San Dieguito River
Watershed Management Area
Water Quality Improvement Plan

Submitted to the San Diego Regional Water Quality Control Board by:

March 2015

DRAFT

Prepared by:

AMEC Environment & Infrastructure, Inc.

With:

ACKNOWLEDGMENTS

The following members of the Water Quality Improvement Plan Consultation Committee have collaborated with the Responsible Agencies to make significant contributions to this plan:

Christina Arias, San Diego Regional Water Quality Control Board
Trish Boaz, Environmental Representative
John Eardensohn, Development Community Representative
Cindy Lin, At-Large Member
Lois Jones, At-Large Member
Robert Stone, At-Large Member
Ed Othmer, At-Large Member
Laura Hunter, At-Large Member
Dustin Fuller, At-Large Member
Cor Shaffer, At-Large Member
Toby Roy, At-Large Member
Jayne Janda-Timba, At-Large Member
Mark Corcoran, At-Large Member

Executive Summary

The Executive Summary will be provided with the complete Draft Water Quality Improvement Plan in June 2015.

Intentionally Left Blank

Table of Contents

Page

Executive Summary i

Acronyms and Abbreviations xi

1 Introduction 1-1
- 1.1 Jurisdiction and Responsibilities 1-2
- 1.2 Regulatory Background 1-8
- 1.3 Water Quality Improvement Plan Process 1-9
- 1.4 Water Quality Improvement Plan Goal and Approach 1-10
- 1.5 The San Dieguito River WMA 1-12
- 1.6 Water Quality Improvement Plan Organization 1-14

2 Priority Water Quality Conditions 2-1
- 2.1 Step 1: Determine Receiving Water Conditions 2-3
  - 2.1.1 The 2010 303(d) List and Beneficial Uses (Consideration 1) 2-5
  - 2.1.2 Applicable TMDLs, Special Biological Habitats, and Receiving Water Limitations (Considerations 2, 3, and 4) 2-11
  - 2.1.3 Data Sources Used To Assess Receiving Water Conditions (Considerations 5 and 6) 2-14
  - 2.1.4 Evidence of Erosional Impacts (Consideration 7) 2-20
  - 2.1.5 Evidence of Adverse Impacts (Consideration 8) 2-20
  - 2.1.6 Potential Improvements in the Overall Condition of the WMA That Can Be Achieved (Consideration 9) 2-21
  - 2.1.7 Receiving Water Conditions 2-21
- 2.2 Step 2: Determine Potential Receiving Water Impacts from MS4 Discharges 2-22
  - 2.2.1 Discharge Prohibitions (Consideration 1) 2-23
  - 2.2.2 Available MS4 Monitoring Data (Consideration 2) 2-23
  - 2.2.3 Location of MS4 Outfalls (Considerations 3, 4, and 5) 2-24
  - 2.2.4 Potential Improvements in the MS4 Discharges That Can Be Achieved (Consideration 6) 2-29
  - 2.2.5 Potential Receiving Water Impacts from MS4 Discharges 2-29
- 2.3 Step 3: Determine Priority Water Quality Conditions 2-29
  - 2.3.1 Potential Improvements in MS4 Discharges and Overall WMA 2-30
  - 2.3.2 Priority Water Quality Conditions 2-31
  - 2.3.3 Priority Water Quality Condition Data Gaps and Considerations 2-32
- 2.4 Step 4: Determine Highest Priority Water Quality Conditions 2-34

Table of Contents (continued)

Page

3 MS4 Sources of Pollutants and/or Stressors 3-1
3.1 Step 1: Identification of Bacteria Sources 3-5
3.1.1 Bacteria-Generating Facilities, Areas, and Activities Within the WMA 3-6
3.1.2 Other Known and Suspected Sources 3-7
3.1.3 Locations of the Responsible Agencies' MS4s 3-11
3.1.4 IDDE Program and Dry Weather Monitoring Data 3-11
3.1.5 Summary of Bacteria Sources 3-12
3.1.6 Adequacy of Available Data 3-17
3.2 Step 2: Prioritization of Bacteria Sources 3-18
3.2.1 Source Controllability 3-18
3.2.2 Level of Human Influence and Source Prioritization 3-19
3.3 Summary of Priority Sources by Responsible Agency 3-22
4 Water Quality Goals, Strategies, and Schedules 4-1
4.1 Goals 4-2
4.1.1 City of Del Mar Goals 4-4
4.1.2 City of Escondido Goals 4-13
4.1.3 City of Poway Goals 4-21
4.1.4 City of San Diego Goals 4-27
4.1.5 City of Solana Beach Goals 4-37
4.1.6 County of San Diego San Dieguito Watershed Goals 4-47
4.2 Strategies 4-53
4.2.1 Strategy Selection 4-53
4.2.2 Nonstructural Strategy Descriptions 4-54
4.2.3 Structural Strategy Descriptions 4-60
4.2.4 Jurisdictional Strategies by Responsible Agency 4-73
4.2.5 Collaborative WMA Strategies 4-83
4.3 Implementation Schedule 4-89
4.3.1 Schedule 4-90
4.3.2 Progress Toward Achieving Numeric Goals 4-90
5 Water Quality Improvement Plan Monitoring and Assessment Program 5-1
5.1 Water Quality Improvement Plan Monitoring Program 5-10
5.1.1 Monitoring to Assess Progress Toward Achieving Goals and Schedules 5-10

Table of Contents (continued)

Page

5.1.2 Receiving Water Monitoring 5-15
5.1.3 MS4 Outfall Monitoring 5-22
5.1.4 Special Studies 5-26
5.1.5 Other Special Studies 5-28
5.1.6 Remaining Data Gaps 5-33
5.1.7 Regional Clearinghouse 5-33
5.2 Water Quality Improvement Plan Assessment Program 5-34
5.2.1 Integrated Assessment 5-37
5.2.2 Receiving Water Assessments 5-40
5.2.3 MS4 Outfall Discharge Assessments 5-40
5.2.4 Special Studies Assessments 5-47
5.2.5 Regional Monitoring Report 5-48
6 Iterative Approach and Adaptive Management Process 6-1
6.1 MS4 Permit Requirements: Iterative Approach and Adaptive Management 6-5
6.2 Annual Assessments and Adaptive Management 6-9
6.2.1 Receiving Waters Assessments 6-11
6.2.2 Annual Evaluation of New Information 6-12
6.3 MS4 Permit Term Assessments and Adaptive Management 6-14
6.3.1 Priority Water Quality Conditions 6-17
6.3.2 Progress Toward Achieving Goals 6-17
6.3.3 Strategies and Schedules 6-24
6.3.4 Monitoring and Assessment Program 6-25
References R-1

Table of Contents (continued)

APPENDIX A Priority and Highest Priority Water Quality Conditions Selection Methodology
APPENDIX B San Dieguito River WMA Maps
APPENDIX C Beneficial Uses of 303(d) Listed Waterbodies in the San Dieguito River WMA
APPENDIX D Additional Data Sources
D.1 Primary and Secondary Data Sources
D.2 Third Party Data Sources Summary
D.3 Potential Persistent Flow Outfalls
D.4 Public Input from Water Quality Improvement Plan Workshop
APPENDIX E Receiving Water Condition and Urban Runoff Assessment
APPENDIX F Receiving Water Conditions, Potential Impacts of MS4 Discharges, and Priority Water Quality Conditions in the San Dieguito River WMA
APPENDIX G Bacterial Conceptual Models and Literature Review
APPENDIX H Identification of Goals
APPENDIX I Jurisdictional Strategies and Schedules
APPENDIX J Strategy Selection and Compliance Analysis
APPENDIX K Strategy Benefits and References
APPENDIX L Comprehensive Benefits Analysis of Water Quality Improvement Plan Strategies
APPENDIX M WMA Alternative Compliance Program Overview
APPENDIX N Monitoring and Assessment Program Fact Sheets

List of Tables

Page

Table 1-1 Jurisdictional Land Areas for the San Dieguito River WMA 1-13
Table 1-2 San Dieguito River WMA Land Uses 1-14
Table 2-1 Section 2010 303(d) Listed Waterbodies and Total Maximum Daily Loads (TMDLs) in the San Dieguito River WMA 2-12
Table 2-2 NPDES Monitoring Stations in the San Dieguito River WMA 2-19
Table 2-3 Medium and High Priority Pollutants for Receiving Waters 2-19
Table 2-4 Medium and High Priority Pollutants for Outfalls 2-24
Table 2-5 Highest Priority Water Quality Conditions in the San Dieguito River WMA 2-35
Table 3-1 Likely Sources of Bacteria Identified in WURMP Annual Reports 3-7
Table 3-2 Storm Water Discharge Permits 3-9
Table 3-3 Sources of Bacteria in the San Dieguito River WMA 3-15
Table 3-4 Potential Bacteria Sources with Data Gaps 3-17
Table 3-5 Prioritized Sources 3-21
Table 3-6 Summary of Priority Sources by Responsible Agency 3-22
Table 4-1 Wet Weather Numeric Goals for the City of Del Mar 4-5
Table 4-2 Dry Weather Numeric Goals for the City of Del Mar 4-9
Table 4-3 Wet Weather Numeric Goals for the City of Escondido 4-15
Table 4-4 Dry Weather Numeric Goals for the City of Escondido 4-19
Table 4-5 Wet Weather Numeric Goals for the City of Poway 4-23
Table 4-6 Dry Weather Numeric Goals for the City of Poway 4-25
Table 4-7 Wet Weather Numeric Goals for the City of San Diego 4-29
Table 4-8 Dry Weather Numeric Goals for the City of San Diego 4-33
Table 4-9 Wet Weather Numeric Goals for the City of Solana Beach 4-39
Table 4-10 Dry Weather Numeric Goals for the City of Solana Beach 4-43
Table 4-11 Wet Weather Numeric Goals for the County of San Diego 4-49
Table 4-12 Dry Weather Numeric Goals for the County of San Diego 4-51
Table 4-13 Categories of JRMP Strategies 4-56
Table 4-14 JRMP Strategy Benefits 4-57
Table 4-15 Structural Strategy Benefits 4-61
Table 4-16 Common Green Infrastructure Strategies 4-63
Table 4-17 Responsible Agency Collaboration with Regional and WMA Water Conservation Programs 4-86
Table 5-1 Water Quality Improvement Plan Monitoring Overview 5-5
Table 5-2. Monitoring Related to Bacteria TMDL Goals 5-11
Table 5-3 Wet Weather Monitoring Related to Jurisdictional Goals 5-12
Table 5-4 Dry Weather Monitoring Related to Jurisdictional Goals 5-13

List of Tables (continued)

Page

Table 5-5. Bight '13 Sample IDs, Site Locations, Dates Sampled, and Sample Depths 5-21
Table 5-6 Number of Major MS4 Outfalls per Jurisdiction 5-23
Table 5-7 Annual Reporting Components 5-35
Table 5-8 Integrated Assessment Components 5-37
Table 5-9 Key Elements of the MS4 Discharge Assessments 5-41
Table 6-1 Adaptive Management on an Annual Basis (Annual Report) 6-9
Table 6-2 Adaptive Management on a Permit Term Basis (Report of Waste Discharge) 6-15
Table 6-3 City of Del Mar Jurisdictional Goals, FY14 – FY18 6-18
Table 6-4 City of Escondido Jurisdictional Goals, FY14 – FY18 6-19
Table 6-5 City of Poway Jurisdictional Goals, FY14 – FY18 6-20
Table 6-6 City of San Diego Jurisdictional Goals, FY16 – FY18 6-20
Table 6-7 City of Solana Beach Jurisdictional Goals, FY14 – FY18 6-22
Table 6-8 County of San Diego Jurisdictional Goals, FY14 – FY18 6-23

List of Figures

Page

Figure 1-1 San Dieguito River WMA Pollutant Discharge Responsibilities 1-6
Figure 1-2 Water Quality Condition Improvement Plan Process 1-11
Figure 2-1 San Dieguito River WMA Priority and Highest Priority Water Quality Condition Selection Process 2-3
Figure 2-2 San Dieguito River WMA 2010 303(d) Listed Waterbodies 2-7
Figure 2-3 San Dieguito River WMA NPDES Monitoring Stations 2-17
Figure 2-4 San Dieguito River WMA Major MS4 Outfalls 2-27
Figure 3-1 Highest Priority Water Quality Conditions Source Identification Process 3-3
Figure 4-1 Determining Total Load Reduction from Nonstructural Practices 4-55
Figure 4-2 Rain Barrel Capturing Runoff From a Residential Property 4-59
Figure 4-3 City of San Diego Pet Waste Dispenser 4-59
Figure 4-4 Comparison of Various Structural Strategy Categories 4-60
Figure 4-5 Bioretention Areas in Parking Lots and Adjacent to Buildings Provide Multiple Benefits by Treating Runoff While Also Serving as Landscape Features and Habitat 4-66
Figure 4-6 Permeable Pavement Functions as a Parking and Driving Surface While Capturing and Treating Storm Water 4-67
Figure 4-7 Examples of Permeable Pavement and Bioretention in the Right-of-Way with Curb and Gutter 4-68
Figure 4-8 Permeable Pavers in the Right-of-Way Without Curb and Gutter 4-68
Figure 4-9 Example of How Callado Road Green Street Project Can Incorporate a Green Street into the Right-of-Way 4-69
Figure 4-10 Example of Multiuse Treatment Area at Eagle Scout Lake 4-71
Figure 4-11 Restored Salt Marsh Habitat Along the Banks of San Dieguito River in Del Mar 4-72
Figure 4-12 San Dieguito Wetland Restoration Project Area 4-84
Figure 4-13 Progress Toward Achieving Wet Weather Interim and Final Watershed Load Reduction Numeric Goals 4-91
Figure 4-14 Progress Toward Achieving Dry Weather Interim and Final Watershed Load Reduction Numeric Goals 4-92
Figure 5-1 Monitoring and Assessment Program Components for the San Dieguito River WMA 5-9
Figure 5-2 MAP Monitoring Locations for the San Dieguito River WMA 5-31
Figure 6-1 Water Quality Improvement Plan Assessment Adaptive Management Framework 6-3
Figure 6-2 Water Quality Improvement Plan Assessment and Reporting Timeline 6-7
Figure 6-3 Receiving Water Exceedance Process (Provision A.4) 6-13

Intentionally Left Blank

Acronyms and Abbreviations

Acronym or Abbreviation	Definition
%	percent
303(d)	Clean Water Act Section 303(d) list of impaired waters
AB	(California) Assembly Bill
AB 411	Beach Safety Act
Ag Waiver	Conditional Waiver of Discharges from Agricultural and Nursery Operations
AGR	Agricultural Supply (beneficial use)
ASBS	Area of Special Biological Significance
Bacteria TMDL	San Diego Regional Water Quality Control Board Resolution Number R9-2010-0001, *Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*
Basin Plan	*Water Quality Control Plan for the San Diego Basin*
Bight ’13	Southern California Bight 2013 Regional Monitoring Survey
BIOL	Preservation of Biological Habitats of Special Significance (beneficial use)
BMI	benthic macroinvertebrates
BMP	best management practice
BOA	Business Owners Association
BOD	biological oxygen demand
Caltrans	California Department of Transportation
CCTV	closed-circuit television
CEDEN	California Environmental Data Exchange Network
City	City of San Diego
CLRP	Comprehensive Load Reduction Plan
Consultation Committee	Water Quality Improvement Plan Consultation Committee

Acronyms and Abbreviations (continued)

Acronym or Abbreviation	Definition
Copermittee	Operator of a municipal separate storm sewer system in San Diego County that is party to the MS4 Permit
CRAM	California Rapid Assessment Method
CWA	Clean Water Act
CWP	Clean Water Program
DAA	District Agricultural Association
DEH	Department of Environmental Health
DPW	Department of Public Works
DSD	City of San Diego Development Services Department
E. coli	*Escherichia coli*
EP Div	(Escondido) Environmental Programs Division
FIB	fecal indicator bacteria
FY	Fiscal Year
FOG	fats, oils and grease
GIS	geographic information system
HMP	Hydromodification Management Plan
HOA	Home Owners Association
HU	hydrological unit
IBI	Index of Biological Integrity
IC/ID	illicit connection and/or illicit discharge
IDDE	illicit discharge detection and elimination
IRWM	Integrated Regional Water Management
JPA	Joint Powers Authority
JRMP	Jurisdictional Runoff Management Program (2013 MS4 Permit)

Acronyms and Abbreviations (continued)

Acronym or Abbreviation	Definition
JURMP	Jurisdictional Urban Runoff Management Program (2007 MS4 Permit)
LID	low-impact development
LTEA	Long-Term Effectiveness Assessment
MEP	maximum extent practicable
MLS	mass loading station
MS4	municipal separate storm sewer system
MS4 Permit	San Diego Regional Water Quality Control Board Order Number R9-2013-0001, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) Draining the Watersheds Within the San Diego Region*
MST	microbial source tracking
MUN	Municipal and Domestic Supply (beneficial use)
MWD	Metropolitan Water District of Southern California
NA	not applicable
NAL	non-storm water action level
NCC	North Coast Corridor
NCTD	North County Transit District
NIH	National Institutes of Health
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
O&G	oil and grease
OAL	California Office of Administrative Law
PCP	pentachlorophenol
PDP	priority development project

Acronyms and Abbreviations (continued)

Acronym or Abbreviation	Definition
PFC	permeable friction course
PGA	pollutant-generating activity
pH	measure of hydrogen ion
Porter-Cologne	Porter-Cologne Water Quality Control Act
POTW	publicly owned treatment works
PUD	(City of San Diego) Public Utilities Department
PWD	(City of San Diego) Public Works Department
REC-1	Contact Water Recreation (beneficial use)
Regional Board	San Diego Regional Water Quality Control Board
Responsible Agency	Responsible Agencies include parties subject to the Bacteria TMDL and participating in this Water Quality Improvement Plan, specifically the Copermittees in the San Dieguito River WMA
Restoration Project	San Dieguito Wetland Restoration Project
RWL	Receiving Water Limitation
SAL	storm water action level
SANDAG	San Diego Association of Governments
SCCWRP	Southern California Coastal Water Research Project
SCE	Southern California Edison
SDC-MLS	San Dieguito Mass Loading Station
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas & Electric
SDRP	San Dieguito River Park
Sediment Control Plan	Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part I Sediment Quality
SFID	Santa Fe Irrigation District

Acronyms and Abbreviations (continued)

Acronym or Abbreviation	Definition
SHELL	Shellfish Harvesting (beneficial use)
SMARTS	Storm Water Multiple Application and Report Tracking System
SMC	Southern California Stormwater Monitoring Coalition
SONGS	San Onofre Nuclear Generating Station
SOP	standard operating procedure
SQO	Sediment Quality Objective
SSID	stressor/source identification
State	State of California
State Board	State Water Resources Control Board
SUSMP	Standard Urban Storm Water Mitigation Plan
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Storm Water Pollution Prevention Plan
T&SW	(City of San Diego) Transportation and Storm Water Department
TBD	to be determined
TDS	total dissolved solids
TIE	toxicity identification evaluation
TMDL	total maximum daily load
TRE	toxicity reduction evaluation
TSS	total suspended solids
TWAS	temporary watershed assessment station
USEPA	United States Environmental Protection Agency
USGS	U.S. Geological Survey
WARM	Warm Freshwater Habitat (beneficial use)

Acronyms and Abbreviations (continued)

Acronym or Abbreviation	Definition
WMA	Watershed Management Area
WMAA	Watershed Management Area Analysis
WMP	Watershed Management Plan
WPP	Watershed Protection Program
WQBEL	water quality-based effluent limits
WQO	water quality objective
WRI	World Resources Institute
WURMP	Watershed Urban Runoff Management Program

1 Introduction

Local government agencies work hard to protect water quality throughout the San Diego region. New regulations along with existing environmental protections create the need for new plans and programs that will address concerns about pollution in local rivers, streams, and other waterways leading to the ocean. Local agencies worked to develop Water Quality Improvement Plans that will help protect and improve the quality of waters in each community of San Diego. These plans address protections in what are known as Watershed Management Areas (WMAs). A Watershed Management Area includes the lands, stream systems, and other tributaries draining to a specific ocean or bay shoreline (or other receiving water). This document is the Water Quality Improvement Plan for the San Dieguito River WMA.

The San Dieguito River WMA is a 346-square-mile portion of central San Diego County encompassing a wide range of terrains and population densities. It includes three distinct hydrologic areas draining to the San Dieguito Lagoon and ultimately the Pacific Ocean. Six local agencies share jurisdictional authority in this WMA and worked collaboratively to prepare this Water Quality Improvement Plan.

Water Quality Improvement Plans are required for each WMA under regulations adopted by the San Diego Regional Water Quality Control Board (Regional Board). The plans address only water flows and discharges from the storm drain systems maintained by the local agencies sharing authority in each area. Other discharges and sources of pollution are considered in the plan to the extent that they affect conditions in the storm drain system.

Following the passage of the Federal Clean Water Act (CWA) in 1972, surface water quality throughout the United States has

Section 1 Highlights

- This Water Quality Improvement Plan helps to protect and improve waters in the San Dieguito River Watershed Management Area.
- The plan specifically addresses conditions within storm water systems and receiving waters of this area.
- San Dieguito River WMA = 346 square miles
- Main Subwatersheds:
  - San Dieguito River Above Sutherland Reservoir
  - San Dieguito River Above Lake Hodges
  - San Dieguito River Below Lake Hodges
- Responsible Agencies:
  - City of Del Mar
  - City of Escondido
  - City of Poway
  - City of San Diego
  - City of Solana Beach
  - County of San Diego
- Other Discharge Impacts:
  - Phase II Permittees – San Diego County Fairgrounds and North County Transit District
  - California Department of Transportation (Caltrans)
  - Construction General Permits
  - Industrial General Permits
  - Federal/State Lands
  - Agricultural Lands

improved substantially. However, poor water quality still impairs some beneficial uses of surface waters in the San Dieguito River WMA. Beneficial uses are "the uses of water necessary for the survival or well-being of man, plants, and wildlife" (Regional Board, 1994).

1.1 Jurisdiction and Responsibilities

The Water Quality Improvement Plan outlines a framework to improve the surface water quality in the San Dieguito River WMA by identifying, prioritizing, and addressing impairments related to urban runoff discharges. On May 8, 2013, the San Diego Regional Water Quality Control Board adopted Order Number R9-2013-0001, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) Draining the Watersheds Within the San Diego Region* (MS4 Permit), establishing requirements for discharges from MS4s in the San Diego region.

The MS4 Permit affects local municipal agencies, including those with jurisdictional responsibilities in the San Dieguito River WMA. As defined in the MS4 Permit, a permittee to an NPDES permit is responsible only for permit conditions relating to the discharges for which it is an operator. In the case of the MS4 Permit, this responsibility includes discharges from Copermittees (jurisdictions party to the MS4 Permit) in the San Diego region. The San Diego County Copermittees are listed in Table 1a of the MS4 Permit and the Copermittees with jurisdictional area within the San Dieguito River WMA are as follows:

- City of Del Mar
- City of Escondido
- City of Poway
- City of San Diego
- City of Solana Beach
- County of San Diego

Each Copermittee must comply with the MS4 discharge prohibitions and receiving water limitations outlined in the MS4 Permit through timely implementation of control measures, other actions specified in the MS4 Permit, and adherence to this Water Quality Improvement Plan. Copermittees are also referred to as Responsible Agencies within the Water Quality Improvement Plan.

The San Dieguito River WMA also includes land areas and MS4s that are owned and operated by parties other than the Copermittees or that are regulated by separate NPDES permits.

Discharges from non-municipal sources and activities (e.g., runoff from agriculture and industrial land uses, federal and state facilities, the California Department of Transportation [Caltrans], and Phase II storm water permittees) are regulated separately. For example, facilities designated as Phase II permittees (small MS4s) are regulated under the Phase II General Permit (State Water Resources Control Board [State Board] Order No. 2013-0001-DWQ). Phase II permittees in the San Dieguito River WMA include fairgrounds and a transit authority. In California, industrial and construction activities are regulated under the General Industrial Permit (State Board Order No. 2014-0057-DWQ) (State Board, 2014) and the General Construction Permit (State Board Order No. 2012-0006-DWQ) (State Board, 2012a). Finally, conditional waivers that remove the need to file a report of waste discharge and that avoid coverage under the NPDES permit program are given to activities such as agriculture and nursery operations, onsite disposal systems, silvicultural operations, and animal operations. Recently, draft general water discharge requirements for commercial agricultural and nursery operations were released for public review. The tentative draft order may be finalized during the development of this Water Quality Improvement Plan, affecting the ways in which sources from commercial agricultural and nursery operations are managed.

Under this regulatory framework, there are two general areas of storm water management responsibilities: (1) jurisdictional inspection and oversight (such as education, enforcement, and other Illicit Discharge Detection and Elimination (IDDE) activities), as described in the Jurisdictional Runoff Management Programs (JRMPs) in the MS4 Permit, and (2) control of pollutant discharges.

(1) The San Dieguito River WMA Copermittees require minimum Best Management Practices (BMPs) and have inspection responsibilities over all lands within their jurisdictional boundaries (including industrial lands and construction sites), except for NPDES Phase II, agricultural, state, federal, Caltrans, and Indian reservation lands. The United States Environmental Protection Agency (USEPA), State Board, and Regional Board are responsible for inspections of Phase II, agricultural, state, federal, and Indian reservation lands. Caltrans is subject to its own State of California (State)-issued MS4 Permit. In addition, the USEPA, State Board, and Regional Board have dual permitting and oversight responsibilities over industrial lands and construction sites.

    Copermittees do have limited regulatory oversight over industrial lands, construction sites, Phase II MS4s, and agricultural, state, federal, and Indian reservation lands. For example, the Copermittees implement IDDE activities to indentify, investigate, and enforce discharges to their MS4s. Discharges to receiving waters from non-municipal sources and activities (e.g., runoff from agriculture and industrial land uses, federal and state facilities, Caltrans, and Phase II storm water permittees) are not regulated or controlled by the Copermittees because they do not enter a MS4. Accordingly, the scope of the Water Quality Improvement Plan is limited to the regulatory oversight of the Copermittees specified above.

(2) In regard to controlling pollutant discharges, various NPDES permits or conditional waivers regulate storm water and non-storm water discharges within the San Dieguito River WMA, as shown in Figure 1-1. The Copermittees are responsible for controlling pollutant discharges from lands within their jurisdictional boundaries, except for agriculture and industrial land uses, federal and state facilities, Caltrans, and Phase II storm water permittees. The Copermittees do not have regulatory authority under the MS4 Permit to require entities regulated by other permits issued by the USEPA, State Board, or Regional Board to implement and/or construct BMPs to treat wet/dry weather pollutant discharges originating from their properties, facilities, and/or activities. However, the MS4 Permit requires the Copermittees to control pollutants originating from non-MS4 or non-municipal lands if those pollutants ultimately discharge into the MS4. Therefore, the Copermittees recognize the need to collaborate with and improve communication between non-municipal entities within the WMA and the appropriate regulatory agencies to ensure discharges are appropriately regulated before entering the MS4, and to improve water quality throughout the San Dieguito River WMA.

To help identify non-municipal sources, the Copermittees are participating in special source identification studies to determine potential sources (including non-municipal sources) of pollutants entering the MS4; these studies are presented in Section 5.

Currently, some of the Copermittees are pursuing a subvention of funds from the State to pay for certain activities required by the 2007 MS4 Permit, including activities that require Copermittees to perform activities outside their jurisdictional boundaries and on a regional or watershed basis. Nothing in this Water Quality Improvement Plan should be viewed as a waiver of those claims or as a waiver of the rights of Copermittees to pursue a subvention of funds from the State to pay for certain activities required by the 2013 MS4 Permit, including the preparation and implementation of the Water Quality Improvement Plan. In addition, several Copermittees have filed petitions with the State Board challenging the requirement to prepare Water Quality Improvement Plans that are not voluntary and that are not linked to a receiving water limitations language compliance path. Nothing in this Water Quality Improvement Plan should be viewed as a waiver of those claims. Because the State Board has not issued a stay of the 2013 MS4 Permit, Copermittees must comply with the MS4 Permit's requirements while the State Board process is pending.

Intentionally Left Blank

Pollutant Discharge Responsibility	Percent of WMA (by land area)
Agriculture	13%
Industrial	0.29%
NPDES Phase II Permit	0.14%
Federal/State Owned Land and Indian Reservations	17%
MS4 - Urban	23%
MS4 - Open Space	19%
MS4 - Vacant/Undeveloped	26%
Caltrans	0.57%
Does not add to 100% due to rounding	

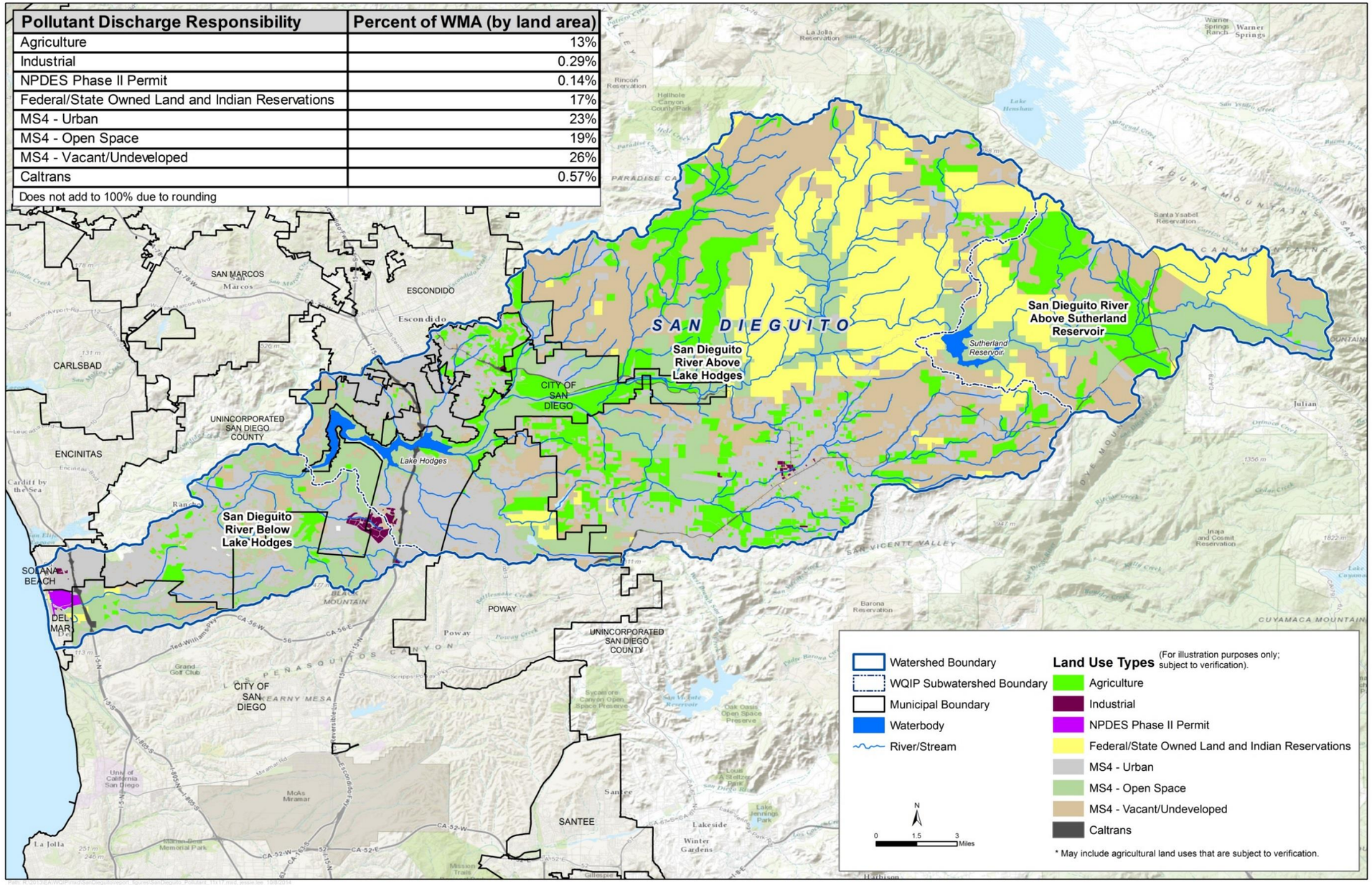


Figure 1-1
San Dieguito River WMA
Pollutant Discharge Responsibilities

Intentionally Left Blank

1.2 Regulatory Background

In 1972, the CWA amended the Federal Water Pollution Control Act, providing the mechanism for regulating discharges to waters of the United States through the NPDES permit program. The CWA requires appropriate NPDES permits for specific types of discharges (e.g., municipal and industrial storm water) to surface waters of the United States. Individual states may administer the federal law through their own legislation, in addition to regulating other types of discharges, such as discharges to land and irrigated agriculture.

California passed the Porter-Cologne Water Quality Control Act (Porter-Cologne) to control water pollution in 1969 (prior to the CWA), and has since amended it to comply with and implement the CWA. Porter-Cologne gave the State Board and the nine Regional Water Quality Control Boards the authority to regulate discharges to waters of the state (which include all waters of the United States) and to issue NPDES permits.

The jurisdictions of the nine Regional Water Quality Control Boards correspond to nine large watershed areas across the state, which are referred to as basins. These basins are delineated using topographical maps surveyed by the United States Geological Survey and are further subdivided into (smaller) watersheds and subwatersheds. The water quality standards, including the beneficial uses and water quality objectives, for each basin are detailed in the Basin Plan for each region. For the San Diego region (Region 9), the Water Quality Control Plan for the San Diego Region (Basin Plan) was adopted in 1994 and has been amended several times since. The San Dieguito River WMA is one of ten watersheds (otherwise referred to as WMAs) within the San Diego Basin and is regulated by the Regional Board using its authority under Porter-Cologne in conjunction with the water quality standards described in the Basin Plan.

For approximately 20 years after the CWA's passage, NPDES permits were primarily issued to wastewater and industrial facilities (such as publicly owned treatment works [POTWs], paper mills, and power plants) that discharged waste to natural surface waterbodies as part of their operations. These regulations substantially improved surface water quality throughout the country. However, many waterbodies still suffer from suboptimal water quality, and their benefits (termed "beneficial uses" in the CWA) were not always attained.

The pathways by which pollutants can enter waters of the state are not limited to wastewater discharging from a pipe. In the early 1990s, the Regional Water Quality Control Boards began to issue NPDES permits to municipalities and other agencies that discharge water via a storm drain system, identified as an MS4. The MS4s, which are systems of conveyances that may include the storm drains and flood control structures associated with land development, are primarily owned and operated by municipalities. MS4s are distinguished from combined sewers, which direct storm drain flows to a wastewater treatment plant; in contrast, MS4s convey water flowing from streets, buildings, and other land areas directly and indirectly into surface waters. They may convey both storm water and authorized non-storm water discharges.

The initial ("Phase I") MS4 Permits, typically issued for a five-year term, focused on actions to be taken by Copermittees. These actions included regulation of residential and commercial activities, new and existing development, other construction activities, facility inspections, water quality monitoring, and programs to detect and eliminate illegal discharges.

The Phase I MS4 Permits also established the following regulatory mechanisms:

- ***Receiving water limitations*** prohibit discharges from MS4s that cause or contribute to the violation of water quality standards or water quality objectives.
- ***Effluent limitations*** are either technology-based to require pollutants to be reduced to the maximum extent practicable (MEP) or water-quality-based to specify the maximum concentration of pollutants in storm water discharges from MS4s.
- ***Discharge prohibitions*** detail what may and may not be legally discharged to a state waterbody in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance.

Monitoring programs required by these early permits were effective in characterizing the receiving waters in urban areas and the pollutants typically found in MS4 discharges. Furthermore, the permit programs developed and implemented numerous BMPs, ranging from street sweeping to public education and outreach to true source control (e.g., eliminating copper from automotive brake pads through state legislation). However, despite the implementation of program activities meeting the MEP standard, impairments of beneficial uses remain. Because the impairments exist, the Regional Board is required to review existing policies and develop new policies, such as TMDLs. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards, and an allocation of that load among the various sources of the pollutant.

The Regional Board worked closely with the Responsible Agencies and interested parties during development of the most recent version of the MS4 Permit to institute a new scientifically based approach to water quality management. The new approach is based on water quality outcomes, rather than on fulfillment of prescriptive activities. While maintaining each jurisdiction's authority and accountability, monitoring is conducted to answer specific questions and provide the basis for implementation actions in the WMA.

1.3 Water Quality Improvement Plan Process

During development of the Water Quality Improvement Plan, the Responsible Agencies solicited data, information, and recommendations through a public participation process, as mandated by Provision F.1.a of the MS4 Permit. The public participation process included public workshops, described in Sections 2 and 3 of this document, and the creation of a Water Quality Improvement Consultation Committee (Consultation Committee), which provided recommendations during the development of the Water

Quality Improvement Plan. The Consultation Committee included the following required representatives:

- A representative of the Regional Board
- A representative of the environmental community (i.e., a non-governmental organization) associated with a waterbody within the WMA
- A representative of the development community familiar with the opportunities and constraints of implementing structural BMPs, retrofitting projects, and stream, channel, or habitat rehabilitation projects in the WMA

In addition to the three required Consultation Committee members, the Responsible Agencies chose ten members at large, based on interest forms received after the first public workshop.

The Consultation Committee will review drafts of key sections of the Water Quality Improvement Plan, and will meet periodically during the two-year development process to discuss the following topics:

- Priorities, potential strategies, and sources of pollutants and stressors (November 2013 [completed])
- Numeric goals, strategies, and schedules (July 2014 [completed], and October 2014 [completed])
- Final Water Quality Improvement Plan (June 2015, 30-day comment period)

1.4 Water Quality Improvement Plan Goal and Approach

The goal of the Water Quality Improvement Plan is to reduce pollutants and stressors from MS4 discharges to further the CWA's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state.

Since the inception of Phase I MS4 Permits more than 20 years ago, the Copermittees have directed substantial resources (through the Watershed Urban Runoff Management Program [WURMP], the Jurisdictional Urban Runoff Management Programs/Plans [JURMPs], and other various programs) to improve water quality in the WMA. This Water Quality Improvement Plan represents the next phase in watershed management and enhancement following many years of monitoring and program implementation. Additionally, this Water Quality Improvement Plan serves as the comprehensive planning document for the proposed management program that will be implemented within the San Dieguito River WMA. As the comprehensive planning document, this Water Quality Improvement Plan incorporates and replaces all previously submitted comprehensive planning documents for this WMA.

This Water Quality Improvement Plan is intended to be a living document and proposes an iterative and adaptive management process to meet the MS4 Permit goals. The overall process is shown in Figure 1-2 and described in this section.

Figure 1-2
Water Quality Condition Improvement Plan Process

The initial step in developing this Water Quality Improvement Plan was reviewing known receiving water impairments and the water quality data that had been collected during prior MS4 Permit cycles, along with other available data and public input. This process identified a set of receiving water conditions within the San Dieguito River WMA (Section 2.1).

For each identified receiving water condition, available data from upstream MS4 discharges were reviewed to determine whether there was evidence that the MS4 discharges may be a source of pollutants to the receiving water condition (Section 2.2). When evidence of a potential linkage was found, the receiving water condition became a “priority water quality condition” (Section 2.3). A subset of these priority water quality conditions was selected to represent the highest priority water quality conditions (Section 2.4).

The CWA regulatory process and the NPDES monitoring programs performed to date have generally been successful in identifying the highest priorities in the San Dieguito River WMA. Selection of the highest priority water quality conditions is based on the methodology developed by the Responsible Agencies (Appendix A) and these conditions reflect some of the most challenging water quality issues to address in the WMA. The strategies identified in this Water Quality Improvement Plan to address these issues are expected to simultaneously address many of the other priorities in the WMA. The highest priority water quality conditions identified in this plan were subject to review and input from the Regional Board; environmental, business, and development organizations; and the public.

Current water quality issues identified by the Copermittees include impaired waterbodies with designations that have been approved by the USEPA, per CWA Section 303(d) (303(d) or 303(d) list or listing). Goals and schedules for addressing these issues have been developed and included in the Basin Plan as TMDLs for certain 303(d) listings.

With the highest priority water quality conditions established, the next step was to identify the potential sources of the pollutants and stressors contributing to the highest priority water quality conditions (Section 3). Concurrently, potential strategies to address the highest priority water quality conditions were identified. The potential strategies ranged from activities such as street sweeping, public outreach, and construction of water quality treatment structures to the development of standards and regulatory initiatives. The potential strategies were selected from existing plans, public feedback, and suggestions from the Consultation Committee.

Given the potential strategies and final Water Quality Improvement Plan goals, interim numeric goals have been developed using the latest research and currently available technology (Section 4). These interim goals provide a schedule for measuring progress toward final numeric goals. Final numeric goals are intended to protect and restore beneficial uses when achieved. According to the MS4 Permit (Provision B.3), "the water quality improvement goals and strategies must address the highest priority water quality conditions by effectively prohibiting non-storm water discharges to the MS4, reducing pollutants in storm water discharges from the MS4 to the MEP, and protecting the water quality standards of receiving waters." Numeric goals and schedules have been developed to track improvements related to the highest priority water quality conditions detailed in this plan, while prioritizing strategies that can address multiple pollutants simultaneously.

In coordination with the Regional Board and other interested parties, the Responsible Agencies have developed a list of recommended strategies with an implementation schedule and the estimated date for achievement of interim and final numeric goals. The list of recommended strategies has been developed by evaluating the potential strategies developed under the previous step for their estimated ability to ultimately achieve the numeric goals, while providing a multi-pollutant benefit. The Responsible Agencies have prioritized the list of recommended strategies by incorporating a comprehensive approach to all pollutants and conditions. The end goal is to optimize the improvement to water quality in relation to the overall cost of implementation and assessment. The Responsible Agencies are committed to contributing to improved water quality in the San Dieguito River WMA by reducing the discharge of pollutants from their MS4s through implementation of the recommended strategies identified in this Water Quality Improvement Plan.

To evaluate progress toward improving water quality and meeting scheduled goals, a question-based program to monitor and assess water quality improvement has been developed (Section 5). The program will be implemented on a watershed basis so that the Responsible Agencies can efficiently combine their resources.

This Water Quality Improvement Plan includes an iterative and adaptive management process for Responsible Agencies to re-evaluate conditions and improve strategies and assessments (Section 6). The process will draw from the data collected as part of the Monitoring and Assessment Program and the JRMP to create a water quality improvement program that is dynamic and proactive.

1.5 The San Dieguito River WMA

The San Dieguito River WMA drains an area of 346 square miles in the west-central part of San Diego County. The WMA includes portions of the cities of Del Mar, Escondido, Poway, San Diego, and Solana Beach, and some unincorporated County of San Diego areas. Respective jurisdictional land areas are provided in Table 1-1. A map providing an overview of the subwatersheds and the jurisdictions within the WMA is located in Appendix B.

Table 1-1
Jurisdictional Land Areas
for the San Dieguito River WMA

Responsible Agencies	Land Area (Acres)
City of Del Mar	990
City of Escondido	4,362
City of Poway	9,011
City of San Diego	27,345
City of Solana Beach	1,597
County of San Diego	176,644

To develop this Water Quality Improvement Plan, the San Dieguito River WMA was separated into three main subwatersheds. These subwatersheds are used to aid organization and to help give geographical context to the conditions and strategies. However, the locations of the receiving waters were not a factor in the determination of the priority water quality conditions. These subwatersheds, which are delineated by the major hydrologic boundaries in the WMA, are the San Dieguito River Below Lake Hodges, the San Dieguito River Above Lake Hodges, and the San Dieguito River Above Sutherland Reservoir.

The San Dieguito River WMA extends from the eastern headwaters in the Volcan Mountains to its outlet at the San Dieguito Lagoon and Pacific Ocean. The eastern portion of the watershed is primarily undeveloped and is dominated by chaparral and oak woodland vegetative communities (Appendix B).

Land use information was obtained from the Geographic Information System (GIS) Land Layer of the San Diego Association of Governments (SANDAG), which contains over 80 different land use classifications. These land use classifications were aggregated into nine general land use classifications. A breakdown of the land uses in the San Dieguito River WMA is shown in Table 1-2. Much of the watershed is composed of vacant or undeveloped land (39 percent), open space parks and recreation (24 percent), and residential (18 percent) land uses. Most of the development is concentrated in the lower or western portions of the watershed (Appendix B).

Table 1-2
San Dieguito River WMA Land Uses

Aggregate Land Use	Area (Acres)	Percentage of Total (%)[1]
Vacant/Undeveloped	86,719	39.14
Open Space/Recreation	52,375	23.64
Residential	39,506	17.83
Agriculture	30,419	13.73
Freeway/Road/Transportation	6,993	3.16
Water	1,676	0.76
Office/Institutional	1,665	0.75
Commercial	1,493	0.67
Industrial	690	0.31

1. Does not add to 100.00% due to rounding.

The map illustrating the impervious areas of the San Dieguito River WMA is provided in Appendix B. Impervious cover in this map is any surface in the landscape that cannot effectively absorb or infiltrate rainfall. Impervious areas include driveways, roads, parking lots, rooftops, and sidewalks. The amount of impervious cover reflects the amount of urbanization in a watershed. Increased impervious cover adds to the rainfall runoff potential in the WMA, with implications for water quality and flood control. Soils on this map are depicted as pervious; however, some local soil types may have such low infiltration rates that they may be nearly impermeable.

1.6 Water Quality Improvement Plan Organization

The organization of the Water Quality Improvement Plan follows the requirements of the MS4 Permit. The Water Quality Improvement Plan sections and the corresponding MS4 Permit Provisions are organized as follows:

Section 1, Introduction—This section provides the purpose of the Water Quality Improvement Plan and summarizes the spatial context of the WMA.

Section 2, Priority Water Quality Conditions—This section describes the process for selecting the priority water quality conditions, including assessing receiving water conditions (Provision B.2.a), assessing impacts of the MS4 discharges (Provision B.2.b), and identifying the priority water quality conditions (Provision B.2.c(1)). This section also identifies the highest priority water quality conditions (Provision B.2.c(2)).

Section 3, MS4 Sources of Pollutants and/or Stressors—This section identifies known and suspected sources of pollutants or other stressors that cause or contribute to the highest priority water quality conditions, describes the prioritization process of the sources or stressors, and summarizes the priority sources or stressors by jurisdictions (Provision B.2.d).

Section 4, Water Quality Goals, Strategies, and Schedules—For the highest priority water quality conditions, this section details the WMA interim and final numeric goals and the schedule for measuring progress toward achieving these goals (Provision B.3.a(1)). These goals are used to develop the jurisdictional specific water quality improvement strategies (Provision B.3.b(1)) and the schedules for jurisdictional specific water quality improvement strategies (Provisions B.3.a(2) and B.3.b(3)).

Section 5, Water Quality Improvement Monitoring and Assessment Program—This section summarizes the integrated Monitoring and Assessment Program (Provision B.4).

Section 6, Iterative Approach and Adaptive Management Process—This section describes the methodology to re-evaluate the priority water quality conditions (Provision B.5.a); adapt the goals, strategies, and schedules (Provision B.5.b); and adapt the Monitoring and Assessment Program (Provision B.5.c). It also describes the processes to modify the Water Quality Improvement Plan (Provision B.6.b) and the JURMP (Provision F.2.a) following re-evaluation.

2 Priority Water Quality Conditions

Local agencies have long worked in partnership to protect and improve water quality throughout the San Dieguito River Watershed Management Area. Over the years, there have been substantial improvements to water quality in the streams and other tributaries leading to the San Dieguito Lagoon. Even so, there are segments of waterbodies in the San Dieguito River WMA that continue to suffer from impairments to water quality.

Working collaboratively with the Regional Board and the public, the agencies with jurisdictional responsibilities in the San Dieguito River WMA have identified a total of 17 priority water quality conditions associated with discharges from storm drain systems within this area. This identification effort is the first step required for the new Water Quality Improvement Plan process (illustrated in the graphic above). The plan developed for the San Dieguito River WMA employs a scientific process of pollutant source identification and management. The potential impairment of contact recreation along the Pacific Shoreline at the San Dieguito Lagoon Mouth from bacteria was determined to be the highest priority water quality condition in the subwatersheds above Lake Hodges during wet weather and below Lake Hodges during wet and dry weather.

Section 2 Highlights

- Describes the process to determine priority water quality conditions and identify highest priority water quality conditions
- Identifies the priority water quality conditions:
  - San Dieguito River Above Sutherland Reservoir—1 priority water quality condition
  - San Dieguito River Above Lake Hodges—10 priority water quality conditions (2 selected on the basis of monitoring data)
  - San Dieguito River Below Lake Hodges—6 priority water quality conditions (2 selected on the basis of monitoring data)
- Identifies the highest priority water quality conditions:
  - Potential impairment of contact recreation along the Pacific Ocean Shoreline at the San Dieguito Lagoon Mouth from indicator bacteria
    - San Dieguito River above Lake Hodges subwatershed during wet weather
    - San Dieguito River below Lake Hodges subwatershed during wet and dry weather

Discharges that are not conveyed by the MS4 are regulated separately. However, the Responsible Agencies are responsible for discharges originating from these non-MS4 lands outside of their regulatory control (i.e., industrial, agricultural, Phase II, state, federal, and Indian reservation lands) if those pollutants are ultimately discharged from the MS4 of a Responsible Agency. Therefore, Responsible Agencies will seek opportunities for collaboration and improved communication with non-municipal sources and the appropriate regulatory agencies to ensure that these discharges are regulated before they enter the Responsible Agencies' MS4s to improve water quality throughout the WMA.

A water quality condition is an impairment of a receiving water beneficial use. Priority water quality conditions are defined in this Water Quality Improvement Plan as receiving water conditions that have evidence of being caused or contributed to by MS4 discharges and may be "pollutants, stressors, and/or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters" (Provision B.2.c).

The priority water quality condition identification process began by assessing the receiving water conditions (Provision B.2.a) and then the impacts from MS4 sources (Provision B.2.b). Combining these assessments resulted in a list of priority water quality conditions. During these assessments, data gaps were discovered. Data gaps are defined in this Water Quality Improvement Plan as areas where there is a lack of information to assess the receiving water conditions or impacts from MS4 sources. Data gaps are addressed by the Monitoring and Assessment Program and Iterative and Adaptive Management Approach (Sections 5 and 6 of the Water Quality Improvement Plan). The highest priority water quality conditions were then selected by the Responsible Agencies from the list of priority water quality conditions, using the process detailed below and summarized in Appendix A.

Figure 2-1 summarizes the selection sequence to identify the priority and highest priority water quality conditions.

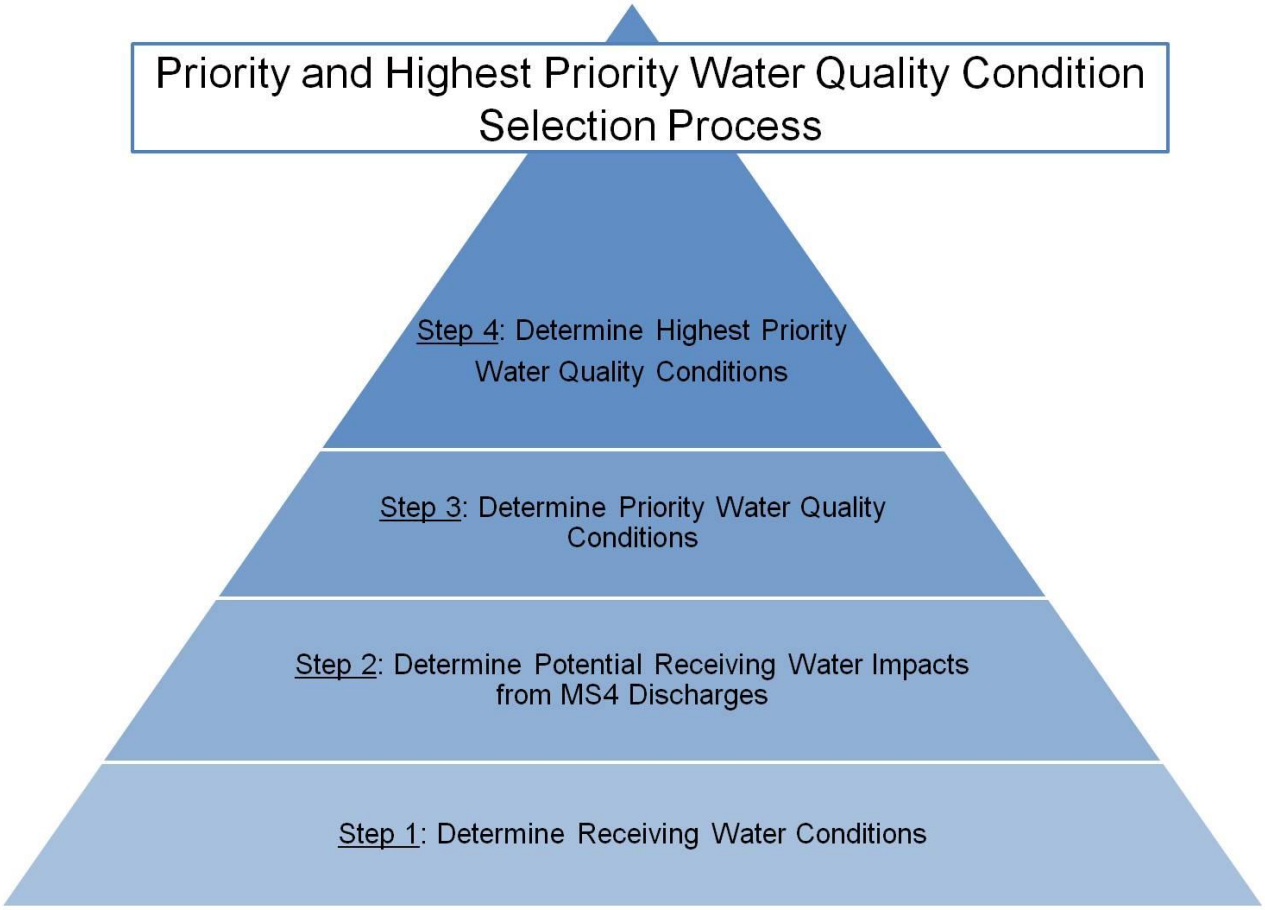


Figure 2-1
San Dieguito River WMA
Priority and Highest Priority Water Quality Condition Selection Process

2.1 Step 1: Determine Receiving Water Conditions

As defined by the USEPA, a receiving water is any body of water (for example, a creek, river, lake, or estuary) into which surface water, treated waste, or untreated wastewater is discharged (USEPA, 2012a).

Identification of receiving water conditions is based on the following considerations, as listed in Provision B.2.a of the MS4 Permit:

(1) Receiving waters listed as impaired on the 2010 303(d) list of impaired waters

(2) TMDLs adopted or under development by the Regional Board

(3) Receiving waters recognized as sensitive or highly valued by the Copermittees, including estuaries designated under the National Estuary Program under CWA Section 320, wetlands defined by the state or U.S. Fish and Wildlife Service's National Wetlands Inventory as wetlands, waters having the Preservation of Biological Habitats of Special Significance beneficial use designation (BIOL), and receiving waters identified as Areas of Special Biological Significance (ASBS)

(4) Receiving water limitations of Provision A.2 of the MS4 Permit

(5) Known historical versus current biological, physical, and chemical water quality conditions

(6) Available, relevant, and appropriately collected and analyzed biological, physical, and chemical receiving water monitoring data, including, but not limited to, data describing:

    (a) Chemical constituents

    (b) Water quality parameters (i.e., pH, temperature, conductivity, etc.)

    (c) Toxicity identification evaluations for both receiving water column and sediment

    (d) Trash impacts

    (e) Bioassessments

    (f) Physical habitat

(7) Available evidence of erosional impacts on receiving waters that are due to accelerated flows (i.e., hydromodification)

(8) Available evidence of adverse impacts on the biological, physical, and chemical integrity of receiving waters

(9) Potential improvements in the overall condition of the WMA that can be achieved

The following subsections detail how Considerations 1 through 9 are incorporated into the assessment.

2.1.1 The 2010 303(d) List and Beneficial Uses (Consideration 1)

2010 303(d) Listings

The 303(d) list is named after the section number of the CWA that established the requirements to create a list of impaired waterbody segments. An impaired waterbody is a waterbody with "chronic or recurring monitored violations" of "applicable numeric and/or narrative water quality criteria" (USEPA, 2012a). Under 303(d), states, territories, and authorized tribes are required to develop lists of impaired waters (303(d) list) and submit them for USEPA approval every two years. The Regional Board is tasked with developing the 303(d) list in the San Diego region.

The latest 303(d) list was updated in 2010 and identifies these impaired waterbodies by specifying:

- The particular waterbody that is impaired (in the San Dieguito River WMA, the specific waterbody can range in scale from an ephemeral stream to portions of the Pacific Ocean Shoreline)
- If known, the pollutant causing the impairment (e.g., bacteria or nutrients)
- The beneficial use(s) potentially impaired
- The potential pollutant source(s)

The San Dieguito River WMA has several 2010 303(d)-listed waterbodies, which are mapped in Figure 2-2. The names of these waterbodies are provided in Table 2-1.

Intentionally Left Blank

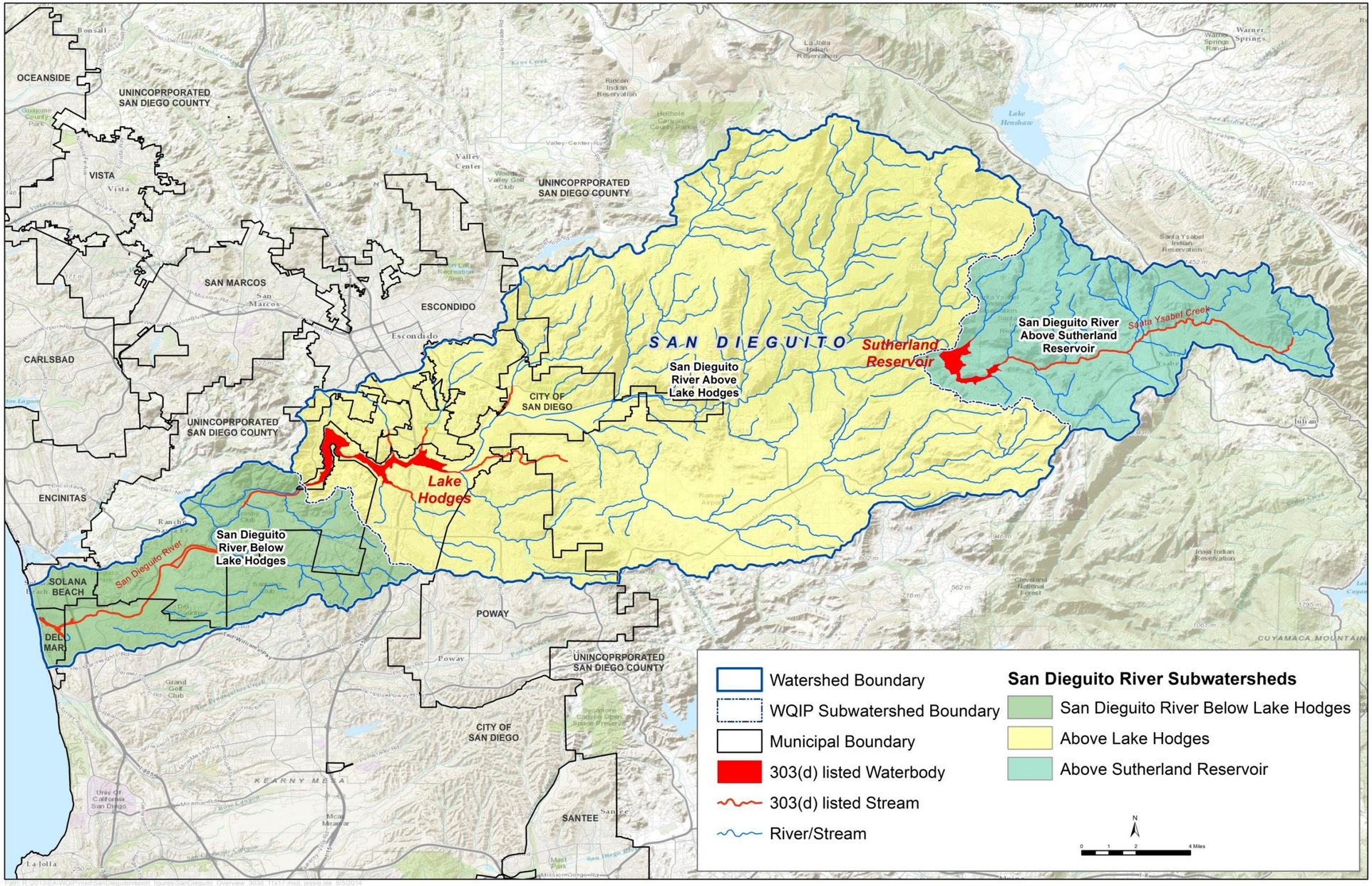


Figure 2-2
San Dieguito River WMA
2010 303(d) Listed Waterbodies

Intentionally Left Blank

Beneficial Uses

The beneficial uses of a waterbody are designated in the Basin Plan and are defined as "the uses of a waterbody necessary for the survival or well-being of man, plants, and wildlife" (Regional Board, 1994). The development and adoption of the Basin Plan are the responsibility of the Regional Board. The beneficial uses listed as impaired on the 303(d) list of impaired waterbodies within the San Dieguito River WMA are described in Appendix C. A total of 97 percent of waterbodies in the San Dieguito River WMA are not impaired or have not been found to be impaired by the Regional Board. Of those waterbodies that are listed in Appendix C as having impairments, most beneficial uses are attained. The Basin Plan, which provides additional details on the beneficial uses in the San Dieguito River WMA, is online at (http://www.waterboards.ca.gov/sandiego /water_issues/programs/ basin_plan/).

Beneficial uses may be impaired by various pollutants and stressors, which may be biological (e.g., indicator bacteria), physical (e.g., sedimentation), or chemical (e.g., metals) in nature. Pollutants, stressors, and conditions that may indicate impairment of beneficial uses in the San Dieguito River WMA include the following:

Aluminum occurs naturally at low levels in receiving waters because it is an abundant metal found in the earth's crust. It may also enter receiving waters in discharges from municipal sources and industry. Aluminum may become toxic to aquatic life under low pH conditions (San Diego Bay Watersheds, 2013).

Color in water can be affected by minerals, plant matter, and algae, as well as municipal sources and industrial pollutants. It is an aesthetic parameter and is associated with the natural color of fish, shellfish, or other resources in surface waters. Dissolved and particulate matter can cause discoloration (Regional Board, 1994).

Chloride is a common mineral that is highly soluble in water. Chlorides may also come from seawater intrusion, agricultural processes, and industrial wastes. Elevated levels of chloride may harm plant life and corrode metals (Regional Board, 1994).

Indicator bacteria are surrogates used to measure the potential presence of harmful bacteria, fecal material, and associated fecal pathogens. The common indicator bacteria include total coliform, fecal coliform, *Escherichia (E.) coli*, and *Enterococcus*. Indicator bacteria may include non-fecal bacteria or be non-fecal in origin (Regional Board, 1994; Southern California Coastal Water Research Project [SCCWRP], 2012).

Iron may occur naturally or may enter the receiving water through metallic iron corrosion or industrial discharges. Iron can degrade domestic water supplies by causing unpleasant tastes, discoloring laundry and plumbing fixtures, and depositing on food during cooking (Regional Board, 1994). However, iron is also an essential micronutrient for human health, and iron deficiency can

lead to iron-deficiency anemia in vulnerable populations including pregnant women, children, and people with heart failure or cancer (National Institutes of Health [NIH], 2014).

pH is a measure of the hydrogen ion (acidity or alkalinity) of water. The Basin Plan states that pH values from 6.5 to 9.0 are harmless. Changes in pH can change the chemical nature of certain constituents. For example, low pH allows toxic elements and compounds to become mobile and be available for uptake by aquatic animals and plants (Regional Board, 1994).

Manganese occurs naturally in groundwater and surface water because of mineral deposits in the earth's crust. Manganese in drinking water is associated with unpleasant tastes and dark stains (Regional Board, 1994).

Mercury occurs naturally and is most commonly released when coal is burned. Once mercury enters the aquatic ecosystem, it can be converted to methylmercury, which is highly toxic and can accumulate in fish and shellfish (USEPA, 2013). When humans consume fish and wildlife that have ingested mercury, health concerns arise (U. S. Geological Survey [USGS], 1997).

Pentachlorophenol (PCP) was popular as an herbicide until it was banned in 1987; it is now primarily used as a wood preservative (USEPA, 2007; USEPA, 2012c). Short- or long-term human exposure to PCP can damage the liver, kidneys, blood, and lungs, and the nervous, immune, and gastrointestinal systems. PCP may also affect aquatic and plant life in surface waters.

Potential eutrophication (nitrogen and phosphorous) conditions exist when excessive amounts of nutrients (commonly nitrogen and phosphorus) are in an aquatic environment. Nutrients can accelerate the growth of algae and phytoplankton, which can reduce dissolved oxygen content and harm aquatic organisms (World Resources Institute [WRI], 2013). This condition can unbalance the aquatic system and so harm fish, wildlife, and human health.

Sulfate is a common anion in water that can occur naturally from gypsiferous deposits and sulfide minerals associated with crystalline rock. High sulfate concentrations in drinking water can cause laxative effects (Regional Board, 1994).

Toxicity, as defined in the Basin Plan, is the adverse response of organisms to chemicals or physical agents. Toxic substances or concentrations thereof produce harmful physiological responses in humans, plants, animals, or other aquatic life (Regional Board, 1994).

Total dissolved solids (TDS) consist of carbonates, bicarbonates, chlorides, sulphates, phosphates, nitrates, magnesium, sodium, iron, manganese, and other substances. TDS can affect the water based in the cells of aquatic organisms. High TDS concentrations can change soil permeability, thereby impacting vegetation (Regional Board, 1994).

Turbidity is a measure of the clarity of water, which is attributed to the amount of suspended particles. Increased turbidity can reduce light penetration, which can reduce photosynthesis and adversely affect aquatic life. High levels of turbidity may also impact drinking water (Regional Board, 1994).

The Index of Biological Integrity (IBI) is a comprehensive method used to evaluate the health of the benthic macroinvertebrate community on a scale of 0 to 100, where 100 is very good condition and 0 is very poor condition. This information can be used to assess the health of the stream and is commonly used with bioassessment (State Board, 2013b). The IBI score is not a pollutant or stressor itself, but instead is a measure of the biological condition of a waterbody; it is used as a surrogate for anthropogenic impacts on receiving water health.

2.1.2 Applicable TMDLs, Special Biological Habitats, and Receiving Water Limitations (Considerations 2, 3, and 4)

San Dieguito River WMA TMDLs

TMDLs identify the total pollutant loading that a receiving water can accept and still meet water quality standards. The Regional Board is required to develop TMDLs or to follow an alternative regulatory process to address impairment listings. One TMDL has been developed in the San Dieguito River WMA.

The Pacific Ocean Shoreline at the San Dieguito Lagoon Mouth was on the 2002 303(d) list for bacteria indicators as impairing contact recreation; this original listing was for the "Pacific Ocean Shoreline, San Dieguito HU." The 2010 303(d) listing was clarified by individually analyzing for the bacteria indicators (*Enterococcus*, fecal coliform, and total coliform) and narrowing down the listing area into a smaller segment near the sampling point of the data being assessed. In this individual data analysis, *Enterococcus* and fecal coliform were removed from the 303(d) list, leaving only total coliform (as impairing the shellfish beneficial use) on the 2010 303(d) list.

Concurrently, the TMDL for *Indicator Bacteria, Project I—Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek),* Resolution No. R9-2010-0001 (Bacteria TMDL) was being developed. The Bacteria TMDL included the Pacific Ocean Shoreline at the San Dieguito Lagoon Mouth (the same smaller segment listed on the 2010 303(d) list) as impaired for contact recreation due to *Enterococcus*, fecal coliform, and total coliform. The Bacteria TMDL was finalized prior to the 2010 303(d) delisting of *Enterococcus* and fecal coliform. Given that the smaller segment was included in the Bacteria TMDL, it was considered a receiving water condition to develop goals and strategies to continue compliance with the Bacteria TMDL requirements and to meet water quality-based effluent limits (WQBELs), as required by the MS4 Permit. Therefore, *Enterococcus* and fecal coliform are still considered as potential stressors at the Pacific Ocean Shoreline per the TMDL, although they are no longer on the 2010 303(d) list.

All 2010 303(d) listings, whether a TMDL has been completed or is scheduled, were identified as receiving water conditions. Table 2-1 summarizes the 2010 303(d)-listed impaired waterbodies and the TMDLs in the San Dieguito River WMA, the assessed length or area of the impairment in the waterbody, and the pollutants listed as causing the impairment. The locations of these waterbodies are mapped in Figure 2-2.

Table 2-1
Section 2010 303(d) Listed Waterbodies and Total Maximum Daily Loads (TMDLs) in the San Dieguito River WMA

Waterbody Name	Assessed Length or Area	Pollutant or Stressor	TMDL Approved by OAL
Santa Ysabel Creek, Upper	12 miles	Toxicity	To be developed
Sutherland Reservoir	561 acres	Color, manganese, and pH	To be developed
		Total nitrogen as N and iron	To be developed
Cloverdale Creek	1.2 miles	Total dissolved solids (TDS) and phosphorus	To be developed
Green Valley Creek	0.98 mile	Sulfates, chloride, manganese, and pentachlorophenol (PCP)	To be developed
Kit Carson Creek	0.99 mile	TDS and PCP	To be developed
Felicita Creek	0.92 mile	TDS and aluminum	To be developed
Lake Hodges	1,104 acres	Phosphorus	To be developed
		Color, nitrogen, turbidity, manganese, and pH	To be developed
		Mercury	To be developed
San Dieguito River	19 miles	Enterococcus, fecal coliform, nitrogen, phosphorus, TDS, and toxicity	To be developed

Table 2-1 (continued)
Section 2010 303(d) Listed Waterbodies and Total Maximum Daily Loads (TMDLs) in the San Dieguito River WMA

Waterbody Name	Assessed Length or Area	Pollutant or Stressor	TMDL Approved by OAL
Pacific Ocean Shoreline at San Dieguito Lagoon Mouth	0.03 mile	Enterococcus, total coliform, and fecal coliform[1]	June 2011
		Total coliform[2]	To be developed

1. Pollutants are not on the 303(d) list but are included in the Bacteria TMDL as potential stressors to Contact Water Recreation beneficial use (REC-1).
2. Potential stressor for impairment of Shellfish Harvesting beneficial use (SHELL).

Note: See Figure 2-2 for a map of the 303(d)-listed waterbodies.

OAL = California Office of Administrative Law

Special Biological Habitats

Biological habitats of special significance are waterbodies designated with the BIOL beneficial use. In the San Dieguito River WMA, the following waterbodies and areas are of special significance and can be classified as (1) impaired for BIOL beneficial use; (2) impaired for other beneficial use(s); or (3) not impaired or not assessed:

- Impairment of BIOL:
  - None
- Impairment of other beneficial use(s):
  - Pacific Ocean Shoreline at the San Dieguito Lagoon Mouth (2010 303(d) listed for impairment of Shellfish Harvesting beneficial use (SHELL) due to total coliform)
- Not impaired or have not been assessed:
  - San Dieguito Lagoon
  - Blue Sky Ecological Reserve
  - Boden Canyon Ecological Reserve
  - Lake Hodges Ecological Reserve

Receiving Water Limitations

Under the receiving water limitations provision of the MS4 Permit (Provision A.2), discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters. Water quality standards are defined in various regulations, including the Basin Plan. Waterbodies that do not meet water quality standards are identified on the 2010 303(d) list.

2.1.3 Data Sources Used To Assess Receiving Water Conditions (Considerations 5 and 6)

The Copermittees participated in the MS4 Permit Regional Monitoring Program under the two previous MS4 Permits. This monitoring program used a triad approach to evaluate receiving water chemistry, toxicity, and benthic community data. It was designed to meet the requirements of previous MS4 Permits. Monitoring plans were submitted to the Regional Board to document sampling and analytical methodology and data quality requirements consistent with USEPA regulations and guidance and regional standard operating procedures (SOPs) such as the Surface Water Ambient Monitoring Program (SWAMP) or SCCWRP, when appropriate.

Since 2005, several primary documents containing biological, physical, and chemical receiving water monitoring data collected under the MS4 Permit monitoring program have been developed. High priority and medium priority pollutants and stressors were identified in these documents by following the WMA Assessment Methodology developed by the Copermittees in 2010. Waterbodies for which monitoring data indicate a failure to meet standards or which are 303(d) listed have been identified as receiving water conditions. Data generated from these monitoring programs provided the basis for the assessments and conclusions of the Long-Term Effectiveness Assessment (LTEA) and the WURMP Annual Reports. These primary data sources as described below were used to identify or assess receiving water conditions for this Water Quality Improvement Plan.

Primary Source 1: Long-Term Effectiveness Assessment

The comprehensive LTEA was developed by the San Diego Copermittees in 2011 as a precursor to the 2012 Report of Waste Discharge (San Diego County Municipal Copermittees, 2011a). It presents and summarizes data for each WMA between 2005 and 2010, and considers historical trends. In addition to NPDES and MS4 outfall monitoring program data collected by the Copermittees directly, the LTEA includes third-party data from agencies and non-governmental organizations. Examples of third parties are the Southern California Stormwater Monitoring Coalition (SMC) (additional data on dry weather receiving water quality) and Coastkeeper (water quality data and observational condition assessments).

Primary Sources 2 and 3: Fiscal Year 2011 and Fiscal Year 2012 Watershed Urban Runoff Management Program Annual Reports

The two most recent Annual Reports produced by the San Dieguito Watershed Copermittees under the WURMP, for Fiscal Year (FY) 2011 and FY 2012 (FY11 and FY12), were consulted as primary data sources. These Annual Reports include monitoring and inspection data and the activities conducted under the WURMP. The reports assess pollutants for the annual receiving water and outfall data collected since the publication of the 2011 LTEA (San Dieguito Watershed Copermittees, 2012 and 2013).

Secondary Data Sources

Numerous secondary data sources augment the primary data sources described above and are listed in Appendix D. These additional data sources were categorized as observational, plan-based, and quality-assured, as follows:

- Observational data may include unplanned visual record(s) of a condition or source or evidence of a condition or source from a single sample or measurement.
- Plan-based data include a structured monitoring plan that bases sampling on standard clean practices; however, these data may not have associated data quality and control requirements.
- Quality-assured data include quality assurance protocols and followed described procedures to collect representative samples and certification that quality control has been performed.

The San Dieguito Watershed Management Plan (WMP), the result of a two-year collaborative effort among community groups, professional consultants, governmental jurisdictions, agriculture interests, environmental conservationists, and water agencies, based identification of priorities on an analysis of monitoring data, regulatory agency reports, and stakeholder outreach (City of San Diego, 2006). This analysis does not identify specific waterbody priorities in the San Dieguito River WMA, but provides priorities for the whole WMA.

These priorities are:

- Nutrients, eutrophication, and oxygen depletion
- Silt and sediment
- Toxicity
- Pathogens in water
- Salinity and dissolved solids
- Litter, trash, and debris

A second source, the City of San Diego Strategic Plan for Watershed Activity Implementation, based identification of priority water quality problems on an assessment of the 2005 Baseline LTEA, monitoring data from the City of San Diego annual storm water monitoring reports, and additional water quality data (City of San Diego, 2007). The priorities identified in the San Dieguito River WMA are:

- Bacteria
- Nutrients
- Total dissolved solids

Because the San Dieguito WMP and Strategic Plan were completed in 2006 and 2007, respectively, the updated 2011 LTEA and the 2011 and 2012 WURMP Annual Reports are more recent assessments of the data available for the San Dieguito River WMA. The priorities identified by the two secondary data sources are similar to those of the two primary data sources.

The primary documents provide current and historical monitoring data for three receiving water monitoring stations, per the requirements of the previous MS4 Permit monitoring program, with the data reported and evaluated independently for wet weather and dry weather. During the previous two MS4 Permit cycles, the stations have been operated and maintained by the Copermittees as part of the monitoring programs. Monitoring included rapid stream bioassessments, toxicity analysis, flow monitoring, trash surveys, and analytical analysis of samples. One station, representing the San Dieguito River Below Lake Hodges subwatershed, has been monitored since 2001. The other two stations, in the San Dieguito River Above Lake Hodges subwatershed, have been monitored biennially since 2008. Figure 2-3 shows the location of the NPDES monitoring stations in the San Dieguito River WMA. Table 2-2 provides additional details on the NPDES monitoring stations.

The LTEA and WURMP Annual Reports have no receiving water monitoring data from the San Dieguito River Above Sutherland Reservoir subwatershed. The limited amount of receiving water quality data in the San Dieguito River Above Sutherland Reservoir subwatershed is identified as a data gap in the development of this Water Quality Improvement Plan.

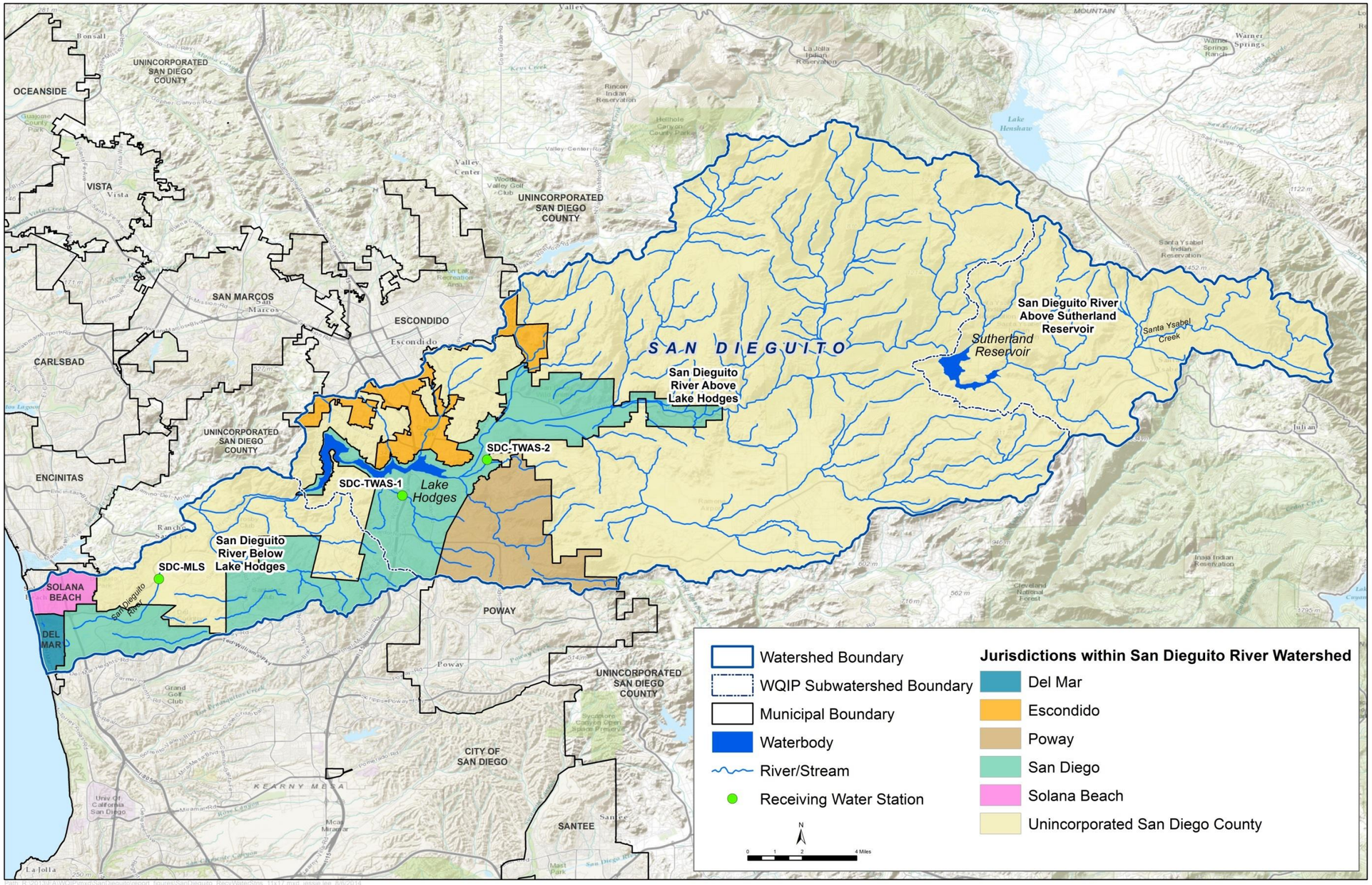


Figure 2-3
San Dieguito River WMA
NPDES Monitoring Stations

Intentionally Left Blank

Table 2-2
NPDES Monitoring Stations in the San Dieguito River WMA

Subwatershed	Station Name	Waterbody	Latitude	Longitude
San Dieguito River Above Lake Hodges	SDC-TWAS1	Green Valley Creek	33.04347	-117.07598
San Dieguito River Above Lake Hodges	SDC-TWAS2	San Pasqual Creek	33.06249	-117.03088
San Dieguito River Below Lake Hodges	SDC-MLS	San Dieguito River	32.99908	-117.20560

MLS = mass loading station; TWAS = temporary watershed assessment station

Data from these three NPDES monitoring stations were considered to represent the receiving water quality of the subwatershed in which they were collected. The data are considered quality-assured, given the municipal NPDES monitoring program requirements. Note that water quality monitoring data can be highly variable, and water quality at any specific point in a subwatershed may vary considerably from that of the samples collected at these stations. Medium or high priorities provided in two or more of the regional monitoring reports, including the LTEA, the MS4 Permit Regional Monitoring Program (which includes the SMC program), and the recent WURMP Annual Reports, are presented in Table 2-3. This list accounts for historical and current water quality monitoring findings used to inform the determination of the receiving water conditions presented in Section 2.1.7.

Table 2-3
Medium and High Priority Pollutants for Receiving Waters

Subwatershed	Dry Weather Conditions	Wet Weather Conditions
San Dieguito River Above Sutherland Reservoir	No receiving water data available	No receiving water data are available.
San Dieguito River Above Lake Hodges	*Enterococcus*[1], total dissolved solids (TDS)[1], total nitrogen[1], total phosphorus[1], and poor to very poor index of biological integrity (IBI)[1]	Fecal coliform[2], TDS[2], and total phosphorus[2]
San Dieguito River Below Lake Hodges	*Enterococcus*[2], TDS[2], total nitrogen[2], and poor to very poor IBI[2]	Fecal coliform[2], TDS[2], and toxicity[2]

1. As identified in two of the three regional monitoring reports summarized in the LTEA, Southern California Stormwater Monitoring Coalition program, and recent WURMP Annual Reports.
2. As identified in both the LTEA and recent WURMP Annual Reports.

2.1.4 Evidence of Erosional Impacts (Consideration 7)

The LTEA identified hydromodification and scouring of stream banks as well as total suspended solids (TSS) and turbidity transported via storm flows as potential causes of low to poor benthic community structure, as measured by the IBI. This information is considered evidence of erosional impacts in the San Dieguito River WMA. The Regional Monitoring Program was not designed to identify specific areas of erosion or hydromodification. More information is needed to characterize the spatial extent of these impacts and potential sources.

The Hydromodification Management Plan (HMP) outlines a monitoring program to assess the effectiveness of hydromodification management facilities (County of San Diego, 2011). Monitoring activities are ongoing and include inflow and outflow monitoring from BMPs, baseline cross-sectional monitoring, and flow-based sediment monitoring. Monitoring data generated by the HMP Monitoring Program will be considered in future iterations of the Water Quality Improvement Plan.

The Copermittees within the San Dieguito River WMA are participating in a regional effort to develop the Watershed Management Area Analysis (WMAA), as provided by the MS4 Permit. The purpose of developing the WMAA at the regional level is to ensure consistency among the Copermittees and between WMAs. The WMAA will develop WMA-specific requirements for structural BMPs and identify a list of candidate projects related to hydromodification, stream restoration, and structural BMPs. The WMAA is being conducted simultaneously with the development of the Water Quality Improvement Plan. The results from the WMAA have been incorporated into Section 4 of the Water Quality Improvement Plan and are submitted as part of this submittal.

2.1.5 Evidence of Adverse Impacts (Consideration 8)

The data sources used in Section 2.1.3 (Considerations 5 and 6) were supplemented with the information gathered during the public workshop and data call to evaluate overall evidence of adverse impacts on the receiving waters. Examples of potential receiving water conditions were presented to the public in a workshop on September 5, 2013, on the basis of evaluation of the key data sources. Public input was received during and after the workshop along with a call for data. The public was asked to respond with final data by September 13, 2013.

Data provided by the public consisted of observational data and email messages, information from regional non-governmental organizations, email communications from members of the public, and additional reports provided by the Responsible Agencies. The data provided information on the evidence of pollutants and stressors at several locations. Most of the data supported the initial list of receiving water conditions. These data sources are summarized in Appendix D.

A list of the receiving water concerns provided by the public is as follows:

- San Dieguito River Above Sutherland Reservoir:
  - No public data submitted
- San Dieguito River Above Lake Hodges:
  - Manganese impacts
  - Nutrients and low dissolved oxygen in Lake Hodges that limit the use of the water supply and increase the cost to treat the problem
  - A comment that human health conditions should be a priority
  - The following issues raised during the public workshop (but no data were provided as evidence to support adding them as receiving water conditions, although they may be added during future revisions of the Water Quality Improvement Plan based on availability of data):
    - Vector issues as a result of stagnant water and mosquitoes
    - Bromides and mercury impacts
- San Dieguito River Below Lake Hodges:
  - Concerns with nutrients (ammonia, total phosphorus, nitrate, and total nitrogen) and low levels of dissolved oxygen
  - Elevated bacteria recorded during a land use study
  - Coastkeeper data that showed low to moderate levels of fecal indicator bacteria

2.1.6 Potential Improvements in the Overall Condition of the WMA That Can Be Achieved (Consideration 9)

The potential improvements in the overall condition of the WMA are discussed in Section 2.3. For the purposes of the Water Quality Improvement Plan, the potential improvements in the receiving waters and overall WMA are directly related to the potential improvements in the quality of the MS4 discharges, so these considerations were combined in the evaluation of the priority conditions.

2.1.7 Receiving Water Conditions

An initial list of receiving water conditions was developed on the basis of the evaluation of the 2010 303(d) list, associated TMDLs, the waterbodies with special biological significance, the priority pollutants or stressors identified from current and historical receiving water monitoring data, and public input. The criteria and data used to evaluate the receiving water conditions are detailed in Appendix E.

A receiving water condition was defined using the following four factors:

(1) The beneficial use(s) that may be associated with the water quality impairment, as determined by the 303(d) listing

(2) The pollutant or stressor causing the impairment

(3) The spatial extent of the impairment, based on the 2010 303(d) listing or the area near the NPDES monitoring location

(4) The temporal extents of the impairment (i.e., wet or dry weather); receiving water conditions, which were based on the evaluation of the 2010 303(d) list, and were assigned both dry and wet weather temporal extents

In some instances, this was not the case and only one temporal extent (i.e., dry weather only) was defined on the basis of best professional judgment.

When additional data become available that may change the assessment of the receiving water conditions, they will be incorporated using the iterative and adaptive management processes described in Section 6. The list of receiving water conditions identified in the San Dieguito River WMA and the determining factor(s) for each condition are summarized in Appendix F. Beneficial uses identified as impaired are defined in Appendix C.

2.2 Step 2: Determine Potential Receiving Water Impacts from MS4 Discharges

Receiving water conditions may be caused by a wide variety of pollutants and stressors, which may or may not result from human activity or urban development. The primary focus of the MS4 Permit is to regulate discharges from MS4 outfalls into receiving waterbodies. Priority water quality conditions in the WMA are defined as receiving water conditions that are impacted by MS4 discharges. Step 1 in the process to determine priority water quality conditions identified the receiving water conditions in the WMA. Step 2 was to assess whether MS4 discharges may cause or contribute to receiving water conditions.

The potential impacts on receiving waters from MS4 discharges were identified on the basis of the following considerations under MS4 Permit Provision B.2.b:

(1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3

(2) Available, relevant, and appropriately collected and analyzed storm water and non-storm water monitoring data from the Copermittees' MS4 outfalls

(3) Locations of each of the Copermittee's MS4 outfalls that discharge to receiving waters

(4) Locations of MS4 outfalls that are known to persistently discharge non-storm water to receiving waters likely causing or contributing to impacts on receiving water beneficial uses

(5) Locations of MS4 outfalls that are known to discharge pollutants in storm water causing or contributing to impacts on receiving water beneficial uses

(6) Potential improvements in the quality of discharges from the MS4 that can be achieved

The following subsections detail how Considerations 1 through 6 are incorporated into the assessment.

2.2.1 Discharge Prohibitions (Consideration 1)

MS4 Permit Provisions A.1 and A.3 prohibit discharges from MS4s that cause or contribute to a receiving water condition, and effectively prohibit all discharges of non-storm water into an MS4. Storm water discharges from an MS4 must be free of pollutants to the MEP and all discharges must comply with applicable WQBELs defined in the MS4 Permit. As described below, potential impacts from MS4 discharges were identified by assessing samples from MS4 outfalls that exceeded water quality standards or that persistently discharged non-storm water related to receiving water conditions identified in the previous section.

2.2.2 Available MS4 Monitoring Data (Consideration 2)

The LTEA and the WURMP Annual Reports described in Section 2.1 were the primary sources of monitoring data from MS4 outfalls in the San Dieguito River WMA; the secondary sources listed in Appendix D were also considered. The WURMP Annual Reports did not contain non-storm water MS4 outfall monitoring data, so the LTEA was the primary source of dry weather outfall data for assessing MS4 impacts.

The water quality results from one or more MS4 outfalls were compiled in the LTEA and WURMP Annual Reports and considered representative of the MS4 within the subwatershed area related to the receiving water stations. The MS4 outfall data were evaluated in a manner consistent with that of the LTEA and WURMP Annual Reports, where the data were used to characterize MS4 water quality in general areas of the WMA. The MS4 outfall data were considered representative of the MS4 discharges to potentially cause or contribute to a receiving water condition on a subwatershed scale. However, data for direct MS4 discharges to a specific receiving water are not typically available.

Monitoring data were compiled from these documents and are summarized at the end of this section. The complete compilation is provided in Appendix E. In Section 2.3, these data are correlated with the receiving water conditions to determine priority water quality conditions.

Table 2-4 summarizes the constituents identified as a high or medium priority in the LTEA and recent WURMP Annual Reports. Priorities are those identified in both the sources.

Table 2-4
Medium and High Priority Pollutants for Outfalls

Subwatershed	Dry Weather Conditions	Wet Weather Conditions
San Dieguito River Above Sutherland Reservoir	No MS4 monitoring data are available	No MS4 monitoring data are available.
San Dieguito River Above Lake Hodges	Chloride, sulfate, *Enterococcus*, fecal coliform, total nitrogen, total and dissolved phosphorus, and TDS	TSS, TDS, and fecal coliform
San Dieguito River Below Lake Hodges	*Enterococcus*, fecal coliform, total and dissolved phosphorus, total nitrogen, chloride, sulfate, and TDS	Fecal coliform

The current regional MS4 outfall monitoring program was designed to monitor the high priority constituents of concern, based on priorities at the time the program plan was developed. This monitoring program design could not always directly link the MS4 outfall data to the water quality of downstream receiving waters because of a limited data set available to correlate MS4 impacts to receiving water conditions. This limited data availability is identified as a data gap. Additionally, the constituents monitored under the MS4 outfall monitoring program include general physical and inorganic non-metals, organics, dissolved and total metals, and bacteriological parameters. As a result, some receiving water conditions lack supporting MS4 impact evidence because of the limited constituent list monitored under the MS4 outfall monitoring program. It is at the discretion of the Responsible Agencies to determine whether a receiving water condition merits additional monitoring to assess MS4 impacts.

The MS4 Permit defines persistent flow as "…*the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.10 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient*."

2.2.3 Location of MS4 Outfalls (Considerations 3, 4, and 5)

The Responsible Agencies maintain maps of the conveyance systems within their jurisdictions. The locations and density of the outfalls may be

a general indicator of MS4 sources in the WMA. Based on available data, Figure 2-4 illustrates the MS4 within the San Dieguito River WMA and identifies major MS4 outfalls that discharge to receiving waters. The Responsible Agencies have updated their current inventories to contain only outfalls that meet the definition of a major MS4 outfall per the MS4 Permit.

The Responsible Agencies have reviewed their updated major MS4 outfall inventories to determine which of these outfalls have persistent discharges of non-storm water on the basis of the requirements of the MS4 Permit. This review involved visiting major outfalls during dry weather and recording observations, including whether there was flow or ponding at each site. When determining if a site had persistent flow, the Responsible Agencies referred to the most recent three monitoring visits in their flow databases. If a site had flow and/or ponding during the most recent three visits, it was determined to be persistent. If one of the visits had dry conditions, the site was considered transient. If all three visits were dry, it was considered a dry site. Dry weather field screening will continue during subsequent monitoring years according to the schedule provided in Section 5.1.3. The persistent flow outfall inventory will be updated accordingly.

The Responsible Agencies have provided a preliminary list of major MS4 outfalls that may have persistent flow based on their Fall 2014 inventory. These outfalls are summarized in Appendix D.3. There are 18 outfalls in the San Dieguito River WMA that may persistently discharge non-storm water:

- City of Del Mar: Two outfalls (one of which is not classified as major)
- City of Escondido: One outfall
- City of Poway: Two outfalls
- County of San Diego: Three outfalls
- City of San Diego: Ten outfalls
- City of Solana Beach: No outfalls. Low flow diverters have been installed in all outfalls previously identified as persistently flowing.

Intentionally Left Blank

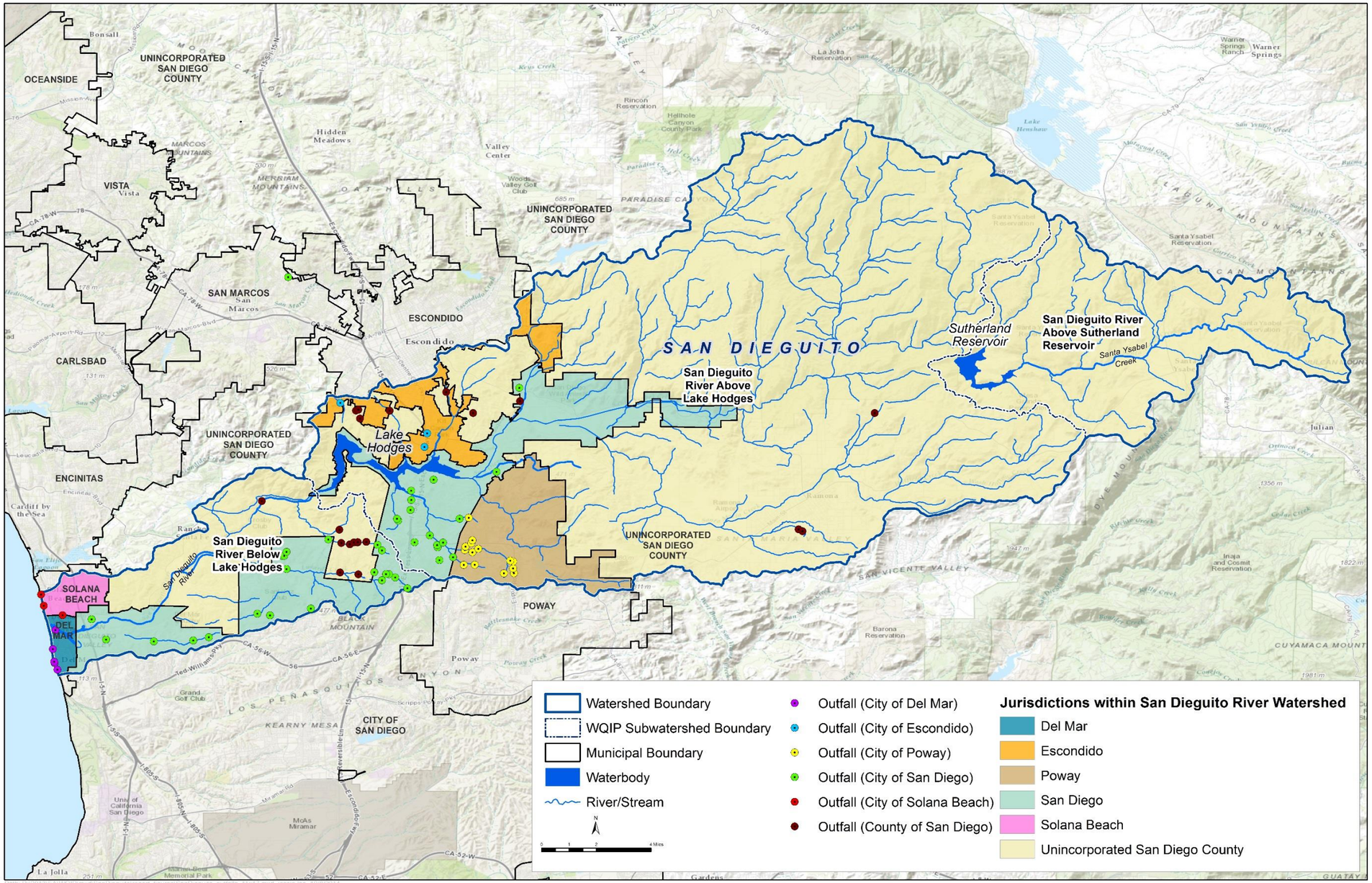


Figure 2-4
San Dieguito River WMA
Major MS4 Outfalls

Intentionally Left Blank

2.2.4 Potential Improvements in the MS4 Discharges That Can Be Achieved (Consideration 6)

Existing water quality regulations, such as TMDLs, have mandated water quality goals and schedules. The Responsible Agencies have diligently planned, developed, and implemented BMP programs throughout the WMA on the basis of the resources available to meet the requirements of these regulations. These programs provide an opportunity to build on previous and planned efforts. The potential improvements in the quality of MS4 discharges are directly linked to the potential for improvements in the receiving waters for the purposes of the Water Quality Improvement Plan. Therefore, potential improvements are integral to, and included in, the evaluation of the potential conditions provided in Section 2.3.1.

2.2.5 Potential Receiving Water Impacts from MS4 Discharges

An initial list of potential impacts from MS4 discharges on receiving water conditions was developed from the evaluation of MS4 outfall monitoring data and the MS4 maps. Impacts from MS4 discharges were identified when one or both of the following criteria were met:

- MS4 outfalls exhibit current or historical monitoring results that exceed water quality standards related to the receiving water condition, based on the subwatershed analysis allowed by the data presented in the LTEA or WURMP Annual Report.
- The MS4 or urban runoff was named as a source or potential source in the 2010 303(d) list of impaired waterbodies or in a TMDL.

The final list of potential impacts from MS4 discharges into subwatersheds in the San Dieguito River WMA is provided in Appendix F. The temporal extent of the MS4 impact is estimated on the basis of the monitoring data or best professional judgment, because the 303(d) list does not provide temporal extent. When additional data that may change the assessment of the potential impacts from MS4 discharges become available, the data will be incorporated per the iterative and adaptive management processes described in Section 6.

2.3 Step 3: Determine Priority Water Quality Conditions

The information gathered to identify receiving water conditions (Section 2.1, MS4 Permit Provision B.2.a) and impacts from MS4 discharges (Section 2.2, MS4 Permit Provision B.2.b) was assessed to “develop a list of priority water quality conditions as pollutants, stressors, or receiving water conditions that are the highest threat to receiving water quality or that most adversely affect the quality of receiving waters” (MS4 Permit Provision B.2.c.(1)).

Priority water quality conditions are defined as receiving water conditions for which there is evidence that MS4 discharges may cause or contribute to the condition. The selection of these conditions is based on (1) analysis of the receiving water conditions and (2) assessment of the MS4 discharges.

An initial list of priority water quality conditions was developed by comparing receiving water conditions with evidence of MS4 contributions. Characterizing the receiving water quality and identifying the potential impacts caused by MS4 discharges to receiving waters in the WMA was necessary to identify the impacts to receiving waters associated with MS4 discharges that were of the most concern to the Responsible Agencies. This initial list was created in compliance with Provisions B.2.c.(1)(a)-(e). The initial list was then compared with the public input that was provided during the September 5, 2013, workshop and the public data call. The priorities identified in previous planning documents were also considered. Many of the same concerns were provided during the workshop and were evident in the planning documents and third-party data. Finally, the overall potential for improvement of MS4 discharges on the overall WMA was considered. The list of priority water quality conditions was then finalized on the basis of these factors. The final list of priority water quality conditions is included in Appendix F.

2.3.1 Potential Improvements in MS4 Discharges and Overall WMA

Regional reference studies led by Copermittees are underway to better understand the potential improvements in the San Dieguito River WMA on the basis of reference receiving water conditions in the San Diego region. Reference receiving water conditions are determined by assessing the water quality in areas with minimal human impact. These conditions will provide an important background to understand and characterize the health of receiving waters affected by human activities (SCCWRP, 2010). Copermittees have committed funds to study bacteria and other stressors throughout the San Diego region in the natural environment in wet and dry weather conditions to better inform solutions and regulations.

Given current regulations, the Bacteria TMDL, monitoring data, and public input, bacteria are a concern in the WMA receiving waters that are well documented and a potential threat to public health. Since the Bacteria TMDL was adopted in 2011, the Responsible Agencies have been developing strategies and programs to address bacteria and to maintain Contact Water Recreation beneficial use (REC-1) uses throughout the San Dieguito River WMA. In addition to the regional reference studies, studies are underway to evaluate the sources and risks of bacteria to human health. The watershed strategies included in Section 4 to target bacteria provide secondary benefits to water quality by potentially reducing other pollutants and stressors. Most of the strategies that will be implemented through this Water Quality Improvement Plan are expected to address multiple receiving water conditions.

The Responsible Agencies are responsible for controlling their MS4 discharges and the impact of these discharges on the receiving waters. The potential improvement in MS4 discharge quality and how it will impact the health of the overall WMA is often unclear. In addition to the MS4 discharges, many factors, such as discharges outside the Responsible Agencies' jurisdiction, natural conditions, and climatic conditions such as drought, influence the receiving water quality. The previous MS4 Permit monitoring program design began to link the MS4 outfall data to the quality of downstream receiving waters and generated a limited data set that can begin to correlate MS4 impacts to receiving water conditions. However, the contributions from MS4 discharges for certain priority conditions are not well known, and therefore their potential for improvement is unknown. These limitations were considered to be data gaps for these priority water quality conditions and are described in Section 2.3.3.

2.3.2 Priority Water Quality Conditions

The identified priority water quality conditions are summarized in Appendix F. The following information is included for each priority water quality condition, per the MS4 Permit:

(1) The beneficial use impairment(s) associated with the priority water quality condition

(2) The pollutant or stressor causing the beneficial use impairment, if known

(3) The temporal extent of the priority water quality condition (dry and/or wet weather)

(4) The geographical extent of the priority water quality condition within the WMA, if known

(5) Lines of evidence leading to identification as a priority water quality condition, including evidence of MS4 discharges that may cause or contribute to the condition

(6) An assessment of the adequacy of the monitoring data to characterize the factors causing or contributing to the priority water quality condition, including consideration of spatial and temporal variation

The impaired beneficial use, potential stressor, temporal extent of the priority water quality condition, lines of evidence clarifying the selection as a priority water quality condition (i.e., determining factors), and data gaps were determined during the assessment of the receiving water conditions and the MS4 impacts. Data gaps are discussed in more detail in Section 2.3.3. The geographical extent of the priority water quality conditions is based on the extent of the associated 303(d) listing or the location of the associated NPDES monitoring location. For each priority water quality condition, the associated Responsible Agencies were determined through an analysis of the geographical extent of the condition and jurisdictional boundaries.

2.3.3 Priority Water Quality Condition Data Gaps and Considerations

From a review of the priority water quality conditions presented in Appendix F, some of monitoring data associated with a number of conditions are not adequate to represent the spatial and temporal variations of the conditions. Additionally, there may be other considerations that should be taken into account when analyzing the data gaps. The priority water quality conditions with data gaps and considerations, where applicable, are as follows:

- Impairment of Municipal and Domestic Supply beneficial use (MUN) in the San Dieguito River Above Sutherland Reservoir:
  - There are no monitoring data for this region or data provided by the public as evidence of receiving water impairment.
  - It is unknown whether MS4 discharges cause or contribute to the receiving water condition.
- Impairment of Agricultural Supply beneficial use (AGR) in the San Dieguito River Above Lake Hodges:
  - There are limitations to the receiving monitoring data used to evaluate the receiving water condition for the 303(d)-listed waterbodies; and no NPDES receiving water monitoring locations were located in Cloverdale Creek.
  - It is unknown whether MS4 discharges cause or contribute to the receiving water condition.

  <u>Considerations</u>

  - The agricultural agencies monitor their activities, facilities, and discharges in accordance with the current Agricultural Waiver issued by the Regional Board.
  - Responsible Agencies may collaborate with the agricultural agencies to address water quality concerns in the WMA and potential contribution from the MS4 discharges.
- Impairment of Warm Freshwater habitat beneficial use (WARM) in the San Dieguito River Above Lake Hodges:
  - The receiving water condition is not well characterized, and no NPDES receiving water monitoring locations were located in Cloverdale Creek.
  - The physical and biological contributions to the impairments have not been characterized.
  - MS4 outfall monitoring conducted under previous MS4 Permit monitoring programs varied the suite of potential pollutants or stressors analyzed or did not include stressors monitored in the receiving waters, based on priorities at the time of program development.

- It is unknown whether MS4 discharges cause or contribute to the receiving water condition.

- Impairment of MUN in the San Dieguito River Above Lake Hodges:
  - There are limitations to the receiving monitoring data used to evaluate the receiving water condition for the 303(d)-listed waterbodies, and no NPDES receiving water monitoring locations were located in 303(d)-listed waterbodies of Felicita Creek and Lake Hodges.
  - It is unknown whether MS4 discharges cause or contribute to the receiving water condition; MS4 data collected on the subwatershed level do not directly link outfall discharges with the impairment, and no MS4 outfalls were directly discharging to the listed waterbodies, including Felicita Creek, Green Valley Creek, and Lake Hodges; this is particularly important in Lake Hodges, where natural processes in the lake may be contributing to the color and eutrophic conditions impairment.

  Considerations

  - For pollutants such as TDS and nutrients, groundwater may be a contributing source, as noted throughout the San Diego region (City of San Diego, 2011).
  - Ongoing studies led by the respective water agencies and watershed management entities are characterizing the receiving water conditions and nutrient loads; these studies include the conceptual design of an upland natural treatment system to reduce pollutant loads being directed into the reservoir as well as in-reservoir water quality management strategies and practices; resulting reports and data derived from the studies will be considered in future revisions of the Water Quality Improvement Plan.
  - Responsible Agencies will collaborate with the water agencies to address water quality concerns in the WMA and potential contributions from the MS4 discharges.

- Potential Impairment of REC-1 in the San Dieguito River Above Lake Hodges:
  - No MS4 data collected on the subwatershed level directly link outfall discharges with the impairment.
  - The magnitude of the contribution from the MS4 is unknown.

  Considerations

  - Historically, Lake Hodges has recorded flow that breaches the dam during wet weather conditions; it is unknown whether these overflows cause or contribute to exceedances at the Pacific Ocean Shoreline.
  - The water agencies are developing a plan to limit or redirect overflows that would eliminate this condition; this plan will be updated upon completion of such a project.

- Impairment of REC-1 San Dieguito River Below Lake Hodges:
  - No MS4 data collected on the subwatershed level directly link outfall discharges with the impairment.
  - The magnitude of the contribution from the MS4 is unknown.

  Considerations

  - Assembly Bill (AB) 411 (Beach Safety Act) monitoring data show that bacteria levels at the Pacific Ocean Shoreline are meeting water quality standards during dry weather; this monitoring program may not monitor at a consistent frequency during the wet season because of restricted funding; the Bacteria TMDL states that compliance is met if the receiving water is meeting the water quality standards.
- Impairment of WARM in the San Dieguito River Below Lake Hodges:
  - The receiving water condition is not well characterized; there are limitations to the data used to evaluate the receiving water condition for the San Dieguito River; in particular, the physical and biological contributions to the impairments have not been characterized.
  - There are limitations to the MS4 outfall data used to evaluate the potential contribution from the MS4 discharges for the listed waterbodies; MS4 outfall monitoring conducted under previous MS4 Permit monitoring programs varied the suite of potential pollutants or stressors analyzed or did not include stressors monitored in the receiving waters, based on priorities at the time of program development.
  - It is unknown whether MS4 discharges cause or contribute to the receiving water condition.

2.4 Step 4: Determine Highest Priority Water Quality Conditions

Once the list of priority water quality conditions was developed, “a subset of the water quality conditions (pursuant to Provision B.2.c.(1))” were identified as the highest priorities. The MS4 Permit provides the Copermittees with the discretion to justify the highest priority water quality conditions for program development and implementation, on the basis of a number of factors, including the potential to improve watershed health, available resources, and best professional judgment. The methodology used to select the priority and highest priority water quality conditions is described in Appendix A. According to the methodology, the highest priority water quality conditions are priority water quality conditions that are either (1) associated with a TMDL, ASBS requirements, or other water quality regulations, or (2) have been elevated to highest priority, based on an evaluation of four additional selection criteria (discussed later in this section). Each priority water quality condition identified in Appendix F was screened against these criteria and the results are summarized below.

The highest priority water quality condition in the San Dieguito River WMA is the potential impairment of REC-1 beneficial uses at the Pacific Ocean Shoreline (Table 2-5). The highest priority water quality condition is associated with the Bacteria TMDL and includes research conducted and programs implemented to reduce the contribution of MS4 discharges to bacteria impairments. The bacteria impairment has the greatest potential for near-term improvement in water quality that can be achieved by controlling discharges from the MS4. Over the past five years, tremendous effort has been invested by the Responsible Agencies to develop and plan BMPs to control bacteria.

Table 2-5
Highest Priority Water Quality Conditions in the San Dieguito River WMA

Highest Priority Condition	Potential Stressor	Temporal Extent		Subwatershed
		Wet	Dry	
Potential impairment of Contact Water Recreation beneficial use (REC-1) at Pacific Ocean Shoreline	Indicator bacteria	✓	–	San Dieguito River Above Lake Hodges
Potential impairment of REC-1 at Pacific Ocean Shoreline	Indicator bacteria	✓	✓	San Dieguito River Below Lake Hodges

The highest priority water quality condition applies to the two western (downstream) subwatersheds in the WMA during wet weather because of the potential for flow to the shoreline from the area above Lake Hodges and below the Sutherland Reservoir. Sutherland Reservoir and the area within the WMA that discharges to Sutherland Reservoir are disconnected by dams from the lower watershed and are not suspected of contributing to the bacteria impairment. During dry weather, the highest priority water quality condition is applicable only in the San Dieguito River Below Lake Hodges subwatershed because the Lake Hodges dam typically does not overflow during dry weather. The selection of the highest water quality conditions with indicator bacteria as the potential stressor will provide water quality benefits to the remaining priority water quality conditions. The strategies described in Section 4 will help address other priority water quality conditions, because many of the strategies needed to reduce bacteria also target other pollutants.

Priority water quality conditions not associated with regulatory drivers were further considered for elevation to a highest priority, on the basis of four additional factors:

(1) The supporting data set is sufficient to adequately characterize the degree to which the priority water quality condition changes seasonally and over geographic area, which supports its consideration as a highest priority water quality condition.

(2) Storm water/non-storm water runoff is a predominant source for the priority water quality condition.

(3) The priority water quality condition is controllable by the Responsible Agencies.

(4) The priority water quality condition would not be addressed by strategies identified for other highest priority water quality conditions in this Water Quality Improvement Plan.

Each of these additional factors must be evaluated to determine whether the priority water quality condition should be elevated to a highest priority water quality condition. Appendix F summarizes the evaluation of the priority water quality conditions not associated with a regulatory driver. This analysis determined that most of the priority water quality conditions will be addressed by strategies applicable to the highest priority water quality conditions, and therefore provides justification for not elevating these conditions to highest priority. Furthermore, for some priority water quality conditions, there is a lack of data to adequately characterize the condition and to definitively state that storm water or non-storm water runoff is the predominant cause of the condition. These data gaps are discussed in Section 2.3.3, and again justify not elevating these conditions to highest priority. When additional data become available to assess these priority water quality conditions, the data will be incorporated per the iterative and adaptive management processes described in Section 6, and the conditions may be re-evaluated for potential elevation to highest priority. This Water Quality Improvement Plan is designed to concentrate efforts on the highest priority water quality conditions, and simultaneously to develop programs to address the other priority water quality conditions.

3 MS4 Sources of Pollutants and/or Stressors

The previous section of this Water Quality Improvement Plan described the process for selecting the highest priority water quality conditions in the San Dieguito River Watershed Management Area. The highest priority water quality condition is the potential limitation of contact recreational beneficial uses along the Pacific Ocean Shoreline at the San Dieguito Lagoon Mouth. This impairment is due to the presence of *Enterococcus* and fecal coliform indicating impairments in the following subwatersheds:

- San Dieguito River Above Lake Hodges (wet weather only)
- San Dieguito River Below Lake Hodges (wet and dry weather)

As shown in the graphic below, the second step of the Water Quality Improvement Plan ("Sources") is to identify and prioritize sources of stressors in the San Dieguito River WMA (Provision B.2.d). Source identification and prioritization in this Water Quality Improvement Plan are based upon the source assessments previously conducted as a part of the 2011 LTEA and as refined by the 2012 WURMP Annual Report.

The highest priority sources for the bacteria impairment in the San Dieguito River WMA are Residential Areas and Sanitary Sewer Overflows/Septic Systems. The goal of the source analysis is to identify and prioritize sources on the basis of the MS4 Permit requirements. It is not required or intended to be an independent source characterization.

Figure 3-1 outlines the process for identifying sources of the highest priority water quality conditions (Step 1) and the method for prioritizing the sources (Step 2). Data gaps identified as part of the source identification are highlighted to guide future analysis. As more source information is gathered, the source identification process may be refined, as described in the iterative and adaptive management processes in Section 6, and priorities may vary by Responsible Agency.

Section 3 Highlights

- Identifies and prioritizes sources of bacteria impairment
- Highest priority sources:
  - Residential areas
  - Sanitary sewer overflows and/or septic systems

Intentionally Left Blank

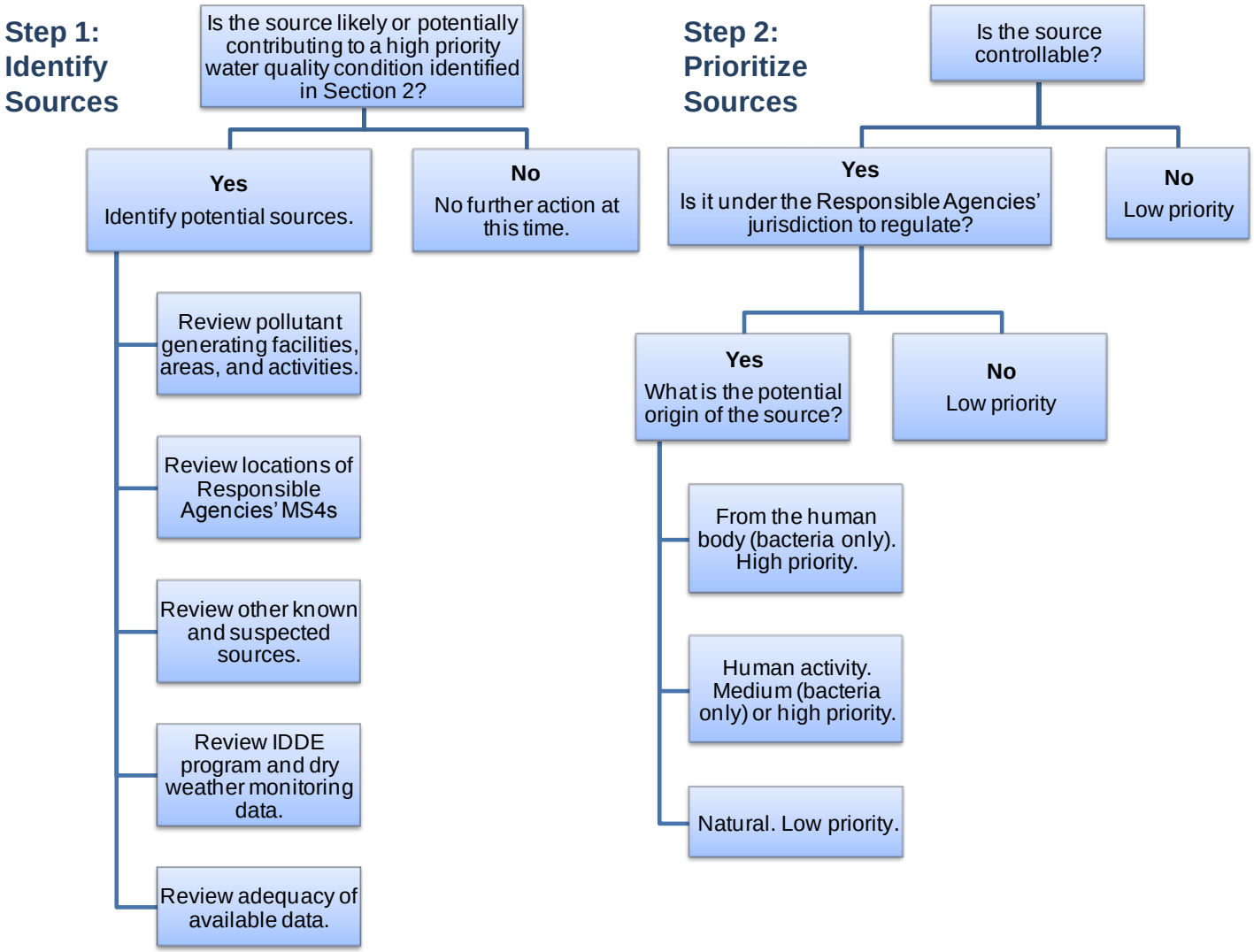


Figure 3-1
Highest Priority Water Quality Conditions Source Identification Process

Intentionally Left Blank

3.1 Step 1: Identification of Bacteria Sources

Per the MS4 Permit (Provision B.2.d), identification of sources of bacteria was based on the following five considerations:

(1) Pollutant-generating facilities, areas, and activities within the WMA

(2) Locations of the Responsible Agencies' MS4s

(3) Other known or suspected sources of non-storm water or pollutants in storm water discharges to receiving waters

(4) Available data from the Responsible Agencies' monitoring and IDDE

(5) Adequacy of available data

Seven primary resources provided the information for these considerations:

(1) 2011 LTEA, as described in Section 2

(2) 2010–2011 WURMP Annual Report, as described in Section 2

(3) 2011–2012 WURMP Annual Report, as described in Section 2

(4) Maps of the MS4 system maintained by each Responsible Agency

(5) JURMP Annual Reports submitted by the Responsible Agencies, which contain agency-specific monitoring data and IDDE data, including the identification of outfalls that persistently flow during dry weather; the most recent JURMP Annual Reports were utilized (City of Del Mar, 2010; City of Escondido, 2012; City of Poway, 2012; City of San Diego, 2012b; City of Solana Beach, 2012; County of San Diego, 2012)

(6) The Bacterial Conceptual Models and Literature Review that were developed by the San Diego County Municipal Copermittees in 2012 (City of San Diego, 2012a); this appendix is duplicated as Appendix G in this Water Quality Improvement Plan

(7) Stakeholder input

Additional data sources were used to augment the primary sources and a complete list is provided in Appendix D. Examples of additional sources are the Bacteria TMDL (Regional Board, 2010) and the 2010 303(d) list.

3.1.1 Bacteria-Generating Facilities, Areas, and Activities Within the WMA

The LTEA evaluated the known bacteria-generating facilities, areas, and activities in the San Diego region, which are defined as follows:

- A **facility** is a type of existing development, such as a commercial or industrial business, a parking structure, a municipal airfield, or a landfill; an MS4 is considered to be a facility.
- An **area** is a communal area such as the trash dumpsters in a commercial strip mall, an open space, a wildlife preserve, or a residential neighborhood.
- **Activities** are practices such as irrigation, portable toilet cleaning, storage of pet wastes, and fertilizer use (Regional Board, 2013).

To identify sources, the LTEA evaluated the available wet and dry weather monitoring data and IDDE program results, as well as the adequacy of the data. The sources were scored using a matrix that accounted for the number of pollutant-generating activities associated with each source (in categories of 0, 1-4, and >4 activities) and the potential for wet weather discharge from each source (from 1 = no discharge potential to 5 = high discharge potential). These scores were then converted into the following qualitative loading potentials:

- **None (N)** denotes sources with no identified pollutant-generating activities and low discharge potential.
- **Unknown (UK)** denotes sources with one or more identified pollutant-generating activities, but very low discharge potential.
- **Unlikely (UL)** denotes sources with no pollutant-generating activities but high discharge potential, or sources with moderate discharge potential and one or more pollutant-generating activities.
- **Likely (L)** denotes sources with high discharge potential and identified pollutant-generating activities.

Beginning with the sources identified in the 2007 MS4 Permit and updating the list with the most recent inventory, the 2011 LTEA evaluated 37 facilities, areas, and activities (sources), and identified a number of likely sources of bacteria. The WURMP Annual Reports identify the likely sources from the LTEA that are found within the San Dieguito River WMA, as well as the quantity of each source. These sources, land use categories, and quantities are summarized in Table 3-1. Sources classified as having an unknown loading potential in the 2011 LTEA are included in the assessment of the adequacy of available data (Section 3.1.6).

Table 3-1
Likely Sources of Bacteria Identified in WURMP Annual Reports

Source	Land Use Category	Number of Identified Likely Sources in San Dieguito River WMA[1]
Agriculture	Other	2 facilities (30,419 acres)
Animal Facilities	Commercial	49 facilities
Eating or Drinking Establishments	Commercial	420 facilities
Mobile Landscaping	Commercial	3 facilities
Nurseries and Greenhouses	Commercial	34 facilities
Roads, Streets, and Parking	Municipal	2 facilities (6,723 acres)
Residential Areas	Residential	38,988 acres

1. Sources are quantified by facility counts or acreage. Facility counts help define the sources during dry weather and land uses help define sources during wet weather.

3.1.2 Other Known and Suspected Sources

Other sources have been identified that may contribute to the bacteria impairment within the San Dieguito River WMA. Discharges from these sources are often conveyed to receiving waters by the Responsible Agencies' MS4s. The principal sources outside the Responsible Agencies' jurisdiction, which are described below, are:

- Phase II MS4 outfalls
- Other permitted discharges
- Other potential point sources
- Other non-point sources

The San Dieguito WMP identifies two main threats to water quality in the San Dieguito River WMA, both of which can include contributions from outside the Responsible Agencies' jurisdictions (City of San Diego, 2006):

- Increased development, resulting in an increase of impermeable surfaces and associated increase in urban and storm water runoff discharges
- Agricultural and turf-related activities, which have the potential to contribute sediments, nutrients, pesticides, and bacteria to the watershed

Phase II MS4s

Phase II MS4s are smaller agencies (relative to municipalities) or areas that are regulated under the State's Phase II MS4 Permit (State Board Order No. 2013-0001-DWG) (State Board, 2013a). They are outside the authority of the Responsible Agencies and, within the San Diego region, can include, but are not limited to, correctional, transit, educational, and federal facilities. Phase II MS4 permittees are responsible for only the runoff from their facilities and activities, whereas the Responsible Agencies are responsible for receiving runoff from other sources. Some Phase II MS4s have been named in the Bacteria TMDL (Regional Board, 2010). Contribution from Phase II MS4s is a suspected source of bacteria in both storm water and dry weather non-storm water discharges.

The San Dieguito River WMA has two Phase II MS4s:

- Del Mar Fairgrounds—This facility (identified as the San Diego County Fairgrounds in the Phase II MS4 Permit) is operated by the 22nd District Agricultural Association (DAA) and includes a racetrack, fairgrounds, and horse park. The facility has had exceedances of water quality objectives for bacteria during wet weather (22nd DAA, 2012).
- North County Transit District (NCTD)—The facilities of the NCTD, which operates bus, light rail, and traditional rail lines, include rail yards and tracks. More information is needed to determine whether NCTD is a source of bacteria.

The Responsible Agencies will collaborate with the Regional Board and Phase II MS4s when possible to collect data to quantify the contribution of Phase II MS4s to the bacteria impairments.

Other Permitted Discharges

Other permitted discharges, such as discharges covered under the State's General Construction Permit (Order No. 2012-0006-DWQ) (State Board, 2012a) and the General Industrial Permit (Order No. 2014-0057-DWQ) (State Board, 2014), may also contribute to the bacteria impairment. Industrial waste treatment facilities, for example, have been identified as a potential point source of bacteria. Agricultural discharges, which are generally covered under a conditional discharge waiver from the Regional Board, are discussed below as an example of non-point source discharges. Such discharges may be conveyed to receiving waters by the Responsible Agencies' MS4s.

In addition to the MS4 Permit, four other types of storm water discharge permits are present within the San Dieguito River WMA, as presented in Table 3-2.

Table 3-2
Storm Water Discharge Permits

Permit Type	Number of Permits in WMA
Municipal Storm Water	1
Industrial Storm Water	22
Construction Storm Water	58
California Department of Transportation (Caltrans) Storm Water	1
Other Individual National Pollutant Discharge Elimination System (NPDES) Discharges	5
Total	**87**

Sources: State Board, 2011a; State Board, 2011b

Construction sites and waste sites have also been identified as significant point sources of bacteria in the San Diego region (Regional Board, 2010). Although there are four municipal landfills and one waste transfer station above Lake Hodges in the San Dieguito River WMA (CalRecycle, 2013), none were identified as likely sources of bacteria in the 2012 WURMP Annual Report. Additional data are necessary to determine whether landfills and other permitted discharges are a source of bacteria in the San Dieguito River WMA. The Responsible Agencies will collaborate with the Regional Board and other permitted dischargers when possible to collect data to quantify their contributions to the bacteria impairment.

Other Point Sources

A point source is a discrete conveyance, such as a pipe or ditch. Private outfalls are point sources that may discharge bacteria to the MS4 or receiving waters; however, no private outfalls have been identified by the Responsible Agencies in the San Dieguito River WMA.

Other Non-Point Sources

Non-point sources typically flow over land and discharge to receiving waters over a broad area, as opposed to a point location. Potential non-point source discharges that may be outside the jurisdiction of the Responsible Agencies include wildlife, agriculture, transient encampments, sewage infrastructure, biofilm regrowth, and other natural sources (City of San Diego, 2009; Regional Board, 2013).

The Bacteria TMDL identifies wildlife areas, which include open space land uses and are sometimes not under the jurisdiction of Responsible Agencies, as sources of bacteria. The wildlife areas partially account for bacteria contributions from wild animals and decaying plant sources.

During wet weather, storm water runoff may carry bacteria from agricultural lands to the MS4. Per the Bacteria TMDL, bacteria carried by agricultural discharges that enter the MS4 conveyance system are considered to be controllable by the MS4s. Agricultural sites operate under a conditional discharge waiver from the Regional Board (Resolution No. R9-2007-0104), meaning that they are exempt from the discharge requirements of the current MS4 Permit (Regional Board, 2007). This waiver expired in 2014, and a new Agricultural Order is expected to go into effect in 2015. A draft tentative order detailing waste discharge requirements for commercial agricultural and nusery operations was released by the Regional Board on January 17, 2014. Under the conditional waiver, agricultural operators may form monitoring groups to monitor water quality and report monitoring results to the Regional Board. One monitoring group currently operates in the San Dieguito River WMA. The Responsible Agencies will look for opportunities to collaborate with the Regional Board and agricultural dischargers when possible and appropriate.

The Bacteria Conceptual Model (City of San Diego, 2012a) identifies transient encampments as a bacteria source that can directly discharge bacteria from human origins to receiving waters. Transient encampments are temporarily located in both municipal and open space land uses. The issues raised by transient encampments are socio-economic by nature. Addressing the sources of homelessness requires coordination with law enforcement, social services, and the legal community. Sources related to sewage infrastructure (such as sewer collection systems, sanitary sewer overflows, illicit discharges to the sewer system, and septic tanks) have also been identified by the Responsible Agencies as potential sources of bacteria. Additionally, during dry periods, bacteria can regrow within the MS4 and create biofilms (City of San Diego, 2012a). These sources may be found within the San Dieguito River WMA and are considered to be under the jurisdiction of the Responsible Agencies.

The contribution of groundwater into the MS4 through infiltration and receiving waters at areas where the groundwater table reaches surface water (rising groundwater) may also be considered a non-point source for freshwater discharges (Regional Board, 2010). During dry weather, bacteria may enter the MS4 or receiving waters through groundwater infiltration or irrigation runoff into municipal drainage channels (County of Los Angeles, 2010).

3.1.3 Locations of the Responsible Agencies' MS4s

The MS4 maps discussed in Section 2 were reviewed as part of the source identification process because the MS4 can convey bacteria from the sources discussed previously to the receiving waters. The San Dieguito River Below Lake Hodges and San Dieguito River Above Sutherland Reservoir subwatershed have a similar number of major MS4 outfalls. The San Dieguito River Above Sutherland Reservoir subwatershed has no major MS4 outfalls, which is consistent with the fact that it has the lowest percentage of urban land uses

3.1.4 IDDE Program and Dry Weather Monitoring Data

In addition to the evaluation in the LTEA, data from the IDDE program and receiving water monitoring programs were reviewed to identify persistent dry weather flows and illicit discharges by the Responsible Agencies' MS4s. Dry weather field screening, inspections, and complaint responses have been shown to be effective means of detecting and eliminating illicit discharges (San Diego County Municipal Copermittees, 2011b).

Dry Weather Field Screening and Persistent Flow

Dry weather field screening data collected as part of the MS4 Permit's transitional monitoring program were also considered on the basis of dry weather persistent flows, where available. Flow during dry weather may result from permitted, allowed, or illegal discharges. Dry weather flow provides a mechanism for transport of bacteria from facilities, areas, or activities to receiving waters.

Per the MS4 Permit Provision D.2.a.2(b)(iv),

> *"Persistent flow is defined as the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient."*

Based on a review of the MS4 outfall map in Section 2, the Responsible Agencies have identified a total of 43 major MS4 outfalls in the San Dieguito River Below Lake Hodges subwatershed and 45 major MS4 outfalls in the San Dieguito River Above Lake Hodges subwatershed. No major outfalls were identified in the San Dieguito River Above Sutherland Reservoir subwatershed. The Responsible Agencies have identified 18 major MS4 outfalls in the San Dieguito River WMA that may persistently discharge non-storm water. These outfalls are presented in Appendix D.3.

Facility Inspections

Facility inspections complement the IDDE program and include informing the public about storm water and dry weather runoff. Inspections also detect potential dry weather flows discharging from facilities. Inspections may confirm whether specific types of facilities are significant sources of bacteria. Although information is available on facility inspections based on the previous permit JURMP annual reporting requirements, the JURMP data assessment did not provide detailed information linking facility inspections to sources of bacteria. Each inspection notes which BMPs are being used and where the inspection takes place. Section 5 (Monitoring and Assessment) and Section 6 (Iterative Approach) describe how JRMP report requirements will be used to answer water quality-related questions by providing more detail on the individual inspections.

Storm Water Complaints

The Responsible Agencies have implemented regional and jurisdictional storm water telephone hotlines since the issuance of Order R9-2001-01 in 2001. Members of the public may call in complaints to the Regional Hotline (maintained by the County of San Diego) or report them online; the County of San Diego then refers the complaints to the appropriate jurisdiction for follow-up. In addition, jurisdictions respond to complaints received on their own telephone hotlines. Complaints received via the hotlines have helped Responsible Agencies identify and eliminate illicit discharges, particularly during dry weather (San Diego County Municipal Copermittees, 2011b).

As with facility inspections, storm water complaints were reported annually on the basis of the previous permit JURMP annual reporting requirements, but the JURMP data assessment did not provide detailed information linking storm water complaints and IDDE investigations to sources. Section 5 (Monitoring and Assessment) and Section 6 (Iterative Approach) describe how JURMP report requirements will be used to better report the water quality-related data associated with storm water complaints and their related follow-up IDDE investigations.

3.1.5 Summary of Bacteria Sources

Eleven known or suspected sources of bacteria were identified in the San Dieguito River WMA, as presented in Table 3-3. Bacteria sources were identified on the basis of the available information and the considerations required by the MS4 Permit.

The Bacteria TMDL states that sources of bacteria may be the same in wet and dry weather. However, while the sources are the same, the transport mechanisms are different. During wet weather, bacteria are discharged to the MS4 and then to the receiving waters via storm water runoff, which is spread over a general area and can be represented by land use. During dry weather, discharges are conveyed by means of non-storm water runoff (including illicit discharges, irrigation runoff, groundwater infiltration, and permitted discharges) associated with specific facilities, areas, or activities. Moreover, sources have different discharge potential under wet and dry conditions. For example, pollutants associated with roadways are almost certain to enter the MS4 during wet weather, but will discharge to receiving waters only under dry conditions if non-storm water flow is present. The different wet and dry weather transport mechanisms require varying strategies to address the impairment. Consequently, both wet and dry weather sources have been identified in this section, and strategies to address the different transport mechanisms are discussed in Section 4.

Sources were also categorized by land use, using the Responsible Agencies' inventory of facilities and land uses, to help develop the goals, strategies, and schedules described in Section 4.

Table 3-3 presents facilities, areas, and activities identified by the Responsible Agencies as known or suspected sources of bacteria, and typical land uses that were associated with the sources as part of the identification process.

Intentionally Left Blank

Table 3-3
Sources of Bacteria in the San Dieguito River WMA

Known or Suspected Source	Land Uses								
	Construction	Commercial	Industrial	Municipal	Residential	Parks and Recreation Areas	Open Space	Landfills	Other[1]
Facility									
Nurseries and Greenhouses	–	✓	–	✓	–	✓	–	–	✓
Eating and Drinking Establishments	–	✓	–	✓	–	✓	–	–	✓
Animal Facilities	–	✓	–	✓	–	–	–	–	✓
Area									
Residential Areas	–	–	–	–	✓	–	–	–	✓
Roads, Streets, and Parking Areas	–	✓	✓	✓	–	✓	–	–	✓
Agriculture	–	–	–	✓	✓	–	–	–	✓
Activity									
Mobile Landscaping	–	✓	–	✓	✓	✓	–	–	–

Table 3-3 (continued)
Sources of Bacteria in the San Dieguito River WMA

Known or Suspected Source	Land Uses								
	Construction	Commercial	Industrial	Municipal	Residential	Parks and Recreation Areas	Open Space	Landfills	Other[1]
Non-WURMP Identified Sources[2]									
Bacteria Regrowth and Biofilms	–	–	–	✓	–	–	–	–	✓
Transient Encampments	–	–	–	–	–	–	–	–	✓
Sanitary Sewer Overflows and Septic Systems	✓	✓	✓	✓	✓	✓	–	–	✓
Wildlife	–	–	–	✓	–	✓	✓	✓	✓

1. Other sources are those outside of the Responsible Agencies' jurisdictions and regulatory authorities; see Section 3.1.2.
2. Sources not identified in the WURMP have been categorized separately because this information has not been subject to the same regulatory review process as have the WURMP-identified sources.

3.1.6 Adequacy of Available Data

The Copermittees' monitoring and inspections programs, along with the MS4 inventory, provide sufficient data to categorize the known or suspected sources of bacteria within the San Dieguito River WMA. However, additional potential sources have been identified during the source identification that cannot be directly linked to bacteria MS4 contributions on the basis of the data available. The contributions of these potential sources to bacteria concentrations in the MS4 are unknown. Table 3-4 presents potential sources that require additional data to determine whether they are likely contributors to impairments within the San Dieguito River WMA.

Table 3-4
Potential Bacteria Sources with Data Gaps

Potential Source with Unknown Magnitude of Impact	Potential Origin of the Source	Source of Data[1]
General Industrial Facilities	Human activity	WURMP
Land Surface Erosion from Municipal, Industrial, and Hazardous Waste Sites	Human body, human activity, and natural	CLRP[2]
Motor Freight	Human body and human activity	WURMP
Offices	Human activity	WURMP
Parks and Recreation (Including Golf Courses, Cemeteries)	Human body, human activity, and natural	WURMP
Pest Control Services	Human activity	WURMP
Reclaimed Water Use	Human activity	CLRP[2]
Vehicle Storage	Human activity	WURMP

1. Potential sources in the WURMP are those classified as "unknown" by the LTEA; the WURMP source name terminology is used.
2. CLRP = Tecolote Watershed Comprehensive Load Reduction Plan (City of San Diego, 2012a).

Additionally, the following sources require further study to determine whether they may be contributing to the bacterial impairment of beneficial uses in the San Dieguito River WMA:

- Phase II MS4s' contribution of bacteria detailed in Section 3.1.2
- Non-point source contributions of bacteria detailed in Section 3.1.2
- Locations and discharge characteristics of private outfalls
- Persistent outfalls from the Responsible Agencies' transitional monitoring program (in progress)

3.2 Step 2: Prioritization of Bacteria Sources

The 2012 USEPA Recreational Water Quality Criteria guidance emphasizes fecal source type as a primary driver of risk (USEPA, 2012b). Based on the USEPA's direction and the findings of Section 3.1, bacteria sources were prioritized according to two factors: (1) the ability of the Responsible Agencies to control the source, and (2) the level of human influence. To determine whether a potential source is controllable, the following factors were considered: (1) the locations of the MS4s and potential contributing land uses during wet weather, (2) known outlets with persistent dry weather flow, and (3) jurisdictional authority.

The relative level of human influence was evaluated on the basis of the origin of the bacteria and the relationship to urban development and human activity. The levels of fecal indicator bacteria (FIB) in a waterbody can be related to recreational health risks; a non-human-impacted waterbody with high FIB densities can pose less risk for water recreation than a human-impacted waterbody with low FIB densities (Soller et al., 2010; Schoen and Ashbolt, 2010). The three categories of source origin are the human body, human activity, and natural sources. For example, sewage spills and transient encampments contribute discharges of bacteria from human sources; pets and secondary wildlife (i.e., wildlife associated with human presence and habitation) contribute other forms of bacteria as a result of human activity; and wildlife contribute bacteria in open spaces independently of human activity.

The prioritization of the known and suspected sources is described in the following subsections.

3.2.1 Source Controllability

Sources were ranked on the basis of the ability of the Responsible Agency to control the associated discharges. Controllable sources are controllable activities by humans, although in some instances (e.g., agricultural activities), Responsible Agencies have limited jurisdictional authority to regulate them. Most point sources were considered controllable, whereas many non-point sources were not. Controllable sources are those sources that are anthropogenic (i.e., influenced by humans) in origin (Regional Board, 2010).

According to the Bacteria TMDL, controllable sources of bacteria include:

- Discharges from municipal land uses
- Discharges from Caltrans
- Discharges from agricultural land uses that flow into the Responsible Agencies' MS4

Sources that are outside the Responsible Agencies' jurisdictional boundaries, non-point sources that are not considered controllable, and sources over which the Responsible Agencies do not have regulatory authority were considered to be non-controllable, including:

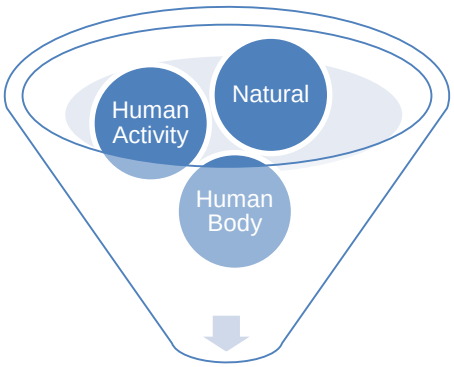
- Discharges from open space and undeveloped land
- Wildlife (except secondary wildlife)
- Bacteria bound in soil and humic material
- Other natural sources not influenced by human activity

Based on this definition, sources in the San Dieguito River WMA were categorized as follows:

- Controllable:
  - Discharge is from a municipal land use, Caltrans, or an agricultural land use; or
  - Identified land uses associated with the facility, area, or activity are within the jurisdiction of the Responsible Agencies.
- Not controllable:
  - Discharge is not from a municipal land use, Caltrans, or an agricultural land use; or
  - No identified land use associated with the facility, area, or activity is within the jurisdiction of the Responsible Agencies.

3.2.2 Level of Human Influence and Source Prioritization

The various bacteria indicators that are used to identify bacteria impairments may originate from humans, animals, or decaying plants. The characterization of sources of bacteria (*Enterococcus* and fecal coliform) based on the level of human influence followed the procedures in the Bacteria Conceptual Model developed for the San Diego County Municipal Copermittees' 2011–2012 Urban Runoff Monitoring Final Report (City of San Diego, 2012a).



Indicator Bacteria Sources

The three categories of source origin are the human body, human activity, and natural:

- Human body: Bacteria carried or shed by humans (e.g., bather shedding and sewage)

- Human activity: Sources from non-human anthropogenic origins (not from the human body, but perhaps increased by human influence or activities such as pet waste and secondary wildlife generation)
- Natural: Sources from non-human non-anthropogenic origins (independent of human influence), such as natural sources, including wildlife and natural plant decay

Sources were ranked on the basis of the category of the bacteria origin. Bacteria sources from the human body were given the highest priority; sources associated with human activity were given medium priority; and sources known or suspected to be natural in origin were given low priority.

For the San Dieguito River WMA, the final prioritization was determined as follows:

- High:
  - Source is controllable, and
  - Human body is identified as a potential origin.
- Medium:
  - Source is controllable, and
  - Human activity is identified as a potential origin.
- Low:
  - Source is not controllable, or
  - Source is controllable and natural is identified as a potential origin.

Table 3-5 presents the prioritization of identified known and suspected sources of bacteria in the San Dieguito River WMA.

Table 3-5
Prioritized Sources

Known or Suspected Source	Controllability	Potential Origin of the Source
Area–High		
Residential Areas	Controllable	Human body and human activity
Activity–High		
Sanitary Sewer Overflows and Septic Systems	Controllable	Human body and human activity
Facility-Medium		
Animal Facilities	Controllable	Human activity
Eating and Drinking Establishments	Controllable	Human activity
Nurseries and Greenhouses	Controllable	Human activity
Area-Medium		
Agriculture	Controllable[1]	Human activity
Roads, Streets, Parking	Controllable	Human activity
Activity-Medium		
Mobile Landscaping	Controllable	Human activity
Wildlife (Secondary)[2]	Controllable	Human activity
Area-Low		
Transient Encampments	Not Controllable[3]	Human body and human activity
Activity-Low		
Wildlife	Not Controllable	Natural
Bacteria Regrowth and Biofilms	Controllable[4]	Human activity and natural

1. Per the Bacteria TMDL, discharges from agricultural lands that flow into the Copermittee's MS4 are controllable.
2. Secondary wildlife comprises vermin and other wildlife species associated with human presence and habitation.
3. Transient encampments are temporarily located in both municipal and open space land uses. The issues raised by transient encampments are socio-economic by nature. Addressing the sources of homelessness requires coordination with law enforcement, social services, and the legal community. Therefore, it has been designated as an uncontrollable source.
4. Bacteria regrowth is a natural phenomenon that is hard to track or predict. The regrowth of bacteria in pipes is influenced by multiple factors, some that are under the direct control of the MS4s and some that are not.

3.3 Summary of Priority Sources by Responsible Agency

For this iteration of the Water Quality Improvement Plan, the JURMP Annual Reports were reviewed to identify the priority sources found in each of the jurisdictions within the San Dieguito River WMA. These reports are unique to each jurisdiction, and did not consistently categorize the source information in the manner presented below. Consequently, land use information provided in the JURMP Annual Reports was used to determine whether certain source types (agriculture; roads, streets, and parking; and residential sources) were found in the jurisdiction.

The priority sources in each jurisdiction are summarized by Responsible Agency in Table 3-6.

Table 3-6
Summary of Priority Sources by Responsible Agency

Source Type[1]	City of Del Mar	City of Escondido	City of Poway	City of San Diego	City of Solana Beach	County of San Diego
High Priority						
Residential Areas	✓	✓	✓	✓	✓	✓
Sanitary Sewer Overflows and/or Septic Systems	–	✓	✓	✓	–	✓
Medium Priority						
Agriculture	–	✓	✓	✓	–	✓
Animal Facilities	✓	✓	–	✓	✓	✓
Eating or Drinking Establishments	✓	✓	✓	✓	✓	✓
Mobile Landscaping	–	✓	✓	✓	–	–
Nurseries/Greenhouses	–	✓	–	✓	✓	✓
Roads, Streets, and Parking	✓	✓	✓	✓	✓	✓
Wildlife (Secondary)[2,3]	✓	✓	✓	✓	✓	✓

Table 3-6 (continued)
Summary of Priority Sources by Responsible Agency

Source Type[1]	City of Del Mar	City of Escondido	City of Poway	City of San Diego	City of Solana Beach	County of San Diego
Low Priority						
Transient Encampments	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]
Bacteria Regrowth and Biofilms[2]	✓	✓	✓	✓	✓	✓
Wildlife[2]	✓	✓	✓	✓	✓	✓

1. Agriculture, Roads, Streets, and Parking, and Residential Areas were based on land use in the San Dieguito River WMA rather than the number of identified sources.
2. Assumed to be present in all Copermittee jurisdictions.
3. Secondary wildlife comprises vermin and other wildlife species associated with human presence and habitation.
4. NA = Not available; the number of transient encampments is not currently assessed by jurisdiction because of the challenges in obtaining an accurate count of encampments, which, by definition, are temporary. A point-in-time count is prepared annually by the Regional Task Force on the Homeless, and can be found on their website (http://www.rtfhsd.org/).

Intentionally Left Blank

4 Water Quality Goals, Strategies, and Schedules

Section 2 established the highest priority water quality condition in the San Dieguito River WMA as the potential impairment of Contact Water Recreation (REC-1) beneficial uses in the Pacific Ocean Shoreline at the San Dieguito Lagoon Mouth (bacteria impairment). The potential impairments are due to *Enterococcus*, total coliform, and fecal coliform from the watershed and other localized sources (e.g., wildlife). Dry weather flows from below Lake Hodges and wet weather flows from the drainage areas above and below Lake Hodges have the potential to influence recreational beneficial use at the Pacific Ocean Shoreline.

Section 3 identified and prioritized sources and stressors potentially contributing to the bacteria impairment in the San Dieguito River WMA by jurisdiction. While the presence of the sources varies by Responsible Agency, the high priority sources likely contributing to the bacteria impairment are residential areas and sanitary sewer/septic system overflows. Medium and low priority sources include agriculture, animal facilities, transient encampments, eating or drinking establishments, mobile landscaping, nurseries/greenhouses, and roads, streets, and parking lots, as well as natural sources.

Section 4 Highlights

- Goals for the highest priority water quality conditions (Section 4.1)
- Details on the planned strategies:
  - A description of the nonstructural and structural strategies to be implemented to achieve the goals (Section 4.2). Collaborative strategies will also be highlighted to address the highest priority water quality conditions (Section 4.2.5).
  - Each Responsible Agency's strategies with an implementation Schedule (Appendix I).
- Specifics of the compliance analysis include:
  - A review of anticipated percent load reductions to demonstrate that final goals will be met by implementing the strategies (Section 4.3.1).
  - The schedule for implementation to demonstrate that interim and final goals will be achieved by implementing the strategies (Section 4.3.2).

As shown in the graphic below, the third step of Water Quality Improvement Plan development process is to identify the goals, strategies, and implementation schedules in the San Dieguito River WMA to address sources and stressors that are potentially contributing to the bacteria impairment (Provision B.3).

The following section presents the goals (Section 4.1) and strategies (Section 4.2) selected by the Responsible Agencies to address the highest priority water quality condition in the San Dieguito River WMA. An analysis to demonstrate progress toward achieving these goals through the proposed strategies and their implementation schedules is presented in Section 4.3.

4.1 Goals

Numeric goals have been developed to support Water Quality Improvement Plan implementation and are used to measure progress toward addressing the highest priority water quality conditions. Numeric goals may take a variety of forms, but are quantifiable so that progress toward and achievement of the goals are measurable. Each highest priority water quality condition may include multiple criteria or indicators. In accordance with the MS4 Permit and applicable regulatory drivers, final goals and reasonable interim goals have been developed. An interim goal is required for each five-year period from Water Quality Improvement Plan approval to the anticipated final goal compliance date (including an interim goal for this permit term).

Within the San Dieguito River WMA, the Bacteria TMDL dictates the bacteria goals for dry and wet weather to address and attain REC-1 beneficial uses. Although the Pacific Ocean Shoreline segment was removed from the 303(d) list for REC-1 impairment in 2010, calculation of the TMDL had already begun and the segment remained in the TMDL through adoption in 2011. The Pacific Ocean Shoreline segment was then incorporated into the TMDL requirements within the MS4 Permit in 2013. Therefore, the TMDL targets are required to be incorporated into the Water Quality Improvement Plan goals. Appendix H presents the Bacteria TMDL targets and a discussion of the existing condition at the shoreline. The TMDL model estimates the frequency of water quality objective (WQO) exceedances for wet weather and requires the Responsible Agencies to calculate dry weather exceedances on the basis of historical data. During wet weather, the TMDL model results estimate an almost 50 percent exceedance frequency for all indicator bacteria. Wet weather monitoring data at the shoreline are not available to confirm the model results. To calculate the existing condition for dry weather, an analysis of the available monitoring data collected between 1996 and 2002 (defined as the existing condition in the Bacteria TMDL) resulted in exceedances of WQOs between 6 percent and 17 percent for the three indicator bacteria. If monitoring data support compliance with wet and dry weather TMDL targets, the Responsible Agencies will use

the adaptive management process in Section 6 to identify new highest priority water quality conditions and to develop goals and strategies to address new priorities.

Responsible Agencies must meet the wet weather Bacteria TMDL targets within 20 years of Bacteria TMDL adoption (FY31) and dry weather targets within 10 years (FY21). Bacteria TMDL targets may be met in the receiving water (the TMDL listed segment), in MS4s discharges, by proving that the MS4 is not causing or contributing to receiving water exceedances, by demonstrating that exceedances are due to loads from natural sources, or by implementing an approved Water Quality Improvement Plan that shows that receiving water or watershed goals will be met.

To mirror TMDL compliance, Water Quality Improvement Plan numeric goals provide multiple compliance pathways within the receiving water or within the watershed. Ultimately, protection of the receiving water is the desired outcome. As discussed in Section 1, discharges from sources other than the Phase I MS4s are outside the jurisdiction and regulatory responsibility of this Water Quality Improvement Plan and may contribute to exceedances of receiving water or watershed goals. Therefore, multiple compliance pathways, including performance-based goals to assess progress on a jurisdictional basis, are included in the Water Quality Improvement Plan numeric goals.

Responsible Agencies developed goals both collaboratively and individually to best address the sources and stressors within the WMA and individual jurisdictions. An individualized approach provides flexibility in selecting interim goals on the basis of jurisdiction-specific strategies and schedules. It also provides the framework for a more accurate assessment of progress toward achieving goals within each jurisdiction. Both performance-based goals and goals based on TMDL targets are included.

Performance-based goals are included to measure the short-term individual progress toward achieving goals given that sustained water quality improvement is typically demonstrated over a longer timeframe. Performance measures are intended to measure an outcome from a strategy or suite of strategies that provide an interim link to reasonable incremental progress in the quality of MS4 discharges and receiving waters by FY18. The strategies or suite of strategies presented have been selected as goals because they are measurable and provide a direct benefit in the short term. Section 4.2 and the associated appendices present the full suite of strategies that will be considered for implementation. Section 4.3 presents the anticipated schedule for implementation and the associated load reduction benefit estimated through implementation of the suite of strategies.

Appendix H presents the Bacteria TMDL numeric targets and provides the basis for the Water Quality Improvement Plan numeric goals. The following sections present final and interim numeric goals by jurisdiction.

4.1.1 City of Del Mar Goals

The City of Del Mar Water Quality Improvement Plan interim and final goals for wet and dry weather are presented in Tables 4-1 and 4-2, respectively. Water Quality Improvement Plan interim goals identified for each five-year assessment period not required by the Bacteria TMDL have been estimated, considering the planning and assessment efforts described in the strategies and schedules discussion (Sections 4.2 and 4.3). In addition to goals based on TMDL targets, which demonstrate sustained water quality improvement over longer periods of time, performance-based goals were selected to measure short-term individual progress toward achieving goals during the current permit cycle.

Strategies that the City of Del Mar will use to achieve the numeric goals are presented in Section 4.2 and include the programs specifically identified in the performance-based goals and associated metrics.

Table 4-1
Wet Weather Numeric Goals for the City of Del Mar

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	43% Days Exceeding WQO (2002 TMDL Model)	See performance measures	43%[2]	33%	25%	22%
	Enterococcus	49% Days Exceeding WQO (2002 TMDL Model)		49%[2]	36%	26%	22%
	Total coliform	43% Days Exceeding WQO (2002 TMDL Model)		43%[2]	33%	25%	22%
OR							
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 wet weather data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	See performance measures	22%	22%	22%	22%
	Enterococcus			22%	22%	22%	22%
	Total coliform			22%	22%	22%	22%
OR							
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	0.5%	0.7%	1.0%	1.5%
	Enterococcus			2.5%	3.9%	6.0%	7.7%
	Total coliform			1.2%	2.2%	3.2%	4.3%

Table 4-1 (continued)
Wet Weather Numeric Goals for the City of Del Mar

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
OR							
# of Direct or Indirect MS4 Discharges to Receiving Water	Discharges	Number of flowing major MS4 outfalls during wet weather monitoring (Section 5.1 of this Water Quality Improvement Plan).	See performance measures	0	0	0	0
OR							
% of Exceedances of Final Receiving Water WQOs Due to Natural Sources[3]	Fecal coliform	Unknown at this time. A detailed source study that differentiates between human and non-human sources would be needed to establish the baseline.	100%	100%	100%	100%	100%
	Enterococcus		100%	100%	100%	100%	100%
	Total coliform		100%	100%	100%	100%	100%
OR							
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Interim compliance is implementation of strategies and schedule (presented in Appendix I) based on analysis results. Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 4.3.2 for compliance analysis results.					

Table 4-1 (continued)
Wet Weather Numeric Goals for the City of Del Mar

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year
		Current Permit Term (FY14 – FY18)
PERFORMANCE MEASURES		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Reduce anthropogenic surface dry weather flows[4] to address bacteria regrowth contributing during wet weather	Historical anthropogenic surface dry weather flow[4] data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	10% reduction in anthropogenic surface dry weather flows[4]

1. Denotes TMDL interim and final WQBEL.
2. Denotes existing wet weather frequency as modeled in the Bacteria TMDL. With limited baseline monitoring data available, this goal reflects a reasonable estimate considering the difficulty in demonstrating progress within the receiving water during wet weather in a short amount of time. Furthermore, development and redevelopment of the urban environment has occurred since the Bacteria TMDL baseline loads were calculated in 2001. As such, this goal demonstrates that progress has been made by the Responsible Agencies by maintaining the existing wet weather exceedance frequency.
3. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
4. The term “dry weather flows” excludes groundwater, other exempt or permitted non-storm water flows, and sanitary sewer overflows.

% = percent; FY = fiscal year; WQO = Water Quality Objective
All numeric goals are cumulative from the baseline assessment for each fiscal year.

Intentionally Left Blank

Table 4-2
Dry Weather Numeric Goals for the City of Del Mar

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year		
			Current Permit Term (FY14-FY18)	FY 16-20	FY 21-25
			FY18	FY19[1]	FY21[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	11% Days Exceeding WQO (2002[2])	See performance measures	5.5%	0%
	Enterococcus	17% Days Exceeding WQO (2002[2])		8.5%	0%
	Total coliform	6% Days Exceeding WQO (2002[2])		3%	0%
OR					
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 dry weather data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	See performance measures	0%	0%
	Enterococcus			0%	0%
	Total coliform			0%	0%
OR					
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	10.4%	20.7%
	Enterococcus			41.7%	83.5%
	Total coliform			7.2%	14.4%
OR					
# of Direct or Indirect MS4 Discharges to Receiving Water	Discharges	Number of persistently flowing major MS4 outfalls provided in Section 5.1 of the Monitoring and Assessment Program of this Water Quality Improvement Plan.	See performance measures	0	0

Table 4-2 (continued)
Dry Weather Numeric Goals for the City of Del Mar

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year		
			Current Permit Term (FY14-FY18)	FY 16-20	FY 21-25
			FY18	FY19[1]	FY21[1]
OR					
% of Exceedances of Final Receiving Water WQOs Due to Natural Sources[3]	Fecal coliform	Unknown at this time. A detailed source study that differentiates between human and non-human sources would be needed to establish the baseline.	100%	100%	100%
	Enterococcus		100%	100%	100%
	Total coliform		100%	100%	100%
OR					
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Interim compliance is implementation of strategies and schedule (presented in Appendix I) based on analysis results. Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 4.3.2 for compliance analysis results.			

Table 4-2 (continued)
Dry Weather Numeric Goals for the City of Del Mar

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year
		Current Permit Term (FY14-FY18)
PERFORMANCE MEASURES		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Reduce anthropogenic surface dry weather flows[4]	Historical anthropogenic surface dry weather flow4 data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	Reduce anthropogenic surface dry weather water flows[4] by 10%

1. Denotes TMDL interim and final WQBEL.
2. The existing exceedance frequency was calculated on the basis of available monitoring data between 1996 and 2002 per MS4 Permit requirements and presented in more detail in Appendix H.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
4. The term “dry weather flows” excludes groundwater, other exempt or permitted non-storm water flows, and sanitary sewer overflows.

All numeric goals are cumulative from the baseline assessment for each fiscal year.

Intentionally Left Blank

4.1.2 City of Escondido Goals

The City of Escondido Water Quality Improvement Plan interim and final goals for wet and dry weather are presented in Tables 4-3 and 4-4, respectively. Water Quality Improvement Plan interim goals identified for each five-year assessment period not required by the Bacteria TMDL have been estimated considering the planning and assessment efforts described in the strategies and schedules discussion (Sections 4.2 and 4.3). In addition to goals based on TMDL targets, which demonstrate sustained water quality improvement over longer periods of time, performance-based goals were selected to measure short-term individual progress toward achieving goals during the current permit cycle. The City of Escondido's jurisdiction is wholly above Lake Hodges. Because there is little connectivity between Lake Hodges and the highest priority water quality condition at the beach during dry weather, the dry weather Bacteria TMDL targets have not been included as Water Quality Implementation Plan goals (see Section 2.4 for a discussion on the determination of the highest priority water quality condition). However, the City of Escondido has developed dry weather performance measures and associated strategies to focus on the elimination of prohibited dry weather flows. Strategies focusing on dry weather flows have multiple benefits and reduce all pollutants, including bacteria and nutrients, to Lake Hodges.

Strategies that the City of Escondido will use to achieve the numeric goals are presented in Section 4.2 and include the programs specifically identified in the performance-based goals and associated metrics.

Intentionally Left Blank

Table 4-3
Wet Weather Numeric Goals for the City of Escondido

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	43% Days Exceeding WQO (2002 TMDL Model)	See performance measures	43%[2]	33%	25%	22%
	Enterococcus	49% Days Exceeding WQO (2002 TMDL Model)		49%[2]	36%	26%	22%
	Total coliform	43% Days Exceeding WQO (2002 TMDL Model)		43%[2]	33%	25%	22%
OR							
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 wet weather data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	See performance measures	22%	22%	22%	22%
	Enterococcus			22%	22%	22%	22%
	Total coliform			22%	22%	22%	22%
OR							
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	0.5%	0.7%	1.0%	1.5%
	Enterococcus			2.5%	3.9%	6.0%	7.7%
	Total coliform			1.2%	2.2%	3.2%	4.3%

Table 4-3 (continued)
Wet Weather Numeric Goals for the City of Escondido

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
OR							
# of Direct or Indirect MS4 Discharges to Receiving Water	Discharges	Number of flowing major MS4 outfalls during wet weather monitoring (Section 5.1 of this Water Quality Improvement Plan).	See performance measures	0	0	0	0
OR							
% of Exceedances of Final Receiving Water WQOs Due to Natural Sources[3]	Fecal coliform	Unknown at this time. A detailed source study that differentiates between human and non-human sources would be needed to establish the baseline.	100%	100%	100%	100%	100%
	Enterococcus		100%	100%	100%	100%	100%
	Total coliform		100%	100%	100%	100%	100%
OR							
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Interim compliance is implementation of strategies and schedule (presented in Appendix I) based on analysis results. Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 4.3.2 for compliance analysis results.					

Table 4-3 (continued)
Wet Weather Numeric Goals for the City of Escondido

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year
		Current Permit Term (FY14 – FY18)
PERFORMANCE MEASURES		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Implement and maintain water quality improvement BMPs to target fecal coliform, *Enterococcus*, total coliform, sediment, and nutrients	N/A	4 acres of drainage area treated through restoration of 1 sediment detention basin in a multiuse treatment area at Eagle Scout (formerly Sand) Lake, Kit Carson Park

1. Denotes TMDL interim and final WQBEL.
2. Denotes existing wet weather frequency as modeled in the Bacteria TMDL. With limited baseline monitoring data available, this goal reflects a reasonable estimate considering the difficulty in demonstrating progress within the receiving water during wet weather in a short amount of time. Furthermore, development and redevelopment of the urban environment has occurred since the Bacteria TMDL baseline loads were calculated in 2001. As such, this goal demonstrates that progress has been made by the Responsible Agencies by maintaining the existing wet weather exceedance frequency.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

All numeric goals are cumulative from the baseline assessment for each fiscal year.

Intentionally Left Blank

Table 4-4
Dry Weather Numeric Goals for the City of Escondido

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year
		Current Permit Term (FY14-FY18)
PERFORMANCE MEASURES		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Reduce dry weather flow in priority drainage area with persistent flow by performing special strategies, including property-based inspections for residents and commercial areas	Historical dry weather flow data will be used to establish a baseline in the first Water Quality Improvement Plan Annual Report.	10% flow reduction at priority outfall (HDG_102)

Intentionally Left Blank

4.1.3 City of Poway Goals

The City of Poway Water Quality Improvement Plan interim and final goals for wet and dry weather are presented in Tables 4-5 and 4-6, respectively. Water Quality Improvement Plan interim goals identified for each five-year assessment period not required by the Bacteria TMDL have been estimated considering the planning and assessment efforts described in the strategies and schedules discussion (Sections 4.2 and 4.3). In addition to goals based on TMDL targets, which demonstrate sustained water quality improvement over longer periods of time, performance-based goals were selected to measure short-term individual progress toward achieving goals during the current permit cycle. The City of Poway's jurisdiction is wholly above Lake Hodges. Because there is little connectivity between Lake Hodges and the highest priority water quality condition at the beach during dry weather, the dry weather Bacteria TMDL targets have not been included as Water Quality Implementation Plan goals (see Section 2.4 for a discussion on the determination of the highest priority water quality condition). However, the City of Poway has developed dry weather performance measures and associated strategies to focus on the elimination of prohibited dry weather flows. Strategies focusing on dry weather flows have multiple benefits and reduce all pollutants, including bacteria and nutrients, to Lake Hodges.

Strategies that the City of Poway will use to achieve the numeric goals are presented in Section 4.2 and include the programs specifically identified in the performance-based goals and associated metrics.

Intentionally Left Blank

Table 4-5
Wet Weather Numeric Goals for the City of Poway

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	43% Days Exceeding WQO (2002 TMDL Model)	See performance measures	43%[2]	33%	25%	22%
	Enterococcus	49% Days Exceeding WQO (2002 TMDL Model)		49%[2]	36%	26%	22%
	Total coliform	43% Days Exceeding WQO (2002 TMDL Model)		43%[2]	33%	25%	22%
OR							
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 wet weather data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	See performance measures	22%	22%	22%	22%
	Enterococcus			22%	22%	22%	22%
	Total coliform			22%	22%	22%	22%
OR							
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	0.5%	0.7%	1.0%	1.5%
	Enterococcus			2.5%	3.9%	6.0%	7.7%
	Total coliform			1.2%	2.2%	3.2%	4.3%
OR							
# of Direct or Indirect MS4 Discharges to Receiving Water	Discharges	Number of flowing major MS4 outfalls during wet weather monitoring (Section 5.1 of this Water Quality Improvement Plan).	See performance measures	0	0	0	0

Table 4-5 (continued)
Wet Weather Numeric Goals for the City of Poway

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
OR							
% of Exceedances of Final Receiving Water WQOs Due to Natural Sources[3]	Fecal coliform	Unknown at this time. A detailed source study that differentiates between human and non-human sources would be needed to establish the baseline.	100%	100%	100%	100%	100%
	Enterococcus		100%	100%	100%	100%	100%
	Total coliform		100%	100%	100%	100%	100%
OR							
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Interim compliance is implementation of strategies and schedule (presented in Appendix I) based on analysis results. Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 4.3.2 for compliance analysis results.					

1. Denotes TMDL interim and final WQBEL.
2. Denotes existing wet weather frequency as modeled in the Bacteria TMDL. With limited baseline monitoring data available, this goal reflects a reasonable estimate considering the difficulty in demonstrating progress within the receiving water during wet weather in a short amount of time. Furthermore, development and redevelopment of the urban environment has occurred since the Bacteria TMDL baseline loads were calculated in 2001. As such, this goal demonstrates that progress has been made by the Responsible Agencies by maintaining the existing wet weather exceedance frequency.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

All numeric goals are cumulative from the baseline assessment for each fiscal year.

Table 4-6
Dry Weather Numeric Goals for the City of Poway

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year
		Current Permit Term (FY14-FY18)
PERFORMANCE MEASURES		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Turf conversion	The baseline of the square footage of turf converted will be identified in the first Water Quality Improvement Plan Annual Report.	5% increase from the baseline through turf conversion

Intentionally Left Blank

4.1.4 City of San Diego Goals

The City of San Diego Water Quality Improvement Plan interim and final goals for wet and dry weather are presented in Table 4-7 and 4-8, respectively. Water Quality Improvement Plan interim goals identified for each five-year assessment period not required by the Bacteria TMDL have been estimated considering the planning and assessment efforts described in the strategies and schedules discussion (Sections 4.2 and 4.3). In addition to goals based on TMDL targets, which demonstrate sustained water quality improvement over longer periods of time, performance-based goals were selected to measure short-term individual progress toward achieving goals during the current permit cycle. The City of San Diego's jurisdiction is both above and below Lake Hodges. Because there is little connectivity between Lake Hodges and the highest priority water quality condition at the beach during dry weather, the dry weather Bacteria TMDL targets have not been included as Water Quality Improvement Plan goals above Lake Hodges. However, the City of San Diego has developed dry weather performance measures and associated strategies below and above Lake Hodges to focus on citywide elimination of prohibited dry weather flows. Strategies focusing on dry weather flows have multiple benefits and reduce all pollutants, including bacteria and nutrients, to Lake Hodges.

Strategies that the City of San Diego will use to achieve the numeric goals are presented in Section 4.2 and include the programs specifically identified in the performance-based goals and associated metrics.

Intentionally Left Blank

Table 4-7
Wet Weather Numeric Goals for the City of San Diego

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	43% Days Exceeding WQO (2002 TMDL Model)	See performance measures	43%[2]	33%	25%	22%
	Enterococcus	49% Days Exceeding WQO (2002 TMDL Model)		49%[2]	36%	26%	22%
	Total coliform	43% Days Exceeding WQO (2002 TMDL Model)		43%[2]	33%	25%	22%
OR							
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 wet weather data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	See performance measures	22%	22%	22%	22%
	Enterococcus			22%	22%	22%	22%
	Total coliform			22%	22%	22%	22%
OR							
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	0.5%	0.7%	1.0%	1.5%
	Enterococcus			2.5%	3.9%	6.0%	7.7%
	Total coliform			1.2%	2.2%	3.2%	4.3%
OR							
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Interim compliance is implementation of strategies and schedule (presented in Appendix I) based on analysis results. Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 4.3.2 for compliance analysis results.					

Table 4-7 (continued)
Wet Weather Numeric Goals for the City of San Diego

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
OR							
# of Direct or Indirect MS4 Discharges to Receiving Water	Discharges	Number of flowing major MS4 outfalls during wet weather monitoring (Section 5 of this Water Quality Improvement Plan).	See performance measures	0	0	0	0
OR							
% of Exceedances of Final Receiving Water WQOs Due to Natural Sources[3]	Fecal coliform	Unknown at this time. A detailed source study that differentiates between human and non-human sources would be needed to establish the baseline.	100%	100%	100%	100%	100%
	Enterococcus		100%	100%	100%	100%	100%
	Total coliform		100%	100%	100%	100%	100%

Table 4-7 (continued)
Wet Weather Numeric Goals for the City of San Diego

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year
		Current Permit Term (FY14 – FY18)
PERFORMANCE MEASURES		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Develop a green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality during wet and dry weather	0 acres treated in 2002, the year used as baseline in the Bacteria TMDL	10.6 acres of drainage area treated through construction of 2 green infrastructure BMPs[4]

1. Denotes TMDL interim and final WQBEL.
2. Denotes existing wet weather frequency as modeled in the Bacteria TMDL. With limited baseline monitoring data available, this goal reflects a reasonable estimate considering the difficulty in demonstrating progress within the receiving water during wet weather in a short amount of time. Furthermore, development and redevelopment of the urban environment has occurred since the Bacteria TMDL baseline loads were calculated in 2001. As such, this goal demonstrates that progress has been made by the Responsible Agencies by maintaining the existing wet weather exceedance frequency.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
4. The 10.6 acres of drainage area treated are associated with 2 GI projects that will be completed by FY18.

All numeric goals are cumulative from the baseline assessment for each fiscal year.

Intentionally Left Blank

Table 4-8
Dry Weather Numeric Goals for the City of San Diego

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year		
			Current Permit Term (FY14-FY18)	FY 16-20	FY 21-25
			FY18	FY19[1]	FY21[1]
BACTERIA TMDL GOALS (Applicable Below Lake Hodges)					
Receiving Water % Days Exceeding WQO	Fecal coliform	11% Days Exceeding WQO (2002[2])	See performance measures	5.5%	0%
	Enterococcus	17% Days Exceeding WQO (2002[2])		8.5%	0%
	Total coliform	6% Days Exceeding WQO (2002[2])		3%	0%
OR					
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 dry weather data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	See performance measures	0%	0%
	Enterococcus			0%	0%
	Total coliform			0%	0%
OR					
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	10.4%	20.7%
	Enterococcus			41.7%	83.5%
	Total coliform			7.2%	14.4%

Table 4-8 (continued)
Dry Weather Numeric Goals for the City of San Diego

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year		
			Current Permit Term (FY14-FY18)	FY 16-20	FY 21-25
			FY18	FY19[1]	FY21[1]
BACTERIA TMDL GOALS (Applicable Below Lake Hodges)					
OR					
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Compliance is based on implementation of strategies listed in Appendix I. See Section 4.3.2 for analysis results.			
OR					
# of Direct or Indirect MS4 Discharges to Receiving Water	Fecal coliform	Number of persistently flowing major MS4 outfalls provided in Section 5.1 of the Monitoring and Assessment Program of this Water Quality Improvement Plan.	See performance measures	0	0
	Enterococcus				
	Total coliform				
OR					
% of Exceedances of Final Receiving Water WQOs Due to Natural Sources[3]	Fecal coliform	Unknown at this time. A detailed source study that differentiates between human and non-human sources would be needed to establish the baseline.	100%	100%	100%
	Enterococcus		100%	100%	100%
	Total coliform		100%	100%	100%

Table 4-8 (continued)
Dry Weather Numeric Goals for the City of San Diego

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year Current Permit Term (FY14-FY18)
PERFORMANCE MEASURES (Applicable Below and Above Lake Hodges)		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Develop a green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality during wet and dry weather	0 acres treated in 2002, the year used as baseline in the Bacteria TMDL	10.6 acres of drainage area treated through construction of 2 green infrastructure BMPs[4]
Implement runoff reduction programs such as education and outreach, enhanced inspections, rebates[5], and increased enforcement	Historical dry weather monitoring data will be used to establish a baseline in the first Water Quality Improvement Plan Annual Report.	10% reduction in prohibited[6] dry weather flow from baseline measured at persistently flowing outfalls in the WMA

1. Denotes TMDL interim and WQBEL.
2. The existing exceedance frequency was calculated on the basis of available monitoring data between 1996 and 2002 per MS4 Permit requirements and presented in more detail in Appendix H.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
4. The 10.6 acres of drainage area treated are associated with 2 GI projects that will be completed by FY18.
5. City of San Diego rebates include grass replacement, rainwater harvesting, downspout disconnect, and micro-irrigation.
6. Does not include allowable discharges as defined in Provision A and Provision E.2.a of the MS4 Permit.

All numeric goals are cumulative from the baseline assessment for each fiscal year.

Intentionally Left Blank

4.1.5 City of Solana Beach Goals

The City of Solana Beach Water Quality Improvement Plan interim and final goals for wet and dry weather are presented in Table 4-9 and 4-10, respectively. Water Quality Improvement Plan interim goals identified for each five-year assessment period not required by the Bacteria TMDL have been estimated considering the planning and assessment efforts described in the strategies and schedules discussion (Sections 4.2 and 4.3). In addition to goals based on TMDL targets, which demonstrate sustained water quality improvement over longer periods of time, performance-based goals were selected to measure short-term individual progress toward achieving goals during the current permit cycle. Strategies that the City of Solana Beach will use to achieve the numeric goals are presented in Section 4.2 and include the programs specifically identified in the performance-based goals and associated metrics.

Intentionally Left Blank

Table 4-9
Wet Weather Numeric Goals for the City of Solana Beach

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	43% Days Exceeding WQO (2002 TMDL Model)	See performance measures	43%[2]	33%	25%	22%
	Enterococcus	49% Days Exceeding WQO (2002 TMDL Model)		49%[2]	36%	26%	22%
	Total coliform	43% Days Exceeding WQO (2002 TMDL Model)		43%[2]	33%	25%	22%
OR							
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 wet weather data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	See performance measures	22%	22%	22%	22%
	Enterococcus			22%	22%	22%	22%
	Total coliform			22%	22%	22%	22%
OR							
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	0.5%	0.7%	1.0%	1.5%
	Enterococcus			2.5%	3.9%	6.0%	7.7%
	Total coliform			1.2%	2.2%	3.2%	4.3%
OR							
# of Direct or Indirect MS4 Discharges to Receiving Water	Discharges	Number of flowing major MS4 outfalls during wet weather monitoring (Section 5.1 of this Water Quality Improvement Plan).	See performance measures	0	0	0	0

Table 4-9 (continued)
Wet Weather Numeric Goals for the City of Solana Beach

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[1]	FY29	FY31[1]
OR							
% of Exceedances of Final Receiving Water WQOs Due to Natural Sources[3]	Fecal coliform	Unknown at this time. A detailed source study that differentiates between human and non-human sources would be needed to establish the baseline.	100%	100%	100%	100%	100%
	Enterococcus		100%	100%	100%	100%	100%
	Total coliform		100%	100%	100%	100%	100%
OR							
MS4 Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is MS4 discharge % load reduction (above). Interim compliance is implementation of strategies and schedule based (presented in Appendix I) on analysis results. Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 4.3.2 for compliance analysis results.					

Table 4-9 (continued)
Wet Weather Numeric Goals for the City of Solana Beach

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year
		Current Permit Term (FY14 – FY18)
PERFORMANCE MEASURES		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Design and install diverters at high priority outfalls to treat first flush and low flows	2002, the baseline for the Bacteria TMDL model	40.5 acres of low flows directed to sanitary sewer through construction of 1 diverter at high priority outfall Seascape Sur
Design and construct curb cuts to redirect water from traditional drainage areas to permeable surfaces	2002, the baseline for the Bacteria TMDL model	8 acres of drainage area treated through curb cuts along Highway 101

1. Denotes TMDL interim and final WQBEL.
2. Denotes existing wet weather frequency as modeled in the Bacteria TMDL. With limited baseline monitoring data available, this goal reflects a reasonable estimate considering the difficulty in demonstrating progress within the receiving water during wet weather in a short amount of time. Furthermore, development and redevelopment of the urban environment has occurred since the Bacteria TMDL baseline loads were calculated in 2001. As such, this goal demonstrates that progress has been made by the Responsible Agencies by maintaining the existing wet weather exceedance frequency.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

All numeric goals are cumulative from the baseline assessment for each fiscal year.

Intentionally Left Blank

Table 4-10
Dry Weather Numeric Goals for the City of Solana Beach

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year		
			Current Permit Term (FY14-FY18)	FY 16-20	FY 21-25
			FY18	FY19[1]	FY21[1]
Receiving Water % Days Exceeding WQO	Fecal coliform	11% Days Exceeding WQO (2002[2])	See performance measures	5.5%	0%
	Enterococcus	17% Days Exceeding WQO (2002[2])		8.5%	0%
	Total coliform	6% Days Exceeding WQO (2002[2])		3%	0%
OR					
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 dry weather data will be used to identify the baseline in the first Water Quality Improvement Plan Annual Report.	See performance measures	0%	0%
	Enterococcus			0%	0%
	Total coliform			0%	0%
OR					
MS4 Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	10.4%	20.7%
	Enterococcus			41.7%	83.5%
	Total coliform			7.2%	14.4%

Table 4-10 (continued)
Dry Weather Numeric Goals for the City of Solana Beach

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year		
			Current Permit Term (FY14-FY18)	FY 16-20	FY 21-25
			FY18	FY19[1]	FY21[1]
OR					
# of Direct or Indirect MS4 Discharges to Receiving Water	Discharges	Number of persistently flowing major MS4 outfalls provided in Section 5.1 of the Monitoring and Assessment Program of this Water Quality Improvement Plan.	See performance measures	0	0
OR					
% of Exceedances of Final Receiving Water WQOs Due to Natural Sources[3]	Fecal coliform	Unknown at this time. A detailed source study that differentiates between human and non-human sources would be needed to establish the baseline.	100%	100%	100%
	Enterococcus		100%	100%	100%
	Total coliform		100%	100%	100%

Table 4-10 (continued)
Dry Weather Numeric Goals for the City of Solana Beach

Compliance Pathways	Baseline	Goals by Assessment Period and Fiscal Year
		Current Permit Term (FY14-FY18)
PERFORMANCE MEASURES		
Suite of Strategies to Measure Performance During First Permit Term	**Baseline**	**FY18**
Design and install diverters at high priority outfalls to treat first flush and low flows	2002, the baseline for the Bacteria TMDL model	40.5 acres of low flows directed to sanitary sewer through construction of 1 diverter at high priority outfall Seascape Sur
Design and construct curb cuts to redirect water from traditional drainage areas to permeable surfaces	2002, the baseline for the Bacteria TMDL model	8 acres of drainage area treated through curb cuts along Highway 101

1. Denotes TMDL interim and final WQBEL.
2. The existing exceedance frequency was calculated on the basis of available monitoring data between 1996 and 2002 per MS4 Permit requirements and presented in more detail in Appendix H.
3. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

All numeric goals are cumulative from the baseline assessment for each fiscal year.

Intentionally Left Blank

4.1.6 County of San Diego San Dieguito Watershed Goals

The County of San Diego Water Quality Improvement Plan interim and final goals for wet and dry weather are presented in Table 4-11 and Table 4-12, respectively. The County of San Diego developed wet weather goals to address the highest priority water quality condition of bacteria below Sutherland Reservoir in the San Dieguito River WMA. One of the compliance options for the TMDL requires a 7.7 percent reduction of the bacteria load from storm drain outfalls discharging to receiving water by 2031. Half of the load reduction, approximately 4 percent, is required by the interim TMDL target date. Because programmatic approaches are estimated to reduce bacteria loads by 10 percent, additional structural controls may not be necessary for compliance.

The programmatic approach involves reducing bacteria loads from storm drain outfalls. The metric established is the implementation of the storm water program, resulting in an estimated 10 percent reduction of the bacteria loads needed to meet compliance. Baseline loads will be determined during FY15-16. The load reduction is anticipated to take place incrementally by permit term, with a 2 percent reduction during the second permit term, a 2 percent reduction during the third permit term, and a 3.7 percent reduction during the fourth permit term. If the modeled reductions are not confirmed by monitoring, then program adjustments will be made according to the adaptive management process. This step may require incorporation of more effective strategies, program design changes, or incorporation of additional structural BMPs if funding is available.

The County of San Diego has established dry weather numeric goals for the highest priority water quality condition of bacteria below Lake Hodges in the San Dieguito River WMA. To comply with one of compliance pathways for the Bacteria TMDL, anthropogenic dry weather discharges from storm drain outfalls to the receiving water must be effectively eliminated. Throughout the implementation of the Water Quality Improvement Plan, adaptive management will be used to evaluate reasonable progress toward the numeric goals and to consider changes to program design and project implementation, as needed, to meet goals and as funding becomes available. This adaptive management process will be further described in the final Water Quality Improvement Plan.

The County of San Diego dry weather goal was established to reduce dry weather flow in storm drains to effectively eliminate anthropogenic discharge, to reduce pollutant loading to waterbodies during dry weather. This goal will be accomplished by implementing numerous JRMP strategies to reduce dry weather runoff, as described in the County of San Diego JRMP and discussed in Section 4.2.4.6.

Using these strategies, the County will target reducing the number of persistently flowing outfalls by 20 percent by 2018. Alternatively, the County may demonstrate a 20 percent decrease in the aggregate flow of the MS4 outfalls by 2018. A baseline volume of flow would be established during FY15-16 through monitoring of flow measurements. Efforts will be adaptively managed to mitigate dry weather flows and consider small-scale structural controls as needed during the second MS4 Permit term. For the final TMDL compliance goal, scheduled for April 2021, the overall goal is no discharges from the County of San Diego's storm drain outfalls to the receiving water, as demonstrated through the storm drain outfall monitoring program.

Table 4-11
Wet Weather Numeric Goals for the County of San Diego

Wet Weather Multi-Benefit Numeric Goals for Highest Priority Water Quality Condition – Bacteria (Below Sutherland Reservoir)							
Title	Metric	Baseline	Outcome	1st Permit Term 2013 – 2018	2nd Permit Term 2018 – 2023	3rd Permit Term 2023 – 2028	4th Permit Term 2028 – 2033
						Meet TMDL Interim Compliance Date April 4, 2028 [1,2]	Meet TMDL Final Compliance Date April 4, 2031
Implement Water Quality Improvement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness	% bacterial load reduction	TBD in FY15-16 in most probable number (MPN)/year from TMDL model	Reduce baseline bacteria loads by 7.7% from storm drain outfalls to meet TMDL required load reductions	Implement programmatic (nonstructural) BMPs to achieve source reduction of bacteria loads from the storm drain outfalls	Reduce bacteria loads by 2% from the storm drain outfalls through continued implementation of programmatic BMPs and, based on adaptive management, focus and enhance efforts where needed	Reduce bacteria loads by an additional 2% (total 4%) from the storm drain outfalls by continued implementation of programmatic BMPs	Reduce bacteria loads by an additional 3.7 % (total 7.7%) from the storm drain outfalls by continued implementation of programmatic BMPs

Table 4-11 (continued)
Wet Weather Numeric Goals for the County of San Diego

Wet Weather Multi-Benefit Numeric Goals for Highest Priority Water Quality Condition – Bacteria (Below Sutherland Reservoir)							
Title	Metric	Baseline	Outcome	1st Permit Term 2013 – 2018	2nd Permit Term 2018 – 2023	3rd Permit Term 2023 – 2028	4th Permit Term 2028 – 2033
						Meet TMDL Interim Compliance Date April 4, 2028 [1,2]	Meet TMDL Final Compliance Date April 4, 2031
Structural BMPs (Optional: as needed and as funding is available)	% bacterial load reduction	TBD in FY15-16 in MPN/year from TMDL model	Reduce baseline bacteria loads from storm drain outfalls to receiving water if needed to meet TMDL required load reduction	Reduce by TBD in FY15-16 % bacteria load from distributed BMPs constructed between 2003 and 2009 during redevelopment	Assess reduction achieved by programmatic BMPs. If needed, reduce bacteria loads through implementation of structural BMPs or through participation in the public-private partnership program and redevelopment	Assess reduction achieved by programmatic BMPs. If needed, reduce bacteria loads through implementation of structural BMPs or through participation in the public-private partnership program and redevelopment	Assess reduction achieved by programmatic BMPs. If needed, reduce bacteria loads through implementation of structural BMPs or through participation in the public-private partnership program and redevelopment

Notes:
1. Request moving Interim TMDL Compliance Date from April 4, 2021 (per MS4 Permit Attachment E, 6.c(1)) to April 4, 2028 to allow adequate time to monitor progress through the adaptive management process of the Water Quality Improvement Plan.
2. Progress toward final goals will be monitored and if implemented BMPs are not enough to meet compliance, then through the adaptive management process of the Water Quality Improvement Plan, more effective and/or additional BMPs will be implemented. The County of San Diego is concerned that a funding source to construct, operate, and maintain structural controls is not identified, if needed to meet compliance.

Table 4-12
Dry Weather Numeric Goals for the County of San Diego

Dry Weather Multi-Benefit Numeric Goals for Highest Priority Water Quality Condition – Bacteria (Below Lake Hodges)						
Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 – 2018	2nd Permit Term Numeric Goals 2018 – 2023	
					TMDL Interim Compliance Date April 4, 2020 [2]	TMDL Final Compliance Date April 4, 2021
Eliminate anthropogenic dry weather flows [1] from storm drain outfalls	% reduction of flow volume or number of outfalls with flows mitigated from persistently flowing storm drain outfalls	To be established during FY15-16 using dry weather flow measurements	Effectively eliminate anthropogenic dry weather flow from storm drain outfalls to receiving water	Reduce by 20% the aggregate flow volume or the number of persistently flowing outfalls during dry weather	Reduce by 75% the aggregate flow volume or the number of persistently flowing outfalls during dry weather	Effectively eliminate anthropogenic dry weather discharges from storm drain outfalls to the receiving water

Notes:
1. Here and throughout this table, the term “dry weather flows” excludes groundwater, other exempt or permitted non-storm water flows, and sanitary sewer overflows.
2. Request moving Interim TMDL Compliance Date from April 4, 2017 (per MS4 Permit Attachment E, 6.c(1)) to April 4, 2020, to allow adequate time to investigate and mitigate dry weather flows through the adaptive management process of the Water Quality Improvement Plan.

Intentionally Left Blank

4.2 Strategies

The Responsible Agencies are tasked with identifying water quality improvement strategies that may be implemented to address the highest priority water quality condition. The strategies were selected on the basis of their ability to effectively and efficiently eliminate non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the MEP, and achieve the interim and final numeric goals identified in Section 4.1. A brief description of the strategy selection process is provided in Section 4.2.1. A general discussion of nonstructural strategies, such as MS4 maintenance and street sweeping, administrative policies, enforcement of municipal ordinances, education and outreach programs, rebate and incentive programs, and collaboration with WMA partners, is presented in Section 4.2.2. Structural strategies are those strategies that can improve water quality by removing pollutants through filtration and infiltration and are introduced in Section 4.2.3. A description of example nonstructural and structural strategies selected by each Responsible Agency to target the highest priority water quality condition by jurisdiction is presented in Section 4.2.4. A comprehensive list of strategies, including the method for implementing each strategy, the cost, and San Dieguito River WMA partners included in the effort, is presented in Appendix I. Strategies implemented on a WMA scale or through collaboration with WMA partners are discussed in more detail in Section 4.2.5. Section 4.3 presents a summary of the analysis results to demonstrate the anticipated progress toward achieving the interim and final goals. Because the load reductions required to meet final goals are less than 10 percent, optimization modeling was not completed in the San Dieguito River WMA. However, the same 10 percent assumption based on an analysis of the extensive list of nonstructural strategies is provided in Section 4.3.1 to provide assurance that wet weather goals will be met.

4.2.1 Strategy Selection

A list of potential strategies (nonstructural and structural) consisting of JRMP activities and enhancements to JRMP activities was developed by the Responsible Agencies, and augmented by public input and discussions with the San Dieguito River WMA Consultation Committee (San Dieguito River WMA Responsible Agencies, 2014). This list was used as a guide by Responsible Agencies to identify strategies appropriate for their jurisdictions.

Strategy selection considered the following:

- Emphasis was given to strategies that target highest priority water quality conditions, and those that provide multiple benefits were favored.
- The Responsible Agencies considered the triple bottom line, evaluating the environmental, economic, and social components of the strategies.

- Strategies that improve and promote cooperation and collaboration between the Responsible Agencies and other governmental agencies (WMA groups, Caltrans, water districts, school districts) and other entities, such as private or non-profit organizations, were also given priority. Responsible Agencies are also continually collaborating with internal jurisdictional departments, and these collaborating entities are also presented in the jurisdictional strategies table.

The Responsible Agencies evaluated their existing programs, the potential for incorporating enhancements and new administrative programs, and the types of structural BMPs that may be considered, if warranted and appropriate for the jurisdiction. All aspects of their JRMPs were evaluated, which provided the necessary background for existing nonstructural solutions and suggested areas where enhanced or restructured activities might be more successful.

Efficiency in pollutant reduction is based partly on identifying the known and suspected areas or sources likely contributing to the highest priority water quality condition. While bacteria-generating activities within the San Dieguito River WMA were identified in Section 3, Appendix J provides prioritized geographical areas where bacteria loading is estimated to be the highest. This prioritization is one of the factors that inform site selection for structural BMPs, and the bacteria loading prioritization and site selection process for structural BMPs is presented in detail in Appendix J.

4.2.2 Nonstructural Strategy Descriptions

Nonstructural strategies are defined as those actions and activities that are intended to reduce storm water pollution and that do not involve construction or implementation of a physical structure to filter and treat storm water. These strategies are also considered nonstructural by the nature of their programmatic implementation. MS4 maintenance and street sweeping, administrative policies, creation and enforcement of municipal ordinances, education and outreach programs, rebate and other incentive programs, and cooperation and collaboration with other watershed or regional partners are examples of nonstructural strategies. Jurisdictions across the region have implemented these types of programs for many years, either in response to MS4 Permit requirements or in response to jurisdiction- or watershed-specific needs (Regional Board, 2013).

The combination of existing efforts and new or enhanced efforts determines the final, expected load reduction (Figure 4-1). Fundamentally, strategies were chosen on the basis of their expected effectiveness in reducing pollutant sources and targeting pollutant-generating activities (PGAs) of concern in the San Dieguito River WMA and their suitability and potential to be implemented by the Responsible Agencies.

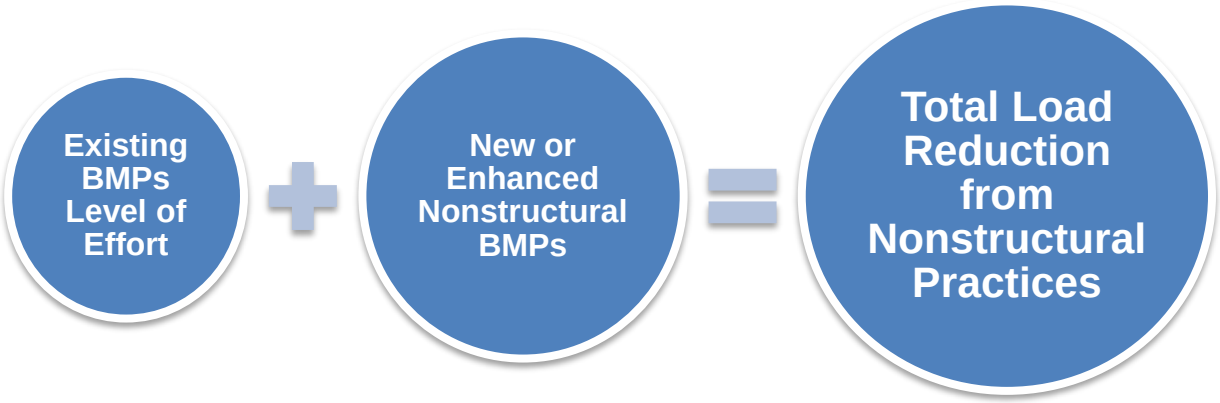


Figure 4-1
Determining Total Load Reduction from Nonstructural Practices

The list of nonstructural strategies for each Responsible Agency is based on the following:

- Existing programs or actions that the Responsible Agencies are already implementing or must implement based on MS4 Permit requirements
- Opportunities for enhancing and refining existing programs or actions
- Identification of new actions or initiatives that are effective or potentially effective in other areas or programs

Most nonstructural strategies are part of each Responsible Agency's JRMPs. The MS4 Permit requires the Responsible Agencies to control the contribution of pollutants to the MS4 and the discharges from the MS4 within their jurisdictions through JRMPs (MS4 Permit Provision E). The MS4 Permit requires the jurisdictions to identify the strategies being implemented by JRMP Provisions E.2 through E.7 as part of the Water Quality Improvement Plan for the highest priority water quality condition.

Nonstructural strategies may be broad, overarching administrative programs or activities targeting specific sources. The MS4 Permit provides guidelines for Responsible Agency implementation of each program; however, they are implemented differently depending on the unique characteristics of each jurisdiction. Responsible Agencies implement strategies within their JRMPs with a specialized approach to best achieve the numeric goals and meet permit requirements within their jurisdictions. Because the MS4 Permit provides flexibility in selecting strategies, not all jurisdictions may identify the same strategies within their JRMPs as some strategies may not be the most appropriate or efficient to achieve pollutant reductions.

A description of the JRMP strategy categories is presented in Table 4-13. The relative benefit associated with water chemistry, physical, and biological improvements achieved by strategy implementation is presented in Table 4-14. The assumptions represent best professional judgment based on literature reviews, practical experience, and stakeholder input. Appendix K includes references for these assumptions. The BMP

benefits outlined in Table 4-14 are dependent on site characteristics, implementation, and the target pollutant of the program or strategy. Although the benefits are variable, estimates of the relative pollutant reduction benefits are provided as comparative reference. Pollutant reductions identify the primary pollutants (●), the secondary pollutants (◗), and the pollutants that the strategy does not address (○). Estimated pollutant reductions assume typical design, land use, and geography, but can be modified to target pollutants or site-specific needs. Additional information on JRMP programs is presented in each Responsible Agency's JRMP document (to be submitted in June 2015).

Table 4-13
Categories of JRMP Strategies

Strategy Category	Strategy Description
Development Planning	Uses Responsible Agencies' land use and planning authority to require implementation of best management practices (BMPs) to address effects from new development and redevelopment.
Construction Management	Addresses pollutant generation from construction activities associated with new development or redevelopment.
Existing Development	Addresses pollutant generation from existing development, including commercial, industrial, municipal, and residential land uses. It includes stream, channel, and habitat restoration and retrofitting in areas of existing development.
Illicit Discharge, Detection, and Elimination (IDDE) Program	Actively detects and eliminates illicit discharges and improper disposal of wastes into the MS4.
Public Education and Participation	Promotes and encourages behaviors to reduce pollutant discharges. Describes opportunities for public participation in water quality improvement planning.
Enforcement Response Plan	Describes escalating enforcement measures for each JRMP component.

Table 4-14
JRMP Strategy Benefits

NONSTRUCTURAL STRATEGY	Average Water Chemistry Benefit[1]									Physical and Biological Benefit			
	Bacteria[2]	Metals	Organics	Sediment	Pesticides	Nutrients	Oil and Grease	Dissolved Solids	Trash	Flow Rate	Volume Reduction	Habitat/ Wildlife	Aquatic Life
JRMP Strategies													
All Development Projects	*Benefit varies by source control or low-impact development (LID) BMP type: Refer to Table 4-15 for a discussion of structural benefits.*												
Priority Development Projects (PDPs)	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗
Construction Management	○	○	○	●	○	○	◗	○	◗	●	●	○	●
Existing Development													
Commercial, Industrial, Municipal, and Residential Minimum BMP Requirements and Facility and Area Inspections	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗
MS4 Infrastructure Maintenance (including Catch Basin Cleaning)	◗	●	○	●	◗	◗	○	○	●	○	○	○	◗
Roads, Streets, and Parking Lots Maintenance (including Street Sweeping)	◗	●	◗	●	○	●	○	◗	●	○	○	○	◗
Pesticide, Herbicides, and Fertilizer Program	○	○	●	○	●	●	○	○	○	○	○	◗	●

Table 4-14 (continued)
JRMP Strategy Benefits

NONSTRUCTURAL STRATEGY	Average Water Chemistry Benefit[1]									Physical and Biological Benefit			
	Bacteria[2]	Metals	Organics	Sediment	Pesticides	Nutrients	Oil and Grease	Dissolved Solids	Trash	Flow Rate	Volume Reduction	Habitat/ Wildlife	Aquatic Life
Retrofit and Rehabilitation in Areas of Existing Development	*Varies by development area; potential benefit for all conditions.*												
IDDE Program	*Benefit varies; potential benefit for all conditions.*												
Public Education and Participation	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗
Enforcement Response Plan	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗	◗

1. For references for the water chemistry benefits for each strategy, refer to Appendix K.
2. Orange-shaded cells indicate the highest priority water quality condition for the WMA.

Responsible Agencies have also identified additional strategies that fall outside of a JRMP category. These additional strategies are not required by MS4 Permit Provision E, but some Responsible Agencies have found them to be effective within their jurisdictions for addressing priority water quality conditions. They may not be appropriate or effective within all jurisdictions.

Example Nonstructural Programs

Residential Rain Barrel Rebate Program

Capturing storm water from rooftops in residential rain barrels is a simple way to reduce demand on the potable water system and help prevent pollution by reducing the amount of runoff entering municipal storm drain systems (Figure 4-2). Reducing the amount of rainwater that enters storm drains also helps prevent erosion of creeks and streambeds, and aids in protecting downstream habitat. Retained runoff can be reused for irrigation, or when reuse is not possible, the retained flows can be slowly released after a period of storage. Released flows can be routed through landscaped areas, in which runoff load reduction can be attained through the processes of infiltration and evapotranspiration, or to bioretention BMPs as part of a treatment train. Through their residential BMP rebate program, for example, the City of San Diego offers residential customers a cash-back rebate of $1.00 for every gallon of rain barrel storage capacity up to 400 gallons when customers purchase and install a rain barrel and connect it to their home's rain gutter downspout.

Figure 4-2
Rain Barrel Capturing Runoff From a Residential Property

Pet Waste Program

Pet waste left on lawns, beaches, trails, and sidewalks contains pathogens such as bacteria, parasites, and viruses. When waste is not picked up, during a storm event the waste can be washed downstream and can flow directly into streams, lakes, and the ocean, causing a threat to both human health and the environment. To address bacteria, Responsible Agencies provide pet waste dispensers and appropriate trash bins in parks and other appropriate areas (Figure 4-3). Pet waste removal education programs and signage to help increase awareness are also potential

Figure 4-3
City of San Diego Pet Waste Dispenser

strategies to target the bacteria impairment within the San Dieguito River WMA.

4.2.3 Structural Strategy Descriptions

Structural strategies can be placed strategically throughout the contributing watershed to improve water quality by removing pollutants through a variety of chemical, physical, and biological processes, including filtration and infiltration. The effectiveness and feasibility of implementing different types of BMPs should be carefully considered given the BMP impact and cost to implement and maintain. Long-term structural BMP effectiveness is often dependent on the construction and routine maintenance of each BMP. Note that there are many areas in the San Dieguito River WMA that contain low-infiltrating soil types. These factors were acknowledged by the Responsible Agencies through consideration of non-infiltrating BMPs in these areas, such as detention ponds, wetlands, and bioretention and permeable pavement with underdrains, as well as through consideration of channel restoration projects or source control strategies. Before implementing structural strategies, Responsible Agencies will consult with appropriate resource agencies (e.g., California Coastal Commission, California Department of Fish and Wildlife, Fish and Wildlife Service, National Marine Fisheries Service, etc.) and will obtain required permits as necessary. Further, Responsible Agencies will identify and apply “lessons learned” during project development and post-development monitoring. Feasibility of maintenance and inspection will be incorporated in the design and site selection stages to ensure that structural BMPs meet engineered specifications and can be maintained for the life of the BMP without difficulty.

Potential structural strategies were broken into three categories on the basis of scale and overall function: (1) green infrastructure, (2) multiuse treatment areas, and (3) water quality improvement BMPs (Figure 4-4). These categories are discussed in detail in the following sections.

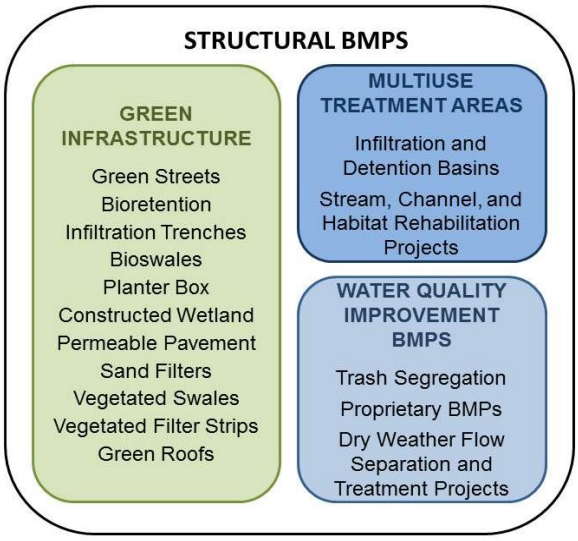


Figure 4-4
Comparison of Various Structural Strategy Categories

Table 4-15 provides the relative benefit to water quality improvement by structural BMP type. Although the benefits are variable, estimates of the relative pollutant reduction benefits are provided as comparative reference. As with the nonstructural benefits, these estimates are based on best professional judgment from literature reviews, practical experience, and stakeholder input. The site characteristics, BMP implementation, and pollutant of concern all influence the BMP benefits. Routine maintenance of these structural strategies also significantly impacts the benefits of the BMPs. A list of references for the benefits for the structural strategies is provided in Appendix K. Pollutant reductions identify the primary pollutants (●), the secondary pollutants (◗), and the pollutants that the strategy does not address (○). Estimated pollutant reductions assume typical design, land use, and geography, but can be modified to target pollutants or site-specific needs.

Table 4-15
Structural Strategy Benefits

STRUCTURAL STRATEGY	Water Chemistry Benefit[1]									Physical and Biological Benefit			
	Bacteria[2]	Metals	Organics	Sediment	Pesticides	Nutrients	Oil and Grease	Dissolved Solids	Trash	Flow Rate	Volume Reduction	Habitat/ Wildlife	Aquatic Life
Green Infrastructure													
Green Infrastructure Outside the Right-of-Way													
Bioretention	●	●	●	●	●	◗	●	◗	●	●	●	○	◗
Infiltration Trenches	●	●	●	●	●	●	●	●	●	●	●	○	●
Bioswales	●	●	●	●	●	◗	●	◗	●	●	●	○	◗
Planter Boxes	●	●	●	●	●	◗	●	◗	●	◗	◗	○	◗
Permeable Pavement	◗	●	◗	●	●	◗	◗	◗	◗	●	●	○	◗
Constructed Wetlands	●	●	◗	●	●	●	◗	◗	●	●	◗	●	◗
Sand Filters	●	●	●	●	●	◗	●	○	●	◗	◗	○	◗
Vegetated Swales	◗	◗	◗	●	◗	◗	◗	○	●	◗	◗	○	◗
Vegetated Filter Strips	◗	◗	◗	●	◗	◗	◗	○	●	◗	◗	○	◗
Green Roofs	◗	◗	○	●	○	○	○	○	○	●	◗	○	◗
Green Streets													
Green Streets	●	●	●	●	●	◗	●	◗	●	●	●	○	◗

Table 4-15 (continued)
Structural Strategy Benefits

STRUCTURAL STRATEGY	Water Chemistry Benefit[1]									Physical and Biological Benefit			
	Bacteria[2]	Metals	Organics	Sediment	Pesticides	Nutrients	Oil and Grease	Dissolved Solids	Trash	Flow Rate	Volume Reduction	Habitat/ Wildlife	Aquatic Life
Multiuse Treatment Areas													
Infiltration and Detention Basins	◗	●	◗	●	●	◗	◗	◗	◗	●	●	○	◗
Stream, Channel, and Habitat Rehabilitation Projects	Varies by project												
Water Quality Improvement BMPs													
Trash Segregation, Proprietary BMPs, and Dry Weather Flow Separation and Treatment Projects	Varies by project												

1. For references for the water chemistry benefits for each strategy, refer to Appendix K.
2. Orange-shaded cells indicate highest priority water quality condition for the WMA.

4.2.3.1 Green Infrastructure

A critical consideration in selecting and evaluating structural BMPs is scale. Structural BMPs that are built within the landscape at the site scale, which often requires retrofit of site designs to accommodate the rerouting and positioning of BMPs onsite, are called green infrastructure. Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city or county, green infrastructure refers to the patchwork of natural areas that provide habitat, flood protection, and cleaner water, and may also benefit the environment through cleaner air. At the scale of a neighborhood or site, green infrastructure includes storm water management systems such as bioretention areas, permeable pavements, and green roofs that use natural processes to soak up, store, and treat water.

Green infrastructure typically incorporates multiple BMPs using the natural features of the site in conjunction with the goal of the site development. Multiple BMPs can be incorporated into the site development to complement and enhance the proposed layout, while also providing water quality treatment and volume reduction. Green infrastructure practices are those methods that provide control and treatment of storm water runoff on or near locations where the runoff initiates, thus providing water quality improvement and volume reduction. The most common and effective green infrastructure BMPs implemented by the Responsible Agencies are listed in Table 4-16. Rain barrels are covered programmatically as a nonstructural strategy, but are also commonly incorporated as multi-benefit components of green infrastructure systems.

Table 4-16
Common Green Infrastructure Strategies

Green Infrastructure BMP	BMP Description	Example Photograph
Bioretention	Shallow vegetated features constructed in green spaces alongside roads, sidewalks, and other paved surfaces. Bioretention includes an engineered soil media designed to encourage pollutant treatment and water storage.	
Infiltration Trenches	Narrow, linear BMPs that have similar functions as bioretention areas with variable surface materials, including rock or decorative stone, designed to allow storm water to infiltrate into subsurface soils.	
Bioswales	Shallow, open channels designed to reduce runoff volume through infiltration and pollutant removal by filtering water through vegetation within the channel and infiltration into bioretention soil media. Bioswales can serve as a storm water conveyance, but the primary objective is water quality enhancement (often referred to as linear bioretention).	

Table 4-16 (continued)
Common Green Infrastructure Strategies

Green Infrastructure BMP	BMP Description	Example Photograph
Planter Box	Fully contained system containing soil media and vegetation that functions similarly to a small biofiltration BMP, but includes an impermeable liner and underdrain.	
Constructed Wetland	Engineered, shallow marsh systems designed to control and treat storm water runoff. Particle-bound pollutants are removed through settling and other pollutants are removed through biogeochemical activity.	
Permeable Pavement	Allows streets, parking lots, sidewalks, and other impervious covers to increase or enhance their infiltration capacity while maintaining the structural and functional features of the materials they replace. Roads such as highways can include permeable friction course (PFC) overlays, which provide water quality benefits when traditional permeable pavement is not suitable.	
Sand Filters	Treatment systems that remove particulates and solids from storm water runoff by facilitating physical filtration.	
Vegetated Swales	Shallow, open channels that are designed primarily for storm water conveyance. Pollutants such as trash and debris are removed by physically straining/filtering water through vegetation in the channel.	

Table 4-16 (continued)
Common Green Infrastructure Strategies

Green Infrastructure BMP	BMP Description	Example Photograph
Vegetated Filter Strips	Bands of dense, permanent vegetation with a uniform slope, designed to provide pretreatment of runoff generated from impervious areas before flowing into another BMP as part of a treatment train.	
Green Roofs	Roofing systems that layer a soil/vegetative cover over a waterproofing membrane and can reduce runoff through interception and evapotranspiration.	

Green infrastructure can provide water quality and community benefits at the site scale outside of the right-of-way or within the public street right-of-way (green streets). The following subsections discuss implementation of green infrastructure in these two settings.

Green Infrastructure Outside the Right-of-Way

Any single BMP or a combination of the BMPs listed in Table 4-16 can be applied at the site scale to capture and treat storm water runoff at the source. These potential small-scale projects are important to the WMA as a whole when incorporated near the top of the watershed because collectively they can provide an effective means of pollutant load reduction, while also attenuating peak flow, reducing discharge volume, and providing aesthetic value and improved habitat quality. These potential small-scale BMPs can be implemented on public parcels by municipalities or incorporated into Priority Development Projects (PDPs) and redevelopment activities on private parcels. Examples of potential existing development retrofits for green infrastructure BMPs outside the right-of-way include converting parking lot medians into planter boxes and asphalt into permeable pavements.

Large portions of the impervious areas on most parcels, regardless of land use type, consist of a combination of parking lots and roof tops. Often those areas can be treated by implementing a system of green infrastructure in landscape areas and by replacing hardscape with comparable permeable materials (see examples in Figure 4-5 and Figure 4-6). Other options for treatment that could be considered for areas outside the right-of-way are green roofs, infiltration trenches, sand filters, vegetated filter strips, and vegetated swales.

Figure 4-5
Bioretention Areas in Parking Lots and Adjacent to Buildings Provide Multiple Benefits by Treating Runoff While Also Serving as Landscape Features and Habitat

Figure 4-6
Permeable Pavement Functions as a Parking and Driving Surface While Capturing and Treating Storm Water

Green Infrastructure in the Right-of-Way (Green Streets)

Green streets can consist of multiple BMP types implemented in a linear fashion within the road right-of-way. Placing BMPs within the right-of-way provides an additional opportunity to treat urban storm water runoff, attenuate peak flow, and reduce discharge volume while improving community pride, land value, and habitat quality. Given that green streets are in the right-of-way, they have no land acquisition costs and are more conveniently accessed for maintenance activities. Green streets also provide the added benefit of treating runoff from both the roadway and the contributing parcel.

The most common configurations for green streets include bioretention areas located between the edge of the pavement and the edge of the right-of-way and permeable pavement installed in the parking lanes. The configuration of the street, particularly the presence of curb and gutter, locations of underground utilities, road classifications, and sidewalk, parking, and right-of-way widths, often dictates the configuration of green streets. Options are presented below for streets with and without curb and gutter.

Streets With Curb and Gutter

Curb and gutter is often desired to provide a clear delineation between the travel lanes and the parkway area of the right-of-way. With this configuration, storm water is often treated through permeable pavement in the parking lanes and bioretention areas in the space between the back of the curb and the sidewalk. Figure 4-7 shows examples of green infrastructure in the parking area and parkway within the right-of-way.

Figure 4-7
Examples of Permeable Pavement and Bioretention in the Right-of-Way with Curb and Gutter

Streets Without Curb and Gutter

Streets without curb and gutter provide direct connection for diffused runoff to be treated within the right-of-way. Often, without the delineation provided by curb and gutter, the right-of-way at the edge of the travel lane can become compacted and eventually cause erosion concerns. Implementing green street concepts could provide an opportunity to stabilize those areas using permeable pavers, as shown in Figure 4-8, or bioretention areas.

Figure 4-8
Permeable Pavers in the Right-of-Way Without Curb and Gutter

Example Green Infrastructure Project in the Right-of-Way

The Callado Road Green Street Project proposes implementing a green street in the right-of-way along Callado Road. The contributing drainage area is approximately 9.86 acres and encompasses the street and the adjacent single-family residential units. The street is crowned, and flow travels away from the center line toward the outside edges to the existing curb and gutter.

The green street is proposed to include permeable pavement, bioretention, and corner pop-out bioretention areas. The proposed retrofit involves narrowing the paved road width and installing bioretention cells between the sidewalk and new curb location. The proposed bioretention cells require grading the existing soils to a depth of 6 inches below the gutter as shown in Figure 4-9.

Figure 4-9
Example of How Callado Road Green Street Project Can Incorporate a Green Street into the Right-of-Way

4.2.3.2 Multiuse Treatment Areas

Large structural treatment control BMPs, referred to as multiuse treatment areas, are regional facilities that receive flows from neighborhoods or larger areas, which often serve dual purposes of flood control and groundwater recharge. These BMPs are often located in public spaces and can be co-located within parks or green spaces. They can provide excellent ecosystem services and aesthetic value to stakeholders. Bioretention areas can enhance biodiversity and beautify the urban environment with native vegetation. Large-scale facilities such as infiltration basins or dry extended detention basis can provide dual use as athletic fields or open spaces.

The following components can be incorporated into multiuse treatment areas to promote multiuse benefits:

- Simple signage or information kiosks can be used to raise public awareness of storm water issues, educate the public, and provide a guide for native plant and wildlife identification.
- Volunteer groups can be organized to perform basic maintenance such as trash removal as an opportunity to raise public awareness.
- Public-private partnerships can be pursued where property owners are supportive of water quality improvement measures and parcels are identified for ideal multiuse treatment area locations.
- Larger BMPs can be equipped with pedestrian cross-paths or benches for wildlife viewing.
- Sculptures and other works of art can be installed within the BMP and outlet structures or cisterns can incorporate aesthetically pleasing colors, murals, or facades.
- Vegetation with canopy cover can provide shade, localized cooling, and noise dissipation.
- Bird and butterfly feeders can be used to attract wildlife to the BMPs.
- Ornamental plants can be cultivated along the perimeter and in the bed of vegetated BMPs (invasive plants should be avoided).

Infiltration and Detention Basins

Large multiuse BMPs considered in the Water Quality Improvement Plan will focus on surface BMPs (on public parcels) that provide treatment through the detention and infiltration of runoff. Examples include infiltration basins and dry extended detention basins. These BMPs are designed to hold runoff for an extended period of time to allow water to evaporate into the atmosphere, infiltrate into native soils, or be transpired by vegetation, while accommodating for overflow and bypass during large storm events. These BMPs are well suited for public spaces such as active (soccer fields) and passive (parks) recreation areas and raise public awareness of storm water management.

Example Multiuse Treatment Area Project

Eagle Scout Lake (formerly Sand Lake) in Escondido's Kit Carson Park, shown in Figure 4-10, serves as a multiuse treatment area and sediment detention basin for a major tributary to Lake Hodges. The basin treats dry and wet weather flows at the confluence of several ephemeral creeks, the most notable of which is Kit Carson Creek. The drainage area includes mostly single family residential homes and open space in the City of Escondido and County of San Diego jurisdictions. The lake slows creek flows and allows suspended sediment to settle, providing water quality and flood protection

benefits for downstream habitat mitigation areas, jurisdictional wetlands, and 303(d)-listed waterbodies, including Kit Carson Creek and Lake Hodges.

In February 2014, the City of Escondido Public Works Department performed a major maintenance project to dredge accumulated sediment and restore the beneficial functions of the lake, which had been reduced in recent years. Vegetation and approximately 25,000 cubic yards of sediment were removed from the lake, thus restoring its treatment function and capacity. As a strategy of this Water Quality Improvement Plan, the City implemented this restoration project and is committing to regularly assessing the functioning of the basin and performing continued maintenance as necessary.

In addition to water quality benefits, Eagle Scout Lake is a visual amenity for park-goers and provides habitat for birds, and other wildlife. The 285-acre municipal park has many popular amenities and high daily visitation rates. Visitors enjoy the lake from benches along its banks and from an adjacent trail that serves as a gateway to the park. In addition, visitors can learn about the lake's resident wildlife from information posted at the site by the Palomar Audubon Society.

Figure 4-10
Example of Multiuse Treatment Area at Eagle Scout Lake

Stream, Channel, and Habitat Rehabilitation Projects

Natural streams, channels, and habitats serve hydrologic and ecological functions that can be compromised when these natural systems are degraded or altered. For instance, increased runoff volumes and velocities can cause bank erosion of streams or channels, which can result in large quantities of sediment and sediment-binding pollutants entering the drainage system. Degraded coastal habitats such as salt marshes, lagoons, and wetlands can disrupt biological productivity, which can lead to unhealthy or poor ecosystems.

Figure 4-11
Restored Salt Marsh Habitat Along the Banks of San Dieguito River in Del Mar
(The San Diego Wildfires Education Project, 2004)

Rehabilitation projects aim to improve stream or channel conditions or restore habitats through engineered enhancements. Stream or channel rehabilitation projects stabilize stream banks or enhance stream settings to achieve water quality benefits. Stream or channel rehabilitation projects can include grading; construction of check structures, drop structures, and channel bed and bank protection measures (Figure 4-11); vegetation planting to protect the channel area; and modified channel cross-sections to promote hydrologic connectivity. Habitat rehabilitation projects aim to improve biological productivity or ecosystem functionality through the restoration of natural hydrologic processes, natural vegetation, and other baseline physical characteristics. In addition to water quality and habitat improvements, other benefits of rehabilitation projects can include restoration of benthic macroinvertebrates and terrestrial wildlife, which are indirect measures of water quality, and can lead to greater public understanding of water quality while serving as recreational opportunities.

4.2.3.3 Water Quality Improvement BMPs

The Responsible Agencies will implement green infrastructure when feasible, but site constraints sometimes preclude use of green infrastructure. In such cases, water quality improvement BMPs may be required to protect water resources. Water quality improvement BMPs include trash segregation, proprietary BMPs, and dry weather flow separation and treatment projects. Maintenance of these BMPs is covered separately under nonstructural strategies as part of each Responsible Agency's MS4 infrastructure maintenance programs, where applicable.

Trash segregation includes inlet devices, such as trash guards or trash racks that are installed to capture trash and debris before conveyance into receiving waters.

Proprietary BMPs are prefabricated commercial products such as hydrodynamic separators or catch basin filter inserts that typically try to provide storm water treatment in space-limited areas, often using patented and innovative technologies. Proprietary BMPs typically use settling, filtration, absorptive/adsorptive materials, vortex separation, and sometimes vegetative components to remove pollutants from runoff.

Dry weather flow separation and treatment projects are those identified and planned for by each respective Responsible Agency to target non-storm water dry season flows and divert these flows for treatment either onsite or to sanitary sewer systems and ultimately wastewater treatment plants.

4.2.4 Jurisdictional Strategies by Responsible Agency

Strategy selection within the San Dieguito River WMA is discussed in Section 4.2.1 and Appendix J. Sections 4.2.4.1 through 4.2.4.6 provide examples of recommended strategies for each Responsible Agency and jurisdiction-specific selection methodologies, if different from watershed-wide selection methodologies. The recommended strategies are those that are intended to specifically target the highest priority water quality conditions to achieve the numeric goals identified in Section 4.1. These strategies are a subset of each Responsible Agency's JRMP. A complete list of strategies by Responsible Agency, including the implementation approach, implementation year, and level of effort required, is presented in Appendix I.

As discussed in Sections 4.2.2 and 4.2.3, most nonstructural and structural strategies typically address multiple pollutants. For example, maintenance activities for catch basins and roads primarily target sediment, metals, and trash. In addition, bacteria and organics can also be removed. Green infrastructure strategies such as bioretention and bioswales, primarily target bacteria, sediment, and metals; however, they can provide dissolved solids and organics reductions as well. Permeable pavement primarily targets sediment, oil and grease, and metals, but can provide secondary benefits toward bacteria and organics reductions as well.

4.2.4.1 City of Del Mar Example Strategies

The City of Del Mar (Del Mar) has selected jurisdictional strategies that best suit the topography and characteristics of its jurisdiction to comply with MS4 Permit requirements. Del Mar's land use primarily consists of low-density residential and commercial areas, so the strategies address problematic areas associated with these characteristics. The following example strategies have been identified to address the highest priority water quality conditions in Del Mar's jurisdiction within the San Dieguito River WMA. A complete list of strategies and their anticipated implementation schedule is provided in Appendix I. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed. Any applicable projects which incorporate or implement this Plan will require its own environmental review, as required by the California Environmental Quality Act by the City of Del Mar as appropriate.

Development Planning – Greater Pervious Area Requirement

Del Mar has a stringent planning requirement that requires a conservative impervious area footprint-to-lot-size ratio, which assists in reducing the amount of directly connected impervious areas within its jurisdiction. Despite stringent planning requirements, the jurisdiction is highly developed, and many roads have not only limited right-of-way, but also limited physical space for green street implementation. While green streets will be considered, options may be limited due to right-of-way constraints and bluff stabilization concerns in many parts of the City of Del Mar.

Existing Development – Enhanced Patrol Program

A key strategy to address dry and wet weather bacteria loads from existing development, which includes commercial, industrial, municipal, and residential land uses, is a patrol-based program throughout the jurisdiction. Del Mar's size facilitates a hands-on approach to inspections, including mobile businesses. Frequent patrols, a minimum of six per year, allow for increased opportunities to identify potential illicit discharges and outreach to business owners and residents. Del Mar also has an irrigation control program in place to specifically address runoff associated with residential and commercial properties.

In addition to the patrol-based program, Del Mar performs street sweeping, catch basin cleaning, and other JRMP activities detailed further in Appendix I.

Public Education and Participation

Implementation of a public education and participation program promotes and encourages development programs, management practices, and behaviors that reduce the discharge of pollutants in storm water. Del Mar plans to continue and to expand several of its current outreach programs. Outreach program efforts distributing informational material on irrigation runoff through the patrol program, conducting trash cleanup events through community-based organizations, and collaborating with other regional education and outreach efforts. Del Mar also plans to review the City storm water website and identify and implement appropriate updates to reflect Water Quality Improvement Plan and JRMP revisions.

Wetland Rehabilitation – Participation in San Dieguito Wetland Restoration

Del Mar has been an active stakeholder in the San Dieguito Wetland Restoration Project, which began construction in 2006. This regional project with multi-jurisdictional involvement is discussed further in Section 4.2.5.1.

Collaboration with Phase II Permittee – 22nd District Agricultural Association

The Del Mar Fairgrounds property, operated by the 22nd District Agricultural Association (DAA), is a Phase II MS4 Permittee and portions of the Fairgrounds are located within the City of Del Mar. The City of Del Mar will continue to coordinate and collaborate with the 22nd DAA on water quality-related issues. This strategy includes pursuing

opportunities for coordinated efforts where mutual benefits to water quality may be achieved for the watershed.

4.2.4.2 City of Escondido Example Strategies

While most of the City of Escondido's (Escondido) jurisdiction is located within the Carlsbad watershed, approximately 24 percent of the City's urban area is located within the San Dieguito River WMA. Significant park and open space is located within this portion of the City: Kit Carson Park (285 total acres, 185 acres of preserved open space), County-owned Felicita Park (53 total acres), and Lake Hodges open space (west of Del Dios Highway and west of I-15 adjacent to Lake Hodges) totaling 662 acres.

Escondido has a multiuse treatment area and sediment detention basin (Eagle Scout Lake, formerly Sand Lake) within the San Dieguito River WMA, which helps prevent sediment discharges to the San Dieguito River. Restoration and continued maintenance of this basin is a significant effort, costing hundreds of thousands of dollars and requiring extensive permitting efforts. Continued maintenance of this basin has been included as a key strategy for this watershed. Although structural BMP opportunities in the watershed will be evaluated, they are less of a priority in this portion of Escondido.

Most of the planned and existing development within the San Dieguito River WMA portion of Escondido is dedicated to residential and commercial purposes. The following example strategies have been identified to address the highest priority water quality conditions in Escondido's jurisdiction within San Dieguito River WMA. A complete list of strategies and their anticipated implementation schedule is provided in Appendix I. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Existing Development – Strategies Targeting Pollutant-Generating Activities

Escondido plans to administer a program aimed to target specific PGAs from existing development. This program would require implementation of minimum BMPs and set inspection frequencies specific to the existing facility types in commercial, industrial, municipal, and residential areas. BMP requirements and inspection frequencies would be specific to the facility, area type, and PGAs, as appropriate. For instance, facilities with the highest potential to generate bacteria (wet/dry), such as food/auto establishments that are subject to fats, oils, and grease (FOG) inspections, would have an increased inspection frequency of twice per year. This program would address other PGAs such as trash enclosures and water-using mobile businesses by establishing requirements and inspection and permitting requirements, respectively. Escondido will focus its property-based inspection program on priority drainage areas identified by persistent flows from major MS4 outfalls. In the San Dieguito River WMA, the drainage area of monitoring station HDG_102 will receive focused attention from staff with heightened inspections and outreach to residents. A pet waste program is intended to address bacteria through education and prevention measures.

Existing Development – Promote Water Conservation Programs that Improve Water Quality

Escondido plans to promote and collaborate with water agencies and other groups to encourage implementation of water conservation programs that improve water quality by reducing irrigation runoff with smart irrigation products or turf replacement and capturing rain water in residential areas. This includes promoting and encouraging implementation of designated BMPs in commercial, agricultural, and industrial areas through collaboration with the Metropolitan Water District of Southern California (MWD) to promote its SoCal Water$mart rebates and products. Products intended to conserve water include weather-based irrigation controllers, rotating sprinkler nozzles, soil moisture sensor system, rain barrels, and turf removal.

Public Education and Participation

New brochures on various BMPs have been developed for this permit cycle. Enhanced property-based inspections in priority drainage area HDG_102 will result in increased education of residents in that area on storm water and landscaping BMPs. Furthermore, the new residential program will enhance education of Home Owners Associations (HOAs) and encourage the use of water conservation incentives to also improve runoff quality. Finally, Escondido has a smartphone application called “Report It” for documenting complaints (graffiti removal, maintenance and storm water discharges). This will be reviewed, and where possible upgraded, to make storm water issues more prominent to encourage more reporting of storm water violations.

Restoration of Eagle Scout (formerly Sand) Lake

Eagle Scout Lake (formerly Sand Lake) is an existing multiuse treatment area and sediment detention basin in the City of Escondido. A major restoration project in early 2014 improved water flow, water quality issues, and health and safety issues (vector control). Escondido anticipates performing a scheduled maintenance once every five years to regularly maintain this site. Actual maintenance frequency will be based on field observations by City staff.

4.2.4.3 City of Poway Example Strategies

The City of Poway (Poway), located in the middle of the watershed, tends to have larger lot sizes and more pervious surfaces. In addition to administrative JRMP strategies, strategies focus on source control, such as open trash enclosures, and monitoring and reduction of the pollutant source exposure and storm water runoff at a public waste yard. The following example strategies have been identified to address the highest priority water quality conditions in Poway’s jurisdiction within San Dieguito River WMA. A complete list of strategies and their anticipated implementation schedule is provided in Appendix I. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Existing Development – Promote Water Conservation Programs that Improve Water Quality

Poway plans to promote and collaborate with water agencies and other groups to encourage implementation of water conservation programs that improve water quality by reducing irrigation runoff with smart products or turf replacement and capturing rain water in residential areas. Poway plans to promote and encourage implementation of designated BMPs in residential areas through collaboration with MWD and the San Diego County Water Authority (SDCWA) to promote SoCal Water$mart rebates and products. Products intended to conserve water include Water$mart irrigation systems, weather-based irrigation controllers, rotating sprinkler nozzles, soil moisture sensor system, rain barrels, and turf removal.

Existing Development – Reconfigure Department of Public Works Waste Yard to Reduce Pollutants

Poway has relocated activities within the Department of Public Works (DPW) waste yard to limit potential of untreated runoff and pollutant loading. Poway plans to enforce the site's Storm Water Pollution Prevention Plan (SWPPP) and perform annual monitoring.

Existing Development – MS4 Infrastructure Maintenance

Poway plans to continue to improve the MS4 infrastructure as well as roads, streets, and parking lots. Strategies to improve the MS4 infrastructure include optimizing catch basin cleaning to maximize pollutant removal, proactively repairing and replacing MS4 components to provide source control, increasing the frequency of open-channel cleaning and scour pond repair to reduce pollutant loads, and implementing controls to prevent sewage infiltration into the MS4. Strategies to enhance the street sweeping program include equipment upgrades and route optimization, sweeping of medians, and outreach of sweeping enhancement in targeted areas.

Public Education and Participation

Implementation of a public education and participation program promotes and encourages development programs, management practices, and behaviors that reduce the discharge of pollutants in storm water. Poway plans to continue and expand several of its current outreach programs by focusing on school-based and community-based education and outreach and events, and targeting human behavior in parks and other public areas that can have significant impacts to habitat, wildlife, and water quality. Poway also plans to review the storm water website and identify and implement required updates to reflect Water Quality Improvement Plan and JRMP revisions and collaborate with other ongoing regional education and outreach efforts.

4.2.4.4 City of San Diego Example Strategies

The City of San Diego (City) has identified administrative policies, urban development management programs, and innovative pilot projects, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in multiple watersheds. Furthermore, the City is currently developing a framework to evaluate other[1] potential benefits that the recommended strategies may provide beyond those associated with water quality. These other benefits may be financial, environmental, or societal. Other benefits refer to additional outcomes of a strategy beyond water quality improvements. Other benefits can include reduced air pollution, increased water conservation, aesthetics-induced property value increases, and increased business investments. The recommended strategies will be scored based on the number of other benefits they provide, and may guide future updates to the Water Quality Improvement Plan (Appendix L).

The following strategies are examples of those selected by the City and planned for implementation. A complete list of strategies planned for implementation and a description of the strategy selection process is provided in Appendix I. These strategies will be implemented by the City; they are not intended to be implemented by private entities (e.g., development, business, industry, etc.). However, some of the City's strategies, such as development planning, may have implications for private entities. In the San Dieguito River WMA, an analysis using a watershed model was conducted to identify the strategies required to be implemented to meet interim and final goals. The strategies and implementation schedules identified in Appendix I demonstrate that numeric goals will be met on the basis of that analysis. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies, if necessary. If strategies are modified, the analysis will be updated as needed to provide assurance that numeric goals will be met. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

The City of San Diego will address discharges of bacteria, and other pollutants through activities on public land across its jurisdiction in the San Dieguito River WMA. The following example strategies provide multiple benefits by addressing bacteria and sediment, as well as other water quality pollutants such as trash. They are targeted at reducing wet weather discharges, but may also assist the City in meeting dry weather numeric goals.

[1] Other benefits refer to outcomes of a strategy beyond water quality improvements. Other benefits can include reduced air pollution, increased water conservation, aesthetics-induced property value increases, and increased business investments.

Development Planning – Development and Implementation of a Green Infrastructure Policy and Program

In FY16, the City will begin developing a policy that will require the inclusion of green infrastructure features on all suitable City projects, including non-SUSMP (Standard Urban Storm Water Mitigation Plan) projects. This policy will be coordinated with ongoing efforts to update City design manuals and low-impact development (LID) design standards for Public LID BMPs. To guide implementation of the new policy, a green infrastructure program will be initiated in parallel. The program will begin with research and recommendations for ideal methods for green infrastructure project siting and prioritization within the City. By FY18, the City will initiate design of green infrastructure and green streets projects as detailed in the corresponding structural strategies.

Existing Development – Enhanced Property-Based Inspection Program

In FY16, the City plans to administer a program that will require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs. This program would increase the number of discharges identified, compared with standard inspections. This program would also include the inspection of existing development at appropriate frequencies and methods, such as property-based inspections in lieu of traditional business inspections. The City conducted an extensive multi-year pilot study of its business inspection program and found that more discharges could be found and abated by inspecting large properties rather than individual businesses.

Existing Development – Increased Enforcement

The City intends to enhance enforcement responses by increasing the number of Code Compliance staff. Between FY16 and FY19, the City is planning to gradually hire additional Code Compliance Officers and support staff to increase compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development as detailed in the City's Enforcement Response Plan. This effort will target increased enforcement of irrigation runoff and water-using mobile businesses.

Existing Development – Residential and Commercial Rebate Programs Targeting Water Quality

The City plans to continue and expand its landscape-based rebate program to target water quality impacts from residential and commercial areas in FY16 and beyond. Expansion of this program can occur through distribution of promotional and information material and brochures to community groups, libraries, and recreational centers. Educational material would emphasize watershed stewardship and encourage the implementation of designated BMPs through rebates for rain barrels, grass replacement, downspout disconnections, and micro-irrigation.

Increased Public Education and Participation

The City of San Diego conducts an extensive public education and outreach program through its Think Blue program. Examples include the following:

- The City will continue and expand several of its current outreach programs. Outreach programs would be widely implemented but targeted to HOAs, Business Owners Associations (BOAs), maintenance districts, various community groups through organized community trash cleanup events, and water-using mobile businesses.

- Workshops will be held, community events will be organized, and informational material and brochures will be disbursed to reach community members to advise them of incentives, regulations, and training, and to provide general information they need for implementation of good watershed stewardship practices or BMPs.

Lake Hodges – Collaboration with Stakeholders

The City plans to continue to collaborate with City of San Diego Public Utilities Department (PUD) and other watershed stakeholders in ongoing efforts to address potential nutrient impairments in Lake Hodges including Integrated Regional Water Management (IRWM) and other grant projects. The City is planning to participate in the Lake Hodges Water Quality Concentration Study. This study will characterize conditions and identify sources to investigate the nutrient loads to Lake Hodges.

In addition, the City will collaborate with stakeholders and water agencies in ongoing efforts to address water quality issues in the San Dieguito Watershed as they pertain to MS4 discharges. This may include participation in Integrated Regional Water Management-led efforts such as coordination and review of grant proposals, research, analysis, studies, modeling.

Structural Strategies – Green Infrastructure

In addition to green infrastructure projects in place within the San Dieguito River WMA, a green street project on Callado Road near Pastoral Street will begin construction in FY16.

Cost of Service Study

The City plans to conduct a Cost of Service Study starting in FY15. This study will examine the full cost of flood control and storm water strategies needed to comply with storm water regulations for the City of San Diego. The City of San Diego's Watershed Asset Management Plan will be used as the basis for the study.

4.2.4.5 City of Solana Beach Example Strategies

The City of Solana Beach (Solana Beach) is a small coastal city with urban, dense development at the coastline and less dense residential lots and commercial centers to the east. Solana Beach, because of its small size, has inherent internal collaboration as

staff implement multiple administrative programs, allowing oversight of planning, development, and enforcement on a holistic level. Similar to the other smaller jurisdictions, Solana Beach's jurisdictional strategies focus on implementing overarching programs, such as promoting BMPs in residential areas and collaborating with other departments and agencies to implement strategies. The following example strategies have been identified to address the highest priority water quality conditions in Solana Beach's jurisdiction within the San Dieguito River WMA. A complete list of strategies and their anticipated implementation schedule is provided in Appendix I. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Development Planning – Expanded Requirement for Onsite Treatment

To encourage LID and protect open space, Solana Beach requires the installment of a detention basin if redevelopment results in an increased impervious area of greater than 500 square feet.

Existing Development – Promote Water Conservation Programs that Improve Water Quality

Solana Beach plans to promote and encourage implementation of designated BMPs in residential and commercial areas. Through collaboration with Santa Fe Irrigation District (SFID), Solana Beach plans to promote runoff reduction products and services, promote MWD's SoCal Water$mart rebates and products, and provide education to residential customers. Featured products include weather-based irrigation controllers, rotating sprinkler nozzles, soil moisture sensor systems, rain barrels, and turf removal.

MS4 Infrastructure – Proactive Sanitary Sewer Infrastructure Replacement Program

Solana Beach will continue to implement an aggressive sewer infrastructure replacement program. Solana Beach uses closed-circuit television (CCTV) to survey a quarter of the sewer infrastructure each year. The results lead to a prioritized list of sewer line replacement projects.

Public Education and Participation – Support the Clean and Green Committee

Solana Beach plans to implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water. The education and participation program will prioritize efforts by high-risk behaviors, pollutants of concern, and target audiences. Efforts would be focused on providing school-based education and outreach, encouraging the reduction of irrigation runoff, expanding outreach, training, and incentive programs to HOAs, developing outreach and training programs for property managers responsible for HOAs and Maintenance Districts, conducting community trash cleanup events, and collaborating with other regional education and outreach efforts. Solana Beach also plans to continue to support the Clean and Green

Committee, a committee of local residents and business owners working to preserve Solana Beach's environment.

Implementation of an NPDES Pollution Management Fee

Solana Beach plans to continue to apply a NPDES pollution management fee to residential and commercial waste and recycling to secure funding for implementation of water quality-related programs. This fee serves as a dedicated funding source to secure implementation of water quality improvement efforts.

Dry Weather Flow Separation and Treatment Projects

Partnering with San Elijo Joint Powers Authority, Solana Beach constructed the Seascape Sur Outfall Storm Water Diversion Structure Project in September 2014 (FY14). This project aims to treat an approximate drainage area of 40.5 acres.

4.2.4.6 County of San Diego Example Strategies

Open space, agriculture, and other low-density land uses cover much of the County of San Diego's jurisdiction within the San Dieguito River WMA. The jurisdictional strategies reflect this and were chosen because they are well suited for these types of land uses.

Dry Weather Strategies

The County's dry weather goal to effectively eliminate anthropogenic discharges will be accomplished through the implementation of numerous JRMP strategies to reduce dry weather runoff, as described in the County of San Diego JRMP. In particular, the County has shifted to a more active field program to better locate and abate dry weather flows. County storm water staff members spend a greater amount of time present in unincorporated communities identifying nuisance anthropogenic flows and addressing them through appropriate education and enforcement strategies. All County staff members have been trained to identify and report illicit discharges and illicit connections during required annual storm water training; this training has been updated to reflect recent MS4 Permit changes.

In addition to the increase in County staff field surveillance, the County is also implementing a focused program to reduce flow at targeted MS4 outfalls that have demonstrated persistent dry weather flows. Using dry weather monitoring data collected from 2013 to 2015, the County has determined four priority outfalls in the San Dieguito River WMA that will be monitored for dry weather flow. If dry weather flows are detected, staff members will initiate a field investigation to seek out and abate the source of flow. This effort will be leveraged and coordinated with the persistent flow outfall reduction being simultaneously investigated and potentially mitigated in accordance with the requirements of the dry weather monitoring program (Provision D.2.b(2)).

Using the strategies above, the County will target to reduce the number of persistently flowing outfalls by 20 percent by 2018. Alternatively, the County may demonstrate a 20 percent decrease in the aggregate flow of the MS4 outfalls by 2018. A baseline volume of flow would be established during FY15-16 through monitoring flow measurements. Efforts will be adaptively managed to mitigate dry weather flows and consider small-scale structural controls as needed during the second MS4 Permit term. For the final TMDL compliance goal, scheduled for April 2021, the overall goal is no discharges from the County of San Diego's storm drain outfalls to the receiving water, as demonstrated through the storm drain outfall monitoring program.

Wet Weather Strategies

The County will address bacteria load reductions primarily through a programmatic approach. The programmatic approach involves reducing bacteria loads from storm drain outfalls. The metric established is the implementation of the storm water program, resulting in an estimated 10 percent reduction of the bacteria loads needed to meet compliance. Baseline loads will be determined during FY15-16. The load reduction is anticipated to take place incrementally by permit term, with a 2 percent reduction during the second permit term, a 2 percent reduction during the third permit term, and a 3.7 percent reduction during the fourth permit term. If the modeled reductions are not confirmed by monitoring, then program adjustments will be made according to the adaptive management process. This may require the incorporation of more effective strategies, changes in program design, or incorporation of additional structural BMPs if funding is available.

Additionally, the County of San Diego will assess during the second permit term whether or not predicted bacteria reductions are being met through the programmatic program. If this assessment indicates that a final load reduction of 7.7 percent cannot be reached through changes to the programmatic program, then structural BMPs will be considered. A county-wide program may be implemented that encourages small-scale structural BMPs through a public-private partnership. The BMPs may include roof downspout disconnects to landscaped areas, and rainwater use through rain barrel capture, rain gardens, and bioswales. This is in addition to the anticipated BMPs required to be constructed during redevelopment. If determined feasible, the public-private partnership small-scale BMP program is an optional strategy to be implemented only as needed and as funding becomes available.

4.2.5 Collaborative WMA Strategies

In addition to implementing strategies on a jurisdictional basis, Responsible Agencies may collaboratively implement projects within the WMA that improve water quality. The WMA strategies in the San Dieguito River WMA include continuation of the San Dieguito Wetland Restoration Project (Restoration Project) and watershed-wide efforts to encourage water conservation targeting dry weather goals with the reduction of irrigation runoff.

4.2.5.1 San Dieguito Wetland Restoration Project

Restoration of the San Dieguito coastal wetlands and lagoon system has been a goal of the Cities of Del Mar and San Diego, and the organizers of the San Dieguito River Park (SDRP), as stated in the San Dieguito Lagoon Resource Enhancement Program (adopted in 1979) and the San Dieguito River Park Concept Plan (adopted in 1994) (SDRP, 2014). The WMA strategies in the San Dieguito River WMA include the North Coast Corridor (NCC) Program and watershed-wide efforts to encourage water conservation targeting dry weather goals with the reduction of irrigation runoff.

Figure 4-12
San Dieguito Wetland Restoration Project Area
(San Dieguito Wetland Restoration Project, 2014)

In September of 2000, the Board of Directors of the San Dieguito River Park Joint Powers Authority (JPA) adopted the Park Master Plan for the Coastal Area (Park Master Plan), which proposed the restoration of the San Dieguito wetlands, non-tidal habitat restoration, and public access (Figure 4-12). The 150-acre wetland restoration work has been primarily accomplished by Southern California Edison (SCE) and partner owners of the San Onofre Nuclear Generating Station (SONGS), including San Diego Gas & Electric (SDG&E), City of Riverside, and City of Anaheim. The San Dieguito River Park JPA, Fish and Wildlife Service, and a variety of state and local agencies are also involved in the implementation of the remainder of the Park Master Plan, including restoring upland non-tidal habitats and establishing public access (SDRP, 2014).

Construction began in fall 2006 and the $90-million Restoration Project was officially dedicated in 2011 (SDG&E, 2014). The Restoration Project has enhanced southern California's unique coastal and marine environment as the restoration has provided adequate tidal flushing and circulation to support biologically diverse habitats. Beyond protecting endangered species and providing habitat to hundreds of bird species and fish, the restoration project has also added a coastal segment to the Coast to Crest Trail, allowing public enjoyment of the wetlands area while protecting sensitive habitat and vegetation (SDG&E, 2014). Funding for monitoring and managing the wetlands is ongoing (SDG&E, 2014).

4.2.5.2 Collaborative Approach to Irrigation Reduction

Responsible Agencies of the San Dieguito River WMA are collaborating with water agencies to encourage implementation of water conservation efforts to aid in the reduction of irrigation runoff. In a Mediterranean climate such as that in southern California, water conservation that attempts to reduce irrigation and minimize storm water runoff can also improve water quality of receiving waterbodies. The Metropolitan Water District of Southern California (MWD) and SDCWA are primary water providers in southern California who lead regional and multijurisdictional programs that incentivize water conservation efforts that impact the reduction of irrigation runoff.

MWD's SoCal Water$mart Program and SDCWA's WaterSmart Program support conservation efforts by offering incentives in the form of rebates for rain barrels, rotating sprinkler nozzles, weather-based irrigation controllers, soil moisture sensor systems, and turf replacement (MWD, 2014; SDCWA, 2014). The San Diego County WaterSmart program also offers landscape training classes and plant fairs to educate and engage the community on water conservation efforts. Several Responsible Agencies and local municipal water districts (e.g., SFID) promote and express interest in collaborating with MWD and SDCWA to support their water conservation incentive programs (Table 4-17). Funding and resources to support these region-wide water conservation efforts for each Responsible Agency are presented in Table 4-17.

There is also potential to collaborate with retail water suppliers who have more direct contact with water users and who can more effectively monitor water consumption to identify possible sources of system leaks and over-irrigation.

Table 4-17
Responsible Agency Collaboration with Regional and WMA Water Conservation Programs

Responsible Agency	Responsible Departmental Agency	Metropolitan Water District (MWD)	San Diego County Water Authority (SDCWA)	Other
Solana Beach	Public Works Department (PWD)	✓	✓	Santa Fe Irrigation District (SFID)
Escondido	Environmental Programs Division (EP Div)	✓	✓	Water conservation is a responsibility of the Environmental Programs Division
City of San Diego	Transportation and Storm Water Department (T&SW); Public Utilities Department (PUD)	✓	–	–
Del Mar	Clean Water Program (CWP)	✓	✓	–
Poway	Development Services Department (DSD)	✓	✓	–
San Diego County	Watershed Protection Program (WPP)	✓	✓	Other County departments, Coastkeeper, I Love a Clean San Diego, and Solana Center for Environmental Innovation

4.2.5.3 Offsite Alternative Compliance Option (WMAA)

The MS4 Permit allows for the implementation of offsite alternative compliance methods in lieu of meeting structural BMP design standards and/or hydromodification management criteria on the project site. To implement an alternative compliance program, a jurisdiction must first complete an optional WMAA as detailed in MS4 Permit Provision B.3.b(4). The San Diego County Copermittees have collectively funded and provided guidance for development of a regional WMAA. Findings of the draft regional WMAA, specific to the San Dieguito River WMA, are provided in Appendix M. The WMAA characterizes important processes of the watershed through creation of GIS layers that include the following information:

- A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates
- A description of existing streams in the watershed, including bed material and composition, and whether they are perennial or intermittent
- Current and anticipated future land uses
- Potential coarse sediment yield areas
- Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins

Information from the WMAA can be used for the following purposes:

- To identify candidate projects that could potentially be used as offsite alternative compliance options in lieu of satisfying full onsite retention, biofiltration, and hydromodification runoff requirements
- To identify and/or prioritize areas where it is appropriate to allow certain exemptions from onsite hydromodification management BMPs

Alternative compliance methods can be implemented at the subwatershed scale (e.g., multiuse treatment area BMPs) or as green infrastructure BMPs (e.g., green streets). Regardless of scale, offsite alternative compliance BMPs mitigate for pollutants not reliably retained on the project site or hydromodification impacts not reliably mitigated onsite per requirements detailed in MS4 Permit Provisions E.3.c.(1) and E.3.c.(2). Note that onsite treatment control BMPs will still be required, although such BMPs would not be required to meet the onsite retention requirements. In addition to meeting site-specific structural BMP and hydromodification management requirements, alternative compliance methods can provide enhanced benefits for the WMA.

In addition to allowing for offsite alternative compliance program development, the WMAA findings can also assist in determining the feasibility of candidate projects for offsite alternative compliance implementation (MS4 Permit Provision B.3.b.(4)(b)). The Responsible Agencies are currently compiling a list of candidate projects that consider the numeric goals of the San Dieguito River WMA as well as projects previously identified in JRMPs and other regulatory documents. Draft candidate project lists currently available are provided in Appendix M. The Water Quality Improvement Plan will be updated to include the final candidate project list, as that list is made available.

The WMAA document was developed as part of a regional Copermittee effort and followed criteria set forth in the MS4 Permit. The effort included a call for data for information to be included in the analysis. Data included in the document are intended for guidance purposes. Where more site-specific information is available, then the more detailed information should be used.

The WMAA also provides an assessment of applicable exemptions to hydromodification management requirements, in addition to the MS4 Permit's allowed exemptions regarding direct discharges to receiving waters including the Pacific Ocean, lakes, or reservoirs (or direct discharges to underground storm drains or concrete-lined channels directly discharging to the Pacific Ocean). For the San Dieguito River WMA, an exemption is recommended for direct discharges to the San Dieguito River downstream of Lake Hodges. No additional potential exemptions are recommended with regard to stabilized conveyances, highly impervious watersheds, or tidally influenced lagoons.

4.2.5.4 Collaboration with the Regional Board

The Responsible Agencies will work with the Regional Board to identify solutions and address sources of potential water quality impairments within the San Dieguito River WMA. Descriptions of the current priorities are provided below and will be updated as implementation, monitoring, and assessment continues.

Enforcement of the Conditional Waiver of Discharges from Agricultural and Nursery Operations (Ag Waiver)

As discussed in Section 1, the MS4 Permit holds the Responsible Agencies responsible for pollutants originating from non-MS4 or non-municipal sources if those pollutants are ultimately discharged from an MS4 under their jurisdiction, although inspection and oversight responsibility may be outside of the Responsible Agencies' purview or authority. The Responsible Agencies, therefore, recognize the need for collaboration and improved communication with non-municipal sources and the appropriate regulatory agencies to (1) ensure that these discharges are appropriately regulated before entering the Responsible Agencies' storm drain systems; and, (2) improve water quality throughout the WMA.

In the San Dieguito River WMA, a strategy to address bacteria, nutrient, and sediment impairment is to ensure that agricultural and nursery dischargers above Lake Hodges are fulfilling their requirements under the Ag Waiver. Enforcement is outside of the

jurisdiction of the Responsible Agencies; however, the Responsible Agencies will work with the Regional Board to address potential priority areas.

Enforcement of Other Non-MS4 Dischargers

The Responsible Agencies will work with the Regional Board to identify and address other sources of potential water quality impairment within the San Dieguito River WMA. These sources may include working with Phase II MS4 dischargers, school districts, non-compliant or non-filing industrial dischargers, or non-compliant construction dischargers, as the need arises.

Bacteria TMDL Updates

The Pacific Ocean Shoreline segment at the San Dieguito Lagoon Mouth was removed from the 303(d) list for REC-1 impairment in 2010. However, calculation of the Bacteria TMDL had already begun and the segment remained in the TMDL through TMDL adoption in 2011. The Pacific Ocean Shoreline segment was then incorporated into the TMDL requirements within the MS4 Permit in 2013. The Responsible Agencies will pursue removal of the beach segment from the Bacteria TMDL and Attachment E of the MS4 Permit.

In February 2010, the Regional Board adopted Resolution No. R9-2010-0001, *Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)* referred to as the Bacteria TMDL. As part of the Bacteria TMDL Implementation Plan, the Regional Board included a planned milestone to consider revisions to the Bacteria TMDL on the basis of new technical information provided by the dischargers or other entities within five years after the effective date of the Bacteria TMDL (April 4, 2016). The Counties of San Diego and Orange, and the City of San Diego, are coordinating with the Regional Board to assess the scope of a third-party TMDL reopener process.

4.2.5.5 Participation in Watershed Council

If a Watershed Council is re-established, the City of San Diego and potentially other Responsible Agencies will participate. Watershed Councils are typically locally organized, voluntary, non-governmental organizations, and are intended to broadly represent various stakeholders in the WMA. Goals of Watershed Councils may vary, but they generally promote watershed protection and sustaining natural resources. This coordination could assist in selecting WMA projects, identifying potential funding opportunities, and promoting communication between community groups and regulated agencies.

4.3 Implementation Schedule

Responsible Agencies must identify reasonable schedules that demonstrate progress toward achieving the interim and final numeric goals presented in Section 4.1. This Water Quality Improvement Plan incorporates the 20-year Bacteria TMDL compliance

schedule to attain wet weather goals and the 10-year Bacteria TMDL compliance schedule to attain dry weather goals. Strategy development and planning included an assessment of relative cost-effectiveness of each strategy and was one of the key drivers in phasing strategy implementation. Nonstructural BMPs are effective in reducing pollutant loads before they enter the storm drain and are generally cost-effective and require a shorter planning period. Therefore, most nonstructural strategies are planned for implementation before or upon approval of the Water Quality Improvement Plan. Structural BMPs can be cost-effective when greater load reductions are needed and treatment must occur after the pollutants enter the storm drain system, particularly when benefits other than water quality improvements are considered. However, planning for structural BMPs requires more time to secure resources, design BMPs, and obtain permits. Most of the structural BMPs are planned for later in the compliance period to allow more time to confirm that the implementation is necessary to meet numeric goals and that the BMPs have been designed to achieve the load reductions required, and that alternatives to construction have been evaluated.

4.3.1 Schedule

A summary of the implementation year and duration of each jurisdictional strategy is presented in Appendix I within each jurisdictional strategy table. If a jurisdictional strategy is not initiated upon approval of the Water Quality Improvement Plan, the expected implementation year is provided. The implementation description within the strategy tables for optional strategies provides the circumstances for implementation and the resources needed. Optional strategies are those strategies that may be triggered in the future to achieve the interim and final numeric goals. The schedules and resources required to implement the WMA strategies are presented in Section 4.2.5, as well as within each jurisdictional annual strategy for those jurisdictions participating in the WMA strategy. This section describes the selection of the schedule for implementation, the benefits expected from the strategies, and the timeframe for meeting the final and interim goals.

4.3.2 Progress Toward Achieving Numeric Goals

To show the expected progress toward achieving numeric goals, anticipated load reductions by strategy type have been estimated. The load reduction estimated from the suite of nonstructural strategies identified by the Responsible Agencies is 10 percent for wet and dry weather. A 10 percent load reduction for nonstructural activities was estimated by averaging the range of measured and anticipated pollutant removal from the list of nonstructural strategies. Strategies were categorized as “high” percent removal, those with greater Responsible Agency control (operation and maintenance of MS4 infrastructure), or “low” percent removal, those requiring public behavior changes. The range of pollutant load reduction was as low as approximately 2 percent and as high as 72 percent. The overall average percent removal for all constituents and all activities is 10.1 percent. The average bacteria removal from the list of strategies was 11.7 percent (HDR, 2014).

The following sections provide the anticipated progress toward achieving numeric goals during wet and dry weather.

4.3.2.1 Progress Toward Achieving Wet Weather Goals

The Bacteria TMDL wet weather load reduction required within the San Dieguito River WMA is less than 10 percent for all indicator bacteria species; therefore, it is anticipated that the suite of nonstructural strategies selected by each Responsible Agency will lead to protection of beneficial uses in the receiving water. The expected progress toward achieving interim and final wet weather WMA load reductions goals is presented in Figure 4-13. If monitoring and assessment demonstrate that the Water Quality Improvement Plan interim goals are not being met, Responsible Agencies may adapt their programs and assess the incorporation of optional strategies, potentially including structural BMPs.

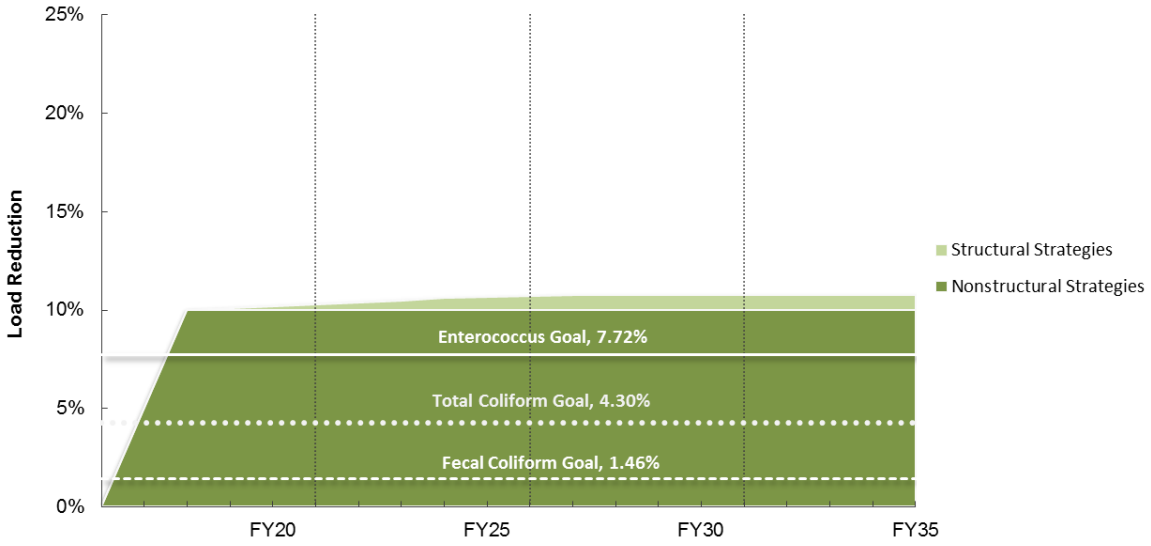


Figure 4-13
Progress Toward Achieving Wet Weather Interim and Final Watershed Load Reduction Numeric Goals

Compliance with wet weather goals may also be met in the receiving water by achieving interim and final wet weather exceedance frequencies. The existing exceedance frequencies were calculated during the development of the Bacteria TMDL. As discussed in Section 4.1, the existing exceedance frequency is 43 percent for fecal and total coliform and 49 percent for *Enterococcus*. Historical wet weather monitoring is not available to provide an up-to-date baseline for the wet weather exceedance frequency. Future wet weather receiving water monitoring (discussed in Section 5) will provide a baseline and allow future demonstration of progress towards meeting the interim and final receiving water goals.

4.3.2.2 Progress Toward Achieving Dry Weather Goals

The expected progress toward achieving interim and final dry weather goals will be based on monitoring results and relies mostly on the implementation of JRMPs, such as the IDDE program, irrigation reduction, and public outreach and education programs. The expected progress toward achieving interim and final dry weather WMA load reductions goals is presented in Figure 4-14.

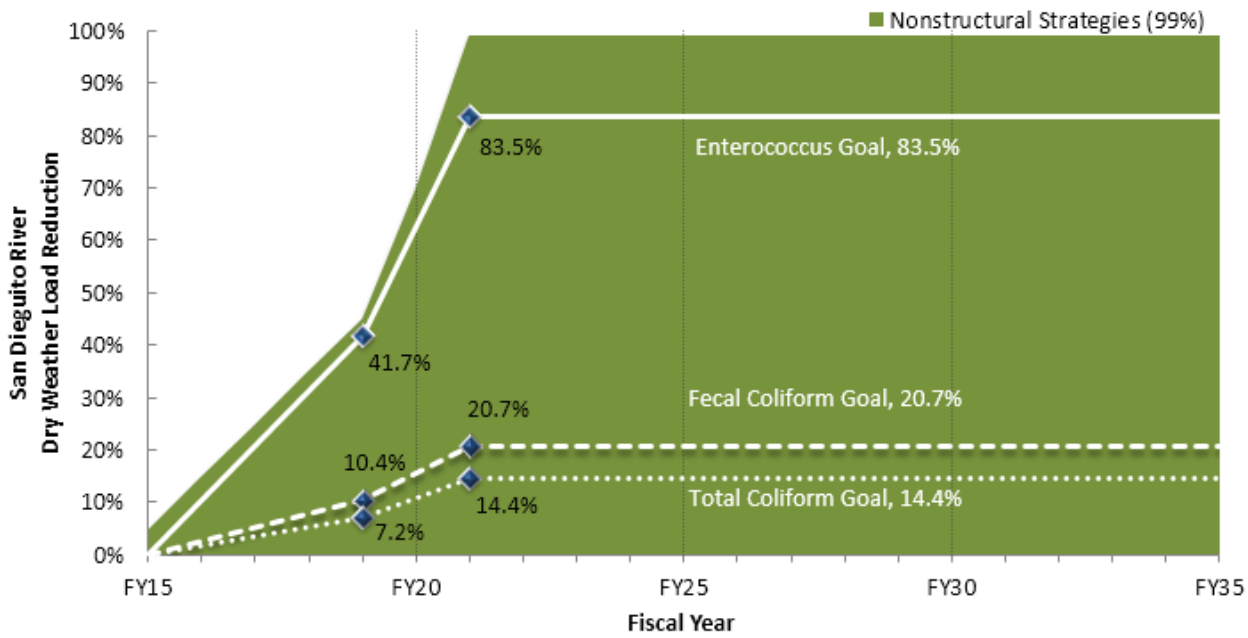


Figure 4-14
Progress Toward Achieving Dry Weather Interim and Final Watershed Load Reduction Numeric Goals

The "existing" dry weather receiving water exceedance frequency was calculated, as required by the MS4 Permit, by analyzing the available monitoring data collected between January 1, 1996, and December 31, 2002. The existing dry weather exceedance frequency (percentage of dry weather days exceeding the WQO at the shoreline) is 17 percent for *Enterococcus*. Fecal coliform and total coliform monitoring results exceeded the WQOs in 11 percent and 6 percent of the samples, respectively. TMDL dry weather modeling results approximated the need for an 84 percent load reduction of *Enterococcus* from the watershed to meet the final goal of zero allowable exceedance days (a 0 percent exceedance frequency) during dry weather. Fecal coliform and total coliform watershed load reductions are estimated at 21 percent and 14 percent, respectively.

It is anticipated that the targeted effort each Responsible Agency is taking to reduce dry weather flows, including promotion of landscaping techniques and tools to eliminate irrigation runoff, inspection programs targeting residential and commercial landscape and other water-using activities, and education and outreach, will meet the Water Quality Improvement Plan goals and TMDL targets. Modeling simulations of 25 percent irrigation reduction and elimination of overspray have demonstrated significant bacteria reduction in the Mission Bay WMA, Los Peñasquitos WMA, and Chollas Watershed. On average, load reduction of fecal coliform, *Enterococcus*, and total coliform is 99.4 percent, 99.2 percent, and 99.2 percent, respectively. If monitoring and assessment demonstrate that compliance is not occurring, Responsible Agencies will adapt their programs and assess the incorporation of optional strategies, including structural BMPs.

Intentionally Left Blank

5 Water Quality Improvement Plan Monitoring and Assessment Program

This section of the Water Quality Improvement Plan describes the development of the Monitoring and Assessment Program for the San Dieguito River WMA. The Monitoring Program includes three major components: (1) the receiving water monitoring program measures the long-term health of the watershed; (2) the MS4 outfall monitoring program investigates the elimination of dry weather flows from MS4 outfalls and the improvement the quality of the flows that exit the MS4 outfalls during rain events; and (3) special studies take a further look into the highest priority water quality conditions presented in Section 2. The Assessment Program includes an annual analysis of the monitoring data and an integrated analysis that combines all previously performed analyses at the end of the MS4 permit term.

Section 5 Highlights

- Develops the Monitoring and Assessment Program for the San Dieguito River WMA Water Quality Improvement Plan.
- Monitoring Program includes the following components:
  - Receiving Water Monitoring
    - Includes 18 total locations for 1 to 5 years of monitoring per location
    - Measures long-term health and attainment of beneficial uses
  - MS4 Outfall Monitoring
    - Includes 19 total locations
    - Dry weather: Includes inspections and inventory development with the goal of eliminating non-storm flow
    - Wet weather: Investigates whether there is a reduction in flow volumes and an improvement in discharge quality
  - Special Studies
- Assessment Program includes:
  - Annual assessments, including a review of the receiving water, MS4 outfall, and special studies data
  - A permit term assessment, combining all previous assessments into an integrated assessment

As shown in the graphic below, the fourth step of the Water Quality Improvement Plan (Monitoring & Assessment) is the development an integrated Monitoring and Assessment Program for the San Dieguito River WMA (Provision B.4, Provision D, Provision E, Provision F, and Attachment E). The Monitoring and Assessment Program moves into the second phase of the Water Quality Improvement Plan process.

The first three steps of the Water Quality Improvement Plan drive the Responsible Agencies' program planning and budgeting processes:

(1) Determining the priority water quality conditions

(2) Identifying the sources

(3) Defining goals, strategies, and schedules in relation to the highest priority water quality conditions

The last three steps of the Water Quality Improvement Plan are designed to evaluate the progress in addressing the priority water quality conditions through monitoring and assessment, updating the Water Quality Improvement Plan where needed (Adaptive Management Process, Section 6 of the Water Quality Improvement Plan), and reporting the findings of the assessments along with any necessary changes. Annual Reporting is described under both Section 5 and Section 6 of this Water Quality Improvement Plan, as it draws on both the Monitoring and Assessment Program and the Adaptive Management Process.

Based on the requirements of the MS4 Permit and Water Quality Improvement Plan process, the Responsible Agencies in the San Dieguito River WMA have developed an integrated Monitoring and Assessment Program that:

(1) Assesses the progress toward achieving the numeric goals and schedules provided in Section 4

(2) Measures the progress toward addressing the highest priority water quality conditions established in Section 2

(3) Evaluates each Responsible Agency's overall efforts to implement the Water Quality Improvement Plan

Water Quality Improvement Plan Monitoring includes sampling, inspection, and data collection at beaches, creeks, estuaries, and storm drain outfalls to observe conditions, improve understanding, and inform the management within the watershed to improve water quality conditions.

The Monitoring and Assessment Program incorporates requirements of Provision B, Provision D of the MS4 Permit along with the specific monitoring and assessment requirements for the Bacteria TMDL listed in Attachment E of the MS4 Permit. Table 5-1 presents an overview of planned monitoring activities for the San Dieguito River WMA, including key monitoring elements and implementation schedule by program. The program is designed to characterize the pollutant levels associated with the highest priority water quality conditions in the discharges from the MS4 outfalls, identify sources of the highest priority water quality condition pollutants, and assess the effectiveness of strategies designed to address the highest priority water quality conditions. Additionally, these programs will generate data to track priority water quality conditions and general health and condition within the WMA. As stated in the Provision D of the MS4 Permit:

> *"The purpose of this provision is for the Copermittees to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Copermittees' MS4s under wet weather and dry weather conditions. The goal of the Monitoring and Assessment Program is to inform the Copermittees about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the MS4s, pollutant sources and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans."*

To implement the Water Quality Improvement Plan process, the Monitoring and Assessment Program will provide the tools necessary to evaluate the main components presented in Sections 2 through 4 of the Water Quality Improvement Plan. In particular, the assessment focuses on the compliance pathways described in Section 4. To do this, Section 5 is divided into two main components, Monitoring and Assessment. Figure 5-1 summarizes the main components of the San Dieguito River WMA Monitoring and Assessment Program.

Intentionally Left Blank

Table 5-1
Water Quality Improvement Plan Monitoring Overview

MS4 Permit Monitoring Programs				Monitoring Elements	Permit Schedule[1]				
					2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Monitoring to Assess Goals and Schedules			Dry/ Wet	Varies by goal and jurisdiction	–	–	●	●	●
Receiving Water Monitoring	Long-Term Receiving Water Monitoring		Dry	Conventionals[2], FIB, nutrients, metals, pesticides, toxicity (chronic), possible TIE/TREs, visual observations, field measurements	●[3]	–	–	–	–
				Hydromodification (channel conditions, discharge points, habitat integrity, evidence and estimate of erosion and habitat impacts)	●[3]	–	–	–	–
				Bioassessment (BMI taxonomy, algae taxonomy, physical habitat characteristics)	●[3]	–	–	–	–
			Wet	Conventionals[2], FIB, nutrients, metals, pesticides, toxicity (chronic), field measurements	●[3]	–	–	–	–
	Regional Monitoring Participation	Bight	Dry	Chemistry, toxicity, benthic infauna	●	–	–	–	●[4]
		SMC	Dry	Bioassessment	●	●	●	●	●
		2011 Hydromodi-fication Monitoring Program (HMP)	Wet	Channel assessments; flow monitoring; sediment transport monitoring	●	●	●	–	–
		AB 411[5]	Dry	FIB	●	●	●	●	●

Table 5-1 (continued)
Water Quality Improvement Plan Monitoring Overview

MS4 Permit Monitoring Programs				Monitoring Elements	Permit Schedule[1]				
					2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Receiving Water Monitoring (continued)	Sediment Quality Monitoring	Sediment Quality Monitoring	Dry	Chemistry, toxicity, benthic infauna	●[6]	●	–	–	–
	TMDL Monitoring	Bacteria TMDL for Pacific Ocean Shoreline at San Dieguito Lagoon Mouth	Dry	FIB, visual observations, optional field measurements	–	–	●	●	●
			Wet	FIB, visual observations, optional field measurements	–	–	●	●	●
MS4 Monitoring	MS4 Field Screening		Dry	Visual: flow condition, presence and assessment of trash in and around the station, IC/IDs, descriptions	●[3]	●[3]	●	●	●

Table 5-1 (continued)
Water Quality Improvement Plan Monitoring Overview

MS4 Permit Monitoring Programs			Monitoring Elements	Permit Schedule[1]				
				2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
MS4 Monitoring (continued)	MS4 Outfall	Dry	Field parameters, conventionals[2], nutrients, metals, FIB	–	–	●	●	●
		Wet	Field parameters, conventionals[2], nutrients, metals, FIB	●[3]	●[3]	●	●	●
Special Studies	San Diego Regional Reference Streams and Beaches	Dry	Field parameters, conventionals[1], FIB, instantaneous flow	2012-2014	●[7]	–	–	–
			Streams only: nutrients, metals, bioassessment (including physical habitat and chlorophyll a)	2012-2014	–	–	–	–
		Wet	Field parameters, conventionals[1], FIB	2012-2014	●	–	–	–
			Streams only: nutrients, metals, toxicity, flow, and precipitation (duration of storm)	2012-2014	●	–	–	–

Table 5-1 (continued)
Water Quality Improvement Plan Monitoring Overview

MS4 Permit Monitoring Programs			Monitoring Elements	Permit Schedule[1]				
				2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Special Studies (continued)	San Dieguito River WMA Bacteria Source Identification and Prioritization Process Special Study	NA	GIS analysis, literature review, data gap analysis	–	–	●	–	–
	Proposed Nutrient Load Characterization for Lake Hodges	TBD	This program is currently under development and elements will be included in the first Water Quality Improvement Plan Annual Report	TBD	TBD	TBD	TBD	TBD
	Stream Gauge Study	Dry/ Wet	Temperature, water level, conductivity (location-dependent)	–	●	●	–	–

BMI = benthic macroinvertebrates; BOD = biological oxygen demand; IC/ID = illicit connection and/or illicit discharge; MST = microbial source tracking; NA = not applicable; O&G = oil and grease; FIB = fecal indicator bacteria SDC-MLS = San Dieguito Mass Loading Station; SMC = Southern California Stormwater Monitoring Coalition; TBD = to be determined; TIE = toxicity identification evaluation; TRE = toxicity reduction evaluation

1. The MS4 Permit was adopted on May 8, 2013; the MS4 Permit became effective on June 27, 2013. Note that the implementation of the programs will depend on the approval date of the Water Quality Improvement Plan and the fiscal year of implementation may be modified.
2. Definition of conventionals (conventional parameters) is based on SWMP guidelines.
3. Completed under the Transitional Monitoring Program according to MS4 Permit Provisions D.1.a and D.2.a.
4. The 2018 Southern California Bight Regional Monitoring will occur during the summer of 2018 or 2019.
5. The AB 411 program is not required by the MS4 Permit. Responsible Agencies are using the data to track beach water quality conditions related to the highest priority water quality condition for the watershed.
6 Sediment Quality Monitoring was completed under the 2013 Southern California Bight Regional Monitoring Program.
7 Dry weather monitoring at reference streams was completed in spring 2014. Dry weather monitoring at reference beaches began in fall 2014.

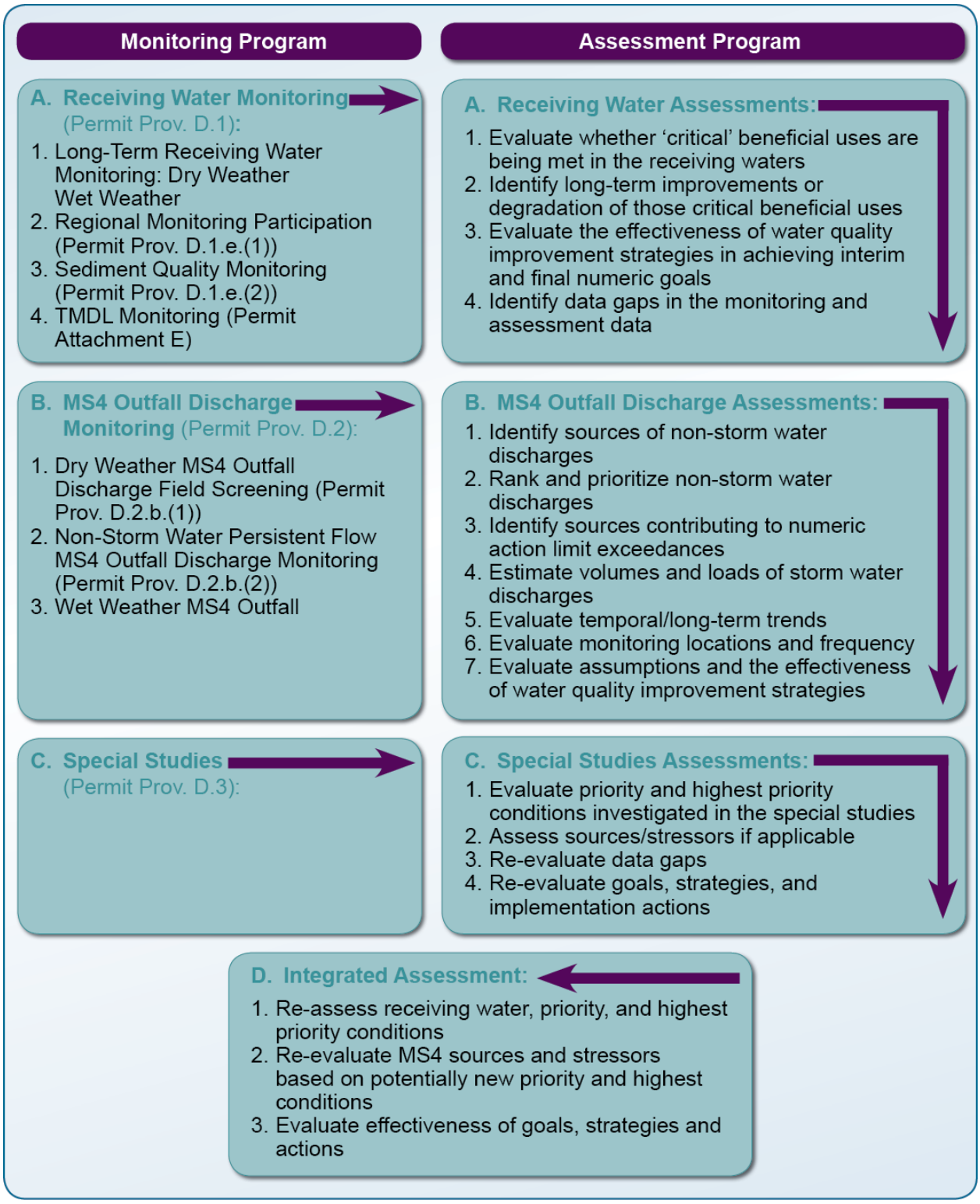


Figure 5-1
Monitoring and Assessment Program Components for the San Dieguito River WMA

5.1 Water Quality Improvement Plan Monitoring Program

The Water Quality Improvement Plan Monitoring Program has four major components:

- Monitoring to assess progress toward achieving short-term goals and schedules
- Receiving water monitoring
- MS4 outfall discharge monitoring
- Special studies

A summary of the Water Quality Improvement Plan Monitoring Program (including detailed information required to complete the monitoring tasks) is in Appendix N. The associated monitoring plans for each of the various elements described in Sections 5.1.1 through 5.1.4 will be available on the Project Clean Water Website, http://www.projectcleanwater.org/index.php, by June 2015. The methods and procedures described in these plans may be modified on the basis of site-specific environmental conditions and updated analytical methodologies.

- Wet weather is defined as >0.1 inch of rainfall within a 24-hour period and the following 72 hours after the end of rainfall.
- Dry weather is defined as all other days where rainfall is <0.1 inch of rainfall within a given 24-hour period.

5.1.1 Monitoring to Assess Progress Toward Achieving Goals and Schedules

This section summarizes monitoring and assesses progress toward achieving goals related to the highest priority water quality condition, which is bacteria for the San Dieguito River WMA, as described in Chapter 2 of the Water Quality Improvement Plan. As outlined in Chapter 4 of the Water Quality Improvement Plan, goals are based on the multiple compliance pathways set forth for the Bacteria TMDL in Attachment E.6 of the MS4 Permit. Compliance with the TMDL may be demonstrated via one of the compliance pathways identified in the MS4 Permit. The proposed compliance dates for both the TMDL's interim goals and final goals are set outside of this Permit cycle. Table 5-2 presents the interim TMDL goals and monitoring that may be used to track progress toward achieving the goals.

Each Responsible Agency has established jurisdictional goals for bacteria, the highest priority water quality condition, during this MS4 Permit term to demonstrate progress toward compliance with the TMDL requirements. Generally, Responsible Agencies have identified near-term goals to address potential bacteria sources and/or to reduce anthropogenic dry weather flow in MS4 outfalls. Data collection or monitoring elements that go beyond the prescribed MS4 Permit activities are tailored to measure progress toward meeting each goal. These elements, which are further detailed in the following subsections, may include visual surveys, inspections, physical sampling or

measurements, and development of new outreach and source control programs related to bacteria reduction.

Table 5-2.
Monitoring Related to Bacteria TMDL Goals[1]

Compliance Pathway		TMDL Goal	Monitoring Elements
1 OR	Receiving Water Conditions	Meet allowable exceedance frequency of the interim or final Receiving Water Limitations (RWLs) in the receiving water	Bacteria data collected at compliance points as described in Section 5.1.2, TMDL Monitoring Program
2 OR	MS4 Outfall Discharges	Meet allowable exceedance frequency in MS4 outfall discharges	Bacteria and flow data collected at outfalls as described in as described in Section 5.1.3, MS4 Outfall Monitoring Program
3 OR	MS4 Outfall Discharges	Pollutant load reductions for discharges from the Responsible Agencies' MS4 outfalls greater than or equal to the final load reductions	Bacteria and flow data collected at outfalls as described in as described in Section 5.1.3, MS4 Outfall Monitoring Program
4 OR	MS4 Outfall Discharges	No direct or indirect discharge from the Responsible Agencies' MS4 outfalls to the receiving water	Visual observation of flow from outfalls to receiving waters as described in Section 5.1.3, MS4 Outfall Monitoring Program
5 OR	Receiving Water Conditions	Exceedances of the final receiving water limitations in the receiving waters due to loads from natural sources	Data from Sections 5.1.1, 5.1.2, 5.1.4, and Jurisdictional Runoff Management Programs.
6	Water Quality Improvement Plan	Implementation of Water Quality Improvement Plan and use of adaptive management	Data from monitoring and Jurisdictional Runoff Management Programs

1. The County of San Diego proposed schedule to meet the TMDL interim goals in Attachment E.6 of the MS4 Permit is 2021 for dry weather and 2028 for wet weather. All other Copermittees propose to meet the TMDL interim goals by 2019 for dry weather and 2024 for wet weather.

Wet Weather Bacteria Monitoring Related to Performance Measures

Responsible Agencies have established wet weather goals for the 2013-2018 MS4 Permit term. Table 5-3 summarizes the data that will be collected to assess these goals by jurisdiction.

Table 5-3
Wet Weather Monitoring Related to Jurisdictional Goals

Jurisdiction	First Permit Term Numeric Goals 2013-2018	Assessment Metric	Monitoring Elements
City of Del Mar	Reduce by 10% anthropogenic surface dry weather flows[1] to address bacteria regrowth contributing during wet weather	Percent anthropogenic surface dry weather flow[1] reduction at MS4 outfalls	Collect flow measurements at selected MS4 outfalls during dry weather
City of Escondido	Implement and maintain water quality improvement BMPs to target fecal coliform, *Enterococcus*, total coliform, sediment, and nutrients from 4 acres of drainage area	Acres of drainage area treated by restoration of 1 sediment detention basin in a multiuse treatment area at Eagle Scout (formerly Sand) Lake, Kit Carson Park	Detail the restoration of BMP, including acres treated
City of San Diego	Develop a green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality from 10.6 acres of drainage area	Acres of drainage area treated by construction of 2 green infrastructure BMPs	Detail the completion of BMPs, including acres treated
City of Solana Beach	Direct 40.5 acres of low flows to the sanitary sewer through construction of 1 diverter at high priority outfall Seascape Sur	Acres of low flow directed to sanitary sewer	Detail the completion of diverter, including acres treated
	Design and construct curb cuts to treat 8 acres of drainage area along Highway 101	Acres of drainage area treated by curb cuts	Detail the completion of curb cuts including acres treated

Table 5-3 (continued)
Wet Weather Monitoring Related to Jurisdictional Goals

Jurisdiction	First Permit Term Numeric Goals 2013-2018	Assessment Metric	Monitoring Elements
County of San Diego	Implement programmatic (nonstructural) BMPs to achieve source reduction of bacteria loads from the MS4 outfalls	Anticipated percent bacteria load reduction	Detail programmatic BMPs implemented
	Reduce % bacteria loads by TBD in FY 15-16 from distributed BMPs constructed between 2003 and 2009 during redevelopment	Anticipated percent bacteria load reduction	Detail of structural BMPs[2]

1. The term "dry weather flow" excludes groundwater, other exempt or permitted non-storm water flows and sanitary sewer overflows.
2. Implementation of structural BMPs is optional, as needed and as funding available.

Dry Weather Bacteria Monitoring Related to Performance Measures

Responsible Agencies have established dry weather goals for the 2013-2018 MS4 Permit term. Table 5-4 summarizes the data that will be collected to assess these goals by jurisdiction.

Table 5-4
Dry Weather Monitoring Related to Jurisdictional Goals

Jurisdiction	First Permit Term Numeric Goals 2013-2018	Assessment Metric	Monitoring Elements
City of Del Mar	Reduce by 10% anthropogenic surface dry weather flows[1]	Percent anthropogenic surface dry weather flow reduction at MS4 outfalls	Collect flow measurements at selected MS4 outfalls
City of Escondido	Reduce by 10% flow in priority drainage area with persistent flow	Percent flow reduction at a priority MS4 outfall	Collect flow measurements at a priority MS4 outfall (HDG_102)

Table 5-4 (continued)
Dry Weather Monitoring Related to Jurisdictional Goals

Jurisdiction	First Permit Term Numeric Goals 2013-2018	Assessment Metric	Monitoring Elements
City of Poway	Achieve a 5% increase in turf conversion from baseline	Percent increase in turf conversion	Specify City programs tracking the implementation of turf conversion, including turf conversion increase
City of San Diego	Develop a green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality from 10.6 acres of drainage area	Acres of drainage area treated by construction of 2 green infrastructure BMPs	Detail the completion of BMPs, including acres treated
	Reduce by 10% the prohibited[2] dry weather flow from baseline measured at persistently flowing outfalls during dry weather	Percent reduction in prohibited[2] dry weather flow	Collect flow measurements at persistently flowing outfalls
City of Solana Beach	Direct 40.5 acres of low flows to the sanitary sewer through construction of 1 diverter at high priority outfall Seascape Sur	Acres of low flow directed to sanitary sewer	Detail the completion of diverter, including acres treated
	Design and construct curb cuts to treat 8 acres of drainage area along Highway 101	Acres of drainage area treated by curb cuts	Detail the completion of curb cuts, including acres treated
County of San Diego	Reduce by 20% the aggregate flow volume or the number of persistently flowing outfalls during dry weather	Percent reduction in dry weather flow[1]	Collect flow measurements at persistently flowing outfalls

1. The term “dry weather flow” excludes groundwater, other exempt or permitted non-storm water flows, and sanitary sewer overflows.
2. Does not include allowable discharges as defined in MS4 Permit Provision A and Provision E.2.a.

5.1.2 Receiving Water Monitoring

The purpose of the receiving water monitoring program is to characterize trends in the chemical, physical, and biological conditions of a receiving water to determine whether beneficial uses are protected, maintained, or enhanced. This program is designed to meet requirements set forth in Provision D.1 of the MS4 Permit. Long-term monitoring occurs during both wet and dry conditions for water quality and physical and biological integrity, along with sediment quality monitoring and participation in regional monitoring. The MS4 Permit also stipulates how TMDL monitoring requirements are to be incorporated into the receiving water monitoring program as described in Attachment E of the MS4 Permit. Receiving waters monitoring comprises the following programs:

- Long-term receiving water monitoring
- Regional monitoring participation
- Sediment quality monitoring
- TMDL monitoring

Long-Term Receiving Water Monitoring

Long-term receiving water monitoring will track the overall health of the receiving waters and is designed to answer the following questions:

- Are conditions in the receiving water protective, or likely protective, of beneficial uses?
- What are the extent and magnitude of the current or potential receiving water problems?
- Are the conditions in the receiving water getting better or worse?

Dry and wet weather monitoring will continue at the historical mass loading station (SDC-MLS) located on the San Dieguito River below Lake Hodges. Copermittees have monitored SDC-MLS since 2001 to meet requirements of previous MS4 Permits. The MLS is depicted on Figure 5-2. This site will be monitored three times during dry weather and three times during wet weather per permit cycle. This monitoring program is designed to monitor the highest priority water quality conditions in the receiving water, along with a comprehensive list of constituents based on the 303(d) list impairments, CLRP, non-storm water action levels (NALs) or storm water action levels (SALs), and Table D-3 of the MS4 Permit. During both dry and wet weather, water samples will be analyzed for conventional constituents, nutrients, metals, pesticides, bacteria, field parameters, and toxicity, when applicable. Toxicity identification evaluations (TIEs), if necessary, will be conducted in compliance with Provisions D.1.c.(4)(f) and D.1.d.(4) of the MS4 Permit and used to determine the causative agent(s) of toxicity. Once per term during dry weather, a bioassessment will be conducted to evaluate chemical, physical, and biological data, and hydromodification monitoring will be conducted to record the

stream conditions and habitat integrity and impacts. These data can be used to re-evaluate priorities via the iterative approach described in Section 6.

The 2013 and 2014 Transitional Monitoring Programs satisfied long-term receiving water monitoring requirements, including dry and wet weather water quality sampling, bioassessments, and hydromodification monitoring for this Permit term. For details of this monitoring program, refer to Appendix N. The methods and procedures provided in Appendix N may be modified on the basis of site-specific environmental conditions and updated analytical methodologies.

Regional Monitoring Participation

Regional monitoring includes separate studies that will evaluate various aspects of receiving water health on a regional scale. The data may be used by Responsible Agencies to answer the following questions:

- Are conditions in the receiving water protective, or likely protective, of beneficial uses?
- What are the extent and magnitude of the current or potential receiving water problems?

Responsible Agencies will participate in the following regional programs:

- Bight

  The Bight regional monitoring program is a multi-agency collaborative effort developed to assess the ecological condition of the Southern California Bight from a regional perspective. The core monitoring program consists of sediment chemistry, sediment toxicity, benthic infauna, demersal fish, and epibenthic invertebrates. The goals of past Bight programs were to answer three primary questions:

  - What are the extent and magnitude of direct impact from sediment contaminants?
  - How does the extent and magnitude of the environmental impact vary by habitat?
  - What is the trend in extent and magnitude of direct impacts from sediment contaminants?

  Sediment quality monitoring was conducted during the summer of 2013 at a total of 22 sites in 9 estuaries and lagoons in the San Diego region, including the San Deiguito River Estuary under the Southern California Bight 2013 Regional Monitoring Survey (Bight ’13) (San Diego County Municipal Copermittees, 2014c). As described in Section 4.1.1.3, sediment monitoring data from Bight ’13 will be used to fulfill part or all of the sediment monitoring requirements of the MS4 Permit. During this Permit term, Responsible Agencies will participate in planning Bight ’18 monitoring programs.

- Stormwater Monitoring Coalition (SMC) Regional Monitoring

Since 2001, Copermittees have partnered with regulated storm water municipalities in southern California, the Regional Boards of Southern California, and the SCCWRP to form the Southern California SMC. The goals of the SMC are to standardize monitoring, improve understanding of storm water mechanics, and identify receiving water impacts from storm water (SCCWRP, 2002). According to its 2014 Research Agenda, the SMC has identified 21 projects for the next 5-year term and is in the process of prioritizing its efforts on the basis of need and available funding (SMC, 2014a). The San Dieguito River WMA Responsible Agencies will continue participation in the SMC Regional Freshwater Stream Bioassessment Monitoring Program (SMC Regional Bioassessment Program) that began as a five year program in 2008–2013 and will be implemented for another five years (2015-2019).

The 2009–2013 SMC Regional Bioassessment Program was designed to address the following monitoring questions (SMC, 2014b):

- What is the extent of impact in streams of southern California?
- What are the stressors that impact southern California streams?
- Is the extent of stream impacts changing over time?

A final monitoring report was prepared on the basis of 2009–2013 results to identify lessons learned, data gaps, and recommendations to guide the design of the 2015–2019 program. In 2015, a new five-year SMC program will extend the initial survey to answer key management questions about the impacts of storm water on stream conditions. The program will have an added emphasis on detecting trends, including non-perennial streams and sampling sediment chemistry and toxicity.

The non-perennial stream monitoring was initiated in April 2014, with site revisits in May and June 2014. Sampling included benthic macroinvertebrates (BMI), algae, physical habitat, and California Rapid Assessment Method (CRAM). The trend site monitoring was conducted during the standard index period (i.e., from mid-May through July). Sampling for trend site monitoring included all of the parameters and constituents of the original SMC Regional Bioassessment Program (San Diego County Municipal Copermittees, 2014b). The bioassessment monitoring was conducted at a total of 64 bioassessment stations; 30 stations were compliance stations; 28 stations were randomly placed SMC stations; and 6 stations were San Diego County reference stations (San Diego County Municipal Copermittees, 2014b).

- Hydromodification Regional Monitoring Program

  Copermittees have developed a regional HMP to address impacts on beneficial uses and stream habitat from increased erosive force potentially caused by an increase in runoff discharge rates and duration from all Priority Development Projects (County of San Diego, 2011). The HMP was initially developed to meet the requirements of the 2007 MS4 Permit. The Monitoring Plan is defined in Chapter 8 of the HMP, and was updated by the San Diego County Regional Copermittees and accepted by the Regional Board in February 2014. The HMP requires monitoring with a final report due to the Regional Board in December 2016. Monitoring consists of channel sediment transport assessments, and continuous flow monitoring of pre-project, post-project, and reference conditions per MS4 Permit Provisions D.1.a and D.1c(6). Additional monitoring is required per MS4 Permit Provision D.1.a(2).

- San Diego County Beach Water Quality (AB 411) Monitoring

  San Diego County Department of Environmental Health (DEH) implements the Beach and Bay Water Quality Monitoring Program to support the statewide program funded by the Beach Safety Act (AB 411). This program is commonly referred to as AB 411 monitoring. The purpose of this monitoring program is to advise the public of potential health risks that could occur with water contact recreation at local beaches. DEH will post a health advisory notice or close a beach when FIB results are above REC-1 water quality standards. There are four AB 411 beach monitoring stations in the San Dieguito River WMA. All sites are sampled a minimum of once weekly during dry weather (April 1 through October 31). The AB411 monitoring program is not required by the MS4 Permit. Responsible Agencies are using the AB 411 data to track beach water quality conditions related to the Highest Priority Water Quality Condition for the watershed.

Sediment Quality Monitoring

Sediment quality monitoring is designed to assess compliance with receiving water limits applicable to MS4 discharges to enclosed bays and estuaries in accordance with the State Water Board's *Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part I Sediment Quality* (Sediment Control Plan). Part I of the State Board's Sediment Quality Control Plan provides sediment quality objectives for enclosed bays and estuaries and does not apply to ocean waters or inland surface waters (State Board, 2009). Sediment quality monitoring will be performed in compliance with Permit Provision D.1.e.(2), which requires preparation of a Sediment Quality Monitoring Plan that satisfies the requirements of the Sediment Control Plan. The California Sediment Quality Objective (SQO) multiple-line-of-evidence approach. The data generated will be used to answer the following question:

- What is the condition of sediments in enclosed bays or estuaries with respect to the statewide sediment quality objectives?

The Sediment Quality Monitoring Plan and Quality Assurance Project Plan (Attachment 4A-2) describe detailed proposed monitoring procedures and analytical methods that are illustrative and may change on the basis of site environmental conditions. As indicated in Table 5-5, sediment quality monitoring of the San Dieguito Lagoon was conducted in the summers of 2013 and 2014.

The participating agencies propose to conduct one round of sediment sampling each Permit term. The second required round of sampling will be satisfied by conducting additional follow-up sampling in the vicinity of potentially impacted sites identified in the first round. Sediment quality monitoring will employ the following general approach to meet the requirements of the MS4 Permit:

(1) Conduct initial monitoring within each qualifying water body per the requirements of the state's Sediment Control Plan. These data will be used to assess the degree of potential impact at each site using the California SQO multiple-line-of-evidence approach in accordance with the assessment criteria specified in Sediment Control Plan Section V. These scores are derived using multiple metrics from three key lines of evidence: (1) sediment chemistry data, (2) toxicity data, and (3) benthic community data. Sites are then categorized as un-impacted, likely un-impacted, possibly impacted, likely impacted, or clearly impacted.

(2) Confirm and characterize pollutant related impacts for any sites that are considered possibly impacted, likely impacted, or clearly impacted, following an integration of all lines of evidence. In accordance with Sediment Control Plan criteria, the data assessment in this phase is required to determine whether the score(s) indicate potential impacts due to toxic pollutants (e.g., freshwater-related contaminant sources from the MS4), or non-toxic pollutants (e.g., physical habitat, freshwater inundation, legacy contaminants, or other potential factors). This phase would be considered the first phase of the level stressor/source identification (SSID) based on existing data. The requirements of this phase are dependent on the site as categorized in the previous phase as follows:

a. Sites deemed to be possibly, likely, or clearly impacted based on initial monitoring for which the impact or impairment is determined to likely not be caused or contributed to by MS4 discharges will be monitored once more in the current Permit term. Follow-up monitoring is required to verify the findings from the first round of monitoring.

i. If results from the follow-up monitoring are consistent (possibly impacted), or un-impacted, no additional follow-up will be required during the current Permit term.

ii. If the second round of sampling reclassifies the station as likely or clearly impacted, an additional follow-up investigation may be needed or suspended pending future routine SQO monitoring. In this circumstance, results of the analytical assessments will be discussed with the Regional

Board staff to determine whether/where any SSID studies should be undertaken, and to identify major elements of the approach for any identified studies. Prior to additional investigation, a site-specific Sediment Assessment Work Plan would be prepared that would outline specific steps and methodologies to be taken.

b. Stations deemed by the assessment to be likely or clearly impacted by MS4 discharges will require additional follow-up investigation and this is deemed the first phase of SSID. A site-specific Sediment Assessment Work Plan will be prepared that will outline specific steps and methodologies to be taken. Per the Sediment Control Plan, SSID comprises three steps: (1) confirmation and characterization of pollutant impacts, (2) pollutant identification, and (3) source identification and management actions.

(3) In the annual Sediment Monitoring Report, describe the planned follow-up monitoring, including any planned SSID studies, and revisions the Sediment Monitoring Plan, accordingly.

During the transitional (pre-Water Quality Improvement Plan) monitoring phase, the Bight ’13 Monitoring Program satisfied the initial monitoring requirements of the state's Sediment Control Plan. As presented in Table 5-5, up to three sites were monitored in the San Dieguito Lagoon in 2013 for the initial screening of sediment quality. Follow-up monitoring was conducted in summer 2014 to further characterize one site that was possibly impacted. Based on the monitoring and assessment completed, sediment conditions in San Dieguito Lagoon are generally protective of the beneficial uses and typical of a tidally influenced shallow lagoon (San Diego County Municipal Copermittees, 2014b). No further monitoring is planned for San Dieguito Lagoon during this Permit term because there was no evidence to indicate that urban runoff from the watershed had significantly impaired the estuarine beneficial use of the receiving water (San Diego County Municipal Copermittees, 2014b). The Sediment Monitoring Report was provided in the 2014 Transitional Monitoring and Assessment Report in accordance with the permit reporting requirements.

Table 5-5.
Bight '13 Sample IDs, Site Locations, Dates Sampled, and Sample Depths

Lagoon/ Estuary	# of Sites	Site ID	Sediment Sampling			Monitored Events	
			Latitude	Longitude	Depth (m)	Date Sampled	Date Sampled
San Dieguito Lagoon	3	8179	32.9661	-117.2525	1.0	8/2/2013	8/11/2014
		8180	32.9664	-117.2579	1.0	8/2/2013	NA
		8187	32.9708	-117.2582	1.0	8/2/2013	NA

Source: Transitional Monitoring and Assessment Report Appendix H Sediment Monitoring Report (San Diego County Municipal Copermittees, 2014b).

NA – Follow-up monitoring not required.

TMDL Monitoring

TMDL provisions, schedules, and monitoring requirements are provided in Attachment E of the MS4 Permit. The purpose of TMDL monitoring programs is to track progress toward achieving compliance with interim and final numeric targets.

The Bacteria TMDL is the only applicable TMDL in the San Dieguito River WMA. Compliance monitoring is designed to meet the receiving water monitoring requirements of the Bacteria TMDL. Wet and dry weather sampling will be conducted each year at the compliance point located at the California Assembly Bill 411 (AB 411) monitoring location along the Pacific Ocean shoreline (25 yards down-current of where ocean currents meet river discharge in ankle-to-knee-deep water). The data generated will be used to address the following questions:

- Are TMDL numeric targets for bacteria indicators being met at the compliance monitoring locations?
- Are bacteria levels improving at the compliance monitoring locations?

Dry weather monitoring will be conducted weekly during the recreation season (April 1 through October 31) to be consistent with AB 411 monitoring frequencies, and monthly (at a minimum) during the wet season per the MS4 Permit requirements. Samples are to be collected on dry weather days, after an antecedent dry period of 72 hours with less than 0.1 inch of rainfall. The scope of compliance monitoring may account for the frequency and type of sampling activities of the existing Health and Safety Code Section 115880 of the AB 411 Monitoring Program to facilitate overlap of monitoring efforts and resources when feasible. Wet weather monitoring will be conducted at the monitoring locations during up to three storm events of each wet season (October 1 through April 30). Per the MS4 Permit Attachment E.6, a minimum of one storm is required to be monitored. Storms resulting in greater than 0.2 inch of precipitation will be targeted for analysis.

FIB are the target constituents for the Pacific Ocean Shoreline within the San Dieguito River WMA, as indicated by the MS4 Permit. Grab samples will be collected in a manner consistent with the requirements of the AB 411 program and analyzed for total coliform, fecal coliform, and *Enterococcus*. For details of this monitoring program, refer to Appendix N. The methods and procedures described in Appendix N may be modified on the basis of site-specific environmental conditions and updated analytical methodologies.

5.1.3 MS4 Outfall Monitoring

The purpose of the MS4 outfall monitoring program is to evaluate the potential contribution from MS4 discharges to the receiving water quality. This program is designed to meet requirements set forth in Provision D.2 of the MS4 Permit. The MS4 outfall monitoring program has both dry and wet weather monitoring components. The outfall monitoring seeks to answer the question:

- Do non-storm water or storm water discharges from the MS4 contribute to receiving water quality problems?

This program is composed of the following two components:

- Dry Weather
  - Field screening
  - MS4 outfall dry weather monitoring
- Wet Weather
  - MS4 outfall wet weather monitoring

Table 5-6 provides the number of major outfalls to be monitored under each component of the MS4 Outfall Monitoring Program by Copermittee. The number of major outfalls monitored per year as shown in Table 5-6 are subject to change on the basis of new information, updates to the Copermittee's MS4 outfall inventories, changes in transient or persistent flow classifications, and/or changes or updates to the priority water quality conditions over the life of the Water Quality Improvement Plan. Detailed proposed monitoring methods and procedures are presented in the MS4 Outfall Monitoring Plan. These methods and procedures may be modified on the basis of site-specific environmental conditions and updated analytical methodologies.

Table 5-6
Number of Major MS4 Outfalls per Jurisdiction

Jurisdiction	Number of Major Outfalls Per Year		
	Field Screening[1]	Dry Weather Monitoring	Wet Weather Monitoring
City of Del Mar	5 (6)[2]	2	1
City of Escondido	3 (3)[2]	1	1
City of Poway	12 (15)[2]	2	1
City of San Diego	42 (42)[3]	5	1
City of Solana Beach	3 (3)[2]	0[4]	1
County of San Diego	16 (20)[2]	3	1

1. Total number of major outfalls within each jurisdiction in the WMA is provided in parentheses.
2. For Copermittees with fewer than 125 major outfalls in the WMA, 80% of major outfalls must be screened twice per year.
3. For Copermittees with portions of their jurisdictions in more than one WMA and more than 500 major MS4 outfalls in its jurisdiction, at least 500 major outfalls must be inspected once per year.
4. All persistently flowing outfalls have been diverted to the sanitary sewer.

MS4 Outfall Dry Weather Monitoring

The purpose of the MS4 Outfall Dry Weather Monitoring Program is to evaluate the potential contribution from MS4 discharges to the receiving water quality during dry conditions and to assess the ability of programs to effectively eliminate non-storm water discharges to waterbodies or waterways. Each Copermittee has established a number of major MS4 outfalls that are prioritized on the basis of non-storm water flow status and threat to receiving water quality, and these outfalls will be screened once or twice annually on the basis of this prioritization. Additionally, the highest priority major MS4 outfalls have been selected for further water quality testing to facilitate source investigations of these outfalls with persistent dry weather flows.

Dry Weather Field Screening

Field screening is visual monitoring of all MS4 outfalls to identify and eliminate sources of persistently flowing non-storm water discharges. Dry weather MS4 outfall discharge field screening is designed to answer the following questions:

- Which non-storm water discharges are transient and which are persistent?
- Which discharges should be investigated as potential illicit connection/illicit discharges?

The frequency of field screening is determined on a jurisdictional basis and is dependent on the number of major outfalls. Provision D.2.b(1) of the MS4 Permit outlines three categories as the basis for frequency, as described below:

- 0-125 major outfalls, 80% of major outfalls 2 times per year
- 125-500 major outfalls, all major outfalls 1 time per year
- 500+ major outfalls, at least 500 major outfalls 1 time per year

Field screening activities will be conducted during dry weather with an antecedent dry period of at least 72 hours with less than 0.1 inch of rainfall. Field observations will include flow condition (pooled, ponded, flowing, or no flow), estimate of flow, characteristics of flow and water, likely source(s), presence of trash, or evidence or signs of illicit connections or illegal dumping. Follow-up investigations will be employed on the basis of jurisdictional IC/ID programs.

Prioritization of Non-Storm Water Persistently Flowing Outfalls

Each jurisdiction ranked its major outfalls independently on the basis of their highest priority conditions, PGAs, and specific site considerations. Copermittees considered the following factors to prioritize persistently flowing outfalls:

- Potential to contribute to a highest or priority water quality condition
- Historical monitoring or inspection data
- Controllability
- Surrounding land uses/potential sources
- Flow rate

Highest Priority MS4 Outfall Dry Weather Monitoring

The purpose of this program is to determine which major persistent-flow MS4 outfalls impact receiving water quality during dry weather. MS4 outfall dry weather monitoring is designed to answer the following questions:

- Do dry weather discharge concentrations at MS4 outfalls meet MS4 Permit action levels?
- What is the relative contribution of MS4 outfalls to priority water quality conditions during dry weather?
- What are the sources of persistent non-storm water flows?

Responsible Agencies will monitor a minimum of five major MS4 outfalls during dry weather (if a Responsible Agency has fewer than five major MS4 outfalls, then all of them will be monitored). Each outfall will be monitored semi-annually during dry weather conditions. During each event, field observations will be recorded, and when

measureable flow is present, in-situ field measurements and analytical data will be collected. Analytical constituents will include constituents contributing to the highest priority conditions, 303(d) list impairments, TMDLs, NALs, and Table D-7 of the MS4 Permit as described in the MS4 Outfall Monitoring Plan (the Plan will be available on the Project Clean Water Website, http://www.projectcleanwater.org/index.php, by June 2015). When historical data demonstrated or justified that analysis of a constituent is not necessary for a particular waterbody or outfall, then it has been removed and its removal notated in the analytical table provided in the Water Quality Improvement Plan Annual Report. The methods and procedures described in the MS4 Outfall Monitoring Plan may be modified on the basis of site-specific environmental conditions and updated analytical methodologies.

Based on the data collected at the MS4 outfalls per jurisdiction as shown in Table 5-6, monitoring at these outfalls may be reprioritized to eliminate monitoring entirely or to reduce it to field screening activities only to address higher priority non-storm water persistent flows. Reprioritization of outfalls may occur if one of the following conditions is met:

- Non-storm water discharges have been effectively eliminated for three consecutive monitoring events; or
- Source(s)s of the persistent flows have been identified as not an illicit or a source of pollutants; or
- Pollutants in the persistent flow do not exceed NALs; or
- The threat to water quality has been reduced by the Participating Agency.

MS4 Outfall Wet Weather Monitoring

The purpose of this program is to identify pollutants in storm water discharges from the MS4s, guide pollutant source identification efforts, and track progress in achieving the goals set forth in Section 4. The Responsible Agencies' five monitoring locations for the wet weather MS4 outfall discharge monitoring component were chosen to be representative of the residential, commercial, industrial, and mixed-use land uses within the San Dieguito River WMA. These five locations will be monitored during one storm event annually. The wet weather MS4 outfall discharge monitoring is designed to answer the following questions:

- Do wet weather discharge concentrations at MS4 outfalls meet MS4 Permit action levels?
- What is the relative contribution of MS4 outfalls to priority water quality conditions during wet weather?
- How do representative MS4 outfalls discharge concentrations, loads, and flows change over time?

A minimum of five outfalls will be monitored once per year during a storm event with greater than 0.1 inch of rainfall. During each event, observational and hydrologic data will be recorded, including duration of the storm, rainfall estimates, and estimated or measured flow rates and volumes. Grab samples will be collected to analyze for pH, temperature, specific conductivity, dissolved oxygen, turbidity, hardness, and indicator bacteria. A composite sample must be collected and analyzed for constituents contributing to the highest priority conditions, 303(d) list impairments, TMDLs, and SALs, as described in the MS4 Outfall Monitoring Plan (the Plan will be available on the Project Clean Water Website, http://www.projectcleanwater.org/index.php, by June 2015). The methods and procedures described in the MS4 Outfall Monitoring Plan may be modified on the basis of site-specific environmental conditions and updated analytical methodologies. If historical data demonstrate or justify that analysis of a constituent is not necessary for a particular waterbody or outfall, then it will be removed and its removal noted in the Water Quality Improvement Plan Annual Report.

The 2013 Transitional Monitoring Programs began implementation of the wet weather MS4 outfall monitoring requirements at the six San Dieguito River WMA outfall monitoring locations.

5.1.4 Special Studies

Special studies have been selected to further investigate the highest priority water quality conditions set forth in Section 2 and to meet requirements of MS4 Permit Provision D.3. The special studies will include a regional special study and a special study specific to the San Dieguito River WMA.

San Diego Regional Reference Streams and Beaches Studies

The regional special studies selected for the San Dieguito River WMA are the San Diego Regional Reference Streams and Beaches Studies currently being conducted by the San Diego and Orange County Copermittees. The studies will develop numeric targets that account for “natural sources” to establish the concentrations or loads from streams in a minimally disturbed by anthropogenic activities or “reference” condition. The Reference Stream Study also collected nutrients, metals, and toxicity data as secondary constituents, with a goal of collecting the data necessary to derive reasonable and accurate numeric targets for bacteria, nutrients, and heavy metals on the basis of a reference approach. This study will provide a scientific basis for evaluating bacteria compliance levels in the Bacteria TMDL. The results of this study will be used to support the forthcoming reopener of the recently adopted Bacteria TMDL and to support numeric targets in future TMDLs for bacteria, nutrients, and metals.

The San Diego Regional Stream Reference Study will address the following questions (SCCWRP, 2013):

- How does the WQO exceedance frequency vary between summer dry weather, winter dry weather, and wet weather?

- How does the WQO exceedance frequency vary by hydrologic factors, including:
  - Size of storm (wet weather only)?
  - Discharge flow rate and volume (wet and dry weather)?
  - Beginning versus end of storm season (wet weather only)?
- How does the WQO exceedance frequency vary by input factors such as:
  - Size of catchment?
  - Geology?
- How does the WQO exceedance frequency vary by biotic and abiotic factors, including:
  - Algal cover and/or biofilms?
  - Water quality (temperature, pH, conductivity, dissolved oxygen, total suspended solids concentration)?

The San Diego Regional Reference Beaches Study will address the following questions (SCCWRP, 2013) in beaches minimally influenced by anthropogenic activities:

- How does the WQO exceedance frequency vary between summer dry weather, winter dry weather, and wet weather?
- How does the WQO exceedance frequency vary by hydrologic factors, including:
- Discharge flow rate (wet and dry weather)
- Status of estuary mouth (open/closed; dry weather only)
- What are the wet and dry weather exceedance frequencies of fecal indicator bacteria in estuaries?

For the stream study, a total of 6 locations were selected for wet weather monitoring and up to 10 locations were selected for dry weather monitoring. Sites were selected to represent 95 percent undeveloped land uses (reference conditions), two major geologic settings, and the target catchment sizes. Wet weather sampling frequency at the six locations consists of three targeted events throughout the wet season (October 1 through April 31). Dry weather sampling frequency consists of weekly sampling for up to 40 weeks at flowing locations during winter and summer dry weather periods. Dry weather sampling occurs if there has been no measurable rainfall for at least 72 hours.

Water samples will be analyzed for a combination of conventional constituents, nutrients, metals, fecal indicator bacteria, microbial source testing, and algae. Of these constituents, *Enterococcus*, *E. coli*, fecal coliform, total coliform, Bacteroides, and *in-situ* parameters are of primary importance; all other analytes are considered secondary. During dry weather sampling, reference stream sites will be assessed for algal percent cover, algal biomass, ash-free biomass, and factors that control the growth of algae

(stream bankful dimensions, canopy cover, and pebble count). Flow discharge rates were estimated for seven reference streams using recorded continuous water level data during both wet and dry weather conditions and measured velocity and flow during sampled wet weather events.

San Dieguito River WMA Bacteria Source Identification and Prioritization Process

The special study specific to the San Dieguito River WMA will assess sources of bacteria in the watershed using the San Diego Bacteria Source Identification and Prioritization Process developed in 2012 as part of the MS4 Permit Report of Waste Discharge process (the Plan will be available on Project Clean Water Website, http://www.projectcleanwater.org/index.php, by June 2015). The study will focus on the beach and lagoon area of the San Dieguito River WMA, with inputs from the upper watershed also considered where relevant and necessary to identify sources of bacteria to the beach and lagoon.

The goal of the study will be to determine the relative magnitude of bacteria in discharges, the geographical character and distribution of sources (i.e., regional or localized), frequency of occurrence in discharges, and human health risk based on readily available data. The San Dieguito Source Identification and Prioritization Process is designed to answer the question:

- What are the specific sources of bacteria impacting the San Dieguito River at the Pacific Ocean Shoreline?

The study will consist of desktop GIS analysis along with Responsible Agency interviews to determine bacteria sources impacting the San Dieguito River at the Pacific Shoreline.

5.1.5 Other Special Studies

Responsible Agencies have planned projects and studies to fill data gaps, further investigate priority and highest priority water quality conditions, or evaluate MS4 discharges and potential impacts. These projects exceed the monitoring requirements of the MS4 Permit. These studies will be implemented on the basis of available resources.

Proposed Nutrient Load Characterization for Lake Hodges

The impairment of municipal beneficial uses in Lake Hodges due to eutrophic conditions in dry weather is a priority water quality condition in the San Dieguito River Above Lake Hodges subwatershed. The City of San Diego's PUD is planning to begin prospective studies that can characterize the nutrient budget or "loading rate" to Lake Hodges and identify the sources of those loads. Specifically, the (1) quantity of total nutrient loads and (2) concentrations of nutrients in various surface flows to the reservoir cannot be derived from current data sources. Additional technical studies and monitoring needed

to ensure proper characterization of nutrient loads to Lake Hodges are suited to a phased approach, as follows:

(1) ***Quantification of Surface Water Entering Lake Hodges*** – The first step to determine a loading rate to the reservoir is gaining a better understanding of the nature of the independent volume contributions of tributary streams into Lake Hodges. Total volume in the reservoir and evapotranspiration losses can be easily accounted for using models, historical reservoir levels data, and climatology data for the watershed. However, before determining contributions of tributary nutrient loads, more contiguous data for independent tributary streams are needed.

The City of San Diego's PUD has 10 established monitoring locations in tributary streams and creeks above Lake Hodges in addition to three in-reservoir monitoring locations to collect samples and in-situ hydrologic data. These locations are sampled consistently, typically on a monthly basis. During periods of little or no flow, some tributaries have measureable flows quantified or recorded as zero during monthly measurements. These zero measurements are likely not reflecting smaller storm events. Additionally, some creeks and rivers are co-located and fed by urbanized areas that may have dry weather contributions, while others are not. More focused and comprehensive monitoring efforts are necessary to properly illustrate the hydrologic contributions and nature of flow originating from tributary streams and creeks including:

Sampling during Storm Events or High Water Flow to Lake Hodges – Currently, samples are obtained on a regular monthly schedule. Special monitoring efforts to coincide with storm events are necessary as a first step toward a characterization of "first-flush" episodes and sustained surface water inflows to the reservoir. The flow data from the wet weather monitoring event can be distinguished from dry weather-based flows. The storm flows would help to gain a better understanding of municipal storm water impacts versus rural land impacts.

(2) ***Nutrient Loading to Reservoir and Potential Source Identification –*** The second component to establishing a nutrient loading rate or budget for Lake Hodges is assessing the concentration of nutrients in reservoir inflows. This would require a more precise and frequent monitoring program beyond what PUD is currently invested in.

More Precise Measurement of Nutrient Concentrations – The nutrient sampling and analysis undertaken by PUD has been adapted to the needs of monitoring for source water protection and rapid assessment of water treatability. A more robust data set paired with a more precise laboratory analysis would be of value to assess contributions for tributary sources. This would require employing laboratory methods with lower detection limits for several nutrient parameters.

Independent Characterizations of Nitrogen and Phosphorus Loads to the Reservoir – Imbalances in total nitrogen and phosphorus ratios can generally be correlated with poor water quality or eutrophic conditions in reservoirs. On the other hand, not all speciations of phosphorus or nitrogen are bioavailable for the primary production in the reservoir. With primary production being the driver for eutrophic conditions (i.e., not all phosphorus or nitrogen is detrimental to water quality), gaining a more thorough understanding of the typical nutrient composition in the source water inputs would allow better characterization of the sources of nutrients. This would help in developing calculations of a nutrient budget and the capacity of the reservoir to assimilate outside nutrient loads. This characterization could include a more comprehensive assessment of seasonal variations of nutrient ratios and correlations with the intensity of primary production and algal blooms.

The City of San Diego's PUD has the technical expertise, facilities, and laboratory equipment to undertake these special studies, but would need to expend considerable additional staff resources to perform the focused sampling and lab analysis needed for a complete nutrient budget for Lake Hodges.

Stream Gauge Study

Many waterbodies in the San Diego region have not been subject to regular flow monitoring. Knowledge of water level is essential for programs, including TMDL implementation, bio-objectives, and bioassessment. The stream gauge study attempts to fill in some of the gaps in the information regarding the level of flow at three stream locations in San Dieguito River WMA. Monitoring will answer the questions:

- What is the level of flow in local streams?
- Which streams are perennial and which are ephemeral?

The study, which began in spring of 2014 and will continue until spring 2015, includes installation of datalogger units. Three dataloggers will gather water level, temperature, and location-dependent conductivity data at 5-minute intervals.

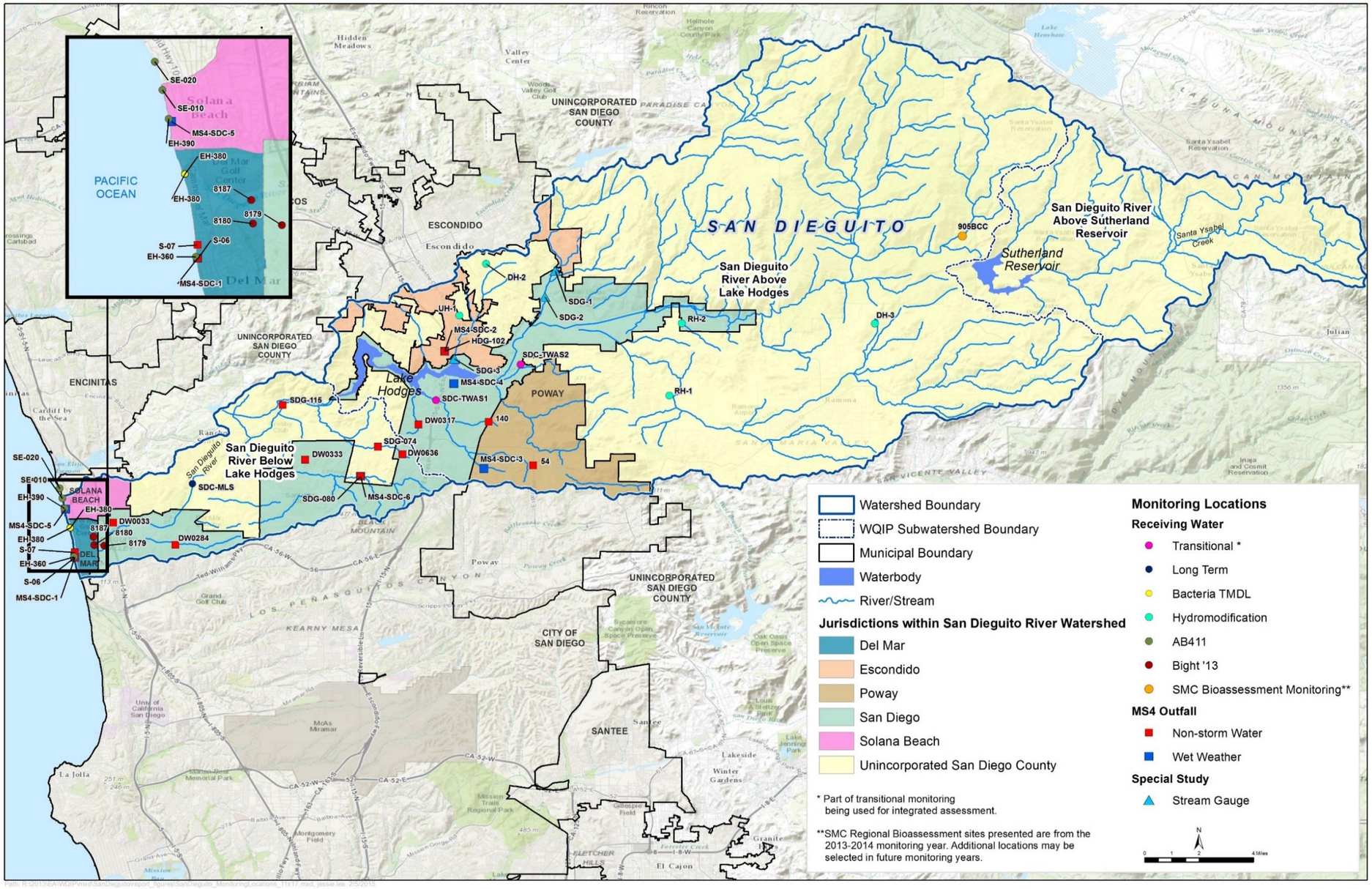


Figure 5-2
MAP Monitoring Locations for the San Dieguito River WMA

Intentionally Left Blank

5.1.6 Remaining Data Gaps

The data gaps discussed in Section 2 were compared with each of the monitoring program components described in the previous subsections. Most of the data gaps will be addressed by the Monitoring and Assessment Program. The long-term monitoring locations include a larger suite of pollutants than previously monitored on the basis of the new MS4 Permit requirements and provide more detail on hydromodification. In addition, because the MS4 outfall monitoring locations for dry and wet weather are prioritized on the basis of the priority water quality conditions identified in Section 2, over time there will be more MS4 data near the waterbodies included in the priority water quality conditions. It is expected to take a few years of monitoring to potentially assess the MS4 contribution to the priority water quality conditions because of the typical high variability of constituent concentrations in storm water. MS4 monitoring locations may also need to change because it is unlikely that MS4 locations will be monitored near each priority water quality condition during one monitoring season.

Some data gaps can be filled by the Responsible Agencies by working collaboratively with other agencies to get access to the data that they collect. For example, local water agencies collect data on color in Lake Hodges. The Responsible Agencies can work with these water agencies to use their data to characterize this specific priority water quality condition.

There are some data gaps that remain because the present state of science does not allow for the full characterization of the cause of the priority water quality condition. The impairment caused by nutrients is impacted by the physical and biological conditions of the receiving water. The link between these factors and the concentration of nutrients in the priority water quality condition waterbodies will not be determined as part of this iteration of the Monitoring and Assessment Program. Similarly, for receiving waters impaired by toxicity, factors other than runoff from the MS4 contribute to toxicity levels. The Monitoring and Assessment Program currently does not include analyses of non-MS4 contributions to toxicity in receiving waters. Additionally, for pollutants such as TDS and nutrients, groundwater may be a contributing source as noted throughout the San Diego Region (City of San Diego, 2011).

5.1.7 Regional Clearinghouse

The Responsible Agencies will use existing data-sharing templates to facilitate compilation of watershed-wide data sets for assessment and reporting purposes. To support reporting under previous Permit cycles, regional data-sharing templates were developed for receiving water monitoring, MS4 outfall monitoring, field screening, and IC/ID reporting. The Responsible Agencies will make the following data and documentation available to the public on the Project Clean Water website:

- San Dieguito River WMA Water Quality Improvement Plan and all updated versions with date of update

- Annual Reports for the WMA
- Jurisdictional Runoff Management Programs document for each Responsible Agency within the WMA and all updated versions with date of update
- BMP Design Manual for each Responsible Agency within the WMA and all updated versions with date of update
- Reports from special studies conducted in the WMA
- Monitoring data uploaded to the California Environmental Data Exchange Network (CEDEN) with links to the uploaded data
- Available GIS data, layers, and/or shape files used to develop the maps to support the Water Quality Improvement Plan, Annual Reports, and Jurisdictional Runoff Management Programs

Project Clean Water is a web-based portal for San Diego County watersheds. It is used as a centralized point of access to share educational materials, water quality information, and MS4 Permit-required reports with the public.

www.projectcleanwater.org.

5.2 Water Quality Improvement Plan Assessment Program

The assessment portion of the Monitoring and Assessment Program will evaluate the data collected under the monitoring programs described in Section 5.1, as well as the information collected as part of the JRMP. The data collected from these two programs will be used to assess the progress toward achieving the Water Quality Improvement Plan numeric goals and schedules and to measure the progress toward addressing the highest priority water quality conditions.

This section summarizes the requirements of the four primary assessments listed in Figure 5-1. Depending on permit requirements, some assessments will be reported annually, as part of the Water Quality Improvement Plan Annual Report, while others will be included in the Report of Waste Discharge that the Copermittees must submit 180 days prior to the end of this MS4 Permit. The timeframe for each of the assessments is as follows:

- Annual Reporting
  - Receiving Water Assessment
  - MS4 Outfall Discharge Assessment
  - Special Studies Assessment
- MS4 Permit Reporting (Report of Waste Discharge at end of MS4 Permit Cycle)
  - Integrated Assessment

The Monitoring and Assessment Program will be evaluated and adapted in the context of the Annual Reporting and the Report of Waste Discharge. The re-evaluation will consider data gaps and the results of all monitoring program elements. Required elements of the Water Quality Improvement Plan Annual Report are provided in Table 5-7.

Modifications may be made to the Monitoring and Assessment Program, but the core elements required by the MS4 Permit and described in Section 5.1 must be maintained. This limits the amount of adaptation that is possible. Potential changes could be to change the frequency of sampling, add a new analyte of concern, or move a monitoring location.

Table 5-7
Annual Reporting Components

Assessment and Documentation	Detailed Data and Information
Summary of data collected, findings, interpretations, and conclusions from the assessments required per Permit Provisions F.b.(3)(a), (b), and (c)	❖ Receiving Water Assessments per Provision D.4.a. ❖ Sediment Quality Assessments per Provision D.1.e(2) ❖ TMDL Assessments per Provision E.6 ❖ MS4 Outfall Discharger Assessments D.4.b ❖ IDDE relevant information and findings per Provision E.2 ❖ Special studies: findings and progress per Provision D.4.c ❖ Re-evaluation of the priority water quality conditions, numeric goals, strategies, schedules, and/or monitoring and assessment, as needed per Provision D.4.d.[1]
Progress of implementing the Water Quality Improvement Plan per Provision F.b.(3)(d)	❖ Progress towards interim and final numeric goals for the highest priority water quality conditions for the watershed ❖ Status of water quality improvement strategies by each Responsible Agency ❖ Proposed modifications to water quality improvement strategies and supporting rationale ❖ Water quality improvement strategies planned for implementation during the next reporting period

Table 5-7 (continued)
Annual Reporting Components

Assessment and Documentation	Detailed Data and Information
Progress of implementing the Water Quality Improvement Plan per Provision F.b.(3)(d) (continued)	❖ Proposed modifications to Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document ❖ Previous modifications or updates incorporated into the Water Quality Improvement Plan and/or each Copermittee's jurisdictional runoff management program document
A completed Jurisdictional Runoff Management Program Annual Report Form for each Copermittee in the WMA, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative per Provision F.b.(3)(e)	❖ City of Del Mar ❖ City of Escondido ❖ City of Poway ❖ City of Solana Beach ❖ City of San Diego ❖ County of San Diego
Any data or documentation utilized in developing the Water Quality Improvement Plan Annual Report for each Responsible Agency, upon request by the Regional Board. Monitoring data must be uploaded to CEDEN and available for access on the Regional Clearinghouse per Provision F.b.(3)(f)	❖ Receiving water and data collected per Provision D. 1 ❖ MS4 outfall discharge monitoring data collected per Provision D.2 ❖ Special Study data ❖ IC/ID investigation data

1. This re-evaluation is not required annually; at minimum, it must be completed as part of the Report of Waste Discharge.

5.2.1 Integrated Assessment

The integrated assessment builds on the receiving water assessment, MS4 outfall discharge assessment, and special studies assessment described in Sections 5.2.2 through 5.2.4. Additionally, the integrated assessment will evaluate the data collected as part of the transitional monitoring program implemented after the approval of the 2013 MS4 Permit and before the implementation of the monitoring program detailed in Section 5.1. Transitional monitoring components from the 2007 MS4 Permit consisted of:

- Continuation of the receiving water monitoring programs performed under the previous MS4 Permits (including monitoring at the two temporary watershed assessment stations (TWAS) on Green Valley Creek and San Pasqual Creek)
- Continuation of the Hydromodification Management Plans monitoring program
- Continued participation in regional receiving water monitoring programs

The Responsible Agencies will integrate the data collected as part of the Monitoring and Assessment Program, along with information collected during the implementation of the JRMP. The integrated assessment will evaluate the main components of the Water Quality Improvement Plan and will follow the assessment process outlined in the MS4 Permit, as summarized in Table 5-8. The priority water quality conditions will be re-evaluated using the receiving water and MS4 outfall discharge assessments on the basis of the methodology presented in Appendix A. The compliance pathways that comprise the goals and schedules in Section 4 will be reviewed on the basis of the results of the receiving water and MS4 outfall discharge assessments, along with data collected as part of the JRMP. This evaluation will highlight the progress in achieving the compliance goals. Finally, both water quality monitoring data and maintenance/observational data related to BMP effectiveness will be used to assess the strategies implemented by the Responsible Agencies. Table 5-8 summarizes the assessment program components.

Table 5-8
Integrated Assessment Components

Water Quality Improvement Plan Components	MS4 Permit Assessment Methodology	Evaluation Assessment
Priority Water Quality Conditions	<u>Re-assess receiving water, priority, and highest priority conditions.</u> (1) Re-evaluate the receiving water conditions per methodology and any new methodology provided in Appendix A.	❖ Receiving Water Assessments ❖ MS4 Outfall Discharge Assessments

Table 5-8 (continued)
Integrated Assessment Components

Water Quality Improvement Plan Components	MS4 Permit Assessment Methodology	Evaluation Assessment
Priority Water Quality Conditions (continued)	(2) Re-evaluate the impacts of MS4 discharges on receiving waters per methodology provided in Appendix A. (3) Identify beneficial uses in receiving waters that must be protected per Receiving Water Assessment (Section 5.2.2). <u>Re-evaluate MS4 sources and stressors based on potentially new priority and highest priority conditions.</u> (4) Re-evaluate the identification of MS4 sources and/or stressors performed in Section 3.	❖ Receiving Water Assessments ❖ MS4 Outfall Discharge Assessments
Goals and Schedules (Compliance Pathways)	<u>Evaluate effectiveness of goals.</u> (1) Evaluate the progress toward achieving interim and final numeric goals for protecting impacted beneficial uses in receiving waters.	❖ Receiving Water Assessments ❖ MS4 Outfall Discharge Assessments ❖ JRMP Assessments

Table 5-8 (continued)
Integrated Assessment Components

Water Quality Improvement Plan Components	MS4 Permit Assessment Methodology	Evaluation Assessment
Strategies	<u>Evaluate effectiveness of strategies and actions.</u> (1) Identify the non-storm water and storm water pollutant loads from the MS4 outfalls based on the MS4 Outfall Discharge Assessment (Section 5.2.3). (2) Identify the non-storm water and storm water pollutant load reductions, or other improvements that are necessary to attain the interim and final numeric goals. (3) Identify the non-storm water and storm water pollutant load reductions, or other improvements, that are necessary to demonstrate that non-storm water and storm water discharges are not causing or contributing to exceedances of receiving water limitations. (4) Evaluate the progress of the strategies toward achieving interim and final numeric goals for protecting beneficial uses in receiving waters.	❖ MS4 Outfall Discharge Assessments ❖ Special Studies Assessments for BMP Effectiveness ❖ JRMP Assessments

The integrated assessment for all three Water Quality Improvement Plan components will be performed during the development of the Report of Waste Discharge. Strategies will be evaluated in the Water Quality Improvement Plan Annual Report on the basis of the data collected as part of the JRMP and any new relevant BMP effectiveness data collected by the Responsible Agencies.

Of particular interest for the integrated assessment to be performed during this MS4 permit cycle is a review of the performance-based goals presented in Section 4. These goals will be reviewed during the development the Report of Waste Discharge. Section 6.3.2 summarizes the jurisdictional goals put forth by each Responsible Agency and the measures that will be used to assess the goals.

5.2.2 Receiving Water Assessments

The assessment of receiving waters involves evaluating the physical, chemical, and biological conditions of the receiving waters and sediments. The Responsible Agencies must assess the status and trends of receiving water quality conditions in coastal waters, estuaries, and streams in the San Dieguito River WMA. This assessment includes evaluation of both dry weather and wet weather conditions. The receiving water assessment to be presented in the Water Quality Improvement Plan Annual Report will:

- Assess whether or not the conditions of the receiving waters are meeting the numeric goals established in Section 4.
- Identify the most critical beneficial uses that must be protected to ensure the overall health of the receiving water.
- Evaluate whether or not those critical beneficial uses are being protected.
- Identify short-term and/or long-term improvements or degradation of those critical beneficial uses.
- Consider whether or not the strategies established in the Water Quality Improvement Plan contribute toward progress in achieving the interim and final numeric goals of the Water Quality Improvement Plan.
- Identify data gaps in the monitoring data needed to assess the provisions above.

5.2.3 MS4 Outfall Discharge Assessments

The MS4 outfall discharge assessments include evaluating both the dry weather monitoring data associated with the IDDE program collected as part of the JURMP program and the wet weather monitoring data collected by the Responsible Agencies. Details of these two separate assessments are provided below. Each Responsible Agency will assess its dry weather MS4 monitoring programs individually and compile results annually as part of the San Dieguito River WMA Water Quality Improvement Plan Annual Report. The key elements of the MS4 Outfall Discharge Assessments are summarized in Table 5-9.

Table 5-9
Key Elements of the MS4 Discharge Assessments

Dry Weather Outfall Assessment	Illicit Discharge	Wet Weather Outfall Assessment
❖ Identify sources of non-storm water discharges on the basis of field screening data or IDDE activities ❖ Rank and prioritize non-storm water discharges ❖ Identify sources contributing to numeric action limit exceedances ❖ Estimate volumes and loads of non-storm water discharges ❖ Evaluate non-storm water discharge monitoring locations ❖ Evaluate the effectiveness of the water quality improvement strategies	❖ All IC/ID investigations ❖ IC/IDs eliminated within the jurisdiction	❖ Estimate volumes and loads of storm water discharges ❖ Evaluate temporal trends ❖ Evaluate storm water discharge monitoring locations and frequency ❖ Evaluate Water Quality Improvement Plan analysis ❖ Evaluate the effectiveness of water quality improvement strategies

Dry Weather MS4 Outfall Assessments

Each Responsible Agency must assess and report the progress of its IDDE program (required pursuant to MS4 Permit Provision E.2) toward effectively prohibiting non-storm water and illicit discharges into the MS4s within its jurisdiction, including the following elements:

- **Identify sources of non-storm water discharges.**

  Based on the dry weather MS4 outfall discharge field screening monitoring described in Appendix N, each Responsible Agency must assess and report as follows (Provision D.4.b(1)(b)):

  - Identify the known and suspected controllable sources (e.g., facilities, areas, land uses, and pollutant generating activities) of transient and persistent flows within the Responsible Agency's jurisdiction in the San Dieguito River WMA.

- Identify sources of transient and persistent flows within the Responsible Agency's jurisdiction in the San Dieguito River WMA that have been reduced or eliminated.
- Identify modifications of the field screening monitoring locations and frequencies for the MS4 outfalls in Responsible Agency's inventory necessary to identify and eliminate sources of persistent flow non-storm water discharges (Provision D.2.b).

The JRMP Annual Report will be used to guide this assessment in the Water Quality Improvement Plan Annual Report. Known and suspected sources will be identified during the implementation of JRMP activities. These activities include the facility inspections that complement the IDDE program and information gathered by the storm water hotline or other public complaints. The JRMP Annual Report now consists of a one-page form that summarizes the JRMP activities in Attachment D of the MS4 Permit, along with supporting information. Section IV of the JRMP Annual Report Form summarizes the findings of the IDDE Program. The back-up that may be provided along with the form may include the following information to help identify sources:

- Subwatershed of the source or complaint
- Potential receiving water of the source or complaint
- Potential pollutant or pollutant category that could be contributed by the source or complaint

Those Copermittees that do not provide this optional back-up will make this information available for collaborative watershed assessments.

- **Rank and prioritize non-storm water discharges.**

Based on the data collected and applicable numeric action levels described in Section 2 and detailed in Attachment M, the Responsible Agencies must rank the persistently flowing major outfalls in their jurisdictions according to the potential threat to receiving water quality and produce a prioritized list of major MS4 outfalls. The Water Quality Improvement Plan will be updated as described in Section 6 on the basis of these findings and with the goal of implementing (in the order of the ranked priority list) targeted programmatic actions and source investigations to eliminate persistent non-storm water discharges and/or pollutant loads.

- **Identify sources contributing to numeric action limit exceedances.**

For the highest priority major MS4 outfalls with persistent flows that exceed NALs (Provision C1.), each Responsible Agency must identify the known and suspected sources within its jurisdiction in the San Dieguito River WMA that may cause or contribute to the numeric action limit exceedances.

- **Estimate volumes and loads of non-storm water discharges.**

  Annually, each Responsible Agency must (1) analyze the data collected as part of the Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Program from the highest priority major MS4 outfalls and (2) use a model or another method to calculate or estimate the non-storm water volumes and pollutant loads collectively discharged from all the major MS4s outfalls in its jurisdiction that have persistent dry weather flows during the monitoring year. These calculations or estimates must include:

  - The percent contribution from each known source for each MS4 outfall
  - The annual non-storm water volumes and pollutant loads collectively discharged from the Responsible Agency's major MS4 outfalls to receiving waters within the Responsible Agency's jurisdiction
  - The annual volumes and pollutant loads for sources of non-storm water not subject to the Responsible Agency's legal authority that are discharged from the Responsible Agency's major MS4 outfalls to downstream receiving waters

- **Evaluate non-storm water discharge monitoring locations**.

  Based on an evaluation of the data collected from the highest priority non-storm water persistent flow MS4 outfall monitoring locations, the outfall monitoring locations may be reviewed and the list reprioritized according to one or more of the following criteria (Provision D.2.b.(2)(b)(ii)):

  - The non-storm water discharges have been effectively eliminated (i.e., there is no flowing, pooled, or ponded water) for three consecutive dry weather monitoring events
  - The sources of the persistent flows have been identified as a category of non-storm water discharges that do not require an NPDES permit and do not have to be addressed as an illicit discharge because they were not identified as sources of pollutants (i.e., the constituents in the non-storm water discharge do not exceed numeric action level) and the persistent flow can be reprioritized to a lower priority
  - The constituents in the persistent flow non-storm water discharge do not exceed NALs (Provision C.1)
  - The source(s) of the persistent flows has (have) been identified as a non-storm water discharge authorized by a separate NPDES permit

  Where these criteria have not been met but the threat to water quality has been reduced by the Responsible Agency, the highest priority persistent flow MS4 outfall monitoring stations may be reprioritized accordingly for continued dry weather MS4 outfall discharge field screening monitoring as part of the Dry Weather MS4 Outfall Discharge Field Screening Program.

Each Responsible Agency must document removal or reprioritization of the highest priority persistent flow MS4 outfall monitoring stations identified under the Non-Storm Water Persistent Flow MS4 Outfall Discharge Monitoring Program in the Water Quality Improvement Plan Annual Report. When a Copermittee removes a persistent flow MS4 outfall monitoring station, it will be replaced with the next highest prioritized major MS4 outfall designated by that jurisdiction in the San Dieguito River WMA. If there are no remaining qualifying major MS4 outfalls within its jurisdiction, the number of major MS4 outfalls monitored will be reduced.

- **Evaluate the effectiveness of the water quality improvement strategies**.

  As part of the Report of Waste Discharge, each Responsible Agency will review the data collected as part of the Dry Weather MS4 Outfall Discharge Monitoring Program and findings from annual dry weather MS4 discharge monitoring assessments described above (Provisions D.4.b.(1)(c)(v)[a]-[c] and Provision D.4.b.(c)(c)(vi)). The evaluation will incorporate the following:

  - Identification of reductions and progress in achieving reductions in non-storm water and illicit discharges to the Responsible Agency's MS4s in the San Dieguito River WMA
  - Assessment of the effectiveness of the water quality improvement strategies being implemented by the Responsible Agencies within their jurisdictions in the San Dieguito River WMA toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4s to receiving waters, and, if possible, estimation of the non-storm water volume and/or pollutant load reductions attributable to specific water quality strategies in the Responsible Agency's jurisdictions
  - Identification of modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Responsible Agency toward reducing or eliminating non-storm water and pollutant loads discharging from the MS4s to receiving waters within its jurisdiction, including a comparison with NALs as appropriate
  - Identification of data gaps in the monitoring data necessary to develop the assessments above (Provisions D.4.b.(1)(c)(i)-(v))

Wet Weather Outfall Assessments and Illicit Discharges

The Responsible Agencies must assess and report the progress of the water quality improvement strategies implemented as part of the Water Quality Improvement Plan and the JRMP toward reducing pollutants in storm water discharges from the MS4s. This is designated as the Wet Weather MS4 Outfall Discharge Monitoring Program. The assessment of this program will:

- **Estimate volumes and loads of storm water discharges**.

  As part of the Water Quality Improvement Plan Annual Report, the Responsible Agencies must analyze the monitoring data collected as part of the Wet Weather MS4 Outfall Discharge Monitoring Program. This includes calculating or estimating the following for each monitoring year:

  - The average storm water runoff coefficient for each land use type within the San Dieguito River WMA
  - For storm events with measurable rainfall greater than 0.1 inch, the volume of storm water and pollutant loads discharged from the monitored MS4 outfalls to receiving waters within the San Dieguito River WMA
  - The total flow volume and pollutant loadings discharged from each Responsible Agency's jurisdiction within the San Dieguito River WMA over the course of the wet season, extrapolated from the data produced from the monitored MS4 outfalls
  - For storm events with measurable rainfall greater than 0.1 inch, the percent contribution of storm water volumes and pollutant loads discharged from the land use type within (1) each hydrologic subarea with a major MS4 outfall to receiving waters or (2) each major MS4 outfall to receiving waters

- **Evaluate temporal trends**.

  To evaluate all the data collected as part of the Wet Weather MS4 Outfall Discharge Monitoring Program, the Responsible Agencies must:

  - Incorporate new outfall monitoring data into time series plots for each long-term monitoring constituent for the San Dieguito River WMA.
  - Analyze statistical trends on the cumulative long-term wet weather MS4 outfall discharge water quality data set. This will include a comparison with SALs (Provision C.2).

- **Evaluate storm water discharge monitoring locations and frequency**.

  The Responsible Agencies may identify modifications to the wet weather MS4 outfall discharge monitoring locations and frequencies necessary to identify pollutants in storm water discharges from the MS4s in the San Dieguito River WMA (Provision D.2.c.(1)).

  Two methods are available per the MS4 Permit to modify the Wet Weather MS4 Discharge Outfall Monitoring Program:

  - The Responsible Agencies may adjust the wet weather MS4 outfall discharge monitoring locations in the San Dieguito River WMA, as needed, to (1) identify pollutants in storm water discharges from MS4s, (2) guide pollutant source identification, and (3) determine compliance with the WQBELs associated with the applicable TMDLs in Attachment E of the MS4 Permit, on the basis of the highest priority water quality conditions identified in Section 2. The number of stations should be, at a minimum, equivalent to the number of stations required under the MS4 Permit (Provision D.2.a.(3)(a)). Additional outfall monitoring locations (above the minimum per jurisdiction) may be required to demonstrate compliance with the WQBELs associated with the Bacteria TMDL and the Draft Sediment TMDL.
  - The Responsible Agencies may adjust the analytical monitoring required for the San Dieguito River WMA if historical data or other supporting information demonstrate or justify that analysis of a constituent is not necessary.

- **Evaluate Water Quality Improvement Plan analysis.**

  The Responsible Agencies will evaluate the Water Quality Improvement Plan analysis on the basis of the wet weather MS4 outfall monitoring data collected and the applicable storm water numeric action levels (Provision C.2). This evaluation will include analyzing and comparing the monitoring data used to develop the Water Quality Improvement Plan, particularly the strategies in Section 4. Additionally, the Responsible Agencies will evaluate whether those analyses should be updated as a component of the adaptive management described in Section 6.

- **Evaluate effectiveness of water quality improvement strategies.**

  As part of the Report of Waste Discharge, the Responsible Agencies will review the data collected pursuant to the Wet Weather MS4 Outfall Discharge Monitoring Program and findings from the annual wet weather MS4 discharge monitoring assessments described above (Provisions D.4.b.(2)(c)(i)-(ii)). The evaluation will:

  - Identify progress in achieving reductions in pollutant concentrations and/or pollutant loads from different land uses or drainage areas discharging from the Responsible Agencies' MS4s in the San Dieguito River WMA.

- Assess the effectiveness of water quality improvement strategies being implemented by the Responsible Agencies within the San Dieguito River WMA toward reducing pollutants in storm water discharges from the MS4s to receiving waters within the WMA to the maximum extent practicable (if possible, include an estimate of the pollutant load reductions attributable to specific water quality strategies implemented by the Responsible Agencies).
- Identify modifications necessary to increase the effectiveness of the water quality improvement strategies implemented by the Responsible Agencies in the San Dieguito River WMA toward reducing pollutants in storm water discharges from the MS4s to receiving waters in the WMA to the maximum extent practicable.
- Annually identify data gaps in the monitoring data necessary to assess Provisions D.4.b.(2)(c)(i)-(iii).

5.2.4 Special Studies Assessments

As part of the Water Quality Improvement Plan Annual Report, the San Dieguito River WMA Responsible Agencies will evaluate the results and findings from the special studies described in Appendix N. They will use the resulting data to (1) assess their relevance to the Responsible Agencies' characterization of receiving water conditions, (2) understand sources of pollutants and/or stressors, and (3) control and reduce the discharges of pollutants from the MS4 outfalls to receiving waters. As with the other monitoring programs, the results of the special studies assessment may warrant modifications of or updates to the Water Quality Improvement Plan.

The San Dieguito River WMA special studies will attempt to answer questions concerning the natural "reference" concentration of bacteria and other pollutants in the region, and identification of the current known sources of bacteria in the San Dieguito River WMA. The special studies will help guide the implementation of the strategies for the highest priority water quality conditions.

Future special studies related to BMP effectiveness that are implemented by the Responsible Agencies in the San Dieguito River WMA will be included in this assessment. Responsible Agencies may select to report the results of BMP effectiveness studies that are being performed in other WMAs if they relate to the highest priority water quality conditions and if results are expected to be transferrable to strategies planned for the San Dieguito River WMA.

5.2.5 Regional Monitoring Report

The regional monitoring and reporting requirement from Provision F.3.c of the MS4 Permit requires integration of all data on a regional scale to recommend modifications to the implementation or assessment of the Water Quality Improvement Plan and jurisdictional runoff management programs. The report must assess the following:

- The beneficial uses of the receiving waters within the San Diego Region that are supported and not adversely affected by the Responsible Agency's MS4 discharges
- The beneficial uses of the receiving waters within the San Diego Region that are adversely affected by the Responsible Agency's MS4 discharges
- The progress toward protecting beneficial uses of the receiving waters within the San Diego Region from Responsible Agency's MS4 discharges
- Pollutants or conditions of emerging concern that may impact beneficial uses of the receiving waters within the San Diego region

6 Iterative Approach and Adaptive Management Process

The iterative approach that facilitates the adaptive management process for the San Dieguito River WMA is presented in this section. The iterative approach re-evaluates the water quality conditions and priorities, goals, and strategies on the basis of MS4 Permit requirements. The adaptive management process details how the Water Quality Improvement Plan (including the Monitoring and Assessment Plan) is revised when new priorities and/or highest priorities are added, how goals will be adjusted or new goals are added, and how the strategies will be modified to meet the latest goals.

As shown in the graphic below, the fifth step of the Water Quality Improvement Plan (Adaptive Management Process) is to develop and outline the adaptive management process for the San Dieguito River WMA (Provisions A.4, B.5, and D.4.d). The sixth step of the Water Quality Improvement Plan (Annual Reporting) is to compile and analyze the information collected as part of the MS4 Permit implementation. Annual Reporting is described under both Section 5 and Section 6 of this Water Quality Improvement Plan, as it draws on both the Monitoring and Assessment Program and the Adaptive Management Process.

Section 6 Highlights

- Iterative approach is developed to facilitate the adaptive management process for the San Dieguito River WMA.
- Iterative approach re-evaluates the following on the basis of the requirements of the MS4 Permit:
  - Conditions and priorities
  - Goals
  - Strategies
- Adaptive management process explains how the Water Quality Improvement Plan will be revised when:
  - New priorities and/or highest priorities are developed
  - Goals are adjusted or new goals are added
  - Strategies are modified to meet the latest goals

The MS4 Permit describes triggers that may require program adaptation, including exceedances of water quality standards in receiving waters, new information, Regional Board recommendations, and public participation. The results of effectiveness assessments of JRMP programs and strategies may also trigger adaptations to the Water Quality Improvement Plan.

Each trigger will result in specific adaptive management processes or actions within timeframes specified in the MS4 Permit. The timing of the adaptive management requirements is typically either annually or at the end of the MS4 Permit term. Other adaptations, especially those driven by TMDLs, will likely occur outside of the MS4 Permit term.

The adaptive management process provides the framework to evaluate progress toward meeting the requirements in the compliance pathways of the Bacteria TMDL that are reflected in the goals presented in Section 4. The adaptive management process will be used in conjunction with the data collected as part of the Monitoring and Assessment Program to evaluate whether modifications to goals, schedules, and/or strategies are necessary to achieve compliance with the interim and final TMDL compliance options provided in Attachment E of the MS4 Permit. Figure 6-1 provides an overview of the adaptive management process.

MS4 Permit requirements, annual assessments and adaptation, and Report of Waste Discharge assessments and adaptations, including triggers and resulting actions, are described in Sections 6.1 through 6.3.

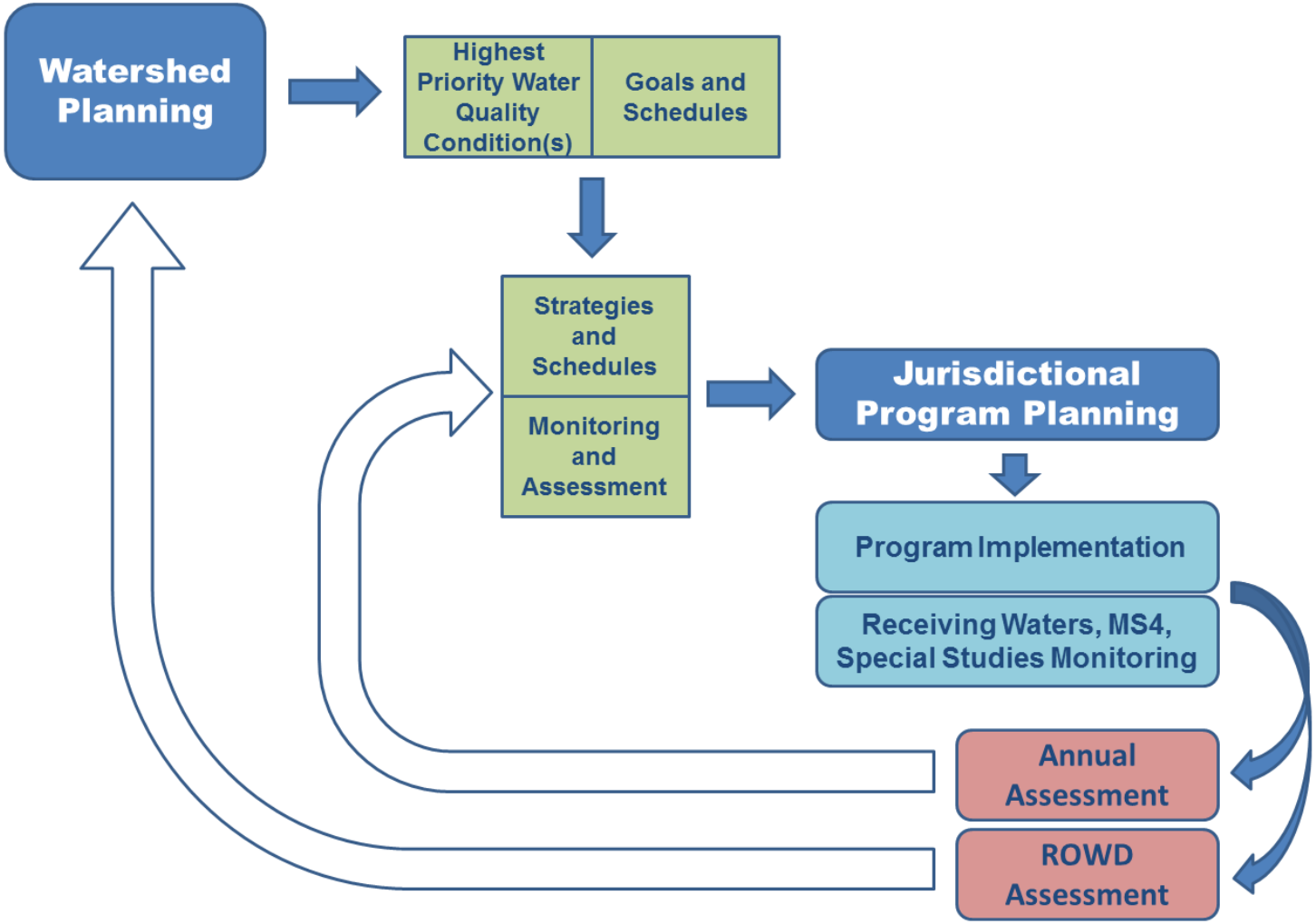


Figure 6-1
Water Quality Improvement Plan Assessment Adaptive Management Framework

Intentionally Left Blank

6.1 MS4 Permit Requirements: Iterative Approach and Adaptive Management

The MS4 Permit includes the requirements for adaptive management in multiple provisions. Provisions A.4, B.5, D.4.d, and F.2.c each contain requirements related to adaptive management. These requirements are:

- Provision A.4 requires the Water Quality Improvement Plan to be designed and adapted to ultimately achieve compliance with the discharge prohibitions (Provisions A.1.a and A.1.c) and receiving water limitations (Provision A.2.a) specified in the MS4 Permit. The provision addresses the adaptive management process that may be triggered when exceedances of water quality standards persist in receiving waters.
- Provision B.5 contains specific considerations that must be included in the adaptive management process, whether performed as part of the Water Quality Improvement Plan Annual Report or as part of the Report of Waste Discharge. This includes the re-evaluation of priority water quality conditions; adaptation of goals, strategies, and schedules; and adaptation of the Monitoring and Assessment Program.
- Provision D.4.d contains the processes for the assessments and adaptive management that must occur in the Report of Waste Discharge preparations.
- Provision F.2.c describes the requirements for updates to the Water Quality Improvement Plan that could result from implementation of the adaptive management requirements.

The following sections elaborate on the adaptive management processes, including the frequencies of adaptation required by the MS4 Permit (annual versus MS4 Permit term), triggers, and resulting actions.

Figure 6-2 provides a tentative timeline for the adaptive management process. The first Water Quality Improvement Plan Annual Report is scheduled to be submitted by the Responsible Agencies in January 2017. It will include an abbreviated monitoring and JRMP implementation period because the Monitoring and Assessment Program and JRMP will not be effective until after the approval of the Water Quality Improvement Plan. The timeline assumes that the Water Quality Improvement Plan will be approved by the Regional Board during fall 2015, with the earliest implementation potentially beginning in October 2015. The second Annual Report for current MS4 Permit cycle will be submitted in January 2018. This submittal will be after the submittal of the Report of Waste Discharge that is due to the Regional Board by December 2017.

Intentionally Left Blank

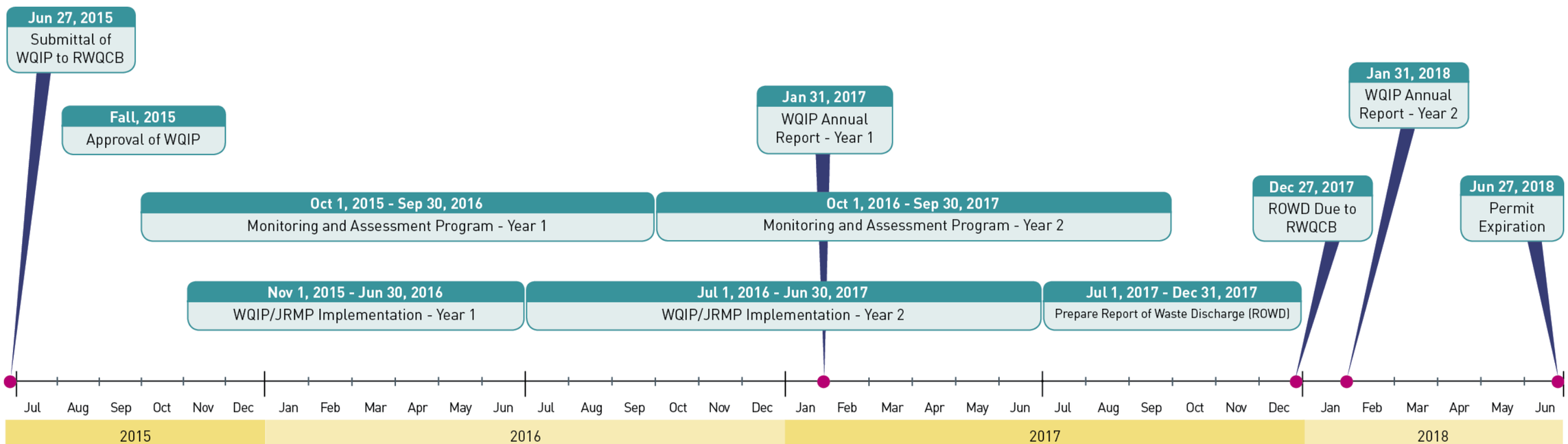


Figure 6-2
Water Quality Improvement Plan
Assessment and Reporting Timeline

Intentionally Left Blank

6.2 Annual Assessments and Adaptive Management

The MS4 Permit contains two conditions that may trigger adaptation annually:

(1) Exceedances of water quality standards in receiving waters

(2) New information

In either case, modifications may be appropriate for the water quality goals, strategies, schedules, and/or Monitoring and Assessment Program. The priority water quality conditions may be modified as needed during the MS4 Permit term, but would likely be modified only as a result of assessments conducted for the Report of Waste Discharge. A summary of the triggers and adaptive management processes that are required annually is presented in Table 6-1.

Table 6-1
Adaptive Management on an Annual Basis (Annual Report)

Plan Element	Trigger[1]	Adaptive Management Process Considerations
Water Quality Strategies and Schedules	Persistent Exceedances Not Addressed (A.4.a.(2))	***Provision A.4.a(2), Integrated Assessment Considerations (Summarized in Figure 6-3)***[2] ❖ Water quality standard exceedances for pollutants that are addressed by the Water Quality Improvement Plan; continuing implementation of the accepted plan and updating as necessary; ❖ If MS4 discharges are causing or contributing to a new exceedance of an applicable water quality standard for pollutants that are not addressed by the Water Quality Improvement Plan, updating of the plan as part of the Water Quality Improvement Plan Annual Report (unless directed by the Regional Board to update it earlier ❖ Following Regional Board approval of modifications to the Water Quality Improvement Plan, update of the JRMP accordingly by the City
	New Information (B.5.b)	***Provision B.5.b, Iterative Approach and Adaptive Management Considerations*** ❖ Modifications to the priority water quality conditions based on Provision B.5.a ❖ Progress toward achieving numeric goals for the highest priority water quality conditions

Table 6-1 (continued)
Adaptive Management on an Annual Basis (Annual Report)

Plan Element	Trigger[1]	Adaptive Management Process Considerations
Water Quality Strategies and Schedules (continued)	New Information (B.5.b) (continued)	❖ Progress toward achieving numeric goals for the highest priority water quality conditions ❖ Progress in meeting established schedules ❖ New policies or regulations that may affect goals ❖ Reductions of non-storm water discharges ❖ Reductions of pollutants in storm water discharges from MS4s to the MEP ❖ New information resulting from the re-evaluation of impacts from MS4 discharges and/or pollutants and stressors ❖ Efficiency in implementing the Water Quality Improvement Plan ❖ Recommendations of the Regional Board ❖ Recommendations received through a public participation process
Monitoring and Assessment Program	Persistent Exceedances Not Addressed (A.4.a.(2))	***Provision A.4.a(2), Integrated Assessment Considerations (Summarized in Figure 6-3)[2]*** ❖ Following the process as described in Figure 6-3, which might include revising the monitoring program to fill data gaps with modifications such as moving monitoring locations, adding additional sample collection, or changing type of sample collected.
	New Information (B.5.c)	***Provision B.5.c, Iterative Approach and Adaptive Management Considerations*** ❖ Re-evaluation based on new information such as modified priority water quality conditions, goals, strategies, or schedules ❖ New information that might include new regulations ❖ Inclusion in the Monitoring and Assessment Program of the monitoring required by the MS4 Permit

1. Following approval of a TMDL with wasteload allocations by the OAL and the USEPA, Responsible Agencies must initiate an update of the Water Quality Improvement Plan within six months.
2. This procedure does not have to be repeated for continuing or recurring exceedances of the same water quality standard(s) once scheduled strategies are implemented unless Responsible Agencies are directed to do so by the Regional Board.

6.2.1 Receiving Waters Assessments

Evaluation of receiving water and MS4 outfall discharge data will be performed annually as part of the Water Quality Improvement Plan Annual Report and is described in Section 5. More comprehensive evaluations of receiving water data will be performed for the Transitional Monitoring and Assessment Program Report and for the Report of Waste Discharge (Provision D.4.a.(1)). These evaluations will summarize receiving water data collected within the San Dieguito River WMA and provide information with the potential to trigger the adaptive management process to achieve compliance with MS4 Permit discharge prohibitions and receiving water limitations as prescribed in Provision A.

Provision A.4 describes adaptive management procedures that the Responsible Agencies must implement "if exceedance(s) of water quality standards persist in receiving waters." If the adaptive management process is triggered under this provision, the process will include the following two key questions:

- Is the MS4 a source of a pollutant causing the exceedances to persist in the receiving waters?
- Are the exceedances are addressed by the Water Quality Improvement Plan?

If the MS4 is determined to be a source of pollutants causing the receiving water exceedance(s) and the receiving water exceedances are addressed under the Water Quality Improvement Plan, the Responsible Agencies will continue implementation of the Water Quality Improvement Plan. If the MS4 is determined to be a source of pollutants causing the receiving water exceedance(s) and the receiving water exceedances are not addressed, the Responsible Agencies will update the plan to address the exceedances as described in Provision A.4.a.(2) and submit the updates with the Water Quality Improvement Plan Annual Report. The updates will include, as applicable:

- A description of strategies that are currently being implemented, are effective, and will continue
- A description of strategies that will be implemented to reduce or eliminate pollutants or conditions that are a source of the receiving water exceedances
- Updates to the implementation schedules for existing, revised, or additional strategies
- Updates to the Monitoring and Assessment Program to track progress toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a

The adaptive management process as required under Provision A.4 is illustrated in Figure 6-3.

6.2.2 Annual Evaluation of New Information

The adaptive management process may also be triggered as new information becomes available. Where appropriate, modifications may be made to goals, strategies, schedules, and/or the Monitoring and Assessment Program and reported in the Water Quality Improvement Plan Annual Report. Types of new information that may trigger the adaptive management process as part of the annual assessment process are discussed below, including the potential trigger(s) for modification(s) and the resulting adaptive management process to be employed.

6.2.2.1 Regulatory Drivers

Where new regulations or policies are adopted that impact WMA planning and implementation processes in the near term, modifications to the Water Quality Improvement Plan goals, strategies, schedules, and/or Monitoring and Assessment Program may be warranted, and, in some cases, required. For example, an update to the Water Quality Improvement Plan will be initiated no later than six months following approval of a TMDL Basin Plan Amendment by the California Office of Administrative Law (OAL) and the USEPA. The trigger applies to TMDLs containing wasteload allocations assigned to Responsible Agencies within the watershed during the term of the MS4 Permit (Provision F.2.c.(2)). Other examples of regulatory drivers that may trigger modifications to the Water Quality Improvement Plan include new state policies (e.g., trash, toxicity, biological objectives, bacteria) and changes resulting from modifications to existing MS4 Permit requirements (e.g., as a result of a reopener).

6.2.2.2 Special Study Results

As part of the Monitoring and Assessment Program, Responsible Agencies will perform special studies related to the highest priority water quality condition for the San Dieguito River WMA. The special studies are designed to provide information related to sources of the highest priority water quality conditions within the San Dieguito River WMA, will be implemented during the MS4 Permit term, and are typically performed over multiple years. As relevant data, conclusions, and lessons learned become available from these studies, the Water Quality Improvement Plan may be modified. The study results may impact the goals, strategies, schedules, and the Monitoring and Assessment Program. Additionally, lessons learned and study results from outside the San Dieguito River WMA, especially those related to bacteria impairments, may also be incorporated into the Water Quality Improvement Plan.

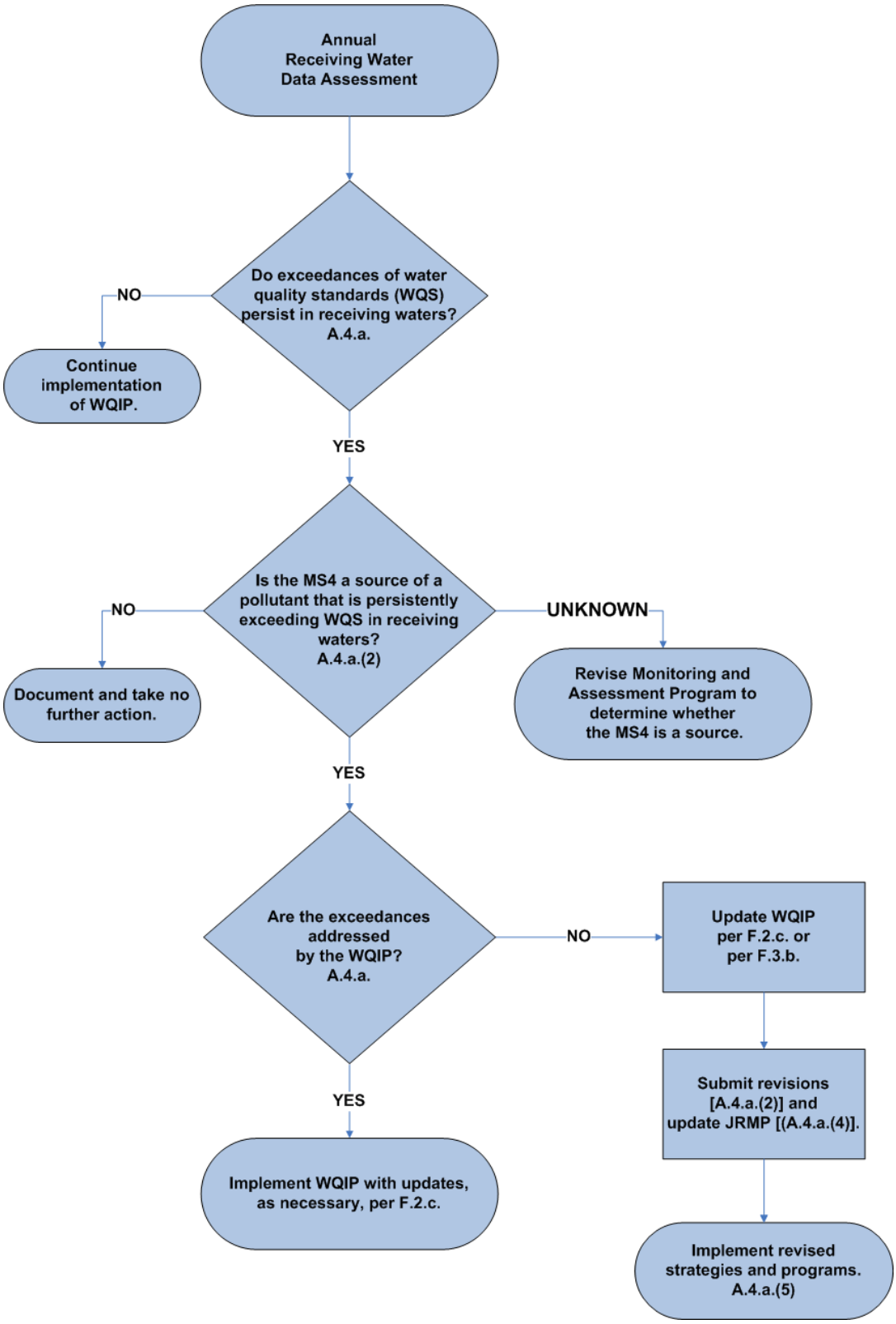


Figure 6-3
Receiving Water Exceedance Process (Provision A.4)

6.2.2.3 Program Effectiveness Assessments

Strategies developed within the Water Quality Improvement Plan will be incorporated into individual Responsible Agency programs through implementation of their respective JRMPs. Each Responsible Agency is implementing programs that are focused on addressing the highest priority water quality conditions within the San Dieguito River WMA. While implementation of these programs has been ongoing in many cases, refinements to the programs provide additional focus on the particular water quality issues identified in the Water Quality Improvement Plan. Over time, Responsible Agencies will use various assessment methods to determine which program refinements are effective and which are not. In some cases, the program effectiveness assessment results may provide useful information leading to adaption of elements of the Water Quality Improvement Plan. Where new information is applicable, it may be used to modify goals, strategies, schedules, and the Monitoring and Assessment Program.

6.2.2.4 Regional Board Recommendations

Adaptation of the Water Quality Improvement Plan may also be required on the basis of recommendations from the Regional Board. Recommendations may be a result of the public participation process, Consultation Committee, review of submitted reports, or other Regional Board interests.

6.3 MS4 Permit Term Assessments and Adaptive Management

The MS4 Permit also contains specific assessments to be performed during preparation of the Report of Waste Discharge. The assessments are longer term in nature, occurring only once during the MS4 Permit cycle. Because the updates to the Water Quality Improvement Plan are required to undergo a full public participation process per Provision F.2.c, including reconvening the Consultation Committee, modifications will consider input from the public and the Regional Board. Adaptation of Water Quality Improvement Plan elements will also consider new regulations or policies as appropriate. In the Report of Waste Discharge preparation, all elements of the Water Quality Improvement Plan are eligible for modifications through the required adaptive management processes. Elements that will be evaluated include the water quality conditions (i.e., priorities), goals and accompanying schedules, strategies and accompanying schedules, and the Monitoring and Assessment Program. Table 6-2 summarizes the triggers and adaptive management processes that are required as part of the Report of Waste Discharge.

Table 6-2
Adaptive Management on a Permit Term Basis (Report of Waste Discharge)

Plan Element	Adaptive Management Process Considerations
Priority Water Quality Conditions (B.5.a, D.4.d.(1))	***Provision B.5.a, Iterative Approach and Adaptive Management Considerations*** ❖ Achievement of the outcome of improved water quality through the implementation of strategies identified in the Water Quality Improvement Plan ❖ New information developed in the re-assessment of receiving water conditions, impacts from MS4 discharges, and subsequent re-evaluation of priorities ❖ Spatial and temporal accuracy of monitoring data ❖ Availability of new information and data from sources outside the JRMP programs that inform the effectiveness of implementation strategies and actions ❖ Recommendations of the Regional Board ❖ Recommendations received through a public participation process
	Provision D.4.d(1), Integrated Assessment Considerations ❖ Re-evaluation of the receiving water conditions and the impacts of MS4 discharges on receiving waters per the process developed in Section 2 of the Water Quality Improvement Plan and included in Appendix A, including the identification of beneficial uses in receiving waters that are protected per the Monitoring and Assessment Program ❖ Re-evaluation of the identification of MS4 sources and/or stressors that correspond to elevation of a new highest priority

Table 6-2 (continued)
Adaptive Management on a Permit Term Basis (Report of Waste Discharge)

Plan Element	Adaptive Management Process Considerations
Water Quality Goals and Schedules (B.5.b, D.4.d.(1))	***Provision B.5.b, Iterative Approach and Adaptive Management Considerations*** ❖ Modifications to the priority water quality conditions based on Provision B.5.a ❖ Progress toward achieving numeric goals for the highest priority water quality conditions ❖ Progress in meeting established schedules ❖ New policies or regulations that may affect goals ❖ Reductions of non-storm water discharges ❖ Reductions of pollutants in storm water discharges from MS4s to the MEP ❖ New information resulting from re-evaluating impacts from MS4 discharges and/or pollutants and stressors ❖ Efficiency in implementing the Water Quality Improvement Plan ❖ Recommendations of the Regional Board ❖ Recommendations received through a public participation process
	Provision D.4.d(1), Integrated Assessment Considerations ❖ Evaluation of the progress toward achieving interim and final numeric goals for protecting impacted beneficial uses in receiving waters
	Provision D.4.d(2), Integrated Assessment Considerations ❖ Identification of the non-storm water and storm water pollutant loads from the MS4 outfalls per Provision D.4.b ❖ Identification of the non-storm water and storm water pollutant load reductions, or other improvements that are necessary to attain the interim and final numeric goals ❖ Identification of the non-storm water and storm water pollutant load reductions, or other improvements, that are necessary to demonstrate that non-storm water and storm water discharges are not causing or contributing to exceedances of receiving water limitations ❖ Evaluation of the progress of the strategies toward achieving interim and final numeric goals for protecting beneficial uses in receiving waters

Table 6-2 (continued)
Adaptive Management on a Permit Term Basis (Report of Waste Discharge)

Plan Element	Adaptive Management Process Considerations
Monitoring and Assessment Program (B.5.c)	***Provision B.5.c, Iterative Approach and Adaptive Management Considerations*** ❖ Review of Monitoring and Assessment Programs based on the requirements in Provision D ❖ Adjustment of the monitoring program to determine whether discharges from the MS4 are causing/contributing to exceedances in the receiving water when new exceedances persist; identification and addressing of data gaps via re-assessment of monitoring locations and frequencies; adjustment of the monitoring program to address results of special studies

6.3.1 Priority Water Quality Conditions

The process for selecting the highest priority water quality condition(s) is documented in Section 2. Given the relatively short duration of the remainder of this MS4 Permit term after expected approval of the Water Quality Improvement Plan, the priority water quality conditions selected during the development of the Water Quality Improvement Plan will remain for the duration of the term. They will be modified only on the basis of new information assessed as part of the Report of Waste Discharge. Data collected during the MS4 Permit term will be used to update the analysis of the priority water quality conditions on the basis of the methodology described in Appendix A and implemented in Section 2.

6.3.2 Progress Toward Achieving Goals

As part of the preparation of the Report of Waste Discharge, the Responsible Agencies will evaluate the progress toward achieving the interim and final numeric goals established in Section 4.1. The Water Quality Improvement Plan interim goals identified for the current permit term are provided in Tables 6-3 through 6-8 along with the related assessment metric for each.

Table 6-3
City of Del Mar Jurisdictional Goals, FY14 – FY18

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year Current Permit Term (FY14-FY18)	Assessment Method
Wet Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Bacteria and Dry Weather Flow Reduction	Reduction in Anthropogenic Surface Dry Weather Flows[1]	Achieve a 10% reduction in anthropogenic surface dry weather flows[1] from historical baseline to address bacteria regrowth contributing during wet weather	Summarize reduction in dry weather flow observed through MS4 Outfall monitoring program in the San Dieguito River WMA in the January 2018 Annual Water Quality Improvement Plan Report.
Dry Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Bacteria and Dry Weather Flow Reduction	Reduction in Anthropogenic Surface Dry Weather Flows[1]	Achieve a 10% reduction in anthropogenic surface dry weather flows[1] from historical baseline	Summarize reduction in dry weather flow observed through MS4 Outfall monitoring program in the San Dieguito River WMA in the January 2018 Annual Water Quality Improvement Plan Report.

1. The term “dry weather flow” excludes groundwater, other exempt or permitted non-storm water flows and sanitary sewer overflows.

Table 6-4
City of Escondido Jurisdictional Goals, FY14 – FY18

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year Current Permit Term (FY14-FY18)	Assessment Method
Wet Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Bacteria, Sediment, and Nutrient Reduction	Restoration of Sediment Detention Basin	Treat 4 acres of drainage area through restoration of 1 sediment detention basin in a multiuse treatment area at Eagle Scout (formerly Sand) Lake, Kit Carson Park	Summarize the completed projects that treat 4 acres of drainage area in the January 2018 Annual Water Quality Improvement Plan Report.
Dry Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Reduce Dry Weather Flow	Dry Weather Flow Reduction from Baseline in Priority Drainage Area	Achieve a 10% reduction in flow from historical baseline at priority persistent flow outfall (HDG_102)	Summarize the dry weather flow reduction observed through MS4 outfall monitoring program in the San Dieguito River WMA in the January 2018 Annual Water Quality Improvement Plan Report.

Table 6-5
City of Poway Jurisdictional Goals, FY14 – FY18

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year	Assessment Method
		Current Permit Term (FY14-FY18)	
Dry Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Bacteria and Dry Weather Flow Reduction	Turf Conversion	Achieve a 5% increase in turf conversion from baseline	Summarize percent increase in turf conversion in the San Dieguito River WMA in the January 2018 Annual Water Quality Improvement Plan Report.

Table 6-6
City of San Diego Jurisdictional Goals, FY16 – FY18

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year	Assessment Method
		Current Permit Term (FY14-FY18)	
Wet Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Bacteria Reduction	Green Infrastructure Policy	Construct 2 green infrastructure BMPs to treat 10.6 acres of drainage area	Summarize the completed projects that capture and treat drainage from 10.6 acres in the January 2018 Annual Water Quality Improvement Plan Report.

Table 6-6 (continued)
City of San Diego Jurisdictional Goals, FY16 – FY18

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year Current Permit Term (FY14-FY18)	Assessment Method
Dry Weather Performance Measures			
MS4 Discharges Dry Weather Flow and Bacteria Reduction	Green Infrastructure Policy	Construct 2 green infrastructure BMPs to treat 10.6 acres of drainage area	Summarize the completed projects that capture and treat drainage from 10.6 acres in the January 2018 Annual Water Quality Improvement Plan Report.
MS4 Discharges Reduce Pollutants in Dry Weather Discharges	Dry Weather Flow Reduction from Baseline	Achieve a 10% reduction in Prohibited[1] dry weather flow from baseline measured at persistently flowing outfalls during dry weather	Summarize the prohibited[1] dry weather flow reduction observed through MS4 outfall monitoring program in the San Dieguito River WMA in the January 2018 Annual Water Quality Improvement Plan Report.

1. Does not include allowable discharges as defined in MS4 Permit Provision A and Provision E.2.a.

Table 6-7
City of Solana Beach Jurisdictional Goals, FY14 – FY18

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year Current Permit Term (FY14-FY18)	Assessment Method
Wet Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Bacteria and Flow Reduction	Design and Installation of Diverters	Direct 40.5 acres of low flows and first flush flow to sanitary sewer through construction of 1 diverter at high priority outfall	Summarize the completed project that directs 40.5 acres of low flows and first flush flow to sanitary sewer in the January 2018 Annual Water Quality Improvement Plan Report.
MS4 Discharges Bacteria and Flow Reduction	Design and Construction of Curb Cuts	Treat 8 acres of drainage area through curb cuts to redirect water from traditional drainage areas to permeable surfaces along Highway 101	Summarize the completed curb cuts that treat 8 acres of drainage area in the January 2018 Annual Water Quality Improvement Plan Report.
Dry Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Bacteria and Dry Weather Flow Reduction	Design and Installation of Diverters	Direct 40.5 acres of low flows and first flush flow to sanitary sewer through construction of 1 diverter at high priority outfall	Summarize the completed project that directs 40.5 acres of low flows and first flush flow to sanitary sewer in the January 2018 Annual Water Quality Improvement Plan Report.
MS4 Discharges Bacteria and Dry Weather Flow Reduction	Design and Construction of Curb Cuts	Treat 8 acres of drainage area through curb cuts to redirect water from traditional drainage areas to permeable surfaces along Highway 101	Summarize the completed curb cuts that treat 8 acres of drainage area in the January 2018 Annual Water Quality Improvement Plan Report.

Table 6-8
County of San Diego Jurisdictional Goals, FY14 – FY18

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year Current Permit Term (FY14-FY18)	Assessment Method
Wet Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Bacteria Reduction	% Bacterial Load Reduction	Implement programmatic (non-structural) BMPs to achieve source reduction of bacteria loads from the MS4 outfalls	Provide a summary of programmatic BMPs implemented in the San Dieguito River WMA in the January 2018 Annual Water Quality Improvement Plan Report.
MS4 Discharges Bacteria Reduction (Optional)	% Bacterial Load Reduction	Reduce % bacteria loads by TBD in FY 15-16 from distributed BMPs constructed between 2003 and 2009 during redevelopment	Provide a summary of structural BMPs[1] implemented in the San Dieguito River WMA in the January 2018 Annual Water Quality Improvement Plan Report.
Dry Weather Performance Measures			
Performance Metrics		FY 18	
MS4 Discharges Dry Weather Flow and Bacteria Reduction	% Reduction of flow volume or number of outfalls with flows mitigated from persistently flowing MS4 outfalls	Reduce by 20% the aggregate flow volume or the number of persistently flowing outfalls during dry weather.	Summarize reduction of dry weather flow[2] volume or reduction of number of persistently flowing outfalls during dry weather in the San Dieguito River WMA in the January 2018 Annual Water Quality Improvement Plan Report.

Table 6-8 (continued)
County of San Diego Jurisdictional Goals, FY14 – FY18

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year	Assessment Method
		Current Permit Term (FY14-FY18)	

1. Implementation of structural BMPs is optional, as needed, and as funding available.
2. The term "dry weather flow" excludes groundwater, other exempt or permitted non-storm water flows and sanitary sewer overflows.

Assessment of the goals and compliance pathways will be performed using data collected per the Monitoring and Assessment Program and JRMP, along with the schedules developed in conjunction with each goal. Depending on the results of the assessment, it may be appropriate to adjust either or both the numeric goals and/or the schedules associated with each goal. The exception is where the interim and/or final numeric goals and schedules are based on approved Bacteria TMDL compliance schedules. In this case, interim schedules may be modified. However, numeric targets (interim and final) and final schedules cannot be modified without changes to the Bacteria TMDL.

6.3.3 Strategies and Schedules

The strategies and implementation schedules developed to address the highest priority water quality conditions in the San Dieguito River WMA will be re-evaluated as part of the preparation of the Report of Waste Discharge. Ultimately, the effectiveness of the strategies will be based on the progress toward achieving the interim and final numeric goals. However, an evaluation of strategies based on the achievement of the interim and final numeric goals may take many years of implementation and monitoring to assess. To supplement the "goal-based" assessments, water quality and programmatic data collected over the MS4 Permit term will be incorporated into the assessment and adaptive process to modify strategies and implementation schedules as appropriate.

6.3.3.1 Water Quality Data Evaluation and Linkage to Strategies

Receiving water data will be assessed as described in Section 5.1. The assessment will indicate progress toward goals and protection of beneficial uses. These data may be used to evaluate the collective effectiveness of the Water Quality Improvement Plan strategies. This information will provide a "big picture" assessment of the success of the strategies over the long term.

MS4 outfall data and special studies results may provide information that is more directly linked to the implementation of individual strategies. Where possible, this information will be used to modify, eliminate, and/or develop new strategies to address the highest priority water quality conditions in the San Dieguito River WMA. Where appropriate, these assessments will include a comparison of the data with the NALs and SALs as required per MS4 Permit Provision C. These data will provide the foundation for the MS4 outfall discharge assessments described in Section 5, which will examine the results of Responsible Agency Illicit Discharge Detection and Elimination Programs and MS4 Outfall Discharge Monitoring Programs. Where strategies can be linked to measurable or demonstrable reductions of non-storm water discharges or of pollutants in storm water, appropriate modifications will be made.

6.3.3.2 Program Assessments

Where available, the results of program effectiveness assessments performed at the jurisdictional or WMA scale may also drive the adaptation of specific strategies. The level of information will vary by jurisdiction and by program, as these types of assessments are not explicitly required under the MS4 Permit. However, in many cases, the jurisdictions are performing programmatic assessments to ensure the most effective use of limited resources. These assessments have the potential to provide information to determine the effectiveness of specific strategies that is more relevant than water quality data collected at outfalls or in receiving waters. In addition, the assessments may be a key driver in adapting strategies. In some cases, modifications to strategies may also be the result of internal jurisdictional opportunities or constraints such as increases or decreases in available funding or staffing.

6.3.4 Monitoring and Assessment Program

As part of the Report of Waste Discharge, the Responsible Agencies will consider modifications to the Monitoring and Assessment Program, consistent with the requirements in Provision D.4.d.(3). During the MS4 Permit term, modifications must be consistent with the requirements of Provisions D.1, D.2, and D.3 (receiving water, MS4 outfall, and special study monitoring requirements, respectively), which limit the amount of adaptation that is possible. However, recommendations within the Report of Waste Discharge provide an opportunity to make more meaningful modifications to the Monitoring and Assessment Program. Examples of potential modifications to the Monitoring and Assessment Program include the following adjustments:

- Determine whether discharges from the MS4 are linked to exceedances in the receiving water.
- Address data gaps via re-assessment of monitoring locations and frequencies.
- Address results of special studies.

Intentionally Left Blank

References

California Department of Resources Recycling and Recovery (CalRecycle). 2013. Solid Waste Information System. Last visited October 2013. http://www.calrecycle.ca.gov/SWFacilities/Directory/Search/.

California 22nd District Agricultural Association (22nd DAA). 2012. Storm Water Management Plan Del Mar Fairgrounds/Horse Park. Prepared by Fuscoe Engineering. March.

City of Del Mar. 2010. *City of Del Mar Jurisdictional Urban Runoff Management Program Annual Report for Fiscal Year 2009-2010.* September 30, Rev. November 30.

City of Escondido. 2012. *Jurisdictional Urban Runoff Management Program 2011-2012 Annual Report*. September.

City of Poway. 2012. *2011/2012 Jurisdictional Urban Runoff Management Program Annual Report*. September.

City of San Diego. 2006. *San Dieguito Watershed Management Plan*. Prepared by Weston Solutions. September.

City of San Diego. 2007. *Strategic Plan for Watershed Activity Implementation*. November. San Diego, CA.

City of San Diego. 2009. *Tecolote Creek Microbial Source Tracking Study*. Phase II. Final. June 30.

City of San Diego. 2011. *City of San Diego San Dieguito Bacteria and Nutrients TMDL—Watershed Characterization Study*. June.

City of San Diego. 2012a. *Tecolote Creek Comprehensive Load Reduction Plan*. June.

City of San Diego. 2012b. *City of San Diego Jurisdictional Urban Runoff Management Plan Fiscal Year 2012 Annual Report.* September 30.

City of Solana Beach. 2012. *Jurisdictional Urban Runoff Management Program (JURMP) Annual Report.* September.

Clean Water Act of 1972. 33 U.S. Code §1251 et seq.

County of Los Angeles. 2010. *Multi-Pollutant TMDL Implementation Plan for the Unincorporated County Area of Los Angeles River Watershed.*

County of San Diego. 2010. *Jurisdictional Urban Runoff Management Plan Annual Report Fiscal Year 2009-2010*.

County of San Diego. 2011. *Hydromodification Management Plan*. Final. http://www.projectcleanwater.org/images/stories/Docs/LDS/HMP/0311_SD_HMP_ wAppendices.pdf.

County of San Diego. 2012. *Jurisdictional Urban Runoff Management Plan Annual Report Fiscal Year 2010–2011*.

Fry, J., G. Xian, S. Jin, J. Dewitz, C. Homer, L. Yang, C. Barnes, N. Herold, and J. Wickham, J. 2011. Completion of the 2006 National Land Cover Database (NLCD) for the Conterminous United States, PE&RS, Vol. 77(9):858-864.

HDR. 2014. *Draft Nonstructural Non-Modeled Activity Pollutant Load Reduction Research. Technical Memo*. Prepared for City of San Diego.

Metropolitan Water District of Southern California (MWD). 2014. *SoCal Water$mart*. Available at http://www.socalwatersmart.com/index.php/home/?p=res. Accessed April 14, 2014.

National Resources Conservation Service (NRCS). 1999. CalWater, California Watershed Dataset. http://catalog.data.gov/dataset/calwater-2-233fac. Accessed November 4, 2013.

National Institutes of Health (NIH). 2014. Iron Dietary Supplement Fact Sheet. http://ods.od.nih.gov/factsheets/Iron-HealthProfessional. Accessed August 4, 2014.

Regional Board. 2007. *Revised Conditional Waivers of Waste Discharge Requirements for Specific Types of Discharge Within the San Diego Region*. Resolution No. R9-2007-0104.

Regional Board. 2010. *Revised TMDL for Indicator Bacteria, Project I—Twenty Beaches and Creeks in the San Diego Region (including Tecolote Creek)*. Resolution No. R9-2010-0001. Approved February 10, 2010. http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/docs/bacteria/updates_022410/2010-0210_BactiI_Resolution&BPA_FINAL.pdf.

Regional Board. 2013. Order Number R9-2013-0001, *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) Draining the Watersheds Within the San Diego Region.*

San Diego Association of Governments (SANDAG). 2009. 2009 Land Use GIS Data. http://www.sandag.org/resources/maps_and_gis/gis_downloads/land.asp. Accessed November 4, 2013.

SANDAG. 2013. 2013 Vegetation Information Maintained by San Diego County Department of Planning and Land Use. http://www.

sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome. Accessed November 4, 2013.

San Diego Bay Watersheds. Aluminum. http://ww.sdbaysdsu. edu/glossary/index.php. Accessed April 30, 2013.

San Diego County Municipal Copermittees. 2011a. Report of Waste Discharge Application for Renewal of NPDES Municipal Storm Water Permit for San Diego County. June 24.

San Diego County Municipal Copermittees. 2011b. *Long-Term Effectiveness Assessment Water Quality Report*. http://www.projectcleanwater. org/index.php?option=com_content&view=article&id=185:2011-ltea-water-quality-report&catid=16. Accessed November 4, 2013.

San Diego County Municipal Copermittees. 2014a. Transitional Receiving Water Monitoring Plan. Prepared by Weston. October.

San Diego County Municipal Copermittees. 2014b. Transitional Monitoring and Assessment Report Appendix H Draft Bioassessment Monitoring Report. Prepared by Weston. December.

San Diego County Municipal Copermittees. 2014c. Transitional Monitoring and Assessment Report Appendix I Draft Sediment Monitoring Report. Prepared by Weston. December.

San Diego County Water Authority (SDCWA). 2014. *WaterSmart.* Available at http://www.watersmartsd.org/faq. Accessed April 14, 2014.

San Diego Gas & Electric (SDGE). 2014. *San Dieguito Wetlands Restoration.* Available at: https://www.sdge.com/environment/preservation-properties/san-dieguito-wetlands-restoration. Accessed April 11, 2014.

San Diego Regional Water Quality Control Board (Regional Board). 1994. Water Quality Control Plan for the San Diego Region (9). September.

San Diego Wildfires Education Project, The. 2004. Available at http://interwork.sdsu. edu/fire. Accessed May 4, 2014.

San Dieguito River Park (SDRP). 2014. San Dieguito Lagoon Wetland Restoration Project. Available at http://www.sdrp.org/projects/coastal.htm. Accessed April 11, 2014.

San Dieguito River WMA Responsible Agencies. 2014*. San Dieguito River WMA Water Quality Improvement Plan, First Deliverable.* City of Del Mar, City of Escondido, City of Poway, City of Solana Beach, County of San Diego, and City of San Diego. May.

San Dieguito Watershed Copermittees. 2012. *San Dieguito Watershed Urban Runoff Management Program Fiscal Year 2011 Annual Report*. City of Del Mar, City of Escondido, City of Poway, City of Solana Beach, County of San Diego, and City of San Diego.

San Dieguito Watershed Copermittees. 2013. *San Dieguito Watershed Urban Runoff Management Program Fiscal Year 2012 Annual Report*. City of Del Mar, City of Escondido, City of Poway, City of Solana Beach, County of San Diego, and City of San Diego.

Schoen, M.E. and N.J. Ashbolt. 2010. Assessing Pathogen Risk to Swimmers at Non-Sewage Impacted Recreational Beaches. *Environmental Science and Technolog*y 44(7): 2286-2291.

Soller, J.A., M.E. Schoen, T. Bartrand, J. Ravenscroft, and T.J. Wade. 2010. Estimated Human Health Risks from Exposure to Recreational Waters Impacted by Human and Non-Human Sources of Fecal Contamination. *Water Research* 44(16): 4674-4691.

Southern California Coastal Water Research Project (SCCWRP). 2002. Stormwater Research Needs in Southern California. Edited by: Brock Bernstein & Kenneth C. Schiff. SCCWRP Technical Report 358.

SCCWRP. 2010. Project Group: Reference Conditions. http://www.sccwrp.org/researchareas/Stormwater/ RunoffCharacterization/ReferenceConditions.aspx. Accessed February 8, 2014.

SCCWRP. 2012. *San Diego County Enterococcus Regrowth Study*, Final Report. http://www.projectcleanwater.org/ images/stories/Docs/MON/final%20work%20products/Bacteria_Regrowth_Study.pdf. Accessed February 5, 2014.

SCCWRP. 2013. *San Diego Regional Reference Stream Study Quality Assurance Project Plan,* Revised.

Southern California Stormwater Monitoring Coalition (SMC). 2014a. Southern California Stormwater Monitoring Coalition 2014 Research Agenda. SCCWRP Technical Report 828.

Southern California Stormwater Monitoring Coalition (SMC). 2014b. Draft Southern California Stormwater Monitoring Coalition (SMC) Annual Report 2013-2014. Prepared by AMEC. December.

State Water Resources Control Board (State Board). 2009. *Water Quality Control Plan for Enclosed Bays and Estuaries – Part I Sediment Quality*. August.

State Board. 2011a. Storm Water Multiple Application and Report Tracking System (SMARTS). https://smarts.waterboards.ca.gov/ smarts/faces/SwSmartsLogin.jsp. Accessed November 4, 2011.

State Board. 2011b. *NPDES Permits (including Storm Water)*. Excel spreadsheet download. http://www.waterboards.ca.gov/water_issues/ programs/ciwqs/publicreports.shtml#facilities. Accessed December 6, 2011.

State Board. 2012a. Order Number 2012-0006-DWQ, *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities.*

State Board. 2012b. Order Number 2012-0011-DWQ, *National Pollutant Discharge Elimination System (NPDES) General Permit for Waste Discharge Requirements for Sate of California Department of Transportation.*

State Board. 2013a. Order Number 2013-0001-DWQ, *National Pollutant Discharge Elimination System (NPDES) General Permit for Waste Discharge Requirements for Discharges from Small Separate Storm Sewer Systems (MS4s).*

State Board. 2013b. California Environmental Protection Agency. *Surface Water Ambient Monitoring Program, Tools for Assessing the Biological Integrity of Surface Waters*. http://www.waterboards.ca.gov/water_issues/ programs/swamp/tools.shtml. Website last updated October 4, 2013; accessed November 4, 2013.

State Board. 2014. Order Number 2014-0057-DWQ. *National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Industrial Activities.*

United States Environmental Protection Agency (USEPA). 2007. Technology Transfer Network Air Toxics Web Site, Pentachlorophenol. http://www.epa.gov/ttnatw01/hlthef/ pentachl.html. Website last updated November 6, 2007; accessed November 4, 2013.

USEPA. 2012a. *Water: Total Maximum Daily Loads (303(d)) Glossary.* http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/glossary.cfm. Last updated May 21, 2012; accessed November 4, 2013.

USEPA. 2012b. *2012 Recreational Water Quality Criteria*. December, 2012. http://water.epa.gov/scitech/swguidance/ standards/criteria/health/recreation/upload/RWQC2012.pdf. Accessed December 6, 2013.

USEPA. 2012c. *Water: Basic Information about Regulated Drinking Water Contaminants. Basic Information about Pentachlorophenol in Drinking Water.* http://water.epa.gov/drink/contaminants/basicinformation/pentachlorophenol.cfm. Last updated May 21, 2012. Accessed October 10, 2013.

USEPA. 2013. Mercury: Basic Information. http://www.epa.gov/mercury/about.htm. Last updated July 9, 2013. Accessed October 10, 2013.

United States Geological Survey (USGS). 1997. *Mercury Contamination of Aquatic Ecosystems.* http://water.usgs.gov/wid/FS_216-95/FS_216-95.html. Accessed April 30, 2012.

World Resources Institute (WRI). 2013. *Eutrophication and Hypoxia, Nutrient Pollution in Coastal Waters, About Eutrophication*. http://www.wri.org/project/eutrophication/about. Accessed November 6, 2013.