Regulatory source controls were generally proposed as a tool for MS4 permittees to enact ordinances to prohibit grocery stores and similar retailers from distributing carry-out plastic bags to consumers. However, subsequent to the State Water Board's public workshop and the public hearing on the proposed Trash Amendments, Senate Bill 270 (2014 Stats. Ch. 850) was enacted. That new law enacts a state-wide plastic bag carry-out ban pertaining to grocery stores and pharmacies that have a specified amount of sales in dollars or retail floor space, which goes into effect July 1, 2015, and imposes the same ban on convenience stores and liquor stores a year later. Enactment of Senate Bill 270 removed the need for regulatory source controls, particularly product bans that would reduce trash, in the proposed Trash Amendments. Consequently, the proposed final Trash Amendments omit regulatory source controls (and its definition) as a method for Track 2 compliance.

The proposed Final Staff Report retains "ordinances," however, as a permissible type of institutional control an MS4 permittee could employ to comply with Track 2 (even though the proposed final Trash Amendments removed "regulatory source controls" as a permissible method). Any such ordinance likely would not involve a product ban. Contrary to ordinances or laws that prohibit distribution of plastic carry-out bags, which are typically accompanied with requirements and/or incentives to utilize reusable bags to avoid a product-substitution effect (such as Senate Bill 270), other types of product bans enacted by ordinance, such as take-out items, are more likely to involve a substitution of the banned item. Mere substitution would not result in reduce trash generation as such product substitution would be discarded in the same manner as the banned item. Any such product ban enacted by ordinance would not reduce trash and would not be an allowable Track 2 compliance method. It is possible that an MS4 permittee's adoption of other types of ordinances could include anti-litter laws or bans on smoking that would meet the requirements.

### 5.2.1 Enforcement of Litter Laws

An institutional control that would likely to be used for compliance with the proposed final Trash Amendments would be enforcement of existing liter laws. By enforcing litter laws in sensitive areas or in areas that generate substantial amounts of litter, an ultimate source of trash loading to a given water body would be reduced or eliminated. Ordinances that prohibit litter are already in place in most municipalities. For example, the Los Angeles City Municipal Code prohibits the disposal of trash anywhere such trash could pollute the storm drain system:

> No person shall throw, deposit, leave, cause or permit to be thrown, deposited, placed, or left, any refuse, rubbish, garbage, or other discarded or abandoned objects, articles, and accumulations, in or upon any street, gutter, alley, sidewalk, storm drain, inlet, catch basin, conduit or other drainage structures, business place, or upon any public or private lot of land in the City so that such materials, when exposed to storm water or any runoff, become a pollutant in the storm drain system (City of Los Angeles Municipal Code § 64.70.02.C.1(a)).

Ensuring compliance with existing statewide and local litter laws and ordinances would eliminate the substantial adverse environmental and economic impacts from the litter, and the need for additional structural or institutional controls that generate their own nominal adverse environmental impacts.

### 5.2.2 Street Sweeping

An institutional control that would likely to be used for compliance with the proposed final Trash Amendments would be continuation of or increasing street sweeping. Street sweeping minimizes trash loading to storm drain systems and water bodies by removing trash from streets and curbs. Maintaining a regular street sweeping schedule reduces the buildup of trash on streets and prevents trash from entering catch basins and the storm drain system. Street sweeping can also improve the appearance of roadways and urban areas. There are three types of street sweepers expected to be utilized for compliance with the proposed final Trash Amendments: mechanical, vacuum filter, and regenerative air sweepers (U.S. EPA 2012b).

- Mechanical sweepers use a broom to remove particles from the street curb and a water spray to control dust. The removed particles are carried by a cylindrical broom to a conveyor belt and into a storage hopper (Federal Highway Administration 2012).

- Vacuum-assisted sweepers also use brooms to remove particles. The removed particles, however, are saturated with water and transported by a vacuum intake to the hopper. Vacuum-assisted dry sweepers use a specialized brush that allows the vacuum system to recover almost all particulate matter. A continuous filtration system prevents very fine particulate matter from leaving the hopper and trailing on the street behind the sweeper (Federal Highway Administration 2012).

- Regenerative air sweepers blow air onto the pavement and immediately vacuum it back to entrain and capture accumulated sediments. A dust separation system regenerates air for blowing back onto the pavement (Federal Highway Administration 2012).

No definitive independent studies have yet been staged to determine the best sweeping system (U.S. EPA 2012b). It is expected, however, that local agencies may use a combination of types of street sweeper to maximize efficiency (CASQA 2003a). In the Los Angeles Region, use of certain sweeper types is dictated by South Coast Air Quality Management District Rule 1186, which requires local agencies to acquire or use only respirable particulate matter certified sweepers beginning January 1, 2000. Furthermore, Rule 1186.1 requires local agencies to acquire alternative fuel or less

polluting street sweepers beginning July 1, 2002 (South Coast Air Quality Management District 2006).

Increasing the frequency of street sweeping in areas with high traffic volume and trash accumulation would further reduce trash loading to the waterways. Increases in street sweeping are expected before the rainy season begins. A successful street sweeping program would be expected to include accurate recordkeeping of curb-miles swept, proper storage and disposal of street sweepings, regular equipment maintenance, and parking policies that restrict parking in problematic areas and notify residents of sweeping schedules (CASQA 2003a).

Using modern and efficient street sweepers may reduce the need for other structural storm water controls and may prove to be more cost-effective than certain structural controls, especially in more urbanized areas with greater areas of pavement (U.S. EPA 2012b).

### 5.2.3 Storm Drain Cleaning

Another institutional control that would likely to be used for compliance with the proposed final Trash Amendments would be continuation of or increasing cleaning of storm drain systems. Routine cleaning of the storm drain system reduces the amount of trash entering water bodies, prevents clogging, and ensures the flood control capacity of the system. Cleanings may occur manually or with pump eductors, vacuums, or bucket loaders. A successful storm drain cleaning program would be expected to include regular inspection and cleaning of catch basins and storm drain inlets, increased inspection and cleaning in areas with high trash accumulation, accurate recordkeeping, cleaning immediately prior to the rainy season to remove accumulated trash, and proper storage and disposal of collected material (CASQA 2003a).

### 5.2.4 Public Education

An additional institutional control that would likely to be used for compliance with the proposed final Trash Amendments would be continuation of or increasing public education programs. Public education can be an effective implementation alternative to reduce the amount of trash entering water bodies. The public is often unaware that trash littered on the street ends up in receiving waters, much less the cost of abating it.

Community outreach is expected to be one way to educate the public about the effects of littering on the quality of receiving waters. Local agencies would provide educational materials to the public via television, radio, print media (e.g., brochures, flyers, and community newsletters), information hotlines outreach to educators and schools, community event participation, and support of volunteer monitoring and cleanup programs. Storm drain inlet stenciling would be another means of educating the public about the direct discharge of storm water to receiving waters and the effects of littering and dumping on receiving water quality. Stenciling can be conducted in partnership with other agencies and organizations to garner greater support for educational programs (U.S. EPA 2005).

Public education programs are already in place in some jurisdictions. Under the Los Angeles County Municipal Storm Water Permit, for example, permittees are required to

implement educational storm water outreach programs (Order No. R4-2012-0175). The residential component of this program includes:

- Conducting storm water pollution prevention public service announcements and advertising campaigns.
- Distribute public education materials regarding the proper handling of waste materials.
- Maintaining a storm water website that includes educational material and opportunities for the public to participate in storm water pollution prevention and clean-up activities.
- Using culturally diverse educational strategies.

Public education materials have already been developed and are available through the Erase the Waste campaign, sponsored by the Water Boards. Erase the Waste is a public education program, working to reduce harmful storm water pollution and improve the environment of the region's coastal and inland communities. The campaign started in Los Angeles County, and materials produced during its three-year run have now been packaged for state and nationwide use. It is built around the theme, *Erase the Waste* – a positive, empowering theme that encourages all residents and stakeholders to take ownership of their communities, help reduce and prevent storm water pollution from the local landscape and "become part of the pollution solution."

The Water Boards have made available the *California Storm Water Toolbox*[15] which includes the following tools for residents, community and civic groups, educators, municipalities and public agencies:

- Advertisements, posters, collateral materials and a comprehensive Neighborhood Action Kit in English, Spanish, Chinese, Korean and Vietnamese – a comprehensive "how-to" guide to community-focused pollution prevention.
- A landmark Water Quality Service Learning Model for grades four through six that meets the state's curriculum standards.
- The Water Quality Detectives After-School Program, an adapted version of the curriculum for middle school and after school setting.
- The California Storm Water Resource Directory, an online inventory of storm water materials developed in partnership with CASQA.

### 5.2.5 Ordinances

Ordinances are a municipal regulation and type of institutional control. Ordinances can range from litter laws, smoking bans, to product bans. Ordinances focus on eliminating or reducing the sources of trash by removing potential products from the waste stream. These methods focus on preventing pollution versus employing methods of controlling pollution. Across California, cities, counties, and the state have litter laws and other

[15] The *California Storm Water Toolbox* is accessible at: http://www.waterboards.ca.gov/water_issues/programs/outreach/erase_waste/index.shtml#toolbox.

existing ordinances. In addition to the enforcement of existing litter laws, reasonably foreseeable methods of compliance could include new litter laws and other ordinances. While a product ban is type of ordinance, it is not anticipated that a product ban would qualify for trash reduction due to product substitution.

## 5.3 Overview of Installation, Operation and Maintenance Activities for Trash Treatment Controls

This section discusses the installation, and operation and/or maintenance activities associated with the reasonably foreseeable methods of compliance with the proposed final Trash Amendments. This information should provide a frame of reference in determining potential environmental impacts of these alternatives described in Section 6 (Environmental Effects of the Trash Amendments) and Section 8 (Alternatives Analysis). Some reasonably foreseeable installation activities for compliance with the proposed final Trash Amendments would consist of the installation of improvements to the storm drain system to attain "full capture". These improvements include installation of screens and inserts for catch basins, Gross Solids Removal Devices within the alignment of storm drain pipes, and trash collection nets in storm drain outlets. Temporary impacts to natural resources from these types of installation activities typically include air pollution from dust and construction equipment, increased runoff and soil erosion, and installation noise.

Installation of storm drain improvements to comply with the proposed final Trash Amendments would likely be located throughout the developed areas of the state. The proposed final Trash Amendments provide up to ten years to complete the installation of storm drain improvements. The installation would occur at different locations at different periods. Equipment to be installed would likely include filters, metal screen, fabric nets, and Gross Solids Removal Devices. Some of the equipment would be mounted on small steel structures. Equipment weights range from several hundred pounds to 100,000 pounds, therefore the installation rigs would range from small truck-mounted cranes to larger track-mounted units. The equipment would be electrically connected together by cable or by buss (open air copper or aluminum tubes). The installation would be either through the inlets or outlets or with the piping. Gross Solids Removal Device station sites would typically be finished with fencing around the site.

### 5.3.1 Storm Drain Improvement Installation Staging and Methods

Most sites for installation activities and staging would be in high density residential, mixed urban, commercial, or industrial areas, as well as public transportation stations, and along portions of State highways. Site preparation would include clearing, grubbing and grading with bulldozers and dump trucks. Access roads would be prepared concurrently with the site operations.

#### Catch Basin Inserts

Improvements to catch basins are expected to include concrete work, installation of filters within the catch basins and installation of screens at the catch basin inlets. These activities entail concrete demolition and refinishing and field fabrication methods such as welding and mechanical bolting. These improvements would be located in existing

catch basins within existing storm drain systems. Construction of new catch basins is not specifically required to comply with the proposed final Trash Amendments, although damaged catch basins may require replacement or new catch basins may be an element of the discretionary compliance program under Track 2. Existing catch basins are located below sidewalks and streets with openings flush with the curb.

Catch basin improvements may include:

- Removal of manhole cover and accessing bottom of catch basin and manually inserting prefabricated catch basin inserts in the bottom or interior of the catch basin.
- Concrete demolition and removal if the entire catch basin needs replacement.
- Catch basin installation – this task pertains to catch basins that require replacement.
- Concrete drilling and welding – this task is required to install fasteners and bracing for screens and brushes at the storm drain inlets. These screens can be welded onto the installed bracing.
- Concrete finishing – to restore site after installation is completed.

Installation of catch basin improvements would likely require the following types of tools: compressor, hand power tools, hand tools, backhoe, welder, light-duty truck.

**Gross Solid Removal Device and Vortex Separation System Installation**

Gross Solids Removal Devices would be for new installations that are located in transportation rights of way. These devices are typically fabricated off-site and transported to the site for installation. The installation sites are typically not located in areas of sensitive receptors[16]. Installation activities are expected to include:

- Site Preparation – a flat area of sufficient size to locate a concrete equipment pad is required. Vegetation removal might be required, as well as placement of a gravel sub-base for the area. The site should be selected for access by an equipment crane, maintenance vehicles and trash collection vehicles.
- Fencing – security fencing is generally preferred for water quality treatment systems located within existing structures in watersheds. Chain link fencing is often selected which involves installation of fence poles. Fence screens are often used in areas where a Gross Solids Removal Device causes adverse visual impacts.
- Concrete pad – Gross Solids Removal Devices are generally fabricated as modular units that are transported to the site and bolted to a concrete pad. This task involves preparing a level sub-base, placement of rebar and forms, and

[16] Sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to toxic chemicals, pesticides, and other pollutants.

pouring ready-mix concrete to form a pad of sufficient dimensions to support the Gross Solids Removal Devices.

- Gross Solids Removal Device placement – the Gross Solids Removal Devices are placed onto the concrete with an equipment crane and secured with anchor bolts.
- Pipe fitting/connection – the storm drain conveyance piping is connected to the Gross Solids Removal Device with standard plumbing connects such as unions or joints. The connections are leak tested.
- Utility service – for Gross Solids Removal Devices which require electrical service, wiring from a nearby service connector would be made to a switchbox located on the concrete pad. Appropriate conduit and wiring for outdoor service would be used.

Equipment required to install Gross Solids Removal Devices is expected to include: equipment crane, concrete mix truck, hand power tools, hand tools, backhoe, and light duty truck. Caltrans provided descriptions of installation of Gross Solids Removal Device in the report Phase I Pilot Study – Gross Solid Removal Devices (Caltrans 2003).

**Trash Nets**

Trash nets would be installed at the outlets of storm drains and channels. These locations are typically located within the interior of the storm drain system where there is limited public access. Installation of trash nets includes field joining techniques and may include concrete repair. Trash net installation is expected to include:

- Preparation of concrete for installation of bracing to hold trash nets. Concrete preparation may entail simple cleaning of the concrete surfaces to patching and resurfacing of areas where the trash nets are to be attached.
- Installation of net bracing – net bracing is typically installed with anchor bolts.
- Attachment of the net to the bracing – simple mechanical devices is used to attach the flexible netting to the metal bracing.

Tools required to install trash netting include: hand power tools, hand tools, backhoe, and light duty truck. Impacts to air quality from installation equipment is expected to be minimal and of a short duration, particularly if equipment is tuned and maintained in good working condition to minimize emissions of criteria pollutants and particulates. Noise impacts are expected to also be short term and are expected to be minimized through installation practices, such as using noise barriers and modified work hours.

### 5.3.2 Maintenance of Treatment Controls and BMPs

Maintenance activities expected to occur for compliance with the proposed final Trash Amendments would include removing trash from catch basins, Gross Solids Removal Devices, and trash nets and providing any mechanical service and repair that may be required. Because each device is limited in the volume of trash that can be collected, it is likely that relatively light-duty trucks can be used. Additionally, there is opportunity to consolidate the trash collected from catch basins, Gross Solids Removal Devices, and

trash nets with other trash to lessen the impacts associated with transport and disposal of trash collected from storm drain improvements.

The impacts from maintenance activities associated with the proposed final Trash Amendments are expected to be minimized through modified work hours and dust suppression methods. Spoils resulting from installation of storm drain improvements are expected to be in relatively small in quantity. These spoils are expected to be disposed of in licensed facilities.

### 5.4 Low-Impact Development Controls and Multi-Benefit Projects

The Storm Water Program at the Water Boards encourages the management of storm water as a resource as identified in the California Water Code section 10562. The main objective of treating storm water as a resource is to protect and restore those watershed processes that are critical to watershed health. Multi-benefit projects that infiltrate and treat storm water runoff are encouraged within MS4 Phase I and Phase II permits.

The proposed final Trash Amendments would allow for the use of LID as part of Track 2 implementation. LID approaches attempt to mimic a site's predevelopment hydrology through a series of practices including filtering storm water with natural media, detaining storm water for infiltration into the ground, and retaining water onsite for reuse. LID is often implemented through BMPs, including conservation designs, low impact landscaping, and practices promoting improved infiltration, runoff storage, runoff conveyance, and filtration (Metres 2013).

The proposed final Trash Amendments would also allow for the use of multi-benefit projects as part of Track 2 implementation. Multi-benefit projects should be designed to maximize water supply, water quality, and environmental and other community benefits (Wat. Code § 10562(b)(2)). Multi-benefit projects lead to collaborations with other agencies and stakeholders to develop storm water infrastructure that improves storm water, urban runoff quality, and improve wildlife habitat. Multi-benefit projects should focus on regional and watershed-wide benefits.

While LID and multi-benefit projects have not directly addressed trash as a traditional pollutant in the past, additional measures can be included so that such projects specifically address trash. For example, the City of Anaheim, as part of the Brookhurst Street Improvement Project, converted impervious surfaces into a greenbelt area with an earthen swale that accepts storm flows from the street, acts as a natural treatment system, allows for limited infiltration, and drains to an existing storm drain inlet (City of Anaheim 2010). Trash can get captured within the bioswales, which infiltrates the storm water. A multi-benefit project should separate the storm water from the trash, thus removing the ability for trash to be transported to a receiving water body via storm water. The trash that accumulates within the bioswale should still be removed. To capture the remaining trash in storm water, an insert could be placed in the storm drain inlet to prevent trash from entering the storm water system. Another example of a multi-benefit project could be a retention basin, where the primary function is to recharge the local groundwater aquifer. To capture trash in the retention basin, a trash net at the retention basin overflow could be installed to capture any trash leaving the retention basin when storm water inflow exceeds the capacity of the retention basin. LID and

multi-benefit projects provided many environmental benefits from improved water quality, reduced number of flooding events, restored aquatic habitat, improved groundwater recharge, and enhanced urban aesthetics. By incorporating trash controls into LID and multi-benefit projects, a permittee can address numerous water quality pollutants within the urban and storm water landscape.

# 6 ENVIRONMENTAL EFFECTS OF ~~PROPOSED~~ TRASH AMENDMENTS

## 6.1 Introduction

The Water Quality Control/208 Planning Program, found in title 23, California Code of regulations sections 3775-3781 has been certified as an exempt regulatory program by the Secretary for Resources (Cal. Code Regs., tit. 14,§ 15251, subd. (g)] and, therefore, the State Water Board is exempt from the requirements of preparing separate documents in compliance with CEQA. However, the State Water Board must conduct an environmental analysis of its actions in a draft SED as part of its approval or adoption according to California Code of Regulations, title 23, section 3777 (see also, Pub. Res. Code ~~Section~~ § 21159). This ~~Draft~~ proposed Final Staff Report is being used to satisfy this requirement.

CEQA's "certified regulatory program" exemption is limited, however, and the State Water Board in the SED must still comply with CEQA's overall objectives to: inform the decision makers and the public about the potentially significant environmental effects of a proposed project; identify ways that significant adverse environmental impacts may be mitigated; and prevent significant, avoidable adverse environmental impacts by changing the proposed project or requiring mitigation measures. There are certain guiding principles that are contained in the CEQA Guidelines that help to inform the Water Board's certified regulatory process and preparation of the draft SED:

> Forecasting: Drafting an EIR or preparing a Negative Declaration necessarily involves some degree of forecasting. While foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can (Cal. Code Regs., tit. 14, § 15144).
>
> Speculation: If, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact (Cal. Code Regs., tit. 14, § 15145).
>
> Specificity: the degree of specificity required in an Environmental Impact Report [or an Environmental Impact Report – equivalent document, such as an SED] will correspond to the degree of specificity involved in the underlying activity which is described in the Environmental Impact Report" (Cal. Code Regs., tit. 14, § 15146)
>
> Standards for Adequacy: An EIR (or Negative Declaration) should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR (or Negative declaration) is to be reviewed in the light of what is reasonably feasible. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure (Cal. Code Regs., tit. 14, § 15151).

This section of the ~~Draft~~ proposed Final Staff Report, as well as the Environmental Checklist in Appendix B, identifies and evaluates the potential environmental impacts

that may arise from proposed final Trash Amendments and the reasonably foreseeable methods of compliance. It also discusses mitigation, where applicable, for the identified potentially significant impacts (Cal. Code Regs., tit. 23, § 3777(b)). The implementation alternatives for achieving compliance with the proposed final Trash Amendments are described in detail in Section 8 of this document. Impacts believed to be potentially significant are described in this section, while impacts that are considered less than significant or where there is no effect are described in Environmental Checklist contained in Appendix B. The following resource areas are included in this section, each of which includes a description of potential impacts, and mitigations.

- Section 6.2 Air Quality
- Section 6.3 Biological Resources
- Section 6.4 Cultural Resources
- Section 6.5 Geology/Soils
- Section 6.6 Greenhouse Gas Emissions
- Section 6.7 Hazards and Hazardous Materials
- Section 6.8 Hydrology/Water Quality
- Section 6.9 Land Use/Planning
- Section 6.10 Noise and Vibration
- Section 6.11 Public Services
- Section 6.12 Transportation/Traffic
- Section 6.13 Utilities/Service Systems

### 6.1.1 Impact Methodology

Any potential environmental impacts associated with the proposed final Trash Amendments depend upon the specific compliance methods selected by the complying permittee, most of whom will be public agencies subject to their own CEQA obligations (see Pub. Res. Code § 21159.2). This document identifies broad mitigation approaches that could be considered at a statewide level. Consistent with Public Resources Code ~~§~~ section 21159 and the State Water Board's certified regulatory program, the document does not engage in speculation or conjecture, but rather considers the potential environmental impacts of the proposed final Trash Amendments and reasonably foreseeable methods of compliance, the feasible mitigation measures, and feasible alternatives (including alternative means of compliance) which would meet the project objectives and avoid or reduce the potentially significant impacts of the proposed project.

Within each of the subsections listed above, this document evaluates the potentially significant impacts of the proposed project and each implementation alternative relative to the subject resource area. The implementation alternatives evaluated in this document are evaluated on a statewide level for impacts for each resource area. Project-level analysis is expected to be conducted by the appropriate public agencies prior to implementation of project specific methods of compliance with the proposed final Trash Amendments. The environmental analysis in this document assumes that the project specific methods of compliance with the proposed final Trash Amendments would be designed, installed, and maintained following all applicable state and local

laws, regulations, and ordinances. Several handbooks are available and currently used by municipal agencies that provide guidance for the selection and implementation of BMPs (CASQA 2003a; 2003b, Water Environment Research Foundation 2005, Caltrans 2010).

### 6.1.2 Level of Analysis

The State Water Board is the lead agency for the proposed final Trash Amendments, while the responsible agencies identified in Section 2.11 (Agencies Expected to use this Staff Report in their Decision Making and Permits) may be the lead agency for CEQA compliance for approval and implementation of a project specific method of compliance with the proposed final Trash Amendments.

The State Water Board does not specify the actual means of compliance by which permittees choose to comply with the proposed final Trash Amendments. However, as required by the State Water Board's certified regulatory program, this draft SED analyzes the potential environmental impacts of the proposed final Trash Amendments and the reasonably foreseeable methods of compliance on a statewide level. The specificity of the "activity" described in this draft SED related to the reasonably foreseeable methods of compliance is of a general nature and the level of analysis of the potentially significant adverse environmental effects is commensurate with that level of detail. At the time of approval of a project-specific compliance project where the detail of the method of compliance is known, a project-level environmental analysis may be performed by the local approval agency.

Project-level impacts of the reasonably foreseeable methods of compliance will necessarily vary depending on the choice of compliance and the size, location, and type of discharger and the environmental resources in and around the project site. It would be speculative to estimate the specific impacts of the proposed final Trash Amendments caused by implementation of a project-specific compliance method. It is possible that, at a specific site with particularly sensitive environmental resources, implementation with compliance measures in either in Track 1 or 2 could cause potentially significant impacts as compared to baseline conditions. Since it is speculative to estimate the type, size, and location of any particular compliance method (e.g. type of construction activities and type of resources adversely affected by those activities), this evaluation makes no attempt to quantify the impacts associated with implementation or maintenance of a particular compliance method.

Per the requirements of the State Water Board's environmental regulations, the resource analysis in this section includes:

- An identification of any significant or potentially significant adverse environmental impacts of the proposed project;
- An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and
- An environmental analysis of the reasonably foreseeable methods of compliance, including:

- An identification of the reasonably foreseeable methods of compliance with the project;
- An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;
- An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and
- An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance. (23 CCR § 3777)

### 6.1.3 Environmental Setting

CEQA directs that the environmental setting normally be used as the baseline for determining significant impacts of a proposed project (Cal. Code Regs., tit.14, §15125, subd. (a)). Section 3 presents a broad overview of the environmental setting for the state of California related to the proposed final Trash Amendments. As such, the environmental setting and baseline for determining impacts is presented at a general level as each regional water board and permittee may address trash with a range of treatment and institutional controls. The following resource sections present additional specific setting information relevant to the assessment of environmental impacts of the proposed final Trash Amendments.

## 6.2 Air Quality

Daily emissions and pollutant concentrations are two ways to quantify air pollution. The term “emissions” means the quantity of pollutant released into the air and has unit of pounds per day (lbs /day). The term “concentrations” means the amount of pollutant material per volumetric unit of air and has unit of parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

### Criteria Pollutants

The Air Resources Board has established state ambient air quality standards (state standards) to identify outdoor pollutant levels considered safe for the public. After state standards are established, state law requires Air Resources Board to designate each area as attainment, nonattainment, or unclassified for each state standard. The area designations, which are based on the most recent available data, indicate the healthfulness of air quality throughout the state. In addition to state standards, the federal Clean Air Act requires U.S. EPA to set national ambient air quality standards (federal standards or national standards). The Air Resources Board makes area designations for ten pollutants: ozone, suspended particulate matter (PM10 and PM2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles. Ambient air quality standards define clean air, and are established to protect even the most sensitive individuals in our communities. An air quality standard defines the maximum amount of a pollutant that can be present in outdoor air without harm to the public's health.

The gaseous criteria pollutants, particulate matter, and toxic air contaminants, and the associated adverse health effects of these air quality contaminants are summarized below.

### Carbon Monoxide

Exposure to high concentrations of carbon monoxide, a colorless and odorless gas, reduces the oxygen-carrying capacity of the blood, and therefore can cause dizziness and fatigue, impair central nervous system functions, and induce angina in persons with serious heart disease. Carbon monoxide is emitted almost exclusively from the incomplete combustion of fossil fuels. In urban areas, motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains emit carbon monoxide. Motor vehicle exhaust releases most of the carbon monoxide in urban areas. Vehicle exhaust contributes approximately 56 percent of all carbon monoxide emissions nationwide and up to 95 percent in cities. Carbon monoxide is a non-reactive air pollutant that dissipates relatively quickly. As a result, ambient carbon monoxide concentrations generally follow the spatial and temporal distributions of vehicular traffic. Carbon monoxide concentrations are influenced by local meteorological conditions; primarily wind speed, topography, and atmospheric stability. Carbon monoxide from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions combine with calm atmospheric conditions.

**Ozone**

While ozone serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing potentially harmful ultraviolet radiation, when it reaches elevated concentrations in the lower atmosphere it can be harmful to the human and to sensitive species of plants. Short-term ozone exposure can reduce lung function and increase an individual's susceptibility to respiratory infection. Long-term exposure can impair lung defense mechanisms and lead to emphysema and/or chronic bronchitis. Ozone concentrations build to peak levels during periods of light winds or stagnant air, bright sunshine, and high temperatures. Ideal conditions occur during summer and early autumn. Sensitivity to ozone varies among individuals. About 20 percent of the population is sensitive to ozone, with exercising children being particularly vulnerable. Ozone is formed in the atmosphere by a complex series of chemical reactions under sunlight that involve "ozone precursors." Ozone precursors are categorized into two families of pollutants: oxides of nitrogen and reactive organic compounds. Oxides of nitrogen and reactive organic compounds are emitted from a variety of stationary and mobile sources. While oxides of nitrogen are considered a criteria pollutant, reactive organic compounds are not in this category, but are included in this discussion as ozone precursors. Ozone is the chief component of urban smog and the damaging effects of photochemical smog generally relate to the concentration of ozone. Meteorology and terrain play major roles in ozone formation. The greatest source of smog producing gases is the automobile.

**Nitrogen Dioxide**

The major health effect from exposure to high levels of nitrogen dioxide is the risk of acute and chronic respiratory disease. Like ozone, nitrogen dioxide typically is not directly emitted, but it is formed through a rapid reaction between nitric oxide and atmospheric oxygen. Nitric oxide and nitrogen dioxide are collectively called oxides of nitrogen and are major contributors to ozone formation. Nitrogen dioxide also contributes to the formation of respirable particulate matter (see discussion of respirable particulate matter below) and fine particulate matter through the formation of nitrate compounds. At atmospheric concentrations, nitrogen dioxide is only potentially irritating. In high concentrations, the result is a brownish-red cast to the atmosphere and reduced visibility.

### Sulfur Dioxide

The major health effect from exposure to sulfur dioxide is acute and chronic respiratory disease. Exposure may cause narrowing of the airways, which may cause wheezing, chest tightness, and shortness of breath. Sulfur dioxide can also react with water in the atmosphere to form acids (or “acid rain”), which can cause damage to vegetation and man-made materials. The main source of sulfur dioxide is coal and fuel oil combustion in power plants and industries, as well as diesel fuel combustion in motor vehicles. Generally, the highest levels of sulfur dioxide are found near large industrial complexes. In recent years, sulfur dioxide concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of sulfur dioxide and by limiting the sulfur content in fuel. Sulfur dioxide concentrations in southern California have been reduced to levels well below the state and national ambient air quality standards, but further reductions in emissions are needed to attain compliance with ambient air quality standards for sulfates, respirable particulate matter, and fine particulate matter, to which sulfur dioxide is a contributor.

### Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Particulate matter is regulated as respirable particulate matter (inhalable particulate matter less than ten micrometers in diameter). More recently it has been subdivided into coarse and fine fractions, with particulate matter less than 2.5 micrometers in diameter constituting the fine fraction. Major sources of respirable particulate matter include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter results from fuel combustion (e.g., from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, fine particulate matter can be formed in the atmosphere from gases such as sulfur dioxide, oxides of nitrogen, reactive organic compounds, and ammonia, and elemental carbon. Fine particulate matter is a subset of respirable particulate matter.

The health effects from long-term exposure to high concentrations of particulate matter are increased risk of chronic respiratory disease like asthma and altered lung function in children. Particles with 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system. Particles that are 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues. These substances can be absorbed into the bloodstream and cause damage elsewhere in the body. Short-term exposure to high levels of particulate matter has been shown to increase the number of people seeking medical treatment for respiratory distress, and to increase mortality among those with severe respiratory problems. Particulate matter also results in reduced visibility. Ambient particulate matter has many sources. It is emitted directly by combustion sources like motor vehicles, industrial facilities, and residential wood burning, and in the form of dust from ground-disturbing activities such as construction and farming. It also forms in the atmosphere from the chemical reaction of precursor gases.

**Toxic Air Contaminants**

Toxic air contaminants include air pollutants that can produce adverse public health effects, including carcinogenic effects, after long-term (chronic) or short-term (acute) exposure. One source of toxic air contaminants is combustion of fossil fuels or digester gas. Human exposure occurs primarily through inhalation, although non-inhalation exposure can also occur when toxic air contaminants in particulate form deposit onto soil and drinking water sources and enter the food chain or are directly ingested by humans. Many pollutants are identified as toxic air contaminants because of their potential to increase the risk of developing cancer. For toxic air contaminants that are known or suspected carcinogens, it has been found that there are no levels or thresholds below which exposure is risk free. No ambient air quality standards exist for toxic air contaminants, except that standards for lead, hydrogen sulfide, and vinyl chloride are provided in California Ambient Air Quality Standards. Instead, numerous national, state, and local rules that affect both stationary and mobile emission sources regulate toxic air contaminants emissions. Individual toxic air contaminants vary greatly in the risk they present; at a given level of exposure one toxic air contaminants may pose a hazard that is many times greater than another. Where data are sufficient to do so, a "unit risk factor" can be developed for cancer risk. The unit risk factor expresses assumed risk to a hypothetical population, the estimated number of individuals in a million who may develop cancer as the result of continuous, lifetime (70-year) exposure to 1 $\mu g/m^3$ of the toxic air contaminants. Unit risk factors provide a standard that can be used to establish regulatory thresholds for permitting purposes. This is, however, not a measure of actual health risk because actual populations do not experience the extent and duration of exposure that the hypothetical population is assumed to experience. For non-cancer health effects, a similar factor called a Hazard Index is used.

Areas with monitored pollutant concentrations that are lower than ambient air quality standards are designated as "attainment areas" on a pollutant-by-pollutant basis. When monitored concentrations exceed ambient standards, areas are designated as "nonattainment areas." An area that recently exceeded ambient standards, but is now in attainment, is designated as a "maintenance area." Nonattainment areas are further classified based on the severity and persistence of the air quality problem as "moderate" "severe" or "serious." Classifications determine the applicability and minimum stringency of pollution control requirements.

### 6.2.1 Regulatory Setting

**Federal**

The U.S. EPA is the federal agency charged with administering the federal Clean Air Act Amendments of 1990, which established a number of requirements. The U.S. EPA oversees state and local implementation of federal Clean Air Act requirements. The Clean Air Act Amendments require the U.S. EPA to approve State Implementation Plans to meet and/or maintain the national ambient standards.

The federal (and California) ambient air quality standards are shown in Table 8.

**Table 8.** Federal and California Ambient Air Quality Standards.

| Pollutant | Averaging Time | California Standards | Federal Standards |
|---|---|---|---|

| | | | Primary | Secondary |
|---|---|---|---|---|
| Ozone | 1 Hour | 0.09 ppm (180 µg/m$^3$) | - | Same as Primary Standard |
| | 8 Hour | 0.070 ppm (137 µg/m$^3$) | 0.075 ppm (147 µg/m$^3$) | |
| Respirable Particulate Matter | 24 Hour | 50 µg/m$^3$ | 150 µg/m$^3$ | Same as Primary Standard |
| | Annual Arithmetic Mean | 20 µg/m$^3$ | - | |
| Fine Particulate Matter | 24 Hour | No Separate State Standard | 35 µg/m$^3$ | 35 µg/m$^3$ |
| | Annual Arithmetic Mean | 12 µg/m$^3$ | 12.0 µg/m$^3$ | 15.0 µg/m$^3$ |
| Carbon Monoxide | 1 Hour | 20 ppm (23 mg/m$^3$) | 35 ppm (40 mg/m$^3$) | - |
| | 8 Hour | 9.0 ppm (10 mg/m$^3$) | 9 ppm (10 mg/m$^3$) | |
| | 8 Hour (Lake Tahoe) | 6 ppm (7 mg/m$^3$) | - | - |
| Nitrogen Dioxide | Annual Arithmetic Mean | 0.030 ppm (57 µg/m$^3$) | 0.053 ppm (100 µg/m$^3$) | Same as Primary Standard |
| | 1 Hour | 0.18 ppm (339 µg/m$^3$) | 100 ppm (188 µg/m$^3$) | - |
| Sulfur Dioxide | Annual Arithmetic Mean | - | 0.030 ppm | - |
| | 24 Hour | 0.04 ppm (105 µg/m$^3$) | 0.14 ppm (365 µg/m$^3$) | - |
| | 3 Hour | - | - | 0.5 ppm (1300 µg/m$^3$) |
| | 1 Hour | 0.25 ppm (655 µg/m$^3$) | 75 ppb (195 µg/m$^3$) | - |
| Lead | 30 Day Average | 1.5 µg/m$^3$ | - | - |
| | Calendar Quarter | - | 1.5 µg/m$^3$ | Same as Primary Standard |

**State**

The California Air Resources Board is the state agency responsible for coordinating both state and federal air pollution control programs in California. In 1988, the State Legislature adopted the California Clean Air Act, which established a statewide air pollution control program. The California Clean Air Act's requirements include annual emission reductions, increased development and use of low emission vehicles, and submittal of air quality attainment plans by air districts. The California Air Resources Board has established state ambient air quality standards, shown in Table 8. Additionally, the California Air Resources

Board has established state standards for pollutants that have no federal ambient air quality standard, including sulfate, visibility, hydrogen sulfide, and vinyl chloride.

**Local**

There are 35 local air districts within the state. Each district (referred to as either an Air Pollution Control District or an Air Quality Management District) is responsible for controlling emissions, primarily from stationary sources of air pollution, within their area. Each district develops and adopts an Air Quality Management Plan, which serves as the blueprint to bring their respective areas into compliance with federal and state clean air standards. Rules are adopted to reduce emissions from various sources.

### 6.2.2 Thresholds of Significance

Air quality impacts would be considered significant if the proposed final Trash Amendments or reasonably foreseeable methods of compliance would:

- Conflict with or obstruct the implementation of the applicable air quality plan (although there are many applicable air quality plans in the state, this analysis utilized the South Coast Air Quality Management District Plan as the representative air quality plan for assessing impacts).
- Violate any air quality standards or contribute substantially to an existing or projected air quality violation (although there are many applicable air quality standards, depending on the air basin in the state, this analysis utilized the South Coast Air Quality Management District's standards as the representative air quality standards for assessing impacts).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under any applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors). This impact threshold is addressed in Section 7.2.

### 6.2.3 Impacts and Mitigation

The Los Angeles Water Board conducted an analysis of potential air quality impacts of the identified alternatives for compliance with the Los Angeles River Trash TMDL (Trash TMDL) (Los Angeles Water Board 2007f). This analysis is incorporated by reference and summarized here. Staff has reviewed this analysis and has concluded that it is an appropriate representation of the potential impacts that could occur in other areas of the state with implementation of the proposed final Trash Amendments, including the reasonably foreseeable methods of compliance.

The South Coast Air Basin (which includes the area covered by the Trash TMDL) is home to more than 42 percent of California's population. Pollutant concentrations in parts of the South Coast Air Basin are among the highest in the nation. South Coast Air Basin emissions improved between 2005 and 2010 and are expected to further improve and

become somewhat constant through 2035 (ARB 2013). With its high population and pollutant concentrations, potential impacts to air quality are likely to be greater in the South Coast Air Basin than in other parts of the state and serves as a maximum possible impact related to air quality. Therefore, potential impacts identified in this analysis would likely be less in all other air basins.

**Impact Assessment Methodology**

This evaluation addresses impacts that have the potential to occur from the proposed final Trash Amendments, including the reasonably foreseeable methods of compliance, including both short -and long-term activities. The evaluation is based on a calculation of the total emissions from travel of construction and maintenance vehicles that might be affected by implementation of the proposed final Trash Amendments. This comparative evaluation was done instead of examining the emissions from each individual source alone and comparing them to a threshold level.

**Vehicle Emissions**

Vehicle emissions were calculated in the Trash TMDL analysis using forecasts of total vehicle miles traveled based on data provided in MOBILE6, which is a vehicle emission software developed by U.S. EPA (U.S. EPA 2003; 2004; 2006). MOBILE6 is used for predicting gram per mile emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, carbon dioxide, PM, and toxics from cars, trucks, and motorcycles under various conditions. The data which this calculation is based on are from technical documents of MOBILE6 (U.S. EPA 2003). Considering the type of work involved in implementation of the proposed final Trash Amendments, the calculation assumed that non-tampered heavy-duty diesel vehicles (HDDV Class 6) would be used for installation/construction/maintenance activities. The mileage was assumed to be 50,000 miles, which is the median mileage for HDDVs. The year of vehicle was assumed to be 2001+ for hydrocarbons, carbon monoxide, oxides of nitrogen, and sulfur dioxide and 1994+ for particulate matter.

Based on assumptions above, the exhaust emission rates were found to be 2.1, 9.92, and 6.49 grams per mile for hydrocarbons, carbon monoxide, and oxides of nitrogen, respectively. The particulate matter standard for HDDVs is 0.1 g/bhp-hr. By applying a conversion factor of 1.942 bhp-hr/mi (from Update Heavy-Duty Engine Emission Conversion Factors for Mobile6 – Analysis of BSFCs and Calculation of Heavy-Duty Engine Emission Conversion Factors), the exhaust emission rate for particulate matter was found to be 0.1942 grams per mile. There was no exhaust emission rate information available for $SO_x$ in MOBILE6. Instead by using diesel fuel sulfur level of eight ppm (from MOBILE6 for years after 2006), diesel fuel economy of 8.71 miles per gallon (from Update Heavy-Duty Engine Emission Conversion Factors for Mobile6 – Analysis of BSFCs and Calculation of Heavy-Duty Engine Emission Conversion Factors), and diesel fuel density of 7.099 pounds per gallon (from Update Heavy-Duty Engine Emission Conversion Factors for MOBILE6 – Analysis of Fuel Economy, Non-Engine Fuel Economy Improvements and Fuel Densities), the exhaust emission rate for sulfur dioxide could be 0.00592 grams per mile, assuming all sulfur in fuel would be transformed to sulfur dioxide.

**Catch Basin Inserts**

Long-term increases in traffic caused by ongoing maintenance of catch basin inserts (e.g., delivery of materials, street sweeping) are potential sources of increased air pollutant emissions.

As an example, the Trash TMDL analysis estimated that approximately 150,000 catch basins could be retrofitted with inserts in the urban portion of watershed. As discussed previously, the Los Angeles River Watershed has 474 square miles highly developed with commercial, industrial, or residential uses. Assuming that 150,000 catch basin inserts were placed evenly in the 474 square miles developed area, each catch basin insert covered 0.00316 square miles. The distance between two catch basin inserts was about 0.056 mile. The total distance for a truck to travel through all 150,000 catch basin inserts units was about 8,342 miles. Assuming catch basins need to be cleaned twice a year. This translated to approximately 822 vehicle trips per day in the watershed. Assuming the 822 trips were arranged at shortest distance, which is reasonable by arranging a round trip, the total travel distance for 822 trips was about 52 miles (9497 miles divided by 183 days, or 822 trips times 0.063 mile). The vehicle emissions for traveling 52 miles are listed in Table 9. Emission levels for all the pollutants were well below the South Coast Air Quality Management District Air Quality Significance thresholds. If all trips were arranged in one day, emission levels for HC, CO, PM, and sulfur dioxide were still well below the significance thresholds. The maximum potential impact of the proposed project for level for oxides of nitrogen was about twice the significance threshold level of 55 lbs/day.

Measures are available to alleviate any potential impacts to air quality due to increased traffic due to catch basin cleanings. Such measures could include: (1) use of construction, maintenance, and street sweeper vehicles with lower-emission engines; (2) use of soot reduction traps or diesel particulate filters; (3) use of emulsified diesel fuel; (4) use of vacuum-assisted street sweepers to eliminate potential re-suspension of sediments during sweeping activity; and (5) the design of trash removal devices to minimize the frequency of maintenance trips (e.g., design for smaller drainage areas ~~and adjusting screen size to prevent clogging~~).

Toxic Air Contaminants Because the emission levels of criteria pollutants during installation and maintenance of catch basin inserts can be below the South Coast Air Quality Management District Air Quality Significance thresholds, the emission of toxic air contaminants is expected to be below the other Air Quality Management District thresholds as well. With its high population and pollutant concentrations, South Coast Air Quality Management District's thresholds are likely to be the most stringent of other Districts in other parts of the state and serves as a maximum threshold related to Toxic Air Contaminants. Therefore, a significant increase in toxic air contaminants is not expected in other areas of the state due to implementation of the proposed final Trash Amendments.

Odor Impacts To the extent improper disposal of, for instance, household hazardous wastes result in them being kept on the street or in inserts, and potentially allowing a release of chemical odors, local residents could be exposed to those effects. Those effects are already occurring in watersheds, however, and should be considered baseline impacts. Nevertheless, to the extent the locality that originated the risk would become newly potentially exposed instead of downstream receptors, those impacts could be potentially significant in those locales. Such impacts could be avoided or mitigated by

educating the local community of the effects of improper disposal of such wastes, enforcing litter ordinances, and timely cleaning out inserts.

**Vortex Separation Systems**

Criteria Pollutants Short term increases in traffic during the construction and installation of vortex separation systems and long-term increases in traffic caused by ongoing maintenance of these devices (e.g., delivery of materials and deployment of vacuum trucks) are potential sources of increased air pollutant emissions. For example, the Trash TMDL analysis estimated that approximately 3700 large capacity vortex separation systems could be installed to collect all the trash generated in the urban portion of the Los Angeles River watershed. Maintenance requirements for trash removal devices demonstrate that devices should be emptied when they reach 85 percent capacity. Vortex separation systems can be designed so that they need be cleaned only once per storm season.

As an example of truck travel within a particular watershed used as a representative maximum possible effect of the proposed project, the Los Angeles River Watershed covers a land area of over 834 square miles, of which 599 square miles are highly developed with commercial, industrial, or residential uses. The remaining area is covered by forest or open space. Assuming that 3700 vortex separation systems were placed evenly in the 599 square miles developed area, each vortex separation system would cover 0.162 square miles. The distance between two vortex separation system units was about 0.40 mile. The total distance for a truck to travel through all 3700 vortex separation system units was about 1489 miles. A vortex separation system would need to be cleaned at minimum once per storm season, i.e., once per year.[17] There are about 247 business days a year. This translated to approximately 15 vehicle trips per business day in the watershed. Assuming the 15 trips were arranged at shortest distance, the total travel distance for 15 trips was about six miles (1489 miles divided by 247 days, or 15 trips times 0.40 mile). The vehicle emissions for traveling six miles are listed in Table 9. Emission levels for all the pollutants are far below the South Coast Air Quality Management District Air Quality Significance thresholds. If all trips are conducted in one day, emission levels for all the pollutants are still well below the significance thresholds (Table 9).

**Table 9.** Vehicle Emissions within the Los Angeles River Watershed Example.

| Device | Trips per day | HC (lbs/day) | CO (lbs/day) | $NO_x$ (lbs/day) | PM (lbs/day) | $SO_2$ (lbs/day) |
|---|---|---|---|---|---|---|
| Vortex Separation System | 15* | 0.029 | 0.132 | 0.086 | 0.0026 | 0.000079 |
| Vortex Separation Systems | 3700** | 6.9 | 32.5 | 21.3 | 0.64 | 0.019 |
| Catch Basin | 21,429* | 0.2 | 1.1 | 0.7 | 0.0 | 0.00068 |

[17] Annual frequency of the cleaning the vortex separation systems may vary across California in response to rain events. However, this variation would not substantially change the conclusions of this analysis.

| | | | | | | |
|---|---|---|---|---|---|---|
| Insert | | | | | | |
| Catch Basin Insert | 150,000** | 43.7 | 206.5 | 135.1 | 4.0 | 0.12 |
| SCAQMD significance threshold | | 55 | 550 | 55 | 150 | 150 |
| *trips conducted over 247 business days, **trips conducted in a single day | | | | | | |

Using the South Coast Air Quality Management District daily construction emissions thresholds as a representative of air quality standards for assessing impacts, the emissions generated by construction equipment for the proposed project are expected to be lower than the daily construction emissions thresholds. However, detailed analysis can only be done at project level. In case daily construction emissions exceed significance thresholds, which are unlikely, construction projects for different vortex separation system units can be conducted on different days to reduce emissions rates.

Measures to decrease air emissions from increased vehicle trips or increased use of construction equipment include: (1) use of construction, and maintenance vehicles with lower-emission engines; (2) use of soot reduction traps or diesel particulate filters; and (3) use of emulsified diesel fuel.

Toxic Air Contaminants The emission levels of criteria pollutants during installation and maintenance of vortex separation system units are far below the South Coast Air Quality Management District Air Quality Significance thresholds, the emissions of toxic air contaminants are expected to be far below the other Air Quality Management District thresholds as well. With its high population and pollutant concentrations, South Coast Air Quality Management District's thresholds are likely to be the most stringent of other Air Quality Management Districts in other parts of the state and serves as a maximum threshold related to Toxic Air Contaminants. Therefore, a significant increase in toxic air contaminants is not expected in other areas of the state due to implementation of the proposed final Trash Amendments.

Odor Impacts During construction of the vortex separation system units, it is possible that foul air could be temporarily released to the atmosphere while enclosed sources are uncovered or piping is reconfigured. These releases could create objectionable odors at the nearest receptors. These impacts are temporary and unpleasant odors, if any, would be at minimum with completion of the installation.

Vortex separation system units may be a source of objectionable odors if design allows for water stagnation or collection of water with sulfur-containing compounds. Storm water runoff is not likely to contain sulfur-containing compounds, but stagnant water could create objectionable odors. Measures to eliminate odors caused by stagnation could include covers, aeration, filters, barriers, and/or odor suppressing chemical additives. Devices could be inspected to ensure that intake structures are not clogged or pooling water. During maintenance, odorous sources could be uncovered for as short of a time period as possible. To the extent possible, trash removal devices could be designed to minimize stagnation of water (e.g., allow for complete drainage within 48 hours) and installed to increase the distance to sensitive receptors in the event of any stagnation.

The potential re-suspension of sediments and associated pollutants during construction could also impact air quality. An operations plan for the specific construction and/or maintenance activities could be completed to address the variety of available measures to limit the air quality impacts. These could include vapor barriers and moisture control to reduce transfer of small sediments to air.

To the extent improper disposal of, for instance, household hazardous wastes result in them being trapped in structural compliance measures, potentially allowing a release of such chemicals, local residents could be exposed to those effects. On balance, however, it is not unfair that the residents of the localities where improper disposal of such materials occurs should suffer those risks rather than allowing the wastes to be conveyed through the water body, to expose downstream citizens to risk instead. Those effects are already occurring in the watershed and should be considered baseline impacts. Nevertheless, to the extent the locality that originated the risk would become newly potentially exposed instead of downstream receptors, those impacts could be potentially significant in those locales. Such impacts could be avoided or mitigated by educating the local community of the effects of improper disposal of such wastes, enforcing litter ordinances, and timely cleaning out vortex separation systems.

**Trash Nets**

Trash nets are end-of-pipe devices. The number of end-of-pipe trash nets installed would be limited by the number of suitable locations within a watershed. Short term increases in traffic during the construction and installation of trash nets and long-term increases in traffic caused by ongoing maintenance of these devices (e.g., replacement of nets) are potential sources of increased air pollutant emissions. After installation, trash nets can be replaced once per year. It is not clear how many trash nets are going to be installed at this point. If the responsible parties make decisions on the numbers of trash nets that are going to be installed, the impacts on air quality caused by installation and maintenance of trash nets should be analyzed at project level. Nevertheless, many fewer trash nets are currently being installed than catch basin inserts, and, anticipating this trend to continue, the impacts of installation and maintenance of trash nets on air quality are expected to be much less than those of catch basin inserts.

Measures to lessen the impacts of increased air emissions caused by increased vehicle trips or construction equipment due to the installation of trash nets include: (1) use of construction, and maintenance vehicles with lower-emission engines; (2) use of soot reduction traps or diesel particulate filters; and (3) use of emulsified diesel fuel.

Trash trapped in trash nets may be a source of objectionable odors. Measures to eliminate odors could include covers, aeration, filters, barriers, and/or odor suppressing chemical additives. During maintenance, odorous sources could be uncovered for as short of a time period as possible. Notably, the current conditions result in significant impacts from odor. The impacts from odor could be alleviated by employing alternative structural devices, such as in-line trash nets, or by employing non-structural controls, for instance, increased litter enforcement.

**Gross Solids Removal Devices**

Short term increases in traffic during the construction and installation of Gross Solids Removal Devices and long-term increases in traffic caused by ongoing maintenance of these devices (e.g., replacement of nets) are potential sources of increased air pollutant emissions. Each Gross Solids Removal Device was designed to capture annual load of gross solids, which would result in one cleaning per year. It is not clear how many Gross Solids Removal Devices are going to be installed at this point. If the responsible parties determine that Gross Solids Removal Devices should be installed, the impacts on air quality caused by installation and maintenance Gross Solids Removal Devices should be analyzed at project level. Nevertheless, many fewer Gross Solids Removal Devices are currently being installed than catch basin inserts, and, anticipating these trends to continue, the impacts of installation and maintenance of Gross Solids Removal Devices on air quality are expected to be much less than those of catch basin inserts.

Measures to lessen the increase of air emissions caused by increased vehicle trips or construction equipment due to the installation of Gross Solids Removal Devices include: (1) use of construction, and maintenance vehicles with lower-emission engines; (2) use of soot reduction traps or diesel particulate filters; and (3) use of emulsified diesel fuel.

Trash trapped in Gross Solids Removal Devices may be a source of objectionable odors. Measures to eliminate odors could include covers, aeration, filters, barriers, and/or odor suppressing chemical additives. During maintenance, odorous sources could be uncovered for as short of a time period as possible. By employing nonstructural controls, for instance, increased litter enforcement, the impacts from odor could be alleviated.

**Enforcement of Litter Laws**

It is possible that the proposed final Trash Amendments may require more workers and vehicles to enforce litter laws. Air pollutant emissions might be increased due to increased driving to enforce litter laws. The increase in traffic due to enforcement of litter laws, however, is expected to be very limited and would not have a noticeable impact on air quality.

**Increased Street Sweeping**

Increased street sweeping would increase traffic and therefore increase air pollutant emissions. Increased street sweeping would not foreseeably be implemented alone for the proposed final Trash Amendments. It is not clear how often street sweeping would be increased to comply with the proposed final Trash Amendments at this point. If the responsible parties determine that a given frequency of street sweeping is necessary, the impacts on air quality caused by increased street sweeping should be analyzed at project level.

Increased street sweeping may increase objectionable odors on street. Nonetheless, measures are available to reduce any potential impacts to air quality due to increased street sweeping. Such measures could include: (1) use of street sweeper vehicles with lower-emission engines; (2) use of soot reduction traps or diesel particulate filters, (3) use of emulsified diesel fuel; (4) use of vacuum-assisted street sweepers to eliminate potential re-suspension of sediments during sweeping activity.

**Public Education**

Similar to enforcement of litter laws, public education is not expected to have noticeable impact on air quality.

**Ordinances**

Similar to enforcement of litter laws and public education, ordinances are expected to have no impact or less-than-significant impact on air quality.

**Exposure of sensitive receptors to substantial pollutant concentrations**

Implementation of the proposed final Trash Amendments is expected to cause a minor amount of construction activities, causing impacts to air quality over baseline conditions. This construction is expected to take place within a short timeframe of several days, spread out over many urban and suburban sites. Due to the short term and dispersed nature of the implementation of the proposed final Trash Amendments, there is no expectation that sensitive receptors will be exposed to substantial pollutant concentrations. In addition, the reasonably foreseeable methods of compliance will be conditioned with standard procedures requiring that the general population not have access to construction areas. Further, maintenance activities would be intermittent and are not expected to create substantial pollutant concentrations. Therefore, potential impacts due to exposure of sensitive receptors to substantial pollutant concentrations are expected to be less than significant for the reasonably foreseeable methods of compliance with the proposed final Trash Amendments.

### 6.2.4 Summary

Installation and maintenance of full capture systems and treatment controls could result in potentially significant environmental effects with regard to air quality. Measures, however, can be applied to reduce and/or eliminate these impacts, as described above. These measures are within the responsibility and jurisdiction of the responsible agencies subject to the proposed final Trash Amendments and can or should be adopted by them. The State Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The State Water Board does, however, recommend that appropriate measures be applied to reduce or avoid potential environmental impacts. Although this analysis concludes that, based on substantial evidence on the record, on a statewide level analysis, all impacts would be less than significant with mitigation; it is foreseeable that these measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. Although there is no information on the record that this would occur, in the event that a specific measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments. All foreseeable methods of compliance listed above would not be of the size or scale to result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally.

## 6.3 Biological Resources

A general description of the environmental setting is presented in Section 3 of this document. Those portions of the state where the proposed final Trash Amendments would be implemented are densely urbanized and the presence of fish and wildlife species and

their supporting habitat severely limited. Any watercourses, riparian habitat or wetlands downstream from the implementation areas would not be adversely impacted by implementation measures. Rather, these areas would be improved by the reduction in trash entering these habitats from upstream sources.

### 6.3.1 Regulatory Setting

#### Federal Regulatory Setting

#### Federal Endangered Species Act

Pursuant to the federal Endangered Species Act, the U. S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries Service, formerly National Marine Fisheries Service, have regulatory authority over federally listed species. Under the Endangered Species Act, a permit is required for any federal action that may result in "take" of a listed species. Section 9 of the Endangered Species Act defines take as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Under federal regulations, take is further defined to include the modification or degradation of habitat where such activity results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

#### Clean Water Act

Section 404 of the CWA requires project proponents to obtain a permit from the U.S. Army Corps of Engineers before performing any activity that involves discharge of dredged or fill material into "waters of the United States," including wetlands. Dredge and fill activities involve any activity, such as construction, that results in direct modification (e.g., alteration of the banks, deposition of soils) of an eligible waterway. Waters of the United States include navigable waters, interstate waters, and other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Many surface waters and wetlands in California meet the criteria for waters of the United States.

In accordance with ~~S~~section 401 of the CWA, projects that apply for a U.S. Army Corps of Engineers permit for discharge of dredged or fill material must obtain water quality certification from the Water Boards indicating that the project would uphold state water quality standards.

#### State Regulatory Setting

#### California Endangered Species Act

Pursuant to the California Endangered Species Act, a permit from the California Department of Fish and Wildlife is required for projects that could result in take of a plant or animal species that is state listed as threatened or endangered. Under California Endangered Species Act, "take" is defined as an activity that would directly or indirectly kill an individual of a species. Authorization for take of state-listed species can be obtained through a California Fish and Wildlife Code ~~S~~section 2080.1 consistency determination or a ~~S~~section 2081 incidental take permit.

### Section 1600 of the California Fish and Wildlife Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream or lake in California that supports wildlife resources is subject to regulation by the California Department of Fish and Wildlife, under ~~S~~sections 1600–1603 of the California Fish and Wildlife Code. Section 1601 states that it is unlawful for any agency to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake designated by California Department of Fish and Wildlife, or use any material from the streambeds, without first notifying California Department of Fish and Wildlife of such activity. The regulatory definition of a stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation. California Department of Fish and Wildlife's jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. Accordingly, a California Department of Fish and Wildlife Streambed Alteration Agreement must be obtained for any project that would result in diversions of surface flow or other alterations to the bed or bank of a river, stream, or lake.

### Porter-Cologne Water Quality Control Act

Under the Porter-Cologne, "waters of the state" fall under the jurisdiction of the appropriate regional water board. The regional water board must prepare and periodically update Basin Plans. Each Basin Plan establishes numerical or narrative water quality objectives to protect established beneficial uses, which include wildlife, fisheries and their habitats. Projects that affect wetlands or waters of the state must meet discharge requirements of the regional water board, which may be issued in addition to a water quality certification or waiver under ~~S~~section 401 of the CWA.

### Local Regulations

Numerous California cities and counties have adopted ordinances regulations and policies for the protection and enhancement of natural resources, including heritage trees, important natural features, habitat alteration, and common and special status species.

## 6.3.2 Thresholds of Significance

A project would normally have a significant effect on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service;

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by ~~S~~section 404 of the CWA (including, but not limited to marsh, riparian scrub, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provision of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan.

### 6.3.3 Impacts and Mitigation

This is a statewide analysis of the potential impacts from each implementation measure. The specific location of each implementation measure would be determined during the implementation of the proposed final Trash Amendments. In general, the activities that would take place with the implementation of the full capture and/or partial capture trash capture systems would be similar in nature to current urban activities that are already occurring in the watersheds. The implementation of additional trash control measures would not foreseeably:

- Cause a substantial reduction of the overall habitat of a wildlife species.
- Produce a drop in a wildlife population below self-sustaining levels.
- Eliminate a plant or animal community.
- Have a substantial adverse effect on federally protected wetlands.
- Conflict with any local policies or ordinances protecting biological resources.

It is not reasonably foreseeable that either the construction/implementation or maintenance phase of potential projects would result in a significant long-term impact to general wildlife species adapted to developed environments.

An objective of the proposed final Trash Amendments is to improve conditions for aquatic life. Removing trash from the State's rivers, streams, and lakes would have an overall positive impact on biological resources.

**Catch Basins**

Catch basin inserts fit directly into curbside catch basins, requiring no expansion of footprint or additional excavation, in urbanized areas where native habitat or special-status species usually are absent. As such, impacts to biological resources would likely not occur, including impacts to species diversity, impacts to special-status species, impacts to habitat,

or impacts to wildlife migration. Furthermore, because installation of catch basin inserts requires no construction or ground disturbance and is accomplished within the existing footprint of the facility, the installation of catch basin inserts would not impact biological resources. Implementation of the Trash Amendments and the use of catch basin inserts would considerably improve habitat for biological resources by removing trash from water bodies, as well as surrounding beaches. No mitigation is required since no potentially significant impacts are anticipated.

**Vortex Separation Systems**

Vortex separation systems would be implemented in currently urbanized areas. Since these areas are already fully urbanized, it is unlikely that the installation of vortex separation systems would cause the removal, disturbance or change in diversity of any plant species or cause a change or reduction in the number of any unique, rare or endangered species of plants. Depending on the final location of facilities, however, potential impacts to biological resources including special-status species and habitat, wetlands, and trees protected under local ordinances or policies could occur.

It is not reasonably foreseeable that implementation of vortex separation systems would result in the introduction of exotic or invasive plant species into an area. Nor would it result in a barrier to the normal replenishment of existing species. In the case that landscaping is incorporated into the specific project design, however, there is a possibility of disruption of resident native species.

It is possible that direct or indirect impacts to special-status animal species may occur at the project level. Because these animal species are protected by state and/or federal Endangered Species Acts, impacts to them would be considered potentially significant. Even though it is expected that potential projects would occur in previously developed areas it is possible for special-status species to occur in what would generally be described as urban areas. If these species are present during activities such as ground disturbance, construction, and operation and maintenance activities associated with the potential projects, it could conceivably result in direct impacts to special status species including the following:

- Direct loss of a sensitive species.
- Increased human disturbance in previously undisturbed habitats.
- Mortality by construction or other human-related activity.
- Impairing essential behavioral activities, such as breeding, feeding or shelter/refugia.
- Destruction or abandonment of active nest(s)/den sites.
- Direct loss of occupied habitat.

In addition, potential indirect impacts may include but are not limited to, the following:

- Displacement of wildlife by construction activities.
- Disturbance in essential behavioral activities due to an increase in ambient noise levels and/or artificial light from outdoor lighting around facilities.

It is not reasonably foreseeable that implementation of vortex separation systems would result in the introduction of new species. In addition, because potential projects would be established in previously heavily developed areas it is not expected that potential project sites would act as a travel route or regional wildlife corridor. Construction of these facilities would not considerably restrict wildlife movement. A travel route is generally described as a landscape feature (such as a ridgeline, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g. water, food, and den sites). Wildlife corridors are generally an area of habitat, usually linear in nature, which connect two or more habitat patches that would otherwise be fragmented or isolated from one another. It is considered unlikely that vortex separation systems would be constructed in areas such as these.

Constructed vortex separation systems, however, may potentially impact wildlife crossings. A wildlife crossing is a small narrow area relatively short and constricted, which allows wildlife to pass under or through obstacles that would otherwise hinder movement. Crossings are typically manmade and include culverts, underpasses, and drainage pipes to provide access across or under roads, highways, or other physical obstacles.

Construction activities associated with the implementation of vortex separation systems may impact migratory avian species. These avian species may use portions of potential project sites, including ornamental vegetation, during breeding season and may be protected under the Migratory Bird Treaty Act while nesting. The Migratory Bird Treaty Act includes provisions for protection of migratory birds under the authority of the U.S. Fish and Wildlife Service and California Fish and Wildlife. The Migratory Bird Treaty Act protects over 800 species including, geese, ducks, shorebirds, raptors, songbirds, and many other relatively common species.

It is not reasonably foreseeable that the implementation of vortex separation systems would result in the deterioration of existing fish and or wildlife habitat. Potential vortex separation systems would be located in previously developed areas and would not result in the removal of sensitive biological habitats.

Vortex separation systems would not be located within the river channel, but rather in the storm drain itself. As such, a foreseeable deterioration of existing fish habitat is not anticipated. It is foreseeable, however, that the implementation of the proposed final Trash Amendments would considerably improve fish habitat by removing trash from water bodies, as well as surrounding beaches.

The following measures should be implemented to reduce or avoid potential project-level impacts to biological resources:

Assuming any unique species are present, plant number and species diversity could be maintained by either preserving them prior, during, and after the construction of vortex separation systems or by re-establishing and maintaining the plant communities post construction.

When the specific projects are developed and sites identified, a search of the California Natural Diversity Database could be employed to confirm that any potentially sensitive plant species or biological habitats in the site area are properly identified and protected as necessary. Focused protocol plant surveys for special-status-plant species could be

conducted at each site location, if appropriate. If sensitive plant species occur on the project site mitigation would be required consistent with appropriate expert analysis. Mitigation measures shall be developed in coordination with U.S. Fish and Wildlife Service and California Department of Fish and Wildlife. Responsible agencies should endeavor to avoid compliance measures that could result in reduction of the numbers of any unique, rare or endangered species of plants, and instead opt for such measures as enforcing litter ordinances in sensitive habitat areas, or siting physical compliance measures sufficiently upstream or downstream of sensitive areas to avoid any impacts.

In the case that landscaping is incorporated into the specific project design, the possibility of disruption of resident native species could be avoided or minimized by using only plants native to the area. Use of exotic invasive species or other plants listed in the Exotic Pest Plant of Greatest Ecological Concern in California should be prohibited (California Exotic Pest Plant Council 1999).

Responsible agencies should endeavor to avoid compliance measures that could result in significant impacts to unique, rare or endangered (special-status) species, should any such species be present at locations where such compliance measures might otherwise be performed, and instead opt for such measures as enforcing litter ordinances in sensitive habitat areas. Mitigation measures, however, could be implemented to ensure that potentially significant impacts to special status animal species are less than significant. When the specific projects are developed and sites identified a search of the California Natural Diversity Database could be employed to confirm that any potentially special-status animal species in the site area are properly identified and protected as necessary. Focused protocol animal surveys for special-status animal species should be conducted at each site location.

If special-status animal species are potentially near the project site area two weeks prior to grading or the construction of facilities and per applicable U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife protocols, pre-construction surveys to determine the presence or absence of special-status species would be conducted. The surveys should extend off site to determine the presence or absence of any special-status species adjacent to the project site. If special-status species are found to be present on the project site or within the buffer area, mitigation should be required consistent with appropriate expert analysis. To this extent, mitigation measures would be developed in coordination with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife to reduce potential impacts.

If vortex separation systems are implemented at locations where they would foreseeably adversely impact species migration or movement patters, mitigation measures previously described could be implemented to ensure that impacts which may result in a barrier to the migration or movement of animal is less than significant. Any site-specific wildlife crossings should be evaluated in consultation with California Department of Fish and Wildlife. If a wildlife crossing would be significantly impacted in an adverse manner, then the design of the project should include a new wildlife crossing in the same general location.

If construction occurs during the avian breeding season for special status species and/or Migratory Bird Treaty Act -covered species, generally February through August, then prior (within two weeks) to the onset of construction activities, surveys for nesting migratory

avian species would be conducted on the project site following U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife guidelines. If no active avian nests are identified on or within 200 feet of construction areas, no further mitigation would be necessary.

Alternatively, to avoid impacts, the agencies implementing the proposed final Trash Amendments may begin construction after the previous breeding season for covered avian species and before the next breeding season begins. If a protected avian species was to establish an active nest after construction was initiated and outside of the typical breeding season (February – August), the project sponsor, would be required to establish a buffer of 200 feet or other measure that would result in equivalent mitigation between the construction activities and the nest site.

If active nest for protected avian species are found within the construction footprint or within the 200-foot buffer zone, construction would be required to be delayed within the construction footprint and buffer zone until the young have fledged or appropriate mitigation measures responding to the specific situation are developed in coordination with U.S. Fish and Wildlife Service or California Department of Fish and Wildlife. These impacts are highly site specific, and assuming they are foreseeable, they would require a project-level analysis and mitigation plan.

Finally, to the extent feasible, responsible agencies should endeavor to avoid compliance measures that could result in significant barriers to the beneficial migration or movement of animals, and instead opt for such measures as enforcing litter ordinances in sensitive areas. No significant impact is anticipated after mitigation.

**Trash Nets**

Trash nets are installed within the storm drain systems either inline or at the end of pipe in urbanized areas where native habitat or special-status species usually are absent. As such, impacts to biological resources would likely not occur, including impacts to species diversity, impacts to special-status species, impacts to habitat, or impacts to wildlife migration. Trash nets used for the purposes of compliance with the proposed final Trash Amendments would not be located within a stream channel, but rather in the storm drain itself and would not result in a foreseeable deterioration of existing fish habitat. Furthermore, because installation of trash nets requires minimal construction and ground disturbance and is accomplished within the existing pipeline, the installation of trash nets does not have the potential to cause a significant impact on biological resources. No mitigation is required since no impact is anticipated.

**Gross Solids Removal Devices**

Like vortex separation systems, Gross Solids Removal Devices are inline structural trash removal devices that are implemented in urbanized areas. As such, the project-level impacts on biological resources due to implementation of Gross Solids Removal Devices would be similar to the project-level impacts associated with vortex separation systems.

The proposed measures to lessen impacts from Gross Solids Removal Devices would be similar to the proposed measures for vortex separation systems. No potentially significant impact is anticipated after measures are applied.

**Enforcement of Litter Laws**

Enforcement of litter laws would involve no relative change to the baseline physical environment related to biological resources, either directly or indirectly and would have no impact on biological resources. Complying with existing statewide and local litter laws and ordinances would eliminate the substantial adverse environmental impacts from the litter, and the need for additional controls that could potentially generate their own nominal biological impacts. No mitigation is required since no impact is anticipated.

**Increased Street Sweeping**

Increased street sweeping and storm drain cleaning would involve no direct change to the physical environment related to biological objectives. Indirect impacts could include an increase in ambient noise levels, but this would not result in a significant impact to general wildlife species adapted to developed environments. No mitigation is required since no significant impact is anticipated.

**Public Education**

Public education would involve no change to the physical environment related to biological resources, either directly or indirectly and would have no impact on biological resources. Successful public education strategies would eliminate the substantial adverse environmental impacts from the litter, and the need for additional structural controls that generate their own nominal biological impacts. No mitigation is required since no impact is anticipated.

**Ordinances**

Similar to enforcement of litter laws and public education, ordinances are expected to have no impact or less-than-significant impact on biological conditions. Successful ordinances would eliminate the substantial adverse environmental impacts from the litter. No mitigation is required since no impact is anticipated.

### 6.3.4 Summary

Adverse impacts to biological resources are not expected to occur due to the nature of the areas where potential implementation measures used to comply with the proposed final Trash Amendments would be located. Most areas are already extensively developed and the presence of significant biological resources is unlikely. In the event that specific compliance projects do encounter biological resources, measures have been identified to avoid or reduce potential impacts to less than significant levels, and these projects would need to have an independent environmental review done by the agency conducting the work.

## 6.4 Cultural Resources

### 6.4.1 Historic Resources

An historical resource includes resources listed in or eligible for listing in the California Register of Historical Resources. The California Register includes resources on the National Register of Historic Places, as well as California State Landmarks and Points of Historical Interest. Properties that meet the criteria for listing also include districts which reflect California's history and culture, or properties which represent an important period or work of an individual, or yield important historical information. Properties of local

significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified as local historical resources are also considered a historical resource (California Office of Historical Preservation 2006). Based on substantial evidence within the administrative record, any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may also be considered to be an historical resource (CEQA Guidelines 15064.5(a)).

### 6.4.2 Archeological Resources

An archeological site may be considered an historical resource if it is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military or cultural annals of California (PRC ~~Section~~ § 5020.1(j)) or if it meets the criteria for listing on the California Register (14 CCR ~~Section~~ § 4850).

If an archeological site is not an historical resource, but meets the definition of a "unique archeological resource" as defined in PRC Section 21083.2, then it should be treated in accordance with the provisions of that section.

### 6.4.3 Thresholds of Significance

A project would normally have a significant effect on cultural resources if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in ~~§~~ section 15064.5 of the CEQA Guidelines.
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to ~~§~~ section 15064.5 of the CEQA Guidelines.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.

### 6.4.4 Impacts and Mitigation

This is a statewide level analysis of the potential impacts from the proposed final Trash Amendments. The specific location of potential impacts would be determined during the implementation of the proposed final Trash Amendments.

**Catch Basin Inserts**

Catch basin inserts fit directly into curbside catch basins in urbanized areas and require no construction or ground disturbance. There is therefore no potential to impact cultural resources from this alternative means of compliance. No mitigation is required since no impact is anticipated.

**Vortex Separation Systems**

Vortex separation systems would be installed in currently urbanized areas where ground disturbance has previously occurred. Because these areas are already fully urbanized it is unlikely that their implementation would cause a substantial adverse change to historical or archeological resources, destroy paleontological resources, or disturb human remains.

Depending, however, on the final location of facilities, potential impacts to cultural resources could occur. Paleontological resources can be found in areas containing fossil-bearing formations. Archaeological resources have been found within urbanized areas. Historic and architectural resources have also been found within urbanized areas. The site-specific presence or absence of these resources is unknown because the specific locations for vortex separation systems would be determined by responsible agencies at the project level. Installation of these systems could result in minor ground disturbances, which could impact cultural resources if they are sited in locations containing these resources and where disturbances have not previously occurred.

Upon determination of specific locations for vortex separation systems, responsible agencies should complete further investigation, including consultation with Native American tribes, to make an accurate assessment of the potential to affect historic, archaeological, or historic resources or to impact any human remains. If potential impacts are identified, measures to reduce impact could include project redesign, such as the relocation of facilities outside the boundaries of archeological or historical sites. According to the California Office of Historic Preservation, avoidance and preservation in place are the preferable forms of mitigation for archeological sites. When avoidance is infeasible, a data recovery plan should be prepared which adequately provides for recovering scientifically consequential information from the site. Studies and reports resulting from excavations must be deposited with the California Historical Resources Regional Information Center. No potentially significant impact is anticipated after these measures are taken.

**Trash Nets**

Trash nets are installed within the storm drain system either inline or at the end of pipe. Installation requires no ground disturbance which might impact cultural resources. No mitigation is required since no impact is anticipated.

**Gross Solids Removal Devices**

Like vortex separation systems, Gross Solids Removal Devices are inline structural trash removal devices that are implemented in urbanized areas. As such, the project-level impacts on cultural resources due to implementation of Gross Solids Removal Devices would be similar to the project-level impacts associated with vortex separation systems.

The proposed measures to lessen the impacts from Gross Solids Removal Devices would be similar to the proposed measures for vortex separation systems. No potentially significant impact is anticipated after these measures are applied.

**Enforcement of Litter Laws**

Enforcement of litter laws would involve no change to the physical environment related to cultural resources, either directly or indirectly and would have no impact on cultural resources. No mitigation is required since no impact is anticipated.

**Increased Street Sweeping**

Increased street sweeping and storm drain cleaning would occur in urbanized areas along public rights of way and would have no potential to impact cultural resources. No mitigation is required since no impact is anticipated.

**Public Education**

Public education would involve no change to the physical environment related to cultural resources, either directly or indirectly and would have no impact on cultural resources. No mitigation is required since no impact is anticipated.

**Ordinances**

Ordinances would involve no change to the physical environment related to cultural resources, either directly or indirectly, and would have no impact on cultural resources. No mitigation is required since no impact or less-than significant is anticipated.

### 6.4.5 Summary

While the potential for adverse impacts to cultural resources is low, there still exists a chance that cultural resources may occur at specific locations where implementation measures could be installed. Measures have been identified that could reduce potential impacts to less than significant levels and should be incorporated into site-specific projects carried out by the local agency.

## 6.5 Geology/Soils

### 6.5.1 Thresholds of Significance

A project would normally have a significant effect on the environment if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42);
    - Strong seismic ground shaking;
    - Seismic-related ground failure, including liquefaction; and/or
    - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; or
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water.

### 6.5.2 Impacts and Mitigation

This is a statewide level analysis of the potential impacts from each compliance measure. The specific location of each compliance measure would be determined during the implementation of the proposed final Trash Amendments.

**Catch Basin Inserts**

Catch basin inserts fit directly into curbside catch basins in urbanized areas and require no construction or ground disturbance. There is, therefore, no potential to impact geology or soils resources from this alternative means of compliance. No mitigation is required since no impact is anticipated.

**Vortex Separation Systems**

No impact due to exposure of people to, or property to, geologic hazards such as rupture of a known earthquake fault, strong seismic ground shaking, liquefaction, or landslides is expected from the implementation of vortex separation systems. Although areas of the state are subject to geologic hazards, compliance with standard design and construction specifications and the recommendations of geotechnical studies prepared at the project level would reduce the risk of damage from seismic-related hazards. Furthermore, it is not reasonably foreseeable that responsible agencies would choose to comply with the proposed final Trash Amendments through structural means in areas where doing so would result in exposure of people or property to geologic hazards. Rather, it is foreseeable that localities would avoid such compliance measures in lieu of other compliance measures, such as enforcing litter ordinances in sensitive areas.

Wind or water erosion of soils may occur as a short-term impact during installation of vortex separation systems. Siltation or deposition within the vortex separation systems may occur, resulting in reduction in siltation or deposition in downstream areas. Reduction in siltation and deposition in downstream areas may be considered a positive impact as fine sediments may contain toxic pollutants. Little or no impact on erosion of affected watercourses is expected since the flow rate in the watercourses is not impacted by foreseeable methods of compliance.

Installation and operation of vortex separation systems would not cause or accelerate instability due to on- or off-site landslides, lateral spreading, subsidence, expansive soils, liquefaction, or collapse. Vortex separation systems would not be of the size or scale to result in unstable earth conditions, changes in geologic substructures, topography or ground surface relief features, or destruction, covering or modification of any unique geologic or physical features. Typical units occupy about 4-1/2 square feet of plan view area for each cubic foot per second that they treat. Implementation of the proposed final Trash Amendments may result in minor surface soil excavation during installation of vortex separation systems and result in temporarily unstable soil but would not, due to small size, however, lead to landslides, lateral spreading, subsidence, expansive soils, liquefaction, or collapse. Most of the relevant areas are already urbanized, and have already suffered soil compaction and hardscaping. Installation of vortex separation systems would occur within the existing storm drain systems.

Compliance with the proposed final Trash Amendments would not require the use of septic tanks or alternative wastewater disposal systems. The presence or absence of soils incapable of adequately supporting their use is not relevant.

To the extent that vortex separation systems are installed in areas subject to geologic hazards, such as, ground shaking, liquefaction, liquefaction-induced hazards, or landslides, geotechnical studies prepared as part of the pre-design process would identify site-specific soil and subsurface conditions and specify design features would keep potential seismic related impacts within acceptable levels. Compliance with existing regulations, building codes, and standards specifications would also keep potential impacts within acceptable levels. The most appropriate measure for potential fault rupture hazards is avoidance (e.g., building setbacks), as most surface faulting is confined to a relatively narrow zone a few feet to tens of feet wide (California Geological Survey 2002).

To the extent that the installation of vortex separation systems causes an increase in erosion, typical established best management practices would be used during implementation to minimize offsite sediment runoff or deposition. Construction sites are required to retain sediments on site, either under a CGP permit or through the construction program of the applicable MS4 Phase I and II permit, which are already designed to minimize or eliminate erosion impacts on receiving water. No potentially significant impact is anticipated after these measures are taken.

To the extent that installation and operation of vortex separation systems could result in ground instability, potential impacts could be avoided or mitigated through mapping to site facilities away areas with unsuitable soils or steep slopes; design and installation in compliance with existing regulations; standard specifications and building codes; ground improvements such as soil compaction; and groundwater level monitoring to ensure stable conditions. No potentially significant impact is anticipated after these measures are taken.

To the extent that any soil is disturbed during installation of vortex separation systems, standard construction techniques, including but not limited to, shoring, piling, and soil stabilization can alleviate any potential impacts. Prior to earthwork, a geotechnical study would be conducted to evaluate geology and soil conditions. No potentially significant impact is anticipated after these measures are taken.

**Trash Nets**

Trash nets are installed within the storm drain system either inline or at the end of pipe. Installation requires no ground disturbance which might impact geology or soils resources. No mitigation is required since no impact is anticipated.

**Gross Solids Removal Devices**

Like vortex separation systems, Gross Solids Removal Devices are inline structural trash removal devices that are implemented in urbanized areas. As such, the project-level impacts on geology and soils resources due to implementation of Gross Solids Removal Devices would be similar to the project-level impacts associated with vortex separation systems.

The proposed measures to lessen the impacts from Gross Solids Removal Devices would be similar to the proposed measures for vortex separation systems. No potentially significant impact is anticipated after these measures are taken.

**Enforcement of Litter Laws**

Enforcement of litter laws would involve no change to the physical environment related to geologic and soil resources either directly or indirectly and would have no impact on geology and soils resources. No mitigation is required since no impact is anticipated.

**Increased Street Sweeping**

Increased street sweeping and storm drain cleaning would occur in urbanized areas along public rights of way and would have no potential to impact geology and soils resources. No mitigation is required since no impact is anticipated.

**Ordinances**

Ordinances would involve no change to the physical environment related to geologic and soil resources, either directly or indirectly, and would have no impact on geologic and soil resources. No mitigation is required since no impact to less-than-significant impact is anticipated.

### 6.5.3 Summary

Installation and maintenance of some full capture devices and treatment controls are not expected to result in potentially significant environmental effects with regard to geology and soils, because municipalities would not reasonably site BMPs where they would risk such impacts. Further, in the unlikely occurrence of such an impact, mitigation measures, which can be applied to reduce and/or eliminate these impacts, are available as described above. These mitigation measures are within the responsibility and jurisdiction of the responsible agencies subject to the proposed final Trash Amendments and can or should be adopted by them (CCR, title 14, ~~section~~ § 15091(a)(2)). The State Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The State Water Board does, however, recommend that appropriate measures be applied to reduce or avoid potential environmental impacts. Although this analysis concludes that, based on substantial evidence on the record, on a statewide level analysis, all impacts would be less than significant with mitigation; it is foreseeable that these measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. Although there is no information on the record that this would occur, in the event that a specific measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments.

## 6.6 Greenhouse Gas Emissions

General scientific consensus and increasing public awareness regarding global warming and climate change have placed new focus on the CEQA review process as a means to address the effects of greenhouse gas emissions from proposed projects on climate change.

Global warming refers to the recent and ongoing rise in global average temperature near Earth's surface. It is caused mostly by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. Global warming itself, however, represents only one aspect of climate change.

Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.

Increases in the concentrations of greenhouse gases in the Earth's atmosphere are thought to be the main cause of human-induced climate change. Greenhouse gases naturally trap heat by impeding the exit of infrared radiation that results when incoming ultraviolet solar radiation is absorbed by the Earth and re-radiated as infrared radiation. The principal greenhouse gases associated with anthropogenic emissions are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, perfluorocarbon, nitrogen trifluoride, and hydrofluorocarbon (Health and Safety Code, ~~section~~ § 38505, subdivision (g); CEQA Guidelines, ~~section~~ § 15364.5). Water vapor is also an important greenhouse gas, in that it is responsible for trapping more heat than any of the other greenhouse gases. Water vapor, however, is not a greenhouse gas of concern with respect to anthropogenic activities and emissions. Each of the principal greenhouse gases associated with anthropogenic climate warming has a long atmospheric lifetime (one year to several thousand years). In addition, the potential heat trapping ability of each of these gases vary significantly from one another. Methane for instance is 23 times more potent than carbon dioxide, while sulfur hexaflouride is 22,200 times more potent than carbon dioxide (Intergovernmental Panel on Climate Change 2001). Conventionally, greenhouse gases have been reported as "carbon dioxide equivalents." Carbon dioxide equivalents take into account the relative potency of non-carbon dioxide greenhouse gases and convert their quantities to an equivalent amount of carbon dioxide so that all emissions can be reported as a single quantity.

The primary man-made processes that release these greenhouse gases include: (1) burning of fossil fuels for transportation, heating and electricity generation, which release primarily carbon dioxide; (2) agricultural practices, such as livestock grazing and crop residue decomposition and application of nitrogen fertilizers, that release methane and nitrous oxide; and (3) industrial processes that release smaller amounts of high global warming potential gases.

In 2005, Executive Order S-3-05 proclaimed that California is vulnerable to the effects of climate change. To combat those concerns, the Executive Order established a long-range greenhouse gas reduction target of 80percent below 1990 levels by 2050.

Subsequently, Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006 (Chapter 488, Statutes of 2006, enacting ~~Sections~~ § 38500-38599 of the Health and Safety Code) was signed. AB 32 requires California to reduce statewide greenhouse gas emissions to 1990 levels by 2020. AB 32 directed the California Air Resources Board to develop and implement regulations that reduce statewide greenhouse gas emissions.

The Climate Change Scoping Plan approved by the California Air Resources Board in December 2008, outlines the State's plan to achieve the greenhouse gas reductions required in AB 32.

Senate Bill (SB) 97, signed in August 2007 (Chapter 185, Statutes of 2007, enacting ~~Sections~~ § 21083.05 and 21097 of the Public Resources Code), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Office of Planning and Research to prepare, develop, and transmit guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions to the California Resources Agency. Office of Planning and Research developed a technical advisory suggesting relevant ways to address climate change in CEQA analyses. The technical advisory also lists potential mitigation measures, describes useful computer models, and points to other important resources. In addition, amendments to CEQA guidelines implementing SB 97 became effective on March 18, 2010.

### 6.6.1 Thresholds of Significance

A project would normally have a significant effect on the environment if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, amendment or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

### 6.6.2 Impacts and Mitigation

The operation of construction equipment for the installation of trash collection devices and the operation of new or increase in maintenance equipment and street sweepers would generate greenhouse gas emissions over baseline conditions. Consistent with the air quality analysis in Section 6.2, greenhouse gas emissions due to construction equipment would be short-term and limited to minor amounts of construction equipment and therefore would not significantly increase greenhouse gas levels in the environment. Greenhouse gas levels are not expected to rise significantly since mitigation measures are available to reduce greenhouse gas emissions due to construction, maintenance and street sweeping activities.

The California Department of Water Resources has developed a set of BMPs to reduce greenhouse gas emissions from California Department of Water Resources construction and maintenance activities (California Department of Water Resources 2012). These BMPs can be used and/or modified to fit specific situations by the implementing agencies to reduce greenhouse gas emissions from their activities:

BMP 1. Evaluate project characteristics, including location, project work flow, site conditions, and equipment performance requirements, to determine whether specifications of the use of equipment with repowered engines, electric drive trains, or other high efficiency technologies are appropriate and feasible for the project or specific elements of the project.

BMP 2. Evaluate the feasibility and efficacy of performing on-site material hauling with trucks equipped with on-road engines.

BMP 3. Ensure that all feasible avenues have been explored for providing an electrical service drop to the construction site for temporary construction power. When generators must be used, use alternative fuels, such as propane or solar, to power generators to the maximum extent feasible.

BMP 4. Evaluate the feasibility and efficacy of producing concrete on-site and specify that batch plants be set up on-site or as close to the site as possible.

BMP 5. Evaluate the performance requirements for concrete used on the project and specify concrete mix designs that minimize greenhouse gas emissions from cement production and curing while preserving all required performance characteristics.

BMP 6. Minimize idling time by requiring that equipment be shut down after five minutes when not in use (as required by the State airborne toxics control measure [Title 13, ~~Section~~ § 2485 of the CCR]). Provide clear signage that posts this requirement for workers at the entrances to the site and provide a plan for the enforcement of this requirement.

BMP 7. Maintain all construction equipment in proper working condition and perform all preventative maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all engine and emissions systems in proper operating condition. Maintenance schedules shall be detailed in an Air Quality Control Plan prior to commencement of construction.

BMP 8. Implement tire inflation program on jobsite to ensure that equipment tires are correctly inflated. Check tire inflation when equipment arrives on-site and every two weeks for equipment that remains on-site. Check vehicles used for hauling materials off-site weekly for correct tire inflation. Procedures for the tire inflation program shall be documented in an Air Quality Management Plan prior to commencement of construction.

BMP 9. Develop a project specific ride share program to encourage carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.

BMP 10. Reduce electricity use in temporary construction offices by using high efficiency lighting and requiring that heating and cooling units be Energy Star compliant. Require that all contractors develop and implement procedures for turning off computers, lights, air conditioners, heaters, and other equipment each day at close of business.

BMP 11. For deliveries to project sites where the haul distance exceeds 100 miles and a heavy-duty class 7 or class 8 semi-truck or 53-foot or longer box type

trailer is used for hauling, a SmartWay[18] certified truck would be used to the maximum extent feasible.

The proposed final Trash Amendments would not conflict with any plan, amendment, or regulation adopted for the purpose of reducing greenhouse gas emissions. Most greenhouse gas reduction plans include replacing government owned vehicles with low or zero-emission vehicles (Marin County 2006, City of Pasadena 2009, City of Citrus Heights 2011, California Department of Water Resources 2012). Implementation of greenhouse gas reduction plans would reduce greenhouse gas emissions from activities undertaken to comply with the proposed final Trash Amendments.

In 2007, the California Air Resources Board adopted the Off-Road Diesel Vehicle Regulation (CCR, title 13, article 4.8, chapter 9) which, when fully implemented, would significantly reduce emissions from off-road, non-agricultural, diesel vehicles with engines greater than 25 horsepower—the types of vehicles typically used in construction activities. The regulation required owners to replace the engines in their vehicles, apply exhaust retrofits, or replace the vehicles with new vehicles equipped with cleaner engines. The regulation also limited vehicle idling, required sales disclosure requirements, and reporting and labeling requirements. The first compliance date for large fleets was March 1, 2010; however, amendments have been made several times to extend the deadlines. When the regulation is fully implemented, owners of fleets of construction, mining, and industrial vehicles would have to upgrade the performance of their vehicle fleets to comply with the regulation.

The California Air Resources Board Scoping Plan (California Air Resources Board 2008) proposes a comprehensive set of actions designed to achieve the 2020 greenhouse gas emissions reductions required under AB 32. While some of the regulations would not be implemented until later, when they do take effect, they would likely result in reduced emissions from construction and maintenance activities. Specific actions in the Scoping Plan that would impact construction and maintenance activities include: low carbon fuel standard (Measure Transportation-2), tire inflation regulation (Measure Transportation-4), the heavy-duty tractor truck regulation (Measure Transporation-7), and commercial recycling (Measure Recycling and Waste-3).

In addition, other efforts by the California Air Resources Board would reduce air pollutant emissions through 2020, including the Diesel Risk Reduction Plan (California Air Resources Board 2000) and the 2007 State Implementation Plan. Measures in these plans would result in the accelerated phase-in of cleaner technology for virtually all of California's diesel engine fleets including trucks, buses, construction equipment, and cargo handling equipment at ports.

[18] The U.S EPA has developed the SmartWay truck and trailer certification program to set voluntary standards for trucks and trailers that exhibit the highest fuel efficiency and emissions reductions. These tractors and trailers are outfitted at point of sale or retrofitted with equipment that significantly reduces fuel use and emissions including idle reduction technologies, improved aerodynamics, automatic tire inflation systems, advanced lubricants, advanced powertrain technologies, and low rolling resistance tires.

### 6.6.3 Summary

With the incorporation of BMPs and compliance with any plans, amendments, or regulations adopted for the purpose of reducing greenhouse gas emissions, projects undertaken to comply with the proposed final Trash Amendments would not have a significant impact on the environment due to greenhouse gas emissions.

## 6.7 Hazards and Hazardous Materials

Hazards and hazardous materials are located throughout the urbanized portion of the state either as naturally occurring or man-made hazards. Contaminated soil and groundwater from commercial and industrial sites such as gas stations, dry cleaners, and manufacturing facilities are located throughout the state. Aboveground and underground storage tanks contain vast quantities of hazardous substances. Thousands of these tanks have leaked or are leaking, discharging petroleum fuels, solvents, and other hazardous substances into the subsurface. These leaks as well as other discharges to the subsurface that result from inadequate handling, storage, and disposal practices can seep into the subsurface and pollute soils and groundwater.

Both naturally occurring hazards and anthropogenic contaminated soils and groundwater could be encountered during the installation of structural treatment alternatives for implementation of the reasonably foreseeable compliance methods for the proposed final Trash Amendments.

Individual projects also may generate hazardous emissions, as the full capture system would, by design, trap substances which could become hazardous to the public or to maintenance workers if not handled in a timely manner and disposed of appropriately. To the extent improper disposal of, for instance, household hazardous wastes result in them being trapped in structural compliance measures, and potentially allowing a release of such chemicals, local residents could be exposed to those effects. To a large extent, those effects are already occurring in the watershed (but further downstream) and should be considered baseline impacts. Nevertheless, the locality that originated the risk would become newly potentially exposed instead of downstream receptors, those impacts could be potentially significant in those locales. Such impacts could be avoided or diminished by educating the local community of the effects of improper disposal of such wastes, enforcing litter ordinances, and timely cleaning out inserts and structural controls.

There is also the potential for public health hazards associated with the installation, operation, and maintenance of structural trash removal devices. Use of heavy equipment during installation and maintenance of structural trash removal devices may add to the potential for construction accidents. Unprotected sites may also result in accidental health hazards for people. In addition, certain structural devices may become a source of standing water. Any source of standing water can potentially become a source of vector production.

### 6.7.1 Thresholds of Significance

A project would normally have a significant effect on the environment if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment.
- Reasonably be anticipated to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- The project is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code ~~S~~section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area.
- For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- Expose people or structures to the risk of loss, injury or death involving wild land fires, including where wild lands are adjacent to urbanized areas or where residences are intermixed with wild lands.

### 6.7.2 Impacts and Mitigation

**Catch Basin Inserts**

Catch basin inserts fit directly into curbside catch basins in urbanized areas and require no construction or ground disturbance. There is, therefore, no potential to encounter contaminated soils or groundwater or other hazards from this alternative means of compliance. Since no construction is required, the use of hazardous materials or potential for construction accidents is unlikely during installation. Catch basin cleaning and maintenance, however, could pose risks to maintenance workers.

To the extent that catch basin cleaning and maintenance could pose risks to maintenance workers, measures to avoid these risks include requiring workers to obtain hazardous materials maintenance, record keeping, and disposal activities training, California Occupational Health and Safety Administration -required Health and Safety Training, and California Occupational Health and Safety Administration Confined Space Entry training.

**Vortex Separation Systems**

It is reasonably foreseeable that hazards or hazardous materials could be encountered during the installation of vortex separation systems. Contamination could exist depending on the current and historical land uses of the area. Depending on their location, vortex separation systems could be proposed in areas of existing oil fields and/or methane zones or in areas with contaminated soils or groundwater. The use of hazardous materials (e.g., paint, oil, gasoline) and potential for accidents is also likely during installation.

Trash that is trapped by vortex separation systems could become hazardous to the public or to maintenance workers who collect and transport the trash if it is not handled in a timely manner and disposed of appropriately.

Installation of vortex separation systems could result in the temporary interference of emergency response or evacuation plans if construction equipment, road closures, or traffic interfered with emergency vehicles traveling through the installation area.

As vortex separation systems would be located in urbanized areas, it is not reasonably foreseeable that their installation would expose people to wildland fires. Furthermore, these are structural trash removal devices that would not serve as residences or places of employment. They would not result in a safety hazard for people residing or working within two miles of public airport or public use airport.

To the extent that installation of vortex separation systems could involve work with or near hazards or hazardous materials, potential risks of exposure can be alleviated with proper handling and storage procedures. The health and safety plan prepared for any project should address potential effects from cross contamination and worker exposure to contaminated soils and water and should include a plan for temporary storage, transportation and disposal of contaminated soils and water. Compliance with the requirements of California Occupational Health and Safety Administration and local safety regulations during installation, operation, and maintenance of these systems would prevent any worksite accidents or accidents involving the release of hazardous materials into the environment, which could harm the public, nearby residents and sensitive receptors such as schools. Systems can be redesigned and sites can be properly protected with fencing and signs to prevent accidental health hazards.

To the extent that trash trapped by vortex separation systems could become hazardous, impacts to maintenance workers and the public could be avoided or alleviated by educating the local community of the effects of improper disposal of such wastes, enforcing litter ordinances, and timely cleaning out inserts and structural controls.

To the extent that installation of vortex separation systems could interfere with emergency response or evacuation plans, traffic control plans should be used to manage traffic through installation zones.

To the extent that vortex separation systems become a source of standing water and vector production, design at the project-level can help reduce vector production from standing water. Netting can be installed over devices to further mitigate vector production. Vector control agencies may also be employed as another source of mitigation. Systems that are prone to standing water can be selectively installed away from high-density areas and away from residential housing and/or by requiring oversight and treatment of those systems by vector control agencies.

**Trash Nets**

Trash nets are installed within the storm drain system either inline or at the end of pipe. There is therefore no potential to encounter contaminated soils or groundwater or other hazards from this alternative means of compliance. Since no construction is required, the use of hazardous materials or potential for construction accidents is unlikely during installation. No mitigation is required since no impact is anticipated.

To the extent that trash net cleaning and maintenance could pose risks to maintenance workers, measures to avoid these risks include requiring workers to obtain hazardous materials maintenance, record keeping, and disposal activities training, California Occupational Health and Safety Administration -required Health and Safety Training, and California Occupational Health and Safety Administration Confined Space Entry training.

**Gross Solids Removal Devices**

Like vortex separation systems, Gross Solids Removal Devices are inline structural trash removal devices that are implemented in urbanized areas. As such, the project-level impacts related to hazards and hazardous materials due to implementation of Gross Solids Removal Devices would be similar to the project-level impacts associated with vortex separation systems.

The proposed measures to decrease impacts from Gross Solids Removal Devices would be similar to the proposed measures for vortex separation systems.

**Enforcement of Litter Laws**

Enforcement of litter laws would involve no change to the physical environment related to hazards and hazardous materials, either directly or indirectly and would have no impact related to hazards, hazardous materials, or public health. No mitigation is required since no impact is anticipated.

**Increased Street Sweeping**

Increased street sweeping and storm drain cleaning would occur in urbanized areas along public rights of way and would have no potential impact related to hazards, hazardous materials, or public health. No mitigation is required since no impact is anticipated.

**Public Education**

Public education would involve no change to the physical environment related to hazards and hazardous materials, either directly or indirectly and would have no impact related to hazards, hazardous materials, or public health. No mitigation is required since no impact is anticipated.

**Ordinances**

Ordinances would involve no change to the physical environment related to hazards and hazardous materials, either directly or indirectly, and would have no impact on hazards and hazardous materials, or public health. No mitigation is required since no impact to less-than-significant impact is anticipated.

### 6.7.3 Summary

Installation and maintenance of some treatment trash-reduction BMPs could result in potentially significant environmental effects with regard to hazards, hazardous materials, and public health. Measures can be applied, however, to reduce and/or eliminate these impacts, as described above. These measures are within the responsibility and jurisdiction of the responsible agencies subject to the proposed final Trash Amendments and can or should be adopted by them (CCR, title 14, ~~section~~ § 15091(a)(2)). The State Water Board does not direct which compliance measures responsible agencies choose to adopt or

the mitigation measures they employ. The State Water Board does, however, recommend that appropriate measures be applied to reduce or avoid potential environmental impacts. Although this analysis concludes that, based on substantial evidence on the record, on a statewide level analysis, all impacts would be less than significant with mitigation; it is foreseeable that these measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. Although there is no information on the record that this would occur, in the event that a specific measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments.

## 6.8 Hydrology/Water Quality

### 6.8.1 Thresholds of Significance

The proposed project would result in a significant impact on hydrology or water quality if it would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate of surface runoff in a manner that causes flooding on- or off-site, creating or contributing to an existing local or regional flooding problem;
- Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures that would impede or redirect floodflows; or
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam;

- Contribute to inundation by seiche, tsunami, or mudflow.

### 6.8.2 Impacts and Mitigation

The proposed final Trash Amendments would not violate any water quality standards or waste discharge requirements; in fact, they are designed to improve water quality. Several reasonably foreseeable methods of compliance may have the potential to cause localized flooding and are described below. It is not reasonably foreseeable that increased street sweeping, enforcement of litter laws, or public education would negatively impact hydrology or water quality.

The installation, operation, and maintenance of full capture systems do not entail the use of groundwater resources, nor would it interfere with groundwater recharge. Multi-purpose projects may include a groundwater recharge component which would be beneficial for groundwater resources. No impacts to groundwater resources are anticipated.

The installation, operation, and maintenance of full capture systems would not alter the drainage pattern of the target areas nor increase the amount of runoff within those areas. Full capture systems are placed at the inlet (catch basin inserts) or outlet (trash nets) of the storm drain system, or inline (vortex separation systems) and do not require any type of re-contouring of the surrounding area nor alteration of any stream courses. The main concern is localized flooding caused by clogging of the trash capture devices, which is discussed below. No other impacts are anticipated.

Compliance with the proposed final Trash Amendments would not place housing or other structures within a 100-year flood hazard area, nor would it expose people and structures to a significant risk of loss, injury, or death by flooding, seiche, tsunami, or mudflow. No impacts are anticipated.

**Catch Basin Inserts**

Catch basin inserts are manufactured frames that typically incorporate filters or fabric and placed in a curb opening or drop inlet to remove trash, sediment, or debris. They can also be perforated metal screens placed horizontally or vertically within a catch basin. These devices have less hydraulic effect than the vortex separation systems or the Gross Solids Removal Devices, however, flooding is still a potential hazard if the filters or screens became blocked by trash and debris and prevents the discharge of storm water into the drain causing localized flooding. This would be of particular concern in areas susceptible to high leaf-litter rates. This potential impact can be diminished through the use of inserts that are designed with automatic release mechanisms or retractable screens that allow flow-through during wet-weather and by performing regular maintenance to prevent the buildup of trash and debris. Therefore, the exposure of people and property to flooding hazards after mitigation is considered less than significant.

**Vortex Separation Systems**

Vortex separation systems are devices designed to allow the incoming flow of urban runoff or storm water to pass through the device while capturing trash and other debris within the unit. These types of devices may result in a potentially significant impact due

to flooding if the screens became blocked by trash and debris and prevent the discharge of storm water or if the vortex separation systems are not properly designed and constructed to allow for bypass of storm water during storm events that exceed the design capacity. This potential impact can be alleviated through the design of the vortex separation systems with overflow/bypass structures and by performing regular maintenance to prevent the build-up of trash and debris. Therefore, the exposure of people and property to flooding hazards after mitigation is considered less than significant.

The vortex separation systems would not alter the direction or slope of the stream channels in the lower watershed, therefore, no change in the direction of surface water flow would occur.

**Trash Nets**

Trash nets are devices that use the natural energy of the flow to trap trash, floatables and solids in disposable mesh nets. Trash nets can be installed at or below grade within existing storm water conveyance structures or retrofitted to an existing outfall structure with only minor modifications. These devices have less hydraulic effect than the vortex separation systems or the Gross Solids Removal Devices; however, flooding is still a potential hazard if the nets became blocked by trash and debris. This potential impact can be alleviated through sizing and designing trash nets to allow for bypass when storm events exceed the design capacity and by performing regular maintenance to prevent the buildup of trash and debris. Therefore, the exposure of people and property to flooding hazards after mitigation is considered less than significant.

**Gross Solids Removal Devices**

Gross Solids Removal Devices are devices designed to allow the incoming flow of urban runoff or storm water to pass through the device while capturing trash and other debris within the unit. These types of devices may result in a potentially significant impact due to flooding hazards if the screens became blocked by trash and debris and prevent the discharge of storm water or if the Gross Solids Removal Devices are not properly designed and constructed to allow for bypass of storm water during storm events that exceed the design capacity. This potential impact can be diminished through the design of the Gross Solids Removal Devices with overflow/bypass structures and by performing regular maintenance to prevent the buildup of trash and debris. Therefore, the exposure of people and property to flooding hazards after mitigation is considered less than significant.

The Gross Solids Removal Devices units would not alter the direction or slope of the stream channels in the lower watershed, therefore, no change in the direction of surface water flows would occur.

### 6.8.3 Summary

Installation and maintenance of some treatment trash-reduction BMPs could result in potentially significant environmental effects with regard to hydrology. Measures, however, can be applied to reduce and/or eliminate these impacts, as described above. These measures are within the responsibility and jurisdiction of the responsible agencies subject to the proposed final Trash Amendments and can or should be

adopted by them (CCR, title 14, ~~section~~ § 15091(a)(2)). The State Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The State Water Board does, however, recommend that appropriate measures be applied to reduced or avoid potential environmental impacts. It is foreseeable that these measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. In the event that a specific measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments.

## 6.9 Land Use/Planning

### 6.9.1 Thresholds of Significance

The proposed project would have a significant environmental impact on land use if it would:

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation to an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

### 6.9.2 Impacts and Mitigation

Due to where they are currently located or would be planned for implementation, it is not expected that the proposed final Trash Amendments and the reasonably foreseeable methods of compliance would either physically divide an established community or conflict with any applicable habitat conservation plan or natural community conservation plan.

**Catch Basin Inserts**

Since, catch basin inserts can be installed at or below grade within existing storm water catch basins with minor modifications to the storm water conveyance structure no adverse impacts are expected on present or planned land use.

**Vortex Separation Systems**

Vortex separation systems (i.e., Continuous Deflective Separation units) are installed below grade and are appropriate for highly urbanized areas where space is limited. In general, a vortex separation system occupies about 4-1/2 square feet of plan view area for each treated cubic feet per second of runoff, with the bulk of the plan view area being well below grade. Maintenance of the Continuous Deflective Separation unit involves the removal of the solids either by using a vactor truck, a removable basket or a clamshell excavator depending on the design and size of the unit.

The installation of vortex separation systems may require modification of storm water conveyance structures; however, these units would generally be sited below grade and within existing storm drain infrastructure. The installation of vortex separation systems is not expected to result in substantial alterations or adverse impacts to a present or planned land use. To the extent that there could be land use impacts at a specific location, these potential land use conflicts are best addressed at the project level. Since the State Water Board cannot specify the manner of compliance with the proposed final Trash Amendments, the State Water Board cannot specify the exact location of trash removal devices. The various municipalities that might install these devices would need to identify local land use plans as part of a project-level analysis to ensure that projects comply with the proposed final Trash Amendments as well as permitted land-use regulations and are consistent with land use plans, general plans, specific plans, conditional uses, or subdivisions.

**Trash Nets**

Since, trash nets can be installed at or below grade within existing storm water conveyance structures or retrofitted to an existing outfall structure with only minor modifications no adverse impacts are expected on present or planned land use.

**Gross Solid Removal Devices**

Gross Solids Removal Devices were developed by Caltrans to be retrofitted below grade into existing highway drainage systems or installed in future highway drainage systems. These devices are appropriate for highly urbanized areas where space is limited. The Gross Solids Removal Devices s can be designed to accommodate vehicular loading. Maintenance of the devices involves the removal of the solids either by using a vactor truck or other equipment.

The installation of Gross Solids Removal Devices may require modification of storm water conveyance structures; however, these units would generally be sited below grade and within existing storm drain infrastructure. The installation of Gross Solids Removal Devices is not expected to result in substantial alterations or adverse impacts to present or planned land use. To the extent that there could be land use impacts at a specific location, these potential land use conflicts are best addressed at the project level. Since the State Water Board cannot specify the manner of compliance with the proposed final Trash Amendments, the State Water Board cannot specify the exact location of trash removal devices. The various municipalities that might install these devices would need to identify local land use plans as part of a project-level analysis to ensure that projects comply with permitted land-use regulations and are consistent with land use plans, general plans, specific plans, conditional uses, or subdivisions.

**Institutional Controls**

It is not reasonably foreseeable that increased street sweeping, enforcement of litter laws, ordinances, or public education would alter present or planned land use.

### 6.9.3 Summary

Construction of vortex separation systems and Gross Solids Removal Devices would not result in permanent features such as aboveground infrastructure that would disrupt, divide, or isolate existing communities or land uses.

## 6.10 Noise and Vibration

### 6.10.1 Background

**Noise**

California Health and Safety Code section 46022 defines noise as "excessive undesirable sound, including that produced by persons, pets and livestock, industrial equipment, construction, motor vehicles, boats, aircraft, home appliances, electric motors, combustion engines, and any other noise-producing objects". The degree to which noise can affect the human environment range from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise; the amount of background noise present before the intruding noise; and the nature of work or human activity that is exposed to the noise source.

Sound results from small and rapid changes in atmospheric pressure. These cyclical changes in pressure propagate through the atmosphere and are often referred to as sound waves. The greater the amount of variation in atmospheric pressure (amplitude) leads to a greater loudness (sound level). Sound levels are most often measured on a logarithmic scale of decibels (dB). The decibel scale compresses the audible acoustic pressure levels which can vary from 20 micropascals (µPa), the threshold of hearing and reference pressure (0 dB), to 20 million µPa, the threshold of pain (120 dB) (Air & Noise Compliance 2006). Table 10 provides examples of noise levels from common sounds.

**Table 10.** Common Sound Levels.

| Outdoor Sound Levels | Sound Pressure (µPa) | Sound Level (dBA) | Indoor Sound Level |
|---|---|---|---|
| | 6,324,555 | 110 | Rock Band at 5m |
| Jet Over-flight at 300m | | 105 | |
| | 2,000,000 | 100 | Inside NY Subway Train |
| Gas Lawn Mower at 1m | | 95 | |
| | 632,456 | 90 | Food Blender at 1m |
| Diesel Truck at 15 m | | 85 | |
| Noisy Urban Area (daytime) | 200,000 | 80 | Garbage Disposal at 1m |
| | | 75 | Shouting at 1m |
| Gas Lawn Mower at 30m | 63,246 | 70 | Vacuum Cleaner at 3m |
| Suburban Commercial Area | | 65 | Normal Speech at 1m |

| | | | |
|---|---|---|---|
| | 20,000 | 60 | |
| Quiet Urban Area (daytime) | | 55 | Quiet Conversation at 1m |
| | 6,325 | 50 | Dishwasher in Adjacent Room |
| Quiet Urban Area (nighttime) | | 45 | |
| | 2,000 | 40 | Empty Theater of Library |
| Quiet Suburb (nighttime) | | 35 | |
| | 632 | 30 | Quiet Bedroom at Night |
| Quiet Rural Area (nighttime) | | 25 | Empty Concert Hall |
| Rustling Leaves | 200 | 20 | |
| | | 15 | Broadcast and Recording Studios |
| | 63 | 10 | |
| | | 5 | |
| Reference Pressure Level | 20 | 0 | Threshold of Hearing |

Source: Air & Noise Compliance 2006.

To determine ambient (existing) noise levels, noise measurements are usually taken using various noise descriptors. The following are brief definitions of typical noise measurements:

Community Noise Equivalent Level

The community noise equivalent level is an average sound level during a 24-hour day. The community noise equivalent level noise measurement scale accounts for noise source, distance, single-event duration, single-event occurrence, frequency, and time of day. Humans react to sound between 7:00 p.m. and 10:00 p.m. as if the sound were actually 5 decibels higher than if it occurred from 7:00 a.m. to 7:00 p.m. From 10:00 p.m. to 7:00 a.m., humans perceive sound as if it were 10 dBA higher than if it occurred from 7:00 a.m. to 7:00 p.m. due to the lower background noise level. Hence, the community noise equivalent level noise measurement scale is obtained by adding an additional 5 decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m., and 10 dBA to sound levels in the night after 10:00 p.m. and before 7:00 a.m. Because community noise equivalent level accounts for human sensitivity to sound, the community noise equivalent level 24-hour figure is always a higher number than the actual 24-hour average.

Equivalent Noise Level

Equivalent noise level is the average noise level on an energy basis for any specific time period. The equivalent noise level for 1 hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. Equivalent noise level can be thought of as the level of a continuous noise that has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.

Sound Exposure Level

Sound exposure level is a measure of the cumulative sound energy of a single event. This means that louder events have greater sound exposure level than quieter events. Additionally, events that last longer have greater sound exposure level than shorter events.

Audible Noise Changes

Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 decibels. A change of at least 5 decibels would be noticeable and likely would evoke a community reaction. A 10-decibel increase is subjectively heard as a doubling in loudness and would most certainly cause a community response. Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or “point source,” would decrease by approximately 6 decibels over hard surfaces and 9 decibels over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet, and so on over hard surfaces. Generally, noise is most audible when traveling along direct line-of-sight. Barriers, such as walls, berms, or buildings that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source because sound can reach the receiver only by bending over the top of the barrier (diffraction). Sound barriers can reduce sound levels by up to 20 dBA. If a barrier, however, is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Sensitive Receptors

Land uses that are considered sensitive to noise impacts are referred to as “sensitive receptors.” Noise-sensitive receptors consist of, but are not limited to, schools, religious institutions, residences, libraries, parks, hospitals, and other care facilities.

**Vibration**

In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving and operating heavy earth-moving equipment. The effects of ground-borne vibration include feelable movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. A vibration level that causes annoyance would be well below the damage threshold for normal buildings.

The background vibration velocity level in residential areas is usually 50 VdB or lower, well below the threshold of perception for humans which is around 65 VdB. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB to 100 VdB. Background vibration is usually well below the threshold of human perception and is of concern only when the vibration affects very sensitive manufacturing or research equipment. Electron microscopes and high-resolution lithography equipment are typical of equipment that is highly sensitive to vibration.

### 6.10.2 General Setting

#### Noise

Existing noise environments will vary considerably based on the diversity of land uses and densities. In most urban environments automobile, truck, and bus traffic is the major source of noise. Traffic generally produces background sound levels that remain fairly constant with time. Individual high-noise-level events that can occur from time to time include honking horns, sirens, operation of construction equipment, and travel of noisy vehicles like trucks or buses. Air and rail traffic and commercial and industrial activities are also major sources of noise in some areas. In addition, air conditioning and ventilating systems contribute to the noise levels in residential areas, particularly during the summer months.

#### Regulatory Framework

The no longer extant California Office of Noise Control, California Department of Health Services developed guidelines showing a range of noise standards for various land use categories in the *1976 Noise Element Guidelines*. These guidelines are now found in Appendix C of the State of California General Plan Guidelines (Governor's Office of Planning and Research 2003). Cities within the state have generally incorporated this compatibility matrix into their General Plan noise elements. These guidelines are meant to maintain acceptable noise levels in a community setting based on the type of land use. Noise compatibility by different types of land uses is a range from "Normally Acceptable" to "Clearly Unacceptable" levels. The guidelines are used by cities within the state to help determine the appropriate land uses that could be located within an existing or anticipated ambient noise level.

Some of the reasonably foreseeable methods of compliance have the potential to affect noise levels. Noise within counties and cities are regulated by noise ordinances, which are found in the municipal code of the jurisdiction These noise ordinances limit intrusive noise and establish sound measurements and criteria, minimum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses, hours of operation for certain activities (such as construction and trash collection), standards for determining noise deemed a disturbance of the peace, and legal remedies for violations.

#### Vibration

Major sources of groundborne vibration would typically include trucks and buses operating on surface streets, and freight and passenger train operations. The most significant sources of construction-induced groundborne vibrations are pile driving and blasting – neither of which would be involved in the installation or maintenance of structural implementation alternatives. Currently, the state of California has no vibration regulations or guidelines.

### 6.10.3 Thresholds of Significance

A project would normally have a significant effect on the environment if it would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- Exposure of persons residing or working in the project area, for a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, to excessive noise levels.
- Exposure of persons residing or working in the project area to excessive noise levels, for a project within the vicinity of a private airstrip.

### 6.10.4 Impacts and Mitigation

Implementation of the proposed final Trash Amendments would not cause a permanent increase in ambient noise levels. All construction and maintenance activities would be intermittent. The remaining thresholds may be exceeded for limited durations depending on the location and ambient noise levels at sites selected for installation of trash removal devices.

Increases in noise levels during installation and/or maintenance of some of the implementation alternatives would vary depending on the existing ambient levels at each site. Once a site has been selected, project-level analysis to determine noise impacts would involve: (i) identifying sensitive receptors within a quarter-mile vicinity of the site, (ii) characterizing existing ambient noise levels at these sensitive receptors, (iii) determining noise levels of any and all installation and maintenance equipment, and (iv) adjusting values for distance between noise source and sensitive receptor. In addition, the potential for increased noise levels due to installation of trash reduction structural controls is limited and short-term. Given the size of the individual projects and the fact that installation would occur in small discrete locations, noise impacts during installation would not foreseeably be greater, and would likely be less onerous than, other types of typical construction activities in urbanized areas, such as ordinary road and

infrastructure maintenance activities, building activities, etc. These short-term noise impacts can be mitigated by implementing commonly-used noise abatement procedures, standard construction techniques such as sound barriers, mufflers and employing restricted hours of operation. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined, depending upon proximity of construction activities to receptors.

Overall, noise levels for installation of several of the reasonably foreseeable methods of compliance are governed primarily by the noisiest pieces of equipment. For most construction equipment the engine is the dominant noise source. Typical maximum noise emission levels (Lmax) are summarized, based on construction equipment operating at full power at a reference distance of 50 feet, and an estimated equipment usage factor based on experience with other similar installation projects. The usage factor is a fraction that accounts for the total time during an eight-hour day in which a piece of installation equipment is producing noise under full power. Although the noise levels in Table 11 represent typical values, there can be wide fluctuations in the noise emissions of similar equipment based on two important factors: (1) the operating condition of the equipment (e.g., age, presence of mufflers and engine cowlings); and (2) the technique used by the equipment operator (aggressive vs. conservative).

**Table 11.** Typical Installation Equipment Noise Emission Levels.

| Equipment | Maximum Noise Level, (dBA) 50 feet from source | Equipment Usage Factor | Total 8-hr Leq exposure (dBA) at various distances | |
|---|---|---|---|---|
| | | | 50ft | 100ft |
| Foundation Installation | | | 83 | 77 |
| Concrete Truck | 82 | 0.25 | 76 | 70 |
| Front Loader | 80 | 0.3 | 75 | 69 |
| Dump Truck | 71 | 0.25 | 65 | 59 |
| Generator to vibrate concrete | 82 | 0.15 | 74 | 68 |
| Vibratory Hammer | 86 | 0.25 | 80 | 74 |
| Equipment Installation | | | 83 | 77 |
| Flatbed Truck | 78 | 0.15 | 70 | 64 |
| Forklift | 80 | 0.27 | 74 | 69 |
| Large Crane | 85 | 0.5 | 82 | 76 |

Source: Los Angeles Water Board 2007f.

### Vortex Separation Systems

Installation of vortex separation systems would potentially involve removal of asphalt and concrete from streets and sidewalks, excavation and shoring, installation of

reinforced concrete pipe, installation of the unit, and repaving of the streets and sidewalks. It is anticipated that installation activities would occur in limited, discrete, and discontinuous areas over a short duration. No major long term or geographically extensive construction activities are anticipated. It is anticipated that excavation, for the purpose of installation, and repaving would result in the greatest increase in noise levels during the period of installation. Table 11 provides noise levels generated by different machinery that may be used in installing the vortex separation systems. The manufacturer of the Continuous Deflective Separation unit (described in detail in Section 5) recommends that the unit receive maintenance 2 to 4 times a year depending on amount and frequency of precipitation. Maintenance involves cleaning using vacuum trucks, which would increase ambient noise levels. The increase in noise levels would be dependent on the proximity of sensitive receptors to the site. Maintenance is also expected to generate 2-4 vehicle trips per year, which is not expected to increase ambient noise levels noticeably.

Contractors and equipment manufacturers have been addressing noise problems for many years, and through design improvements, technological advances, and a better understanding of how to minimize exposures to noise, noise effects can be minimized. An operations plan for the specific construction and/or maintenance activities could be developed to address the variety of available measures to limit the impacts from noise to adjacent homes and businesses. To minimize noise and vibration impacts at nearby sensitive sites, installation activities should be conducted during daytime hours to the extent feasible. There are a number of measures that can be taken to reduce intrusion without placing unreasonable constraints on the installation process or substantially increasing costs. These include noise and vibration monitoring to ensure that contractors take all reasonable steps to minimize impacts when near sensitive areas; noise testing and inspections of equipment to ensure that all equipment on the site is in good condition and effectively muffled; and an active community liaison program. A community liaison program should keep residents informed about installation plans so they can plan around noise or vibration impacts; it should also provide a conduit for residents to express any concerns or complaints.

The following measures would minimize noise and vibration disturbances at sensitive areas during installation:

- Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All installation equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding).
- Perform all installation in a manner to minimize noise and vibration. Use installation methods or equipment that will provide the lowest level of noise and ground vibration impact near residences and consider alternative methods that are also suitable for the soil condition. The contractor should select installation processes and techniques that create the lowest noise levels.

- Perform noise and vibration monitoring to demonstrate compliance with the noise limits. Independent monitoring should be performed to check compliance in particularly sensitive areas. Require contractors to modify and/or reschedule their installation activities if monitoring determines that maximum limits are exceeded at residential land uses.
- Conduct truck loading, unloading and hauling operations so that noise and vibration are kept to a minimum by carefully selecting routes to avoid going through residential neighborhoods to the greatest possible extent. Ingress and egress to and from the staging area should be on collector streets or higher street designations (preferred).
- Turn off idling equipment.
- Temporary noise barriers shall be used and relocated, as practicable, to protect sensitive receptors against excessive noise from installation activities. Consider mitigation measures such as partial enclosures around continuously operating equipment or temporary barriers along installation boundaries.
- The installation contractor should be required by contract specification to comply with all local noise and vibration ordinances and obtain all necessary permits and variances.

These and other measures can be classified into three distinct approaches as outlined in Table 12.

**Table 12.** Noise Abatement Measures**.**

| Type of Control | Description |
|---|---|
| Source Control | *Time Constraints* – Prohibiting work during sensitive nighttime hours<br>*Scheduling* – performing noisy work during less sensitive time periods<br>*Equipment Restrictions* – restricting the type of equipment used<br>*Substitute Methods* –using quieter equipment when possible<br>*Exhaust Mufflers* – ensuring equipment have quality mufflers installed<br>*Lubrication and Maintenance* – well maintained equipment is quieter<br>*Reduced Power Operation* – use only necessary power and size<br>*Limit equipment on-site* – only have necessary equipment onsite<br>*Noise Compliance Monitoring* – technician on-site to ensure compliance |
| Path Control | *Noise barriers* – semi-portable or portable concrete or wooden barriers<br>*Noise curtains* – flexible intervening curtain systems hung from supports<br>Increased distance – perform noisy activities further away from receptors |
| Receptor Control | *Community participation* –open dialog to involve affected parties<br>*Noise complaint process* – ability to log and respond to noise complaints |

Source: Adapted from Thalheimer 2000.

Increases in ambient noise levels are expected to be less than significant once measures have been properly applied to reduce potential impacts.

### Catch Basin Inserts

Installation of catch basin inserts should not involve any construction activity or the use of major equipment therefore no significant increase in ambient noise levels is anticipated.

Catch basins need to be cleaned regularly. Frequency of cleaning depends on the amount of trash flowing into the insert. Increased street sweeping can decrease the amount of trash, caught by catch basin inserts. Catch basins are cleaned out on varying schedules at a minimum frequency of once a year as a requirement of the MS4 Phase I or Phase II permit. This implementation measure does not require an increase in cleaning frequency above what is already required for existing permits, therefore no significant increase in noise levels over baseline are anticipated. It is not anticipated that ambient noise levels will be increased by the use of catch basin inserts. To the contrary it is expected that since the design of many of these inserts act to prevent trash from entering the catch basins, the frequency of cleanouts of these basins may be reduced as a result of reduced trash loading. In the unlikely event, however, that there should be an increase in noise levels generated by current clean-out practices, the source, path and receptor control measures presented in Table 12 should be applied. Therefore, increases in ambient noise levels are expected to be less than significant once measures have been properly applied to reduce potential impacts.

### Trash Nets

Installation of trash nets should not involve any construction activity or the use of major equipment therefore no significant increase in ambient noise levels is anticipated. Maintenance of the trash nets involves replacing the nets when full or after each major storm event as necessary. Frequency of maintenance would depend on the trash volumes generated in the catchment area of the net. Equipment used to detach and haul away the trash nets may result in temporary increases in ambient noise levels. In the unlikely event that there should be an increase in noise levels generated by the equipment used to detach and haul away nets, the source, path and receptor control measures presented in Table 12 should be applied. Therefore, increases in ambient noise levels are expected to be less than significant once measures have been properly applied to reduce potential impacts.

### Gross Solid Removal Devices

Gross Solids Removal Devices are the full capture systems being used by Caltrans for highway drainage systems and as such would be located adjacent to freeways and major highways under Caltrans' jurisdiction. Installation of Gross Solids Removal Devices would involve activities similar to those for vortex separation system installation. Clean-outs of Gross Solids Removal Devices are expected to occur only once per year. Equipment and/or machinery employed in this exercise may not significantly increase ambient noise levels as the potential sites for these units would already be subject to high traffic noise levels. In addition, increase in noise levels due to clean-outs would be of low frequency and short duration. Therefore, the installation of Gross Solids Removal Device is not expected to cause any potentially significant impacts.

**Increased Street Sweeping**

Increased street sweeping would involve an increase in current street sweeping frequencies in order to reduce the amount of trash accumulating on streets between cleanings. Any increases in street sweeping frequencies would be geared towards high trash generation areas such as those with commercial and industrial land-uses. The increase in ambient noise levels is expected to be limited in duration. Therefore, any increase in ambient noise levels over baseline conditions are expected to be less than significant.

**Other Institutional Controls**

Litter enforcement, ordinances, and public education are not expected to create any increases in ambient noise levels, and no mitigation would be required.

### 6.10.6 Summary

Installation and maintenance of some structural trash-reduction BMPs could result in potentially significant environmental effects with regard to noise. Measures, however, can be applied to reduce and/or eliminate these impacts are available as described above. These mitigation measures are within the responsibility and jurisdiction of the responsible agencies subject to the proposed final Trash Amendments and can or should be adopted by them. The State Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The State Water Board does, however, recommend that appropriate measures be applied to reduced or avoid potential environmental impacts. It is foreseeable that these measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. Although there is no information on the record that this would occur, in the event that a specific mitigation measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments.

## 6.11 Public Services

### 6.11.1 Thresholds of Significance

A project would normally have a significant effect on the environment if it would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: (a) Fire protection, (b) Police protection, (c) School, (d) Parks, and (e) Other public facilities. (See Environmental Checklist in Appendix B for discussion).

### 6.11.2 Impacts and Mitigation

While, ~~I~~implementation of the proposed final Trash Amendments may require some activities at or in the vicinity of public service facilities, the proposed final Trash Amendments would not require the establishment of new or altered government facilities to provide the services outlined above. However, response times for fire and

police protection may be temporarily affect during installation of trash collection devices and are discussed below.

**Catch Basin Inserts**

Although the delays due to installations would be more localized and of shorter duration than installation of vortex separation systems, since the installation of catch basin inserts is not as complicated as the other structural BMPs, more maintenance may be required depending on the design of these units, since the capacity for trash collection may be limited to the size of the unit. However, the environmental impacts, and mitigation for those impacts, associated with the installation, maintenance and monitoring of catch basin inserts are expected to be similar to those for the vortex separation systems. Therefore, the potential delays in response times for fire and police vehicles due to installation of catch basin inserts after mitigation are less then significant.

**Vortex Separation Systems**

There is potential for temporary delays in response times of fire and police vehicles due to road closure/traffic congestion during installation of the vortex separation systems. To mitigate potential delays the responsible agencies could notify local emergency and police service providers of construction activities and road closures, if any, and coordinate with the local fire and police providers to establish alternative routes and traffic control during the installation activities. Most jurisdictions have in place established procedures to ensure safe passage of emergency and police vehicles during periods of road maintenance, construction, or other attention to physical infrastructure, and there is no evidence to suggest that installation of these structural devices would create any more significant impediments than other such typical activities. Any construction activity would be subject to applicable building and safety codes and permits. Therefore, the potential delays in response times for fire and police vehicles after mitigation are less then significant.

Since the installation of vortex separation systems would not result in development of land uses for residential, commercial, and/or industrial uses nor would the these units result in an increase of growth, it is reasonably foreseeable that the vortex separation systems would not result in a need for new or altered fire or police protection services. In addition, Emergency Preparedness Plans could be developed in consultation with local emergency providers to ensure that the new vortex separation systems would not contribute to an increase in the cumulative demand for fire and police emergency services.

Once the vortex separation systems are installed and operating, maintenance and monitoring of the devices would be required to verify that the structural BMP is performing properly and as expected. Maintenance and monitoring activities may also cause road closures and/or traffic congestion, but the same measures can be implemented as those for installation of the structures.

**Trash Nets**

The environmental impacts associated with the installation, maintenance and monitoring of trash nets are similar to those for the catch basin inserts. As with the catch basin

inserts, more maintenance may be required depending on the design of these units since, the capacity for trash collection may be limited to the size of the trash net. With implementation of the mitigation presented for the vortex separation systems, this impact would be less than significant.

**Gross Solids Removal Devices**

There is potential for temporary delays in response times of fire and police vehicles due to road closure/traffic congestion during installation of the Gross Solids Removal Devices. To mitigate potential delays the responsible agencies could notify local emergency and police service providers of construction activities and road closures, if any, and coordinate with the local fire and police providers to establish alternative routes and traffic control during the installation activities. Most jurisdictions have in place established procedures to ensure safe passage of emergency and police vehicles during periods of road maintenance, construction, or other attention to physical infrastructure, and there is no evidence to suggest that installation of these structural devices would create any more significant impediments than other such typical activities. Any construction activity would be subject to applicable building and safety codes and permits. Therefore, the potential delays in response times for fire and police vehicles after mitigation are less then significant.

Since, the installation of Gross Solids Removal Devices would not result in development of land uses for residential, commercial, and/or industrial uses nor would the these units result in increased growth, it is reasonable foreseeable that the vortex separation system units would not result in a need for new or altered fire or police protection services. In addition, Emergency Preparedness Plans could be developed in consultation with local emergency providers to ensure that the new Gross Solids Removal Devices would not contribute to an increase in the cumulative demand for fire and police emergency services.

Once the Gross Solids Removal Devices are installed and operating, maintenance and monitoring of the devices would be required to verify that the structural BMP is performing properly and as expected. Maintenance and monitoring activities may also cause road closures and/or traffic congestion, but the same measures can be implemented as those for installation of the structures.

**Increased Street Sweeping**

Non-structural BMPs may include increased street sweeping. The impacts of these increases can be minimized by efficient timing of the increased street sweeping, for example, prior to storm events. By identifying land uses where trash production is high (e.g., commercial retail), an increase in street sweeping would yield the greatest results.

**Ordinances**

Ordinances are not expected to create any impacts to public services, and no mitigation would be required.

### 6.11.3 Summary

Installation and maintenance of structural trash-reduction BMPs ~~should~~ could ~~not~~ result in ~~potentially~~ less than significant environmental effects with regard to public services.

Measures, however, can be applied to reduce and/or eliminate these impacts, as described above. These mitigation measures are within the responsibility and jurisdiction of the responsible agencies subject to the proposed final Trash Amendments and can or should be adopted by them. The State Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The State Water Board does, however, recommend that appropriate measures be applied to reduced or avoid potential environmental impacts. It is foreseeable that these measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. Although there is no information on the record that this would occur, in the event that a specific mitigation measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments.

## 6.12 Transportation/Traffic

### 6.12.1 Thresholds of Significance

A project would normally have a significant effect on the environment if it would:

- Conflict with an applicable plan, ordinance or amendment establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks.

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). Result in inadequate emergency access.

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

### 6.12.2 Impacts and Mitigation

Implementation of the proposed final Trash Amendments would not result in a change in air traffic patterns or substantially increase hazards due to design features or incompatible uses.

**Vortex Separation Systems**

The installation of vortex separation systems may result in additional vehicular movement. These impacts would be temporary and limited in duration to the period of installation. Maintenance requirements for trash removal devices demonstrate that devices could be emptied when they reach 85 percent capacity. Trash removal devices, however, can be designed so that they need be cleaned only once per storm season.

For example, the Los Angeles Water Board staff estimated that 3700 vortex separation systems would be needed in the Los Angeles River watershed. Assuming that these devices are cleaned once per storm season (November 1 to March 31, or 150 days), this translates to approximately 25 vehicle trips per day in the Los Angeles River watershed. An additional 25 trips per day, watershed-wide, would not foreseeably result in a substantial or significant change to traffic flow, other than short-term congestion on limited roadway segments. The approximately 25 trips per day are fewer than the number of trips that would trigger the requirement of a traffic impact analysis per the Los Angeles County Congestion Management Plan (Metropolitan Transit Authority 2004). Consequently, the proposed project would be in conformance with the existing Los Angeles County Congestion Management Plan, and this impact would be less than significant (Los Angeles Water Board 2007f). As traffic in Los Angeles County represents the maximum impacts related to traffic congestion, impacts of the proposed final Trash Amendments to traffic circulation are expected to be less than or similar to these results throughout the state.

To the extent that site-specific projects entail excavation in roadways, such excavations should be marked, barricaded, and traffic flow controlled with signals or traffic control personnel in compliance with authorized local police or California Highway Patrol requirements. These methods would be selected and implemented by responsible local agencies considering project level concerns. Standard safety measures should be employed including fencing, other physical safety structures, signage, and other physical impediments designed to promote safety and minimize pedestrian/bicyclists accidents. It is not foreseeable that this proposal would result in significant increases in traffic hazards to motor vehicles, bicyclists or pedestrians, especially when considered in light of those hazards currently endured in an ordinary urbanized environment.

In order to reduce the impact of construction traffic, implementation of a construction management plan for specified facilities could be developed to minimize traffic impacts upon the local circulation system. A construction traffic management plan could address traffic control for any street closure, detour, or other disruption to traffic circulation. The plan could identify the routes that construction vehicles would use to access the site, hours of construction traffic, and traffic controls and detours. The plan could also include plans for temporary traffic control, temporary signage, location points for ingress and egress of construction vehicles, staging areas, and timing of construction activity which appropriately limits hours during which large construction equipment may be brought on or off site. Potential impacts could also be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement. It is anticipated that impacts after mitigation would be less than significant.

**Catch Basin Inserts**

No construction activity or use of heavy equipment is anticipated for catch basin insert installation. Therefore additional vehicular movement during installation of the catch basin inserts to control trash is unlikely to be significant. Also, it is not anticipated that any such increase would have an adverse effect on traffic and transportation, as they would be limited and short-term. With respect to maintenance, catch basins need to be cleaned regularly. Frequency of cleaning depends on the amount of trash flowing in through the insert. This implementation measure does not require an increase in cleaning frequency above baseline conditions for what is already required for existing permits, therefore no significant increase in traffic is anticipated. Impacts from other maintenance activities, such as street sweeping, are not expected to be significant.

**Trash Nets**

The number of end-of-pipe trash nets installed would be limited by the number of suitable locations. Installation and maintenance of trash nets would create environmental impacts similar to those of the vortex separation systems.

Mitigation measures to be applied would be the same as those for the vortex separation systems. It is anticipated that impacts after mitigation would be less than significant.

**Gross Solids Removal Devices**

Gross Solids Removal Devices are the implementation alternatives developed by Caltrans for trash reduction from roadways. Hence their installation would foreseeably be limited to rights of way over which Caltrans has jurisdiction. Clean-outs of Gross Solids Removal Devices are expected to occur only once per year. Therefore, fewer Gross Solids Removal Devices would be installed than vortex separation systems within a given jurisdiction and, cleanout would be less frequent, so the impacts of installation and maintenance of Gross Solids Removal Devices on traffic are expected to be much less than those of vortex separation systems. Consequently, this impact would be a less than significant impact.

**Increased Street Sweeping**

The number of trips generated by increased street sweeping would depend of the magnitude of increase in sweeping frequency determined by any responsible agency choosing to use this implementation alternative. Increased street sweeping would not foreseeably be implemented alone for the proposed final Trash Amendments. It is not clear how often street sweeping would be increased to comply with the proposed final Trash Amendments at this point. If the stakeholders make decisions on the frequency of street sweeping, the impacts on traffic and transportation caused by increased street sweeping could be analyzed at the project level. Nevertheless, the impacts of increased street sweeping have been included in the reasonably foreseeable methods of compliance, such as catch basin inserts, that may also include increased street sweeping. It is not anticipated that such increases would have a significant impact on traffic and transportation.

**Ordinances**

Ordinances are not expected to create any impacts to transportation/traffic, and no mitigation would be required.

### 6.12.3 Summary

The foreseeable methods of compliance may entail short-term disturbances during installation of treatment controls to control trash. The specific project impacts can be mitigated by appropriate mitigation methods during installation. To the extent that significant adverse traffic impacts occur in a given locality, those effects are already occurring and should be considered baseline impacts. Nevertheless, to the extent the locality that originated the trash would become newly exposed to increased traffic from the need to properly dispose of trash generated locally instead of downstream jurisdictions; those impacts could be potentially significant in those locales. Under the proposed final Trash Amendments, municipalities would abate locally generated trash, rather than causing the downstream cities and other stakeholders to suffer the effect of the trash or the cost of cleaning up the trash.

Installation and maintenance of full capture systems and treatment controls could result in potentially significant environmental effects with regard to transportation/traffic. Mitigation measures are available to be applied to reduce and/or eliminate these impacts; these are described above. These mitigation measures are within the responsibility and jurisdiction of the responsible agencies and can or should be adopted by them. The State Water Board does not direct which compliance measures responsible agencies choose to adopt or which mitigation measures they employ. The State Water Board does, however, recommend that appropriate mitigation measures be applied in order that potential environmental impacts be reduced or avoided. It is foreseeable that these mitigation measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. Although there is no information on the record that this would occur, in the event that a specific mitigation measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments.

## 6.13 Utilities/Service Systems

### 6.13.1 Thresholds of Significance

A project would normally have a significant effect on the environment if it would:

- Exceed wastewater treatment requirements of the applicable Regional Water Board. (See Environmental Checklist in Appendix B for discussion).
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (See Environmental Checklist in Appendix B for discussion).
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

- Have insufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed. (See Environmental Checklist in Appendix B for discussion).
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments. (See Environmental Checklist in Appendix B for discussion).
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs. (See Environmental Checklist in Appendix B for discussion).
- Fail to comply with federal, state, and local statutes and regulations related to solid waste. (See Environmental Checklist in Appendix B for discussion).

### 6.13.2 Impacts and Mitigation

Potential projects undertaken to comply with the proposed final Trash Amendments would not result in the need for a new or substantial alteration to water supply utilities. The implementation of the proposed final Trash Amendments would not result in the development of any large residential, retail, industrial or any other development projects that would significantly increase the demand on the current water supply facilities or require new water supply facilities. There would be no impacts related to water supply and no mitigation is required.

Implementation of the proposed final Trash Amendments involves a progressive reduction in trash discharges to the water bodies of the State through structural BMPs, enforcement of existing litter laws, and institutional controls. These strategies to reduce trash are not related to sewer systems[19] and would not affect Publicly Owned Treatment Works nor would they impact any septic tank systems. The implementation of the proposed final Trash Amendments would not result in the need for a new or alterations to existing sewer or septic tank systems. The structural BMPs that may be implemented such as catch basin inserts would be implemented to update the storm drain system and reduce trash entering state waters. Except as otherwise noted, storm drain systems in California are completely separate from the sewer systems and septic tank systems. Thus, there would be no impacts related to sewer and septic tank systems and no mitigation is required.

[19] The City of Sacramento (downtown area) and the City and County of San Francisco have combined sewer and storm water systems where storm water is conveyed to the Publicly Owned Treatment Works. (The City of Fresno also has a combined system, but its wastewater is discharged to infiltration basins, not to surface water.) Since any trash carried by storm water to the Publicly Owned Treatment Works would be collected at the Publicly Owned Treatment Works and not discharged to surface waters, these systems would not be subject to the proposed final Trash Amendments. However, the Publicly Owned Treatment Works owners may want to implement the controls identified for the proposed Trash Amendments to reduce the amount of trash entering their facilities.

Compliance with the proposed final Trash Amendments would require that significant amounts of solid waste that would otherwise enter storm drains, be collected by institutional controls and structural methods for collecting trash, or by source control and proper litter disposal by citizens. To the extent that decreases in available landfill space may occur in a local upstream region, those effects are likely already occurring in downstream communities as a result of the improper disposal of trash by the upstream communities; such effects should be considered baseline impacts, as they are presently carried by downstream communities.

For example, the City of Long Beach uses “clam shell” tractors, other heavy duty equipment, and many, many truck trips to cart away the tons of trash generated from all the upstream cities. So while upstream communities may see an increase in the amount of solid waste delivered to their landfill as a result of the proposed final Trash Amendments, downstream communities would see a proportionate decrease. The overall capacity of landfills throughout the state would not be affected. Furthermore, it is reasonably foreseeable that the proposed final Trash Amendments would precipitate education about the environmental and economic effects of litter, and thereby stimulate greater efforts to use less disposable materials, and to recycle more, thus reducing the use of resources and the amount of trash entering the landfills. Increased recycling would be considered a positive environmental impact.

In addition, to trash collected as part of compliance with the proposed final Trash Amendments, there would be nominal amounts of construction debris generated by the installation of structural BMPs. Existing landfills should have adequate capacity to accommodate this limited amount of construction debris. In addition, many municipalities have construction and demolition debris recycling and reuse programs. Recycling and reuse of construction and demolition material has been shown to considerably reduce the amount of debris sent to landfills. For example, according to the County of Los Angeles, except under unusual circumstances, it is feasible to recycle or reuse at least 50% of construction and demolition debris (Los Angeles County Department of Public Works 2005). Impacts on the disposal of solid waste would be less than significant and no mitigation is required.

**Storm Water Drainage**

In order to achieve compliance with the proposed final Trash Amendments, the storm water drainage systems may need to be retrofitted with structural BMPs such as catch basin inserts and or full capture systems. These structural BMPs have the potential to significantly impact the storm water drainage system. Impacts to the storm drains may range from potentially significant to less than significant with mitigation depending on the specific structural BMP implemented. The agencies implementing and complying with the proposed final Trash Amendments would plan and implement the best full capture systems for their municipality. Overall, the installation of full and partial capture systems may substantially alter storm drain systems.

The most critical potential impact related to implementation of full or partial capture systems is the risk of increased flooding due to improperly designed or maintained structural controls. The trash collected by these devices (not the devices themselves) has the potential to impede the course and flow of flood waters through the storm drain

system. This risk is considerably lower with properly designed and maintained full capture systems that include a flood event bypass system. Under large storm conditions, the trash capture unit would be bypassed and the storm water flows and the trash would be directly discharged to the receiving waters. The risk of increased street flooding is greater for the catch basin inserts. In general, the inserts are simple screens that are placed inside the catch basin to prevent large pieces of trash from being discharged into water bodies. If under storm conditions these screens were to become clogged with trash it would impede the flow of the storm water and could possibly cause flooding and adversely affect the operation of the public service facility (also discussed in Section 6.8 Hydrology/Water Quality).

The potential risk of increased flooding can be mitigated by proper design and maintenance. For example, the screens can be engineered to be removable and or retractable; the screens could be removed prior to forecasted large storm events to reduce the risk of flooding and adversely affect the operation of the public service facility (also discussed in Section 6.8 Hydrology/Water Quality).

The prevention and removal of trash from state waters through structural BMPs of catch basin inserts and full capture systems ultimately would lead to improved water quality and protection of aquatic life and habitat; expansion of opportunities for public recreational access; enhancement of public interest in our rivers, lakes, and ocean; public participation in restoration activities; and enhancement of the quality of life of riparian and shoreline residents. These improvements outweigh the risk of potentially increased flooding and adversely affect the operation of the public service facility (also discussed in Section 6.8 Hydrology/Water Quality); furthermore, proper design and maintenance of structural BMPs, as discussed above, would mitigate this risk. This impact is considered potentially significant and mitigation should be incorporated.

Recommended mitigation measures: (i) Design and install full capture systems by a licensed civil engineer or environmental engineer in consultation with a hydrologist to ensure there would be adequate capacity for storm water flows and or a storm water bypass system; and, (ii) Regularly maintain full capture systems to remove trash and to prevent the accumulation of trash -- especially prior to forecasted storm events.

Installation and maintenance of full capture systems and treatment controls would result in potentially significant environmental effects with regard to storm water drainage. Mitigation measures, which can be applied to reduce and/or eliminate these impacts, however, are available as described above. These mitigation measures are within the responsibility and jurisdiction of the agencies responsible for implementing the proposed final Trash Amendments and can or should be adopted by them. The State Water Board directs neither the compliance measures responsible agencies choose to adopt, nor the mitigation measures they employ. The State Water Board does, however, recommend that appropriate mitigation measures be applied in order that potential environmental impacts be reduced or avoided. It is foreseeable that these mitigation measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. Although there is no information on the record that this would occur, in the event that a specific mitigation measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need

to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments.

### 6.14 Other Dischargers

The proposed final Trash Amendments would apply to discharges of trash not covered by a NPDES permit. The Water Boards may require the implementation of trash controls in areas or facilities that may generate trash, such as, high usage campgrounds, picnic areas, beach recreation areas, marinas, etc. The discharge of trash into water bodies from these areas usually occurs by direct deposition into the water or wind-borne deposition of trash from nearby areas.

The most likely means of compliance for these areas would be institutional controls including public education (e.g., signage to dispose of trash properly) and providing an appropriate level of trash collection (e.g., the frequency of trash collection is appropriate to prevent the overflow and spillage of trash from trash bins, which can then make its way to nearby waterways). Potential environmental impacts from these activities are similar to those discussed for institutional controls in the previous sections. The implementation of institutional controls in these areas would not have a significant impact on the environment.

### 6.15 Time Extension ~~(Option for Board Consideration)~~

~~The Trash Amendments propose for State Water Board consideration an approach to grant time extensions for final compliance to MS4 permittees who employ regulatory source controls (e.g., bans of single-use consumer products). While granting time extensions would delay full implementation of the proposed Trash Amendments, it would not have an adverse impact on the environment.~~ The proposed Trash Amendments provided a time extension to MS4 Phase I and II permittees with regulatory authority over land uses for each regulatory source control adopted by a MS4 Phase I or II permittee. Each regulatory source control adopted by a permittee could provide such permittee with a one-year time extension to achieve final compliance with either Track 1 or Track 2. The time extension option was proposed to receive public input on the potential advantages and disadvantages to this approach. However, subsequent to the State Water Board's public workshop and the public hearing on the proposed Trash Amendments, Senate Bill 270 (2014 Stats. Ch. 850) was enacted. That new law enacts a state-wide plastic bag carry-out ban pertaining to grocery stores and pharmacies that have a specified amount of sales in dollars or retail floor space, which goes into effect July 1, 2015, and imposes the same ban on convenience stores and liquor stores a year later. Such product ban was generally the type of regulatory source control contemplated and discussed with regard to consideration of the time extension option. Effectively enactment of Senate Bill 270 removed the need for regulatory source controls in the proposed Trash Amendments. With the enactment of Senate Bill 270, the proposed final Trash Amendments omit "regulatory source controls" from a method to comply with Track 2. As a result, the proposed final Trash Amendments omit any allowance of time extensions and will not be evaluated further.

## 6.16 Low-Impact Development Controls and Multi-Benefit Projects

The proposed final Trash Amendments include compliance options referred to as LID controls and multi-benefit projects. Examples of LID controls are treatment controls that employ natural and constructed features that reduce the rate of storm water runoff, filter out pollutants, facilitate storm water storage onsite, infiltrate storm water into the ground to replenish groundwater supplies, or improve the quality of receiving groundwater and surface water. Examples of multi-benefit projects include projects that are designed to infiltrate, recharge or store storm water for beneficial reuse, develop or enhance habitat and open space through storm water and non-storm water management, prevent water pollution, and/or reduce storm water and non-storm water runoff volume.

Because LID controls and multi-benefit projects are part of a larger suite of compliance options and because these types of projects are highly site specific, the array of potential LID and multi-benefit projects is too vast to discuss within this statewide analysis. The range of potential environmental impacts can vary greatly between projects. For example, the City of Anaheim prepared a Mitigated Negative Declaration for its Brookhurst Street Improvement Project and found potential significant impacts to air quality, biological resources, and cultural resources unless mitigation measures were incorporated into the project (City of Anaheim 2010). The City of Pasadena is preparing an EIR for its Hahamongna Multi-Benefit/Multi-Use Project (City of Pasadena 2012). It has tentatively identified potential impacts to aesthetics, air quality, biological resources, cultural resources, greenhouse gas emissions, hydrology and water quality, noise, and transportation/traffic.

Potential environmental impacts from LID or multi-benefit projects would depend on the size and location of the project. It is foreseeable that the overall project could have a significant effect on the environment. It would be speculation, however, as to what those impacts might be at this level of review. Furthermore, measures that may be incorporated into the project to account for trash issues would most likely be a minor part of the project as a whole. The proposed final Trash Amendments would not affect what those impacts might be, and as such would not cause or increase the level of impact future LID or multi-benefit projects may or may not have. The permitting authority responsible for future LID and/or multi-benefit projects would need to conduct project-specific environmental reviews pursuant to CEQA, as appropriate.

## 6.17 Regulatory Source Controls (Ordinances)

"Regulatory source controls" was included in the proposed Trash Amendments as one of the several treatment controls that could be utilized by MS4 permittees with regulatory authority over priority land uses to comply with the prohibition of trash under Track 2. "Regulatory source controls" was defined in the proposed Trash Amendments as:

> Institutional controls that are enforced by an ordinance of the municipality to stop and/or reduce pollutants at their point of generation so that they do not come into contact with storm water. Regulatory source controls could consist of, but not be limited to, bans of single use consumer products.

Regulatory source controls were proposed as a tool for MS4 permittees to enact ordinances to prohibit grocery stores and similar retailers from distributing carry-out plastic bags to consumers. However, subsequent to the State Water Board's public workshop and the public hearing on the proposed Trash Amendments, Senate Bill 270 (2014 Stats. Ch. 850) was enacted. That new law enacts a state-wide plastic bag carry-out ban pertaining to grocery stores and pharmacies that have a specified amount of sales in dollars or retail floor space, which goes into effect July 1, 2015, and imposes the same ban on convenience stores and liquor stores a year later. Effectively, enactment of Senate Bill 270 removed the need for regulatory source controls in the proposed Trash Amendments.

Consequently, the proposed final Trash Amendments omit regulatory source controls (and its definition) as a method for Track 2 compliance. Because a state-wide ban on plastic carry-out bags in grocery and other similar retail stores shall go into effect pursuant to state law and not the Trash Amendments, any type of ordinance that would prohibit plastic carry-out bags enacted pursuant to the Trash Amendments is now speculative with the enactment of Senate Bill 270. Therefore, this Staff Report does not provide an environmental analysis of a ban on plastic carry-out bags, because such controls are not a reasonably foreseeable method with which a permittee could comply with the trash prohibition under Track 2.

Similar to the prior draft, however, the proposed Final Staff Report retains "institutional controls" as a permissible method an MS4 permittee could employ to comply with Track 2. The proposed final Trash Amendments' definition for "institutional controls" includes "ordinances":

> Institutional controls are non-structural best management practices (i.e., no structures are involved) that may include, but not be limited to, street sweeping, sidewalk trash bins, collection of the trash, anti-litter educational and outreach programs, producer take-back for packaging, and ordinances.

Pursuant to that definition, a permittee's enactment of an ordinance remains an allowable type of institutional control which may be implemented to comply with Track 2, even though the proposed final Trash Amendments removed "regulatory source controls" as a permissible method. Yet, any such ordinance likely would not involve a product ban. Contrary to ordinances or laws which prohibit distribution of plastic carry-out bags, which are typically accompanied with requirements and/or incentives to utilize reusable bags to avoid a product-substitution effect (such as Senate Bill 270), other types of product bans enacted by ordinance, such as take-out items, are more likely to involve a substitution of the banned item. Mere substitution would not result in reduce trash generation as such product substitution would be discarded in the same manner as the banned item. Any such product ban enacted by ordinance would not reduce trash and would not be an allowable Track 2 compliance method. Therefore, this Staff Report does not provide an environmental analysis of ordinances banning products because such bans are not a reasonably foreseeable method with which a permittee could comply with the trash prohibition. It is possible that an MS4 permittee's adoption of other types of ordinances (e.g., anti-litter laws or bans on smoking), may still be a

reasonably foreseeable method of compliance, but those types of ordinances are not expected to cause potential environmental impacts through use of replacement products or through other indirect impacts.

The other types of institutional controls (e.g., street sweeping, sidewalk trash bins, collection of the trash, etc.) available for a permittee to comply with the trash prohibition under Track 2 are evaluated in the preceding sections under the resource potentially at issue.

# 7 OTHER ENVIRONMENTAL CONSIDERATIONS

This section of the ~~Draft~~ proposed Final Staff Report identifies and evaluates potential growth-inducing impacts[20] and cumulative impacts[21] that may arise from the proposed final Trash Amendments.

## 7.1 Growth-Inducing Impacts

In compliance with the requirements to prepare a draft SED and meet the substantive requirements of CEQA, this section describes the potential for the proposed final Trash Amendments to cause potential environmental impacts through the inducement of growth (see also Appendix B, Environmental Checklist, Population and Housing). Growth inducement occurs when projects affect the timing or location of either population or land use growth, or create a surplus in infrastructure capacity. Direct growth inducement occurs when, for example, a project accommodates populations in excess of those projected by local or regional planning agencies. Indirect growth inducement occurs when, for example, a project that accommodates unplanned growth consequently (i.e., indirectly) establishes substantial new permanent employment opportunities (for example, new commercial, industrial, or governmental enterprises). Another example of indirect growth is if a construction project generates substantial short-term employment opportunities that indirectly stimulate the need for additional housing and services.

### 7.1.2 Types of Growth

The primary types of growth that occur are: (1) development of land and (2) population growth. (Economic growth, such as the creation of additional job opportunities, also

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[20] The State CEQA Guidelines describe growth-inducing impacts as follows:

> …[T]he ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are impacts which would remove obstacles to population growth…Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects... [In addition,] the characteristics of some projects...may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment. (14 CCR § 15126.2(d).)

[21] The State CEQA Guidelines define cumulative impacts as follows:

> "Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts:
>
> (a) The individual effects may be changes resulting from a single project or a number of separate projects.
>
> (b) The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. (14 CCR § 15355.)

could occur; however, such growth generally would lead to population growth and, therefore, is included indirectly in population growth.)

**Growth in Land Development**

Growth in land development considered in this analysis is the possible physical development of residential, commercial, and industrial structures in and around where implementation of the proposed final Trash Amendments and reasonably foreseeable methods of compliance may be located. Land use growth is subject to general plans, community plans, parcel zoning, and applicable entitlements and is dependent on adequate infrastructure to support development.

**Population Growth**

Possible population growth considered in this analysis is the possible growth in the number of persons that live and work in the areas in and around where implementation of the proposed final Trash Amendments and reasonably foreseeable methods of compliance may be located. Population growth occurs from natural causes (births minus deaths) and net emigration from or immigration to other geographical areas. Emigration or immigration can occur in response to economic opportunities, life style choices, or for personal reasons. Although land use growth and population growth are interrelated, land use and population growth could occur independently from each other. This has occurred in the past where the housing growth is minimal, but population within the area continues to increase. Such a situation results in increasing population densities with a corresponding demand for services, despite minimal land use growth.

Overall development in the state is governed by local General Plans (developed by counties or cities), which are intended to plan for land use development consistent with California law. The General Plan is the framework under which development occurs, and, within this framework, other land use entitlements (such as variances and conditional use permits) can be obtained.

### 7.1.3 Existing Obstacles to Growth

The environmental analysis is required to discuss ways in which the proposed project could foster economic or population growth or the construction of additional housing. Included in this analysis is consideration as to whether the proposed final Trash Amendments (or reasonably foreseeable methods of compliance) remove obstacles to population growth or may encourage and facilitate other activities that could significantly affect the environment. See 14 CCR ~~S~~section 15126.2(d). Obstacles to growth could include such things as inadequate infrastructure or public services, such as an inadequate water supply that results in rationing, or inadequate wastewater treatment capacity that results in restrictions in land use development. Policies that discourage either natural population growth or immigration also are considered to be obstacles to growth.

### 7.1.4 Potential for Compliance with the ~~Proposed~~ Trash Amendments to Induce Growth

**Direct Growth Inducement**

As some of the reasonably foreseeable methods of compliance of the proposed final Trash Amendments focus on non-structural BMPs and improvements to storm drain systems located throughout urbanized portions of the watershed, the proposed final Trash Amendments would not result in the construction of new housing and, therefore, would not directly induce growth.

**Indirect Growth Inducement**

Two areas of potential indirect growth inducement are relevant to a discussion of the proposed final Trash Amendments: (1) the potential for compliance with the proposed final Trash Amendments to generate economic opportunities that could lead to additional immigration; and, (2) the potential for the proposed final Trash Amendments to remove an obstacle to land use or population growth.

Installation of full capture systems or other methods of compliance within Track 2 to comply with the proposed final Trash Amendments would occur over a ten-year time period. Installation and maintenance spending for compliance would generate jobs throughout the region and elsewhere where goods and services are purchased or used to install full capture systems. The alternatives would result in direct jobs and indirect jobs.

Although the construction activities associated with implementation of the proposed final Trash Amendments would increase the economic opportunities in an area or region, this construction is not expected to result in or induce substantial or significant growth related to population increase or land use development. The majority of the new jobs that would be created by this construction are expected to be filled by persons already employed and residing in the area or region. The second area of potential indirect growth inducement is through the removal of obstacles to growth. The proposed final Trash Amendments would require retrofit of existing public services or additional design requirements to new services (services that would occur without the proposed final Trash Amendments). The drainage systems would not increase as a result of the proposed final Trash Amendments. As discussed above, any obstacles that may exist to the location of public services and commensurate land use development or to population growth within an area affected by the proposed final Trash Amendments would not be altered by the implementation of the proposed final Trash Amendments.

## 7.2 Cumulative Impacts Analysis

In compliance with the requirements to prepare a draft SED and meet the substantive requirements of CEQA, this section describes the potential for the proposed final Trash Amendments to cause a considerable contribution to a cumulatively significant impact (see also Appendix B, Environmental Checklist, Mandatory Findings of Significance).The fundamental purpose of the cumulative impacts analysis is to ensure that the potential environmental impacts of any individual project are not considered in isolation. Impacts that may be individually less than significant on a project specific basis, could pose a potentially significant impact when considered with the impacts of other past, present, and probable future projects.

The cumulative impact analysis need not be performed at the same level of detail as a "project level" analysis but must be sufficient to disclose potential combined effects that could constitute a cumulative significant adverse impact. The CEQA Guidelines direct that the cumulative impacts analysis either include a list of the past, present and probable future projects producing related or cumulative impacts or provide a summary of projections and cumulative impact analysis contained in an applicable adopted plan or related planning document. (~~Section~~ §15130, subd. (b)(1).)

This draft SED discusses whether the proposed Trash Amendments' incremental effect is cumulatively considerable and, where that is the case, describes the significant cumulative impacts of the proposed project in combination with past, present, and probable future projects. CEQA Guidelines direct that this cumulative impact analysis be either provided through the "list approach" of "projections approach". The cumulative impacts from implementation of the proposed final Trash Amendments are discussed, for this statewide analysis, through analyzing the possible projects that could occur to cause impacts in combination of the proposed final Trash Amendments in relation to existing land use planning throughout the state, in the following two sections: (1) the program level cumulative impacts, and (2) the project level cumulative impacts. On the program level, impacts from reasonably foreseeable statewide water quality actions and regional activities, including multiple TMDLs and permit requirements, are analyzed across the nine regional water boards, on a statewide basis. On the project level, it is not possible to provide an environmental analysis of individual probable future projects that could occur to cause impacts that would combine with impacts of the proposed final Trash Amendments. The cumulative impacts analysis entails a general consideration of construction and other project-level activities that may occur in the vicinity of trash control implementation measures.

### 7.2.1 Program Cumulative Impacts

The State Water Board currently is developing a wide range of Statewide Policies and Significant General Permits. The entire list of Statewide Policies and Significant General Permits can be found in the State Water Board's Executive Director's report, which is updated on monthly basis.[22] In the April 22, 2014 Executive Director's Report, the active Statewide Policies and Significant General Permits are listed in Appendix B of the report (State Water Board 2014). The majority of these actions are not yet formally proposed but are considered reasonably foreseeable probable future projects, within the temporal scope of implementation of the proposed final Trash Amendments.

Of the Statewide Polices and Significant General Permits actively being addressed by State Water Board, the following four projects have potential nexus to the scope of the proposed final Trash Amendments thereby causing environmental impacts that may, in conjunction with impacts of the proposed final Trash Amendments, cause a cumulative impact: (1) Proposed Toxicity Amendment to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Toxicity Provisions); (2) Water Quality Control Policy for Wetland Area Protection and Dredge or Fill Permitting

[22] State Water Board Executive Director's Reports are accessible at: http://www.waterboards.ca.gov/board_info/exec_dir_rpts/

(Wetlands Policy); (3) Proposed Amendment to the Statewide Water Quality Control Plan for Ocean Waters to Address Desalination Intakes and Discharges, and to Incorporate Non-Substantive Changes (Desalination Amendment); and (4) Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan).

The State Water Board anticipates creating the ISWEBE Plan through the adoption of Toxicity Provisions. The goals of the Toxicity Provisions include: (a) a new method to determine the toxicity of discharges, (b) statewide numeric objectives, and (c) further standardization of toxicity provisions for NPDES dischargers and facilities subject to WDR and conditional waivers.

The Wetlands Policy has the goal of developing: (a) a wetland definition that would reliably define the diverse array of California wetlands based on the United States Army Corps of Engineers' wetland delineation methods to the extent feasible, (b) a regulatory mechanism for discharges of dredged or fill material into waters of the state, based on the 404 (b)(1) guidelines (40 C.F.R. parts 230-233) that includes a watershed focus, and (c) an assessment method for collecting wetland data to monitor progress toward wetland protection and to evaluate program development.

As with the Trash Amendments, the Desalination Amendment proposes to amend the Ocean Plan. The Desalination Amendment has four components: (a) implementation procedures for regional water boards to evaluate the best site, design, technology, and mitigation measures to minimize adverse impacts to aquatic life at new or expanding desalination facilities; (b) industry specific receiving water limits for salinity; (c) alternative implementation procedures for discharges of waste brine; and (d) provisions protecting sensitive habitats, species, Marine Protected Areas, and State Water Quality Protection Areas from degradation associated with desalination intakes and discharges.

The State Water Board is pursuing a four-phased process to develop and implement updates to the Bay-Delta Plan and flow objectives for priority tributaries to the Delta to protect beneficial uses in the Bay-Delta watershed. Phase 1 proposes to update the San Joaquin River flow and southern Delta water quality requirements included in the Bay-Delta Plan. Phase 2 proposes other comprehensive changes to the Bay-Delta Plan to protect beneficial uses not addressed in Phase 1. Phase 3 focuses on changes to water rights and other measures to implement changes to the Bay-Delta Plan from Phases 1 and 2. Phase 4 involves developing and implementing flow objectives for priority Delta tributaries outside of the Bay-Delta Plan updates.

In addition to the State Water Board actions, the regional water boards are in the process of developing a variety of basin plan amendments including TMDLs for different pollutants, as well as issuing various permits throughout the state. Examples include: Aquatic Ecosystem Restoration Policy (North Coast Water Board), Stream and Wetland Protection Policy (San Francisco Bay Water Board), TMDLs for Nitrogen Compounds and Orthophosphates in the Lower Salinas River Watershed (Central Coast Water Board), Implementation Plans for the TMDLs for Metals in the Los Cerritos Channel and for Metals and Selenium in the San Gabriel River and Impaired Tributaries (Los Angeles Water Board), Central Valley Salinity Alternatives for Long-Term Sustainability (Central Valley Water Board), Pesticide Prohibition Basin Plan Amendment (Lahontan Water

Board), Revise Indicator Bacteria for a 17-Mile Reach of the Coachella Valley Storm Water Channel (Colorado River Water Board), Recreation Standards for Inland Fresh Surface Waters (Santa Ana Water Board), and Rainbow Creek Nitrogen and Phosphorus TMDLs (San Diego Water Board).

The goal of all of the Water Board's actions is to protect and improve the quality of the state's waters. Implementation measures identified during the development of these policies, amendments, and Basin Plan amendments, as well as the reasonably foreseeable methods of compliance for these actions, may have similar potential impacts as those identified for the proposed final Trash Amendments. As such, there may be a cumulative impact to certain resources depending on the location and timing of the implementation measures. Potential cumulative impacts are discussed further in the following section.

### 7.2.2 Project Cumulative Impacts

Implementation of the proposed final Trash Amendments would occur throughout the entire state and it would be speculative to attempt to estimate the specific project-level actions that could occur in and around the areas of implementation that would contribute to a cumulative effect of the proposed final Trash Amendments and reasonably foreseeable methods of compliance. The reasonably foreseeable methods of compliance would typically occur in urban areas. The other types of actions that may occur in and around these urban areas are infrastructure maintenance, redevelopment projects, and infill projects. The impacts of these types of actions typically involve air quality, noise and traffic associated with construction and, depending on the timing of the implementation of the reasonably foreseeable methods of compliance, these impacts could combine with the potential impacts of the proposed final Trash Amendments. The cumulative impacts of specific projects that will comply with the requirements of the proposed final Trash Amendments should be considered by the implementing municipality or agency. Implementation of projects related to other nearby projects, however, may result in cumulative effects of the following nature:

1. Noise and Vibration - Local residents in the near vicinity of installation and maintenance activities related to compliance with the proposed final Trash Amendments may be exposed to noise and possible vibration. The cumulative effects, both in terms of added noise and vibration at multiple implementation sites, and in the context of other unrelated projects, would most likely not be considered cumulatively significant due to the typically minor and temporary nature of the installation and maintenance activities that could cause the noise and possible vibration. However, if deemed a considerable contribution to a cumulative impact, mitigation methods include: (1) scheduling installation and maintenance activities during daytime hours; (2) noise and vibration monitoring; (3) noise testing and inspections of equipment; and (4) an active community liaison program.

2. Air Quality - Implementation of the proposed final Trash Amendments, including the reasonably foreseeable methods of compliance, may cause additional emissions of criteria pollutants and slightly elevated levels of carbon monoxide during trash device installation activities and, to a lesser extent, possible maintenance activities. Implementation of the proposed final Trash Amendments, in conjunction with all

other activities within the area, may contribute to a region's nonattainment status during the installation period. Since installation and maintenance-related emissions are typically minor and temporary, compliance with the proposed final Trash Amendments is not expected to not result in long-term significant cumulative air quality impacts. In the short-term, cumulative impacts could be significant if the combined emissions from the individual projects exceed the threshold criteria for the individual pollutants. In this case, mitigation measures include: (1) use of construction, and maintenance vehicles with lower-emission engines; (2) use of soot reduction traps or diesel particulate filters; and (3) use of emulsified diesel fuel.

3. Transportation and Circulation - Compliance with the proposed final Trash Amendments may involve contemporaneous installation activities at a number of sites. Further, installation of treatment controls may occur in the same general time and space as other related or unrelated projects. In these instances, construction activities from all projects could produce cumulative traffic effects which may be significant, depending upon a range of factors including the specific location involved and the precise nature of the conditions created by the dual construction activity. Mitigation to address this potentially significant cumulative impact would involve special coordination efforts by local, regional, and state entities regarding the timing of various construction and other activities adversely affecting traffic. Overall, with this mitigation, significant cumulative impacts are not anticipated since coordination can occur and, as appropriate, transportation mitigation methods are available as discussed previously.

4. Utilities and Service Systems – Compliance with the proposed final Trash Amendments would involve the disposal of trash that is removed or prevented from entering state waters. The amount of trash collected as a result of the proposed final Trash Amendments is not expected to increase substantially over baseline conditions. In addition, the proposed final Trash Amendments are not expected to substantially affect other public services. Therefore, the cumulative effects of compliance activities, construction activities and other related projects on utilities such as land disposal sites is not a considerable contribution to the cumulative impact.

5. Greenhouse Gas Emissions - Compliance with the proposed final Trash Amendments may involve contemporaneous installation activities at a number of sites. Further, installation of trash devices and other compliance measures, including maintenance activities and additional street sweeping, may occur in the same general time and space as other related or unrelated projects. In these instances, construction activities from all projects could produce greenhouse gas emissions which may have a significant cumulative impact, depending upon a range of factors (e.g., location, vehicular activity, machinery usage, etc.). As stated previously, the construction and maintenance activities associated with implementation of the proposed final Trash Amendments would be short term and are not expected to cause substantial greenhouse gas emissions. However, the cumulative effect of greenhouse gases has been identified as a concern within California, the United States, and global climate and, therefore, this impact is considered potentially

significant. With the incorporation of BMPs (see Section 6.6.2) and compliance with greenhouse gas reduction plans, amendments, or regulations, the cumulative effect of greenhouse gas emissions could be reduced to less-than-significant levels.

# 8 ALTERNATIVES ANALYSIS

State Water Board regulations require this draft SED to contain an analysis of range of reasonable alternatives to the project and reasonably foreseeable methods of compliance that could feasibly meet the project objectives and to avoid or substantially reduce any potentially significant adverse environmental impacts.[23] The State Water Board has identified the following six alternatives for analysis in draft SED.

## 8.1 No Project Alternative

The purpose of assessing a No Project Alternative in an environmental document such as this draft SED is to allow decision makers and the public to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The No Project Alternative would involve the State Water Board deciding not to approve any amendments to the Ocean Plan or the ISWEBE Plan.

Under the No Project Alternative, trash would continue to accumulate in state waters and the adverse effects identified in Section 1 and Appendix A would continue to occur. Consistent with baseline conditions, beneficial uses of water would not be protected. Additionally, the number of trash-related 303(d) listing and TMDLs would continue for an increasing number of water bodies with a lack of statewide consistency. The lack of consistency would continue from a lack of a water quality objective specific for trash and variability between existing trash-related water quality objectives among Basin Plans. For this reason, the State Water Board determines that this is not the preferred alternative.

## 8.2 Regional Water Board Alternative

In the Regional Water Board Alternative, each regional water board would either adopt a water quality objective for trash to the respective basin plan or adopt individual TMDLs for 303(d) listed water bodies for trash. If the individual amendments and TMDLs (as well as their respective implementation strategies) were similar to the proposed final Trash Amendments, the potential environmental impacts would also be similar. There is, however, the potential that the individual regional water boards would develop different trash water quality objectives and implementation provisions, resulting in a continued lack of statewide consistency. Furthermore, it would be an inefficient use of staff time (and corresponding costs) to develop up to eight different approaches to trash-control in state waters. For these reasons, the State Water Board determines that this is not the preferred alternative.

## 8.3 Full Capture System Alternative

The Full Capture System Alternative would meet the goals of preventing trash from entering state waters, provide consistency statewide, and establish a water quality objective. In this alternative, NPDES permittees would have installation, operation and maintenance requirements across all land uses, regardless of trash generation rates,

[23] 23 CCR § 3777, subd. (b)(3).

and only have a single option for compliance. The potential, however, for environmental impacts to occur would increase due to the increase in the amount of required construction and maintenance. Furthermore, costs associated with implementing this alternative would be significantly higher than under the proposed final Trash Amendments. The incremental improvement of this alternative over using the proposed final Trash Amendments' targeted land-use approach with dual compliance track options, which include institutional controls in combination with treatment controls and multi-benefit projects, does not appear to provide substantial benefits related to trash removal versus potential impacts to the environment. For these reasons, the State Water Board determines that this is not the preferred alternative.

### 8.4 Institutional Control Alternative

The Institutional Control Alternative would meet the goal of preventing trash from entering state waters, provide consistency, and establish a water quality objective. In this alternative, NPDES storm water permits would contain requirements that permittees increase their use of institutional controls (such as street sweeping, clean-up events, education programs, additional public trash cans and increased collection frequency expanded recycling and composting efforts, and adoption of ~~regulatory source controls~~ ordinances) in order to comply with the prohibition of discharge. This alternative's focus on the use of institutional controls rather than full capture systems could potentially decrease the environmental impacts from the installation of full capture systems and retrofitting of catch basins. The increase of institutional controls, such as street sweeping, collection of trash cans, and construction of recycling and composting facilities, however, could also result in environmental impacts, such as increased noise and vibration, or and poorer air quality caused by the increased frequency of street sweeping. Because street sweeping trucks move slowly, there may be an impact on transportation within high trash generating areas, which would require coordination with street parking rules. Nevertheless, the potential environmental impacts from this Institutional Control Alternative are not predicted to be significant. Permittees should have flexibility to determine the most effective means of controlling trash because of particular conditions within each jurisdiction, such as conditions of sites, types of trash, and the resources available for maintenance and operation. Therefore, the Trash Amendments propose the dual compliance options of Track 1 and Track 2.

### 8.5 Reduced Land Use Alternative

To reduce potential environmental impacts from trash control strategies, the Reduced Land Use Alternative would focus on a fewer number of land uses within a municipality. As a representative example, the City of Los Angeles monitored trash generation rates and found that the three highest trash generating land uses were residential (36 percent), commercial (33 percent), and industrial (19 percent) (City of Los Angeles 2002). The priority land uses for the Reduced Land Use Alternative would focus on the top two trash generating land uses: residential (high density and mixed urban) and commercial. Reducing the number of priority land uses would still reduce the discharge of trash from a municipality and reduce the number of treatment and institutional controls that would need to be implemented by permittees in California.

In addition, the Reduced Land Use Alternative would provide consistency statewide, establish a water quality objective, and prevent some trash from entering state waters; however it would not reduce the discharge of trash as much as the proposed final Trash Amendments would. The proposed final Trash Amendments focus on controlling the discharge of trash from more high trash generating areas than this alternative would, namely: high-density residential, commercial, industrial, mixed urban, and public transportation land uses.

By reducing the number of implementation measures necessary for compliance, the potential environmental impacts of this approach would also be reduced. The reduction in impacts could include less noise and vibrations from installation and maintenance of full capture systems, comparatively fewer emissions of criteria pollutants, carbon monoxide, and greenhouse gases due to the reduced amount of construction and installation of full capture systems, and less impact to land disposal sites. This Alternative, however, would not be as protective of beneficial uses as the proposed final Trash Amendments would be, because land uses such as industrial land uses, would not be captured. The goals of the project to protect beneficial uses and reduce the discharge of trash would only be partially achieved under this alternative. For these reasons, the State Water Board determines that this is not the preferred alternative.

### 8.6 Reduced NPDES Permittee Alternative

The Reduced NPDES Permittee Alternative would reduce the number of permits with specific trash-control requirements. While the Reduced NPDES Permittee Alternative would establish a water quality objective, and prevent some trash from entering State Waters, it would not reduce the discharge of trash as much as the proposed final Trash Amendments. The proposed final Trash Amendments focus on controlling the discharge of trash from the dominant transport pathway – storm water. Thus, the proposed final Trash Amendments require implementation provisions to be incorporated into NPDES permits, namely the MS4 Phase I, MS4 Phase II, Caltrans, IGP, and CGP.

The potential for the transport of trash via storm water to receiving water bodies is highest among the MS4 Phase I, MS4 Phase II, and Caltrans permittees due to the combination of land use types, area of land, and number of people within these MS4 permittees' respective jurisdictions. At present, the IGP and CGP already contain components of the proposed final Trash Amendments. Specifically, the IGP has a prohibition of discharge of preproduction plastics, and the CGP contains a prohibition of discharge of any debris from construction sites. Therefore, the Reduced NPDES Permittee Alternative would focus specific requirements for trash in MS4 Phase I, MS4 Phase II, and Caltrans permits.

In this alternative, comparatively fewer permittees would be required to institute increased trash controls. To this end, programmatically is it is possible that there would be reduced environmental impacts. The reduction in impacts may include less noise and vibrations from installation and maintenance of full capture systems, comparatively fewer emissions of criteria pollutants, carbon monoxide, and greenhouse gases due to the construction and installation of full capture systems, and less impact to land disposal sites. At a programmatic level, the potential environmental impacts may be slightly reduced with the Reduced NPDES Permittee Alternative. This Alternative, however,

would not be as protective of beneficial uses, as trash from light industrial facilities would not be removed from storm water. The goals of the project to protect beneficial uses and reduce the discharge of trash would only be partially achieved under this Alternative. For these reasons, the State Water Board determines that this is not the preferred alternative.

# 9 WATER CODE SECTIONS 13241 AND 13242 AND ANTIDEGRADATION

California Water Code section 13241 requires assessment of specific factors when adopting water quality objectives. These factors consist of:

- Past, present, and probable future beneficial uses of water.
- Environmental characteristics and water quality of the hydrographic unit under consideration.
- Water quality conditions that could be reasonably attained through coordinated control of all factors affecting water quality.
- Economic considerations.
- The need for developing new housing.
- The need to develop and use recycled water.

The proposed final Trash Amendments would alter existing water quality objectives for state waters; therefore, CWC section 13241 does apply to these proposed final Trash Amendments.

## 9.1 Past, Present and Future Beneficial Uses of Water

The presence of trash impairs s the established beneficial uses present in basin plans and the Ocean Plan, as discussed in Section 1 and Appendix A.

The proposed final Trash Amendments, including the water quality objective for trash, would protect all beneficial uses in state waters. The proposed final Trash Amendments support the Water Boards' existing water quality control plans and policies, and provide a better means to ensure that any future beneficial uses are also protected from trash impairments.

## 9.2 Environmental Characteristics and Water Quality of the Hydrographic Unit Under Consideration

The proposed final Trash Amendments apply to all waters of the state. More specifically, the proposed final Trash Amendments are primarily focused on areas of high trash generation within the jurisdictions of NPDES MS4 Phase I and MS4 Phase II municipalities, Caltrans, and facilities and sites covered under the IGP and CGP. The environmental characteristics of all hydrographic units affected by the proposed final Trash Amendments are described in Section 3.

## 9.3 Water Quality Conditions that Could Reasonable be Attained Through Coordinated Control of All Factors Affecting Water Quality

The Water Boards are required to ensure that all discharges, regardless of type, comply with all water quality control plans and policies. The proposed water quality objective for trash can be implemented through a prohibition of discharge to all surface waters of the state, with the exception of those waters within the jurisdiction of the Los Angeles Water Board with trash or debris TMDLs that are in effect prior to the effective date of the Trash Amendments. Compliance of the prohibition of discharge would be specified

through NPDES permits issued pursuant to section 402(p) of the Federal Clean Water Act, WDRs, and ~~W~~waivers of WDRs.

### 9.4 Economic Considerations

Under the requirements of Water Code sections 13170 and 13241, subdivision (d) and 23 CCR section 3777, subdivisions (b)(4) and (c),~~that require~~ the State Water Board must ~~to~~ consider economics when establishing water quality objectives. This consideration of economics ~~analysis~~ is not a cost-benefit analysis, but a consideration of potential costs of a suite of reasonably foreseeable measures to comply with the proposed final Trash Amendments. This economic analysis utilized two basic methods to estimate the incremental cost of compliance for permitted storm water discharge: the first method was based on cost of compliance per capita, and the second method was based on land cover.

This economic analysis estimated the incremental annual cost to comply with the requirements of the proposed final Trash Amendments ranged from $4 to $10.67 per year per capita for MS4 Phase I NPDES permittees and from $7.77 to $7.91 per year per capita for smaller communities regulated under MS4 Phase II permits. For IGP facilities, the estimated compliance cost is $33.9 million or $3,671 per facility. To comply with the proposed final Trash Amendments, expenditures by Caltrans are estimated to increase by ~~$37~~ $34.5 million in total capital costs and ~~$15~~ $14.7 million per year for operation and maintenance of structural controls.

The full economic consideration is described in Appendix C.

### 9.5 The Need for Developing Housing

The adoption of the proposed final Trash Amendments is not expected to constrain housing development in California. The implementation requirements of the proposed final Trash Amendments would need to be incorporated into the CGP and requirements for new urban development within MS4 Phase I or MS4 Phase II Permits. The trash requirements are anticipated to be minimal in cost to the overall costs of development. Additionally, the incorporation of trash treatment controls during the construction and development of storm drain inlets in new housing developments would be lower in cost than retrofitting storm drains with trash treatment controls. As a result, the proposed final Trash Amendments would not interfere with the need for developing new housing.

### 9.6 The Need to Develop and Use Recycled Water

The adoption of the proposed final Trash Amendments is not expected to restrict the need to develop and use recycled water. Currently, there are no restrictions on recycling of water due to trash. Therefore, the proposed final Trash Amendments and possible alternatives are consistent with the need to develop and use recycled water. Removing trash from the wastewater should be beneficial to the recycled water treatment process.

### 9.7 Water Code Section 13242

California Water Code section 13242 requires that the program of implementation for achieving the water quality objective within the proposed final Trash Amendments

include a description of the nature of the actions which are necessary to achieve the objective, time schedules for actions to be taken, and a description of surveillance to be undertaken to determine compliance with the water quality objective. In compliance with CWC section 13242, the proposed final Trash Amendments include a prohibition of discharge and program of implementation in order to achieve the objective, time schedules for compliance, and monitoring and reporting requirements - all as described in Section 2 as well as Appendix D for the Ocean Plan and Appendix E for the ISWEBE Plan.

### 9.8 Antidegradation

Federal and state antidegradation policies found at 40 CFR section 131.12 and in State Water Board Resolution No. 68-16, respectively, impose levels of protection for state waters depending on the highest quality of the receiving water at issue since 1968 – the year that the State Water Board adopted California's antidegradation policy. Where a receiving water is of higher quality than applicable water quality standards, that higher quality must be maintained unless certain conditions are met.

The State Water Board does not anticipate any degradation of water quality as a result of the adoption and implementation of the proposed final Trash Amendments. Upon adoption of the proposed final Trash Amendments, the state would, for the first time, have a water quality objective for trash and implementation provisions that would apply to all surface waters of the state, with the exception of those waters within the jurisdiction of the Los Angeles Water Board with trash or debris TMDLs that are in effect prior to the effective date of the proposed final Trash Amendments. The proposed final Trash Amendments would not result in a degradation of water quality standards in those waters, as the existing TMDL provisions are more stringent than the proposed final Trash Amendments.

Furthermore, the San Francisco Water Board's San Francisco Bay MRP (Order No. R2-2009-0074) requires MS4 permittees to develop and implement "Short-Term Trash Load Reduction Plans". This includes implementation of a mandatory minimum level of trash capture; cleanup and abatement progress on a mandatory minimum number of trash hot spots; and implementation of other control measures and best management practices, such as trash reduction ordinances, to prevent or remove trash loads from MS4s to attain a 40% reduction in trash loads by July 1, 2014. The San Francisco Bay MRP has an existing set of annual monitoring and reporting requirements. The required trash load reduction through the Short-Term Trash Load Reduction Plans does not conflict with the implementation provisions set forth in the proposed final Trash Amendments. The San Francisco Water Board can determine a San Francisco Bay MRP permittee implementing controls substantially equivalent to Track 2 has a submitted an implementation plan that is equivalent to the implementation plan requirement in the Trash Amendments. As such, the proposed final Trash Amendments would not result in a degradation of water quality standards in waters regulated by the San Francisco Bay MRP, because the proposed final Trash Amendments are at least as protective of water quality as the San Francisco Bay MRP.

As a result, the adoption and implementation of the proposed final Trash Amendments would not lead to the degradation of any water quality standards, and would instead enhance water quality across the state.

# 10 SCIENTIFIC PEER REVIEW

California Health and Safety Code section 57004 requires external scientific peer review of the scientific basis for any rule proposed by any board, office or department within Cal/EPA. Scientific peer review is a mechanism for ensuring that regulatory decisions and initiatives are based on sound science. Scientific peer review also helps strengthen regulatory activities, establishes credibility with stakeholders, and ensures that public resources are managed effectively. Scientific peer review on the scientific elements of the proposed Trash Amendments and Draft Staff Report ~~is underway,~~ was conducted through an Interagency Agreement between Cal/EPA and the University of California. The Peer Review process commenced on March 10, 2014 with a Request for External Scientific Peer Review and concluded on July 14, 2014. Three peer reviewers were selected and participated in reviewing the scientific elements of the Draft Staff Report. Peer Review was overall supportive of the proposed Trash Amendments and Draft Staff Report with recommendations to strength the scientific basis of the analysis. The proposed Final Staff Report contains the additional scientific studies recommended following Peer Review.

The three peer reviewers are following:

- Tamara Galloway, Ph.D.
  Professor of Ecotoxicology
  College of Life & Environmental Sciences
  University of Exeter
- David Barnes, Ph.D.
  Professor, Civil & Environmental Engineering
  College of Engineering and Mines
  University of Alaska
- Detlef Knappe, Ph.D.
  Professor, Department of Civil, Construction, & Environmental Engineering
  North Carolina State University

The Peer Review response is available at:
http://www.waterboards.ca.gov/water_issues/programs/peer_review/trash_control/

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# APPENDIX A: TRASH BACKGROUND

## I. Beneficial Uses Impacted by Trash

The proposed final Trash Amendments are directed toward achieving the highest water quality consistent with the maximum benefit to California. Beneficial uses, as defined by Porter-Cologne section 13050, are the uses of surface water and groundwater that may be protected against water quality degradation. The Water Boards are charged with protecting these uses from pollution and nuisance that may occur as a result of waste discharges. Beneficial uses of surface waters, ground waters, marshes, and wetlands serve as a basis for establishing water quality objectives and discharge prohibitions to attain these goals and are defined in the basin plans for each regional water board and the Ocean Plan.

There are many beneficial uses in California, defined in the basin plans for each regional water board and the Ocean Plan, which can be impacted by trash. This section discusses the impacts of trash to beneficial uses associated with aquatic life and public health (Figure 27).

Trash is a threat to aquatic habitat and life as soon as it enters state waters. Mammals, turtles, birds, fish, and crustaceans are threatened following the ingestion or entanglement of trash (Moore et al. 2001, U.S. EPA 2002). Ingestion and entanglement can be fatal for freshwater, estuarine, and marine life. Similarly, habitat alteration and degradation due to trash can make natural habitats unsuitable for spawning, migration, and preservation of aquatic life. These negative effects of trash to aquatic life can impact twelve beneficial uses. A summary of specific impacts associated with each aquatic life beneficial use are presented in Table 13.

**Figure 27.** Trash Impacting Beneficial Uses (NOAA Marine Debris Program, Algalita Marine Research Institute, California Coastal Commission, and LA County Flood Control District).

### Impacts of Trash to Aquatic Habitat and Life

Regardless of the method trash reaches waterways, trash is a threat to aquatic habitat and life as soon as it enters state waters. Mammals, turtles, birds, fish, and crustaceans are threatened following the ingestion or entanglement of trash (Moore et al. 2001, U.S. EPA 2002). Ingestion and entanglement can be fatal for freshwater, estuarine, and marine life. Similarly, habitat alteration and degradation due to trash can make natural habitats unsuitable for spawning, migration, and preservation of aquatic life. These negative effects of trash to aquatic life can impact several beneficial uses. A summary of specific impacts associated with each aquatic life beneficial use is presented in Table 13.

**Table 13.** Trash-Related Impacts to Aquatic Life Beneficial Uses.

| Beneficial Use | Impact of Trash to Specific Aquatic Life Beneficial Use |
|---|---|
| Warm Freshwater Habitat | • Ingestion and entanglement by fish or wildlife (including invertebrates).<br>• Freshwater habitat alteration or degradation.<br>• Interference with ecosystem function, including interference with benthic communities.<br>• Transportation of invasive species from floating trash. |
| Cold Freshwater Habitat | |
| Inland Saline Water Habitat | • Ingestion and entanglement by fish or wildlife (including invertebrates).<br>• Saline water habitat alteration or degradation.<br>• Interference with ecosystem function, including interference with benthic communities.<br>• Transportation of invasive species from floating trash. |

| Beneficial Use | Impact of Trash to Specific Aquatic Life Beneficial Use |
|---|---|
| Estuarine Habitat | • Ingestion and entanglement by fish or wildlife (including estuarine mammals, waterfowl, and shorebirds).<br>• Ingestion of toxic ~~or biological~~ compounds (including shellfish) associated with trash.<br>• Estuarine habitat alteration or degradation.<br>• Interference with ecosystem function, including interference with benthic communities and shellfish.<br>• Transportation of invasive species from floating trash. |
| Marine Habitat | • Ingestion and entanglement by fish or wildlife (including marine mammals, birds, and turtles).<br>• Ingestion of toxic ~~or biological~~ compounds (including shellfish) associated with trash.<br>• Marine habitat alteration or degradation, including alterations to kelp habitat.<br>• Interference with ecosystem function, including interference with benthic communities, shellfish and kelp.<br>• Transportation of invasive species from floating trash. |
| Wildlife Habitat | • Ingestion and entanglement by wildlife (including mammals, birds, reptiles, amphibians, and invertebrates).<br>• Terrestrial habitat alteration or degradation, including alterations to wildlife water and food sources.<br>• Interference with ecosystem function.<br>• Transportation of invasive species from floating trash. |
| Preservation of Biological Habitats | • Habitat alteration and degradation, including alterations to established refuges, parks, sanctuaries, and ecological reserves.<br>• Interference with ecosystem function.<br>• Transportation of invasive species from floating trash, potentially leading to species displacement. |
| Preservation of Areas of Special Biological Significance | • Habitat alteration or degradation of marine life refuges, ecological reserves, and designated Areas of Special Biological Significance.<br>• Interference with ecosystem function, including interference with kelp propagation.<br>• Transportation of invasive species from floating trash, potentially leading to species displacement. |
| Rare, Threatened, or Endangered Species | • Ingestion and entanglement by plant or animal species listed as rare, threatened or endangered.<br>• Alteration or degradation of habitat that supports plant or animal species listed as rare, threatened or endangered.<br>• Interference with ecosystem function.<br>• Transportation of invasive species from floating trash, potentially leading to species displacement. |
| Migration of Aquatic Organisms | • Alteration or degradation of habitat that supports migration or other temporary activities by aquatic organisms.<br>• Interference with ecosystem function. |
| Spawning, Reproduction, and/or Early Development | • Alteration or degradation of habitat that is suitable for reproduction and early development of fish.<br>• Interference with ecosystem function. |

| Beneficial Use | Impact of Trash to Specific Aquatic Life Beneficial Use |
|---|---|
| Wetland Habitat | • Ingestion and entanglement by fish, invertebrates, and insects.<br>• Ingestion of toxic ~~or biological~~ compounds (including shellfish) associated with trash.<br>• Natural or man-made wetland ecosystem alteration or degradation.<br>• Interference with ecosystem function, including interference with benthic communities and shellfish.<br>• Transportation of invasive species from floating trash. |

### Effects of Trash on Aquatic Habitat

Trash that settles to a riverbed, bottom of a bay, or ocean floor can interfere with normal ecosystem functions and have immediate and long-term effects on the aquatic habitat. Settled trash is a problem for bottom feeders and dwellers and can contribute to sediment pollution. Settled trash can smother the growth of aquatic vegetation, disrupt nurseries and spawning areas, and disturb benthic communities (United Nations Environment Program 2009). Trash can alter the aquatic habitat and impact the aquatic biodiversity as it introduces hard surfaces for colonization as well as provides increased places of refuge for mobile species. Hard surfaces may attract hard-substratum sessile species that may have been previously limited and, consequently, displace soft bottom species due to competition and predation (Katsanevakis et al. 2007). Serious alterations, such as hypoxia and anoxia conditions, can result when the gas exchange between the overlying waters and pore waters of the sediments is prohibited by the accumulation of trash, specifically plastic trash (Goldberg 1994). Settled trash can also disturb benthic communities by mechanical scouring as trash twists and moves with flow, currents, and tides, damaging the bottom fauna (United Nations Environment Program 2009). Furthermore, aquatic life can be threatened by trash when it causes increased siltation and turbidity resulting in blocking of essential sunlight or smothering of sea grass species.

Trash is found settling in the deep-sea to depths of 13,028 feet. Specifically in the Monterey Canyon, trash is most abundant where aggregation and downslope transport of trash from the continental shelf are enhanced by canyon dynamics (Figure 28). Based on 1,149 video records over a 22-year time period, the majority of trash was plastic (33%) and metal (23%) with relatively high number of observations of trash in the deep-sea environment (Schlining et al. 2013). Thus, submarine canyons can function to transport trash from coastal to deep-sea habitats.

**Figure 28.** A Discarded Tire in Monterey Canyon (Monterey Bay Aquarium Research Institute).

Trash that does not settle can float and be suspended for great distances. Floating trash, specifically plastic trash, is capable of carrying and distributing potentially harmful, non-native species of animals and plants to foreign aquatic habitats (Winston 1982, Highsmith 1985, Minchin 1996, Barnes 2002, Masó et al. 2003). ~~In fact, t~~Trash is found to more than double the rafting opportunities for biota at 30 remote islands across subtropics locations and higher latitudes (Barnes 2002). Trash drifting on ocean currents eventually becomes home to entire communities of encrusting and attached organisms. Aquatic life that uses trash as transport includes bryozoans, barnacles, polychaete worms, hydroids, and mollusks (Barnes 2002). Plastics are not readily biodegradable, but travel slowly in oceans, making them a more effective invasive species dispersal mechanism than vessels or ballast water (Barnes 2002). Although plastics constitute the larger percentage of floating trash, other common anthropogenic floating objects include polystyrene, wooden items, and fishing gear (Barnes and Milner 2005). While these studies have largely focused on trash in marine waters, similar conditions are expected to occur in estuarine, freshwater, and saline systems.

Not only can trash serve as a vessel for aquatic life, but trash, particularly plastic trash, can serve as a transport medium for pollutants and ~~ab~~sorb persistent organic pollutants in the marine environment (Carpenter et al. 1972, Mato et al. 2001, Derraik 2002). Although the quantities and effects of these contaminants have yet to be fully determined, plastic trash in the marine environment, including resin pellets, plastic fragments have been found to contain organic contaminants, including polychlorinated biphenyls, polycyclic aromatic hydrocarbons, petroleum hydrocarbons, organochlorine pesticides, phthalate ester plasticizers, polybrominated diphenylethers, and alkylphenols and bisphenol- A (Giam et al. 1978, Teuten et al. 2009; DG Europe 2011). Some of these compounds are added during plastic manufacture (e.g., nonylphenol, bisphenol- A, and polybrominated diphenylethers), while others (e.g., polychlorinated biphenyls and DDT) are ~~ad~~sorbed from the surrounding seawater (Mato et al. 2001, Moore et al. 2005, Teuten et al. 2009, Hirai et al. 2011). Although plastic trash may have the capacity to ~~ab~~sorb toxins, there is limited research on the extent of toxic exposure from plastic vectors compared to other exposure pathways such as atmospheric deposition and ocean currents (Gouin et al. 2011). Microplastics are unlikely to be an important global geochemical reservoir for historically released persistent organic pollutants such as polychlorinated biphenyls, dioxins, and DDT, and it is not clear if microplastics play a larger role as chemical reservoirs on smaller scales (NOAA 2008b).

Persistent organic pollutants found in or carried by trash may present potential threats in aquatic environments as they can leach from surface of trash to state waters. Leaching and degradation of plasticizers, polymers, and other plastic additives are complex phenomena dependent on environmental conditions and the chemical properties of each additive (Teuten et al. 2009). Persistent organic pollutants, however, have a high affinity for plastic in seawater, which may elevate POP concentrations on microplastic particles but reduce their bioavailability (NOAA 2008b).

**Effects of Trash Ingestion on Wildlife, Freshwater, Estuarine, and Marine Aquatic Life**

Many species, including mammals, birds, turtles, and fish, have been reported to ingest several different forms of trash. Ingestion of trash may occur either because of misidentification of trash items or accidental consumption during feeding and normal behavior. The effects of trash ingestion include starvation, suffocation, and internal injuries and infections. Ingested items can block air passages, prevent breathing, and be fatal (U.S. EPA 1992; 2002). In addition, some trash (e.g., diapers, medical and household waste, and chemicals) can be a source of bacteria, viruses, and toxic substances that can impact aquatic life. As described below, many studies have been completed on the impact of trash ingestion in marine environments; the effects of trash ingestion are expected to be the same in freshwater, saline, and estuarine environments.

For birds, ingestion of small plastic fragments and preproduction plastic pellets floating at the water surface pose a significant threat. At least 50 species of seabirds are known to ingest plastic debris (Day et al. 1985). Birds confuse these plastic fragments and preproduction plastic pellets with normal prey items, such as fish eggs or larvae, which are similar in both size and color.

Ingestion of trash by marine mammals has been reported to cause fatalities. In 2008, the ingestion of floating trash was fatal to two large sperm whales that were found stranded along the northern California coast (Jacobsen et al. 2010).

Sea turtles are especially prone to ingestion of marine trash, particularly plastics. Sea turtles, mistaking them for food, swallow plastic bags that block the turtle's digestive tract and lead to starvation (U.S. EPA 1992). Trash items that have been found in digestive tracts of turtles include plastic bags, tar, fishing lines, ropes, polystyrene, rubber, fishing hooks, charcoal, aluminum cans, aluminum foil, cardboard, net fragments, cloth, plastic spherules, strings, wood, cigarette filters, cellophane, bottles, vinyl films, pieces of latex balloons, and beer crown corks (Balazs 1985, Gramentz 1988, Plotkin and Amos 1990, Bjorndal et al. 1994, Tomás et al. 2002). Numerous studies that have reported high incidence of trash ingestion include: 10 of 33 leatherback turtles (30.3%) (Sadove and Morreale 1990); 19 of 32 sea turtles (59.4%) (Duronslet et al. 1991); 25 of 51 sea turtles (49%) (Bjorndal et al. 1994), and 23 of 38 green turtles (60.5%) (Bugoni et al. 2001). Even small quantities of trash can be fatal as seen by the death of two sea turtles where the trash represented only 4.6 and 5.8 percent of wet mass and 3.2 and 9.8 percent of volume of gut contents of the two turtles, respectively (Bjorndal et al. 1994).

Ingestion of trash can be particularly detrimental to aquatic life when trash contains or carries toxic compounds. Trash, particularly plastic trash, has plastic additives and can ~~ab~~sorb contaminants ambient in state waters such as polychlorinated biphenyls and DDT. These contaminants can be assimilated by aquatic life through ingestion. Ryan et al. (1988) found that the mass of ingested plastic in birds was positively correlated with polychlorinated biphenyls in their fat tissue and eggs. Also, Teuten et al. (2007) found that a priority pollutant, phenanthrene, was transmitted to a lugworm by plastic that was mixed into the sediments inhabited by the worm. Phenanthrene is not a plastic additive, but was ~~ab~~sorbed by the plastic from the ambient water.

Although there is limited research on the bioaccumulation of toxic compounds associated with plastics, a preliminary experiment demonstrating the transfer of contaminants from plastics to higher trophic level organisms was performed by Endo et al. (2005). The results of this study suggest that plastic-derived polychlorinated biphenyls are transferrable to biological tissue of birds after ingestion, especially lower-chlorinated congeners commonly found in plastic resin pellets. Since lower-chlorinated congeners are easily metabolized and cannot be biomagnified through the food chain, their presence in animal tissue is indicative of plastic ingestion. This phenomenon was also demonstrated by Yamashita et al. (2011), which found that the mass of ingested plastic in short-tailed shearwaters in the North Pacific Ocean was positively correlated with concentrations of lower-chlorinated congeners. Given the limited research of the biological uptake and bioaccumulation of toxics from plastics, plastic trash is not a significant vector of toxics relative to other exposure processes, such as atmospheric deposition and ocean currents (Gouin et al. 2011). Using lungfish and North Sea cod as model species, Koelmans et al. (2014) determined the potential leaching of nonylphenol and bisphenol A in the intestinal tracts from plastic ingestion. They found that plastic ingestion will make a negligible contribution to the transfer of additive as compared to other routes of exposure. However, salinity has been shown likely to have a strong effect on the sorption of contaminants, especially polymers, on plastic (Velzeboer et al. 2014). The transport and movement of contaminants by plastic particles in the aquatic environment are greatly influenced by local conditions. The transport of pollutants, such as DDT and polyaromatic hydrocarbons, is from freshwater and estuarine to fully marine conditions (Bakir et al. 2014). Overall, while the uptake and bioaccumulation of pollutants from plastics has been shown to occur, there is limited understanding of the significance in comparison to other modes of pollutant transfer in the environment.

Ingestion of toxic compounds and aquatic fatalities in freshwater, estuarine, and marine water systems negatively impact beneficial uses of aquatic life. Fatalities induced by trash ingestion or toxicity can affect aquatic life in warm and cold freshwater, inland saline water, estuarine, marine, wetland, and terrestrial habitats. Beneficial uses can be impacted when the ingestion of trash causes aquatic life fatalities or physiological stress in ASBS, and mortality or physiological stress in rare, threatened, or endangered species. See Table 13 for a summary of specific impacts of trash ingestion associated with each aquatic life beneficial use.

**Effects of Trash Entanglement on Wildlife, Freshwater, Estuarine, and Marine Aquatic Life**

In addition to ingestion, entanglement can result when an animal becomes encircled or ensnared by trash. Entanglement can cause wounds and associated infections, strangulation or suffocation, and impair the ability of an animal to swim, fly, find food, and escape predators (Figure 29; U.S. EPA 1992). Once entangled, animals have trouble eating, breathing or moving, all of which can be fatal. Similar to the discussion on trash ingestion, the studies describing effects of trash entanglement in marine environments also apply to freshwater and estuarine environments since the impacts are the same, regardless of the aquatic habitat.

**Figure 29.** Trash Entanglement (NOAA Marine Debris Program 2013).

According to the US Marine Mammal Commission, 136 marine species have been reported in entanglement incidents, including six species of sea turtles, 51 species of seabirds, and 32 species of marine mammals (Marine Mammal Commission 1996). Marine animals, particularly seals and sea lions, become entangled because of the natural curiosity and tendency to investigate unusual objects in the environment. Between 1982 and 2006, 268 entanglements of the endangered monk seal were documented in the Northwestern Hawaiian Islands. Additionally, many birds, including ducks geese, cormorants, and gulls have been found entangled in six-pack rings (U.S. EPA 1992), and nearly one million seabirds are thought to die from entanglement or ingestion of floatable material each year (U.S. EPA 2002).

Although entanglement is considered a serious mortality factor, the mortality rate due to entanglement is difficult to quantify. Many species vulnerable to entanglement are oceanic or migratory and are scattered across wide areas. Animals that become entangled and die either quickly sink or are consumed by predators, eliminating them from potential detection (Laist 1987). For these reasons, the estimated mortality rates and the effects of trash entanglement may actually be underestimated.

Fatalities induced by entanglement can affect aquatic life in warm and cold freshwater habitats, as well as inland saline water, estuarine, marine, wetland, and terrestrial habitats. Aquatic life fatalities in these habitats impact the beneficial when entanglement causes aquatic life fatalities in preserved areas of biological significance and fatalities of rare, threatened, or endangered species. See Table 13 for a summary of specific impacts associated with trash entanglement on each aquatic life beneficial use.

### Impacts of Trash on Public Health

Trash in state waters can impact humans by means of jeopardizing public health and safety and posing harm and hindrance to recreational, navigational, and commercial activities. Trash can also affect the traditional and cultural rights of indigenous people or subsistence fishers to waters of the state. Specific impacts associated with each public health beneficial use are presented in Table 14.

**Table 14.** Trash-Related Impacts to Public Health Beneficial Uses.

| Beneficial Use | Impact of Trash to Specific Public Health Beneficial Use |
|---|---|
| Municipal and Domestic Supply | • Alterations or degradation to waters that are used for community, military, or individual water supply systems (including drinking water).<br>• Health hazards due to ingestion of water where diseases were transported by trash. |

| Beneficial Use | Impact of Trash to Specific Public Health Beneficial Use |
|---|---|
| Navigation | • Safety hazards (including hazards to boats, rafts or other vessels used for shipping, travel, or transportation by private, military or commercial vessels). |
| Water Contact Recreation | • ~~Any amount of trash impacts this beneficial use.~~<br>• Health and safety hazards (including hazards from bacteria, viruses, toxic substances, mosquito production, and injuries).<br>• Health hazards due to consumption of fish with diseases transported by trash or ingestion of water where diseases were transported by trash.<br>• Safety hazards (including hazards to boats, rafts or other recreational vessels).<br>• Alterations or degradation to waters that support contact water recreation. |
| Non-Contact Water Recreation | • ~~Any amount of trash impacts this beneficial use.~~<br>• Safety hazards (including hazards to boats, rafts or other recreational vessels).<br>• Alterations or degradation to waters that support non-contact water recreation. |
| Commercial and Sport Fishing | • Safety hazards (including hazards to boats, rafts or other commercial or recreational vessels).<br>• Health hazards due to consumption of fish, shellfish, or other aquatic species with diseases transported by trash.<br>• Alterations or degradation to waters that support commercial and sport fishing. |
| Aquaculture | • Health hazards due to consumption of aquatic plants or animals with diseases transported by trash.<br>• Alterations or degradation to waters that support aquaculture. |
| Shellfish Harvesting | • Safety hazards (including hazards to boats, rafts or other commercial or recreational vessels).<br>• Health hazards due to consumption of filter-feeding shellfish with diseases transported by trash.<br>• Alterations or degradation to waters that support shellfish harvesting. |
| Native American Culture | • Health hazards due to consumption of fish or shellfish with diseases transported by trash.<br>• Elimination/reduction of native fish or shellfish populations that support the cultural and/or traditional rights of indigenous people.<br>• Alteration or degradation to the habitat of or death to aquatic life that support the cultural beliefs of indigenous people.<br>• Alterations or degradation to waters that support Native American culture. |
| Subsistence Fishing | • Health hazards due to consumption of fish or shellfish with diseases transported by trash.<br>• Alterations or degradation to waters that support subsistence fishing. |
| Note: Not all kinds of trash impact the specific human life beneficial uses. | |

## Effects of Trash on Public Health

Trash poses health and safety hazards for the safety of fishermen, recreational boaters, and children playing in the waterways and beaches. Items such as broken glass, medical waste, rope, and fishing line pose immediate risks to human safety. Injuries incurred by incisions from glass and metal can expose a person's bloodstream to microbes in the stream's water that may cause illness (Los Angeles Water Board 2010). Swimmers, divers, and snorkelers can become entangled in submerged or floating trash

such as rope or fishing line. Some trash (e.g., diapers and medical and household waste) can be a source of bacteria, viruses, and toxic substances (Musmeci et al. 2010). Medical and personal hygiene trash, for instance, can indicate the presence of pathogenic contaminants such as streptococci, fecal coliform, and other bacterial contamination. Consumption or contact with water contaminated with these pathogens could result in infectious hepatitis, diarrhea, bacillary dysentery, skin rashes, and even typhoid and cholera. Also, some debris, such as containers or tires, can collect water and support mosquito production and associated risks of diseases such as encephalitis and the West Nile Virus (Los Angeles Water Board 2010). Trash, specifically plastic waste, has a potential to expose humans to chemicals, such as bisphenol A and phthaletes (DG Europe 2011).

Trash in state waters can pose serious risks to recreational users including incisions and exposure to disease. Because of these health and safety hazards, trash may be an immediate threat to public health depending on the type of trash, where there is bodily contact with water, and where ingestion of water is reasonably possible. Therefore, waters designated with the beneficial use water contact recreation (Table 14) can be negatively impacted by the presence of trash. In addition, beneficial uses associated with the human consumption of water, shellfish, aquatic plants and animals, and commercial and sport fish, may be impacted by trash. Specifically, the ingestion of water or food that may be contaminated by bacteria, viruses, or toxic compounds found in trash poses a significant public health concern.

**Effects of Trash on Contact & Non-Contact Water Recreation, Commercial and Sport Fishing, and Navigation**

Beyond the immediate health and safety hazards caused by trash, the presence of trash in state waters can also affect beneficial uses of waters where there is less bodily contact with water. Damage to boats, rafts, and other recreational vessels through entanglement of equipment and propellers can lead to potentially hazardous and perhaps fatal situations for boaters (Figure 30). For these circumstances, trash present in waters designated for recreational activities and for transportation can impact the beneficial uses of non-contact water recreation and navigation, respectively.

**Figure 30.** Entangled Propeller (NOAA Marine Debris Program).

### Effects of Trash on Native American Culture

Some waters within the jurisdiction of the North Coast Water Board are protected by the beneficial use, Native American Culture. This beneficial use describes waters that support the cultural and/or traditional rights of indigenous people such as subsistence fishing and shellfish gathering, basket weaving, jewelry material collection, navigation to traditional ceremonial locations, and ceremonial uses. Trash affects this use by reducing the numbers of fish and/or shellfish, and/or by introducing toxic compounds to the waters making the waters too dangerous or unsuitable for this beneficial use. The North Coast Water Board also has a subsistence fishing beneficial use that protects the use of waters for subsistence fishers. Many people living near freshwater or marine areas depend on food from their nearby water bodies for survival. Similar to the Native American Culture use, trash affects the subsistence fishing use if waters are void of fish and/or shellfish or if toxic compounds associated with trash impact the aquatic life. The effect on these uses is similar to the aquatic life and public health impacts of trash described above.

## II. Trash in the Environment

The presence of trash in surface waters, especially in coastal and marine waters, is a serious issue in California. According to California's 2008-2010 Integrated Report, there are 73 water bodies listed as having impaired water quality due to the presence of large amounts of trash. Trash discarded on land is frequently transported through storm drains and to waterways, shorelines, the seafloor, and the ocean. Statewide and local studies have documented the presence of trash in state waters and the accumulation of land-based trash in the ocean. Street and storm drain trash studies conducted in regions across California have provided insight into the composition and quantity of trash that flows from urban streets into the storm drain system and out to adjacent waters (Figure 31).

**Figure 31.** Don't Trash California (Caltrans).

**Composition of Trash**

Since 1986, the California Coastal Commission and the Ocean Conservancy have organized the Coastal Cleanup Day to collect trash from beaches, inland waterways, coastal waters, and underwater annually through voluntary efforts at sites around the world (Figure 32). In 2012, volunteers removed 854,496 pieces of trash totaling 1,444,546 from 2,023 miles of Coastal Cleanup sites throughout California. The top ten items collected from 1989-2012 were: (1) cigarette butts; (2) bags (paper and plastic); (3) food wrappers and containers; (4) caps and lids; (5) cups, plates, forks, knives, and spoons; (6) straws and stirrers; (7) glass beverage bottles; (8) plastic beverage bottles; (9) beverage cans; and (10) building materials. These items made up nearly 90 percent of the items removed and cataloged by Coastal Cleanup Day events. These data generated by the Coastal Cleanup Day efforts provide valuable information on the sources of debris, as well as the types and quantity of debris in California.

In addition to the dominance of consumer products in the waste stream, preproduction plastics pellets are a particular concern when the raw material is improperly disposed and reaches a water body. A 1998 study, conducted in Orange County by Moore et al., found the most abundant debris items on beach sites were preproduction plastics, foamed plastics, and hard plastics. A 2009 collaborative baseline study conducted by the Southern California Coastal Water Research Project and the State Water Board estimated that preproduction plastic made up 95 percent of the debris on California's beaches, and other plastic debris items made up an additional 4.6 percent (Moore et al. 2013). The densest distribution of debris was found in the San Diego, Orange, Los Angeles and San Francisco County Regions, and appears to correlate with the more densely populated coastal watersheds in California.

Plastic, the largest component and among the longest of life spans of trash materials, is an increasingly local and global threat to aquatic and marine life and environments. Although plastics are one of the most common forms of trash and may have lasting and deleterious impacts, all forms of trash are a threat to state waters.

**Figure 32.** California Coastal Cleanup Day Advertisements (California Coastal Commission).

**Transport of Trash in the Environment**

Trash in state waters is related to the direct and indirect activities of inhabitants inland, along coastal shorelines, and offshore (NOAA 2008a). A major source of trash is either intentionally or accidentally improperly discarded waste, thrown or deposited on land and in water bodies. If trash occurs on land, it is commonly transported to nearby water bodies by wind and/or rain or dry ~~season~~ weather runoff. The five primary sources and transport mechanisms for trash to state waters are (Figure 33):

1. Littering by the public on or adjacent to waterways;
2. Storm events draining watersheds and carrying trash originating from littering, inadequate waste handling or illegal dumping via the storm drain system to receiving waters;
3. Wind-blown trash, also originating from littering, inadequate waste handling or illegal dumping;
4. Illegal dumping into or adjacent to water bodies, and;
5. Direct disposal (overboard disposal and/or dumping) of trash into water bodies from vessels involved in commercial, military, fishing or recreational activities.

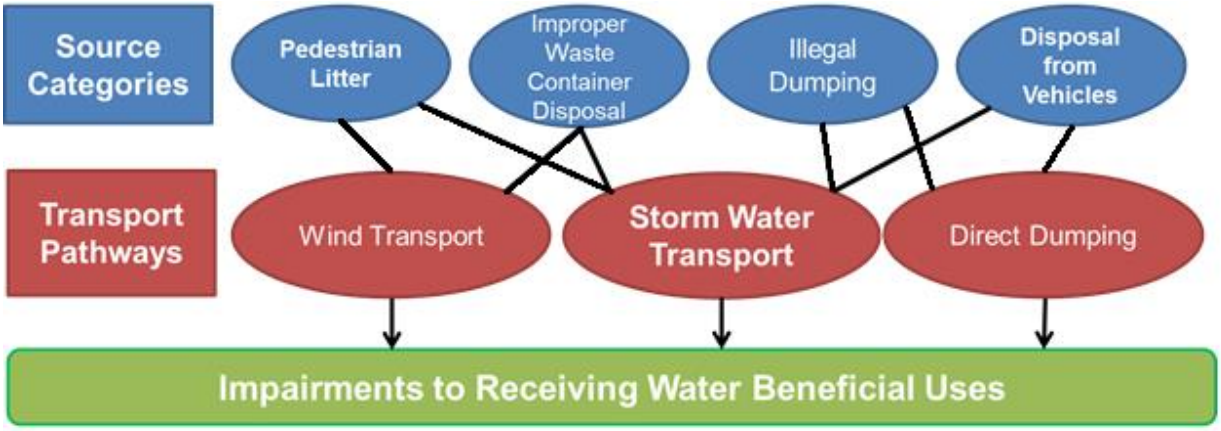


**Figure 33.** Transport of Trash to Waters of the State.

Littering is commonly the first route for trash to enter the environment. It is considered as a land-based source of trash and frequently accumulates in the vicinity of shopping centers, car parking lots, fast food outlets, railway and bus stations, roads, schools, public parks and gardens, garbage bins, landfill sites, and recycling depots. Results of trash generation studies conducted in Los Angeles County and City of Los Angeles in 2001 and 2004 concluded that high trash generation rates occur at highly populated and highly visited areas that attract vehicular and pedestrian traffic. Objects that can be easily transported by wind, such as plastic and paper trash, are a particular problem because they can become floatable trash even when originally disposed of in an appropriate manner. Uncontained trash can be blown directly into inland surface waters (including rivers, lakes, estuaries, and drains), enclosed bays, and the ocean, or it can be transported to the ocean if blown into a river, stream, or enclosed bay that empties to coastal waters (U.S. EPA 2002, San Diego CoastKeeper 2010).

Storm water can also wash trash into drainage systems, where it is able to travel via the storm water systems, streams, rivers, lakes, and estuaries until it eventually reaches coastal waters (Armitage and Rooseboom 2000, Richmond and Clendenon 2011). Trash will accumulate in areas of generation until the local authority either removes it or it is transported by wind and/or storm water runoff to nearby drainage systems and water bodies (Armitage and Rooseboom 2000). During storms and other periods of high winds or high waves, almost any kind of trash (including glass, metal, wood, and medical waste) can be deposited into the waters of the state (U.S. EPA 2002). A significant contribution from runoff has been shown in recent studies monitoring the density of marine trash before and after storm events. A study conducted on the Los Angeles and San Gabriel Rivers found the greatest abundance of plastic trash occurred after a rain event (Moore et al. 2011). A study conducted off the Southern California coast found trash increased after a storm event, reflecting inputs from land-based runoff and re-suspended matter (Lattin et al. 2004).

According to NOAA, it is estimated that 80 percent of marine trash comes from land-based sources (1999). Evidence of floating trash and trash on the seafloor suggests that trash from land-based sources can travel and impact waters downstream, along coastal shores, and in marine waters of the state. Trash that ends up on California beaches is indicative of trash accumulated from upstream sources, as well as other

sources such as visitor littering, poor management of waste containers, and recreational water activities. The transport of trash from land-based sources is not unique to California; the transport of trash is occurring globally. For example, the Danube River in Austria is reported to have a net flow rate of 4.2 tons of trash per day, with industrial raw materials accounting for over 70 percent of the reported items (Lechner et al. 2014). In the Tamar Estuary in London, plastics accounted for 82 percent of the trash found and the tidal cycle was a factor in the transport of trash (Sadri et al. 2014).

Illegal dumping and direct disposal of trash can take place in both fresh and marine waters. Trash is directly deposited into surface waters from accidental loss, improper waste management or by illegal disposal. Sources may include commercial fishing vessels; merchant, military and research vessels; recreational boats; cruise ships; and offshore petroleum platforms and associated supply vessels; beach recreation; and illegal encampments adjacent to waterways and water bodies. Trash deposition associated with recreational boating (Richmond and Clendenon 2001) also contributes to the problem, a majority of which is found to be plastic trash (Milliken and Lee 1990). One study that assessed trash generation along the shorelines of Orange County, suggested that water-based sources, such as overboard disposal were more significant than littering or wind deposition at these locations (Moore et al. 2001). While there are laws regulating the dumping of trash from boats and vessels in rivers, streams, marinas and seas, the global nature of trash, the inability to confine trash within territorial boundaries and the complexity of identifying trash sources have made laws difficult to develop and even harder to enforce.

**Trash Assessment Studies**

Potential sources of trash have been identified in trash assessment studies performed in the San Francisco Bay Region, Los Angeles River watershed and in Santa Clara County. Collectively, these trash assessments have identified the following as potential sources: direct littering and dumping, downstream transport and accumulation, recreational land-uses, industrial land-uses, urban runoff, pedestrians, vehicles, and improper management of waste containers (Santa Clara Valley Urban Runoff Pollution Prevention Program 2007, Surface Water Ambient Monitoring Program 2007, U.S. EPA 2012b).

Over the 2003-2005 monitoring period, the San Francisco Bay Region Rapid Trash Assessment study found that over 50 percent of the trash collected in urban streams was composed of plastic items. Glass (19%) and biodegradable items (10%) were also commonly found. Direct littering and dumping as well as downstream transport and accumulation were the two major transport mechanisms identified as responsible for the trash in streams in this region (Surface Water Ambient Monitoring Program 2007). High trash deposition rates were generally associated with wet weather, which reflects accumulation from upstream sources. As for dry season deposition, elevated deposition rates were primarily associated with localized littering and dumping, wind-blown trash from nearby sources, and, at certain sites, accumulation from upstream sources due to dry season runoff. Overall, trash levels generally increased in a downstream direction from headwaters to the mouth of the watershed. Other sources of trash near creek channels were identified as parks, schools, roads, or poorly kept commercial facilities.

In the Los Angeles River Watershed, the Santa Clara Valley Urban Runoff Pollution Prevention Program performed Rapid Trash Assessment in the lakes, along lakeshores, near fences and at the outlet of storm drains to document the impairment of Los Angeles area lakes. Rapid Trash Assessment site visits evaluated different land use types surrounding the lakes such as recreational use, industrial businesses, and urban runoff (U.S. EPA 2012b). The study suggests that trash in recreational areas surrounding the lake is likely transported from people littering in the area and from uncovered trash cans. In recreational areas, trash problems were primarily caused by overflowing trash cans and littering of small trash items, such as cigarette butts. Facilities in recreational areas, such as bathrooms and parking lots, were also identified as key hotspots for trash. Although industrial sites surrounding Peck Road Park Lake were too steep to appropriately conduct a quantitative trash assessment, items observed from a distance included plastic bags, milk jugs, a tire, a cooler, metal cable, and industrial scraps. Lastly, an inlet to Peck Road Park Lake was assessed to evaluate trash derived from urban runoff. This area demonstrated heavy accumulation of trash and evidence of trash dumping. Specific items found in the inlet of the lake included semiconductors, pepper sprays, spray paint cans, cigarette butts, large furniture items, foamed polystyrene, and plastic pieces (U.S. EPA 2012b).

Based on urban creek trash assessments in Santa Clara County, four source categories of trash have been identified by Santa Clara Valley Urban Runoff Pollution Prevention Program: pedestrians, vehicles, waste containers, and illegal dumping (Santa Clara Valley Urban Runoff Pollution Prevention Program 2007). Pedestrian locations are likely the greatest source of trash that ends up in local water bodies. Areas most affected by trash include high foot traffic locations (e.g., shopping plazas, convenience stores, and parks), transition points (e.g., bus stops, train stations, and entrances to public buildings), and special event venues (e.g., concerts, sporting events, and fairs). Drivers and passengers are also responsible for trash when they litter directly from vehicles or do not adequately cover their vehicles when transporting trash. Land areas that may accumulate trash from vehicles include roads, highways, and parking lots. Waste containers that are overflowing or uncovered and the improper handling of trash during curbside collection may also contribute to the problem. Illegal dumping of trash may occur within a watershed or directly into a waterway. High occurrences of illegal dumping often are by illegal encampments near or within riparian areas (Santa Clara Valley Urban Runoff Pollution Prevention Program 2007).

**Land-Based Generation Studies**

Studies show that trash is predominantly generated on land and then transported to a receiving water body. The main transport pathway of trash to receiving water bodies is through storm water transport. Several studies have been conducted to determine the sources of land-based trash generation and the rates of trash generation areas. The land areas evaluated in these studies typically included the following: high density residential, low density residential, commercial services, industrial, public facilities, education institutions, military institution, transportation, utilities, mixed urban, open space, agriculture, water, and recreation land uses.

In 2001, the City of Los Angeles Watershed Protection Division performed a geographical analysis of trash generation in the City of Los Angeles. The study showed

that trash is most severe in Central City (Downtown LA) and nearby communities where commercial, industrial, and residential land uses are predominant (City of Los Angeles 2002). According to the 2004 Trash Baseline Monitoring results in Los Angeles County, the highest trash-generating land-uses were high-density residential, mixed use urban, commercial, and industrial land uses in the Ballona Creek Watershed and Los Angeles River Watershed, respectively (County of Los Angeles Department of Public Works 2004a; 2004b). The results indicate that high generation of trash is commonly found at highly populated and highly visited areas that attract high vehicular and pedestrian traffic.

BASMAA worked collaboratively with the permittees of the San Francisco Bay Area's Regional Stormwater Permit to develop a regionally consistent method to establish baseline trash loads from their municipality. The project, BASMAA Baseline Trash Generation Rates Project, assisted the permittees in establishing a baseline by which to demonstrate progress towards trash load reduction goals. The project assessed the baseline trash generation rates at 137 monitoring sites at nine different land uses, determined that the four land uses with the highest trash generation rates are (1) retail and wholesale, (2) high-density residential, (3) K-12 schools, and (4) commercial/services and industrial, and developed a conceptual model for trash generation rates (EOA, Inc. 2012a). The project provided a scientifically-sound method for developing trash generation rates that can be adjusted, based on permittee/site specific conditions, and used to develop baseline loading rates and loads (EOA, Inc. 2012a). Baseline loads form the reference point for comparing trash load reductions achieved through control measure implementation (EOA, Inc. 2012b).

**Outfall and Storm Drain Monitoring**

Outfall and storm drain monitoring results are useful in determining the types of trash that is transported to receiving waters from inland locations. Paper, plastics, cigarette butts, and vegetation are common forms of trash collected in the outfalls and storm drains by Caltrans and municipalities such as Fresno and Stockton.

The Litter Management Pilot Study conducted in 1998 through 2000 by Caltrans identified that trash collected during outfall monitoring in the Los Angeles area consists of paper, plastic, wood, cigarette butts, foamed polystyrene, metal, and glass (Caltrans 2000). Further evaluation of the Litter Management Pilot Study data indicated that smoking- and food-related trash accounted for 20-30 percent of the trash by weight and volume and that approximately 90 percent of the trash collected at the storm drain outfall is floatable (Caltrans 2000). The high percentage of floatable trash can be indicative of the short residence time in the drainage system. Though plastics are one of the more common forms of trash in receiving waters (Moore et al. 2001, Moore et al. 2005; 2011), the Litter Management Pilot Study showed that non-plastics represent 67 percent of trash composition by weight, 57 percent by volume and 66 percent by count (Caltrans 2000). Caltrans reported that polystyrene items represented 5 percent by weight and 15 percent by volume. Plastic film including bags represented 7 percent by weight and 12 percent by volume.

During the 2001-2002 monitoring season, the Caltrans Public Education Litter Monitoring Study collected storm water trash data at Caltrans highway sites in Fresno

and Stockton, California. The majority of material collected was vegetation. Trash, however, as defined as manufactured items greater than 5 millimeters, ranged from 5 to 18 percent by weight and 11 to 43 percent by volume (Caltrans 2004~~2~~).

**Street and Storm Drain Trash Audits**

Street and storm drain trash audits characterize trash that can be transported to surface waters by wind, runoff, or storm water collection systems. Trash audits reveal the composition of littered products depicting the materials (paper, plastic, metal, and glass), type of product (bottle, cup, can, and cigarette butt), and sometimes the land-based sources of littered items. In California, two studies that have collected and assessed trash for brands and identifiable sources are the Source Reduction Pilot Project in the San Francisco Bay area and the storm drain trash audit of the City of Oxnard. A street trash audit was conducted in San Francisco, but the sources of the trash were not identified.

In 2010-2011, Clean Water Action coordinated a Source Reduction Pilot Project in which trash was characterized at isolated sites in four jurisdictions: Oakland, Richmond, San Jose, and South San Francisco. The results of the project identified that cigarette butts were the most common item found in trash. The leading quantifiable type of trash on city streets was food and beverage packaging (67%) (Clean Water Action 2011a). Altogether, 81 percent of trash collected originated from food establishments, including fast food, cafes, grocery stores, and convenience food stores. The results of this study suggest that businesses that sell “take-out” food and beverages are the largest sources of trash after cigarette smokers. These studies are instructive because businesses and institutions that decide to purchase packaged and disposable products influence the quantity of potential material that is available to become littered, dumped, improperly disposed, and thus potentially transported to nearby waters.

In 2005, the City of Oxnard completed a study of trash in the open channel storm drain system. According to the Stormdrain Keeper program, the most common trash items collected were plastic, cellophane, paper products, and foamed polystyrene (Pumford 2005). While much of the trash removed from the storm drain open channel was unmarked, key contributors of marked trash were fast food businesses and markets.

A street trash audit was conducted in San Francisco in April 2007 and April 2008. Within this study, trash was classified as “large” for items over four square inches or as “small” for items smaller than four square inches. For both monitoring periods, the most significant type of large trash observed was paper products, followed by plastic materials. Plastic materials include plastic packaging, wrap, plastic bags, and beverage containers. As for small trash observations, the most significant type of small trash was chewing gum, followed by glass pieces (City and County of San Francisco 2007, City of San Francisco 2008).

## III. Current Efforts to Address Concerns Related to Trash in California Waters

Regulations and policies are currently implemented in California to address trash in state waters. These efforts are discussed in the following sections.

**State Laws and Local Ordinances**

Statewide laws and local ordinances have been adopted in California to address trash. For instance, California prohibits littering where such litter "creates a public health and safety hazard, a public nuisance, or a fire hazard" (Penal Code ~~section~~ § 374.4). The California Vehicle Code provides that no one may throw or trash, including cigarettes onto highways and adjacent areas (~~section~~ § 23111 and 23112).

In 2006, California passed Assembly Bill (AB) 2449, the Plastic Bag Recycling Law. This law requires certain retail establishments (grocery stores and pharmacies) that make plastic bags available at checkout to set up in store recycling programs to accept plastic bags. AB 2449 restricted the ability of cities and counties to regulate single-use plastic grocery bags through the imposition of a fee on plastic bags. In 2012, Senate Bill (SB) 1219 repealed the provisions that preempted local regulatory action, and extended recycling requirements for large supermarkets that distribute plastic bags to collect them for recycling until 2020.

California is the leader in implementing local ordinances with goals of reducing trash, specifically plastics. The two types of ordinances passed by local governments focus on addressing single-use disposable items: expanded polystyrene foam and single-use plastic bags. At least 65 jurisdictions have either banned expanded polystyrene foam food containers completely or have prohibited use by government agencies or at public events. A few jurisdictions that have banned or partially banned polystyrene for takeout food packaging include San Francisco, Los Angeles County, Sonoma County, Malibu, and Berkeley (Clean Water Action 2011b).

In 2006, the City of San Francisco passed a ban on single-use plastic bags in grocery stores and pharmacies. Since then, at least 72 local jurisdictions have adopted city and county ordinances for single-use plastic bags (Environment California Research and Policy Center 2011). In 2013, the City of Los Angeles became the largest city in the United States to adopt a single-use carryout bag ordinance. Most ordinances have a paper bag fee as well as a ban on plastic due to the desire to promote reusable bags as the bag of choice. Some large retailers also offer a five cent credit or other discounts for bringing a reusable bag. Statewide, several attempts have been made to pass plastic bag ban bills over the past several years, including AB 1998 in 2010 and SB 405 in 2013, although none have been passed in the State Legislature (West Coast Governors' Alliance on Ocean Health 2013).

On September 30, 2014, Governor Edmund G. Brown Jr. signed the nation's first statewide ban on single-use plastic bags—Senate Bill 270 (Sen. Padilla)(2014 Stat. Ch. 850)(adding Chapter 5.3 to Part 3 of Division 30 of the Public Resources Code). Senate Bill 270 aligns state law with the ordinances passed by local governments in California to reduce plastic waste. The new law prohibits grocery stores and pharmacies that have a specified amount of sales in dollars or retail floor space from providing single-use carry-out plastic bags as of July 1, 2015, and enacts the same ban for convenience stores and liquor stores on or after the following year. The legislation prohibits stores from selling or distributing a recycled paper bag or compostable bags at the point of sale for at a cost of less than $0.10.

The proposals to ban plastic bags and polystyrene food containers could result in the use of alternative materials with a variety of potential impacts. Data from the City of San

Francisco's Streets Litter Re-Audit report confirmed that eliminating all food-related polystyrene would simply change the type of litter found on our streets and in our waterways, and result in an increase in the non-polystyrene related litter items, thus, showing no overall reduction in litter (or trash to the waterways) (City of San Francisco 2008). Without a ban on all plastic and paper carryout bags, a ban on only plastic bags would simply cause a shift back to paper. According to some lifecycle data, which did not look at end-of-life impacts, greenhouse gas emissions would double due to releases associated with paper bag production and use (Boustead Consulting & Associates Ltd. 2007). In addition, some studies show that policies which force consumers to switch from plastic bags to paper will double energy use and quadruple the amount of waste generated. Similarly, bans on polystyrene food containers would cause a shift to materials with other significant environmental impacts (University of California at San Diego 2006).

### No Existing Trash-Specific Water Quality Objectives

Each regional water board has adopted narrative objective(s) for pollutants in its basin plan (Table 15). These narrative objectives refer to trash-related pollutants and other pollutants such as foam and sediment in general terms (i.e., floatable, suspended, and settleable material), but do not specifically refer to trash as a specific pollutant. The Ocean Plan also has similar floatable, suspended, and settleable material objectives, but no specific mention of trash as a pollutant. As summarized in Table 15, there is variability among the existing narrative objectives in the basin plans and the Ocean Plan. Additionally, the ISWEBE Plan lacks a trash-related water quality objective.

**Table 15.** Trash-Related Water Quality Objectives.

| Basin Plan / Ocean Plan | Water Quality Objective |
|---|---|
| North Coast | *For inland surface waters, enclosed bays and estuaries*<br>Floating Material: Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.<br>Suspended Material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.<br>Settleable Material: Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses. |
| San Francisco Bay | *For all surface waters except the Pacific Ocean*<br>Floating Material: Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.<br>Suspended Material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.<br>Settleable Material: Waters shall not contain substances in concentrations that result in the deposition of material that cause nuisance or adversely affect beneficial uses. |

| Basin Plan / Ocean Plan | Water Quality Objective |
|---|---|
| Central Coast | *For all inland surface waters, enclosed bays and estuaries*<br><br>Floating Material: Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.<br>Suspended Material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.<br>Settleable Material: Waters shall not contain settleable material in concentrations that result in deposition of material that causes nuisance or adversely affects beneficial uses. |
| Los Angeles | *For inland surface waters and enclosed bays and estuaries (including wetlands)*<br><br>Floating Material: Floating materials can be an aesthetic nuisance as well as provide substrate for undesirable bacterial and algal growth and insect vectors. Waters shall not contain floating materials, including solids, liquids, foams and scum, in concentrations that cause nuisance or adversely affect beneficial uses.<br><br>Solid, Suspended, or Settleable Materials: Surface waters carry various amounts of suspended and settleable materials from both natural and human sources. Suspended sediments limit the passage of sunlight into waters, which in turn inhibits the growth of aquatic plants. Excessive deposition of sediments can destroy spawning habitat, blanket benthic (bottom dwelling) organisms, and abrade the gills of larval fish. Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses. |
| Central Valley<br><br>Sacramento and San Joaquin Basins | *All surface waters in the basin*<br><br>Floating Material: Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.<br><br>Settleable Material: Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.<br><br>Suspended Material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses. |
| Central Valley<br><br>Tulare Lake Basin | *For inland surface waters*<br><br>Floating Material: Waters shall not contain floating material, including but not limited to solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.<br><br>Settleable Material: Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.<br><br>Suspended Material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses. |

| Basin Plan / Ocean Plan | Water Quality Objective |
|---|---|
| Lahontan | *For all surface waters*<br><br>Floating Materials: Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect the water for beneficial uses. For natural high quality waters, the concentrations of floating material shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.<br><br>Settleable Materials: Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of settleable materials shall not be raised by more than 0.1 milliliter per liter.<br><br>Suspended Materials: Waters shall not contain suspended materials in concentrations that cause nuisance or that adversely affects the water for beneficial uses. For natural high quality waters, the concentration of total suspended materials shall not be altered to the extent that such alterations are discernible at the 10 percent significance level.<br><br>*Specific to Pine Creek Watershed*<br><br>Settleable Material: The concentration of settleable material shall not be raised by more than 0.2 milliliter per liter (maximum) and by no more than an average of 0.1 milliliter per liter during any 30-day period. |
| Colorado River | *All surface waters*<br><br>Aesthetic Qualities: All waters shall be free from substances attributable to wastewater of domestic or industrial origin or other discharges which adversely affect beneficial uses not limited to:<br><br>- Settling to form objectionable deposits;<br><br>- Floating as debris, scum, grease, oil, wax, or other matter that may cause nuisances; and<br><br>- Producing objectionable color, odor, taste, or turbidity.<br><br>Suspended Solids and Settleable Solids: Discharges of wastes or wastewater shall not contain suspended or settleable solids in concentrations which increase the turbidity of receiving waters, unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in turbidity does not adversely affect beneficial uses.<br><br>*Specific to New River (has Trash TMDL)*<br><br>The waters of the River shall be essentially free from trash, oil, scum, or other floating materials resulting from human activity in amounts sufficient to be injurious, unsightly, or to cause adverse effects on human life, fish, and wildlife. Persistent foaming shall be avoided. |

| Basin Plan / Ocean Plan | Water Quality Objective |
|---|---|
| Santa Ana | *For enclosed Bays and estuaries*<br><br>Floatables: Floatables are an aesthetic nuisance as well as a substrate for algae and insect vectors. Waste discharges shall not contain floating materials, including solids, liquids, foam or scum, which cause a nuisance or adversely affect beneficial uses.<br><br>Solids, Suspended and Settleable: Settleable solids are deleterious to benthic organisms and may cause anaerobic conditions to form. Suspended solids can clog fish gills and interfere with respiration in aquatic fauna. They also screen out light, hindering photosynthesis and normal aquatic plant growth and development. Enclosed bays and estuaries shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors.<br><br>*For inland surface waters*<br><br>Floatables: Floatables are an aesthetic nuisance as well as a substrate for algae and insect vectors. Waste discharges shall not contain floating materials, including solids, liquids, foam or scum, which cause a nuisance or adversely affect beneficial uses.<br><br>Solids, Suspended and Settleable: Settleable solids are deleterious to benthic organisms and may cause anaerobic conditions to form. Suspended solids can clog fish gill and interfere with respiration in aquatic fauna. They also screen out light, hindering photosynthesis and normal aquatic plant growth and development. Inland surface waters shall not contain suspended or settleable solids in amounts which cause a nuisance or adversely affect beneficial uses as a result of controllable water quality factors. |
| San Diego | *For all inland surface waters, enclosed bays and estuaries, coastal lagoons and ground waters*<br><br>Floating Material: Floating material is an aesthetic nuisance as well as a substrate for algae and insect vectors. Waters shall not contain floating material, including solids, liquids, foams, and scum in concentrations which cause nuisance or adversely affect beneficial uses.<br><br>Suspended and Settleable Solids: Suspended and settleable solids are deleterious to benthic organisms and may cause the formation of anaerobic conditions. They can clog fish gills and interfere with respiration in aquatic fauna. They also screen out light, hindering photosynthesis and normal aquatic plant growth and development. Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses. |
| Ocean Plan | *Objectives*<br><br>1. Floating particulates and grease and oil shall not be visible.<br>2. The discharge of waste shall not cause aesthetically undesirable discoloration of the ocean surface.<br>3. Natural light shall not be significantly reduced at any point outside the initial dilution zone as the result of the discharge of waste.<br>4. The rate of deposition of inert solids and the characteristics of inert solids in ocean sediments shall not be changed such that benthic communities are degraded.<br><br>*Implementation Provisions*<br><br>Waste discharged to the ocean must be essentially free of:<br><br>1. Material that is floatable or will become floatable upon discharge.<br>2. Settleable material or substances that may form sediments which will degrade benthic communities or other aquatic life.<br>3. Substances which will accumulate to toxic levels in marine waters, sediments or biota.<br>4. Substances that significantly decrease the natural light to benthic communities and other marine life.<br>5. Materials that result in aesthetically undesirable discoloration of the ocean surface. |

| Basin Plan / Ocean Plan | Water Quality Objective |
|---|---|
| ISWEBE Plan | No water quality objective applicable to trash. |

### Current NPDES Permits and Existing Trash TMDLs

The CWA establishes the NPDES permit as the primary mechanism for achieving water quality standards in navigable waters. NPDES permits are issued to point source dischargers and include effluent and receiving water limitations. Effluent limitations are based on the water quality objectives in the applicable basin plan and are designed to attain and maintain water quality standards in the receiving waters. Currently, existing NPDES permits, such as MS4 Phase I, MS4 Phase II, and Caltrans, have some existing requirements for trash reduction in the form of institutional controls, such as street sweeping and educational programs. These existing requirements can be applicable to multiple types of urban storm water pollutants, including trash.

For those waters that do not attain water quality standards even after NPDES permits are issued to point sources with the effluent limitations described above, the CWA requires states to adopt TMDLs for the pollutants causing the impairment in a water body. TMDLs are designed to restore water quality by controlling the pollutants that cause or contribute to such excursions. A TMDL assigns waste load allocations for specific pollutants to point sources discharging effluent pursuant to the terms and conditions of NPDES permits. A TMDL also assigns load allocations to nonpoint source discharges. Attainment of all load and waste load allocations would, in most cases, result in compliance with the water quality standards within a reasonable time period.

Additionally, discharges not subject to NPDES permits are regulated under Porter-Cologne through WDRs, ~~W~~waivers of WDRs, and prohibitions of discharge. WDRs are issued by regional water boards and are issued individually for a specific discharge or generally to cover a category of discharges. WDRs may include effluent limitations or other requirements designed to implement applicable water quality control plans, and they may specify when and where a discharge of waste will not be permitted.

The presence of trash in California waters has resulted in a number of waters listed as impaired on the CWA ~~S~~section 303(d) list of Water Quality Limited Segments over the past several listing cycles. According to California's 2008-2010 ~~S~~section 303(d) list of impaired waters, there are 73 listings due to trash in California waters. These impairments will ultimately require some action to address the listing (e.g., TMDLs or other actions). According to the 2010 Integrated Report, 73 water bodies have approved TMDLs for impairments due to trash and debris. Although listings occur in four Regions (San Francisco Bay, Los Angeles, Colorado River Basin, and San Diego), TMDLs have only been developed to date in the Los Angeles Region and the Colorado River Basin Region. In the Colorado River Basin, a TMDL for trash was adopted for the New River (at the international boundary) that included a numeric target of zero trash (Colorado River Basin Water Board 2006). In the Los Angeles Region, fifteen TMDLs were adopted for trash and debris by either the Los Angeles Water Board or U.S. EPA: East Fork San Gabriel River, Ballona Creek and Wetland, Los Angeles River Watershed, Revolon Slough, Beardsley Wash, Ventura River Estuary, Malibu Creek Watershed,

Lake Elizabeth, Munz Lake, Lake Hughes, Legg Lake, Machado Lake, Santa Monica Bay Nearshore and Offshore, Peck Road Park Lake, Echo Park Lake, and Lincoln Park Lake (Table 16; Los Angeles Water Board 2000; 2004; 2007a; 2007b; 2007c; 2007d; 2007e; 2007f; 2008g; 2010, U.S. EPA 2012a).

The Los Angeles Water Board's trash and debris TMDLs set the numeric target for trash in the applicable water bodies to zero, as derived from the water quality objective in the basin plans. The TMDLs have all also defined trash to be "man-made litter," as defined by the California Government Code (§ 68055.1(g)). Implementation plans vary slightly but are mostly based on phased percent reduction goals that can be achieved through discharge permits, BMPs, and structural controls.

**Table 16.** Existing Trash and Debris TMDLs.

| TMDL Name (Year TMDL Effective) | Numeric Target | Implementation |
|---|---|---|
| **Los Angeles Water Board** | | |
| Santa Monica Bay Near and Offshore (2012) | 0 (zero) trash and plastic pellets | For trash, the TMDL recommended implementation of full capture systems, MFAC program, or nonstructural BMPs (e.g., trash collection, public education, and bans on certain non-degradable items). For plastic pellets, industries must comply with the Statewide Industrial Permit or other general or individual industrial permits, which require a Stormwater Pollution Prevention Plan. |
| Peck Road, Lincoln Park, and Echo Park Lakes (2012) | 0 (zero) trash | Recommended implementation of full capture systems, MFAC program, or nonstructural BMPs (e.g., trash collection, public education, and bans on certain non-degradable items). |
| Malibu Creek (2009) | 0 (zero) trash | 100% reduction, 8 years from effective date of TMDL using full capture systems or MFAC program for point sources; MFAC or appropriate alternative program for nonpoint sources |
| Lake Elizabeth, Munz Lake, and Lake Hughes (2008) | 0 (zero) trash | 10% reduction after third year and 20% per year thereafter using full capture systems or MFAC program for point sources; MFAC or appropriate alternative program for nonpoint sources |
| Legg Lake (2008) | 0 (zero) trash | 100% reduction, 8 years from effective date of TMDL using full capture systems or MFAC program for point sources; MFAC or appropriate alternative program for nonpoint sources |
| Los Angeles River (2008) | 0 (zero) trash | 40% reduction after first year and 10% per year thereafter using any combination of full/partial capture systems or institutional controls |
| Machado Lake (2008) | 0 (zero) trash | Full capture systems or MFAC program for point sources; MFAC or appropriate alternative program for nonpoint sources |

| | | |
|---|---|---|
| Revolon Slough and Beardsley Wash (2008) | 0 (zero) trash | 100% reduction, 8 years from effective date of TMDL<br>Full capture systems or MFAC program for point sources; MFAC or appropriate alternative program for nonpoint sources |
| Ventura River (2008) | 0 (zero) trash | 100% reduction, 8 years from effective date of TMDL using full capture systems or MFAC program for point sources; MFAC or appropriate alternative program for nonpoint sources |
| Ballona Creek and Wetland (2005) | 0 (zero) trash | Phased reduction of 10% per year over a 10-year period using capture systems (e.g., catch basin inserts, structural vortex separation system, end of pipe nets) and/or institutional measures (e.g., street sweeping, enforcement of litter laws) |
| East Fork San Gabriel River (2001) | 0 (zero) trash | Litter prevention, trash sweeps, patrol staff enforcing litter laws, trash receptacles and signs |
| **Colorado River Basin Water Board** | | |
| New River (2007) | 0 (zero) trash | 75% reduction within 2 years from effective date of TMDL; 100% reduction within 3 years. |

The San Francisco Bay Water Board uses provisions in the San Francisco Bay ~~Area~~ MRP to address trash in the 27 303(d) listed water bodies in the Region (Order R2-2009-0074). The San Francisco Bay MRP applies to 76 large, medium and small municipalities and flood control agencies in the San Francisco Bay Region. The San Francisco Bay ~~Area~~ MRP 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." The trash-related receiving water limitations identified in the San Francisco Bay ~~Area~~ MRP do not place numeric targets on trash but use narrative language to prohibit trash discharges. In the San Francisco Bay MRP, trash is as defined in the California Government Code ~~S~~section 68055.1(g).

Compliance with the discharge prohibition and trash-related Receiving Water Limitations is met through a timely implementation of control measures, BMPs, and any trash reduction ordinances or mandatory full trash capture devices to reduce trash loads from MS4s by set percent reductions (San Francisco Water Board 2009). The San Francisco Bay ~~Area~~ MRP requires that permittees reduce trash from their storm sewer systems by 40 percent by July 1, 2014. The San Francisco Bay MRP permittees are developing and implementing a Short-Term Trash Load Reduction Plan. The implementation of the Short-Term Trash Load Reduction Plan includes a mandatory minimum level of trash capture systems, cleanup and abatement progress on a

mandatory minimum number of Trash Hot Spots[24], and implementation of other control measures and BMPs, such as trash reduction ordinances, to prevent or remove trash loads from MS4s to attain a 40 percent reduction in trash loads by July 1, 2014 (City of Cupertino 2012, City of San Jose 2012).

**State Policy Efforts**

In response to the increasing problem of trash within the state, particularly plastic trash, policymakers have initiated efforts such as the California Ocean Protection Council's Resolution on Reducing and Preventing Marine Debris (2007) and subsequent Implementation Strategy for Reducing Marine Litter (2008). These policies respectively call for target reductions of trash within a set timeline, and prioritize state efforts for source reduction of "worst offender" plastic trash, such as cigarette butts, plastic bottle caps, plastic bags, and polystyrene. The Implementation Strategy also prioritizes extended producer responsibility for packaging waste, which has already been embraced in Canada, the EU, and other countries (California Ocean Protection Council 2007; 2008). Neither the California Ocean Protection Council Resolution nor the Implementation Strategy details methodologies for decreasing trash in the context of NPDES storm water permitting or other federal and state clean water laws.

In 2013, the West Coast Governor's Alliance on Ocean Health introduced a Marine Debris Strategy. The objectives of the Strategy are to prevent marine debris from entering the ocean or littering beaches; maximize recovery of marine debris in the ocean or on shore; reduce and prevent the negative impacts of marine debris; and enhance existing efforts through communication and collaboration among interested parties on the West Coast. The Strategy provides a toolbox of key actions that may be implemented collaboratively or individually by western states at its discretion and allows for the successful achievement of target milestones through various reduction methods.

[24] Trash Hot Spots are to be cleaned up to a level of "no visual impact" at least one time per year for the term of the permit. Trash Hot Spots shall be at least 100 yards of creek length or 200 yards of shoreline length.

# APPENDIX B: ENVIRONMENTAL CHECKLIST

## Background

**PROJECT TITLE**: Amendment~~s~~ to the ~~Statewide~~ Water Quality Control Plan~~s~~ for the Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California ~~to Control Trash~~

**LEAD AGENCY:** State Water Recourses Control Board

Division of Water Quality

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**PROJECT LOCATION:** Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California, and Water Quality Control Plan for Ocean Waters of California.

**DESCRIPTION OF PROJECT**: The State Water Board is proposing ~~Amendments to Statewide Water Quality Control Plans to Control Trash (Trash Amendments)~~ an Amendment to the Water Quality Control Plan for Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. The amendment to control trash and Part 1 Trash Provisions are collectively referred to as the "Trash Amendments".[25] ~~proposes to adopt the Trash Amendments into both the Ocean Plan and the~~

[25] The State Water Board intends to amend the Water Quality Control Plan for Enclosed Bays and Estuaries of California to create the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California Plan (ISWEBE Plan). The State Water Board intends that the Part 1 Trash Provisions will be incorporated into the ISWEBE Plan, once it is adopted.

~~forthcoming ISWEBE Plan.~~ The provisions proposed in the proposed final Trash Amendments include six elements: (1) water quality objective, (2) applicability, (~~2~~3) prohibition of discharge, (~~3~~4) implementation provisions, (5~~4~~) time schedule, ~~(5) a time extension option for State Water Board consideration~~, and (6) monitoring and reporting requirements. The proposed provisions would apply to all surface waters of the state, with the exception of those waters within the jurisdiction of the Los Angeles Water Board with trash or debris TMDLs that are in effect prior to the effective date of the Trash Amendments.

The State Water Board's project objective for the proposed final Trash Amendments is to address the impacts of trash on surface water bodies across California (with the exception of those waters within the jurisdiction of the Los Angeles Water Board with trash or debris TMDLs that are in effect prior to the effective date of the Trash Amendments) through development of a statewide plan governing trash. The project objective for the proposed final Trash Amendments is to provide statewide consistency for the Water Boards' regulatory approach to protect aquatic life and public health beneficial uses, and reduce environmental issues associated with trash in state waters, while focusing limited resources on high trash generating areas.

The reasonably foreseeable methods of compliance with the proposed final Trash Amendments are described in Section 5, and the environmental effects are described in Section 6 of the ~~Draft~~ proposed Final Staff Report. The reasonably foreseeable methods of compliance are addressed by type of trash-control method, namely: treatment controls (e.g., catch basin inserts, vortex separation systems, trash nets, and Gross Solids Removal Devices), institutional controls (e.g., enforcement of litter laws, street sweeping, storm drain cleaning, public education, and ordinances), and LID and multi-benefit projects.

## Environmental Impacts

The environmental factors checked below could be potentially affected by this project. See the Section 6 of the ~~Draft~~ proposed Final Staff Report for more details.

| | | | | | |
|---|---|---|---|---|---|
| ☐ | Aesthetics | ☐ | Agriculture and Forestry Resources | ☑ | Air Quality |
| ☑ | Biological Resources | ☑ | Cultural Resources | ☑ | Geology/Soils |
| ☑ | Greenhouse Gas Emissions | ☑ | Hazards & Hazardous Materials ☐ Energy and Mineral Resources | ☑ | Hydrology/Water Quality |
| ☑ | Land Use/Planning | ☐ | Mineral Resources | ☑ | Noise |
| ☐ | Population/Housing | ☑ | Public Services | ☐ | Recreation |
| ☑ | Transportation/Traffic | ☑ | Utilities/Service Systems | ☐ | Mandatory Findings of Significance |

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|

AESTHETICS. Would the project:

| | | | | | |
|---|---|---|---|---|---|
| a) | Have a substantial adverse effect on a scenic vista? | ☐ | ☐ | ☑ | ☐ |
| b) | Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | ☐ | ☐ | ☐ | ☑ |
| c) | Substantially degrade the existing visual character or quality of the site and its surroundings? | ☐ | ☐ | ☑ | ☐ |
| d) | Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☐ | ☑ |

Although the proposed final Trash Amendments do not require land alteration, it is expected that some minimal land alteration would be associated with several of the reasonably foreseeable methods of compliance. While compliance may require the installment of full capture systems, it is unlikely that the aesthetics of the natural environment would be adversely affected by improvements to existing infrastructure.

The general aesthetic characteristic of those portions of the state where the proposed final Trash Amendments would be implemented are densely urbanized. Implementing trash reduction measures should reduce the visual effects of litter generated within the jurisdiction and should reduce the visual effects of the high volumes of trash that collect downstream from the upstream sources. Trash may collect near storm water inlets where capture devices block trash from entering the storm water system. The amount of trash that may accumulate at these locations should not differ from baseline conditions, and the trash accumulating would not be entering the storm water system. Increased street sweeping and other institutional controls could lessen the amount of trash near storm water drop inlets, decreasing the amount of trash that may accumulate. Implementation of the proposed final Trash Amendments would eventually improve the overall aesthetic appeal of the state by the removal of visible trash, thus resulting in a positive impact.

Since vortex separation system units and catch basin inserts would be installed within already existing storm drain networks, it is also not foreseeable that the installation of a vortex separation system or catch basin insert would substantially damage scenic resources and/or degrade the existing visual character or quality of any particular location and its surroundings. It is not foreseeable that the installation activities associated with these units would result in any substantial adverse effect on the scenic vistas of the location. Catch basin insert are unlikely to create an aesthetically offensive site after installation because they are installed at street level.

Installation of in-line trash nets would not foreseeably obstruct scenic vistas or opens views to the public as their installation will be limited to locations within the storm drain system and not in open channels. To the extent that a particular control at a particular site could obstruct scenic views, such an impact could be avoided by employing non-

structural controls such as increased litter enforcement. End-of-Pipe trash nets are surface devices and could impair the aesthetics of the installation site. This impairment could be alleviated by employing alternative structural devices, such as in-line trash nets, or by employing nonstructural controls, such as increased litter enforcement. Trash nets could also become targets of vandalism. Improved security measures and enforcement of anti-vandalism regulations could decrease instances of vandalism.

Gross Solids Removal Devices are subsurface devices and, as such, would not foreseeably obstruct scenic vistas or open views after installation. The installation of Gross Solids Removal Devices, however, may affect the aesthetics of the installation site. This effect on aesthetics could be lessened by using construction BMPs, such as screening off the construction site. Standard architectural and landscape architectural practices can be implemented to reduce impacts from aesthetically offensive structural impacts. Any effects would be short-term and not be considered to substantially degrade the existing visual character or quality of the site and its surroundings.

Gross Solids Removal Devices, as well as trash nets, could also become targets of vandalism. Vandalized structures may become an aesthetically offensive site. Vandalism, however, already exists to some degree in most urbanized areas and adding new structures are not likely to have any impact upon current vandalism trends over baseline conditions. Improved security measures and enforcement of anti-vandalism regulations could decrease instances of vandalism.

Neither increased street sweeping, enforcement of litter laws, ordinances, nor public education result in impairment of scenic and open views. Rather, these alternatives would pose a positive aesthetic impact by reducing visible trash.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| AGRICULTURAL AND FOREST RESOURCES. In determining whether impacts to agricultural resources are significant environmental impacts, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project: | | | | |
| a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping & Monitoring Program of the California Resources Agency, to non-agricultural uses? | ☐ | ☐ | ☐ | ☑ |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☐ | ☑ |

| | | | | |
|---|---|---|---|---|
| c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined by Public Resources Code section 4526)? | ☐ | ☐ | ☐ | ☑ |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☑ |
| e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☑ |

The proposed final Trash Amendments would not affect agriculture or farmland as they do not alter zoning laws or require conversions to different land uses. Significant trash generation is not expected on agricultural or forestry lands, therefore the use of structural BMPs is not likely in these areas.

Increased street sweeping would be implemented in currently urbanized areas, and it is unlikely that this implementation would cause the removal, disturbance or change in agricultural or forest resources. The implementation would not result in new population or employment growth at the extent that could create a need for new housing development on agricultural or forest land. The implementation also would not require any off-site road improvements or other infrastructure that could result in conversion of farmland to non-agricultural use or forest land to non-forest use.

Enforcements of litter laws, ordinances, and public education would be implemented in currently urbanized areas. There are no foreseeable impacts on agricultural or forest resources.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|

AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

| | | | | |
|---|---|---|---|---|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☑ | ☐ | ☐ |
| b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | ☐ | ☑ | ☐ | ☐ |
| c) Expose sensitive receptors to substantial pollutant concentrations? | ☐ | ☐ | ☑ | ☐ |

| | | | | |
|---|---|---|---|---|
| d) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)? | ☐ | ☑ | ☐ | ☐ |
| e) Create objectionable odors affecting a substantial number of people? | ☐ | ☑ | ☐ | ☐ |

Potential impacts to air quality due to implementation of the proposed final Trash Amendments are discussed in Section 6.2 Air Quality of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| BIOLOGICAL RESOURCES. Would the project: | | | | |
| a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☑ | ☐ | ☐ |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☑ | ☐ |
| c) Have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the federal Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, *etc.*) through direct removal, filling, hydrological interruption or other means? | ☐ | ☐ | ☑ | ☐ |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites? | ☐ | ☑ | ☐ | ☐ |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☐ | ☑ | ☐ |

| | | | | |
|---|---|---|---|---|
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | ☐ | ☐ | ☑ | ☐ |

Potential impacts to biological resources due to implementation of the proposed final Trash Amendments are discussed in Section Installation and maintenance of full capture systems and treatment controls could result in potentially significant environmental effects with regard to air quality. Measures, however, can be applied to reduce and/or eliminate these impacts, as described above. These measures are within the responsibility and jurisdiction of the responsible agencies subject to the proposed final Trash Amendments and can or should be adopted by them. The State Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The State Water Board does, however, recommend that appropriate measures be applied to reduce or avoid potential environmental impacts. Although this analysis concludes that, based on substantial evidence on the record, on a statewide level analysis, all impacts would be less than significant with mitigation; it is foreseeable that these measures may not always be capable of reducing these impacts to levels that are less than significant in every conceivable instance. Although there is no information on the record that this would occur, in the event that a specific measure or alternative may not reduce impacts to levels that are less than significant, the project proponent may need to consider an alternative strategy or combination of strategies to comply with the proposed final Trash Amendments. All foreseeable methods of compliance listed above would not be of the size or scale to result in alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally.

6.3 of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| CULTURAL RESOURCES. Would the project: | | | | |
| a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5? | ☐ | ☑ | ☐ | ☐ |
| b) Cause a substantial adverse change in the significance of an archaeological resource as defined in § 15064.5? | ☐ | ☑ | ☐ | ☐ |
| c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☑ | ☐ | ☐ |
| d) Disturb any human remains, including those interred outside of formal cemeteries? | ☐ | ☑ | ☐ | ☐ |

Potential impacts to cultural resources due to implementation of the proposed final Trash Amendments are discussed in Section 6.4 Cultural Resources of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| GEOLOGY and SOILS. Would the project: | | | | |
| a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| i) Rupture of a known earthquake fault, as delineated in the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines & Geology Special Publication 42. | ☐ | ☐ | ☐ | ☑ |
| ii) Strong seismic ground shaking? | ☐ | ☐ | ☐ | ☑ |
| iii) Seismic-related ground failure, including liquefaction? | ☐ | ☑ | ☐ | ☐ |
| iv) Landslides? | ☐ | ☐ | ☐ | ☑ |
| b) Result in substantial soil erosion or the loss of topsoil? | ☐ | ☑ | ☐ | ☐ |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse? | ☐ | ☐ | ☐ | ☑ |
| d) Be located on expansive soils, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | ☐ | ☐ | ☐ | ☑ |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternate wastewater disposal systems where sewers are not available for the disposal of wastewater? | ☐ | ☐ | ☐ | ☑ |

Potential impacts to geological and soil resources due to implementation of the ~~draft~~ proposed final Trash Amendments are discussed in Section 6.5 Geology/Soils of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| GREENHOUSE GAS EMISSIONS. Would the project: | | | | |
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ❒ | ☑ | ❒ | ❒ |

| | | | | |
|---|---|---|---|---|
| b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases? | ❒ | ❒ | ❒ | ☑ |

Potential impacts from greenhouse gas emissions due to implementation of the proposed final Trash Amendments are discussed in Section

6.6 Greenhouse Gas Emissions of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| HAZARDS and HAZARDOUS MATERIALS. Would the project: | | | | |
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | ☐ | ☑ | ☐ | ☐ |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | ☐ | ☑ | ☐ | ☐ |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school? | ☐ | ☑ | ☐ | ☐ |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or to the environment? | ☐ | ☑ | ☐ | ☐ |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard for people residing or working in the project area? | ☐ | ☑ | ☐ | ☐ |
| f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? | ☐ | ☑ | ☐ | ☐ |
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☑ | ☐ | ☐ |
| h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? | ☐ | ☐ | ☐ | ☑ |

Potential impacts from hazards or hazardous materials due to implementation of the proposed final Trash Amendments are discussed in Section 6.7 Hazards and Hazardous Materials of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| HYDROLOGY and WATER QUALITY. Would the project: | | | | |
| a) Violate any water quality standards or waste discharge requirements? | ☐ | ☐ | ☐ | ☑ |
| b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (*e.g.*, the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? | ☐ | ☐ | ☐ | ☑ |
| Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? | ☐ | ☐ | ☐ | ☑ |
| Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? | ☐ | ☑ | ☐ | ☐ |
| Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff? | ☐ | ☐ | ☐ | ☑ |
| Otherwise substantially degrade water quality? | ☐ | ☐ | ☑ | ☐ |
| Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | ☐ | ☐ | ☐ | ☑ |
| Place within a 100-year flood hazard area structures which would impede or redirect flood flows? | ☐ | ☐ | ☐ | ☑ |
| Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam? | ☐ | ☐ | ☐ | ☑ |
| Inundation by seiche, tsunami, or mudflow? | ☐ | ☐ | ☐ | ☑ |

Potential impacts to hydrology and water quality due to implementation of the proposed final Trash Amendments are discussed in Section

6.8 Hydrology/Water Quality of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| LAND USE AND PLANNING. Would the project: | | | | |
| a) Physically divide an established community? | ☐ | ☐ | ☐ | ☑ |
| b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? | ☐ | ☐ | ☑ | ☐ |
| c) Conflict with any applicable habitat conservation plan or natural community conservation plan? | ☐ | ☐ | ☐ | ☑ |

Potential impacts to land use and planning due to implementation of the proposed final Trash Amendments are discussed in Section

6.9 Land Use/Planning of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| MINERAL RESOURCES. Would the project: | | | | |
| a) Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State? | ☐ | ☐ | ☐ | ☑ |
| b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | ☐ | ☐ | ☐ | ☑ |

The proposed final Trash Amendments will not have a substantial impact on mineral resources. Any mineral resources that may occur within areas chosen for the installation of structural controls will have already been made unavailable by the existence of the current land uses and related infrastructure. Implementation of the proposed final Trash Amendments will not further impact any potential mineral resources.

| | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No |
|---|---|---|---|---|

| Issues (and Supporting Information Sources): | | | | Impact |
|---|---|---|---|---|
| **NOISE. Would the project result in:** | | | | |
| a) Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☑ | ☐ | ☐ |
| b) Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels? | ☐ | ☑ | ☐ | ☐ |
| c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? | ☐ | ☐ | ☐ | ☑ |
| d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? | ☐ | ☑ | ☐ | ☐ |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing in or working in the project area to excessive noise levels? | ☐ | ☑ | ☐ | ☐ |
| f) For a project within the vicinity of a private airstrip, would the project expose people residing in or working in the project area to excessive noise levels? | ☐ | ☑ | ☐ | ☐ |

Potential noise impacts due to implementation of the proposed final Trash Amendments are discussed in Section 6.10 Noise and Vibration of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **POPULATION AND HOUSING. Would the project:** | | | | |
| a) Induce substantial population growth in an area either directly (*e.g.*, by proposing new homes and businesses) or indirectly (*e.g.*, through extension of roads or other infrastructure)? | ☐ | ☐ | ☐ | ☑ |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☑ |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☑ |

The proposed final Trash Amendments would not induce population growth, affect housing, or displace individuals. See also Section 7.1 Growth-Inducing Impacts of the ~~Draft~~ proposed Final Staff Report for further discussion.

Vortex separation systems (i.e., Continuous Deflective Separation units) are installed below grade and are appropriate for highly urbanized areas where space is limited. The installation of vortex separation systems may require modification of storm water conveyance structures. These devices can be installed in existing storm drain infrastructure, therefore, no additional land is required nor is there a need to displace existing housing. Maintenance of the vortex separation system involves the removal of the solids either by using a vactor truck, a removable basket or a clam shell excavator depending on the design and size of the unit. Therefore, it is not reasonably foreseeable that the installation and maintenance of vortex separation systems would directly or indirectly induce population growth, displace people or existing housing, or create a demand for additional housing. To the extent that these devices, if employed, would displacement of available housing, it is not reasonably foreseeable that the responsible agencies would install such a device. Rather, an agency would foreseeably opt for non-structural control measures, such as enforcing litter ordinances.

The Gross Solids Removal Devices were developed by Caltrans to be retrofitted below grade into existing highway drainage systems or installed in future highway drainage systems. These devices are appropriate for highly urbanized areas where space is limited. The Gross Solids Removal Devices can be designed to accommodate vehicular loading. Maintenance of the devices involves the removal of the solids either by using a vactor truck or other equipment. The installation of Gross Solids Removal Devices may require modification of storm water conveyance structures; however, these units would generally be sited below grade and within existing storm drain infrastructure. The installation of Gross Solids Removal Devices is not expected to require additional land nor is there a need to displace existing housing. To the extent that these devices, if employed, may conceivably require the displacement of available housing, it is not reasonably foreseeable that the responsible agencies would install such a device. Rather, an agency would foreseeably opt for non-structural control measures, such as enforcing litter ordinances.

It is not reasonably foreseeable that the installation and maintenance of trash nets or catch basin inserts would induce population growth, displace people or existing housing or create a demand for additional housing. These units are installed entirely within existing storm drain infrastructure.

It is not reasonably foreseeable that increased street sweeping would induce population growth, displace people or existing housing or create a demand for additional housing. Current street sweeping, whether infrequent or frequent, does not have this effect. It is not reasonably foreseeable that enforcement of litter laws would induce population growth, displace people or existing housing or create a demand for additional housing. Current litter laws do not have this effect. It is not reasonably foreseeable that public education and ordinances would induce population growth, displace people or existing housing or create a demand for additional housing.

Less Than
Significant With

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|

PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service rations, response times or other performance objectives for any of the public services:

| | | | | | |
|---|---|---|---|---|---|
| a) | Fire protection? | ☐ | ☑ | ☐ | ☐ |
| b) | Police protection? | ☐ | ☑ | ☐ | ☐ |
| c) | Schools? | ☐ | ☐ | ☐ | ☑ |
| d) | Parks? | ☐ | ☐ | ☐ | ☑ |
| e) | Other public facilities? | ☐ | ☐ | ☐ | ☑ |

Because of the expected location of the proposed project and reasonably foreseeable methods of compliance, it is not expected to be in the vicinity of or affect the objectives for schools, parks, or other public facilities. Potential impacts to fire and police protection public services due to implementation of the proposed final Trash Amendments are discussed in Section

6.11 Public Services of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|

RECREATION. Would the project:

| | | | | |
|---|---|---|---|---|
| a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☑ | ☐ |
| b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment? | ☐ | ☐ | ☑ | ☐ |

The proposed final Trash Amendments would not have a substantial impact on recreation.

Treatment controls (e.g., vortex separation systems, catch basin inserts, etc.), can be installed at or below grade in existing storm drain systems, which should not require any additional land. Therefore, it is not reasonably foreseeable that park land, recreational of open space areas will be needed for the installation of structural controls.

Installation of treatment controls may temporarily impact the usage of existing recreational sites. For instance, bike lanes or parking locations for recreational facilities may be temporarily unavailable during installation of structural controls. These potential impacts will be short in duration and have a less-than-significant effect on recreation.

It is not reasonably foreseeable that increased street sweeping, enforcement of litter laws, ordinances, or public education would impact the quality or quantity of existing recreational opportunities. In addition, implementation of the proposed final Trash Amendments is designed to improve the quality of the affected water bodies and associated beaches and shorelines. This will likely create a positive impact and increase recreational opportunities throughout the watersheds.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| TRANSPORTATION / TRAFFIC. Would the project: | | | | |
| a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? | ☐ | ☑ | ☐ | ☐ |
| b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways? | ☐ | ☑ | ☐ | ☐ |
| c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks? | ☐ | ☐ | ☐ | ☑ |
| d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☐ | ☑ |
| e) Result in inadequate emergency access? | ☐ | ☑ | ☐ | ☐ |
| f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? | ☐ | ☑ | ☐ | ☐ |

Potential impacts to transportation/traffic due to implementation of the proposed final Trash Amendments are discussed in Section 6.12 Transportation/Traffic of the ~~Draft~~ proposed Final Staff Report.

| | Potentially | Less Than Significant With Mitigation | Less Than |
|---|---|---|---|

| Issues (and Supporting Information Sources): | Significant Impact | Incorporated | Significant Impact | No Impact |
|---|---|---|---|---|
| **UTILITIES AND SERVICE SYSTEMS.** Would the project: | | | | |
| a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? | ☐ | ☐ | ☐ | ☑ |
| b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts? | ☐ | ☐ | ☐ | ☑ |
| c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental impacts? | ☐ | ☑ | ☐ | ☐ |
| d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? | ☐ | ☐ | ☐ | ☑ |
| e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? | ☐ | ☐ | ☐ | ☑ |
| f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? | ☐ | ☐ | ☑ | ☐ |
| g) Comply with federal, state, and local statutes and regulations related to solid waste? | ☐ | ☐ | ☐ | ☑ |

Potential impacts related to storm drainage to implementation of the proposed final Trash Amendments are discussed in Section 6.13 Utilities/Service Systems of the ~~Draft~~ proposed Final Staff Report.

| Issues (and Supporting Information Sources): | Potentially Significant Impact | Less Than Significant With Mitigation Incorporated | Less Than Significant Impact | No Impact |
|---|---|---|---|---|
| **MANDATORY FINDINGS OF SIGNIFICANCE.** | | | | |
| a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? | ☐ | ☑ | ☐ | ☐ |

| | | | | |
|---|---|---|---|---|
| b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects) | ☐ | ☑ | ☐ | ☐ |
| c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☑ | ☐ | ☐ |

The proposed final Trash Amendments would neither degrade the environment nor adversely affect cultural resources. The installation of structural controls may temporarily impact environmental resources, but as discussed in Section 6 of the ~~Draft~~ proposed Final Staff Report, implementation of the mitigation measures identified in the draft SED should reduce potential impacts to less-than significant levels.

As discussed in Section 7.2 Cumulative Impacts Analysis of the ~~Draft~~ proposed Final Staff Report, adoption of the proposed final Trash Amendments would not result in significant cumulatively considerable impacts with implementation of mitigation measures. The overall effect of the proposed final Trash Amendments would be a reduction in the amount of trash entering the State's water bodies thereby improving water quality and protecting the beneficial uses of those waters.

The proposed final Trash Amendments would not, in any way, cause substantial adverse effects on human beings. Where temporary effects have been identified in the ~~Draft~~ proposed Final Staff Report (i.e., transportation/traffic), mitigation measures have also been identified to reduce those impacts to less-than-significant levels.

# APPENDIX C: ECONOMIC CONSIDERATIONS FOR THE PROPOSED FINAL AMENDMENT~~S~~ TO THE ~~STATEWIDE~~ WATER QUALITY CONTROL PLAN~~S~~ FOR THE OCEAN WATERS OF CALIFORNIA TO CONTROL TRASH AND PART 1 TRASH PROVISIONS OF THE WATER QUALITY CONTROL PLAN FOR INLAND SURFACE WATERS, ENCLOSED BAYS, AND ESTUARIES OF CALIFORNIA ~~TO CONTROL TRASH~~

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## Summary and Findings

California communities spend more than $428 million annually to control trash from entering waters of the state, or $10.71 per capita. This economic analysis estimates that between $2.93 and $7.77 more per resident might need to be spent each year for the next ten years to implement the proposed final Trash Amendments. The economic analysis also finds that communities in the Los Angeles Region implementing a trash and debris Total Maximum Daily Load (TMDL) are spending an average of $5.3 per resident per year more than communities not implementing a trash or debris TMDL.

This economic analysis provides an estimate of the compliance costs and considers the incremental costs applicable National Pollutant Discharge Elimination System (NPDES) permitted storm water dischargers and other dischargers may need to incur based on the implementation provisions and time schedules in the proposed final Trash Amendments. The NPDES storm water permits addressed in this economic analysis include Municipal Separate Storm Sewer Systems (MS4s) Phase I and Phase II, Department of Transportation (Caltrans), Industrial General Permit (IGP), and the Construction General Permit (CGP).

Two basic methods[26] to estimate the incremental cost of compliance were used in this economic analysis. The first method is based on cost of compliance per capita, and the second method is based on land cover.

The estimated incremental annual cost to comply with the requirements of the proposed final Trash Amendments ranged from $4[27] to $10.67[28] per year per capita for MS4 Phase I NPDES permittees and from $7.77[29] to $7.91[30] per year per capita for smaller communities regulated

[26] The introduction includes a more detailed description of the methods used in this economic analysis.

[27] The estimated incremental cost of $4.09 is based on a mixture of full capture systems and institutional controls. See Table 18 ($67 M divided by a population of 16.4 M).

[28] The estimated cost is based on all capital expenditures occurring in one single year. See Table 13 ($176 M divided by a population of 16.4 M).

[29] The estimated incremental cost of $7.77 is based on a mixture of full capture systems and institutional controls. See Table 25 ($32.9 M divided by a population of 4.2 M).

under MS4 Phase II NPDES permits. For IGP facilities, the estimated compliance cost is $33.9 million or $3,671[31] per facility. Caltrans currently spends $52 million on trash control[32]. To comply with the proposed final Trash Amendments, expenditures by Caltrans are estimated to increase by ~~$37~~ $34.5 million in total capital costs and ~~$15~~ $14.7 million per year for operation and maintenance of structural controls[33]. A summary of the findings are presented in Table 1 with detailed discussion in body of the economic analysis.

In addition to employing trash control, permittees would need to prepare implementation plans and submit monitoring reports. Cost associated with implementation plans and monitoring and reports were not included in this analysis due to the uncertainty of the costs of implementing these new requirements.

This economic analysis fulfills the requirements of Water Code sections 13170 and 13241, subdivision (d) that require the State Water Board to consider economics when establishing water quality objectives. This economic analysis is not a cost-benefit analysis, but a consideration of potential costs of a suite of reasonably foreseeable measures to comply with the proposed final Trash Amendments.

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[30] The estimated cost is based on all capital expenditures occurring in one single year. See Table 21 ($33.5 M divided by a population of 4.2 M).

[31] See Table 28 and Table 30. Total cost divided by number of facilities.

[32] ~~Caltrans Press Release. April 25, 2013. Available at: http://www.dot.ca.gov/hq/paffairs/news/pressrel/13pr033.htm~~ McGowen, Scott. California Department of Transportation. Letter to Diana Messina, State Water Resources Control Board. November 7, 2014

[33] See Table 30.

**Table 1.** Summary of Estimated Compliance Costs of the Proposed **Final** Trash Amendments for NPDES Storm Water Permits

| NPDES Storm Water Permit | Number of Entities Accessed | Population /Size | Baseline of Current Trash Control Costs: Total and Per Capita Per Year | Estimated Incremental Cost for Track 1:Total and Per Capita Per Year | Estimated Incremental Cost for Track 2:Total and Per Capita Per Year (at Year 10) |
|---|---|---|---|---|---|
| **MS4 Phase I**<br>**(Based on per capita estimate approach)** | 193 communities | 16,498,556 | $160 M Total ($9.7 per capita)<br>$22 M for Full Capture System costs ($1.36 per capita)<br>$138 M Institutional Controls ($8.34 per capita) | **Highest Annual Incremental Cost** [a]:<br>$65 M (total)<br>$3.95 (per capita)<br>**Total Capital Cost** [b]**:**<br>$123M (total)<br>$7.47 (per capita)<br>**Operation & Maintenance:** $52.8 M per year<br>$3.20 (per capita) | $67,481,061<br>$4.09 per capita |
| **MS4 Phase II**<br>**(Based on per capita estimate approach)** | 148 communities | 4,310,345 | $49 M Total ($11.53 per capita)<br>$6.8 M for Full Capture System ($1.62 per capita)<br>$42 M Institutional Controls ($9.91 per capita) | **Highest Annual Incremental Cost**[a]:<br>$12.4 M (total)<br>$2.93 (per capita)<br>**Total Capital Cost** [b]**:** $23.4M<br>$5.54 (per capita)<br>**Operation & Maintenance:** $10 M per year<br>$2.37 (per capita) | $32,922,053<br>$7.77 per capita |
| **MS4 Phase I and Phase II (Based on Land Coverage Approach)** | 262,302 acres of developed, high intensity land coverage | 20,736,141 | $209 M Total<br>($10.1 per capita)<br>$29 M for Full Capture System ($1.39 per capita)<br>$180 M Institutional Controls ($8.68 per capita) | **Highest Annual Incremental Cost**[a]:<br>$81 M (total)<br>$3.93 (per capita)<br>**Total Capital Cost** [b]**:**<br>$188.6 M (total)<br>$9.1 (per capita)<br>**Operation & Maintenance:** $80.8 M per year<br>$3.90 (per capita per year) | Not Estimated |

| | | | | | |
|---|---|---|---|---|---|
| **Industrial General Permit** | 9,251 facilities | N/A | Unknown | $33.9 M[d]<br><br>$3,671 per facility | |
| **Construction General Permit** | 6,121 facilities | N/A | Unknown | No expected increase | No expected increase |
| **Caltrans** | N/A | ~~55,000 miles~~ 50,000 lane miles (15,000 centerline miles) | ~~$52~~ $80 M per year | **Total Capital Cost:** ~~$37~~ $34.5M<br><br>**Operation & Maintenance:** ~~$16~~ $14.7 M per year | N/A |

[a] Annual cost at Year 10 (highest cost year) is assumed to be 10% of the total capital cost plus the total operation and maintenance cost for treatment controls.

[b] Total capital costs are incremental total costs to achieve full compliance with the proposed final Trash Amendments.

[c] Operation and maintenance costs are annual costs after full installation of all required treatment controls.

[d] Since the current baseline costs are unknown, all trash control costs are conservatively assumed to be incremental.

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## 1. INTRODUCTION

The presence of trash in surface waters, especially coastal and marine waters, is a serious issue in California. The State Water Resources Control Board (State Water Board) is proposing ~~Amendments to Statewide Water Quality Control Plans to Control Trash (Trash Amendments)~~ an Amendment to the Water Quality Control Plan for Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. This economic analysis shall collectively refer to the amendment to control trash and Part 1 Trash Provisions as "Trash Amendments".[34] The proposed final Trash Amendments would amend the Water Quality Control Plans for Ocean Waters of California (Ocean Plan) and be incorporated to the forthcoming Inland Surface Waters, Enclosed Bays, and Estuaries of California (ISWEBE Plan). The proposed final Trash Amendments aim to provide statewide consistency for the Water Boards' regulatory approach to protect aquatic life and public health beneficial uses, and reduce environmental issues associated with trash in state waters, while focusing limited resources on high trash generating areas.

The proposed final Trash Amendments would apply to all surface waters of the state: ocean waters, enclosed bays, estuaries, and inland surface waters, with the exception of those waters within the jurisdiction of the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) with trash or debris TMDLs that are in effect prior to the effective date of the Trash Amendments. The provisions proposed in the final Trash Amendments include six elements: (1) water quality objective, (2) applicability, (~~2~~3) prohibition of discharge, (~~3~~4) implementation provisions, (~~4~~5) time schedule, ~~(5) a time extension option for State Water Board consideration~~, and (6) monitoring and reporting requirements.

A central element of the proposed final Trash Amendments is a land-use based compliance approach to focus trash control to areas with high trash generation rates. Within this land-use based approach, a dual alternative compliance Track approach is proposed for permitted storm water dischargers (i.e., MS4 Phase I, MS4 Phase II, Caltrans, IGP, and CGP) to implement the prohibition of discharge for trash. Table 2 outlines the proposed alternative compliance Tracks for permitted storm water dischargers. Specifics of the proposed final Trash Amendments are described in Section 2 of the ~~Draft~~ proposed Final Staff Report.

[34] The State Water Board intends to amend the Water Quality Control Plan for Enclosed Bays and Estuaries of California to create the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California Plan (ISWEBE Plan). The State Water Board intends that the Part 1 Trash Provisions will be incorporated into the ISWEBE Plan, once it is adopted.

**Table 2.** Overview of Proposed Compliance Tracks for NPDES Storm Water Permits

| | Track 1 | Track 2 |
|---|---|---|
| **NPDES Storm Water Permit** | MS4 Phase I and II<br><br>IGP/CGP* | MS4 Phase I and II<br>Caltrans<br>IGP/CGP* |
| **Plan of Implementation** | Install, operate and maintain full capture systems in storm drains that capture runoff from one or more of the priority land uses/facility/site. | Implement a plan with a combination of full capture systems, multi-benefit projects, institutional controls, and/or other treatment controls to achieve full capture system equivalency. ~~institutional controls, and/or multi-benefit projects with same performance results of Track 1 with the MS4 jurisdiction/significant trash generating areas/facility/site.~~ |
| **Time Schedule** | 10 years from first implementing permit but no later than 15 years from the effective date of the ~~proposed~~ Trash Amendments.** | 10 years from first implementing permit but no later than 15 years from the effective date of the ~~proposed~~ Trash Amendments.** |
| **Monitoring and Reporting** | Demonstrate installation, operation, and maintenance of full capture systems and provide mapped location and drainage area served by ~~of~~ full capture systems.*** | Develop and implement set of monitoring objectives that demonstrate ~~mandated performance results,~~ effectiveness of the selected combination of ~~treatment and institutional~~ controls~~,~~ and compliance with full capture system equivalency ~~the equivalency to Track 1~~.*** |

* IGP/CGP permittees would first demonstrate inability to comply with the outright prohibition of discharge of trash.

** Any new development within the MS4 permittee's jurisdiction must be built to immediately comply with Track 1 or Track 2. MS4 permittees designated after the effective date of the implementing permit would be in full compliance ten years after the date of designation. Where a permitting authority makes a determination that a specific land use or location generates a substantial amount of trash, the permitting authority has the discretion to determine a time schedule with a maximum of ten years. IGP/CGP permittees would demonstrate full compliance with deadlines contained in the first implementing permit.

*** No trash monitoring requirements for IGP/CGP, however, IGP/CGP permittees would be required to report trash controls.

This economic analysis provides an estimate of the compliance costs and considers the incremental costs permitted storm water dischargers and other dischargers may need to incur based on the implementation provisions and time schedules proposed in the final Trash Amendments. The economic analysis was conducted under a set of assumptions identified in each section. All costs are expressed in February 2014 dollars, unless otherwise noted.

### a. Data Sources, Methodology and Assumptions, Limitations and Uncertainties

This analysis applies general economic principles and generally accepted methods of economic analysis. This section provides an overview of the data sources, a description of the methodology used, the assumptions and the limitations of the analysis.

**Data Sources**

The data used in this analysis has been obtained from secondary sources and previous studies conducted by universities and other organizations. All data and reports used are publicly available.

Data has been obtained primarily from three sources:

- Cost Considerations conducted for trash and debris TMDLs by the Los Angeles Water Board.
- Studies and surveys conducted by:
  - Kier Associates. The Cost of West Coast Communities of Dealing with Trash, Reducing Marine Debris. September 2012. Prepared for United States Environmental Protection Agency (U.S. EPA).
  - Kier Associates. Waste in Our Water: The Annual Cost to California Communities of Reducing Litter that Pollutes Our Waterways. August 2013. Prepared for the National Resources Defense Council (NRDC).
  - Black & Veatch. Quantification Study of Institutional Measures for Trash TMDL Compliance. November 2012. Prepared for the City of Los Angeles.
- Office of Water Programs, California State University. NPDES Stormwater Cost Survey. January 2005. Prepared for State Water Board.

The economic analysis used Federal 2010 Census data for estimates of land use, population and median household income. For other social and economic information, we relied on the information publicly released by the Demographic Research Unit of the California Department of Finance[35].

We compiled the available cost data and analyzed it by categories of costs[36]. Average and per capita costs were computed and tallied for each category based on the size of the communities. To control for anomalous spending patterns in communities, total annual expenditures were divided by total populations to yield weighted averages (within each population size group).

**Methodology and Assumptions**

This economic analysis provides a summary overview of the costs associated with reasonably foreseeable means of compliance permittees may select to be in compliance with the proposed final Trash Amendments. This economic analysis is conducted at the macro level to assess the estimated overall impact of the proposed final Trash Amendments. It does not specify the compliance cost for specific permittees. A more detailed analysis would be needed to estimate costs at the micro or project-specific level for each individual permittee.

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[35] The Economic Research Unit prepares economic forecasts and analyses of various economic developments, advises state departments and local government agencies, and provides economic information to the public. Available at: http://www.dof.ca.gov/research/economic_research_unit/

[36] Categories of cost include, street sweeping, storm drain cleaning and maintenance, storm water capture devices, manual cleanup and public education.

With respect to MS4s Phase I and Phase II permittees, this economic analysis uses data gathered from individual municipalities regarding current trash control expenditures to establish the baseline of control costs. The economic analysis considers two potential methods to estimate compliance costs with the proposed final Trash Amendments. The first method estimates the current expenditures of trash control per capita and the per capita costs to comply with the proposed final Trash Amendments. The second method estimates the per acre cost for high intensity land cover, e.g., proxy for priority land uses.

The cost factors were used to estimate the potential cost of compliance with the proposed final Trash Amendments to MS4 Phase I and Phase II permittees based on respective population sizes and urban areas classified as high intensity. The estimated incremental compliance costs represent the cost of the additional level of trash control above and beyond the current level of costs incurred by MS4 Phase I or Phase II permittees subject to the proposed final Trash Amendments. To avoid the disproportionate influence on the overall average cost of large communities, compliance costs were estimated based on population size group.

For IGP permittees, we assumed that smaller facilities would choose to comply with the proposed final Trash Amendments implementing institutional controls rather than full capture systems. It is likely that only larger facilities would choose to install full capture systems. We identified two groups based on facility size. For Track 1 analysis, we estimated similar installation and annual operation and maintenance costs as the municipalities. For Track 2 analysis, we estimated the costs of institutional controls to include a $500 initial training and an annual cost of $300 in other measures. This approach is described in more detail in Section 7.

For Caltrans, the proposed final Trash Amendments focus trash control to significant trash generating areas within its jurisdiction. Currently, there is a lack of information about the specific locations where additional trash control will be implemented. Using a GIS analysis, we made the conservative assumption that significant trash generating areas could be approximated using a percentage of Caltrans facilities located within urban areas. We estimated similar installation and annual operation and maintenance costs as the municipalities. This approach is described in more detail in Section 8.

*Estimates Based on Costs per Capita*

Humans are the only source of trash as defined in the proposed final Trash Amendments. It is reasonable to assume that the amount of trash generated is directly proportional to the population of each community. Areas with high trash generation rates are influenced by land use type and population density. Factors to take into consideration when evaluating cost of compliance are the size of the community, population density and land use types[37].

To estimate the potential incremental costs of compliance with the proposed final Trash Amendments for MS4 Phase I and Phase II permittees not included in the Los Angeles Region, the average annual per capita cost of implementing full capture systems (Track 1) is estimated using the current average per capita annual cost of areas that are already in compliance with the trash and debris TMDLs within the Los Angeles Region. Per capita cost factors were applied to the entire population in each MS4 Phase I and Phase II. By using this method, the potential cost of compliance with the proposed final Trash Amendments is likely overestimated since not all members of the population would be living in high trash generating areas. At the same time, this method is more accurate at estimating the cost of complying with institutional controls that are proportional to the population size group. To address this potential source of error, we developed specific cost estimates for each MS4 Phase I and Phase II by population size group.

[37] Available land coverage data was used in proxy of land use information. See Section 6 of the Economic Analysis.

This should mitigate for potential variability, such as an observed proportional relationship between high trash generating land uses and MS4 Phase I and Phase II population size groups[38].

*Estimates Based on Land Uses*

Trash generation rates can vary by land use, therefore a second method was used to estimate the compliance cost of a full capture system based on land coverage[39]. The number of storm drains per acre varies, depending on the type of land use (e.g., high density residential, commercial, mixed urban, and public transportation stations).

Land coverage data was used to calculate the number of storm drains within each segmented road and land cover. Information on land coverage specific for each specific community regulated under an MS4 Phase I and Phase II permit is not readily available. A total statewide number is estimated based on land coverage of high intensity[40].

This method is the most accurate method to estimate the cost of implementing full capture systems (Track 1)[41]. Using land coverage to estimate the total cost of compliance focuses on the actual priority land use area that would be impacted and excludes other low density populated areas. This methodological approach may reduce the error generated when using per capita estimates on large communities with large populations and proportionally low developed density. This method, however, may overestimate costs by including high intensity land coverage that is not part of an MS4. Since the proposed final Trash Amendments define priority land uses based on the different types of land uses, using land coverage for the analysis may be underestimating the area subject to trash controls.

**Limitations and Uncertainties**

The economic analysis estimates the potential cost of compliance following two methodologies. The two selected methods have advantages and limitations. The first method is based on average cost per capita and may overestimate the total cost of compliance by assuming that all populations in each community will bear the cost of implementing full capture systems. The second method is based on area defined as developed, high-intensity land coverage, which is assumed to be a proxy for priority land uses as defined in the proposed final Trash Amendments. The analysis, based on cost per capita, would provide best estimates for small and medium size communities with a smaller ratio of resident per acre of high density residential; however this may inflate the total cost for large communities with a small acreage of low density residential areas or communities with an even acreage range of low to high density residential areas. This method is more accurate to estimate the cost of complying with institutional controls that are proportional to the population size group, but this method is less

[38] See Section 4(b)(i) for a discussion of high density residential areas in proportion to population.

[39] Land cover data was utilized as a proxy to predictively identify priority land uses subject to the proposed final Trash Amendments. The analysis assumes that priority land uses correlates with land cover information. This assumption may underestimate the total area subject to compliance with the proposed final Trash Amendments.

[40] USGS Multi-Resolution Land Characteristics Consortium Land Cover Data 2006. Available at: http://www.mrlc.gov/nlcd06_leg.php

[41] It would be less accurate when estimating the cost of implementing Track 2, because means of compliance through Track 2 has high diversity with available trash controls. Some institutional trash control options, such as education, are not simply relatable to land use area in contrast to locations of full capture systems.

accurate to estimate the cost of implementing full capture systems. Using both methods of analysis would help minimize the potential error in the estimates inherent to each method individually.

**Assumption Regarding Compliance Schedules**

The proposed final Trash Amendments provide ten years from the first implementing permit for certain permittees to achieve full compliance[42]. Cost estimates for compliance in this economic analysis include the operational costs of treatment and institutional controls. These cost estimates assume a 10% per year expenditure of capital cost in order to achieve full implementation in ten years.

### b. Organization of This Economic Analysis

The economic analysis is organized as follows. Sections 1, 2, and 3 describe the permitted storm water dischargers subject to the proposed final Trash Amendments and their current trash control expenditures that are used as the baseline for the remainder of the economic analysis. Sections 4 and 5 estimate the potential incremental costs for MS4 Phase I and II permittees based on cost per capita. Section 6 estimates the potential incremental costs of compliance based on land coverage for MS4 Phase I and II permittees implementing full capture systems. Section 7 estimates the potential costs for facilities regulated under the IGP. Section 8 estimates the potential costs for Caltrans. Finally, Section 9 includes information on other dischargers subject to the proposed final Trash Amendments. A summary of the conclusions reached in each section is stated at the outset of each section, for the convenience of the reader.

[42] The proposed final Trash Amendments include a 15-year cap, so if a Water Board delays in adopting or reissuing, permittees may not have the full ten years to comply.

## 2. PERMITTEES SUBJECT TO THE PROPOSED FINAL TRASH AMENDMENTS

One of the main transport mechanisms of trash to receiving waters is through the storm water system. The proposed final Trash Amendments therefore focus on trash control by requiring that NPDES storm water permits, specifically the MS4 Phase I and Phase II Permits, Caltrans Permit, the CGP, and the IGP, to contain implementation provisions that require permittees to comply with the prohibition of discharge. These provisions focus on trash control in the locations with high trash generation rates, in order to maximize the value of limited resources spent on addressing the discharge of trash into state waters.

As of August 6, 2013, the Water Boards reported[43] 16,996 storm water facilities regulated under the Storm Water Construction Facilities, Storm Water Industrial Facilities, and Storm Water Municipal NPDES Permits (Table 3).

**Table 3.** Facilities and Municipalities Regulated Under the Storm Water Permitting Program

| Regional Water Board | Construction | Industrial | Municipal (Phase I and Phase II) | Total |
|---|---|---|---|---|
| **1** | 179 | 337 | 14 | 538 |
| **2** | 1,069 | 1,316 | 109 | 2,494 |
| **3** | 457 | 401 | 45 | 903 |
| **4** | 1,193 | 2,683 | 100 | 3,976 |
| **5F** | 554 | 453 | 25 | 1,032 |
| **5R** | 173 | 198 | 3 | 374 |
| **5S** | 887 | 1,094 | 67 | 2,048 |
| ***5 all.*** | *1,614* | *1,745* | *95* | *3,454* |
| **6A** | 72 | 40 | 5 | 117 |
| **6B** | 307 | 190 | 5 | 502 |
| ***6 all.*** | *379* | *230* | *10* | *619* |
| **7** | 253 | 172 | 19 | 444 |
| **8** | 1,136 | 1,583 | 62 | 2,781 |
| **9** | 924 | 784 | 79 | 1,787 |
| **TOTAL** | **7,204** | **9,251** | **532** | **16,996** |

### a. MS4 Phase I and Phase II Permits

The State Water Resources Control Board and Regional Water Quality Control Board's (collectively, the Water Boards) Municipal Storm Water Permitting Program regulates storm water discharges from MS4s. Storm water is runoff from rain or snow melt that runs off surfaces such as rooftops, paved streets, highways or parking lots and can carry with it trash. The runoff

[43] Water Boards' Fiscal Year 2012-2013 Performance Report released on September 2013. Available at: http://www.waterboards.ca.gov/about_us/performance_report_1213/regulate/21200_npdes_sw_facilities.shtml

with trash can then drain directly into a local stream, lake or bay. The MS4[44] permits are issued in two categories or phases: MS4 Phase I and MS4 Phase II.

Some permittees have provisions specific to the control of trash. For example, the San Francisco Bay Municipal Regional Stormwater Permit requires discharges to meet water quality objectives and ensure the protection of the beneficial uses of receiving waters and their associated habitats. Permittees must demonstrate compliance with trash-related receiving water limitations through implementation of structural controls and institutional controls to reduce trash loads from MS4s. The San Francisco Bay Water Board set load reductions for trash from storm water discharges at 40% by 2014.

In the Los Angeles Region, fifteen TMDLs were adopted for trash and debris by either the Los Angeles Water Board or U.S. EPA. The Los Angeles Water Board's trash and debris TMDLs set the numeric target for trash in the applicable water bodies to zero, as derived from the water quality objective in the basin plans. The TMDLs have all also defined trash to be "man-made litter," as defined by the California Government Code (§ 68055.1(g)). Implementation plans vary slightly but are mostly based on phased percent reduction goals that can be achieved through discharge permits, best management practices (BMPs), and structural controls.

In this economic analysis, the communities regulated under the MS4 NPDES program have been grouped based on factors such as size, land use zones, and population.

### b. California Department of Transportation

Caltrans is responsible for the design, construction, management, and maintenance of the state highway system, including freeways, bridges, tunnels, Caltrans' facilities, and related properties. Caltrans is subject to the permitting requirements of CWA section 402(p). Caltrans' discharges consist of storm water and non-storm water discharges from state owned rights-of-way.

Before July 1999, discharges from Caltrans' MS4 were regulated by individual NPDES permits issued by the Regional Water Boards. On July 15, 1999, the State Water Board issued a statewide permit (Order No. 99-06-DWQ) which regulated all discharges from Caltrans MS4s, maintenance facilities and construction activities. On September 19, 2012, the Caltrans' permit was re-issued (Order No. 2012-0011-DWQ) and became effective on July 1, 2013.

Caltrans' System-Wide Management Program describes the procedures and practices used to reduce or eliminate the discharge of pollutants to storm drainage systems and receiving waters. A revised System-Wide Management Program must be submitted to the State Water Board for approval by July 1, 2014.

### c. Permitted Storm Water Industrial and Construction Facilities

Under the industrial program, the State Water Board issues an NPDES Industrial General Permit to 9,200 dischargers associated with ten broad categories of industrial activities (Order No. 97-03-DWQ). The permit also requires that dischargers develop a Storm Water Pollution Prevention Plan (SWPPP) and a monitoring plan. Through the SWPPP, dischargers are

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[44] **Municipal Stormwater Phase I Facilities**: The Municipal Storm Water Permits regulate storm water discharges from MS4s. Under Phase I, which began in 1990, the Water Boards have issued NPDES MS4 permits to permittees serving populations greater than 100,000 people. Many of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. These permits are reissued as the permits expire.

**Municipal Stormwater Phase II Facilities**: Under Phase II, the State Water Board adopted a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities (10,000 to 100,000 people), including non-traditional small MS4s which are governmental facilities such as military bases, public campuses, prisons and hospital complexes.

required to identify sources of pollutants, and describe the means to manage the sources to reduce storm water pollution. For the monitoring plan, facility operators may participate in group monitoring programs to reduce costs and resources. The regulated industrial sites by regional water board are presented in Table 4.

**Table 4:** Facilities Regulated under the Storm Water Industrial and Construction Program **(as of June 30, 2013)**

| Regional Water Board | Industrial Storm Water Facilities | Construction Storm Water Facilities |
|---|---|---|
| **1** | 334 | 134 |
| **2** | 1,319 | 922 |
| **3** | 396 | 391 |
| **4** | 2,689 | 1,072 |
| **5** | 1,721 | 1,341 |
| **6** | 227 | 313 |
| **7** | 172 | 219 |
| **8** | 1,573 | 892 |
| **9** | 770 | 835 |
| **TOTAL** | 9,201 | 6,121 |

CGP permittees are already required to comply with a prohibition of debris discharge from construction sites[45]. Although current costs for trash control by CGP permittees are unknown, there is no expected increase of costs as a result of the proposed final Trash Amendments.

### d. Other Facilities and Activities Subject to the Proposed Trash Amendments

The proposed final Trash Amendments include a prohibition of discharge for discharges not regulated under NPDES permits, Waste Discharge Requirements (WDRs) or ~~W~~waivers of WDRs. The prohibition also applies to the discharge of preproduction plastic by manufacturers of preproduction plastics, transporters and users of preproduction plastics to surface waters of the state.

Also, the proposed final Trash Amendments include a provision allowing the Water Boards to require trash controls in areas or facilities that may generate trash, such as high usage campgrounds, picnic areas, beach recreation areas, or marinas.

Due to the uncertainty surrounding the activities and facilities potentially subject to these requirements, these groups were not included in the economic analysis.

[45] State Board Action 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ. Prohibition III. D. page 21. Available at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo2009_0009_dwq.pdf
Debris is defined as "Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste."

## 3. CURRENT TRASH CONTROL EXPENDITURES

Communities in California spend approximately $428 million per year to combat and cleanup trash, which is $10.71 per resident[46]. Communities within the jurisdiction of the Los Angeles Water Board are already complying with trash and debris TMDLs, and they are currently spending[47] $15.04 on average per resident per year to do so. This is 55% higher than the communities not implementing trash or debris TMDLs[48].

Caltrans spends approximately ~~$52~~ $80 million a year on "litter removal" (i.e., trash control), or approximately ~~$1,040~~ $1,600 per lane-mile[49].

Specific information about the current costs that IGP permittees incur to control trash is unknown. CGP permittees are already required to comply with a prohibition of debris discharge from construction sites[50], so though current costs for trash control by CGP permittees are unknown, they are not expected to increase as a result of the proposed Trash Amendments.

### a. Summary of Existing Trash Control Studies

In 2012, Kier Associates published a study[51] for U.S. EPA to quantify the overall costs of managing trash. The study found that, on average, small and medium West Coast communities (in California, Oregon and Washington) spend at least $14 per year per resident in trash management and marine debris reduction efforts. The study concluded that the largest cities did not enjoy much in the way of "economies of scale". The largest cities are spending, conservatively, $13 per year per resident on trash management and marine debris reduction efforts.

In August 2013, NRDC released another study[52] (NRDC Study) assessing the annual cost to California communities of reducing litter that pollutes waterways. The NRDC Study is based on a direct survey of 221 randomly selected communities. The NRDC Study found that California communities spend $428,400,000 each year to combat and clean up litter and to prevent it from ending up in the state's rivers, lakes, canals and oceans. The NRDC Study indicated a large disparity in the annual average compliance cost per capita ranging between $8.94 and $18.33 per resident to manage litter (Table 5). The annual average statewide spending was $10.71 per resident (Figure 1). The highest reported expenditure was the City of Del Mar in San Diego County with an average of $71 per resident.

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[46] Kier Associates. 2013. Waste in Our Water: The Annual Cost to California Communities of Reducing Litter That Pollutes Our Waterways. Prepared for NRDC. Available at: http://docs.nrdc.org/oceans/files/oce_13082701a.pdf, page 19.

[47] Not including costs associated with beach cleanups specific to coastal communities.

[48] Communities not implementing trash or debris TMDL are spending an average of $9.68 per resident per year.

[49] See fn. ~~28~~32, *ante*.

[50] State Board Action 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ. Prohibition III. D. page 21. Available at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo2009_0009_dwq.pdf . Debris is defined as "Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste."

[51] Kier Associates. 2012. The Cost to West Coast Communities of Dealing with Trash, Reducing Marine Debris. Prepared for U.S. EPA, Region 9. Available at: http://www.epa.gov/region9/marine-debris/cost-w-coast-debris.html#report

[52] Kier Associates. 2013. Waste in Our Water: The Annual Cost to California Communities of Reducing Litter That Pollutes Our Waterways. Prepared for NRDC. Available at: http://docs.nrdc.org/oceans/files/oce_13082701a.pdf

The NRDC Study collected information from 95 communities ranging from 700 residents (Etna in Siskiyou County) to more than 4 million residents (the City of Los Angeles) regarding six categories of litter management:

- Waterway and beach cleanup
- Street sweeping
- Installation of storm water capture devices
- Storm drain cleaning and maintenance
- Manual cleanup of litter
- Public education

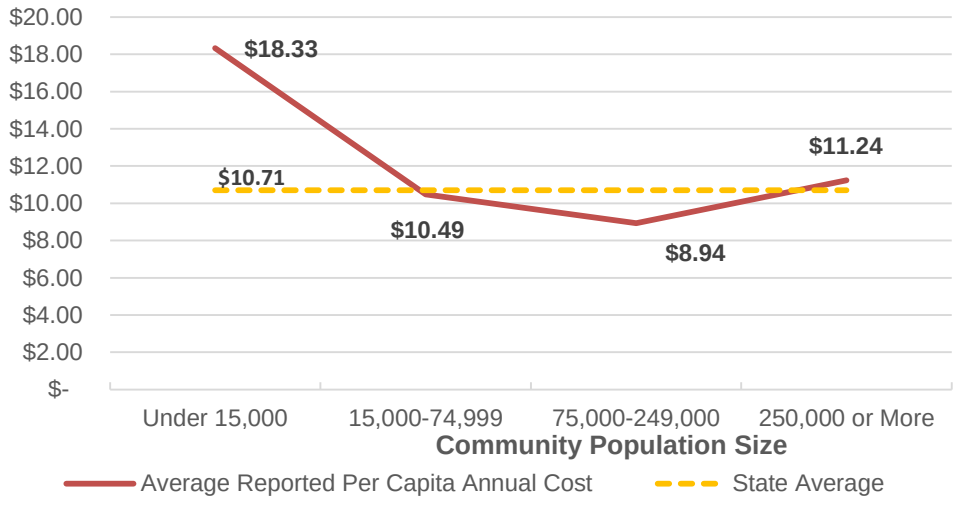
Table 5 and Figure 1 summarize the findings of the NRDC Study.

**Table5.** Estimated Current Annual Costs of Trash Control

| Community Size | Population Range | Range of Annual Reported Cost | Average Reported Annual Costs | Average Reported Per Capita Cost |
|---|---|---|---|---|
| **Largest** | 250,000 or more | $2,877,400-$36,360,669 | $13,929,284 | $11.24 |
| **Large** | 75,000-249,000 | $350,158-$2,379,746 | $1,131,156 | $8.94 |
| **Midsize** | 15,000-74,999 | $44,100-2,278,877 | $457,001 | $10.49 |
| **Small** | Under 15,000 | $300-$890,000 | $144,469 | $18.33 |

Source: NRDC Study 2013

**Figure 1.** Trash Annual Control Costs Per Capita by Community Population Size Group



### b. Use of Existing Studies in This Economic Analysis

The proposed final Trash Amendments include an exception for waters of the state where existing trash and debris TMDLs adopted by the Los Angeles Water Board or U.S. EPA are in effect prior to the proposed final Trash Amendments. This may result in some limitations in extrapolating statewide costs directly from the studies described above. To address this limitation, we combined the data in the NRDC Study and the Kier Associates' U.S. EPA Study to calculate a baseline of current costs. The costs were stratified based on community type and size. The summary of the average annual cost per capita for communities outside of the Los Angeles Water Board boundaries by type of trash control type are presented in Table 6.

**Table 6.** Estimated Current Annual Average Cost Per Capita by Type of Trash Control and by Community Size of MS4 Phase I and Phase II (Not Including Communities within the Los Angeles Region)

| MS4 Communities by Population Size (Not Including Los Angeles Communities) | Street Sweeping | Storm Drain Cleaning & Maint. | Storm Water Capture Devices | Manual Cleanup | Public Education | Total Annual Cost Per Capita |
|---|---|---|---|---|---|---|
| **>500,000** | $4.19 | $3.28 | $1.19 | $1.27 | $0.65 | **$10.41** |
| **100,000-500,000** | $3.73 | $2.24 | $1.18 | $0.51 | $0.55 | **$7.64** |
| **75,000-100,000** | $5.65 | $1.07 | $0.93 | $1.89 | $0.51 | **$9.15** |
| **50,000-75000** | $5.33 | $3.15 | $1.53 | $1.57 | $0.42 | **$10.20** |
| **25,000-50,000** | $3.94 | $2.75 | $1.90 | $1.86 | $0.37 | **$9.73** |
| **10,000-25,000** | $3.61 | $1.21 | $3.26 | $2.21 | $0.50 | **$10.09** |
| **0-10,000** | $9.26 | $2.31 | $1.25 | $2.32 | $1.69 | **$15.34** |
| **All MS4 Communities** | **$4.38** | **$2.79** | **$1.29** | **$1.28** | **$0.58** | **$9.68** |

Source: NRDC Study 2013

In comparison, the average cost per capita in communities within Los Angeles Water Board boundaries are presented in Table 7.

**Table 7.** Estimated Current Annual Average Cost Per Capita by Type of Trash Control and by Community Size within the Los Angeles Region

| Los Angeles Region MS4 Communities by Population Size | Street Sweeping | Storm Drain Cleaning & Maint. | Storm Water Capture Devices | Manual Cleanup | Public Education | Total Annual Average Cost Per Capita |
|---|---|---|---|---|---|---|
| **>500,000** | $6.52 | $1.23 | $2.64 | $4.16 | $1.21 | **$15.76** |
| **100,000-500,000** | $5.22 | $2.26 | $1.57 | $0.05 | $0.15 | **$9.22** |
| **75,000-100,000** | $7.62 | $0.26 | $7.92 | $1.19 | $0.39 | **$16.79** |
| **50,000-75000** | $6.57 | $0.50 | $6.42 | $1.81 | $0.22 | **$14.46** |
| **25,000-50,000** | $5.28 | $1.52 | $0.75 | $1.20 | $0.46 | **$7.79** |
| **10,000-25,000** | $10.58 | $4.62 | $16.00 | $4.10 | $0.85 | **$29.84** |
| **0-10,000** | | | | | | |
| **All Los Angeles MS4 Communities** | **$6.72** | **$1.87** | **$6.54** | **$2.25** | **$0.48** | **$15.04** |

Source: NRDC Study 2013

On average, the annual expenditures per capita in communities in the Los Angeles Region are 55% greater than the average cost in the rest of California. The data was collected in 2011 and 2012; as such not all communities were in full compliance with the Los Angeles Water Board's existing trash and debris TMDLs.

Table 8 compares the total estimated annual current expenditures (including those in the Los Angeles Region) for trash control with economic factors such as State Domestic Product, per capita income, and other economic indicators. For example, the City of Los Angeles budget for FY 13-14[53] is $7.69 billion. The City of Los Angeles' annual total expenditures related to trash control identified in the NRDC Study are $36,360,669[54] which represents 0.473% of its annual budget. The City of San Diego[55] spends 0.51%[56] of its annual budget on trash control. At the other end of the spectrum, the City of San Anselmo, with a population of 12,336, expends $161,000 in trash controls or approximately 1.3% of its annual budget of $12.4 million[57].

Caltrans annually spends ~~$52~~ $80 million[58] on litter removal. This is approximately ~~0.41%~~ 6.7% of their ~~$12.7~~ $1.2 billion maintenance budget for FY 13-14. Caltrans manages over 50,000 lane-miles of roadways; owns and operates 265 state highways; and owns and manages

[53] City of Los Angeles Budget for FY 13-14. Available at: http://cao.lacity.org/budget/summary/2013-14BudgetSummaryBooklet.pdf

[54] Kier Associates. Waste in Our Water. Appendix A, page XVI, Table 13.

[55] City of San Diego. Proposed 2014 Budget. Available at: http://www.sandiego.gov/fm/proposed/pdf/2014/vol1/v1executivesummary.pdf

[56] Calculated from Kier Associates-WASTE IN OUR WATER, Appendix B, page ii, Table 9 and City of San Diego's Proposed 2014 Budget.

[57] City of San Anselmo. 2012 Budget. Available at: http://www.marinij.com/ci_21546177/san-anselmo-council-approves-2012-budget

[58] See fn. ~~28~~32, *ante*.

12,300 bridges and 665 buildings and other structures. Caltrans spends an average of ~~$1,040~~ $1,600 per lane-mile on litter removal.

**Table 8.** Existing Trash Control Expenditures in Perspective

| Statistic | Budget/Value | Annual Expenditures on Trash Control | Conclusion |
|---|---|---|---|
| **California 2012 Gross State Domestic Product** | $2.0035 trillion | $428[59] million | Californians spend **0.02%** of the State Domestic Product in trash controls. |
| **California 2013 average income per capita** | $28,341 | $10.71 | Californians spend **0.03%** of their average income per capita in trash controls. |
| **California State Budget for FY 2013-14** | $145.3 billion | $428 million | The California State budget is 7.25% of the California State Domestic product. The cost of trash controls is approximately **0.3%** of the State Budget. |
| **The City of Los Angeles Budget for FY 13-14** | $7.69 billion | $36.3 million | The City of Los Angeles spends **0.47%** of their annual budget on trash control. |
| **City of San Diego Budget for FY 2014** | $2.75 billion | $14[60] million | The City of San Diego spends **0.51%** of their annual budget on trash control. |
| **City of San Anselmo Budget (population of 12,336)** | $12.4 million | $161,000[61] | The City of San Anselmo spends **1.31%** of their annual budget on trash control. |
| **Caltrans Division of Maintenance** | ~~$12.7 billion~~ $1.2 billion | ~~$52 million~~ $80 million | Caltrans spends ~~**0.41%**~~ **6.7%** of their annual maintenance budget on litter removal (approximately ~~$1,040~~ $1,600 per lane-mile). |

### c. Cost Information from Adopted Trash and Debris TMDLs

In the Los Angeles Region, fifteen TMDLs were adopted for trash and debris by either the Los Angeles Water Board or U.S. EPA. Six of the fifteen trash and debris TMDLs include cost considerations that identify the least expensive method of compliance to be catch basin inserts (CBI), which is a type of full capture system (Table 9). The six trash TMDLs were selected as a representative baseline for the cost of adopted trash TMLDs to provide a cost comparison to the proposed Trash Amendments. The existing trash and debris TMDLs are assumed an installation cost factor for a CBI unit of $800 and annual operations and maintenance cost of $342[62] per unit. Catch basin inserts must be monitored frequently and must be used in conjunction with frequent street sweeping. Based on the six trash TMDLs, the annual costs to install and operate

[59] Kier Associates. 2013. Waste in Our Water: The Annual Cost to California Communities of Reducing Litter That Pollutes Our Waterways. Prepared for NRDC. Available at: http://docs.nrdc.org/oceans/files/oce_13082701a.pdf, page 19.

[60] Kier Associates. Waste in Our Water. Appendix A, page XVII, Table 13.

[61] Kier Associates. Waste in Our Water. Appendix A, page XIX, Table 14.

[62] Los Angeles Water Board. 2007. Trash TMDL for Los Angeles River Watershed Final Staff Report dated August 9, 2007. Available at: http://www.waterboards.ca.gov/losangeles/board_decisions/basin_plan_amendments/technical_documents/2007-012/09_0723/L.%20A.%20River%20Trash%20TMDL_Final%20%20Staff%20Report_August%209,%202007.pdf Section VIII. Cost Considerations. Subsection B. Cost of Implementing Trash TMDL. Subdivision 1. Catch Basin Inserts. Paragraph 1. Page 38. The annual operations and maintenance of $342 is estimated based on the information provided in the Trash TMDL and is the result of dividing the $51.3 million required in servicing and capital costs (see Table 9 on page 38 of the Los Angeles River Trash TMDL) by the 150,000 catch basins that would need to be retrofitted with inserts to cover 574 square miles of the watershed. See paragraph 1 on page 38 of Los Angeles River 2007 trash TMDL.

full capture systems range between $5 per capita to $22.95 per capita, with an average of $14.33 cost per capita (Table 9).

**Table 9.** Costs Identified in Trash and Debris TMDLs Adopted by the Los Angeles Water Board

| TMDL | Adoption Date | Population/ Household | Total Area and Developed, High Intensity Areas (in acres) | Capital Cost | Operations and Maintenance Annual Cost | Total Annualized Cost | Total Annual Cost Per Capita | Annual Cost Per Acre "Developed, High Intensity" |
|---|---|---|---|---|---|---|---|---|
| **Los Angeles River Watershed** 2007-012 | Sept. 23, 2008 | 4,414,748<br>1,367,890 households | 531,612 (42,730) | $120 million | $51.3 million | $63.3 million | $14.33 | $1,481 |
| **Ventura River** Estuary 2007-008 | Mar. 6, 2008 | 15,630<br>4,867 households | 26,176 (58) | $607,200 | $303,600 | $425,000 | $27.19 | $7,350 |
| **Malibu Creek** 2008-007 | July 7, 2009 | 59,461<br>21,794 households | 48,438 (29) | $1,600,000 | $785,000 | $1,099,800 | $18.5 | $38,040 |
| **Ballona Creek** and Wetland 2004-023 | Aug. 11, 2005 | 1,501,881<br>597,311 households | 81,972 (16,264) | $25 million | $12.5 million | $15 million | $10 | $922 |
| **Dominguez Channel** 2007-006 | Mar. 6, 2008 | 245,000<br>82,000 households | 13,452 (7,680) | $1,805,000 | $902,000 | $1,082,500 | $4.41 | $141 |
| **Calleguas Creek** 2007-007 | Mar. 6, 2008 | 65,000<br>21,000 households | 32,326 (505) | $1,200,000 | $596,000 | $835,000 | $12.88 | $1,653 |

Assumptions used in the TMDLs' cost considerations: Capital costs are fully spent in ten years. Operations and maintenance cost is based on full implementation. After ten years, full capture systems need to be fully replaced (10% a year). Total cost is estimated after implementation. Average of three persons per household. CBIs are considered the lowest cost method of compliance.

As part of the economic analysis, we analyzed the potential compliance costs for MS4 communities within the Los Angeles Water Board's jurisdiction implementing trash TMDLS as if they have to comply with the proposed final Trash Amendments instead of full compliance with their current trash TMDLs.

The most significant difference between the Los Angeles Region trash and debris TMDLs and the proposed final Trash Amendments is the focus on trash control in high trash generating areas. We estimated the compliance cost with Track 1 or the installation of full capture systems in "developed, high intensity" land coverage in Los Angeles Region, and compared the results with the current compliance costs.

The current annualized cost of compliance (Table 10) for the selected trash and debris TMDLs in the Los Angeles Region is calculated to be $81.7 million ($12.97 per capita). The estimated cost for the same communities if complying with only the proposed final Trash Amendments would be $28.4 ($4.5 per capita); therefore those communities would have saved approximately $53 million a year ($8.47 per capita) if they had to comply only with the proposed final Trash Amendments.

**Table 10.** Compliance Costs for Municipalities Complying with Select[63] Trash TMDLs Compared to Estimated Compliance Costs for the Proposed Final Trash Amendments

| Trash TMDL | Population | Area "Developed, High Intensity" (acres) | Estimated Total Capital Cost (to comply with Trash Amendments only) | Estimated Cost Per Capita (to comply with Trash Amendments only) | Estimated O&M Annual Cost (to comply with Trash Amendments only) | Estimated Annualized Cost (to comply with Trash Amendments only) | *Current Annualized Costs of Compliance with trash TMDLs* | *Current Cost Per Capita* |
|---|---|---|---|---|---|---|---|---|
| **Los Angeles River 2007-012** | 4,414,748 | 42,730 | $34,184,000 | $4.08 | $14,613,660 | $18,032,060 | *$63,300,000* | *$14.33* |
| **Ventura River 2007-008** | 15,630 | 58 | $46,400 | $1.57 | $19,836 | $24,476 | *$425,000* | *$27.19* |
| **Malibu Creek 2008-007** | 59,461 | 29 | $23,200 | $0.21 | $9,918 | $12,238 | *$1,099,800* | *$18.50* |
| **Ballona Creek 2004-023** | 1,501,881 | 16,264 | $13,011,200 | $4.57 | $5,562,288 | $6,863,408 | *$15,000,000* | *$10.00* |
| **Dominguez Channel 2007-006** | 245,000 | 7,680 | $6,144,000 | $13.23 | $2,626,560 | $3,240,960 | *$1,082,500* | *$4.41* |
| **Calleguas Creek 2007-007** | 65,000 | 505 | $404,000 | $3.28 | $172,710 | $213,110 | *$835,000* | *$12.88* |
| **TOTAL** | **6,301,720** | **67,266** | **$53,812,800** | **$4.50** | **$23,004,972** | **$28,386,252** | ***$81,742,300*** | ***$12.97*** |

[63] The six presented trash TMDLs in Table are the most representative trash TMDL that cover areas similar to the high trash generating areas of the proposed final Trash Amendments.

## 4. MS4 Phase I Permittees: Cost Per Capita Method

### a. MS4 Phase I Statistics

Data was obtained for MS4 Phase I permittees using the California Integrated Water Quality System (CIWQS). MS4 Phase I permittees were then grouped by population size. Of the 376 MS4 Phase I permittees, the permittees associated with Caltrans and those records that did not have complete information necessary for the analysis, such as population, were removed from the analysis. The remaining 289 MS4 permittees were used in this analysis (Table 11).

**Table 11.** MS4 Phase I Permittees by Regional Water Board

| Number of MS4 Phase I Communities by Population Size | Regional Water Board 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|
| >500,000 | | 1 | | 2 | 1 | | | | 1 | 5 |
| 100,000-500,000 | | 11 | 1 | 16 | 4 | | | 17 | 4 | 53 |
| 75,000-100,000 | | 5 | | 10 | 2 | | | 6 | 5 | 28 |
| 50,000-75,000 | | 12 | | 13 | 4 | | | 15 | 6 | 50 |
| 25,000-75,000 | | 20 | | 24 | 3 | | 6 | 8 | 9 | 70 |
| 10,000-25,000 | | 12 | | 22 | 3 | 1 | 3 | 9 | 5 | 55 |
| 0-10,000 | | 8 | | 10 | 1 | 2 | 1 | 4 | 2 | 28 |
| **Grand Total** | | **69** | **1** | **97**[64] | **18** | **3** | **10** | **59** | **32** | **289** |

Out of the 289 MS4 Phase I permittees identified for the economic analysis, 192[65] are located outside the Los Angeles Water Board boundaries and would be subject to the proposed final Trash Amendments. Table 12 shows the population living in locations regulated under a Phase I MS4 permit.

[64] The 97 facilities are subject to an existing trash and debris TMDLs and thus removed from this economic analysis.

[65] Of the 193 MS4 Phase I permittees outside the Los Angeles Region, one was a duplicate in the database and removed from the analysis.

**Table 12.** Population Regulated Under MS4 Phase I Permits

| MS4 Phase I Communities by Population Size | Regional Water Board 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|
| >500,000 | | 894,943 | | 4,917,745 | 799,407 | | | | 1,223,400 | 7,835,495 |
| 100,000-500,000 | | 1,715,218 | 150,441 | 2,380,622 | 1,498,871 | | | 3,191,801 | 911,063 | 9,848,016 |
| 75,000-100,000 | | 407,979 | | 865,587 | 175,603 | | | 523,614 | 411,052 | 2,383,835 |
| 50,000-75,000 | | 749,499 | | 785,896 | 234,054 | | | 889,346 | 339,605 | 2,998,400 |
| 25,000-75,000 | | 658,814 | | 904,866 | 112,580 | | 233,462 | 323,637 | 356,748 | 2,590,107 |
| 10,000-25,000 | | 201,038 | | 385,651 | 62,781 | 23,609 | 59,535 | 157,235 | 104,895 | 994,744 |
| 0-10,000 | | 40,063 | | 36,533 | 1,420 | 8,890 | 3,816 | 28,528 | 5,609 | 124,859 |
| **Grand Total** | | **4,667,554** | **150,441** | **10,276,900** | **2,884,716** | **32,499** | **296,813** | **5,114,161** | **3,352,372** | **26,775,456** |

The number of MS4 Phase I permittees considered in this economic analysis is limited to 289, which represents a total population of 26,775,456 or 72% of the population of California (37,253,959[66]). The 192 MS4 Phase I permittees outside the Los Angeles Region have a total population of 16,498,556 or 45% of California population.

### b. Potential Compliance Options

The final Trash Amendments propose a dual alternative Track approach for compliance with the prohibition of discharge of trash.

#### *i. Track 1: Full Capture Systems*

To determine the incremental cost of compliance, we needed to establish the baseline cost for the MS4 Phase I permittees in this analysis using available cost data from the NRDC (Table 6). For those permittees without the NRDC Study cost data, the average NRDC Study cost factors were applied for each permittee size group (assuming a similar level of current expenditures). Based on that data, the 192 MS4 Phase I permittees are spending $22,412,501 ($1.36 per capita) per year to install, operate and maintain full capture systems.

Generally, larger communities have a larger proportion of developed, high intensity in proportion to their population. To compensate for this, a Geographic Information Systems (GIS) analysis was used to determine the ratio of high intensity land coverage for each permittee population size group. We estimated separate per capita cost for each community size based on existing land coverage data for permittees outside the Los Angeles Region. The areas of San Francisco and Sacramento serviced by a combined sewer system were excluded. We used the actual land

[66] U.S. Census Bureau. 2010.

coverage area classified as high intensity to estimate, for each community size, the number of acres that would need to install full capture systems. The estimated capital cost for each full capture system were assumed as $800, the annual operations and maintenance is $342, and an average of one full capture system per acre. The cost estimate assumes all costs are incurred in the same year (Year 10).

The increased cost of implementing full capture systems is estimated to be $176 million or $10.67 more on average per capita per year, assuming all full capture systems are installed in a year. This estimate includes the operation and maintenance of the full capture systems (Table 13Table 13). This incremental cost per capita varies based on the size of the permittee. For example, some permittees may have an increase of $13.76 per capita per year, while others may only see an increase of $5.61 on average per capita per year.

**Table 13.** Incremental Cost of Compliance for MS4 Phase I Communities Using Full Capture Systems by Community Size

| MS4 Phase I Community Size | MS4 Phase I Comm unities | Total Population (A) | Current Cost (baseline) | Current Cost Per Capita (baseline B) | Estimated Annual Cost Per Capita (After Full Implementat ion in Year 10) (C+D) | *Estimated Total Capital Costs Per Capita (C)* | *Estimated Annual O&M Per Capita (in Year 10) (D)* | Total Estimated Incremental Cost Of Compliance (C+D-B) X A |
|---|---|---|---|---|---|---|---|---|
| >500,000 | 3 | 2,917,750 | $2,451,409 | $0.84 | $14.60 | *$10.22* | *$4.38* | $40,077,769 |
| 100,000-500,000 | 37 | 7,467,394 | $10,469,051 | $1.40 | $12.80 | *$8.96* | *$3.84* | $85,245,951 |
| 75,000-100,000 | 18 | 1,518,248 | $1,293,517 | $0.85 | $10.50 | *$7.35* | *$3.15* | $14,646,291 |
| 50,000-75,000 | 37 | 2,212,504 | $3,059,738 | $1.38 | $11.00 | *$7.70* | *$3.30* | $21,335,016 |
| 25,000-75,000 | 46 | 1,685,241 | $3,033,531 | $1.80 | $8.70 | *$6.09* | *$2.61* | $11,629,598 |
| 10,000-25,000 | 33 | 609,093 | $2,028,291 | $3.33 | $7.70 | *$5.39* | *$2.31* | $2,675,719 |
| 0-10,000 | 18 | 88,326 | $78,965 | $0.89 | $6.50 | *$4.55* | *$1.95* | $490,845 |
| **Total** | 192 | 16,498,556 | $22,414,501 | $1.36 | $12.03 | *$8.42* | *$3.61* | $176,101,189 |

In summary, the 192 MS4 Phase I permittees analyzed are currently spending approximately $22.4 million annually to install and operate full capture systems[67]. To comply with Track 1 of the proposed Trash Amendments, an estimated additional cost of $176 million or an additional $10.67 ($12.03 – $1.36) per capita on the year that full compliance is achieved. The total capital costs are estimated at $8.42 per capita or $139 million. Once the full capture systems are installed (capital costs), the annual operations and maintenance costs are estimated at $3.2 per capita or $52.8 million. Assuming permittees install 10% of the structural controls each year, the incremental capital, operation and maintenance costs in Year 10 (highest cost year) would be $65 million for all affected permittees ($3.95 per capita).

[67] The NRDC data does not break down the costs into capital and operation and maintenance.

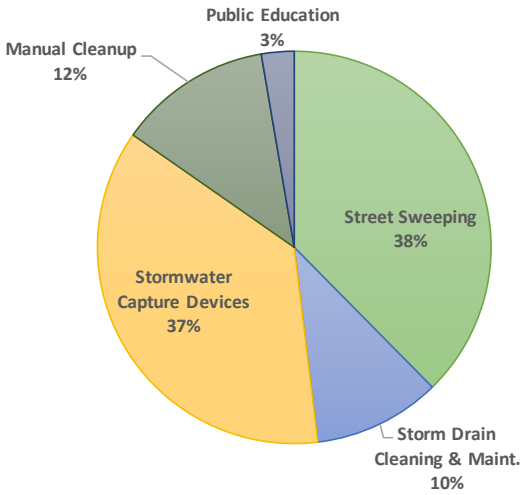
### *ii. Track 2: Combination of Full Capture Systems, Other Treatment Controls, Institutional Controls, Multi-Benefit Projects*

A 2012 study[68] conducted by the California Coastal Commission and the Algalita Marine Research Institute and partially funded by the State Water Board concluded that:

*"There is no one method for completely controlling trash in stormwater. Institutional controls may provide the best long-term solution, especially those focused on prevention. However, depending on the magnitude of the problem, institutional controls may be inadequate. Focusing on enforcement of litter laws is considered by many to provide the most "bang for the buck". However, most urban municipalities will have to do more to physically capture and control trash in urban waterways or to prevent it from reaching the waterway."*

Previous studies have demonstrated that mixed institutional controls and full capture systems provide a high level of performance/compliance. For example, the City of Los Angeles has implemented a comprehensive trash prevention program involving both structural and institutional measures. The Los Angeles' program has included the installation of full capture and partial capture systems in catch basins, as well as ongoing efforts to implement institutional measures such as public outreach, street sweeping and catch basin cleaning.

**Figure 2.** Percentage of Expenditures by Trash Control Category in the Los Angeles Region (Source: NRDC Study




The proposed final Trash Amendments specify that Track 2 must be implemented to achieve the equivalent level of performance to the exclusive use of full capture systems (Track 1) in the priority land uses.

On November 6, 2012, a study[69] prepared for the City of Los Angeles by Black & Veatch, assessed the effectiveness of institutional measures for trash TMDL compliance. The study conducted in Los Angeles show that institutional measures can be effective in medium and low trash-generating areas but may not achieve the same level of compliance in high trash-generating areas. The results show a 12.5% trash reduction in 2012 from the 2007 baseline in medium and low trash generating areas.

The question that remains is what ideal mixture of institutional controls, other treatment controls, multi-benefit projects and full capture systems permitted dischargers might choose to comply with the proposed final Trash Amendments at a minimum cost.

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[68] Gordon, Miriam, and Ruth Zamist. "Municipal Best Management Practices for Controlling Trash and Debris in Stormwater and Urban Runoff." n.d. California Coastal Commission; Algalita Marine Research Foundation. 31 Jul 2012 <http://plasticdebris.org/Trash_BMPs_for_Munis.pdf>.

[69] Black & Veatch. 2012. Quantification Study of Institutional Measures for Trash TMDL Compliance.

Based on the data provided in the NRDC Study, permittees in the Los Angeles Region are currently[70] spending approximately 37% of trash control expenditures in implementing full capture systems (Figure 2). This percentage varies significantly depending on the size of the permittee's jurisdiction, population density, and area of priority land uses. Larger sized permittees dedicate 17% of trash control expenditures to full capture systems, and smaller sized permittees dedicate 46% of trash control expenditures to full capture systems (Table 14 and Figure 3).

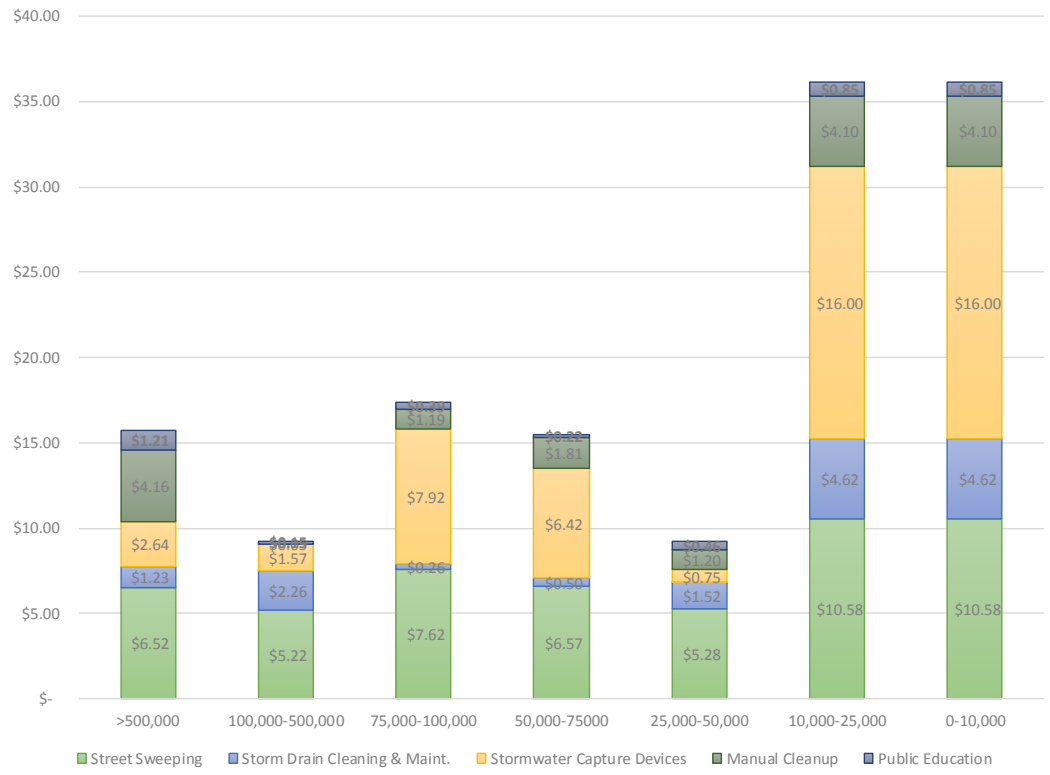
**Table 14.** Current Expenditures in Trash Control by Category in the Los Angeles Region

| Los Angeles Region MS4 By Population Size | Street Sweeping | Storm Drain Cleaning & Maint. | Stormwater Capture Devices | Manual Cleanup | Public Education | Total Annual Average Cost Per Capita |
|---|---|---|---|---|---|---|
| **>500,000** | $ 6.52 | $ 1.23 | $ 2.64 | $ 4.16 | $ 1.21 | **$ 15.76** |
| **100,000-500,000** | $ 5.22 | $ 2.26 | $ 1.57 | $ 0.05 | $ 0.15 | **$ 9.22** |
| **75,000-100,000** | $ 7.62 | $ 0.26 | $ 7.92 | $ 1.19 | $ 0.39 | **$ 16.79** |
| **50,000-75000** | $ 6.57 | $ 0.50 | $ 6.42 | $ 1.81 | $ 0.22 | **$ 14.46** |
| **25,000-50,000** | $ 5.28 | $ 1.52 | $ 0.75 | $ 1.20 | $ 0.46 | **$ 7.79** |
| **10,000-25,000** | $ 10.58 | $ 4.62 | $ 16.00 | $ 4.10 | $ 0.85 | **$ 29.84** |
| **0-10,000** | | | | | | |
| **Grand Total** | **$ 6.72** | **$ 1.87** | **$ 6.54** | **$ 2.25** | **$ 0.48** | **$ 15.04** |

Source: NRDC Study 2013

[70] Current expenditures in Los Angeles Region are not necessarily the total amount of expenditures needed to comply with the proposed final Trash Amendments since the communities in Los Angeles Region were not scheduled to be in full compliance with their TMDLs as of the date that NRDC collected the data. This information is only illustrative to estimate the adequate distribution of full capture and institutional control expenditures.

**Figure 3.** Current Trash Controls Per Capita by Permittee Size in the Los Angeles Region




Source: NRDC Study 2013

The data shows that permittees in Los Angeles Region are already implementing full capture systems in combination with institutional controls.

In comparison, the data collected for MS4 Phase I permittees outside the Los Angeles Region have a substantially different cost structure of trash control related to the use of institutional controls, regardless of the size of the permittee's jurisdiction.

Permittees outside the Los Angeles Region dedicate 13% of their trash-control resources to full capture systems. This percentage varies significantly depending on size (population density and land use area). For example, larger sized communities dedicate 11% to 14% of trash control resources to full capture systems, and smaller sized communities dedicate a larger percentage (up to 30%) to full capture systems (Figure 4 and Table 15).

**Figure 4.** Percentage of Expenditures by Trash Control Category Outside the Los Angeles Region (Source: NRDC Study 2013)

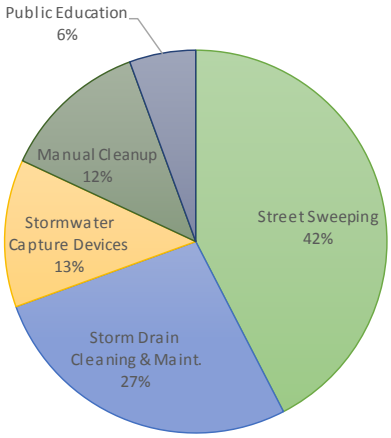


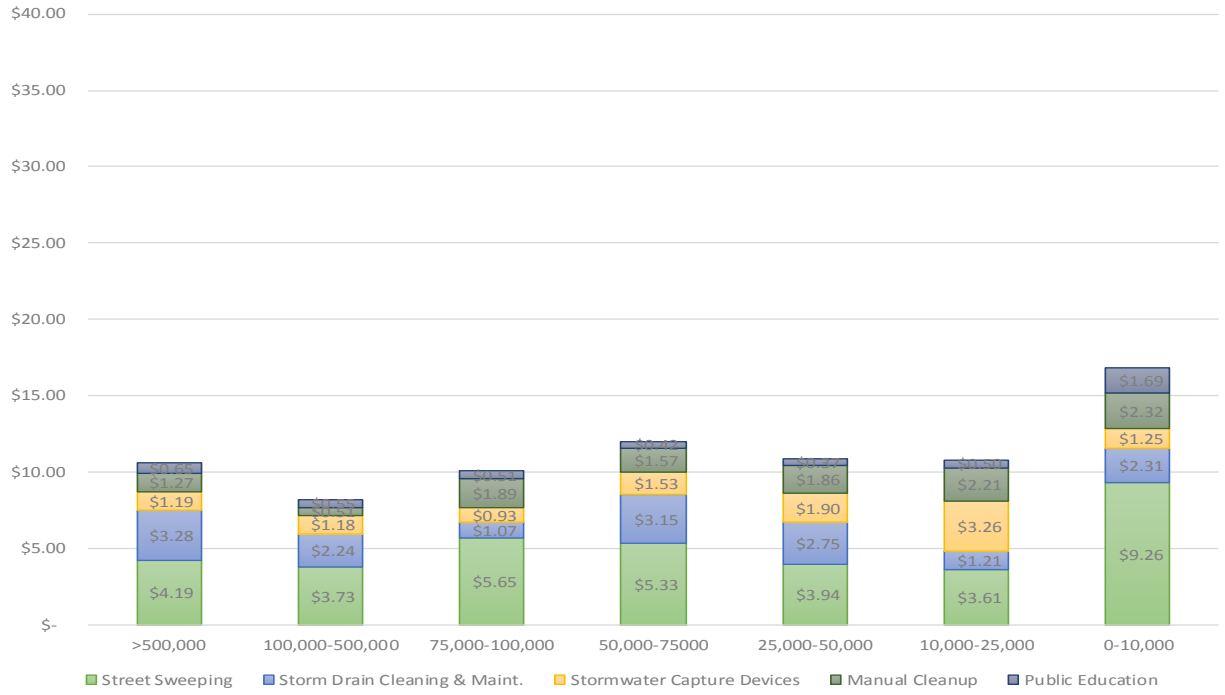
**Table 15.** Current Annual Per Capita Expenditures in Trash Control by Category Outside the Los Angeles Region

| MS4 By Population Size | Street Sweeping | Storm Drain Cleaning & Maint. | Stormwater Capture Devices | Manual Cleanup | Public Education | Total Annual Cost Per Capita |
|---|---|---|---|---|---|---|
| **>500,000** | $ 4.19 | $ 3.28 | $ 1.19 | $ 1.27 | $ 0.65 | **$ 10.41** |
| **100,000-500,000** | $ 3.73 | $ 2.24 | $ 1.18 | $ 0.51 | $ 0.55 | **$ 7.64** |
| **75,000-100,000** | $ 5.65 | $ 1.07 | $ 0.93 | $ 1.89 | $ 0.51 | **$ 9.15** |
| **50,000-75000** | $ 5.33 | $ 3.15 | $ 1.53 | $ 1.57 | $ 0.42 | **$ 10.20** |
| **25,000-50,000** | $ 3.94 | $ 2.75 | $ 1.90 | $ 1.86 | $ 0.37 | **$ 9.73** |
| **10,000-25,000** | $ 3.61 | $ 1.21 | $ 3.26 | $ 2.21 | $ 0.50 | **$ 10.09** |
| **0-10,000** | $ 9.26 | $ 2.31 | $ 1.25 | $ 2.32 | $ 1.69 | **$ 15.34** |
| **Grand Total** | **$ 4.38** | **$ 2.79** | **$ 1.29** | **$ 1.28** | **$ 0.58** | **$ 9.68** |

Source: NRDC Study 2013

This information is represented in Figure 5.

**Figure 5.** Current Trash Controls Per Capita by MS4 Phase I Permittee Size Outside the Los Angeles Region




Source: NRDC Study 2013

We determined the baseline costs for current use of institutional controls using cost factors obtained using data from the NRDC Study. The cost factors were applied to the population within each population size group. Table 16 summarizes the current estimated expenditures for MS4 Phase I permittees.

**Table 16.** Estimated Current Total Annual Expenditures in Trash Control by Category in MS4 Phase I Permittees Outside the Los Angeles Region

| Baseline Expenditures. MS4 By Population Size | Street Sweeping | Storm Drain Cleaning & Maint. | Stormwater Capture Devices | Manual Cleanup | Public Education | Total Annual Cost |
|---|---|---|---|---|---|---|
| **>500,000** | $ 12,239,133 | $ 9,577,468 | $ 3,468,147 | $ 3,703,492 | $ 1,895,704 | **$ 30,369,032** |
| **100,000-500,000** | $ 27,841,905 | $ 16,706,970 | $ 8,801,453 | $ 3,775,087 | $ 4,132,958 | **$ 57,066,650** |
| **75,000-100,000** | $ 8,572,112 | $ 1,629,968 | $ 1,412,616 | $ 2,870,335 | $ 770,787 | **$ 13,890,738** |
| **50,000-75000** | $ 11,788,359 | $ 6,971,166 | $ 3,388,229 | $ 3,473,392 | $ 928,365 | **$ 22,558,015** |
| **25,000-50,000** | $ 6,648,246 | $ 4,634,900 | $ 3,197,960 | $ 3,135,473 | $ 629,481 | **$ 16,405,397** |
| **10,000-25,000** | $ 2,198,389 | $ 736,123 | $ 1,987,132 | $ 1,346,130 | $ 305,923 | **$ 6,143,977** |
| **0-10,000** | $ 817,704 | $ 203,876 | $ 110,750 | $ 205,061 | $ 148,889 | **$ 1,355,031** |
| **Grand Total** | **$ 72,188,075** | **$ 46,050,511** | **$ 21,225,758** | **$ 21,193,701** | **$ 9,542,549** | **$ 159,741,928** |

No studies identified the mix of institutional control measures and full capture systems that would be used by any given community to comply with Track 2, as the most effective means of controlling trash are highly dependent on the particular site conditions, types of trash, and the available resources for maintenance and operation.

This economic analysis therefore considers several compliance options using the data from the NRDC Study. We has applied the current mixture of institutional controls and full capture systems from communities implementing trash and debris TMDLs in the Los Angeles Region, and compared this information with the information obtained from MS4 Phase I permittees located outside the Los Angeles Region. We then calculated the difference in the level of expenditures for each community group based on population size. The differences were used to estimate the total incremental cost for MS4 Phase I permittees located outside the Los Angeles Region (Table 17).

The data collected on institutional control expenditures show that the average expenditures by Los Angeles Water Board MS4 Phase I permittees are greater than non-Los Angeles Water Board MS4 Phase I permittees, not just for full capture systems but also for expenditures on several types of institutional controls (Table 17).

**Table 17.** Institutional Control Expenditures Per Capita in the Los Angeles Region and by Other Phase I MS4 Permittees

| Average Trash Controls Cost | Los Angeles Region | Other Communities | Difference |
|---|---|---|---|
| Stormwater Capture Devices | $ 6.54 | $ 1.29 | **$ 5.25** |
| Street Sweeping | $ 6.72 | $ 4.38 | **$ 2.34** |
| Storm Drain Cleaning & Maint. | $ 1.87 | $ 2.79 | **$ (0.92)** |
| Manual Cleanup | $ 2.25 | $ 1.28 | **$ 0.97** |
| Public Education | $ 0.48 | $ 0.58 | **$ (0.10)** |
| **Total Current Annual (True) Average Cost Per Capita** | **$ 15.04** | **$ 9.68** | **$ 5.36** |

The data in Table 17 suggests that for the more that is spent on full capture systems means that less needs to be spent on institutional controls, such as storm drain cleaning, maintenance and public education.

In some cases, the estimated per capita costs in categories such as full capture systems, manual cleanup and public education, for permittees outside of the Los Angeles Region is already greater than for permittees implementing trash and debris TMDLs. For those cases, the current level of expenditures was applied and no incremental costs would be necessary to comply with the proposed final Trash Amendments.

Table 18 presents the estimated annual incremental cost if all MS4 Phase I permittees select Track 2. The total annual cost is estimated to be approximately $67 million ($4.09 per capita) in the year when full compliance is achieved. Therefore on average, the cost of compliance with Track 2 would be lower than complying with Track 1 (i.e., only using full capture systems).

**Table 18.** Estimated Incremental Costs of Compliance with Track 2 for MS4 Phase I Permittees Outside the Los Angeles Region

| Estimated Increase in Total Trash Controls Cost by Population Community Size Group | >500,000 | 100,000-500,000 | 75,000-100,000 | 50,000-75000 | 25,000-50,000 | 10,000-25,000 | 0-10,000 | Total |
|---|---|---|---|---|---|---|---|---|
| Stormwater Capture Devices | $4,234,713 | $2,922,356 | $10,611,908 | $10,816,046 | $0 | $7,758,356 | $1,302,809 | **$37,646,188** |
| Street Sweeping | $6,784,597 | $11,137,892 | $2,996,938 | $2,747,793 | $2,249,827 | $4,245,815 | $116,590 | **$30,279,451** |
| Storm Drain Cleaning & Maint. | ($5,988,636) | $169,341 | ($1,235,224) | ($5,864,914) | ($2,073,334) | $2,077,887 | $204,033 | **($12,710,847)** |
| Manual Cleanup | $8,434,348 | $0 | $0 | $531,240 | $0 | $1,151,151 | $157,220 | **$10,273,959** |
| Public Education | $1,634,774 | $0 | $0 | $0 | $145,730 | $211,806 | $0 | **$1,992,310** |
| **Total Incremental Cost** | **$15,099,795** | **$14,229,588** | **$12,373,622** | **$8,230,165** | **$322,223** | **$15,445,015** | **$1,780,652** | **$67,481,061** |

**Other Compliance Costs**

In addition to compliance tracks, the proposed final Trash Amendments includes monitoring, evaluation and reporting requirements. These would potentially increase the cost of compliance with the proposed final Trash Amendments. This economic analysis does not include an estimate of those potential costs. These costs are expected to be negligible relative to capital and operation and maintenance costs.

### c. Compliance Schedules

The final Trash Amendments propose a time schedule for permittees to comply ten years from the effective date of the first implementing permit.[71] One potential compliance schedule is 10% completion of controls per year. We have estimated the average annual cost to comply with Track 1 and Track 2 once the permittees have achieved full implementation. Capital costs were distributed evenly in order to achieve full compliance within ten years (10% each year).

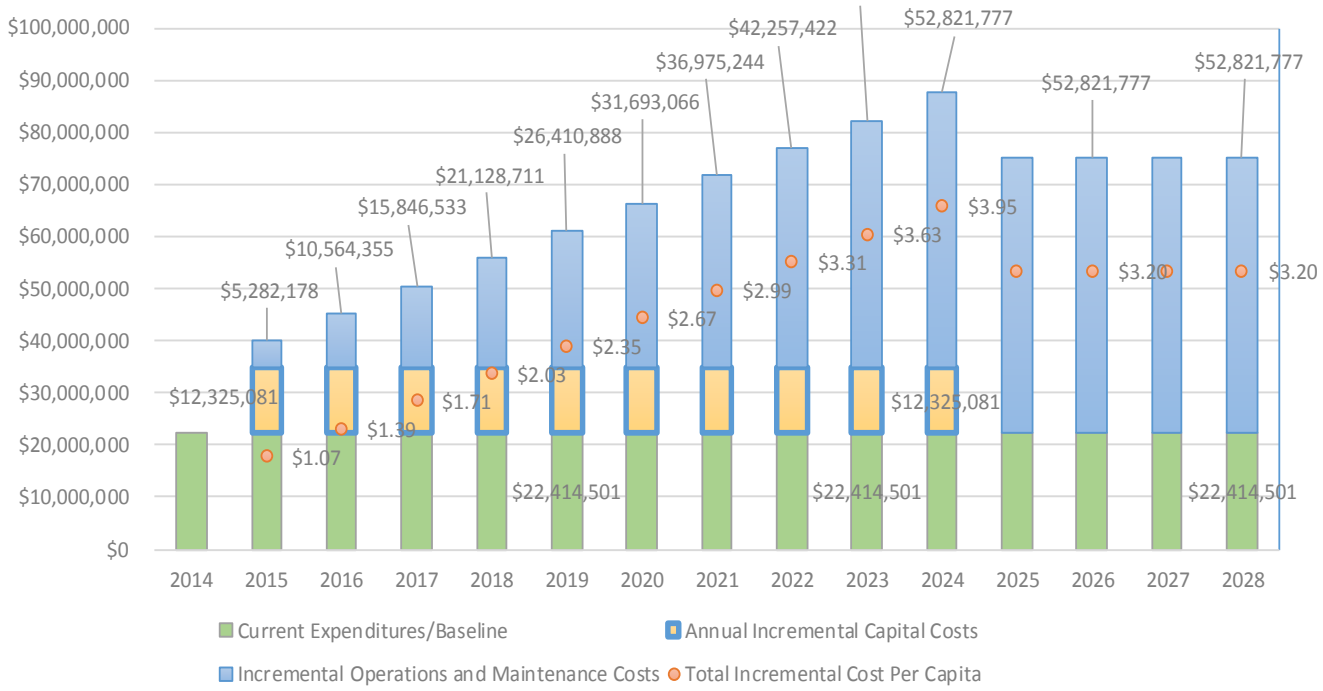
To estimate the annual incremental cost of compliance, the following cost factors and assumptions are used:

- Compliance starts in January 2015.
- The installation of a full capture system is $800 per unit.

[71] See fn. ~~37~~42, *ante*.

- The annual cost of operations and maintenance for a full capture system is $342 per unit install.
- The total cost to install, operate and maintain a full capture system in Year 1 is $1,142.
- Full capture systems were installed in 10% increments over ten years.
- Maintenance cost for each year includes the cost of operating and maintaining each full capture system. For example, the operations and maintenance cost in Year 2 is the sum of the 10% full capture systems installed in Year 1 plus the 10% installed in Year 2.

**Figure 6.** Compliance Schedule with Track 1 for MS4 Phase I Permittees Estimated Total Costs 2014-2024



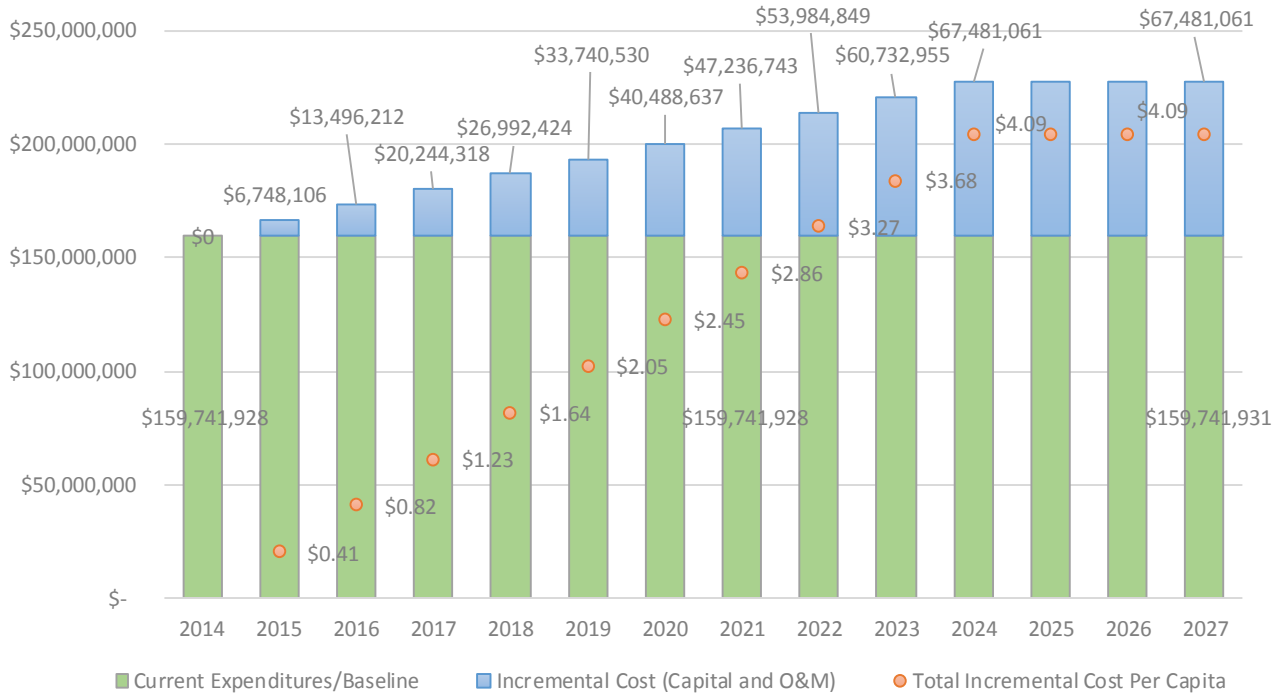

Assuming communities install 10% of the structural controls each year, the capital, operation and maintenance costs in Year 10 (highest cost year) would be $65 million for all Phase 1 affected permittees ($3.95 per capita). The total cost of installing (capital costs) full capture systems in MS4 Phase I permittees is estimated at $8.42 per capita or approximately $123 million. Spread out over ten years equally is approximately $12.3 million per year. Operations and maintenance of the installed full capture systems increases based on the accumulated installed units (capital costs). As a result, operations and maintenance cost per capita fluctuates from $0.32 in Year 1 to $3.2 in Year 10.

**Compliance Schedule with Track 2**

The incremental cost in the year of full compliance with the proposed final Trash Amendments is approximately $67.5 million or $4 per capita[72] (Figure 7).

[72] After Year 10 the incremental cost is assumed to remain constant at $67.48 million per year.

**Figure 7.** Compliance Schedule with Track 2 for MS4 Phase I Permittees




### d. Limitations and Uncertainties

Current cost of trash controls implemented through MS4 permits in California ranged from $3 per person a year for municipalities with a population of 500,000 or more to up to $60 per year for small municipalities. The selection of the method of compliance with the proposed final Trash Amendments will highly depend on the site specific conditions of every permittee, such as:

- Compliance alternatives
- Costs of controls
- Types of trash
- Site characteristics
- Compliance schedules
- Current compliance rates (for establishing the baseline)
- Other economic factors, technology, inflation, risks, regulatory framework

## 5. MS4 Phase II Permittees: Cost Per Capita Method

### a. MS4 Phase II Statistics

Data for MS4 Phase II permittees was obtained using CIWQS and grouped by population size. Of the 156 MS4 Phase II listed permittees, eight were removed due to incomplete information necessary for the analysis[73]. 148 MS4 Phase II permittees were identified for the analysis (Table 19).

**Table 19.** MS4 Phase II Permittees by Regional Water Board

| **Number of MS4 Phase II** | Regional Board | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Population Size | 1 | 2 | 3 | 4 | 5F | 5R | 5S | 6A | 6B | 7 | 8 | 9 | Grand Total |
| >500,000 | | | | | | | | | | | | | |
| 100,000-500,000 | | | 1 | | | | 1 | | | | | | 2 |
| 75,000-100,000 | | | 2 | | 2 | 1 | 2 | | | | | | 7 |
| 50,000-75,000 | | 4 | 4 | | 1 | 1 | 6 | | 3 | | | | 19 |
| 25,000-50,000 | 2 | 4 | 11 | | 5 | | 9 | | | 3 | | | 34 |
| 10,000-25,000 | 6 | 2 | 12 | | 5 | 1 | 14 | 1 | | 2 | | | 43 |
| 0-10,000 | 4 | 15 | 8 | | 3 | | 11 | 1 | 1 | | | | 43 |
| **Grand Total** | **12** | **25** | **38** | | **16** | **3** | **43** | **2** | **4** | **5** | | | **148** |

There are no permittees listed in CIWQS under Phase II in the jurisdiction of the Los Angeles Water Board, Santa Ana Water Board, and San Diego Water Board[74]. Table 20 shows the population living in municipalities regulated under the MS4 Phase II permit.

[73] Additionally, the City of Avalon and other non-traditional Phase II permittees in the Los Angeles Region are new enrollees to MS4 Phase II permit and lack data on CIWQS. Thus, the new enrollees were not included in the analysis.

[74] There are ten MS4 Phase II permittees in Los Angeles Region, eleven MS4 Phase II permittees in the Santa Ana Region and nine MS4 Phase II permittees in the San Diego Region that are tracked in the Storm Water Multiple Application and Report Tracking System (SMARTS) database but were not included in the CIWQS database at the time of the economic analysis.

**Table 20.** Population for Municipalities Regulated Under MS4 Phase II Permits

| Number of MS4 Phase I Municipalities by Population Size | Regional Water Board 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|
| >500,000 | | | | | | | | | | |
| 100,000-500,000 | | | 144,000 | | 112,581 | | | | | 256,581 |
| 75,000-100,000 | | | 190,053 | | 410,070 | | | | | 600,123 |
| 50,000-75,000 | | 254,276 | 219,526 | | 492,190 | 194,000 | | | | 1,159,992 |
| 25,000-75,000 | 66,832 | 145,456 | 361,578 | | 558,983 | | 126,005 | | | 1,258,854 |
| 10,000-25,000 | 96,229 | 22,785 | 201,976 | | 304,542 | 13,000 | 35,334 | | | 673,866 |
| 0-10,000 | 31,371 | 100,176 | 49,676 | | 95,346 | 11,600 | | | | 288,169 |
| **Grand Total** | **194,432** | **522,693** | **1,166,809** | | **1,973,712** | **218,600** | **161,339** | | | **4,237,585** |

In summary, 148 municipalities regulated under Phase II of the MS4 program with a total population of 4,237,585, representing 11.5% of California population (2010 Census) are considered in this analysis.

Using the information provided in the referenced studies, a baseline of current costs was created based on municipality type and size. The NRDC Study was relied upon for the data obtained from a direct survey of 221 California municipalities. The summary of the current average annual cost per capita by category of trash control is presented in Table 6. This methodology as previously described for MS4 Phase I permittees was replicated for the MS4 Phase II permittees.

### b. Potential Compliance Options

#### *1. Track 1: Full Capture Systems*

An analysis of the increased annual average cost for the 148 MS4 Phase II permittees shows that the total potential incremental cost for all Phase II MS4s is $33 million (Table 21).

**Table 21.** Incremental Cost of Compliance for MS4 Phase II Communities Using Full Capture Systems by Municipality Size

| MS4 Phase II Municipality Size | MS4 Phase II | Total Population (A) | Current Cost (baseline) | Current Cost Per Capita (baseline B) | Estimated Annual Cost Per Capita (After Full Implementation in Year 10) (C+D) | *Estimated Total Capital Costs Per Capita (C)* | *Estimated Annual O&M Per Capita (in Year 10) (D)* | Total Estimated Incremental Cost Of Compliance (C+D-B) X A |
|---|---|---|---|---|---|---|---|---|
| >500,000 | | | | | | | | |
| 100,000-500,000 | 2 | 256,581 | $321,137 | $1.25 | $12.82 | *$8.96* | *$3.84* | $2,967,648 |
| 75,000-100,000 | 7 | 600,123 | $533,630 | $0.89 | $10.50 | *$7.35* | *$3.15* | $5,766,952 |
| 50,000-75,000 | 19 | 1,159,992 | $1,462,858 | $1.26 | $11.03 | *$7.70* | *$3.30* | $11,327,048 |
| 25,000-75,000 | 34 | 1,258,854 | $2,084,477 | $1.66 | $8.70 | *$6.09* | *$2.61* | $8,868,698 |
| 10,000-25,000 | 43 | 673,866 | $2,156,399 | $3.20 | $7.72 | *$5.39* | *$2.31* | $3,047,851 |
| 0-10,000 | 43 | 288,169 | $300,253 | $1.04 | $6.45 | *$4.55* | *$1.95* | $1,558,787 |
| **Total** | **148** | **4,237,585** | **$6,858,754** | **$1.62** | **$9.53** | ***$6.67*** | ***$2.86*** | **$33,536,983** |

In summary, the 148 MS4 Phase II communities analyzed are currently spending $6.8 million per year to install and operate full capture systems. To comply with Track 1 in one year is estimated to be an additional cost of $33.5 million or an additional $7.91 (difference between $9.53 and $1.62) per capita in the year that full compliance is achieved. The incremental total capital costs are estimated at $5.54[75] per capita or $23.4 million. Once full capture systems are installed (capital costs), the annual operation and maintenance costs are estimated at $2.37[76] per capita or $10 million. Assuming permittees install 10% of the structural controls each year, the capital, operation and maintenance costs in Year 10 ( highest cost year) would be $12 million ($2.93 per capita) (Figure 9).

### 2. *Track 2: Combination of Full Capture Systems, Other Treatment Controls, Institutional Controls, Multi-Benefit Projects*

Track 2 of the proposed final Trash Amendments focuses on permittees installing, operating, and maintaining any combination of full capture systems, other treatment controls, institutional controls, and/or multi-benefit projects. The combinations of trash controls must achieve the same performance results as Track 1.

MS4 Phase II permittees are already spending resources in full capture systems and institutional controls. Table 22 shows the average annual cost per capita for each type of trash control.

[75] Costs are estimated based on a full capture system at $800 per unit (capital costs) and $342 annual cost of operations and maintenance per unit. Therefore, capital costs are estimated to be 70% of the costs if all full capture systems are installed in one year and operations and maintenance cost are estimated to be 30% of the total costs. The capital costs incremental cost is calculated by multiplying $7.91 (the difference between $9.53 and $1.62) by 70% (i.e., $7.91 X 0.7 = $5.54).

[76] The operations and maintenance incremental cost is calculated by multiplying $7.91 (the difference between $9.53 and $1.62) by 30% (i.e., $7.91 X 0.3 = $2.37).

**Table 22.** Current Average Annual Expenditures Per Capita by Trash Control Category by Population Size Group (MS4 Phase II Permittees)

| MS4 PHASE II By Population Size | Street Sweeping | Storm Drain Cleaning & Maint. | Stormwater Capture Devices | Manual Cleanup | Public Education | Total Annual Cost Per Capita |
|---|---|---|---|---|---|---|
| **>500,000** | | | | | | |
| **100,000-500,000** | $ 4.08 | $ 2.12 | $ 1.25 | $ 0.56 | $ 0.58 | **$ 8.59** |
| **75,000-100,000** | $ 6.98 | $ 1.34 | $ 0.86 | $ 2.13 | $ 0.52 | **$ 11.84** |
| **50,000-75000** | $ 5.85 | $ 3.31 | $ 1.25 | $ 1.41 | $ 0.40 | **$ 12.24** |
| **25,000-50,000** | $ 3.92 | $ 3.06 | $ 1.62 | $ 1.96 | $ 0.40 | **$ 10.95** |
| **10,000-25,000** | $ 3.99 | $ 1.23 | $ 3.13 | $ 2.07 | $ 0.48 | **$ 10.90** |
| **0-10,000** | $ 4.68 | $ 2.64 | $ 1.03 | $ 2.48 | $ 1.57 | **$ 12.41** |
| **Grand Total** | **$ 4.96** | **$ 2.50** | **$ 1.59** | **$ 1.81** | **$ 0.52** | **$ 11.38** |

Source: NRDC Study 2013

The actual cost of trash controls by category is presented in Table 23 and Figure 8. The total estimated population regulated under a MS4 Phase II permit is 4,310,345.

**Table 23.** Current Expenditures in Annual Trash Control Category by Population Size Group (MS4 Phase II Permittees)

| MS4 PHASE II By Population Size | Street Sweeping | Storm Drain Cleaning & Maint. | Stormwater Capture Devices | Manual Cleanup | Public Education | Total Annual Cost | Population |
|---|---|---|---|---|---|---|---|
| **>500,000** | | | | | | | |
| **100,000-500,000** | $ 1,045,952 | $ 545,074 | $ 321,137 | $ 143,258 | $ 148,913 | $ 2,204,334 | **256,581** |
| **75,000-100,000** | $ 4,329,764 | $ 833,308 | $ 533,630 | $ 1,323,013 | $ 321,491 | $ 7,341,206 | **620,156** |
| **50,000-75000** | $ 6,835,786 | $ 3,870,160 | $ 1,462,858 | $ 1,650,517 | $ 468,274 | $ 14,287,595 | **1,167,639** |
| **25,000-50,000** | $ 5,043,383 | $ 3,930,905 | $ 2,084,477 | $ 2,515,101 | $ 508,387 | $ 14,082,253 | **1,286,248** |
| **10,000-25,000** | $ 2,750,042 | $ 846,592 | $ 2,156,399 | $ 1,427,361 | $ 329,857 | $ 7,510,251 | **689,112** |
| **0-10,000** | $ 1,359,397 | $ 768,567 | $ 300,253 | $ 722,072 | $ 457,452 | $ 3,607,742 | **290,609** |
| **Grand Total** | **$ 21,364,325** | **$ 10,794,607** | **$ 6,858,754** | **$ 7,781,321** | **$ 2,234,375** | **$ 49,033,382** | **4,310,345** |

Source: NRDC Study 2013

**Figure 8.** Current Annual Trash Control Per Capita for MS4 Phase II Communities

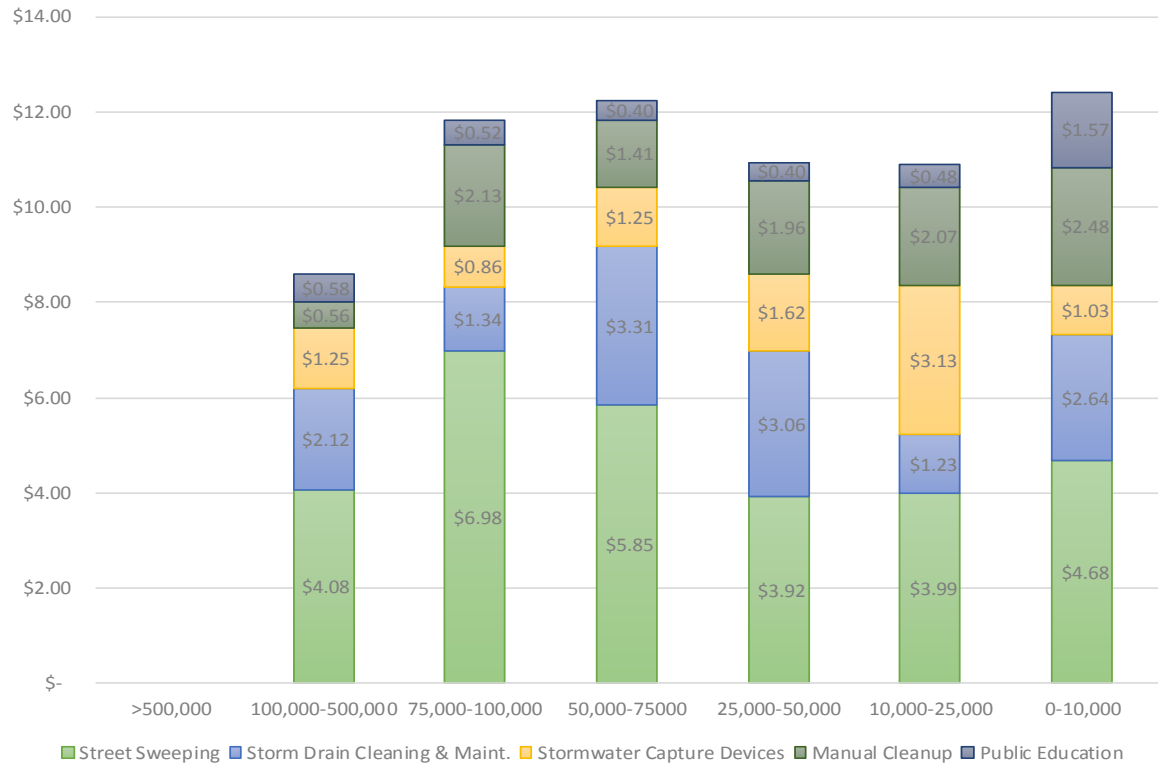



Table 24 highlights the main differences of annual trash control expenditures per capita between the permittees inside and outside the Los Angeles Region.

**Table 24.** Average Annual Trash Control Expenditures Per Capita in the Los Angeles Region and MS4 Phase II Communities

| Average Trash Controls Cost | Los Angeles Region | Phase II Communities | Difference |
|---|---|---|---|
| Stormwater Capture Devices | $ 6.54 | $ 1.59 | **$ 4.95** |
| Street Sweeping | $ 6.72 | $ 4.96 | **$ 1.76** |
| Storm Drain Cleaning & Maint. | $ 1.87 | $ 2.50 | **$ (0.63)** |
| Manual Cleanup | $ 2.25 | $ 1.81 | **$ 0.44** |
| Public Education | $ 0.48 | $ 0.52 | **$ (0.04)** |
| **Total Current Annual (True) Average Cost Per Capita** | **$ 15.04** | **$ 11.38** | **$ 3.66** |

Table 25 summarizes the estimated annual incremental cost of trash controls choosing a combination of institutional controls and full capture systems. MS4 Phase II permittees would

spend an additional $32 million a year once full implementation is achieved[77], an additional $7.77[78] per capita per year if compliance is completed in one year.

**Table 25.** Estimated Annual Incremental Costs of Compliance with Track 2 for MS4 Phase II Permittees Outside the Los Angeles Water Region

| Estimated Increase in Total Trash Controls Cost by Population Community Size Group | >500,000 | 100,000-500,000 | 75,000-100,000 | 50,000-75000 | 25,000-50,000 | 10,000-25,000 | 0-10,000 | Total |
|---|---|---|---|---|---|---|---|---|
| Stormwater Capture Devices | | $ 81,695 | $4,378,006 | $6,033,384 | $0 | $8,869,393 | $4,349,491 | **$23,711,968** |
| Street Sweeping | | $293,400 | $395,824 | $835,602 | $1,748,006 | $4,540,763 | $1,715,246 | **$9,528,842** |
| Storm Drain Cleaning & Maint. | | $34,799 | ($672,068) | ($3,286,340) | ($1,975,808) | $2,337,105 | $574,046 | **($2,988,266)** |
| Manual Cleanup | | $0 | $0 | $462,910 | $0 | $1,397,998 | $469,425 | **$2,330,333** |
| Public Education | | $0 | $0 | $0 | $83,287 | $255,888 | $0 | **$339,175** |
| **Total Incremental Cost** | | **$409,895** | **$4,101,762** | **$4,045,556** | **($144,515)** | **$17,401,148** | **$7,108,208** | **$32,922,053** |

### c. Compliance Schedules

Compliance schedules for MS4 Phase II permittees is ten years of the effective date of the first implementing permit[79]. The analysis uses the same methodology as previously described for MS4 Phase I permittees.

**Compliance Schedule with Track 1**

Total incremental cost in the year of full compliance with the proposed final Trash Amendments is estimated to be $12.3 million or $2.93 per capita. After Year 10, the incremental cost of operating and maintaining the full capture systems the cost may be $10 million per year[80] ($2.37 per capita) (Figure 9).

[77] This estimated annual incremental cost is assuming that all necessary expenditures are conducted in one single year and the operations and maintenance associated with those specific expenditures. See compliance schedule for an analysis of incremental cost of compliance over a 10 year period.

[78] $7.77 is the result of dividing the total annual cost presented in Table ($32,922,053) by the population of the 148 communities selected (4,237,585) (i.e., $32,922,053 / 4,237,585 = $7.77).

[79] See fn. ~~37~~42, *ante*.

[80] Operations and maintenance costs are estimated at $342 per year for every full capture system installed. Therefore for every $800 of full capture system installed, $342 (or 42.75% of capital costs) would be spent annually in operations and maintenance. After 10 years of installation of full capture systems, MS4 Phase II communities would have spent $23,463,510 on full capture systems. To maintain and operate $23,463,510 full capture systems, the permittees would need to spend $10 million annually (i.e., $23,463,510 X 0.4275 = $10,030,650).

**Figure 9.** Compliance Schedule with Track I for MS4 Phase II Permittees with Estimated Total Costs

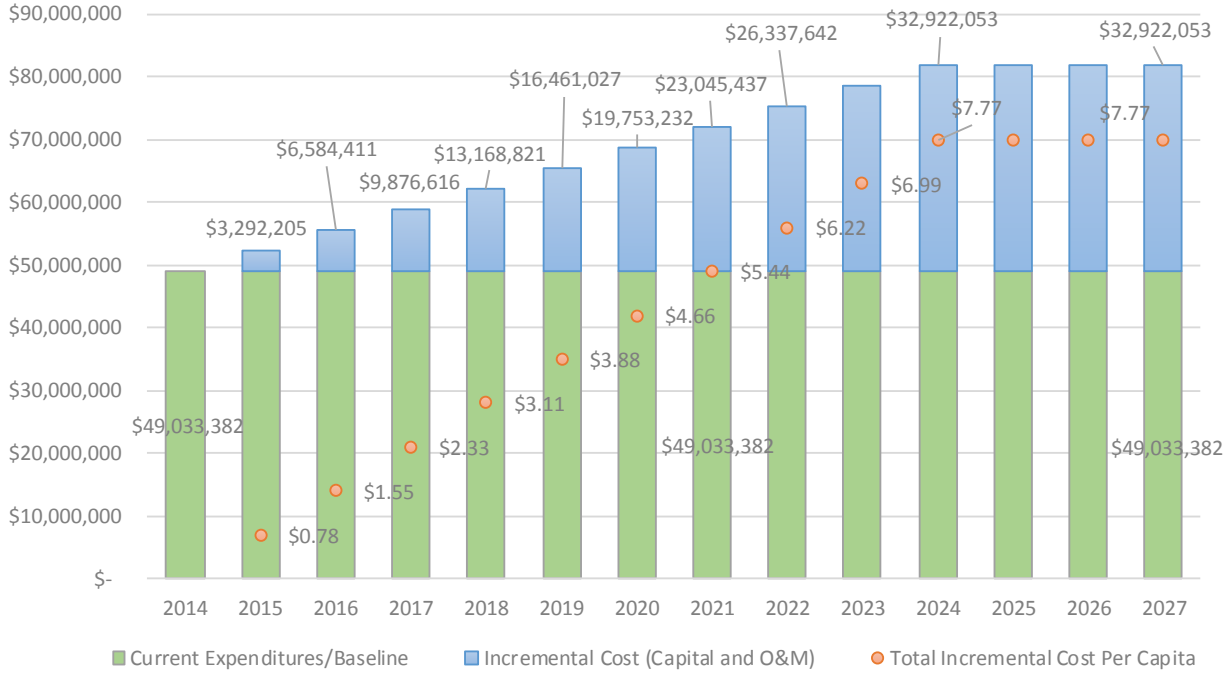
Assuming installation of 10% of the structural controls each year, the capital, operation and maintenance incremental costs in Year 10 (highest cost year) would be $12.3 million for affected MS4 Phase II permittees ($2.93 per capita). The total cost of installing (capital costs) full capture systems in MS4 Phase II permittees is estimated at $5.54 per capita or approximately $23.4 million. This total amount spread out in ten years equally is approximately $2.3 million per year. Operations and maintenance of the installed full capture systems increases based on the accumulated installed units (capital costs). As a result, operations and maintenance cost per capita fluctuates from $0.24 in Year 1 to $2.37 in Year 10.

**Compliance Schedule with Track 2**

The incremental cost in the year of full compliance with the proposed final Trash Amendments is $32.9 million or $7.77[81] per capita (Figure 10).

[81] $7.77 is the result of dividing the total annual cost presented in Table ($32,922,053) by the population of the 148 communities selected (4,237,585) (i.e., $32,922,053 / 4,237,585 = $7.77).

**Figure 10.** Compliance Schedule with Track 2 for MS4 Phase II Permittees



## 6. MS4 Phase I and Phase II Permittees: Land Coverage Method

### a. Costs Based on Land Coverage

Trash generation rates vary by land use. Sections 4 and 5 were used methodology to estimate compliance costs for Track 1 and Track 2. This section uses a second method of cost analysis to estimate the compliance cost of a full capture system based on land coverage. The number of storm drains within a linear road mile is based on land coverage. Since counties do not have a uniform classification of land cover codes or divisions, the data was collated from USGS Multi-Resolution Land Characteristics Consortium Land Cover Data 2006. The data can be accessed at: http://www.mrlc.gov/nlcd2006.php. The categories identified were the following:

- Land Use (LU) 22 or "Developed, Low Intensity". This is defined as developed low intensity includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-49 percent of total cover. These areas most commonly include single-family housing units.
- Land Use (LU) 23 or "Developed, Medium Intensity". This is defined as developed medium intensity includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-79 percent of the total cover. These areas most commonly include single-family housing units.
- Land Use (LU) 24 or "Developed, High Intensity". This is defined as developed high intensity includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80-100 percent total cover.

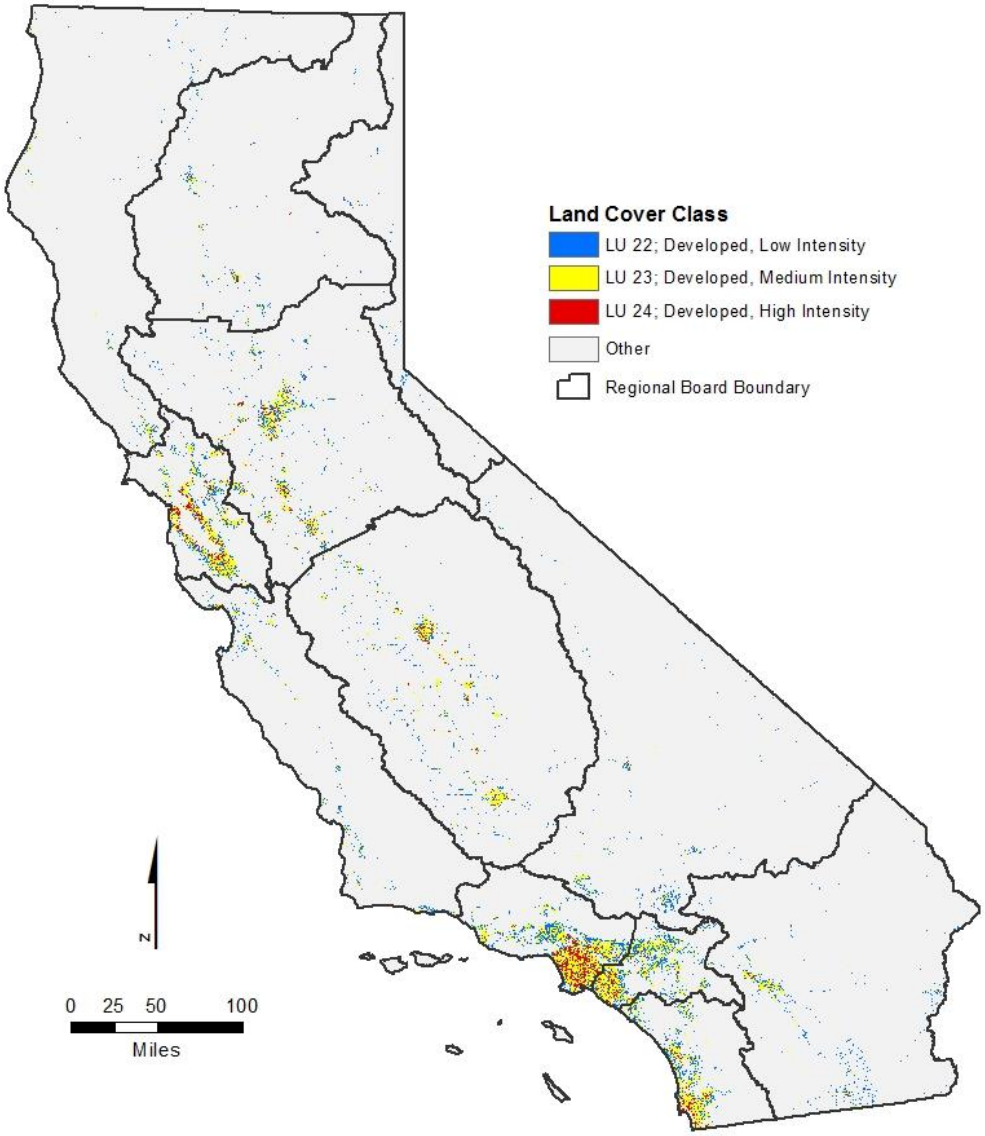
Land coverage was utilized to as a proxy to preliminarily identify priority land uses subject to the proposed final Trash Amendments. The analysis assumes that priority land uses, as defined in the proposed final Trash Amendments, correlate with land cover information for LU 24. Table 26 shows the land cover in acres by regional water board, and Figure 11 shows a map of developed areas by regional water board.

**Table 26.** Land Coverage by Regional Water Board.

| Regional Water Board | Developed, High Intensity (acres) LU24 | Developed, Medium Intensity (acres) LU23 | Developed, Low Intensity (acres) LU22 | Total (acres) |
|---|---|---|---|---|
| **1** | 3,363.72 | 28,436.50 | 53,925.15 | 85,725.37 |
| **2** | 79,241.00 | 283,766.94 | 189,907.27 | 552,915.21 |
| **3** | 7,365.93 | 65,757.88 | 96,791.50 | 169,915.32 |
| **4** | 116,476.55 | 369,140.92 | 234,763.83 | 720,381.30 |
| **5** | 88,199.95 | 394,570.64 | 422,365.75 | 905,136.34 |
| **6** | 5,519.61 | 38,368.20 | 124,361.10 | 168,248.92 |
| **7** | 6,822.85 | 56,434.21 | 119,589.18 | 182,846.23 |
| **8** | 42,020.59 | 256,479.11 | 216,122.48 | 514,622.18 |
| **9** | 41,759.49 | 196,458.79 | 153,307.11 | 391,525.39 |
| **Total (acres)** | 390,769.69 | 1,689,413.19 | 1,611,133.37 | 3,691,316.26 |

Source: USGS Multi-Resolution Land Characteristics Consortium Land Cover Data 2006

**Figure 11.** Developed Land Cover Classes by Regional Water Board.




Compliance with Track 1 for MS4 permittees requires installing, operating and maintaining full capture systems for all storm drains that capture runoff from one or more of the priority land uses in their jurisdictions. Costs Considerations conducted for developing the TMDLs in the Los Angeles Region estimated that, in high intensity developed areas, an average of approximately one catch basin per acre is needed. Therefore, one full capture system per acre was used for the compliance cost estimates.

There are 390,769 acres classified as “Developed, High Intensity” in California. Los Angeles Water Board MS4 permittees are already implementing trash and debris TMDLs (116,476 acres) were subtracted from the total. The areas in City of San Francisco (10,830 acres of high density), and Sacramento (1,160 acres) served by combined sewer systems were subtracted from the total. Trash generated on areas served by combined sewer systems would be captured and removed at the regional wastewater treatment plant instead of being discharged through a conventional storm drain system. Therefore, the total high intensity land potential subject to the proposed final Trash Amendments is 262,302.3 acres. The population within this high intensity land cover is 20.7 million.

The average cost of installing a catch basin insert was estimated to be $800 and the annual operation and maintenance was $324. We estimated one catch basin per acre and one full capture system is needed per catch basin. Similar to the compliance schedule discussion in Sections 5 and 6, full capture systems were assumed to be installed at a rate of about 10% per year, with full build out in Year 10.

As described in previous sections, MS4 Phase I and Phase II permittees are spending $29 million a year or $1.41 per resident per year in operating and maintaining full capture systems[82]. Table 27 and Figure 12 shows the estimated total cost of compliance per year assuming a compliance period of ten years and that 10% of full capture systems are installed each year.

During the first ten years of the implementation of the proposed final Trash Amendments, permittees may incur an incremental average cost of $41 million a year ($2 per capita) to install, operate and maintain full capture systems in high density areas. The total incremental annual cost of operating and maintain all full capture systems installed after Year 10 is $60 million or an average cost per resident per year of $2.91. Table 27 shows the total estimated costs, the incremental cost and the cost per capita for each year starting in 2015 and ending in 2026.

### b. Limitations and Uncertainties

The estimates based on land coverage are based on the following assumptions:

1. Land Coverage is a surrogate for land use designation. Priority land uses are correlated to land coverage.

   Using land coverage to estimate the total cost of compliance focuses on the actual priority land uses that would be impacted. This may reduce the error that the estimates using per capita would have on large communities with large populations and low developed density. At the same time, it may overestimate the costs by including all high intensity land uses that are not part of an MS4. The proposed final Trash Amendments define priority land uses based on the different types of uses. By using land coverage instead of land use the analysis may be underestimating the area subject to compliance with the proposed final Trash Amendments.

2. The average cost of a full capture system is $800 and the annual operations and maintenance is $342.
   A broad range of compliance options are available to the permittees subject to the proposed final Trash Amendments. The selection of the full capture system depends on many site specific factors and conditions. Capital cost per unit ranges from $300 per catch basin inserts for installation (capital costs) and $330 annual maintenance to $80,000 per vortex separator system for installation (capital costs) and $30,000 annual maintenance. Different methods may cover different areas, for example a drop inlet may only cover one acre, whereas a vortex separator system may cover many acres, therefore a normalized cost per acre was estimated at $800 in capital cost and $342 in annual operations and maintenance.

3. The analysis is highly sensitive to this assumption and more site specific estimates would be necessary to develop a more accurate estimate.

   The number of full capture systems per acre in priority land uses is one full capture system per acre. There is no one size fits all assumption for storm drain inlet placing. High intensity blocks vary greatly in size depending on what city they are in and the local conditions

[82] See Table 13 and Table for a description of the baseline of current costs. ($22.4 million for MS4 Phase I permittees and $6.8 for MS4 Phase II permittees)

(rainfall, slope, density, impervious surfaces, etc.). Rough estimates range from one catch basin in a three-acre urban area in the City of Los Angeles[83] (0.33 per acre) and up. For this analysis, one catch basin per acre was assumed. The analysis is highly sensitive to this assumption and more site specific estimates would be necessary to develop a more accurate estimate.

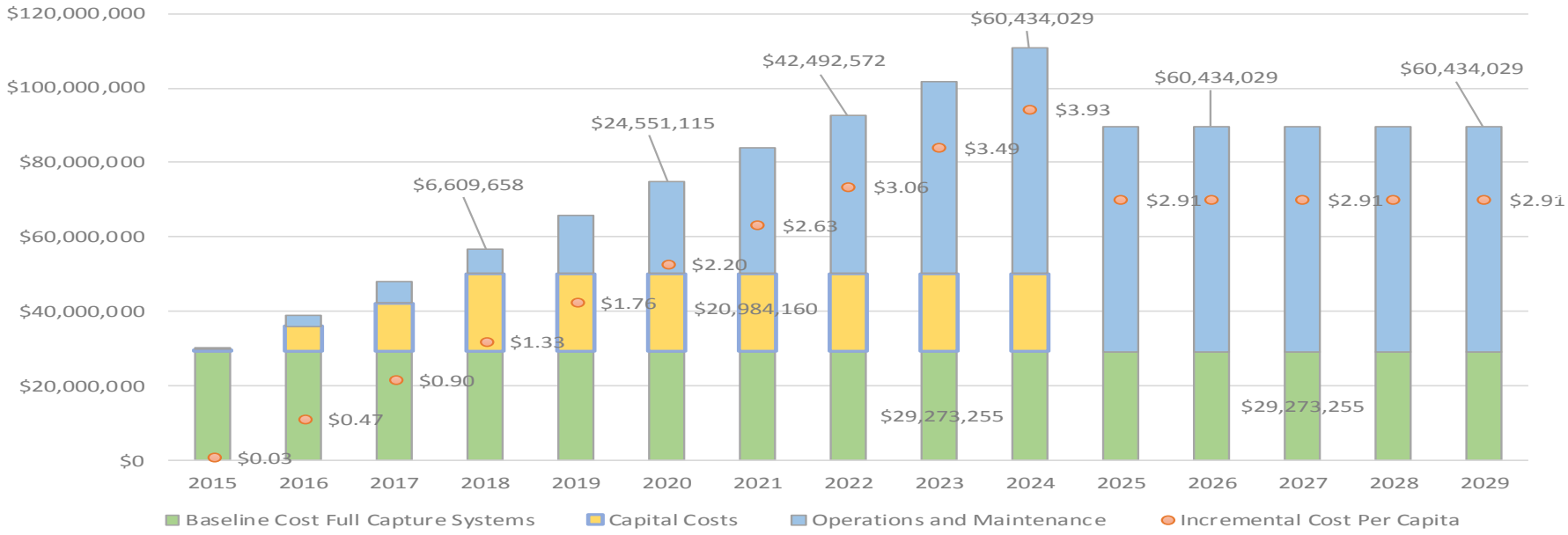
4. The land coverage analysis does not take into consideration institutional controls or other approved methods of compliance.
   Compliance with the proposed final Trash Amendments can be achieved with the installation of structural controls or a combination of structural controls and other methods including institutional controls. The land coverage analysis does not include an estimate of potential cost for a combination of institutional and structural controls per acre of priority land use. This approach would probably estimate the more reliable results. Further analysis would be necessary to estimate total costs of Track 2.

[83] City of Los Angeles Stormwater Management Division. 2002. High Trash-Generation Areas and Control Measures. http://www.lastormwater.org/wp-content/files_mf/trash_gen_study.pdf

**Table 27.** Cost of Compliance Schedule Based on High Intensity Land Cover

| Cost Categories | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Capital Costs** | $20,984,160 | $20,984,160 | $20,984,160 | $20,984,160 | $20,984,160 | $20,984,160 | $20,984,160 | $20,984,160 | $20,984,160 | $20,984,160 | $0 | $0 |
| **Operations and Maintenance** | $8,970,728 | $17,941,457 | $26,912,185 | $35,882,914 | $44,853,642 | $53,824,370 | $62,795,099 | $71,765,827 | $80,736,556 | $89,707,284 | $89,707,284 | $89,707,284 |
| **Total Cost** | $29,954,888 | $38,925,617 | $47,896,345 | $56,867,074 | $65,837,802 | $74,808,530 | $83,779,259 | $92,749,987 | $101,720,716 | $110,691,444 | $89,707,284 | $89,707,284 |
| ***Cost Per Capita*** | *$1.44* | *$1.88* | *$2.31* | *$2.74* | *$3.18* | *$3.61* | *$4.04* | *$4.47* | *$4.91* | *$5.34* | *$4.33* | *$4.33* |
| ***Baseline Cost Full Capture Systems*** | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* | *$29,273,255* |
| **Incremental Cost** | **$681,633** | **$9,652,361** | **$18,623,090** | **$27,593,818** | **$36,564,547** | **$45,535,275** | **$54,506,003** | **$63,476,732** | **$72,447,460** | **$81,418,189** | **$60,434,029** | **$60,434,029** |
| ***Incremental Cost Per Capita*** | *$0.03* | *$0.47* | *$0.90* | *$1.33* | *$1.76* | *$2.20* | *$2.63* | *$3.06* | *$3.49* | *$3.93* | *$2.91* | *$2.91* |

**Figure 12** Compliance Schedule for Track 1 for MS4 Phase I and Phase II Permittees Based on High Intensity Land Coverage



## 7. Potential Costs for Industrial and Construction Permittees

There are 9,251 industrial facilities regulated under the Storm Water Industrial Program[84]. The estimated compliance costs (track 1) with the proposed final Trash Amendments for the industrial facilities are $33.9[85] million or $3,671[86] per facility.

The number of full capture systems required to comply with track 1 is directly proportional to the number of catch basins and storm drains in each industrial site. Information regarding the number of storm drains in each industrial site is not available in the SMARTS database[87].

Given the small size of many industrial permittees, we assumed that smaller facilities would choose to comply with the proposed final Trash Amendments implementing institutional controls rather than full capture systems. It is likely that only larger facilities would choose to install full capture systems. We identified two groups based on facility size. Out of the 9,251 industrial sites, 2,501 facilities with a size larger than 10 acres were assumed to comply by installing full capture systems and 6,750 facilities with a size of less than 10 acres, or without size information, would comply by implementing institutional controls such as training and manual cleanup.

In our calculations, the following assumptions[88] were made and used for the cost factors.

- Facilities larger than 10 acres would comply with Track 1.
- An average of 10 catch basins per facility for facilities greater than 10 acres.
- The cost of installation of each full capture system is estimated to be $800 and the annual operation and maintenance to be $342.
- Facilities smaller than 10 acres would implement institutional controls.
- Cost of institutional controls includes a $500 initial training and an annual cost of $300 in other measures.
- Industrial facilities are not implementing any trash control methods to comply with the proposed final Trash Amendments, therefore all costs are incremental.

### a. Track 1: Full Capture Systems

The estimated cost of compliance for industrial dischargers larger than 10 acres selecting Track 1 (2,501 facilities) would be approximately $28.5 million in a single year[89] and $8.5 million

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[84] CGP permittees are already required to comply with a prohibition to discharge debris and trash from construction sites. State Board Action 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ. Prohibition III. D. page 21. Available at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo2009_0009_dwq.pdf. Debris is defined (footnote 4) as "Litter, rubble, discarded refuse, and remains of destroyed inorganic anthropogenic waste." Trash control costs are therefore not expected to increase for CGP permittees as a result of the proposed final Trash Amendments.

[85] The total cost of $33.9 million is the sum of the cost for large industrial facilities calculated in Table (i.e., $28.5 million) and Table (i.e., $5.4 million).

[86] This is the result of dividing the total cost of $33.9 million by the 9,251 industrial facilities.

[87] SMARTS is the main database used to manage the Storm Water program. Available at: Stormwater Multi-Application, Reporting, and Tracking System (SMARTS)

[88] Assumptions are necessary because of the limitations in the data available regarding the activities conducted at the industrial facilities, the number of workers in each facility, etc.

annually following initial implementation (Table 28). The average operation and maintenance annual cost per facility is estimated to be $3,420 and the one time average installation cost of full capture systems per facility is estimated to be $8,000.

**Table 28.** Estimated Cost of Compliance for Industrial Facilities Larger than 10 Acres

| Size of Industrial Site | Number of Facilities | Number of Catch Basins @ 10 per Facility | Installation @ $800 | Operation @ $342 | Total Cost |
|---|---|---|---|---|---|
| >100 Acres | 923 | 9,230 | $7,384,000 | $3,156,660 | $10,540,660 |
| 10-100 acres | 1,578 | 15,780 | $12,624,000 | $5,396,760 | $18,020,760 |
| **Total** | **2,501** | **25,010** | $20,008,000 | $8,553,420 | **$28,561,420** |

### b. Track 2: Combination of Full Capture Systems, Other Treatment Controls, Institutional Controls, Multi-Benefit Projects

The estimated cost of compliance for industrial permittees smaller than 10 acres selecting Track 2 (6,750 facilities) would be approximately $5.4 million in a single year and $2 million annually following initial implementation (Table 29).

**Table 29.** Estimated Cost of Compliance for Industrial Facilities Smaller than 10 Acres

| Size of Industrial Site | Number of Facilities | Training @ $500 | Operation @ $300 | Total Cost |
|---|---|---|---|---|
| <10 acres | 3,571 | $1,785,500 | $1,071,300 | $2,856,800 |
| No Size Data | 3,179 | $1,589,500 | $953,700 | $2,543,200 |
| **Total** | **6,750** | $3,375,000 | $2,025,000 | **$5,400,000** |

### c. Compliance Schedule

Industrial permittees subject to the proposed final Trash Amendments must demonstrate full compliance with the deadlines of the first implementing NPDES permit (whether such permits are modified ~~re-opened~~, re-issued, or newly adopted). The deadlines cannot exceed the terms of the first implementing permit. With uncertain compliance timelines for these permittees, it is difficult to estimate and predict the schedule of the cost of complying with the proposed final Trash Amendments, which is why this analysis assumes a permittees' full compliance being achieved in a single year, rather than amortized over several years.

[89] No compliance schedule is estimated in this section for IGP permittees. Therefore all expenditures are estimated as if they were incurred in a single year.

## 8. POTENTIAL COSTS FOR CALTRANS

Caltrans' Division of Maintenance expenditures on "litter removal" are $80 million ~~range from 41 million~~ [90] ~~to 52~~ million per year [91]. According to Caltrans, there are approximately ~~55,000~~ 50,000 (approximately 15,000 centerline miles) in California[92]. Therefore, the current cost of litter removal is, on average, ~~$1,000~~ $1,600 per lane mile per year.

### a. Compliance with the Proposed Final Trash Amendments

Caltrans may comply with the proposed final Trash Amendments by installing, operating and maintaining any combination of full capture systems, other treatment controls, institutional controls and/or multi benefit projects for all storm drains that captures runoff from its significant trash generating areas.

Caltrans already implements a variety of institutional controls, including a statewide public outreach and education program (e.g., "Don't Trash California"). Caltrans also operates the Adopt-a-Highway program to clean up trash from its roadways. For this reason, and because of the many site-specific factors Caltrans will need to consider that are not available, we cannot identify with precision specific trash control that Caltrans may use. To determine the economic impact to Caltrans, we considered one possible approach that assumes no increase of institutional controls and some incremental level of structural controls to reduce trash loads to waters.

To estimate the location and relative extent of Caltrans' significant trash generating areas, we used a GIS analysis to determine the centerline miles of the state highway system. Areas already covered by existing trash and debris TMDLs and the areas of San Francisco and served by combined sewer systems[93] were excluded. Next, we identified urban boundaries using city, town and census defined places from the U .S. Census Bureau TIGER/LineR Shapefiles[94]. Figure 13 provides a map of the resulting 5,990 urban centerline miles. We then assumed that 20% of the urban centerline miles would serve as a proxy for significant trash generating areas that that would require additional structural controls to comply with the proposed final Trash Amendments. Using this method, 1,198 centerline miles were identified that may need to be addressed using structural control.

For unit costs, we assumed the same installation ($800) and annual operation and maintenance (~~$324~~ $342) costs as those used in Section 7. We estimated that there are approximately 18 catch basins per mile in rural areas and 36 catch basins per mile in urban areas. Because significant trash generating areas are more likely to be in urban areas, we used the higher estimate to calculate the number of catch basins needing full capture devices. Under these

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[90] Litter removal costs are provided by Caltrans Maintenance Program. ~~For more about Litter Abatement.~~ Available at: http://www.dot.ca.gov/docs/LitterAbatementPlan.pdf

[91] See fn. ~~28~~32, *ante*.

[92] California State Transportation Agency. 2012. 2012 California Public Road Data, Table 1. Accessed May 2014. Available at: http://www.dot.ca.gov/hq/tsip/hpms/datalibrary.php

[93] Areas with a combined sewer system are not explicitly carved out by the proposed final Trash Amendments, but because all storm water in these areas is captured and treated, they are not considered significant trash generating areas and should not require additional trash controls. Therefore these areas were also excluded from Caltrans cost analysis.

[94] U. S. Census Bureau. 2012. 2012 TIGER Shapefiles for census tracts and census designated places. Accessed January 2014. Available at: http://www.census.gov/geo/maps-data/data/tiger-line.html

assumptions, estimated incremental capital costs for Caltrans would be approximately $35 million and incremental annual operation would be approximately $15 million (Table 30).

**Table 30.** Incremental Capital Costs and Operation and Maintenance Estimates for Caltrans

| Factor | Estimates |
|---|---|
| Centerline Miles of Roadway | 15,147 |
| Centerline miles in Urban areas. | 5,990 |
| Percent of subject miles requiring structural controls | 20% |
| Affected Miles | 1,198 |
| Drop inlets per mile | 36 |
| Total number of drop inlets | 46534 |
| Total Capital Cost (@ $800 per drop inlet) | **$34,502,400** |
| Annual Operation & Maintenance Cost (@ $342 per drop inlet per year) | **$14,749,776** |

### b. Compliance Schedule

Compliance with the water quality objective and implementing the prohibition of discharge will be demonstrated by Caltrans according to a time schedule set forth in the proposed final Trash Amendments. The compliance schedule will be contingent on the effective date of the first implementing permit. Caltrans must demonstrate full compliance within ten years of the effective date of the first implementing permitting permit[95]. The State Water Board can set achievements of interim milestones for compliance within a specific permit. These interim milestones could be set as a percent reduction or percent installation per year or over several years. Assuming a 10% annual investment in structural controls, the annual capital cost would be approximately $3.5 million.

Reaching full compliance with the prohibition of discharge will require extensive planning by Caltrans. To assist Caltrans with planning for full compliance, the State Water Board will issue a Water Code section 13267 or 13383 order within 18 months of the effective date of the proposed final Trash Amendments requesting an implementation plan. Requesting an implementation plan from Caltrans permittees prior to the will optimize compliance planning and implementation.

### c. Limitations and Uncertainties

Due to the differences in the type, size and distribution of facilities, the construction, operation and maintenance of trash control systems on highways and roads managed by Caltrans districts will be extremely site specific, and may differ significantly from costs for municipalities. The calculations are sensitive to the assumptions used to estimate significant trash generating areas and the percentage of those areas that would require additional structural controls. For

[95] See fn. ~~37~~42, *ante*.

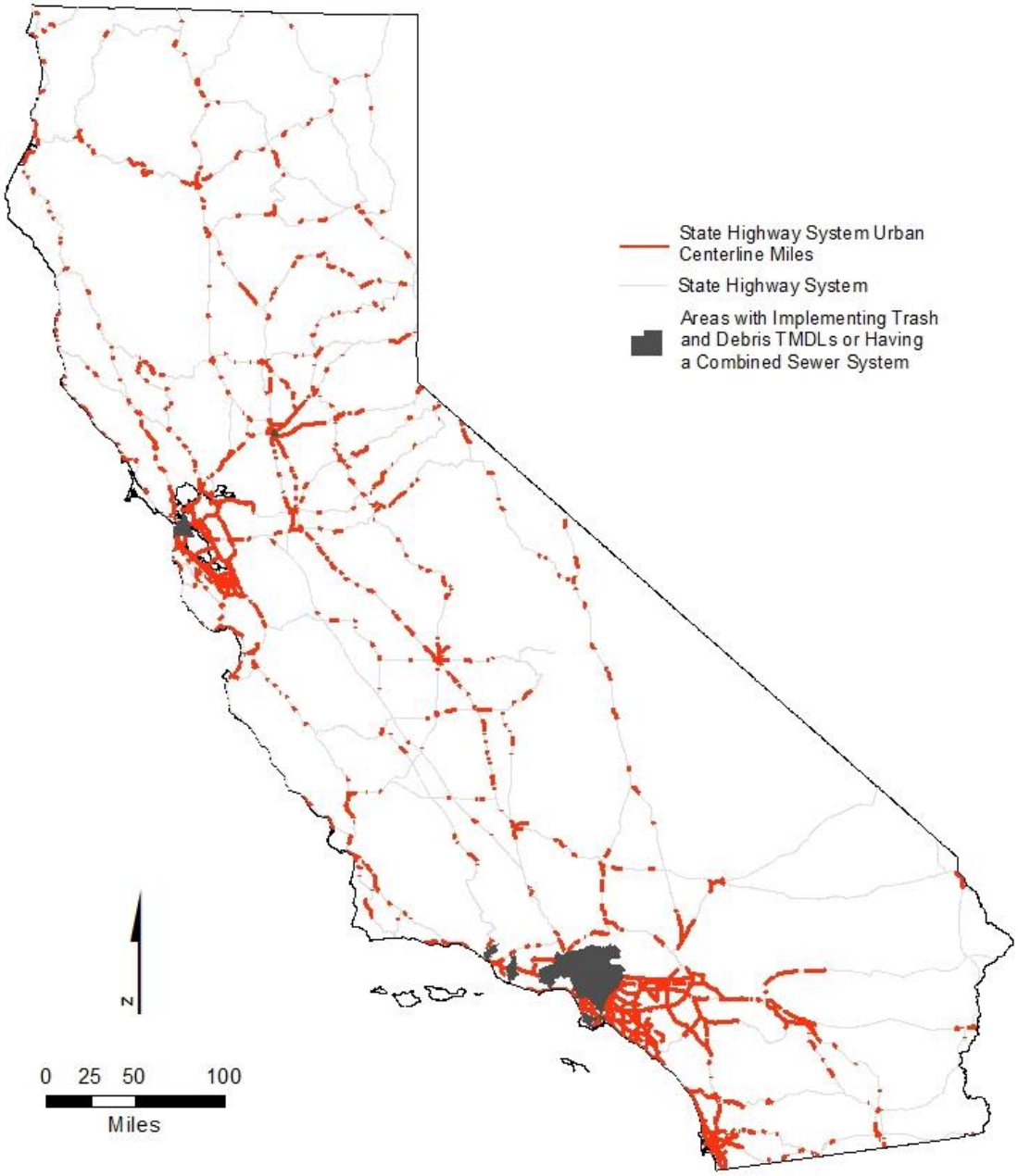
example, we based cost calculations on the assumption that significant trash generating areas will largely correspond to urban areas. However, this assumption may underestimate costs that some significant trash generating areas will occur in non-urban areas, such as rest stops. GIS data from Caltrans indicates there are currently 88 rest stop areas in California, seven of which are already accounted for in the calculation of urban centerline miles. If these rest areas are determined to be significant trash generating areas, the capital costs are expected to increase by less than $1 million using the methodology described above. In addition, Caltrans has suggested that 40% is a more reasonable estimate of the Percent of subject miles requiring structural controls[96]. However Caltrans did not provide justification for this estimate. If the calculations in Table 30 were revised to use Caltrans assumptions, the total estimated capital cost would increase to approximately $69 million.

~~In addition~~ Finally, we anticipate that Caltrans likely will choose Gross Solids Removal Devices in many locations instead of catch basin inserts. Gross Solids Removal Devices are generally more expensive to install and maintain, but also cover larger areas. Without additional information on the specific location and site conditions where additional trash controls will be needed, we cannot determine whether on balance Gross Solids Removal Devices will be more or less expensive than catch basin inserts[97].

[96] Source: McGowen, Scott., California Department of Transportation. Letter to Diana Messina, California State Water Resources Control Board. November 7, 2014.

[97] During the comment period and subsequent correspondence and conversations with Caltrans, Caltrans provided a cost estimate of $176,000 per treated acre as the total installation cost for gross solid removal devices. However, this estimate was developed to address TMDL compliance for multiple pollutants (Source: McGowen, Scott., California Department of Transportation. Letter to Diana Messina, California State Water Resources Control Board. November 7, 2014). Caltrans may indeed choose to install Gross Solid Removal Devices to address multiple pollutants, but cheaper alternatives exist for trash and therefore the full costs associated with Gross Solids Removal Devices may not be reasonably attributed to these amendments. In fact, to the extent that Gross Solid Removal Devices are already required under the Caltrans MS4 permit, costs to implement the Trash Amendments could be substantially less than estimated above. Please see the responses to comments document for additional information.

**Figure 13.** State Highway System Centerlines in Urban Areas



## 9. POTENTIAL COSTS FOR OTHER DISCHARGERS

The proposed final Trash Amendments include a provision that allows the Water Boards to require dischargers that are not subject to Section 3[98] of the proposed final Trash Amendments to implement trash controls in areas or facilities that may generate trash. Such areas or facilities may include (but are not limited to) high usage campgrounds, picnic areas, beach recreation areas, parks not subject to an MS4 permit, or marinas.

Because of the optional nature of this provision, no baseline figures are available with which to conduct an economic analysis. The absence of specific baseline figures, coupled with the variety of compliance options available, and the resulting wide range of costs related to this group of dischargers, no information is available to develop specific cost estimates for the incremental trash control costs associated with this category of dischargers at this point.

## 10. CONCLUSION

The presence of trash in surface waters, especially coastal and marine waters, is a serious issue in California. California communities are currently spending $428 million annually to control trash from entering water of the states, which varies between the sizes of communities. With the proposed final Trash Amendments, the State Water Board's objective is to provide statewide consistency for the Water Boards' regulatory approach to protect aquatic life and public health beneficial uses, and reduce environmental issues associated with trash in state waters, while focusing limited resources on high trash generating areas.

To achieve this objective, a central element of the proposed final Trash Amendments is a land-use based compliance approach to focus trash control to areas with high trash generation rates. Within this land-use based approach, a dual alternative compliance Track approach is proposed for permitted storm water dischargers (i.e., MS4 Phase I, MS4 Phase II, Caltrans, IGP, and CGP) to implement the prohibition of discharge for trash.

Under the requirements of Water Code sections 13170 and 13241, subdivision (d) that require the State Water Board to consider economics when establishing water quality objectives. This economic analysis is not a cost-benefit analysis, but a consideration of potential costs of a suite of reasonably foreseeable measures to comply with the proposed final Trash Amendments. This economic analysis utilized two basic methods to estimate the incremental cost of compliance for permitted storm water discharge: the first method was based on cost of compliance per capita, and the second method was based on land cover.

This economic analysis estimated the incremental annual cost to comply with the requirements of the proposed final Trash Amendments ranged from $4 to $10.67 per year per capita for MS4 Phase I NPDES permittees and from $7.77 to $7.91 per year per capita for smaller communities regulated under MS4 Phase II permits. For IGP facilities, the estimated compliance cost is $33.9 million or $3,671 per facility. To comply with the proposed final Trash Amendments, expenditures by Caltrans are estimated to increase by ~~$37~~ $34.5 million in total capital costs and ~~$15~~ $14.7 million per year for operation and maintenance of structural controls.

[98] As proposed to the Ocean Plan Ch. III(L)(2). As proposed to the ISWEBE Plan Ch. IV(~~B~~A)(3).

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# APPENDIX D: PROPOSED FINAL ~~TRASH~~ AMENDMENT~~S~~ TO WATER QUALITY CONTROL PLAN FOR OCEAN WATERS OF CALIFORNIA TO CONTROL TRASH

(Revisions made to the Draft Staff Report, including the Draft Substitute Environmental Documentation, are shown in red font and single-strikeout/single-underline)

## Draft text of the final amendment to control trash ~~Trash Amendments~~ proposed to be amended into Chapter II – Water Quality Objectives of the Ocean Plan

C. Physical Characteristics

5. Trash* shall not ~~accumulate~~ present in ocean waters, along shorelines or adjacent areas in amounts that adversely affect beneficial uses or cause nuisance.

## Draft text of the final amendment to control trash ~~Trash Amendments~~ proposed to be amended into Chapter III – Program of Implementation of the Ocean Plan

I. Prohibition of Discharge

**6. Trash***

The discharge of Trash* to surface waters of the State~~,~~ or the deposition of Trash* where it may be discharged into surface waters of the State is prohibited. Compliance with this prohibition of discharge shall be achieved as follows:

a. Dischargers with NPDES permits~~, WDRs, or Waivers of WDRs~~ that contain specific requirements for the control of Trash* that are consistent with these Trash Provisions* shall be determined to be in compliance with this prohibition if the dischargers are in full compliance with such requirements.

b. Dischargers with non-NPDES waste discharge requirements (WDRs) or waivers of WDRs that contain specific requirements for the control of Trash* shall be determined to be in compliance with this prohibition if the dischargers are in full compliance with such requirements.

*Represents a defined term in the California Ocean Plan.

c. Dischargers with NPDES permits, WDRs, or ~~W~~waivers of WDRs that do not contain specific requirements for the control of Trash* are exempt from these Trash Provisions*.

d. Dischargers without NPDES permits, WDRs, or ~~W~~waivers of WDRs must comply with this prohibition of discharge.

e. Chapter III.I.6.b and Chapter III.L.3 notwithstanding, ~~T~~this prohibition of discharge applies to the discharge of preproduction plastic* by manufacturers of preproduction plastics*, transporters of preproduction plastics*, and manufacturers that use preproduction plastics* in the manufacture of other products to surface waters of the State, or the deposition of preproduction plastic* where it may be discharged into surface waters of the State, unless the discharger is subject to a NPDES permit for discharges of storm water* associated with industrial activity.

L. Implementation Provisions for Trash*

**1. Applicability**

a. These Trash Provisions* shall be implemented through a prohibition of discharge (Chapter III.I.6) and through NPDES permits issued pursuant to section 402(p) of the Federal Clean Water Act, waste discharge requirements (WDRs), or waivers of WDRs (as set forth in Chapter III.L.2 and Chapter III.L.3 below).

b. These Trash Provisions* apply to all surface waters of the State, with the exception of those waters within the jurisdiction of the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) for which trash Total Maximum Daily Loads (TMDLs) are in effect prior to the effective date of these Trash Provisions*[99]; provided, however, that:

(1) Upon the effective date of these Trash Provisions*, the Los Angeles Water Board shall cease its full capture system* certification process~~,~~ and provide that any new full capture systems* shall be

[99] In the Los Angeles Region, there are fifteen (15) trash TMDLs for the following watersheds and water bodies: Los Angeles River Watershed, Ballona Creek and ~~Watershed~~ Wetland, Malibu Creek ~~Watershed~~, Santa Monica Bay Nearshore and Offshore, East Fork of the San Gabriel River, Revolon Slough ~~/~~and Beardsley Wash, Ventura River Estuary, Machado Lake, Lake Elizabeth, Lake Hughes, Munz Lake, Peck Road Park Lake, Echo Park Lake, Lincoln ~~Lake~~ Park and Legg Lake. Three of these were established by the US-EPA: Peck Road Park Lake, Echo Park Lake and Lincoln Lake.

*Represents a defined term in the California Ocean Plan.

certified by the State Water Board in accordance with these Trash Provisions*.

(2) Within one year of the effective date of these Trash Provisions*, the Los Angeles Water Board shall convene a public meeting to reconsider the scope of its trash TMDLs, with the exception of those for the Los Angeles River and Ballona Creek watersheds, ~~and~~ to particularly consider an approach that would focus MS4* permittees' trash-control efforts on high-trash generation areas within their jurisdictions.

**2. Dischargers Permitted Pursuant to Federal Clean Water Act Section 402(p)**

Permitting authorities* shall include the following requirements in NPDES permits issued pursuant to Federal Clean Water Act section 402(p):

a. MS4* permittees with regulatory authority over priority land uses* shall be required to comply with the prohibition of discharge in Chapter III.I.6.a herein by either of the following measures:

(1) Track 1: Install, operate, and maintain full capture systems* for all storm drains that captures runoff from ~~one or more of~~ the priority land uses* in their jurisdictions; or

(2) Track 2: Install, operate, and maintain any combination of full capture systems*, multi-benefit projects*, other treatment controls*, and/or institutional controls* ~~other treatment controls*, institutional controls*, and/or multi-benefit projects*~~ within either the jurisdiction of the MS4* permittee or within the jurisdiction of the MS4* permittee and contiguous MS4* permittees~~, so long as such combination achieves the same performance results as compliance under Track 1 would achieve for all storm drains that captures runoff from one or more of the priority land uses* within such jurisdiction(s)~~. The MS4* permittee shall demonstrate that such combination achieves full capture system equivalency*. The MS4* permittee may determine which controls to implement to achieve compliance with full capture system equivalency*. It is, however, the State Water Board's expectation that the MS4* permittee will elect to install full capture systems* where such installation is not cost-prohibitive.

b. The California Department of Transportation (Department) shall be required to comply with the prohibition of discharge in Chapter III.I.6.a herein in all significant trash generating areas* by installing, operating, and

*Represents a defined term in the California Ocean Plan.

maintaining any combination of full capture systems*, multi-benefit projects*, other treatment controls*, and/or institutional controls* ~~other treatment controls*, institutional controls*, and/or multi-benefit projects*~~ for all storm drains that captures runoff from ~~one or more of the~~ significant trash generating areas*. The Department shall demonstrate that such combination achieves full capture system equivalency*. In furtherance of this ~~measure~~ provision, the Department and MS4* permittees that are subject to the provisions of Chapter III.L.2.a herein shall coordinate their efforts to install, operate, and maintain full capture systems*, multi-benefit projects*, other treatment controls*, and/or institutional controls* ~~other treatment controls*, institutional controls*, and/or multi-benefit projects*~~ in significant trash generating areas* and/or priority land uses*.

c. Dischargers that are subject to NPDES permits for discharges of storm water* associated with industrial activity (including construction activity) shall be required to comply with the prohibition of discharge in Chapter III.I.6.a herein by eliminating Trash* from all storm water* and authorized non-storm water* discharges consistent with an outright prohibition of the discharge of Trash* contained within the applicable NPDES permit regulating the industrial or construction facility ~~(e.g., the prohibition contained in State Water Board Order No. 2009-0009-DWQ, as amended)~~. If the discharger can satisfactorily demonstrate to the permitting authority* its inability to comply with the outright prohibition of the discharge of Trash* contained within the applicable NPDES permit, then the ~~discharger shall either~~ permitting authority* may require the discharger to either:

(1) Install, operate, and maintain full capture systems* for all storm drains that captures runoff from the facility or site regulated by the NPDES permit; or,

(2) Install, operate, and maintain any combination of full capture systems*, multi-benefit projects*, other treatment controls*, and/or institutional controls* ~~other treatment controls*, institutional controls*, and/or multi-benefit projects*~~ for the ~~entire~~ facility or site regulated by the NPDES permit~~, so long as such combination achieves the same performance results as exclusive use of full capture systems* would achieve for all storm drains that captures runoff from the facility or site.~~ The discharger shall demonstrate that such combination achieves full capture system equivalency*.

Termination of permit coverage for industrial and construction storm water* dischargers shall be conditioned upon the proper operation and maintenance of all controls (e.g., full capture systems*, multi-benefit

*Represents a defined term in the California Ocean Plan.

projects*, other treatment controls*, and/or institutional controls* ~~other treatment controls*, institutional controls*, and/or multi-benefit projects*)~~ used at their facility(ies).

d. A permitting authority* may determine that specific land uses or locations (e.g., parks, stadia, schools, campuses, or roads leading to landfills) generate substantial amounts of Trash*. In the event that the permitting authority* makes that determination, the permitting authority* may require the MS4* to comply with Chapter III.L.2.a.1 or Chapter III.L.2.~~b~~a.2 ~~(as the case may be)~~, as determined by the permitting authority*, with respect to such land uses or locations.

## 3. Other Dischargers

A permitting authority* may require dischargers, described in Chapter III.I.6.c or Chapter III.I.6.d, that are not subject to Chapter III.L.2 herein, to implement any appropriate Trash* controls in areas or facilities that may generate Trash*. Such areas or facilities may include (but are not limited to) high usage campgrounds, picnic areas, beach recreation areas, parks not subject to an MS4* permit, or marinas.

## 4. Time Schedule

The permitting authority* shall ~~re-open~~ modify, re-issue, or newly adopt NPDES permits issued pursuant to section 402(p) of the Federal Clean Water Act that are subject to the provisions of Chapter III.L.2 herein to include requirements consistent with these Trash Provisions*. The permitting authorities* shall abide by the following time schedules:

a. NPDES Permits Regulating MS4* Permittees that have Regulatory Authority over Priority Land Uses*.[100]

(1) ~~Within eighteen (18) months of the effective date of these Trash Provisions*, each permitting authority* shall either: (i) issue an order pursuant to Water Code section 13267 or 13383 requiring~~

[100] The time schedule requirement in Chapter III.L.4.a.1 requiring MS4* permittees to elect Chapter III.L.2.a.1 (Track 1) or Chapter III.L.2.a.2 (Track 2) do not apply to MS4* permittees subject to the Municipal Regional Stormwater NPDES Permit (MRP) for the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board) because that permit already requires control requirements substantially equivalent to Track 2. The time schedule requirement in Chapter III.L.4.a.1 requiring MS4* permittees to submit an implementation plan does not apply to the MRP permittees if the San Francisco Bay Water Board determines that an MRP permittee has already submitted an implementation plan prior to the effective date of the Trash Provisions* that is equivalent to the implementation plan required by Chapter III.L.4.a.1.

*Represents a defined term in the California Ocean Plan.

~~each MS4* permittee that will be complying under Chapter III.L.2.a.1 (Track 1) or Chapter III.L.2.b.2 (Track 2) to submit written notice to the permitting authority* stating whether such MS4* permittee will comply with the prohibition of discharge under Track 1 or Track 2, or (ii) re-open, re-issue, or adopt an implementing permit that includes requirements consistent with these Trash Provisions*, and that requires notice from each MS4* as to whether it has elected to comply under Track 1 or Track 2. Each MS4* permittee shall have three (3) months from either receipt of the permitting authority's* Water Code section 13267 or 13383 order, or the effective date of the implementing permit (whichever date is earlier) to respond to the applicable permitting authority* with its written notice.~~ Within eighteen (18) months of the effective date of these Trash Provisions*, for each permittee, each permitting authority* shall either:

A. Modify, re-issue, or adopt the applicable MS4* permit to add requirements to implement these Trash Provisions*. The implementing permit shall require written notice from each MS4* permittee stating whether it has elected to comply under Chapter III.L.2.a.1 (Track 1) or Chapter III.L.2.a.2 (Track 2) and such notice shall be submitted to the permitting authority* no later than three (3) months from the effective date of the implementing permit, or for MS4s* designated after the effective date of these Trash Provisions*, three (3) months from the effective date of that designation. The implementing permit shall also require that within eighteen (18) months of the effective date of the implementing permit or new designation, MS4* permittees that have elected to comply with Track 2 shall submit an implementation plan to the permitting authority*. The implementation plan shall describe: (i) the combination of controls selected by the MS4* permittee and the rationale for the selection, (ii) how the combination of controls is designed to achieve full capture system equivalency*, and (iii) how full capture system equivalency* will be demonstrated. The implementation plan is subject to approval by the permitting authority*.

B. Issue an order pursuant to Water Code section 13267 or 13383 requiring the MS4* permittee to submit, within three (3) months from receipt of the order, written notice to the permitting authority* stating whether such MS4* permittee will comply with the prohibition of discharge under Chapter III.L.2.a.1 (Track 1) or Chapter III.L.2.a.2 (Track 2). For MS4s* designated after the

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effective date of these Trash Provisions*, the order pursuant to Water Code section 13267 or 13383 shall be issued at the time of designation. Within eighteen (18) months of the receipt of the Water Code section 13267 or 13383 order, MS4* permittees that have elected to comply with Track 2 shall submit an implementation plan to the permitting authority* that describes: (i) the combination of controls selected by the MS4* permittee and the rationale for the selection, (ii) how the combination of controls is designed to achieve full capture system equivalency*, and (iii) how full capture system equivalency* will be demonstrated. The implementation plan is subject to approval by the permitting authority*.

~~Within eighteen (18) months of receipt of either the permitting authority's* Water Code section 13267 or 13383 order, or the effective date of the implementing permit (whichever date is earlier), MS4* permittees that have elected to comply with Chapter III.L.2.a.2 (Track 2) shall submit an implementation plan to the applicable permitting authority* that: (i) describes the combination of controls selected by the MS4* permittee and the rationale for the selection, (ii) describes how the combination of controls is designed to achieve the same performance results as compliance under Track 1 would achieve, and (iii) how the performance will be demonstrated.~~

(2) For MS4* permittees that elect to comply with Chapter III.L.2.a.1 (Track 1), the implementing permit shall state that full compliance shall occur within ten (10) years of the effective date of the first implementing permit ~~(whether such permit is re-opened, re-issued or newly adopted), along with~~ except compliance for any new development within the MS4* permittee's jurisdiction must be built to immediately comply with Track 1, and as specified in Chapter III.L.4.a.5. The permit shall also require these permittees to demonstrate achievement~~s~~ of interim milestones such as an average of ten percent (10%) of the full capture systems* installed every year. In no case may the final compliance date be later than fifteen (15) years from the effective date of these Trash Provisions*.

(3) For MS4* permittees that elect to comply with Chapter III.L.2.a.2 (Track 2), the implementing permit shall state that full compliance shall occur within ten (10) years of the effective date of the first implementing permit ~~(whether such permit is re-opened, re-issued or newly adopted), along with~~ except compliance for any new development within the MS4* permittee's jurisdiction must be built

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to immediately comply with Track 2, and as specified in Chapter III.L.4.a.5. The permit shall also require these permittees to demonstrate achievement~~s~~ of interim milestones such as average load reductions of ten percent (10%) per year. In no case may the final compliance date be later than fifteen (15) years from the effective date of these Trash Provisions*.

(4) The implementing permit shall state that for MS4* permittees designated after the effective date of the implementing permit, full compliance shall occur within ten (10) years of the effective date of the designation. The permit shall also require such designations to demonstrate achievement of interim milestones such as average load reductions of ten percent (10%) per year or other progress to full implementation.

(5) Where a permitting authority* makes a determination pursuant to Chapter III.L.2.d that a specific land use generates a substantial amount of Trash*, that permitting authority* has discretion to determine the time schedule for full compliance. In no case may the final compliance date be later than ten (10) years from the determination.

b. NPDES Permits Regulating the Department.

(1) Within eighteen (18) months of the effective date of these Trash Provisions*, the State Water Board shall issue an order pursuant to Water Code section 13267 or 13383 requiring the Department to submit an implementation plan to the Executive Director of the State Water Board that: (i) describes the specific locations of its significant trash generating areas*, (ii) the combination of controls selected by the Department and the rationale for the selections, and (iii) how it will demonstrate ~~performance~~ full capture system equivalency*.

(2) The Department must demonstrate full compliance with Chapter III.L.2.b herein within ten (10) years of the effective date of the first implementing NPDES permit ~~(whether such permit is re-opened, re-issued, or newly adopted)~~, along with achievements of interim milestones such as average load reductions of ten percent (10%) per year. In no case may the final compliance date be later than fifteen (15) years from the effective date of these Trash Provisions*.

c. NPDES Permits Regulating the Discharges of Storm Water* Associated with Industrial Activity (Including Construction Activity). Dischargers that

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are subject to the provisions of Chapter III.L.2.c herein must demonstrate full compliance in accordance with the deadlines contained in the first implementing NPDES permits ~~(whether such permits are re-opened, re-issued, or newly adopted)~~. Such deadlines may not exceed the terms of the first implementing permits.

~~**5. Time Extensions for Achieving Full Compliance (Option for Board Consideration)**~~

~~The permitting authority* may give MS4* permittees that are complying under section Chapter III.L.2.a up to a three (3) year time extension for achieving full compliance in areas where regulatory source controls* are employed that take effect prior to or within three (3) years of the effective date of these Trash Provisions*. Each regulatory source control* employed by an MS4* will be eligible for up to a one (1) year time extension.~~

**5. Monitoring and Reporting**

The permitting authority* must include monitoring and reporting requirements in its implementing permits. The following monitoring and reporting provisions are the minimum requirements that must be included within the implementing permits:

a. MS4* permittees that elect to comply with Chapter III.~~J~~L.2.a.1 (Track 1) shall provide a report to the applicable permitting authority* demonstrating installation, operation, maintenance, and the Geographic Information System- (GIS-) mapped location and drainage area served of its full capture systems* on an annual basis.

b. MS4* permittees that elect to comply with Chapter III.~~J~~L.2.b.2 (Track 2) shall develop and implement monitoring plans that demonstrate the ~~mandated performance results,~~ effectiveness of the full capture systems*, multi-benefit projects*, other treatment controls*, and/or institutional controls*. ~~other treatment controls*, institutional controls*, and/or multi-benefit projects*~~ and compliance with ~~the performance standard~~ full capture system equivalency*. Monitoring reports shall be provided to the applicable permitting authority* on an annual basis, and shall include GIS-mapped locations and drainage area served for each of the full capture systems*, multi-benefit projects*, other treatment controls*, and/or institutional controls*~~other treatment controls*, institutional controls*, and/or multi-benefit projects*~~ installed or utilized by the MS4* permittee. ~~At a minimum,~~ In developing the monitoring reports the MS4* permittee ~~shall~~ should consider ~~address and answer~~ the following questions:

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(1) What type of and how many treatment controls*, institutional controls*, and/or multi-benefit projects* have been used, and in what locations?

(2) How many full capture systems* have been installed (if any), ~~and~~ in what locations have they been installed, and what is the individual and cumulative area served by them?

(3) What is the effectiveness of the total combination of treatment controls*, institutional controls*, and multi-benefit projects* employed by the MS4* permittee?

(4) Has the amount of Trash* discharged from the MS4* decreased from the previous year? If so, by how much? If not, explain why.

(5) Has the amount of Trash* in the MS4's* receiving water(s) decreased from the previous year? If so, by how much? If not, explain why.

c. The Department, as subject to the provisions of Chapter III.~~J~~L.2.c, shall develop and implement monitoring plans that demonstrate the ~~mandated performance results,~~ effectiveness of the controls~~,~~ and compliance with ~~the performance standard~~ full capture system equivalency*. Monitoring reports shall be provided to the State Water Board on an annual basis, and shall include GIS-mapped locations and drainage area served for each of the full capture systems*, multi-benefit projects*, other treatment controls*, and/or institutional controls* ~~other treatment controls*, institutional controls*, and/or multi-benefit projects*~~ installed or utilized by the Department. ~~Monitoring reports can be included with the Annual Report. At a minimum,~~ In developing the monitoring report, the Department ~~shall~~ should consider ~~address and answer~~ the following questions:

(1) What type of and how many treatment controls* institutional controls*, and/or multi-benefit projects* have been used~~,~~ and in what locations?

(2) How many full capture systems* have been installed (if any), ~~and~~ in what locations have they been installed, and what is the individual and cumulative area served by them?

(3) What is the effectiveness of the total combination of treatment controls*, institutional controls*, and multi-benefit projects employed by the Department?

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(4) Has the amount of Trash* discharged from the Department's MS4* decreased from the previous year? If so, by how much? If not, explain why.

(5) Has the amount of Trash* in the receiving waters decreased from the previous year? If so, by how much? If not, explain why.

d. Dischargers that are subject to the provisions of Chapter III.~~J~~L.2.c herein shall be required to report the measures used to comply with Chapter III.~~J~~L.2.c.

**Draft text of the final amendment to control trash ~~Trash Amendments~~ proposed to be amended into Appendix I of the Ocean Plan**

**APPENDIX I**

**DEFINITION OF TERMS**

**Full capture system** is a treatment control* (either a single device or a series of devices) that traps all particles that are 5 mm or greater, and has a design treatment capacity that is either: a) of not less than the peak flow rate, Q, resulting from a one-year, one-hour, storm in the subdrainage area, or b) appropriately sized to, and designed to carry at least the same flows as, the corresponding storm drain.

[Rational equation is used to compute the peak flow rate: Q = C•I•A, where Q = design flow rate (cubic feet per second, cfs); C = runoff coefficient (dimensionless); I = design rainfall intensity (inches per hour, as determined per the rainfall isohyetal map specific to each region, and A = subdrainage area (acres).]

Prior to installation, full capture systems* must be certified by the Executive Director, or designee, of the State Water Board. Uncertified full capture systems* will not satisfy the requirements of these Trash Provisions*. To request certification, a permittee shall submit a certification request letter that includes all relevant supporting documentation to the State Water Board's Executive Director. The Executive Director, or designee, shall issue a written determination approving or denying the certification of the proposed full capture system* or conditions of approval, including a schedule to review and reconsider the certification. Full capture systems* ~~that have been~~ certified by the Los Angeles Regional Water Board prior to the effective date of these Trash Provisions* and full capture systems* listed in Appendix I of the Bay Area-wide Trash Capture Demonstration Project, Final Project Report (May 8, 2014) will satisfy the requirements of these Trash Provisions*, unless the Executive Director, or designee, of the State Water Board determines otherwise.

**Full capture system equivalency** is the Trash* load that would be reduced if full capture systems* were installed, operated, and maintained for all storm drains that capture runoff from the relevant areas of land (priority land uses*, significant trash generating areas*, facilities or sites regulated by NPDES permits for discharges of

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storm water* associated with industrial activity, or specific land uses or areas that generate substantial amounts of Trash*, as applicable). The full capture system equivalency* is a Trash* load reduction target that the permittee quantifies by using an approach, and technically acceptable and defensible assumptions and methods for applying the approach, subject to the approval of permitting authority*. Examples of such approaches include the following:

(1) Trash Capture Rate Approach. Directly measure or otherwise determine the amount of Trash* captured by full capture systems* for representative samples of all similar types of land uses, facilities, or areas within the relevant areas of land over time to identify specific trash capture rates. Apply each specific Trash* capture rate across all similar types of land uses, facilities, or areas to determine full capture system equivalency*. Trash* capture rates may be determined either through a pilot study or literature review. Full capture systems* selected to evaluate Trash* capture rates may cover entire types of land uses, facilities, or areas, or a representative subset of types of land uses, facilities, or areas. With this approach, full capture system equivalency* is the sum of the products of each type of land use, facility, or area multiplied by Trash* capture rates for that type of land use, facility, or area.

(2) Reference Approach. Determine the amount of Trash* in a reference receiving water in a reference watershed where full capture systems* have been installed for all storm drains that capture runoff from all relevant areas of land. The reference watershed must be comprised of similar types and extent of land uses (including priority land uses* and all other land uses), facilities, or areas as the permittee's watershed. With this approach, full capture system equivalency* would be demonstrated when the amount of Trash* in the receiving water is equivalent to the amount of Trash* in the reference receiving water.

**Institutional controls** are non-structural best management practices (i.e., no structures are involved) that may include, but not be limited to, street sweeping, sidewalk Trash* bins, collection of the Trash*, anti-litter educational and outreach programs, producer take-back for packaging, and regulatory source controls* (i.e., and ordinances).

**Low-impact development controls** are treatment controls* that employ natural and constructed features that reduce the rate of storm water* runoff, filter out pollutants, facilitate storm water* storage onsite, infiltrate storm water* *into the ground to replenish groundwater supplies, or improve the quality of receiving groundwater and surface water. (See Water Code §Section10564 of Division 6 of the Water Code.)

**Multi-benefit project** is a treatment control* project designed to achieve any some or all of the benefits set forth in Ssection 10562, subdivision (d) of the Water Code. Examples include projects designed to: infiltrate, recharge or store storm water* for

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beneficial reuse; develop or enhance habitat and open space through storm water* and non-storm water management; ~~prevent storm water* pollution;~~ and/or reduce storm water* and non-storm water runoff volume.

**Municipal Separate Storm Sewer System** (MS4) has the same meaning set forth in 40 ~~C.F.R. §~~ Code of Federal Regulations section 122.26(b)(8).

**Preproduction plastic** has the same meaning set forth in ~~S~~section 13367(a) of the Water Code.

**Priority land uses** are those developed sites, facilities, or land uses (i.e., not simply zoned land uses) within the MS4* permittee's jurisdiction from which discharges of Trash* are regulated by this Ocean Plan as follows:

(1) **High-density residential**: all land uses with at least ten (10) developed dwelling units/acre.
(2) **Industrial**: land uses where the primary activities on the developed parcels involve product manufacture, storage, or distribution (e.g., manufacturing businesses, warehouses, equipment storage lots, junkyards, wholesale businesses, distribution centers, or building material sales yards).
(3) **Commercial**: land uses where the primary activities on the developed parcels involve the sale or transfer of goods or services to consumers (e.g., business or professional buildings, shops, restaurants, theaters, vehicle repair shops, etc.)
(4) **Mixed urban**: land uses where high-density residential, industrial, and/or commercial land uses predominate collectively (i.e., are intermixed).
(5) **Public transportation stations**: facilities or sites where public transit agencies' vehicles load or unload passengers or goods (e.g., bus stations and stops).
(6) **Equivalent alternate land uses**: An MS4* permittee with regulatory authority over priority land uses* may issue a request to the applicable permitting authority* that ~~it~~ the MS4* permittee be allowed to comply under Chapter III.~~J~~L.2.a.1 with alternate land uses within ~~its~~ the MS4* permittee's jurisdiction that generate rates of trash that are equivalent to or greater than one or more of the high density residential, industrial, commercial, mixed urban, and/or public transportation station sites, facilities, or land uses defined above. Comparative Trash* generation rates shall be established through the reporting of quantification measures such as street sweeping and catch basin cleanup records; mapping; visual trash presence surveys, such as the "Keep America Beautiful Visible Litter Survey"; or other information as required by the permitting authority*.

~~**Regulatory source controls** are institutional controls* that are enforced by an ordinance of the municipality to stop and/ or reduce pollutants at their point of generation so that they do not come into contact with storm water*. Regulatory source controls could consist of, but not be limited to, bans of single-use consumer products.~~

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**Significant trash generating areas** means all locations or facilities within the Department's jurisdiction where Trash* accumulates in substantial amounts, such as:

(1) Highway on- and off-ramps in high density residential, commercial, and industrial land uses (as such land uses are defined under "priority land uses*" herein).
(2) Rest areas and park-and-rides.
(3) State highways in commercial and industrial land uses (as such land uses are defined under priority land uses* herein).
(4) Mainline highway segments to be identified by the Department through pilot studies and/or surveys.

**Storm water** has the same meaning set forth in 40 C.F.R. § Code of Federal Regulations section 122.26(b)(13) and 55 Federal Register 47990, 47995 (Nov. 16, 1990).

**Treatment controls** are structural best management practices to either (a) remove pollutants and/or solids from storm water* runoff, wastewater, or effluent, or (b) capture, infiltrate or reuse storm water* runoff, wastewater, or effluent. Treatment controls include full capture systems* and low-impact development controls*.

**Trash** means all improperly discarded solid material from any production, manufacturing, or processing operation including, but not limited to, products, product packaging, or containers constructed of plastic, steel, aluminum, glass, paper, or other synthetic or natural materials.

**Trash Provisions** are the Wwater Qquality Oobjective for Trash*, as well as the prohibition of discharge set forth in Chapter III.I and implementation requirements set forth in Chapter III.JL herein.

*Represents a defined term in the California Ocean Plan.

# APPENDIX E: PROPOSED FINAL PART 1 TRASH PROVISIONS ~~AMENDMENTS TO~~ OF THE WATER QUALITY CONTROL PLAN FOR INLAND SURFACE WATERS, ENCLOSED BAYS, AND ESTUARIES OF CALIFORNIA[101]

(Revisions made to the proposed Trash Amendments (Appendices D and E) are shown in red font and single-strikeout/double –underline)

## Draft text of the final Part 1 Trash Provisions ~~Amendments~~ proposed to Chapter III – Water Quality Objectives of the ISWEBE Plan

**B Trash**

TRASH shall not ~~accumulate~~ present in surface waters, along shorelines or adjacent areas in amounts that adversely affect beneficial uses or cause nuisance.

## Draft text of the final Part 1 Trash Provisions ~~Amendments~~ proposed to Chapter IV – Implementation of Water Quality Objectives of the ISWEBE Plan

**~~B~~A Trash**

**1. Applicability**

a. These TRASH PROVISIONS shall be implemented through a prohibition of discharge (Chapter IV.~~B~~A.2) and through NPDES permits issued pursuant to section 402(p) of the Federal Clean Water Act, waste discharge requirements (WDRs), or waivers of WDRs (as set forth in Chapter IV.~~B~~A.3 and Chapter IV.A.4 below).

b. These TRASH PROVISIONS apply to all surface waters of the State, with the exception of those waters within the jurisdiction of the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) for which trash Total Maximum Daily Loads (TMDLs) are in effect prior to the effective date of these TRASH PROVISIONS [102]; provided, however, that:

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[101] The State Water Board intends to amend the Water Quality Control Plan for Enclosed Bays and Estuaries of California to create the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California Plan (ISWEBE Plan). The State Water Board intends that the Part 1 Trash Provisions will be incorporated into the ISWEBE Plan, once it is adopted.

[102] In the Los Angeles Region, there are fifteen (15) trash TMDLs for the following watersheds and water bodies: Los Angeles River Watershed, Ballona Creek and ~~Watershed~~ Wetland, Malibu Creek ~~Watershed~~, Santa Monica Bay Nearshore and Offshore, East Fork of the San Gabriel River, Revolon Slough ~~/~~and Beardsley Wash, Ventura River Estuary, Machado Lake, Lake Elizabeth, Lake Hughes, Munz Lake, Peck Road Park Lake, Echo Park Lake, Lincoln ~~Lake~~ Park and Legg Lake. Three of these were established by the US EPA: Peck Road Park Lake, Echo Park Lake and Lincoln Lake.

(1) Upon the effective date of these TRASH PROVISIONS, the Los Angeles Water Board shall cease its FULL CAPTURE SYSTEM certification process~~,~~ and provide that any new FULL CAPTURE SYSTEMS shall be certified by the State Water Board in accordance with these TRASH PROVISIONS.

(2) Within one year of the effective date of these TRASH PROVISIONS, the Los Angeles Water Board shall convene a public meeting to reconsider the scope of its trash TMDLs, with the exception of those for the Los Angeles River and Ballona Creek watersheds, ~~and~~ to particularly consider an approach that would focus MS4 permittees' trash-control efforts on high-trash generation areas within their jurisdictions.

**2. Prohibition of Discharge**

The discharge of TRASH to surface waters of the State~~,~~ or the deposition of TRASH where it may be discharged into surface waters of the State is prohibited. Compliance with this prohibition of discharge shall be achieved as follows:

a. Dischargers with NPDES permits~~, WDRs, or Waivers of WDRs~~ that contain specific requirements for the control of TRASH that are consistent with these TRASH PROVISIONS shall be determined to be in compliance with this prohibition if the dischargers are in full compliance with such requirements.

b. Dischargers with non-NPDES WDRs or waivers of WDRs that contain specific requirements for the control of TRASH shall be determined to be in compliance with this prohibition if the dischargers are in full compliance with such requirements.

c. Dischargers with NPDES permits, WDRs, or ~~W~~waivers of WDRs that do not contain specific requirements for the control of TRASH are exempt from these TRASH PROVISIONS.

d. Dischargers without NPDES permits, WDRs, or ~~W~~waivers of WDRs must comply with this prohibition of discharge.

e. Chapter IV.A.2.b and Chapter IV.A.4 notwithstanding, ~~T~~this prohibition of discharge applies to the discharge of PREPRODUCTION PLASTIC by manufacturers of PREPRODUCTION PLASTICS, transporters of PREPRODUCTION PLASTICS, and manufacturers that use PREPRODUCTION PLASTICS in the manufacture of other products to surface waters of the State, or the deposition of PREPRODUCTION PLASTIC where it may be discharged into surface waters of the State~~,~~

unless the discharger is subject to a NPDES permit for discharges of STORM WATER associated with industrial activity.

**3. Dischargers Permitted Pursuant to Federal Clean Water Act Section 402(p)**

PERMITTING AUTHORITIES shall include the following requirements in NPDES permits issued pursuant to Federal Clean Water Act section 402(p):

a. MS4 permittees with regulatory authority over PRIORITY LAND USES shall be required to comply with the prohibition of discharge in Chapter IV.~~B~~A.2.a herein by either of the following measures:

(1) Track 1: Install, operate, and maintain FULL CAPTURE SYSTEMS for all storm drains that captures runoff from ~~one or more of~~ the PRIORITY LAND USES in their jurisdictions; or

(2) Track 2: Install, operate, and maintain any combination of FULL CAPTURE SYSTEMS, MULTI-BENEFIT PROJECTS, other TREATMENT CONTROLS, and/or INSTITUTIONAL CONTROLS ~~other TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS~~ within either the jurisdiction of the MS4 permittee or within the jurisdiction of the MS4 permittee and contiguous MS4 permittees~~, so long as such combination achieves the same performance results as compliance under Track 1 would achieve for all storm drains that captures runoff from one or more of the PRIORITY LAND USES within such jurisdiction(s)~~. The MS4 permittee shall demonstrate that such combination achieves FULL CAPTURE SYSTEM EQUIVALENCY. The MS4 permittee may determine which controls to implement to achieve compliance with the FULL CAPTURE SYSTEM EQUIVALENCY. It is, however, the State Water Board's expectation that the MS4 permittee will elect to install FULL CAPTURE SYSTEMS where such installation is not cost-prohibitive.

b. The California Department of Transportation (Department) shall be required to comply with the prohibition of discharge in Chapter IV.~~B~~A.2.a herein in all SIGNIFICANT TRASH GENERATING AREAS by installing, operating, and maintaining any combination of FULL CAPTURE SYSTEMS, MULTI-BENEFIT PROJECTS, other TREATMENT CONTROLS, and/or INSTITUTIONAL CONTROLS ~~other TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS~~ for all storm drains that captures runoff from ~~one or more of the~~ SIGNIFICANT TRASH GENERATING AREAS. The Department shall demonstrate that such combination achieves FULL CAPTURE SYSTEM EQUIVALENCY. In furtherance of this ~~measure~~ provision, the Department and MS4 permittees that are subject to the provisions of Chapter IV.~~C~~A.3.a herein shall coordinate their efforts to install, operate, and

maintain FULL CAPTURE SYSTEMS, MULTI-BENEFIT PROJECTS, other TREATMENT CONTROLS, and/or INSTITUTIONAL CONTROLS ~~other TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS~~ in SIGNIFICANT TRASH GENERATING AREAS and/or PRIORITY LAND USES.

c. Dischargers that are subject to NPDES permits for discharges of STORM WATER associated with industrial activity (including construction activity) shall be required to comply with the prohibition of discharge in Chapter IV.~~B~~A.2.a herein by eliminating TRASH from all STORM WATER and authorized non-STORM WATER discharges consistent with an outright prohibition of the discharge of TRASH contained within the applicable NPDES permit regulating the industrial or construction facility ~~(e.g., the prohibition contained in State Water Board Order No. 2009-0009-DWQ, as amended)~~. If the discharger can satisfactorily demonstrate to the PERMITTING AUTHORITY its inability to comply with the outright prohibition of the discharge of TRASH contained within the applicable NPDES permit, then the ~~discharger shall either~~ PERMITTING AUTHORITY may require the discharger to either:

(1) Install, operate, and maintain FULL CAPTURE SYSTEMS for all storm drains that captures runoff from the facility or site regulated by the NPDES permit; or,

(3) Install, operate, and maintain any combination of FULL CAPTURE SYSTEMS, MULTI-BENEFIT PROJECTS, other TREATMENT CONTROLS, and/or INSTITUTIONAL CONTROLS ~~other TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS~~ for the ~~entire~~ facility or site regulated by the NPDES permit, ~~so long as such combination achieves the same performance results as exclusive use of FULL CAPTURE SYSTEMS would achieve for all storm drains that captures runoff from the facility or site~~. The discharger shall demonstrate that such combination achieves FULL CAPTURE SYSTEM EQUIVALENCY~~.~~

Termination of permit coverage for industrial and construction STORM WATER dischargers shall be conditioned upon the proper operation and maintenance of all controls (i.e., FULL CAPTURE SYSTEMS, other TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS) used at their facility(ies).

d. A PERMITTING AUTHORITY may determine that specific land uses or locations (e.g., parks, stadia, schools, campuses, or roads leading to landfills) generate substantial amounts of TRASH. In the event that the PERMITTING AUTHORITY makes that determination, the PERMITTING AUTHORITY may require the MS4 to comply with Chapter IV.~~C~~A.3.a.1 or Chapter IV.~~C~~A.3.~~b~~a.2 ~~(as the case may be)~~, as determined by the PERMITTING AUTHORITY, with respect to such land uses or locations.

## 4. Other Dischargers

A PERMITTING AUTHORITY may require dischargers, described in Chapter IV.A.2.c or Chapter IV.A.3.d, that are not subject to Chapter IV.~~C~~A.3 herein, to implement any appropriate TRASH controls in areas or facilities that may generate TRASH. Such areas or facilities may include (but are not limited to) high usage campgrounds, picnic areas, beach recreation areas, parks not subject to an MS4 permit, or marinas.

## 5. Time Schedule

The PERMITTING AUTHORITY shall ~~re-open~~ modify, re-issue, or newly adopt NPDES permits issued pursuant to section 402(p) of the Federal Clean Water Act that are subject to the provisions of Chapter IV.~~B~~A.3 herein to include requirements consistent with these TRASH PROVISIONS. The PERMITTING AUTHORITIES shall abide by the following time schedules:

### a. NPDES Permits Regulating MS4 Permittees that have Regulatory Authority over Priority Land Uses.[103]

(1) ~~Within eighteen (18) months of the effective date of these TRASH PROVISIONS, each PERMITTING AUTHORITY shall either: (i) issue an order pursuant to Water Code section 13267 or 13383 requiring each MS4 permittee that will be complying under Chapter IV.B.3.a.1 (Track 1) or Chapter IV.B.3.b.2 (Track 2) to submit written notice to the PERMITTING AUTHORITY stating whether such MS4 permittee will comply with the prohibition of discharge under Track 1 or Track 2, or (ii) re-open, re-issue, or adopt an implementing permit that includes requirements consistent with these TRASH PROVISIONS, and that requires notice from each MS4 as to whether it has elected to comply under Track 1 or Track 2. Each MS4 permittee shall have three (3) months from either receipt of the PERMITTING AUTHORITY'S Water Code section 13267 or 13383 order, or the effective date of the implementing permit (whichever date is earlier) to respond to the applicable PERMITTING AUTHORITY with its written notice.~~ Within eighteen (18) months of the effective date of these TRASH

[103] The time schedule requirement in Chapter IV.A.5.a.1 requiring MS4 permittees to elect Chapter IV.A.3.a.1 (Track 1) or Chapter IV.A.3.a.2 (Track 2) do not apply to MS4 permittees subject to the Municipal Regional Stormwater NPDES Permit (MRP) for the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board) because that permit already requires control requirements substantially equivalent to Track 2. The time schedule requirement in Chapter IV.A.5.a.1 requiring MS4 permittees to submit an implementation plan does not apply to the MRP permittees if the San Francisco Bay Water Board determines that an MRP permittee has already submitted an implementation plan prior to the effective date of the TRASH PROVISIONS that is equivalent to the implementation plan required by Chapter IV.A.5.a.1.

PROVISIONS, for each permittee, each PERMITTING AUTHORITY shall either:

A. Modify, re-issue, or adopt the applicable MS4 permit to add requirements to implement these TRASH PROVISIONS. The implementing permit shall require written notice from each MS4 permittee stating whether it has elected to comply under Chapter IV.A.3.a.1 (Track 1) or Chapter IV.A.3.a.2 (Track 2) and such notice shall be submitted to the PERMITTING AUTHORITY no later than three (3) months from the effective date of the implementing permit, or for MS4s designated after the effective date of these TRASH PROVISIONS, three (3) months from the effective date of that designation. The implementing permit shall also require that within eighteen (18) months of the effective date of the implementing permit or new designation, MS4 permittees that have elected to comply with Track 2 shall submit an implementation plan to the PERMITTING AUTHORITY. The implementation plan shall describe: (i) the combination of controls selected by the MS4 permittee and the rationale for the selection, (ii) how the combination of controls is designed to achieve FULL CAPTURE SYSTEM EQUIVALENCY, and (iii) how FULL CAPTURE SYSTEM EQUIVALENCY will be demonstrated. The implementation plan is subject to approval by the PERMITTING AUTHORITY.

B. Issue an order pursuant to Water Code section 13267 or 13383 requiring the MS4 permittee to submit, within three (3) months from receipt of the order, written notice to the PERMITTING AUTHORITY stating whether such MS4 permittee will comply with the prohibition of discharge under Chapter IV.A.3.a.1 (Track 1) or Chapter IV.A.3.a.2 (Track 2). For MS4s designated after the effective date of these TRASH PROVISIONS, the order pursuant to Water Code section 13267 or 13383 shall be issued at the time of designation. Within eighteen (18) months of the receipt of the Water Code section 13267 or 13383 order, MS4 permittees that have elected to comply with Track 2 shall submit an implementation plan to the PERMITTING AUTHORITY that describes: (i) the combination of controls selected by the MS4 permittee and the rationale for the selection, (ii) how the combination of controls is designed to achieve FULL CAPTURE SYSTEM EQUIVALENCY, and (iii) how FULL CAPTURE SYSTEM EQUIVALENCY will be demonstrated. The implementation plan is subject to approval by the PERMITTING AUTHORITY.

~~Within eighteen (18) months of receipt of either the PERMITTING AUTHORITY'S Water Code section 13267 or 13383 order, or the effective date of the implementing permit (whichever date is earlier), MS4 permittees that have elected to comply with Chapter III.B.2.a.2. (Track 2) shall submit an implementation plan to the applicable PERMITTING AUTHORITY that: (i) describes the combination of controls selected by the MS4 permittee and the rationale for the selection, (ii) describes how the combination of controls is designed to achieve the same performance results as compliance under Track 1 would achieve, and (iii) how the performance will be demonstrated.~~

(2) For MS4 permittees that elect to comply with Chapter IV.~~B~~A.3.a.1 (Track 1), the implementing permit shall state that full compliance shall occur within ten (10) years of the effective date of the first implementing permit ~~(whether such permit is re-opened, re-issued or newly adopted), along with~~ except compliance for any new development within the MS4 permittee's jurisdiction must be built to immediately comply with Track 1, and as specified in Chapter IV.A.5.a.5. The permit shall also require these permittees to demonstrate achievement~~s~~ of interim milestones such as an average of ten percent (10%) of the full capture systems installed every year. In no case may the final compliance date be later than fifteen (15) years from the effective date of these TRASH PROVISIONS.

(3) For MS4 permittees that elect to comply with Chapter IV.~~B~~A.3.a.2 (Track 2), the implementing permit shall state that full compliance shall occur within ten (10) years of the effective date of the first implementing permit ~~(whether such permit is re-opened, re-issued or newly adopted), along with~~ except compliance for any new development within the MS4 permittee's jurisdiction must be built to immediately comply with Track 2, and as specified in Chapter IV.A.5.a.5. The permit shall also require these permittees to demonstrate achievement~~s~~ of interim milestones such as average load reductions of ten percent (10%) per year. In no case may the final compliance date be later than fifteen (15) years from the effective date of these TRASH PROVISIONS.

(4) The implementing permit shall state that for MS4 permittees designated after the effective date of the implementing permit, full compliance shall occur within ten (10) years of the effective date of the designation. The permit shall also require such designations to demonstrate achievement of interim milestones such as average load reductions of ten percent (10%) per year or other progress to full implementation.

(5) Where a PERMITTING AUTHORITY makes a determination pursuant to Chapter IV.A.4 that a specific land use generates a substantial amount of TRASH, that permitting authority has discretion to determine the time schedule for full compliance. In no case may the final compliance date be later than ten (10) years from the determination.

b. **NPDES Permits Regulating the Department.**

(1) Within eighteen (18) months of the effective date of these TRASH PROVISIONS, the State Water Board shall issue an order pursuant to Water Code section 13267 or 13383 requiring the Department to submit an implementation plan to the Executive Director of the State Water Board that: (i) describes the specific locations of its SIGNIFICANT TRASH GENERATING AREAS, (ii) the combination of controls selected by the Department and the rationale for the selections, and (iii) how it will demonstrate ~~performance~~ FULL CAPTURE SYSTEM EQUIVALENCY.

(2) The Department must demonstrate full compliance with Chapter IV.~~B~~A.3.b herein within ten (10) years of the effective date of the first implementing NPDES permit ~~(whether such permit is re-opened, re-issued, or newly adopted)~~, along with achievements of interim milestones such as average load reductions of ten percent (10%) per year. In no case may the final compliance date be later than fifteen (15) years from the effective date of these TRASH PROVISIONS.

c. **NPDES Permits Regulating the Discharges of Storm Water Associated with Industrial Activity (Including Construction Activity).**

Dischargers that are subject to the provisions of Chapter IV.~~B~~A.3.c herein must demonstrate full compliance in accordance with the deadlines contained in the first implementing NPDES permits ~~(whether such permits are re-opened, re-issued, or newly adopted)~~. Such deadlines may not exceed the terms of the first implementing permits.

~~**6. Time Extensions for Achieving Full Compliance (Option for Board Consideration)**~~

~~The PERMITTING AUTHORITY may give MS4 permittees that are complying under section Chapter IV.C.3.a up to a three (3) year time extension for achieving full compliance in areas where REGULATORY SOURCE CONTROLS are employed that take effect prior to or within three (3) years of the effective date of these TRASH PROVISIONS. Each REGULATORY SOURCE CONTROL employed by an MS4 will be eligible for up to a one (1) year time extension.~~

## 6. Monitoring and Reporting

The PERMITTING AUTHORITY must include monitoring and reporting requirements in its implementing permits. The following monitoring and reporting provisions are the minimum requirements that must be included within the implementing permits:

a. MS4 permittees that elect to comply with Chapter IV.~~C~~A.3.a.1 (Track 1) shall provide a report to the applicable PERMITTING AUTHORITY demonstrating installation, operation, maintenance, and the Geographic Information System- (GIS-) mapped location and drainage area served of its full capture systems on an annual basis.

b. MS4 permittees that elect to comply with Chapter IV.~~C~~A.3.a.2 (Track 2) shall develop and implement monitoring plans that demonstrate the ~~mandated performance results,~~ effectiveness of the FULL CAPTURE SYSTEMS, MULTI-BENEFIT PROJECTS, other TREATMENT CONTROLS, and/or INSTITUTIONAL CONTROLS, ~~other TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS~~, and compliance with ~~the performance standard~~ FULL CAPTURE SYSTEM EQUIVALENCY. Monitoring reports shall be provided to the applicable PERMITTING AUTHORITY on an annual basis, and shall include GIS-mapped locations and drainage area served for each of the FULL CAPTURE SYSTEMS, MULTI-BENEFIT PROJECTS, other TREATMENT CONTROLS, and/or INSTITUTIONAL CONTROLS ~~other TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS~~ installed or utilized by the MS4 permittee. ~~At a minimum,~~ In developing the monitoring reports the MS4* permittee ~~shall~~ should consider ~~address and answer~~ the following questions:

(1) What type of and how many TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS have been used~~,~~ and in what locations?

(2) How many FULL CAPTURE SYSTEMS have been installed (if any), ~~and~~ in what locations have they been installed, and what is the individual and cumulative area served by them?

(3) What is the effectiveness of the total combination of TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and MULTI-BENEFIT PROJECTS employed by the MS4 permittee?

(4) Has the amount of TRASH discharged from the MS4 decreased from the previous year? If so, by how much? If not, explain why.

(5) Has the amount of TRASH in the MS4's receiving water(s) decreased from the previous year? If so, by how much? If not, explain why.

c. The Department, as subject to the provisions of Chapter IV.~~C~~A.3.b, shall develop and implement monitoring plans that demonstrate the ~~mandated performance results,~~ effectiveness of the controls~~,~~ and compliance with ~~the performance standard~~ FULL CAPTURE SYSTEM EQUIVALENCY. Monitoring reports shall be provided to the State Water Board on an annual basis, and shall include GIS-mapped locations and drainage area served for each of the FULL CAPTURE SYSTEMS, MULTI-BENEFIT PROJECTS, other TREATMENT CONTROLS, and/or INSTITUTIONAL CONTROLS ~~other TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS~~ installed or utilized by the Department. ~~Monitoring reports can be included with the Annual Report.~~ ~~At a minimum,~~ In developing the monitoring report, the Department ~~shall~~ should consider ~~address and answer~~ the following questions:

(1) What type of and how many TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and/or MULTI-BENEFIT PROJECTS have been used~~,~~ and in what locations?

(2) How many FULL CAPTURE SYSTEMS have been installed (if any), ~~and~~ in what locations have they been installed, and what is the individual and cumulative area served by them?

(3) What is the effectiveness of the total combination of TREATMENT CONTROLS, INSTITUTIONAL CONTROLS, and MULTI-BENEFIT PROJECTS employed by the Department?

(4) Has the amount of TRASH discharged from the Department's MS4 decreased from the previous year? If so, by how much? If not, explain why.

(5) Has the amount of TRASH in the receiving waters decreased from the previous year? If so, by how much? If not, explain why.

d. Dischargers that are subject to the provisions of Chapter IV.~~C~~A.3.c herein shall be required to report the measures used to comply with Chapter IV.~~C~~A.3.c.

**Draft text of the final Part 1 Trash Provisions ~~Amendments~~ proposed to Appendix A: Glossary of the ISWEBE Plan**

FULL CAPTURE SYSTEM: A TREATMENT CONTROL (either a single device or a series of devices) that traps all particles that are 5 mm or greater, and has a design treatment capacity that is either: a) of not less than the peak flow rate, Q, resulting from

a one-year, one-hour, storm in the subdrainage area, or b) appropriately sized to, and designed to carry at least the same flows as, the corresponding storm drain.

[Rational equation is used to compute the peak flow rate: Q = C•I•A, where Q = design flow rate (cubic feet per second, cfs); C = runoff coefficient (dimensionless); I = design rainfall intensity (inches per hour, as determined per the rainfall isohyetal map specific to each region, and A = subdrainage area (acres).]

Prior to installation, FULL CAPTURE SYSTEMS must be certified by the Executive Director, or designee, of the State Water Board. Uncertified FULL CAPTURE SYSTEMS will not satisfy the requirements of these TRASH PROVISIONS. To request certification, a permittee shall submit a certification request letter that includes all relevant supporting documentation to the State Water Board's Executive Director. The Executive Director, or designee, shall issue a written determination approving or denying the certification of the proposed FULL CAPTURE SYSTEM or conditions of approval, including a schedule to review and reconsider the certification. FULL CAPTURE SYSTEMS ~~that have been~~ certified by the Los Angeles Regional Water Board prior to the effective date of these TRASH PROVISIONS and FULL CAPTURE SYSTEMS listed in Appendix I of the Bay Area-wide Trash Capture Demonstration Project, Final Project Report (May 8, 2014) will satisfy the requirements of these TRASH PROVISIONS, unless the Executive Director, or designee, of the State Water Board determines otherwise.

FULL CAPTURE SYSTEM EQUIVALENCY: The TRASH load that would be reduced if FULL CAPTURE SYSTEMS were installed, operated, and maintained for all storm drains that capture runoff from the relevant areas of land (PRIORITY LAND USES, SIGNIFICANT TRASH GENERATING AREAS, facilities or sites regulated by NPDES permits for discharges of STORM WATER associated with industrial activity, or specific land uses or areas that generate substantial amounts of TRASH, as applicable). The FULL CAPTURE SYSTEM EQUIVALENCY is a TRASH load reduction target that the permittee quantifies by using an approach, and technically acceptable and defensible assumptions and methods for applying the approach, subject to the approval of PERMITTING AUTHORITY. Examples of such approaches include the following:

(1) Trash Capture Rate Approach. Directly measure or otherwise determine the amount of TRASH captured by FULL CAPTURE SYSTEMS for representative samples of all similar types of land uses, facilities, or areas within the relevant areas of land over time to identify specific TRASH capture rates. Apply each specific TRASH capture rate across all similar types of land uses, facilities, or areas to determine FULL CAPTURE SYSTEM EQUIVALENCY. TRASH capture rates may be determined either through a pilot study or literature review. FULL CAPTURE SYSTEMS selected to evaluate TRASH capture rates may cover entire types of land uses, facilities, or areas, or a representative subset of types of land uses, facilities, or areas. With this approach, FULL CAPTURE SYSTEM EQUIVALENCY is the sum of the products of each type of land use, facility, or area multiplied by TRASH capture rates for that type of land use, facility, or area.

(2) Reference Approach. Determine the amount of TRASH in a reference receiving water in a reference watershed where FULL CAPTURE SYSTEMS have been installed for all storm drains that capture runoff from all relevant areas of land. The reference watershed must be comprised of similar types and extent of land uses (including PRIORITY LAND USES and all other land uses), facilities, or areas as the permittee's watershed. With this approach, FULL CAPTURE SYSTEM EQUIVALENCY would be demonstrated when the amount of TRASH in the receiving water is equivalent to the amount of TRASH in the reference receiving water.

INSTITUTIONAL CONTROLS: Non-structural best management practices (i.e., no structures are involved) that may include, but not be limited to, street sweeping, sidewalk TRASH bins, collection of the TRASH, anti-litter educational and outreach programs, producer take-back for packaging, ~~and REGULATORY SOURCE CONTROLS (i.e., and~~ ordinances~~)~~.

LOW-IMPACT DEVELOPMENT CONTROLS: TREATMENT CONTROLS that employ natural and constructed features that reduce the rate of STORM WATER runoff, filter out pollutants, facilitate STORM WATER storage onsite, infiltrate STORM WATER into the ground to replenish groundwater supplies, or improve the quality of receiving groundwater and surface water. (See Water Code §~~Section~~10564 ~~of Division 6 of the Water Code~~.)

MULTI-BENEFIT PROJECT: A TREATMENT CONTROl project designed to achieve any ~~some or all~~ of the benefits set forth in ~~S~~section 10562, subdivision (d) of the Water Code. Examples include projects designed to: infiltrate, recharge or store STORM WATER for beneficial reuse; develop or enhance habitat and open space through STORM WATER and non-STORM WATER management; ~~prevent STORM WATER pollution;~~ and/or reduce STORM WATER and non-STORM WATER runoff volume.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4): Same meaning set forth in 40 ~~C.F.R. §~~ Code of Federal Regulations section 122.26(b)(8).

PREPRODUCTION PLASTIC: Same meaning set forth in ~~S~~section 13367(a) of the Water Code.

PRIORITY LAND USES: Those developed sites, facilities, or land uses (i.e., not simply zoned land uses) within the MS4 permittee's jurisdiction from which discharges of TRASH are regulated by this Plan as follows:

(1) High-density residential: all land uses with at least ten (10) developed dwelling units/acre.
(2) Industrial: land uses where the primary activities on the developed parcels involve product manufacture, storage, or distribution (e.g., manufacturing businesses, warehouses, equipment storage lots, junkyards, wholesale businesses, distribution centers, or building material sales yards).
(3) Commercial: land uses where the primary activities on the developed parcels involve the sale or transfer of goods or services to consumers (e.g., business or professional buildings, shops, restaurants, theaters, vehicle repair shops, etc.)

(4) Mixed urban: land uses where high-density residential, industrial, and/or commercial land uses predominate collectively (i.e., are intermixed).
(5) Public transportation stations: facilities or sites where public transit agencies' vehicles load or unload passengers or goods (e.g., bus stations and stops).
(6) Equivalent alternate land uses: An MS4 permittee with regulatory authority over priority land uses may issue a request to the APPLICABLE PERMITTING AUTHORITY that the MS4 permittee be allowed to comply under Chapter IV.~~B~~A.3.a.1. with alternate land uses within ~~its~~ the MS4 permittee's jurisdiction that generate rates of trash that are equivalent to or greater than one or more of the high density residential, industrial, commercial, mixed urban, and/or public transportation station sites, facilities, or land uses defined above. Comparative TRASH generation rates shall be established through the reporting of quantification measures such as street sweeping and catch basin cleanup records; mapping; visual trash presence surveys, such as the "Keep America Beautiful Visible Litter Survey"; or other information as required by the PERMITTING AUTHORITY.

PERMITTING AUTHORITY: The State Water Board or Regional Water Board, whichever issues the permit.

~~REGULATORY SOURCE CONTROLS: INSTITUTIONAL CONTROLS that are enforced by an ordinance of the municipality to stop and/ or reduce pollutants at their point of generation so that they do not come into contact with STORM WATER. REGULATORY SOURCE CONTROLS could consist of, but not be limited to, bans of single-use consumer products.~~

SIGNIFICANT TRASH GENERATING AREAS: All locations or facilities within the Department's jurisdiction where TRASH accumulates in substantial amounts, such as:

(1) Highway on- and off-ramps in high density residential, commercial, and industrial land uses (as such land uses are defined under "PRIORITY LAND USES" herein).
(2) Rest areas and park-and-rides.
(3) State highways in commercial and industrial land uses (as such land uses are defined under PRIORITY LAND USES herein).
(4) Mainline highway segments to be identified by the Department through pilot studies and/or surveys.

STORM WATER: Same meaning set forth in 40 ~~C.F.R. §~~ Code of Federal Regulations section 122.26(b)(13) and 55 Federal Register 47990, 47995 (Nov. 16, 1990).

TREATMENT CONTROLS: Structural best management practices to either (a) remove pollutants and/or solids from STORM WATER runoff, wastewater, or effluent, or (b) capture, infiltrate or reuse STORM WATER runoff, wastewater, or effluent. TREATMENT CONTROLS include FULL CAPTURE SYSTEMS and LOW-IMPACT DEVELOPMENT CONTROLS.

TRASH: All improperly discarded solid material from any production, manufacturing, or processing operation including, but not limited to, products, product packaging, or

containers constructed of plastic, steel, aluminum, glass, paper, or other synthetic or natural materials.

TRASH PROVISIONS: The ~~W~~water ~~Q~~quality ~~O~~objective for TRASH, as well as the prohibition of discharge and implementation requirements set forth in Chapter IV.~~B~~A herein.