Santa Monica Bay Jurisdictional Group 2 and 3 Enhanced Watershed Management Program - DRAFT

Prepared by:

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Executive Summary

The Santa Monica Bay (SMB) Jurisdictional Groups 2 and 3 (JG2/JG3) Enhanced Watershed Management Program (EWMP) has been developed by the Santa Monica Bay Enhanced Watershed Management Group (SMB EWMP Group), which is comprised of City of Los Angeles, County of Los Angeles, City of Santa Monica, City of El Segundo, and the Los Angeles County Flood Control District (LACFCD). The EWMP is a requirement of the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit Order No. R4-2012-0175 (Permit), which was adopted by the Los Angeles Regional Water Quality Control Board (Regional Board) and became effective on December 28, 2012. The purpose of the Permit is to ensure the MS4s in Los Angeles County are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region.

The Permit allows Permittees to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) or an Enhanced Watershed Management Program (EWMP) to achieve compliance with receiving water limitations (RWL) and water quality-based effluent limits (WQBELs). The City of Los Angeles (City), City of Santa Monica, City of El Segundo, Unincorporated areas of the County of Los Angeles (County), and the LACFCD, collectively referred to as the SMB EWMP Group, submitted a revised notice of intent (NOI) to develop an EWMP in December of 2013 to fulfill the requirements of the Permit.

ES-1 INTRODUCTION

As part of the Permit requirements, the SMB EWMP Group developed a Coordinated Integrated Monitoring Plan (CIMP) to monitor the effectiveness of the EWMP and resultant change in surface water quality. In addition to demonstrating compliance with NPDES requirements, the CIMP will serve as a guide for future adaptive management of the EWMP.

The SMB watershed management area (WMA) EWMP Group area falls within the boundaries of JG2 and JG3, which are located within the central region of the Santa Monica Bay Watershed. Subwatersheds within the SMB EWMP Group Area include the urbanized Dockweiler and Santa Monica subwatersheds, as well as natural open space located in the Castle Rock, Pulga Canyon, Temescal Canyon, and Santa Monica Canyon subwatersheds. The JG2/JG3 area totals 34,362 acres within the Santa Monica Bay Watershed. **Figure ES-1** illustrates the extent of the SMB EWMP Group Area. It is noted that the geographical scope of the SMB EWMP Group area excludes areas of land totaling 9,124 acres for which the MS4 Permittees do not have jurisdiction, including land owned by the State of California, Caltrans, the United States Government, and an area of the Chevron Facility located in the City of El Segundo. Therefore, with the exclusion of these areas, the SMB EWMP Group area covers 25,238 acres.

Approximately 49 percent of the SMB EWMP Group area is open space, of which approximately 93 percent is located in the northern natural portion of the subwatersheds and approximately 7 percent is located in the urbanized Dockweiler subwatershed. The boundary of the Santa Monica Bay, as defined by the National Estuary Program, extends from the Los Angeles/Ventura County line to the northwest, southward to Point Fermin located on the Palos Verdes Peninsula to the southeast. The land area that drains into the SMB follows the crest of the Santa Monica Mountains on the north to Griffith Park, then extends south and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of the Baldwin Hills. South of Ballona Creek, the drainage area is a narrow coastal strip between Playa del Rey and Palos Verdes. Subwatersheds and associated water bodies/tributaries are shown in **Table ES-1**.

Figure ES-1
Santa Monica Bay Enhanced Watershed Management Plan Group Area

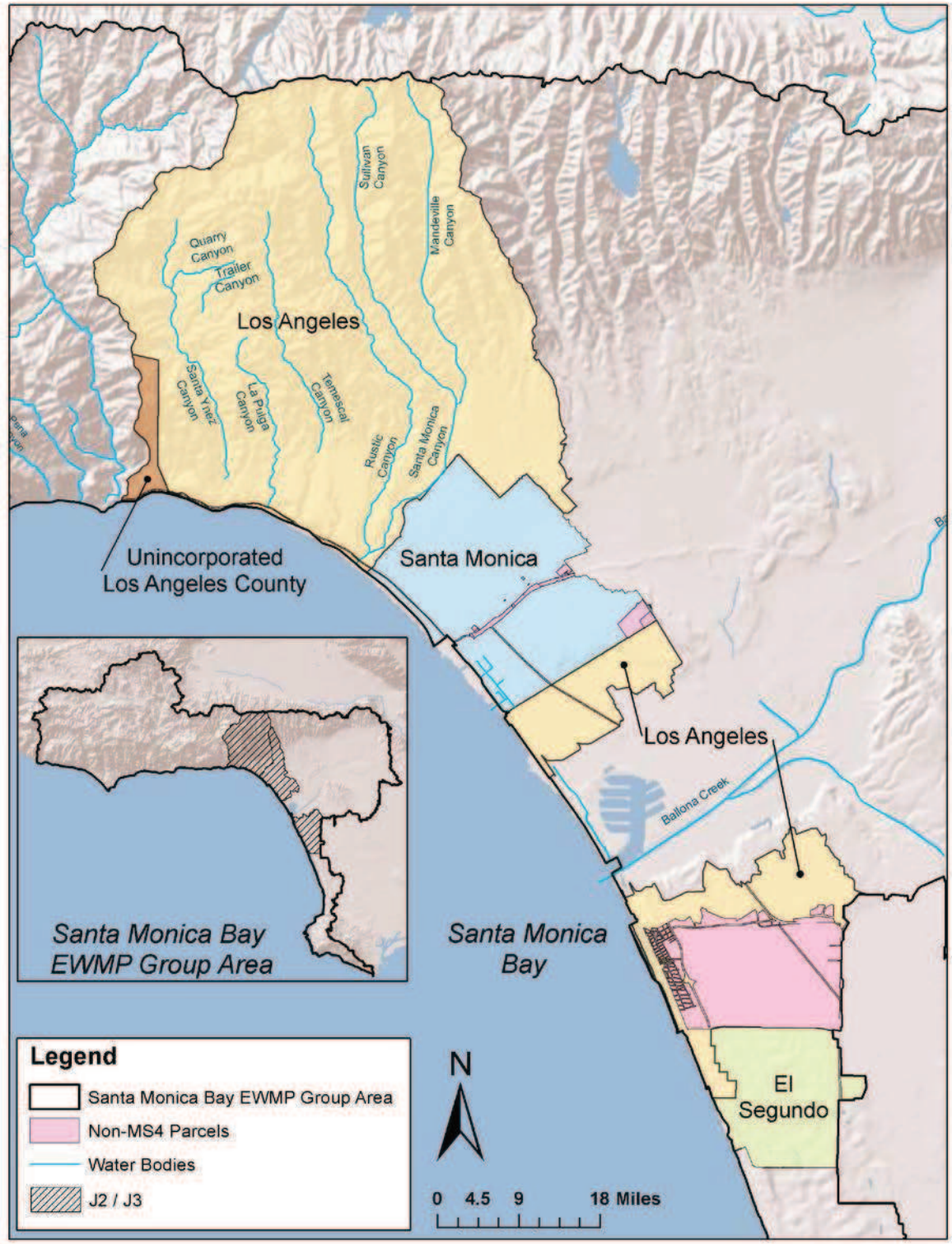


Table ES-1
Santa Monica Bay EWMP Area Subwatersheds and Associated Water Bodies/Tributaries

Subwatershed	Water Body	Water Body/Tributary
Castle Rock	Santa Ynez Canyon	Quarry Canyon Trailer Canyon
Pulga Canyon	La Pulga Canyon	-
Temescal Canyon	Temescal Canyon	-
Santa Monica Canyon	Santa Monica Canyon	Rustic Canyon Creek Sullivan Canyon Creek Mandeville Canyon Creek
Santa Monica	Santa Monica Bay	-
Dockweiler	Santa Monica Bay	-

When designated beneficial uses of a particular receiving water body are being compromised by exceeding water quality, Section 303(d) of the federal Clean Water Act (CWA) requires identifying and listing that water body as "impaired". Once a water body has been deemed impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutant(s). A TMDL is an estimate of the total load of pollutants from point, non-point, and natural sources that a water body may receive without exceeding applicable water quality standards (with a "factor of safety" included). Once established, the TMDL allocates the loads among current and future pollutant sources to the water body.

There are currently four TMDLs in effect for the water bodies within the JG2/JG3 geographical scope, plus one that has not yet been approved by the United States Environmental Protection Agency (USEPA) and is therefore not yet effective. These TMDLs are summarized in **Table ES-2**.

Table ES-3 identifies the applicable WQBELs and/or RWLs established pursuant to TMDLs included in the Permit and addressed by this EWMP.

Table ES-2
North Santa Monica Bay Coastal Watersheds (NSMBCW) TMDLs

TMDL Name	Agency	TMDL Effective Date
SMB Beaches (SMBB) Bacteria TMDL, Reconsideration of Certain Technical Matters of the SMBB Bacteria TMDL, Resolution R12-007[1]	Regional Board	July 2, 2014
SMB TMDL for DDT and PCBs	USEPA	March 26, 2012
SMB Nearshore Debris TMDL, Resolution R10-010	Regional Board	March 20, 2012
SMB Beaches (SMBB) Bacteria TMDL, Dry Weather, Resolution 2002-004[2]	Regional Board	July 15, 2003
SMB Beaches (SMBB) Bacteria TMDL, Wet Weather, Resolution 2002-022[2]	Regional Board	July 15, 2003

[1] This TMDL revision was approved by the USEPA in July 2014.
[2] This TMDL was revised pursuant to Resolution R12-2007.

Table ES-3
Final Permit RWLs and WQBELs for SMB TMDLs

Reference	Parameter	Effluent Limitation/ Receiving Water Limitation
SMB Nearshore Debris TMDL	Trash – WQBEL	Zero
	Plastic Pellets – WQBEL	Zero
TMDL for PCBs/DDT (for LA County MS4)	DDT – WQBEL	27.08 g/yr (based on 3-year averaging period)[2]
	PCBs – WQBEL	140.25 g/yr (based on 3-year averaging period)
SMBB Bacteria TMDL	Total coliform (daily maximum) – WQBEL	10,000 Most Probable Number (MPN)/100 mL
	Total coliform (daily maximum), if the ratio of fecal-to-total coliform exceeds 0.1 – WQBEL	1,000 MPN/100 mL
	Fecal coliform (daily maximum) – WQBEL	400 MPN/100 mL
	Enterococcus (daily maximum) – WQBEL	104 MPN/100 mL
	Total coliform (geometric mean[1]) – WQBEL/RWL	1,000 MPN/100 mL
	Fecal coliform (geometric mean[1]) – WQBEL/RWL	200 MPN/100 mL
	Enterococcus (geometric mean[1]) – WQBEL/RWL	35 MPN/100 mL

[1] The reopened 2012 TMDL, which was approved by USEPA in July 2014, modified the 30 day rolling average to weekly calculation of a rolling six week geometric mean using five or more sample, starting all calculation weeks on Sunday.
[2] Group load-based WQBELs that apply to all SMB MS4 dischargers; the individual load-based WQBELs for JG2/JG3 MS4 agencies would be an area-weighted fraction of this.

EWMP Development Process

Development of the EWMP for the SMB EWMP Group included four major components:

- Identification of water quality priorities to provide the basis for prioritizing implementation activities, as well as the selection and scheduling of BMPs in the Reasonable Assurance Analysis (RAA).
- Identification of watershed control measures (i.e., BMPs – best management practices) to reduce the impact of stormwater and non-stormwater on receiving water quality.
- Reasonable Assurance Analysis to demonstrate that control measures, specifically BMPs, will be effective.
- Stakeholder involvement to provide the opportunity for meaningful stakeholder input throughout the development of the EWMP.

ES-2 WATER QUALITY PRIORITIES

Water quality priorities provide the basis for prioritizing project implementation; selecting and scheduling BMPs; and focusing monitoring activities developed in the CIMP. Details on the development of the water quality priorities are included in the CIMP (MWH Team B, 2014).

Based on the water quality characterization, the water body–pollutant combinations (WBPCs) were classified into one of three categories, in accordance with Section IV.C.5(a)ii of the Permit. **Table ES-4** summarizes the criteria for each category, as defined by the Permit. **Table ES-5** presents the WBPCs for the SMB EWMP. Subwatersheds in SMB were further modeled into compliance monitoring location (CML) regions. These modeled CML subwatersheds, and these are herein referred to "CML analysis regions" and were used in the RAA modeling.

Table ES-4
Description of Water Body-Pollutant Prioritization Categories

Category	Description
1	Water body-pollutant combinations under Category 1 (highest priority) are defined in the Permit as "water body-pollutant combinations for which water quality-based effluent limitations and/or receiving water limitations are established in Part VI.E and Attachments L through R [of the Permit]."
2	Category 2 (high priority) water body-pollutant combinations are defined as "pollutants for which data indicate water quality impairment in the receiving water according to the State's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (State Listing Policy) and for which MS4 discharges may be causing or contributing to the impairment."
3	Category 3 (Medium Priority) designations are to be applied to "water body-pollutant combinations that are not 303(d)-listed, but which exceed applicable receiving water limitations contained in the Permit and for which MS4 discharges may be causing or contributing to the exceedance."

Table ES-5
Water Body Pollutant Prioritization[1]

Category	Water Body	Pollutant	Compliance Deadline
1	SMB Beaches	Summer dry weather bacteria	7/15/2006 (Final: Single sample summer AEDs)
	SMB Beaches	Wet weather bacteria	7/15/2009 (Interim: 10% single sample ED reduction) 7/15/2013 (Interim: 25% single sample ED reduction) 7/15/2018 (Interim: 50% single sample ED reduction) 7/15/2021 (Final: Single sample AED) 7/15/2021 (Final: Geometric Mean [GM])
	SMB Beaches	Winter dry weather bacteria	7/15/2009 (Final: Single sample winter AEDs)[2]
	SMB Offshore/ Nearshore	Debris	3/20/2016 (20% load reduction) 3/20/2017 (40% load reduction) 3/20/2018 (60% load reduction) 3/20/2019 (80% load reduction) 3/20/2020 (100% load reduction)
	SMB	DDTs	Compliance to be demonstrated through monitoring and adaptive management process [3]
	SMB	PCBs	Compliance to be demonstrated through monitoring and adaptive management process P[3]
2	Santa Monica Canyon Channel	Lead	NA
	Santa Monica Canyon Channel	Indicator bacteria	NA
3	None	None	None

[1] Listed in order of compliance deadline, interim and final are included.
[2] Compliance date per 2013 reopened TMDL, which is not yet effective (i.e., USEPA and Office of Administrative Law approval is pending).
[3] Although the TMDL lacks a formal compliance schedule for the WQBEL, the TMDL Executive Summary does state, "The time frame for attainment of the TMDL targets for the rest of Santa Monica Bay (other than the Palos Verdes shelf) is 11 years for DDT and 22 years for PCBs."

ES-3 REASONABLE ASSURANCE ANALYSIS

An important component of the SMB EWMP is the RAA. The RAA is a process used to demonstrate that institutional and structural control measures are expected to be sufficient for achieving applicable WQBELs and/or RWLs that have compliance deadlines within the Permit term. In addition to using the RAA as a means for determining the efficacy of existing and potential control measures, the RAA also facilitates the selection of BMPs as well as the prioritization of BMP implementation. While the methodology of the RAA evolved over the course of the EWMP development, the RAA approach remained consistent with the applied methodology and the "RAA Guidelines" as issued by the Regional Board (Regional Board, 2014).

In order to demonstrate reasonable assurance, BMP opportunities were identified in a prioritized manner. Prioritization was based on cost (low cost BMPs were prioritized highest); BMP effectiveness for the pollutants of concern (BMPs that had greater treatment efficiency for the pollutants of concern in a particular analysis region were prioritized higher than other BMPs); and implementation.
The RAA was performed according to the following steps:

- Assume non-modeled non-structural BMP load reduction (2.5-7.5 percent of baseline pollutant load);

- Calculate public retrofit incentives (e.g., downspout disconnects) and redevelopment load reductions;
- Calculate load reductions attributable to anticipated new permit compliance activities of non-MS4 entities (e.g., Industrial General Permit holders and Caltrans);
- Calculate planned and proposed regional/centralized BMP load reductions based on existing plans and parcel screening analysis;
- Meet the target load reduction (TLR) by backfilling the remaining load reduction with specific regional/centralized BMP projects or distributed BMPs assumed treat a percentage of developed land uses.

ES-4 WATERSHED CONTROL MEASURES

As part of the development of the EWMP, the Permit specifies that watershed control measures, also referred to as BMPs, shall be identified to: 1) ensure that stormwater discharges meet receiving water and effluent limits as established in the Permit, and 2) reduce overall impacts to receiving waters from stormwater and non-stormwater runoff.

BMPs are grouped into two broad categories, structural and institutional. Structural BMPs are physically-constructed control measures that alter the hydrology or water quality of stormwater or non-stormwater. Structural BMPs includes infiltration basins, bioswales, and bioretention/bioinfiltration. Institutional BMPs are source control measures that prevent the release of flow/pollutants or transport of pollutants, but do not involve construction of physical facilities. Minimum control measures (MCMs), such as street sweeping, are a subset of institutional BMPs.

The EWMP summarizes watershed control measures, including BMP types and existing BMPs, which reduce the current pollutant load to meet past and future compliance requirements. In addition, the EWMP summarizes BMPs that will be implemented to meet Permit compliance requirements, including institutional (non-structural) and structural BMPs consisting of low impact development (LID), distributed green streets, and regional BMPs.

A summary of total BMP runoff retained in acre-feet (AF) by Permittee is shown in **Table ES-6** for regional projects and in **Table ES-7** for distributed projects.

Table ES-6
Summary of Total Regional BMP Runoff Retained over Critical Year by Permittee

Implementation Date for Compliance	Regional BMP Total Runoff Retained over Critical Year (AF)				
	County of Los Angeles	City of Los Angeles	City of Santa Monica	City of El Segundo	Total
2018	0.0	465.3	562.5	232.2	1260.0
2021	0.0	758.9	518.3	0.0	1277.2
Total	0.0	1224.2	1080.8	232.2	2537.2

Table ES-7
Summary of Total Distributed BMP Runoff Retained over Critical Year by Permittee

Implementation Date for Compliance	Green Street BMP Total Runoff Retained over Critical Year (AF)				
	County of Los Angeles	City of Los Angeles	City of Santa Monica	City of El Segundo	Total
2018	4.8	283.3	184.5	0.0	472.6
2021	4.6	246.6	166.2	0.0	417.3
Total	9.4	529.9	350.7	0.0	890.0

The SMB EWMP includes multi-benefit regional projects that retain the stormwater volume from the 85th percentile, 24-hour storm for the drainage areas tributary to the multi-benefit regional projects. The EWMP process emphasizes identifying Regional EWMP projects that are individually or collectively able to capture runoff from the 85th percentile, 24-hour storm.

Through an extensive screening process and coordination with the SMB EWMP Group, eight proposed example regional EWMP project sites were selected for conceptual design. These eight regional projects will retain and infiltrate or beneficially use stormwater runoff for the drainage area tributary to the project.

The location and BMP type of the eight highlighted regional EWMP projects are summarized in **Table ES-8** and shown on **Figure ES-2.** A conceptual level design was developed for each of the example Regional EWMP projects, which includes the selection of BMP type, preliminary sizing, configuration, and diversion pipeline alignment. A geotechnical evaluation and review per California Environmental Quality Act (CEQA) guidelines was completed for the example Regional EWMP projects. **Table ES-9** shows a summary of all planned/proposed regional projects and green streets separated by Agency.

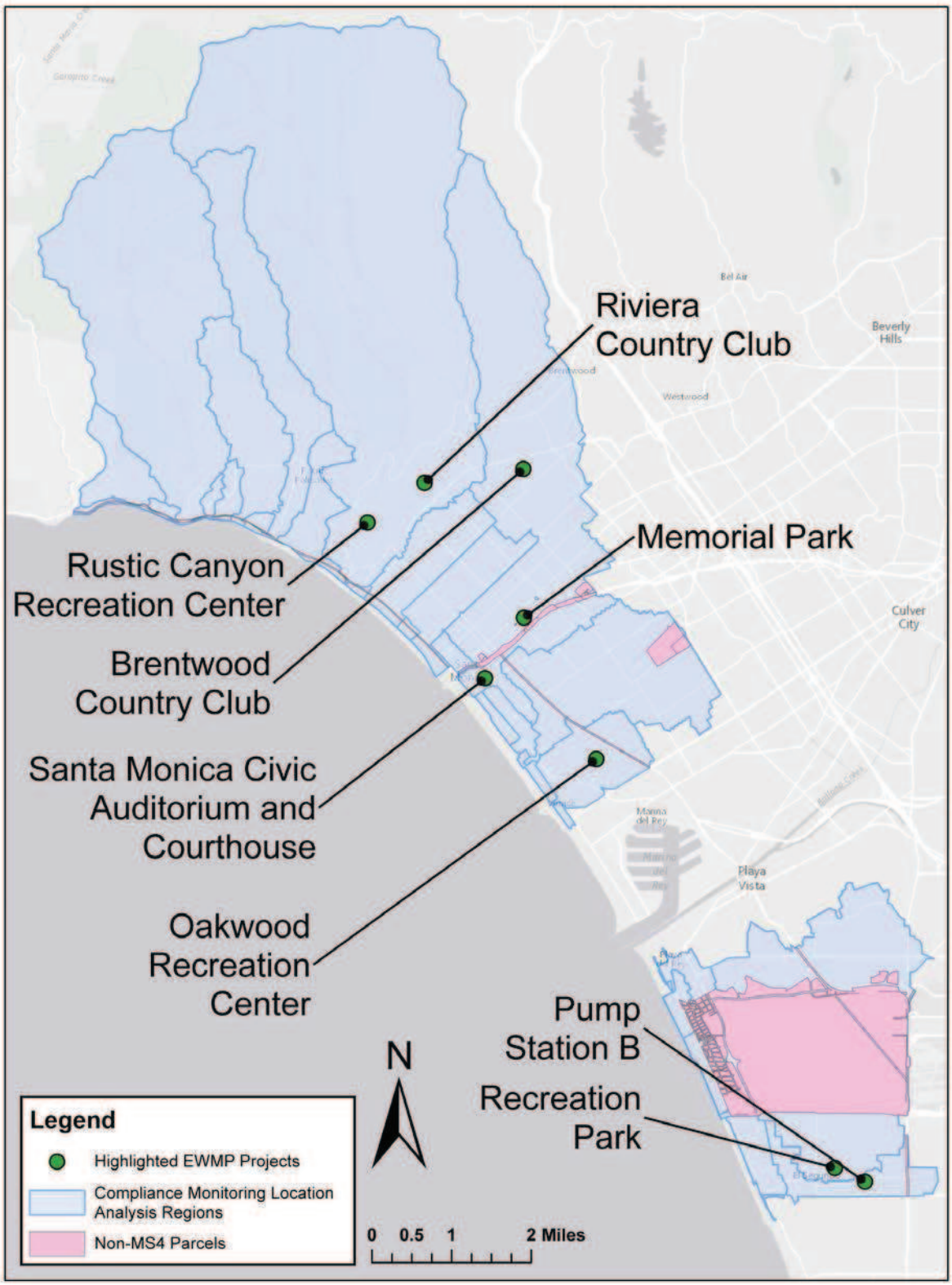
Table ES-8
Summary of Eight Proposed Regional EWMP Projects

Regional EWMP Project	BMP Type	Jurisdiction	Address / Location
Brentwood Country Club	Storage, Infiltration, and Use	City of Los Angeles	590 S Burlingame Ave, Los Angeles, CA 90049
Oakwood Recreation Center	Storage, Infiltration, and Use	City of Los Angeles	767 California Ave, Venice, CA 90291
Riviera Country Club	Storage, Infiltration, and Use	City of Los Angeles	1250 Capri Dr., Pacific Palisades, CA 90272
Rustic Canyon Recreation Center	Subsurface Infiltration	City of Los Angeles	601 Latimer Rd., Santa Monica, CA 90402
Line B Pump Station	Surface Infiltration	City of El Segundo	201-223 Center St., El Segundo, CA 90245
Recreation Park	Subsurface Infiltration	City of El Segundo	401 Sheldon St., El Segundo, CA 90245
Memorial Park	Storage, Infiltration, and Use	City of Santa Monica	1401 Olympic Blvd., Santa Monica, CA 90404
Santa Monica Civic Auditorium and Courthouse	Subsurface Infiltration	City of Santa Monica	1855 Main St, Santa Monica, CA 90401

Table ES-9
Summary of Planned/Proposed Regional Projects and Green Street Area by Agency

Agency	Number of Proposed/Planned Regional Projects	Proposed Green Street Area (square feet)
Los Angeles	16	4,412,791
Santa Monica	16	1,995,665
El Segundo	4	0.354087
Unincorporated Los Angeles County	0	78,657

Figure ES-2
Eight Proposed Regional EWMP Projects



ES-5 IMPLEMENTATION SCHEDULE

The EWMP Implementation Plan is the schedule for compliance for each jurisdiction to address water quality priorities and comply with the provisions of the MS4 Permit. Through the RAA, a series of quantitative analyses was used to identify the capacities of LID, green streets and regional BMPs that comprise the EWMP Implementation Plan and assure those control measures will address the water quality priorities per the milestones/compliance schedules. Implementation of the EWMP implementation plan will provide a BMP-based compliance pathway for each jurisdiction under the MS4 Permit.

Scheduling of control measure implementation is based on the milestones of the SMB TMDLs, as follows:

- Bacteria
    - Milestone 1: Achieve 10% of the reduction for wet weather bacteria (2009 – achieved)
    - Milestone 2: Achieve 25% of the reduction for wet weather bacteria (2013 – achieved)
    - Milestone 3: Achieve 50% of the reduction for wet weather bacteria (2018)
    - Milestone 4: Achieve 100% of the reduction for wet weather bacteria (2021)
- Debris
    - Milestone 1: Achieve 20% of the reduction for debris (2016)
    - Milestone 2: Achieve 40% of the reduction for debris (2017)
    - Milestone 3: Achieve 60% of the reduction for debris (2018)
    - Milestone 4: Achieve 80% of the reduction for debris (2019)
    - Milestone 5: Achieve 100% of the reduction for debris (2020)
- DDT and PCB
    - Compliance will be demonstrated through monitoring (CIMP)

Permittee actions can be categorized into three groups: implementation of projects, continued water quality monitoring, and reporting of monitoring results and progress. Annual reporting will be completed each year as part of the CIMP. In addition to assessing the overall progress of the EWMP, the CIMP reporting will detail the implemented BMPs and demonstrate that the cumulative BMP capacities achieve the interim targets. Data obtained through CIMP monitoring will be used to determine the overall effectiveness of the EWMP and will be the next phases of WMP implementation during the adaptive management process.

ES-6 ADAPTIVE MANAGEMENT

The EWMP is intended to be implemented as an adaptive program. As new program elements are implemented and information is gathered over time, the EWMP will undergo modifications to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the EWMP will employ an adaptive management process that will allow the EWMP to evolve over time.

The adaptations to the EWMP, as called for in the adaptive management process, include: 1) re-characterization of water quality priorities, 2) a source assessment re-evaluation, 3) an effectiveness assessment of watershed control measures, and/or 4) an updated RAA. The CIMP will gather additional data on receiving water conditions and stormwater/non-stormwater quality to inform these analyses. These adaptations will be implemented and repeated every two years as part of the adaptive management process. There are numerous studies currently being conducted that will allow agencies to adapt the EWMP as needed.

ES-7 IMEPLEMENTATION COSTS AND FINANCIAL STRATEGY

Based on the RAA, a set of optimal BMPs were derived, having reasonable assurance of meeting the interim and final limitation milestones set forth by the Regional Board. Total estimated BMP costs are shown in **Table ES-10**. Estimated costs are based on model results; however, real costs will depend on monitoring results and the outcome of the adaptive management process. As a result, it is emphasized that these estimated costs are preliminary and have the potential to be reduced through the adaptive management process.

Table ES-10
Total Costs for Watershed ($ Millions)

Permittee	Capital	O&M
Los Angeles	$408.8	$54.2
Santa Monica	$213.2	$33.5
Uninc. LA County	$5.9	$0.53
El Segundo	$20.8	$6.42
Total	$648.7	$94.7

A financial strategy is needed to address these additional costs of compliance with the 2012 MS4 permit as a result of the extensive set of BMPs or "recipe for compliance" for the SMB EWMP Group. Currently, a funding source for all of the activities described in this EWMP has not been determined, and obtaining funds for all of the activities identified in the EWMP is anticipated to take many years.

Even though the Regional Board only implemented Order No R4-2012-0175, NPDES No CAS00401 on November 2012; the co-Permittees have been addressing stormwater discharge requirements for a long time prior to November 2012. Co-Permittees have existing recurring costs associated with stormwater activities in excess of $50M annually.

Just as the engineering and strategic solutions for watershed management rely upon a coordinated regional approach, so too does the financial strategy. Capital and operating costs for watershed programs are large and span decades. As such, there is no single "right" way to finance these programs. Instead, the financial strategy presented in this EWMP outlines a set of multiple approaches, allowing each co-Permittee to select those strategies that best fit their specific circumstances. Available financial strategies include: grants; user, property, and resource fees and charges; as well as legislative and policy measures.