



**RIVERSIDE COUNTY**  
WATERSHED PROTECTION

# **CONSOLIDATED MONITORING PROGRAM (CMP)**

Santa Margarita Region  
Santa Ana Region  
Whitewater River Region

*November 2020 Revision*

**TABLE OF CONTENTS**

<b>Vol.</b>	<b>Section</b>	<b>Page</b>
I.	INTRODUCTION .....	I
II.	QAPP .....	II
	GROUP A ELEMENTS: PROJECT MANAGEMENT	
	GROUP B ELEMENTS: DATA GENERATION AND ACQUISITION	
	GROUP C ELEMENTS: ASSESSMENTS AND RESPONSE ACTIONS	
	GROUP D ELEMENTS: DATA VALIDATION AND USABILITY	
III.	SANTA MARGARITA REGION MONITORING PLAN..... (REFERENCE TO THE WATER QUALITY IMPROVEMENT PLAN)	III
IV.	SANTA ANA REGION MONITORING PLAN .....	IV
	1.0 INTRODUCTION	
	2.0 WATER QUALITY OBJECTIVES	
	3.0 RECEIVING WATER MONITORING PROGRAM	
	4.0 MS4 OUTFALL AND MASS EMISSIONS MONITORING	
	5.0 ILLICIT CONNECTION/ILLEGAL DISCHARGE MONITORING	
	6.0 SPECIAL STUDIES	
	7.0 DATA RECORDS, MANAGEMENT, AND REPORTING	
	8.0 REFERENCES	
V.	WHITE WATER RIVER REGION MONITORING PLAN .....	V
	1.0 INTRODUCTION	
	2.0 WATER QUALITY OBJECTIVES	
	3.0 RECEIVING WATER MONITORING PROGRAM	
	4.0 MS4 OUTFALL AND IC/ID MONITORING PROGRAM	
	5.0 ILLICIT CONNECTION/ILLEGAL DISCHARGE FOLLOW-UP INVESTIGATIONS	
	6.0 SPECIAL STUDIES	
	7.0 DATA RECORDS, MANAGEMENT, AND REPORTING	
	8.0 REFERENCES	
VI.	GLOSSARY .....	VI

## ABBREVIATIONS AND ACRONYMS

303(d) List	Clean Water Act Section 303(d) List of Water Quality Limited Segments
AVB	Area Velocity Bubbler
BMI	Benthic Macroinvertebrate Index
BMP	Best Management Practices
BOD	Biological Oxygen Demand
CASQA	California Stormwater Quality Association
CCC	Criteria Continuous Concentration
CEDEN	California Environmental Data Exchange Network
cfs	cubic feet per second
CMC	Criteria Maximum Concentration
CMP	Consolidated Monitoring Program for Water Quality Monitoring
COC	Chain of Custody
COD	Chemical Oxygen Demand
CPOM	Coarse Particulate Organic Matter
CSBP	California State Bioassessment Protocol
CSCI	California Stream Condition Index
CTR	California Toxics Rule
CWA	Clean Water Act
DAMP	Drainage Area Management Plan
District	Riverside Flood Control and Water Conservation District
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbon
<del>DQO</del>	<del>Data Quality Objective</del>
EDD	Electronic Data Deliverable
EPA	[United States] Environmental Protection Agency
EPT taxa	Ephemeroptera, Plecoptera and Trichoptera taxa
FY	Fiscal Year
GIS	Geographic Information Systems
HA	Hydrologic Area
HSA	Hydrologic Subarea
HU	Hydrologic Unit
IAH	High Priority Inland Aquatic Habitat
IBI	Index of Biotic Integrity
IC/ID	Illicit Connection/Illegal Discharge
ID	Identification
IDDE	Illicit Discharge Detection and Elimination
JRMP	Jurisdictional Runoff Management Plan
LCS	Laboratory Control Spike
LESJWA	Lake Elsinore/San Jacinto Watershed Agency
LID	Low Impact Development
mg/L	milligram per liter
mL	milliliters
MBAS	methylene blue active substances
MDL	Method Detection Limit
ML	State Board Minimum Level
MLS	Mass Loading Station
MMP	Model Monitoring Program
MRP	Monitoring and Reporting Program
MPN	most probably number

<u>MQO</u>	<u>Measurement Quality Objective</u>
MSHCP	Multiple Species Habitat Conservation Plan
MS4	Municipal Separate Storm Sewer System
ng/L	nanograms per liter
NAL	Non-Storm Water Action Level
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
NWS	National Weather Service
Permittees	County of Riverside, the incorporated Cities, and Riverside County Flood Control and Water Conservation District
pH	Measurement of hydrogen ion concentration (i.e. acidity or alkalinity)
PHab	Physical habitat assessment
POP	Probability of Precipitation
QAPrP	Quality Assurance Program Plan
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QPF	Quantitative Precipitation Forecast
QPS	Qualitative Precipitation Statement
RCWD	Rancho California Water District
RCFCWCD	Riverside County Flood Control and Water Conservation District (District)
RL	Reporting Limit
ROWD	Report of Waste Discharge
RWB	Reachwide Benthos
RWQCB	Regional Water Quality Control Board, Water Board, Regional Board
SAL	Storm Water Action Level
SAR	Santa Ana Region
SCCWRP	Southern California Coastal Water Research Project
SM	Standard Method
SMC	Stormwater Monitoring Coalition
SMR	Santa Margarita Region
SOP	Standard Operating Procedure
SRM	Standard Reference Material
State Board MLs	State Board Minimum Level RLs
SWRCB	State Water Resources Control Board
SWAMP	Surface Water Ambient Monitoring Program
SWQTF	Stormwater Quality Standards Task Force
TDS	Total Dissolved Solids
TIE	Toxicity Identification Evaluation
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TRE	Toxicity Reduction Evaluation
Triad	Water quality assessment using chemistry, toxicity, and bioassessment
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WER	Water Effects Ratio
WQIP	Water Quality Improvement Plan
WQO	Water Quality Objective

WMA  
WWR  
µg/L

Watershed Management Area  
Whitewater River Region  
microgram per liter

# **VOLUME I: INTRODUCTION**

## **Rev. 7 - November 2020**

*Rev. 6 - January 2020*

*Rev. 5 - October 2018*

*Rev. 4 - October 2017*

*Rev. 3 - July 2014*

*Rev. 2 - November 2013*

*Rev. 1 - October 2012*

*May 2011*



## I. INTRODUCTION

The Consolidated Monitoring Program (CMP) was created to incorporate monitoring requirements for all applicable monitoring programs covered under the three separate National Pollutant Discharge Elimination (NPDES) permits. The Riverside County Flood Control and Water Conservation District (District), as the Principal Permittee, administers the CMP on behalf of the Permittees named in the three NPDES permits in Riverside County. The District encompasses 2,700 square miles and extends from the northwest portion of Riverside County east to Desert Hot Springs and Palm Springs and south to San Diego County through the Temecula area, maintaining jurisdiction over the western 40% of Riverside County. Three distinct watersheds are present within Riverside County: the Santa Margarita River Watershed, the Santa Ana River Watershed, and the Whitewater River Watershed. The areas of Riverside County under Permittee jurisdiction within each of the respective watersheds are known as the Santa Margarita Region (SMR), the Santa Ana Region (SAR), and the Whitewater River Region (WWR). Each watershed is governed by a separate Regional Water Quality Control Board (Regional Board) and separate NPDES permits for which the District is listed as Principal Permittee. State Water Resources Control Board (SWRCB) oversees the Regional Boards.

### **Legal Authority**

The Federal Clean Water Act (CWA) established a national policy designed to help maintain and restore the physical, chemical and biological integrity of the nation's waters. In 1972, the CWA established the National Pollutant Discharge Elimination System (NPDES) permit program to regulate the discharge of pollutants from "point sources" to waters of the United States. From 1972 to 1987, the main focus of the NPDES permit program was to regulate conventional point pollutant sources such as sewage treatment plants and industrial facilities. The 1987 amendments to the CWA established regulations for controlling discharges from Municipal Separate Storm Sewer Systems (MS4s) through the NPDES permitting process. NPDES permits are regulated by state and regional water quality control board, which require municipalities, including the Permittees, to regulate the water quality within their individual and collective jurisdictions. The District is granted authority, as Principal Permittee, to regulate NPDES permit compliance through the Riverside County Board of Supervisors.

### **History of the CMP**

The goal of the NPDES MS4 regulatory program is to manage the quality of urban runoff to prevent impacts to Receiving Waters within the Permittees' respective jurisdictions. [The CMP is intended to be a living document and will be updated as necessary to ensure its ongoing efficacy, address safety considerations, and address MS4 permit requirements. The CMP may be updated annually. Updates to the CMP are conducted to individual volumes, as necessary, and reported in each permit region's monitoring annual report.](#)

The original CMP was drafted in March 1994 and was accepted as part of the applications for MS4 permit renewal by the San Diego, Santa Ana, and the Colorado Regional Boards in 1995. Subsequently, the Regional Boards directed the Riverside County Permittees to implement the CMP in the "second round" MS4 permits. The CMP was updated in 2004 and 2008 to address the monitoring program objectives and the requirements of the third-round MS4 permits issued by the San Diego (2002), Santa Ana (2004) and Colorado (2008) Regional Boards. The CMP was updated in 2014 to address the monitoring program objectives and the requirements of the fourth-round MS4 permits issued by the San Diego (2010), Santa Ana (2010) and Colorado (2013) Regional Boards. The 2017 CMP included the monitoring program objectives and the requirements of the fourth-round MS4 permits issued by the Santa Ana (2010) and the Colorado (2013) Regional Boards, as well as includes updates to reflect the fifth-round Regional Permit issued by the San Diego (2015) Regional Board. The January 2020 CMP included errata for organization changes of key personnel and other minor program changes and improvements. [The November 2020 CMP revisions address updates to data measurement quality objectives in the QAPP, references to the](#)

~~administrative extension of monitoring requirements for each of the expired permits, current status of regional monitoring, minor updates and clarification in the respective monitoring plan volumes, changes in reference to key personnel and contacts, and other clarifications as appropriate. The CMP is intended to be a living document and will be updated as necessary to ensure its ongoing efficacy, address safety considerations, measure cost effectiveness, and address MS4 permit requirements. The CMP may be updated annually. Updates to the CMP are conducted to individual volumes, as necessary, and reported in each permit region's monitoring annual report.~~

### **Climate and Hydrology**

Riverside County incorporates one east-west and two north-south trending mountain ranges with intermediate valleys and desert areas. In a matter of minutes one can travel from a microclimate where convective storms, influenced by temperature differences in the atmosphere, are the most critical to a microclimate influenced primarily by orographic conditions, or those influenced by topography. Average annual precipitation is generally correlated with altitude, with higher altitudes receiving more precipitation than lower areas. The climate in the SMR and SAR is characterized as semi-arid with an average annual precipitation of 11-14 inches in the urbanized areas of the SAR and 12-16 inches in the urbanized areas of the SMR. The climate in the WWR is characterized as arid, with an average annual precipitation of 3-6 inches in the urbanized areas.

The climate of Western Riverside County, including the SMR and SAR watersheds, is typically Mediterranean, characterized by warm, dry summers and cool, rainy winters. About 75% of the precipitation occurs during the four-month period from December through March. Mean seasonal depth of precipitation ranges from less than 10 inches in the valley areas to over 40 inches in the mountains. Precipitation increases with increasing elevation to the summit of the Coastal range. Shading effects of the Coastal range lead to low precipitation amounts throughout the lower portions of the Inland area. Precipitation increases again farther away from the Coastal range in the northeastern area of the District. Further description of the hydrologic conditions of the Santa Ana watershed can be found in the Riverside County Drainage Area Management Plan (DAMP), and for the Santa Margarita watershed it can be found in the Upper Santa Margarita Watershed Water Quality Workplan.

The climate of the Coachella Valley region of Riverside County, within the WWR watershed, is arid as characterized by hot summers and mild winters. This region is prone to summer thunderstorms with high intensity rainfall which may result in flash floods in ephemeral washes and/or creeks that are typically dry throughout the majority of the year. According to the Colorado River Basin Water Quality Control Plan (Basin Plan), the average annual rainfall in the Coachella Valley is 3.6 inches. Further descriptions of the hydrologic conditions of the WWR are available in the 2013 Whitewater River Region MS4 Permit, and also in the Whitewater River Region Stormwater Management Plan (SWMP).

### **The MS4**

The primary purpose of the MS4 is to protect life and property from the impacts of unconfined flooding. In addition to protecting life and property, flood prevention protects the environment by protecting materials from exposure to flood waters. Specifically, the flooding of residential, commercial or industrial development results in inundation of stored materials and wastes and may result in the release of pollutants to Receiving Waters, even where those materials and wastes are properly stored and managed using appropriate Best Management Practices (BMPs). An additional objective of the regional MS4 in Riverside County is water conservation. The District allows public agencies to use the MS4 for water transfers to facilitate water conservation and for groundwater recharge.

Due to the climate, geology, geography, and development conditions, the flows in the MS4s and the Receiving Waters in Riverside County are generally ephemeral or intermittent. Dry weather flows that



reach the MS4 typically permeate the ground or evaporate before reaching Receiving Waters. In general, flow is only observed as a result of larger storms. Exceptions include flows from springs, rising groundwater, POTW discharges, and water delivery discharges. **Table 1-1** below presents those Receiving Waters with perennial flows and the sources of non-storm flows:

**Table 1-1: District Receiving Waters with Perennial Flows**

Receiving Water	Watershed	Source of Non-Storm Flows
Santa Ana River	Santa Ana	POTW effluent; rising groundwater
Arlington Wash	Santa Ana	Produced water from Arlington Desalter
Temescal Wash	Santa Ana	POTW effluent; produced water from Arlington Desalter
Lake Evans	Santa Ana	Urban runoff augmented by well water
Lake Mathews	Santa Ana	Imported potable water
La Sierra Channel	Santa Ana	Rising groundwater
Anza Channel	Santa Ana	Rising groundwater
Box Springs Channel	Santa Ana	Raw potable water from Orange County Water District
Sunnyslope Channel	Santa Ana	Rising groundwater
Lower reach of Murrieta Creek	Santa Margarita	Rising groundwater; potable water from Rancho California Water District
Lower reach of Temecula Creek	Santa Margarita	Rising groundwater
Upper Whitewater River (to North Palm Springs Recharge Basins)	Whitewater	80% Colorado river water, 20% snowmelt
Coachella Valley Stormwater Channel	Whitewater	POTW effluent; agricultural return water / rising groundwater

**Coverage Under MS4 Permits**

The District serves as the Principal Permittee in the SAR and SMR MS4 Permits, and Co-Principal Permittee with the County of Riverside in the WWR MS4 Permit. As the Principal Permittee, the District is responsible for administering the required monitoring programs, including but not limited to collecting water quality samples; reviewing, analyzing, and reporting data; and processing contracts and service agreements for laboratory, consulting, and interagency services. Other Permittees may also conduct monitoring activities, such as water quality sampling and field screening/reconnaissance, either under the umbrella of the CMP or due to MS4 permit-specific monitoring requirements.

Riverside County is under the purview of three Regional Boards, as presented in **Table 1-2** below:

**Table 1-2: District MS4 Permits**

Regional Water Quality Control Board	Area	Order No.	NPDES No.	Adoption Date
Region 9: San Diego	Santa Margarita Watershed	R9-2015-0100 <sup>1</sup>	CAS010266	November 18, 2015

<sup>1</sup> The San Diego Regional Water Board adopted a Regional NPDES Permit, Order No. R9-2013-0001 that did not incorporate the Riverside County Permittees until the adoption of the 2015 Amendment, Order No. R9-2015-0100.

Region 8: Santa Ana	Santa Ana Watershed	R8-2010-0033	CAS618033	January 29, 2010
Region 7: Colorado River Basin	Whitewater River Region	R7-2013-0011	CAS617002	June 20, 2013

Although the Permits have expired, the Co-Permittees will continue implementing the existing, relevant monitoring program requirements until permit renewal. The CMP is intended to comply with the core programmatic elements of each of the watershed MS4 permits and additional requirements and recommendations by the Surface Water Ambient Monitoring Program (SWAMP).

**The Model Monitoring Program**

In 2004, the Stormwater Monitoring Coalition's (SMC) Model Monitoring Technical Committee developed Technical Report #419, Model Monitoring Program for Municipal Separate Storm Sewer Systems in Southern California (MMP). The purpose of developing the model program was to provide "a common framework for municipal urban runoff programs and Regional Board staff to use in developing and/or revising program requirements for monitoring Receiving Waters for impacts, status and trends, toxicity, mass emissions, and source identification." The model program was designed around five core management questions:

1. Are conditions in Receiving Waters protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential Receiving Water problems (i.e., impairments)?
3. What is the relative urban runoff contribution to the Receiving Water problem(s) (i.e., impairments)?
4. What are the sources of urban runoff that contribute to Receiving Water problem(s) (i.e., impairments)?
5. Are conditions in Receiving Waters getting better or worse?

The CMP is designed to follow the guidelines and structure of the MMP. The goal of the MS4 urban runoff program is to manage the quality of urban runoff to prevent impacts to Receiving Waters within the Permittees respective jurisdictions. The objectives necessary to support this goal are a superset of the MMP core management questions. These objectives are as follows:

1. Develop and support an effective MS4 management program.
2. Identify those Receiving Waters, which, without additional action to control pollution from urban runoff, cannot reasonably be expected to achieve or maintain applicable Water Quality Standards. (MMP Questions 1 and 3)
3. Characterize Pollutants associated with Urban Runoff and assess the influence of urban land uses on Receiving Water quality. (MMP Questions (2, 3, and 4)
4. Analyze and interpret the collected data to identify trends, if any, both to prevent impairments through the implementation of preventive BMPs and to track improvements based on the MS4 management program. (MMP Question 5)

**Water Quality: Point and Non-Point Pollutant Sources**

Stormwater runoff is surface water that flows as a result of precipitation, through both urbanized and non-urbanized areas. It is a complex conglomeration of diverse point and non-point sources conveyed in such a way that they discharge to Receiving Waters at measurable points. The non-point inputs are varied and include inputs from open space, agricultural, and other non-urban sources.

Although the quality of discharges from most point sources has been improved or the discharges themselves eliminated by diverting flows for treatment at a treatment facility, water quality impairments remain in Riverside County. Non-point sources may also contribute to Receiving Water impairment. Many non-point sources, including discharges from lands not within the Permittees jurisdiction, are untreated or inadequately treated and may be discharged into the MS4 and/or Receiving Waters.

The nature of all sources of pollutants potentially contributing to these impairments, including but not limited to stormwater runoff, needs to be identified and characterized for the development of effective control programs. Impairments are identified in the CWA Section 303(d) List of Water Quality Limited Segments (303(d) List) and are discussed under the individual programs and in monitoring annual reports.

### **CMP Structure**

The CMP is divided into six volumes: the Introduction, the Quality Assurance Project Plan (QAPP), the SMR Monitoring Plan, the SAR Monitoring Plan, the WWR Monitoring Plan, and the Glossary of commonly used terms. The QAPP, located in Volume II, covers common elements of all three programs including general QA/QC, standard operating procedures, and general program information. The SMR Monitoring Plan<sup>2</sup>, the SAR Monitoring Plan, and the WWR Monitoring Plan, located in Volumes III through and V, cover monitoring programs and information specific to the respective watershed. Volume VI includes a glossary of commonly used terms used throughout the CMP. Together, these six volumes are the CMP.

---

<sup>2</sup> Prior to the issuance of the SMR's 2015 Regional Permit, Volume III was the sole basis for the SMR Monitoring Plan; however the SMR Volume now refers to the Monitoring and Assessment Plan contained within the approved Water Quality Improvement Plan (WQIP) as required by the permit. The SMR's WQIP also makes reference to the QAPP in Volume II as appropriate to maintain the linkage of the monitoring plan to appropriate monitoring protocols as used by the Riverside County Co-Permittees. Moving forward, the WQIP will be updated, if needed, to reflect changes or modifications to the SMR Monitoring and Assessment Plan. Changes to the Monitoring and Assessment Plan contained within the approved Water Quality Improvement Plan (WQIP) will also be referenced in the CMP and QAPP as appropriate.