



*Ventura Countywide
Stormwater Quality
Management Program*

2014-2015
Permit Year

Ventura Countywide Stormwater Quality
Management Program Annual Report

Attachment E8

County of Ventura and Watershed
Protection District - Bacteria TMDL
Outfall Monitoring Plan for Malibu Creek
Watershed



Camarillo
County of Ventura
Fillmore
Moorpark
Ojai
Oxnard
Port Hueneme
Santa Paula
Simi Valley
Thousand Oaks
Ventura

Ventura County Watershed Protection District

December 14, 2015

Prepared for

County of Ventura Public Works Agency

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Bacteria TMDL Outfall Monitoring Plan

for Malibu Creek Watershed

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1 INTRODUCTION

1.1 Background

This Monitoring Plan addresses the requirements of the Malibu Creek Bacteria Total Maximum Daily Load (TMDL) Basin Plan Amendment (Attachment A to Resolution No. R12-009, 2012), which states,

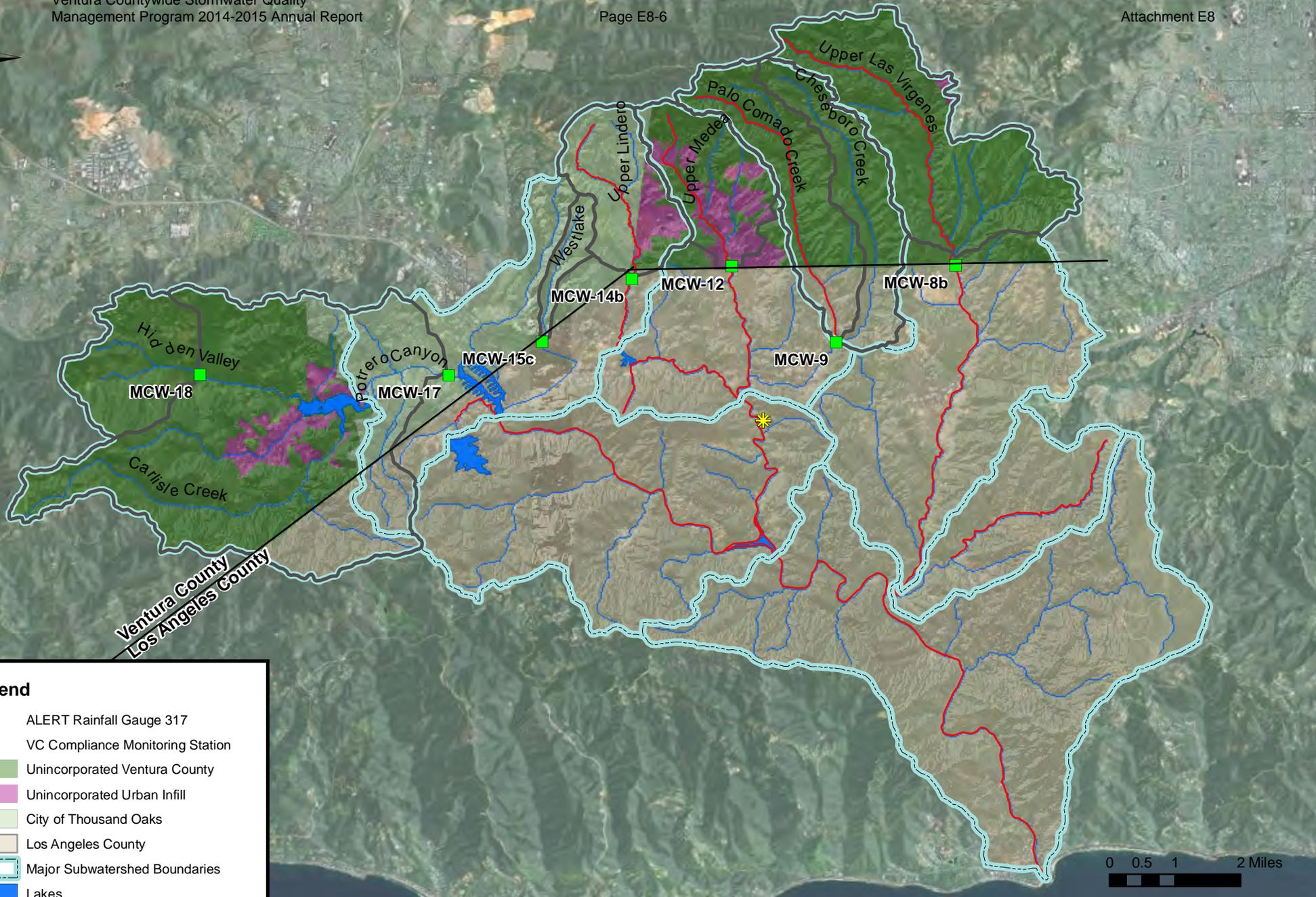
“Responsible jurisdictions and agencies shall submit an outfall monitoring plan within 6 months of the effective date of the TMDL revised by Resolution R12-009. The outfall monitoring plan shall propose an adequate number of representative outfalls to be sampled, a sampling frequency, and protocol for enhanced outfall monitoring as a result of an in-stream exceedance. Responsible jurisdictions and agencies can use existing outfall monitoring stations in the MS4 permit, where appropriate for both the permit and TMDL objectives.”

The Malibu Creek Watershed (MCW) is located approximately 35 miles west of Los Angeles and extends from the Santa Monica Mountains to the Pacific Coast (see Figure 1). The 109 square mile watershed drains into the Malibu Lagoon and ultimately into Santa Monica Bay when the Lagoon is breached (LA DPW, 2008). There are eight major subwatersheds in the MCW, five of which are fully or partially contained within the unincorporated areas of Ventura County. Within these five, only the drainage areas to Potrero Canyon, Upper Lindero Creek, and Upper Medea Creek contain any developed areas, County-owned municipal separate storm sewer systems (MS4s), or District-owned facilities (Table 1). Receiving water quality in these three drainages is being characterized under the MCW TMDL Compliance Monitoring Plan (CMP) through sampling at sites MCW 17, MCW-14b, and MCW-12, which are located downstream of County areas.

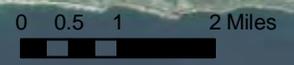
Table 1. Potrero, Upper Lindero, and Upper Medea Subwatershed Characteristics within Unincorporated Ventura County.

Subwatershed	Portion of Drainage Area within Unincorporated Ventura County (ac)	HUC 12	Urban MS4 Land Use (% of total area within Unincorporated Ventura County)				Other non-MS4 Land Use (% of total area within Unincorporated Ventura County)		
			SF Residential	MF Residential	Commercial	Industrial	Agriculture	Education	Open Space
Potrero Canyon	7,171	Potrero Valley Creek	4.2	0.2	1.1	0.2	10.8	0	81.6
Upper Lindero	588	Medea Creek	35.4	12.2	3.7	0.4	0	2.8	45.5
Upper Medea	2,063	Medea Creek	23.1	6.5	0.3	0	0	3.6	66.5

SF Residential = single family residential
 MF Residential = multi-family residential



- Legend**
- ALERT Rainfall Gauge 317
 - VC Compliance Monitoring Station
 - Unincorporated Ventura County
 - Unincorporated Urban Infill
 - City of Thousand Oaks
 - Los Angeles County
 - Major Subwatershed Boundaries
 - Lakes
 - Streams
 - 303(d) Listed for Bacteria or Nutrients
 - Drainage Area to Monitoring Station



**Bacteria TMDL Outfall Monitoring Plan
Ventura County, CA**

**Figure 1. Malibu Creek Watershed
Major Subwatershed Delineations**

Several tributaries and lakes in the MCW have bacteria TMDLs and are identified on California’s Clean Water Act Section 303(d) list for water quality impairments of beneficial uses, as defined in the Los Angeles Regional Water Quality Control Board (LARWQCB) Basin Plan (2011).

Bacteria Waste Load Allocations (WLAs) are assigned to unincorporated Ventura County for discharges from their MS4s. WLAs assigned to MS4 discharges are expressed as the allowable number of daily or weekly receiving water sample days that may exceed the single sample limits or geometric mean limits (“allowable exceedance days”) (Malibu Creek Bacteria TMDL Basin Plan Amendment, Attachment A). Outfall discharges are considered a potential point source of impairing pollutants and, because they are regulated as such, unincorporated Ventura County intends to address discharges from land under their jurisdiction which drains into or through their MS4. In some urban areas, the majority of the stormwater drains through private storm drains (e.g., Lake Sherwood Homeowners Association [HOA]), and the minimal County MS4s do not include any outfalls and are not appropriate for sampling under this Monitoring Plan.

1.1.1 Malibu Creek Bacteria TMDL

On January 24, 2006, the United States Environmental Protection Agency (USEPA) made effective the TMDL for Bacteria in MCW (Bacteria TMDL) developed by the LARWQCB. The Basin Plan was amended by Resolution R12-009 based on the reconsideration of certain technical matters of the Bacteria TMDL, was adopted by the LARWQCB on June 7, 2012, and was made effective on July 2, 2014. Per the Basin Plan Amendment, this Outfall Monitoring Plan is due January 2, 2015 (six months from the effective date of the amendment).

The following Malibu Creek tributaries located within unincorporated Ventura County are on the 303(d) List for bacteria and are being addressed by a USEPA-approved bacteria TMDL:

Table 2. Beneficial Uses of 303(d) Listed Malibu Creek Tributaries within Unincorporated Ventura County.

Tributary	Beneficial Use (defined in Basin Plan, 2011)
Las Virgenes Creek	REC 1, REC-2
Palo Comado Creek	None
Medea Creek Reach 2	REC-1, REC-2
Lindero Creek Reach 2	REC-1 (intermittent), REC-2 (intermittent)

Source: Table 2-1a of LARWQCB Basin Plan (2011)

The Basin Plan objectives that serve as the numeric targets for the bacteria TMDL are listed in Table 3.

Table 3. Numeric Targets in Freshwater Designated for Water Contact Recreation (REC-1).

Geometric Mean Limits (Freshwater)	
Indicator	mpn/100mL
<i>E. coli</i>	126
Single Sample Limits (Freshwater)	
Indicator	mpn/100mL
<i>E. coli</i>	235

Geometric means are calculated as rolling six-week averages. No annual exceedances are allowed for the geometric mean limits. The number of annual allowable exceedance days for the single sample limits differ depending on season, dry weather or wet-weather, and by sampling locations. Wet weather is defined in the MCW Bacteria TMDL as days on which 0.1 inch of rain or more occurs, plus the three days following the rain event. Dry weather is considered to be all other days.

The single sample allowable exceedance days for Malibu Creek (Upper, Middle, and Lower) are shown in Table 4.

Table 4. Single Sample Allowable Exceedance Days within Malibu Creek during Dry and Wet Weather.

Season	Compliance Deadline	Daily Sampling	Weekly Sampling
Dry Weather	January 24, 2012	5	1
Wet Weather	July 15, 2021	15	2

1.1.2 MS4 Permits

The MCW is subject to two different NPDES MS4 Permits, the Ventura County MS4 Permit (Order No. R4-2010-0108) in the upper portion of the watershed (area addressed by this monitoring plan) and the Los Angeles County MS4 Permit (Los Angeles MS4 Permit; Order No. R4-2012-0175) in the lower part of the watershed. In addition to the outfall monitoring requirements of the TMDL, the recent outfall monitoring requirements of the MS4 permits were considered in developing this monitoring design.

The Ventura County MS4 Permit requirements specify that the Principal Permittee shall monitor major storm drain outfalls^a listed in Attachment I of the Permit^b for a total of four monitoring events (one dry-weather and three wet-weather storm events) per major outfall. Grab samples are to be collected for pathogen indicators from storm events of 0.25 inches or greater. The Ventura County MS4 Permit, Attachment F (pg. F-4) specifies major outfall monitoring requirements. Similar to the Ventura County MS4 Permit, the Los Angeles County MS4 permit requires representative outfalls to be monitored three times per year during wet weather and one time per year during dry weather.

1.2 Purpose

County of Ventura (County) and the Ventura County Watershed Protection District (District), with assistance from Geosyntec Consultants, have prepared this MCW Bacteria TMDL Outfall Monitoring Plan (“Monitoring Plan”). The purpose of the Monitoring Plan is to summarize the approach for monitoring bacteria at County outfall locations contributing to Malibu Creek tributaries to determine if Bacteria TMDL requirements for the Malibu Creek Watershed are being met in unincorporated urban areas of Ventura County, as well as present how monitoring data will be used to inform the iterative approach for implementing Best Management Practices (BMPs) as needed towards achieving compliance with TMDL WLAs.

1.3 Scope

This Monitoring Plan describes the methods for implementing the outfall requirements of the Malibu Creek TMDL and serves as guidance for monitoring methodology and analysis. Water quality will be monitored to quantitatively determine if the TMDL requirements are being met, to show if implemented BMPs are effective, and to provide information on the sources of bacteria in case WLAs are being exceeded downstream. The Monitoring Plan includes the following information specific to TMDL compliance:

- Proposed number of representative outfalls to be sampled;
- Site selection, rationale, and GPS information for the sampling locations;
- Sampling frequency and methodology;
- Protocol for enhanced outfall monitoring as a result of a downstream receiving water exceedance where/when such exceedances are concurrently found in the associated representative outfall locations;

^a According to the Los Angeles County and Ventura County MS4 Permits, major outfall is defined as 36” or greater or equivalent (single conveyance other than a circular pipe with drainage area of more than 50 acres) or for storm sewers that receive stormwater from areas zoned as industrial that discharge from a pipe with a diameter of 12” or greater or equivalent (single conveyance other than circular pipe with drainage area of 2 acres or more).

^b None of the major outfalls identified for MS4 permit monitoring are located within the unincorporated Ventura County area of the MCW.

- Reporting requirements, including what data will be collected and how it will be used to evaluate project effectiveness; and
- Quality control.

1.4 Related Existing County Monitoring Plans

1.4.1 Malibu Creek and Lagoon Bacteria TMDL Compliance Monitoring Plan (2008)

The Malibu Creek and Lagoon Bacteria TMDL CMP (LA DPW, 2008) was developed to comply with the original TMDL requirements for receiving water monitoring. The Monitoring Plan identifies 18 receiving water monitoring sites (six of which are representative of unincorporated Ventura County) to meet the monitoring site requirements established in the Basin Plan Amendment. The MCW Bacteria TMDL Monitoring Plan agencies collect grab samples on a weekly basis. Monitoring under this plan was approved by the LARWQCB on September 11, 2007 and the Plan was revised on February 25, 2008. In addition, after the TMDL reconsideration became effective, fecal coliform monitoring was discontinued as approved by the LA RWQCB Executive Officer (October 31, 2014), and therefore currently the freshwater samples are analyzed for *E. coli* only.

1.4.2 Upper Malibu Creek Watershed Dry Weather Source Identification Study (2014)

The Upper MCW Dry Weather Source Identification Study (Study), performed by the County, identified sub-drainages in Upper Medea and Lindero drainage areas that were found to be contributing the highest loads of *E. coli*, anthropogenic inputs of fecal pollution, nutrients, and estimated relative contributions of natural vs. anthropogenic sources of fecal pollution. According to the Study, SSM exceedances in the Medea Creek drainage area were highest in urban outfalls M02, M05 and M08, which flow to receiving water monitoring location MCW-12. Almost all of the County area in the Lindero Creek drainage area drains to outfall L03, the storm drain network's outfall to the creek. Three small subdrainage areas drain to the City of Thousand Oaks' MS4, and one small subdrainage area downstream of L03 drains to an outfall that has no access.

The outfall monitoring locations for this Outfall Monitoring Plan were selected from the County outfall locations that were identified in the Study. Average dry weather flowrates reported in the Study can be found in Table B-1 of Appendix B.

1.5 Document Organization

This Monitoring Plan is organized as follows:

- Section 2 describes the monitoring plan design, including monitoring objectives, parameters, sites, frequency, laboratory methods, safety considerations, and quality assurance/quality control,
- Section 3 provides the reporting procedures, including frequency and content, delivery format, and data management, and

- Section 4 provides references.

1.6 Terms of Service

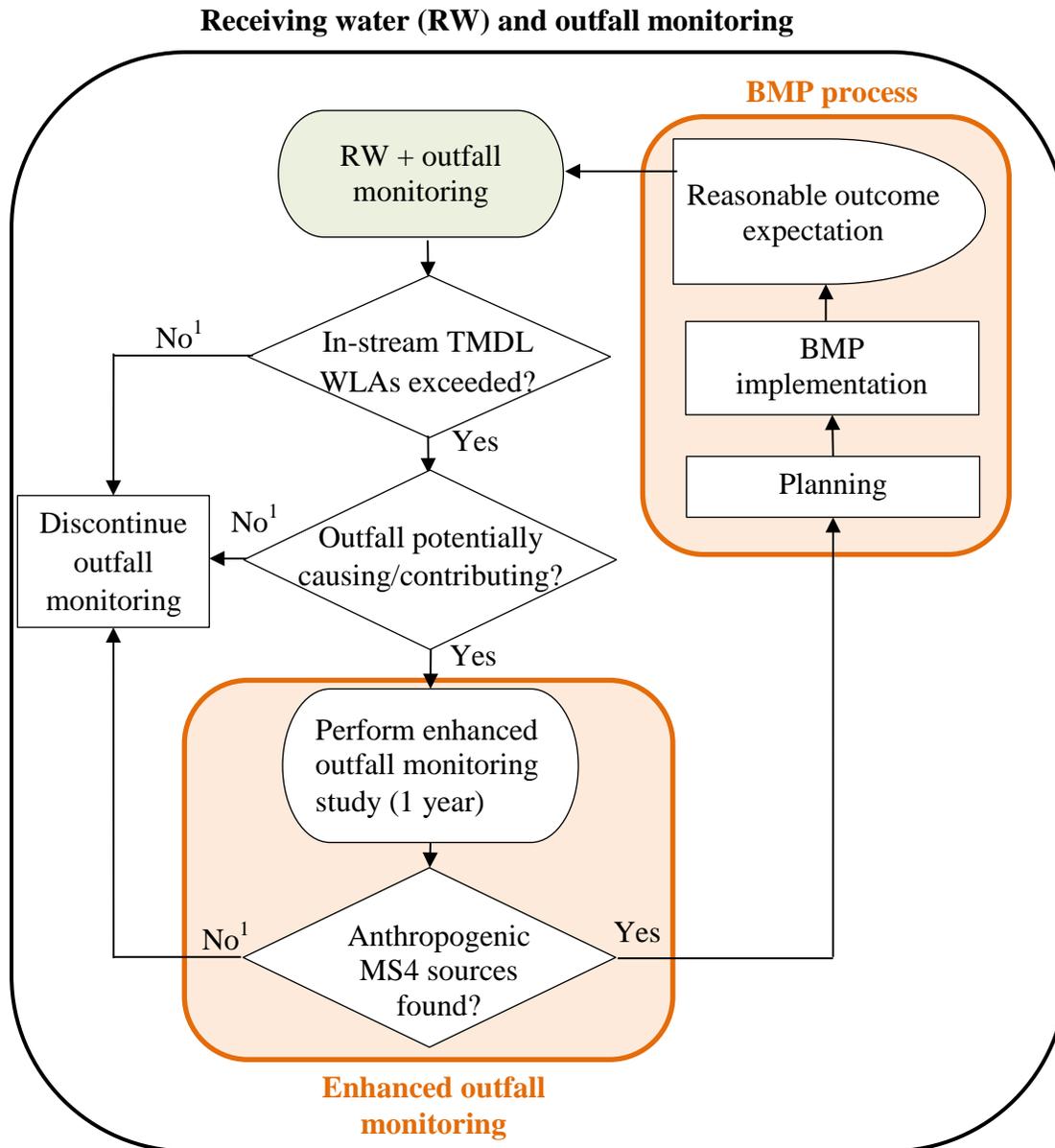
This work was conducted by Geosyntec Consultants (Geosyntec) for County of Ventura and the Ventura County Watershed Protection District. This work was managed and conducted by Avery Blackwell and Stacy Luell, P.E., respectively. Peer and senior reviews were conducted respectively by Megan Otto, P.E. and Brandon Steets, P.E., in accordance with Geosyntec's quality assurance policies.

2 MONITORING PLAN DESIGN

2.1 Iterative Process Toward TMDL Compliance

This Monitoring Plan is intended to support the County implement an iterative process towards achieving compliance with the Malibu Creek Bacteria TMDL WLAs (Figure 2).

In all phases of the iterative process, monitoring will occur in receiving waters and selected outfalls, in order to determine in-stream exceedances of WLAs and whether County MS4s may cause or contribute to those in-stream exceedances. If discharges from County MS4 representative outfalls are found to potentially cause or contribute to a downstream receiving water exceedance, enhanced outfall monitoring will be performed to identify sub-drainages and sources of bacteria within or to the County MS4s. Once anthropogenic sources are identified, enhanced outfall monitoring will be suspended, and the BMP implementation process will be initiated. Once appropriate BMPs are implemented, and after a reasonable duration to allow these BMPs to have an effect (i.e., “reasonable outcome expectation” in Figure 2), downstream water quality results will be re-evaluated and the iterative process will continue until TMDL WLAs are met.



1. Outfall monitoring will be discontinued after 3 consecutive years of 'no' outcomes.

Figure 2. Iterative Process Toward Achieving Bacteria TMDL Compliance

2.2 Monitoring Plan Objectives

The purpose of this Monitoring Plan is to summarize an approach for monitoring bacteria to determine if Bacteria TMDL requirements for the MCW are being met in unincorporated urban areas of Ventura County.

The primary objectives of this Monitoring Plan are to:

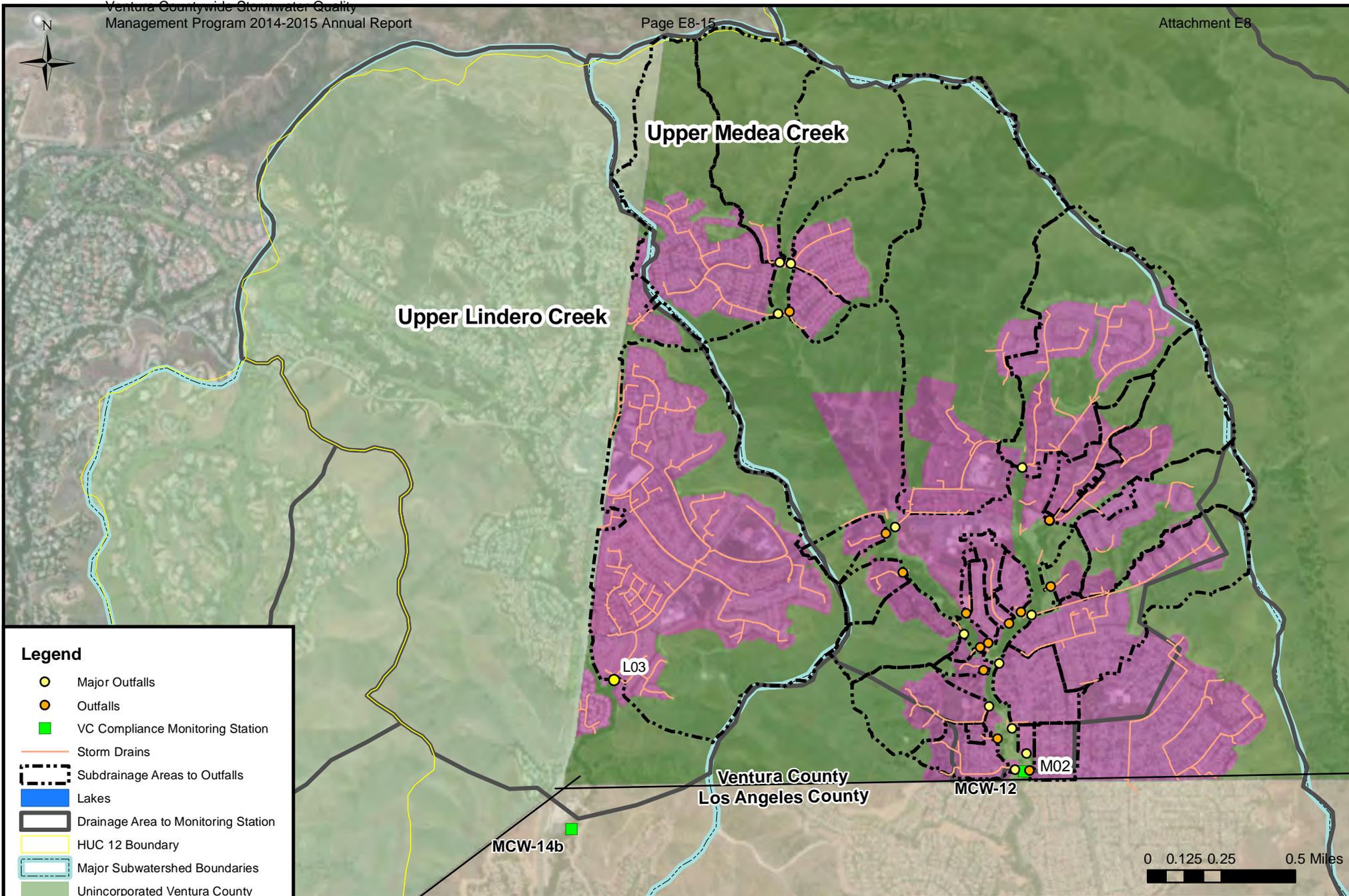
1. Satisfy outfall monitoring requirements of the reconsidered MCW Bacteria TMDL (Resolution No. R12-009);
2. Collect outfall discharge water quality data to verify whether the Ventura County MS4 caused or contributed to exceedances of WLAs in downstream receiving waters, monitored at Ventura County TMDL monitoring stations;
3. Collect water quality data to locate and identify sources of bacteria to Ventura County MS4; and
4. Inform the BMP implementation process.

All monitoring activities are conducted in accordance with the Standard Provisions for Monitoring described in Attachment F of the Ventura County MS4 Permit and in 40 CFR Section 122.41(j). Outfall monitoring results for *E. coli* will be compared to water quality objectives as described in the Bacteria TMDL.

2.3 Monitoring Sites

Two outfall locations have been selected for dry and wet weather outfall monitoring—L03 in the Upper Lindero Creek subwatershed and M02 in the Upper Medea Creek subwatershed (Figure 3). These were selected based on outfall size, ownership, contributing land use, proximity to receiving water monitoring locations, and presence of flow as identified during the Upper MCW Dry Weather Source Identification Study (2014), the Illicit Connections and Illicit Discharges Field Screening Effort (2012)^c, and a site survey for siting BMP locations in the Oak Park Green Streets Urban Retrofit project (on-going design effort as a part of the Proposition 84 Stormwater Grant Program’s funded project). Even though The Upper Lindero and Upper Medea Creek subwatersheds are within a single HUC12, and the Los Angeles County MS4 permit allows one outfall to be sampled per HUC12, the County has elected to include outfalls in each of these subwatersheds. While the Potrero Creek subwatershed has a small amount of unincorporated County developed area with County inlets and manholes (Figure 4), the County and District do not own any MS4 outfalls that could discharge to the receiving water monitoring location (MCW-17). The District only owns channels which are also considered receiving waters and, therefore, would otherwise have no outfalls to be considered for inclusion in the Monitoring Plan.

^c The Illicit Connections and Illicit Discharges Field Screening Effort field reconnaissance study, performed by Ventura County in February 2012, was performed to locate, describe, and quantify dry weather flows within County outfalls.



Legend

-  Major Outfalls
-  Outfalls
-  VC Compliance Monitoring Station
-  Storm Drains
-  Subdrainage Areas to Outfalls
-  Lakes
-  Drainage Area to Monitoring Station
-  HUC 12 Boundary
-  Major Subwatershed Boundaries
-  Unincorporated Ventura County
-  Unincorporated Urban Infill
-  City of Thousand Oaks
-  Los Angeles County

**Bacteria TMDL Outfall Monitoring Plan
Ventura County, CA**

**Figure 3. Malibu Creek Watershed
Selected Outfall Monitoring Sites**

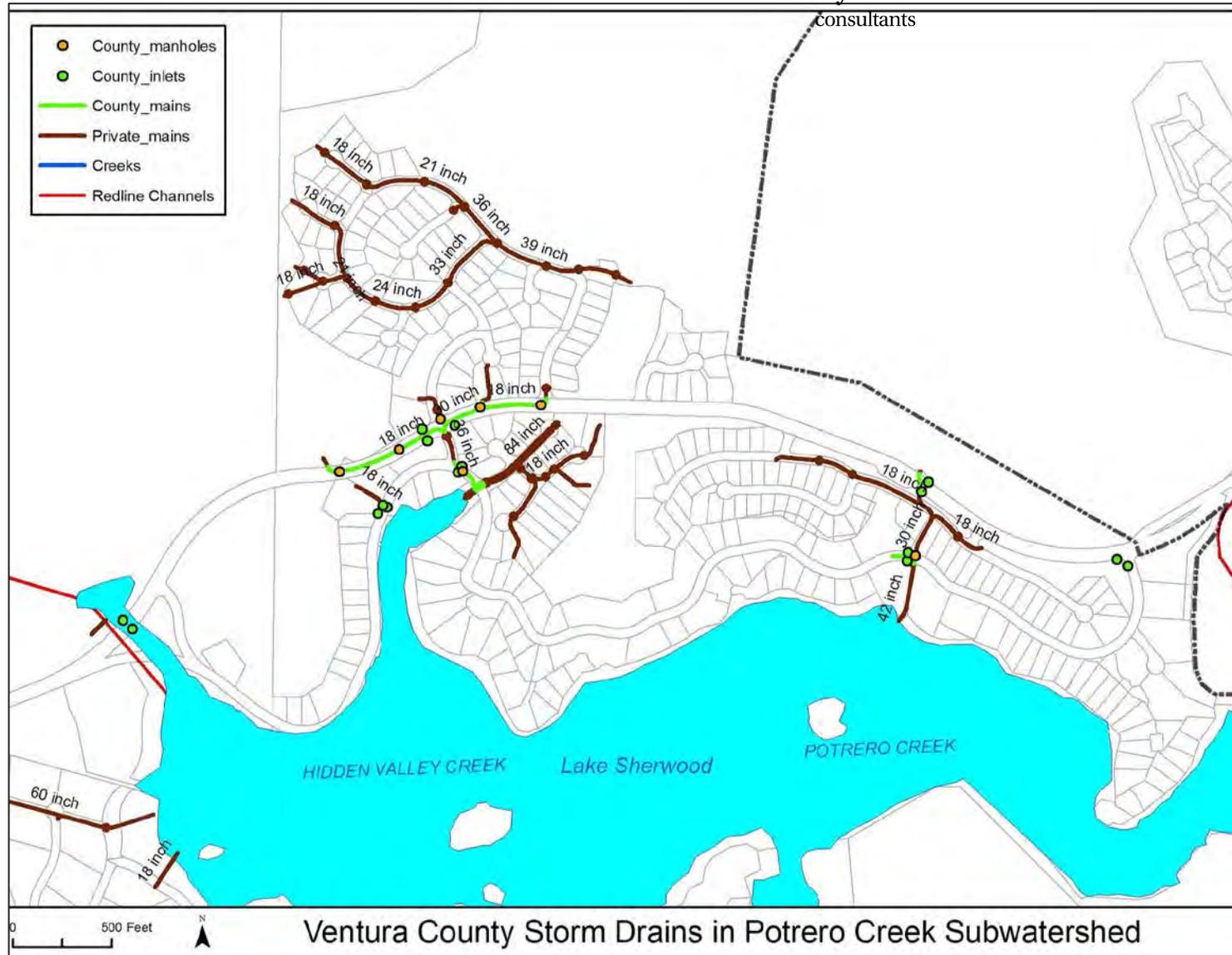


Figure 4. Ventura County Storm Drains in Potrero Creek Subwatershed
Source: Ventura County Watershed Protection District, 2014

2.3.1 Site Selection Approach

The following methodology was used to select outfall monitoring sites:

- 1) All major County outfalls and most other outfalls were identified in the Source Identification Study (2014).

The identified County outfalls were field screened to assess:

- i. Accessibility and safety considerations for monitoring personnel and equipment;
 - ii. Representativeness of the outfall and linkage with downstream receiving water monitoring locations;
 - iii. Feasibility of accurate flow measurement within the outfall/storm drain.^d
- 2) A detailed desktop screening of each identified County outfall was conducted with respect to tributary land uses. The Ventura County MS4 Permit states that drainage(s) to the selected outfall(s) shall be representative of the land uses within the permittee's jurisdiction. To the extent practicable, the urban land uses contributing to the monitored outfalls represent the distribution of urban land uses within unincorporated Ventura County contributing to in-stream sample locations MCW-14b and MCW-12 (see Table 1 and Figure 3).
 - 3) In conjunction with steps 1 and 2 above, potential outfall monitoring sites in the Medea Creek subwatershed were further screened based on dry weather discharge information from the Source Identification Study (2014) and the Illicit Connections and Illicit Discharges Field Screening Effort (2012), and the Prop 84 funded Oak Park Green Streets Urban Retrofit project, with planned installation of ten modular wetlands and two biofilters for bacteria removal throughout the subwatershed in the summer of 2015. Site selection criteria included observation of dry weather flows during previous studies, and treatment of drainage area runoff by modular wetland unit(s) and/or biofilter(s).

The site selection approach is detailed in Table B-1 of Appendix B. The final monitoring location selections are shown in Table 5.

Outfall monitoring sites L03 and M02 will be considered representative for untreated and treated urban runoff from Ventura County jurisdictions in all Upper Malibu Creek subwatershed, respectively.

^d Alternative upstream in-network monitoring locations, such as manholes or channels, can be sampled to facilitate access and flow accuracy and to ensure the safety of the monitoring team.

Table 5. Outfall Monitoring Site Selections.

Site ID	Responsible Agency	Subwatershed	Coordinates			Diameter (in)	
M02	Ventura County	Upper Medea	Long -118° 45'	41.2"	Lat 34° 10'	6.8"	30
L03	Ventura County	Upper Lindero	Long -118° 47'	9.0"	Lat 34° 10'	23.73"	108

2.4 Sampling Frequency

Outfall samples will be collected on a monthly basis, plus three additional wet days per year will be sampled. Results from this routine outfall monitoring can be used to determine whether County MS4 outfalls are exceeding the bacteria WQOs at a similar or greater frequency to the downstream samples, and therefore whether they are likely causing or contributing to potential downstream receiving water exceedances of WLAs. Based on the Upper MCW Dry Weather Source Identification Study (2014), the County has established that, when flowing, outfalls will likely exceed numeric limits for bacteria most of the time. Therefore, weekly outfall sampling (to determine if MS4 outfalls may cause or contribute to downstream WLA exceedances) is not necessary, and instead outfall sampling efforts will be directed towards enhanced outfall sampling with the goal of locating and identifying sources of bacteria.

Monthly outfall sampling will occur on the same dates as the weekly receiving water sampling (e.g., the first weekly receiving water sampling date of each calendar month), plus at least three additional “wet day” samples (weather permitting) will be taken annually on weekly receiving water sampling dates that are forecasted to be “wet days,” determined prior to sampling. For instance, if weekly receiving water sampling occurs every Tuesday, rain gauge data would be checked on Monday to see if greater than or equal to 0.1” had fallen on Saturday, Sunday, or Monday (72 hour period prior to the sample date). If greater than or equal to 0.1” of rainfall had occurred within the 72 hour period preceding the sample date, the Tuesday sample would be considered a “wet day” outfall sample. This will result in a minimum of three wet weather outfall sampling results per year.

For processing sampling results for reporting purposes, rain gauge data from within the MCW will be used to determine whether each sample is to be characterized as a dry or wet day result. The Los Angeles County Department of Public Works’ ALERT Rainfall Gauge 317 (Agoura, auto rain gauge reference ID 434) will be used as the reference rain gauge (Figure 2). Data from this rainfall gauge are available through the Los Angeles County Department of Public Works: <http://dpw.lacounty.gov/wrd/Precip/index.cfm>.

2.5 Enhanced Outfall Monitoring

Enhanced outfall monitoring in a subwatershed will be initiated when annual data evaluations indicate that an in-stream exceedance of the annual allowable exceedance day WLAs has occurred for a full monitoring season, and the corresponding upstream outfall samples exceed more frequently than 1.6% or 19% for dry or wet weather, respectively (these percentages are

based on reference stream datasets used in the TMDL). For example, if MCW-14b exceeds a WLA during a monitoring season, and the County's outfall L03 (located upstream of MCW-14b) indicates exceedances of the reference stream allowed exceedance percentages, the County MS4 outfall located in the Lindero subwatershed will be triggered for enhanced sampling. Enhanced outfall monitoring will consist of conducting a source identification study to locate and identify anthropogenic sources of bacteria, including sampling multiple locations and analyzing samples for *E. coli* and one or more host-specific DNA marker (i.e., human at a minimum, and possibly dog and/or bird as well). Source identification strategies recommended by the California Source Identification (SIPP) Manual (Griffith et al., 2013) will be followed where relevant. Additional investigations such as flow mapping, CCTV, and testing the integrity of nearby sanitary sewers may be included as well, as needed. Enhanced sampling locations will be selected from available County MS4 outfall locations (and manholes, if needed), which are shown in Figure 3. If needed, private storm drain outfalls will be considered for sampling. Monthly outfall monitoring will continue during implementation of enhanced outfall monitoring. Once enhanced outfall monitoring results in identification of one or more anthropogenic sources of bacteria in the MS4 drainage area, the BMP implementation process will start and enhanced outfall monitoring will be suspended. If WLAs continue to be exceeded in-stream after water quality improvements due to BMP implementation can be reasonable expected, the iterative process shown in Figure 2 will resume.

2.6 Sample Collection Methods for Laboratory Analysis

Wet and dry weather samples will be collected at the outfalls manually, using a sample pole if needed. Grab samples will be collected in appropriate sample bottles with preservatives as necessary, placed on ice, and delivered to the lab under chain-of-custody within the six-hour holding time. Field measurements will also be collected and will include temperature, pH, turbidity, dissolved oxygen, and specific conductance. Each sample will be associated with recorded observations of site conditions, which should include, at a minimum, sample ID, collection date and time, weather conditions including rainfall during past 72 hours, flow measurement, environmental conditions (e.g., presence of wildlife or other potential bacteria sources), suspicious discharges, sample characteristics (sheen, foam, color, etc.), and sampler's name. An outfall monitoring observation log form is provided in Appendix D. Methodology and Standard Operating Procedures (SOPs) provided in the Ventura County Stormwater Program: Water Quality Monitoring SOPs (2011), will be followed.

As stated in the MCW CMP, sampling will be conducted by qualified professionals with proper training and in accordance with accepted industry protocols. The County may elect to contract this program's implementation to outside consultant(s). Quality assurance procedures shall be in accordance with Standard Methods for Examination of Water and Wastewater, 20-21st Editions (APHA 1999-05). Sampling should only occur when conditions are safe. The safety of the sample collector is the top priority and should preclude scheduled sampling.

2.7 Laboratory Analytical Methods

Outfall samples will be tested for *E. coli*. During enhanced monitoring, samples will be also tested for at least one human marker (HF183), and potentially other source markers as needed. HF183 is being included not for compliance purposes but to inform whether human fecal sources are contributing to the measured *E. coli* concentrations. Analytical methods for *E. coli* will be

selected from USEPA-approved methods to meet Monitoring Plan requirements, including ensuring reporting accuracy and method detection limits, and will be consistent with methods in the MCW CMP. These methods will be implemented by a laboratory that is contracted before the monitoring event. HF183 will be analyzed by a qualified microbial source tracking analytical lab, implementing methods recommended by the California Source Identification (SIPP) Manual (Griffith et al., 2013), or similar. Necessary dilutions or aliquot volumes will be processed to ensure that quantifiable results can be produced within the expected range of concentrations. *E. coli* results will be reported as organisms per 100 mL of sample. When selecting analytical labs for TMDL monitoring, the importance of practical, fast turnaround times should be emphasized.

To provide consistency and comparability between events, only analytical laboratories certified for *E. coli* analysis by the State of California will be contracted for sampling events.

2.8 Quality Assurance/ Quality Control

Quality assurance/quality control (QA/QC) practices should be consistent with the Ventura County Stormwater Program: Water Quality Monitoring SOP (2011) and the MCW CMP. Analytical data quality objectives, including accuracy, precision, percent recovery, target reporting limits, and completeness are detailed in the MCW CIMP (2014). Analytical method and detection limit requirements for *E. coli* are listed in the Upper MCW Dry Weather Source Identification Study, Appendix A, Section 3 (2014).

3 REPORTING PROCEDURES

3.1 Report Frequency and Contents

Consistent with the CMP, monthly data summary reports will also be submitted to the LARWQCB as well as participating responsible agencies by the last day of each month for data collected during the previous month. The monthly reports will include a summary of results, number of exceedances, and key observations as well as the field logs and analytical reports as appendices. Sampling days will also be reported as either wet or dry based on local rain gauge data.

Three months after completion of the first year of outfall monitoring and annually thereafter, the County will prepare and submit to LARWQCB an annual outfall monitoring data evaluation report. This report will include a detailed work plan for source identification study if required based on the annual evaluation of in-stream and outfall monitoring data. It is anticipated that each time the source identification study is required, the detailed scope will vary in each subwatershed based on the most recent monitoring data evaluation results and status of BMP implementation. The proposed adaptive management strategy to implement the proposed enhanced outfall monitoring (Section 2.5) combined with on-going BMP implementation by the County will provide the most effective and efficient process towards compliance with the TMDL WLAs.

The County may elect to combine reporting into one singular annual report for the Outfall Monitoring Plan and the CMP if approved by the LARWQCB.

Both quantitative and qualitative results will be stored electronically in a project folder.

4 REFERENCES

County of Los Angeles Department of Public Works (LA DPW), 2008. Malibu Creek and Lagoon Bacteria TMDL Monitoring Plan.

California Regional Water Quality Control Board, Los Angeles Region (LARWQCB), 2011. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties.

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Appendix A:

Malibu Creek and Lagoon Bacteria Total Maximum Daily Load Basin Plan Amendment

Attachment A to Resolution No. R12-009

Amendment to the Water Quality Control Plan for the Los Angeles Region to Revise the Total Maximum Daily Load for Bacteria in the Malibu Creek Watershed

Adopted by the California Regional Water Quality Control Board, Los Angeles Region on June 7, 2012.

Amendments:

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Add:

Chapter 7. Total Maximum Daily Loads (TMDLs) Summaries
7-10 Malibu Creek and Lagoon Bacteria TMDL

List of Figures, Tables and Inserts

Add:

Chapter 7. Total Maximum Daily Loads (TMDLs)

Tables

7-10 Malibu Creek and Lagoon Bacteria TMDL

7-10.1. Malibu Creek and Lagoon Bacteria TMDL: Elements

7-10.2. Malibu Creek and Lagoon Bacteria TMDL: Final Allowable Exceedance Days by
Sampling Location

7-10.3. Malibu Creek and Lagoon Bacteria TMDL: Significant Dates

Chapter 7. Total Maximum Daily Loads (TMDLs) Summaries, Section 7-10 (Malibu Creek and Lagoon Bacteria TMDL)

This TMDL was adopted by the Regional Water Quality Control Board on December 13, 2004.

This TMDL was approved by:

The State Water Resources Control Board on September 22, 2005.

The Office of Administrative Law on December 1, 2005.

The U.S. Environmental Protection Agency on January 10, 2006.

This TMDL was revised and adopted by the Regional Water Quality Control Board on June 7, 2012.

This revised TMDL was approved by:

The State Water Resources Control Board on [Insert Date].

The Office of Administrative Law on [Insert Date].

The U.S. Environmental Protection Agency on [Insert Date].

The following table includes the elements of this TMDL.

Attachment A to Resolution No. R12-009

Table 7-10.1. Malibu Creek and Lagoon Basins Bacteria TMDL: Elements

Element	Key Findings and Regulatory Provisions
<i>Problem Statement</i>	Elevated bacterial indicator densities are causing impairment of the water contact recreation (REC-1) beneficial use at Malibu Creek, Lagoon, and adjacent beach. Swimming in waters with elevated bacterial indicator densities has long been associated with adverse health effects. Specifically, local and national epidemiological studies compel the conclusion that there is a causal relationship between adverse health effects and recreational water quality, as measured by bacterial indicator densities.
<i>Numeric Target</i> <i>(Interpretation of the numeric water quality objective, used to calculate the waste load allocations)</i>	<p>The TMDL has a multi-part numeric target based on the bacteriological water quality objectives for marine and fresh water to protect the water contact recreation use. These targets are the most appropriate indicators of public health risk in recreational waters.</p> <p>These bacteriological objectives are set forth in Chapter 3 of the Basin Plan.¹ The objectives are based on four bacterial indicators and include both geometric mean limits and single sample limits. The Basin Plan objectives that serve as the numeric targets for this TMDL are:</p> <p>In Marine Waters Designated for Water Contact Recreation (REC-1)</p> <p><u>1. Geometric Mean Limits</u></p> <p>a. Total coliform density shall not exceed 1,000/100 ml. b. Fecal coliform density shall not exceed 200/100 ml. c. <i>Enterococcus</i> density shall not exceed 35/100 ml.</p> <p><u>2. Single Sample Limits</u></p> <p>a. Total coliform density shall not exceed 10,000/100 ml. b. Fecal coliform density shall not exceed 400/100 ml. c. <i>Enterococcus</i> density shall not exceed 104/100 ml. d. Total coliform density shall not exceed 1,000/100 ml, if the ratio of fecal-to-total coliform exceeds 0.1.</p> <p>In Fresh Waters Designated for Water Contact Recreation (REC-1)</p> <p>1. Geometric Mean Limits</p> <p>a. <i>E. coli</i> density shall not exceed 126/100 ml.</p> <p>2. Single Sample Limits</p> <p>a. <i>E. coli</i> density shall not exceed 235/100 ml.</p> <p>These objectives are generally based on an acceptable health risk for</p>

¹ The bacteriological objectives were revised by a Basin Plan amendment adopted by the Regional Board on October 25, 2001, and subsequently approved by the State Water Resources Control Board, the Office of Administrative Law and finally by U.S. EPA on September 25, 2002. The bacteriological objectives for freshwater were revised a second time by a Basin Plan amendment adopted by the Regional Board on July 8, 2010, and subsequently approved by the State Water Resources Control Board, the Office of Administrative Law and finally by U.S. EPA on December 5, 2011.

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Element	Key Findings and Regulatory Provisions
	<p>marine recreational waters of 19 illnesses per 1,000 exposed individuals as set by the US EPA (US EPA, 1986).</p> <p>The targets apply throughout the year. The final compliance point for the targets is the point at which the effluent from a discharge initially mixes with the receiving water.</p> <p>In this TMDL, implementation of the above bacteria objectives and the associated TMDL numeric targets is achieved using a „reference system/anti-degradation approach“ rather than the alternative „natural sources exclusion approach“ or strict application of the single sample objectives. As required by the federal Clean Water Act and California Water Code, Basin Plans include beneficial uses of waters, water quality objectives to protect those uses, an anti-degradation policy, collectively referred to as water quality standards, and other plans and policies necessary to implement water quality standards. This TMDL uses a “reference system/anti-degradation approach” to implement the water quality objectives per the implementation provisions in Chapter 3. On the basis of the historical exceedance frequency at Southern California reference reaches, a certain number of daily exceedances of the single sample bacteria objectives are permitted. The geometric mean targets may not be exceeded at any time. For the purposes of this TMDL, the geometric means shall be calculated weekly as a rolling geometric mean using 5 or more samples, for six week periods starting all calculation weeks on Sunday. For the single sample targets, each existing monitoring site in Malibu Creek and its tributaries is assigned an allowable number of exceedance days for two time periods (1) dry-weather, and (2) wet-weather (defined as days with 0.1 inch of rain or greater and the three days following the rain event.) Each monitoring site in Malibu Lagoon is assigned an allowable number of exceedance days for three time periods (1) summer dry-weather (April 1 to October 31), (2) winter dry-weather (November 1 to March 31), and (3) wet-weather (defined as days with 0.1 inch of rain or greater and the three days following the rain event.)</p>
Source Analysis	<p>Fecal coliform bacteria may be introduced from a variety of sources including storm water runoff, dry-weather runoff, onsite wastewater treatment systems, and animal wastes. An inventory of possible point and nonpoint sources of fecal coliform bacteria to the waterbody was compiled, and both simple methods and computer modeling were used to estimate bacteria loads for those sources. Source inventories were used in the analysis to identify all potential sources within the Malibu Creek watershed, modeling was used to identify the potential delivery of pathogens into the creeks and the lagoon.</p>
Loading Capacity	<p>The loading capacity is defined in terms of bacterial indicator densities, which is the most appropriate for addressing public health risk, and is equivalent to the numeric targets, listed above. As the numeric targets must be met at the point where the effluent from storm drains or other discharge initially mixes with the receiving water throughout the day,</p>

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Element	Key Findings and Regulatory Provisions
	no degradation or dilution allowance is provided.
<i>Waste Load Allocations (for point sources)</i>	<p>Waste Load Allocations (WLAs) assigned to municipal separate storm sewer system discharges are expressed as the number of daily or weekly sample days that may exceed the single sample limits or geometric mean limits as identified under “Numeric Target.” WLAs are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection.</p> <p>No exceedances are allowed for the geometric mean limits. The allowable days of exceedance for the single sample limits differ depending on season, dry weather or wet-weather, and by sampling locations as described in Table 7-10.2.</p> <p>For each monitoring site in Malibu Creek and its tributaries, allowable exceedance days are set on an annual basis as well as for two time periods. These two periods are:</p> <ol style="list-style-type: none"> 1. dry-weather 2. wet-weather (defined as days of 0.1 inch of rain or more plus three days following the rain event). <p>For each monitoring site in Malibu Lagoon, allowable exceedance days are set on an annual basis as well as for three time periods. These three periods are:</p> <ol style="list-style-type: none"> 1. summer dry-weather (April 1 to October 31) 2. winter dry-weather (November 1 to March 31) 3. wet-weather (defined as days of 0.1 inch of rain or more plus three days following the rain event). <p>The responsible jurisdictions and responsible agencies are the permittees and co-permittees regulated under municipal separate storm sewer system (MS4) permits including the County of Los Angeles, Los Angeles County Flood Control District, County of Ventura, Ventura County Watershed Protection District, the cities of Malibu, Calabasas, Agoura Hills, Hidden Hills, Westlake Village, and Thousand Oaks; Caltrans, and the California Department of Parks and Recreation. The responsible jurisdictions and responsible agencies include the permittees and co-permittees of the MS4 permits for Los Angeles County and Ventura County, and Caltrans and any future Phase II MS4 permits. The storm water permittees are individually responsible for the discharges from their municipal separate storm sewer systems to Malibu Creek, Malibu Lagoon or tributaries thereto. The California Department of Parks and Recreation (State Parks), as the owner of the Malibu Lagoon and Malibu Creek State Park, is the responsible agency for these properties. However, since the reference watershed approach used in developing this TMDL is intended to make allowances for natural sources, State Parks is only responsible for: conducting a study of bacteria loadings from birds in the Malibu Lagoon, water quality monitoring, and compliance with load allocations applicable to</p>

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Element	Key Findings and Regulatory Provisions
	<p>anthropogenic sources on State Park property (e.g., onsite wastewater treatment systems). The Santa Monica Mountains Conservancy and the National Park Service as the owner of natural parkland also are responsible for water quality monitoring and compliance with load allocations resulting from anthropogenic sources (e.g., onsite wastewater treatment systems) from lands under their jurisdiction.</p> <p>The Tapia Water Reclamation Facility (TWRf) discharging to Malibu Creek is given individual WLAs equal to the bacteriological objectives contained in Chapter 3 during dry weather and wet weather.</p> <p>Discharges from general NPDES permits, general industrial storm water permits and general construction storm water permits are not expected to be a significant source of bacteria. Additionally, these discharges are not eligible for the reference system approach set forth in the implementation provisions for the bacteriological objectives in Chapter 3. Therefore, the waste load allocations for these discharges for all time periods are the bacteriological objectives contained in Chapter 3. Any future enrollees under a general NPDES permit, general industrial storm water permit or general construction storm water permit within the Malibu Creek watershed management area will also be subject to a WLA based on these bacteriological objectives.</p>
<p>Load Allocations (for nonpoint sources)</p>	<p>Load Allocations (LA) are expressed as the number of daily or weekly sample days that may exceed the single sample limits or geometric mean limits as identified under “Numeric Target.” LAs are expressed as allowable exceedance days because the bacterial density and frequency of single sample exceedances are the most relevant to public health protection.</p> <p>No exceedances are allowed for the geometric mean limits. The allowable days of exceedance for the single sample limits differ depending on season, dry weather or wet-weather, and by sampling locations as described in Table 7-10.2.</p> <p>For each monitoring site in Malibu Creek and its tributaries, allowable exceedance days are set on an annual basis as well as for two time periods. These two periods are:</p> <ol style="list-style-type: none"> 1. dry-weather 2. wet-weather (defined as days of 0.1 inch of rain or more plus three days following the rain event). <p>For each monitoring site in Malibu Lagoon, allowable exceedance days are set on an annual basis as well as for three time periods. These three periods are:</p> <ol style="list-style-type: none"> 1. summer dry-weather (April 1 to October 31) 2. winter dry-weather (November 1 to March 31) 3. wet weather (defined as days of 0.1 inch of rain or more plus three days following the rain event).

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Element	Key Findings and Regulatory Provisions
	<p>Onsite wastewater treatment systems were identified as the major nonpoint anthropogenic source within the watershed. The responsible agencies are the county and city health departments and/or other local agencies that oversee installation and operation of on-site wastewater treatment systems. However, owners of on-site wastewater treatment systems are responsible for actual discharges.</p>
Implementation	<p>The regulatory mechanisms to implement the TMDL may include, but are not limited to the Los Angeles County MS4 NPDES Permit, Ventura County MS4 NPDES Permit, the Caltrans Storm Water Permit, any future Phase II MS4 permits, waste discharge requirements (WDRs), Memorandum of Understandings (MOUs), revised MOUs, or other appropriate mechanisms consistent with the Nonpoint Source Implementation and Enforcement Policy, general NPDES permits, general industrial storm water permits, general construction storm water permits, the authority contained in Sections 13225, 13263, 13267, and 13383 of the California Water Code, and other appropriate regulatory mechanisms. Each NPDES permit assigned a WLA shall be reopened or amended at reissuance, in accordance with applicable laws, to incorporate the applicable WLAs as a permit requirement. This TMDL will be implemented in two phases as outlined in Table 7-10.3. By January 24, 2012, compliance with the allowable number of dry-weather exceedance days must be achieved. By July 15, 2021, compliance with the allowable number of wet-weather exceedance days and the geometric mean targets must be achieved.</p>
Margin of Safety	<p>A margin of safety has been implicitly included through the following conservative assumptions.</p> <ul style="list-style-type: none"> • The watershed loadings were based on the 90th percentile year for rain (1993) based on the number of wet weather days. This should provide conservatively high runoff from different land uses for sources of storm water loads • The watershed loadings were also based on a very dry rain year (1994). This ensures compliance with the numeric target during low flows when septic systems and dry urban runoff loads are the major bacterial sources. • The TMDL was based on meeting the fecal coliform 30-day geometric mean target of 200 MPN/ 100 ml, which for these watersheds was estimated to be more stringent level than the allowable exceedance of the single sample standard. This approach also provides assurance that the <i>E. coli</i> single sample standard will not be exceeded. • The load reductions established in this TMDL were based on reduction required during the two different critical year conditions. A wet year when storm loads are high, and a more typical dry year when base flows and assimilative capacity is low. This adds a margin of safety for more typical years.

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Element	Key Findings and Regulatory Provisions
	<p>In addition, an explicit margin of safety has been incorporated, as the load allocations will allow exceedances of the single sample targets no more than 5% of the time on an annual basis, based on the cumulative allocations proposed for dry and wet weather. Currently, the Regional Board concludes that there is water quality impairment if more than 10% of samples at a site exceed the single sample bacteria objectives annually.</p>
<p><i>Seasonal Variations and Critical Conditions</i></p>	<p>Seasonal variations are addressed by developing separate waste load allocations for two time periods (dry-weather, and wet-weather) in Malibu Creek and its tributaries, and three time periods (summer dry-weather, winter dry-weather, and wet weather) in Malibu Lagoon based on public health concerns and observed natural background levels of exceedance of bacterial indicators.</p> <p>The critical condition for this bacteria TMDL is wet weather generally, when data for the reference system indicate that the single sample bacteria objectives are exceeded on 19% of the wet-weather days sampled in Malibu Creek and its tributaries and on 22% of the wet-weather days sampled in Malibu Lagoon. To more specifically identify a critical condition within wet weather in order to set the allowable exceedance days, the 90th percentile „storm year“² in terms of wet days is used as the reference year. The number of wet-weather days in the 1993 reference year was 75 days, and the number of dry-weather days was 290 days (210 summer dry-weather days and 80 winter dry-weather days).</p>
<p><i>Compliance Monitoring</i></p>	<p>Responsible jurisdictions and agencies shall submit a compliance monitoring plan to the Executive Officer of the Regional Board for approval. The compliance monitoring plan shall specify sampling frequency (daily or weekly) and sampling locations and that will serve as compliance points.</p> <p>Responsible jurisdictions and agencies shall submit an outfall monitoring plan within 6 months of the effective date of the TMDL revised by Resolution R12-009. The outfall monitoring plan shall propose an adequate number of representative outfalls to be sampled, a sampling frequency, and protocol for enhanced outfall monitoring as a result of an in-stream exceedance. Responsible jurisdictions and agencies can use existing outfall monitoring stations in the MS4 permit, where appropriate for both the permit and TMDL objectives.</p> <p>If the number of exceedance days is greater than the allowable number of exceedance days the water body segment shall be considered out-of-compliance with the TMDL. Responsible jurisdictions or agencies shall not be deemed non-attaining if the outfall monitoring described in the paragraph above demonstrates that bacterial sources originating within the jurisdiction of the responsible agency have not caused or</p>

² For purposes of this TMDL, a „storm year“ means November 1 to October 31. The 90th percentile storm year was 1993 with 75 wet days at the LAX meteorological station.

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Element	Key Findings and Regulatory Provisions
	<p>contributed to the exceedance.</p> <p>The County of Los Angeles, Los Angeles County Flood Control District, County of Ventura, Ventura County Watershed Protection District, and municipalities within the Malibu Creek watershed, Caltrans, and the California Department of Parks and Recreation are strongly encouraged to pool efforts and coordinate with other appropriate monitoring agencies in order to meet the challenges posed by this TMDL by developing cooperative compliance monitoring programs.</p>

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Table 7-10.2. Malibu Creek and Lagoon Bacteria TMDL: Final Annual Allowable Exceedance Days for Single Sample Limits by Sampling Location

Compliance Deadline		January 24, 2012		July 15, 2021	
		Dry Weather ^		Wet Weather ^	
Station ID	Location Name	Daily sampling (No. days)	Weekly sampling (No. days)	Daily sampling (No. days)	Weekly sampling (No. days)
LA RWQCB	Triunfo Creek	5	1	15	2
LA RWQCB	Lower Las Virgenes Creek	5	1	15	2
LA RWQCB	Lower Medea Creek	5	1	15	2
LVMWD (R-9)	Upper Malibu Creek, above Las Virgenes Creek	5	1	15	2
LVMWD (R-2)	Middle Malibu Creek, below Tapia discharge 001	5	1	15	2
LVMWD (R-3)	Lower Malibu Creek, 3 mi below Tapia	5	1	15	2
LVMWD (R-4)	Malibu Lagoon, above PCH	5	1	15	2
LVMWD (R-11)	Malibu Lagoon, below PCH	9*	2*	17	3
-----	Other sampling stations as identified in the Compliance Monitoring Plan as approved by the Executive Officer including at least one sampling station in each subwatershed, and areas where frequent REC-1 use is known to occur.	5	1	15	2

Notes: The number of allowable exceedances is based on the lesser of (1) the reference system or (2) existing levels of exceedance based on historical monitoring data.

The allowable number of exceedance days is calculated based on the 90th percentile storm year in terms of wet days at the LAX meteorological station.

^ A dry day is defined as a non-wet day. A wet day is defined as a day with a 0.1 inch or more of rain and the three days following the rain event. *The number of allowable exceedance days is for the winter dry-weather period. No exceedance days are allowed for the summer dry-weather period.

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Table 7-10.3. Malibu Creek and Lagoon Bacteria TMDL: Significant Dates

Date	Action
<p>May 24, 2006</p>	<p>Responsible jurisdictions and responsible agencies must submit a comprehensive bacteria water quality monitoring plan for the Malibu Creek Watershed to the Executive Officer of the Regional Board. The plan must be approved by the Executive Officer before the monitoring data can be considered during the implementation of the TMDL. In developing the 13267 order, the EO will consider costs in relation to the need for data. With respect to benefits to be gained, the TMDL staff report demonstrates the significant impairment and bacteria loading. Further documenting success or failure in achieving waste load allocations will benefit the responsible agencies and all recreational water users.</p> <p>The purpose of the plan is to better characterize existing water quality as compared to water quality at the reference watershed, and ultimately, to serve as a compliance monitoring plan. The plan must provide for analyses of all applicable bacteria indicators for which the Basin Plan has established objectives including <i>E. coli</i> for fresh water and <i>enterococcus</i> for marine water. The plan must also include sampling locations that are specified in Table 7-10.2, at least one location in each subwatershed, and areas where frequent REC-1 use is known to occur. However, this is not to imply that a mixing zone has been applied; water quality objectives apply throughout the watershed—not just at the sampling locations.</p>
<p>January 24, 2007</p>	<ol style="list-style-type: none"> 1. Responsible jurisdictions and responsible agencies shall provide a written report to the Regional Board outlining how each intends to cooperatively achieve compliance with the TMDL. The report shall include implementation methods, an implementation schedule, and proposed milestones. Specifically, the plan must include a comprehensive description of all steps to be taken to meet the dry weather compliance schedule, including but not limited to a detailed timeline for all categories of bacteria sources under their jurisdictions including but not limited to nuisance flows, urban stormwater, on-site wastewater treatment systems, runoff from homeless encampments, horse facilities, and agricultural runoff. 2. Local agencies regulating on-site wastewater treatment systems shall provide a written report to the Regional Board's Executive Officer detailing the rationale and criteria used to identify high-risk areas where on-site systems have a potential to impact surface waters in the Malibu Creek watershed. Local agencies may use the approaches outlined below in (a) and (b), or an alternative approach as approved by the Executive Officer. <ol style="list-style-type: none"> (a) Responsible agencies may screen for high-risk areas by establishing a monitoring program to determine if discharges from OWTS have impacted or are impacting water quality in Malibu Creek and/or its tributaries. A surface water monitoring program demonstration must

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Date	Action
	<p>include monitoring locations upstream and downstream of the discharge, as well as a location at mid-stream (or at the approximate point of discharge to the surface water) of single or clustered OWTS. Surface water sampling frequency will be weekly for bacteria indicators and monthly for nutrients. A successful demonstration will show no statistically significant increase in bacteria levels in the downstream sampling location(s).</p> <p>(b) Responsible agencies may define the boundaries of high-risk or contributing areas or identify individual OWTS that are contributing to bacteria water quality impairments through groundwater monitoring or through hydrogeologic modeling as described below:</p> <p>(1) Groundwater monitoring must include monitoring in a well no greater than 50-feet hydraulically downgradient from the furthest extent of the disposal area, or property line of the discharger, whichever is less. At a minimum, sampling frequency for groundwater monitoring will be quarterly. The number, location and construction details of all monitoring wells are subject to approval of the Executive Officer.</p> <p>(2) Responsible agencies may use a risk assessment approach, which uses hydrogeologic modeling to define the boundaries of the high-risk and contributing areas. A workplan for the risk assessment study must be approved by the Executive Officer of the Regional Board.</p> <p>3. OWTS located in high-risk areas are subject to system upgrades as necessary to demonstrate compliance with applicable effluent limits and/or receiving water objectives.</p>
January 24, 2008	<p>The California Department of Parks and Recreation shall provide the Regional Board Executive Officer, a report quantifying the bacteria loading from birds to the Malibu Lagoon.</p> <p>The Regional Board's Executive Officer shall require the responsible jurisdictions and responsible agencies to provide the Regional Board with a reference watershed study. The study shall be designed to collect sufficient information to establish a defensible reference condition for the Malibu Creek and Lagoon watershed.</p>
January 24, 2012	Achieve compliance with the applicable Load Allocations and Waste Load Allocations, expressed as allowable exceedance days during dry weather.
July 15, 2018	The Regional Board shall reconsider the TMDL.
July 15, 2021	Achieve compliance with the wet-weather Load Allocations and Waste Load Allocations (expressed as allowable exceedance days

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Date	Action
	for wet weather) and compliance with the geometric mean limit.

Appendix B: Outfall Evaluation

Outfalls in the County area of the Upper Medea Creek and Upper Lindero Creek subwatersheds, both located in the Medea Creek HUC12 watershed. One monitoring location from each subwatershed was selected based on an evaluation of data presented in the table below.

Table B-1. Outfall Evaluation Matrix

Subwatershed	Outfall ID	Site Selection Criteria								
		Diameter (in)	Accessible?	Drainage Area (ac)	Predominant Land Use ^a	Are Land Uses to the Outfall Representative of Unincorporated County Urban Land Uses Within the Subwatershed?	Dry Weather Flow Status		Average Dry Weather Flowrate (gpm) ^a	Human Marker Detected ^b
							Upper MCW Dry Weather Source Identification Study (2014)	Illicit Connections and Illicit Discharges Field Screening Effort (2012)		
Upper Medea Creek	M01	36	Yes	25	SF Residential	Yes	Yes	No	2.24	No
	M02	30	Yes	18	SF Residential	Yes	Yes	No	1.35	Yes
	M03	Not Observed	Yes	4	SF Residential	Yes	Trickle	Not Observed ^c	--	Not Observed
	M04	18	Yes	2	SF Residential	Yes	No	Not Observed	--	Not Observed
	M05	36	Yes	37	SF Residential	Yes	Yes	Trickle	3.59	Yes
	M06	48	Yes*	56	Vacant	No	No	No	--	Not Observed
	M07	18	Yes*	6	MF Residential	No	No	No	--	Not Observed
	M08	60	Yes	120	SF Residential	Yes	Yes	Not Observed	2.24	No
	M09	Not Observed	Yes	Not Observed	Not Observed	Unknown	Trickle	No	--	Not Observed
	M11	24	Yes	9	SF Residential	Yes	Yes	Not Observed	--	Not Observed
	M12	18	Yes*	3	MF Residential	No	No	No	--	Not Observed

Subwatershed	Outfall ID	Site Selection Criteria								
		Diameter (in)	Accessible?	Drainage Area (ac)	Predominant Land Use ^a	Are Land Uses to the Outfall Representative of Unincorporated County Urban Land Uses Within the Subwatershed?	Dry Weather Flow Status		Average Dry Weather Flowrate (gpm) ^a	Human Marker Detected ^b
							Upper MCW Dry Weather Source Identification Study (2014)	Illicit Connections and Illicit Discharges Field Screening Effort (2012)		
	M13	48	Yes	54	Vacant	No	No	No	--	Not Observed
	M14	24	Yes	4	Education	No	No	No	--	Not Observed
	M15	30	Yes*	21	Vacant	No	No	Not Observed	--	Not Observed
	M16	24	Yes	20	Vacant	No	Trickle	Not Observed	--	Not Observed
	M17	72	Yes*	382	Vacant	No	Yes	Not Observed	5.39	Not Observed
	M20	Not Observed	Yes	Not Observed	SF Residential	Yes	Yes	Not Observed	--	Not Observed
	M21	72	Yes; May not be during high flows	197	Vacant	No	Yes	Not Observed	--	Not Observed
	M23	48	Yes; May not be during high flows	88	Vacant	No	Unknown	Not Observed	--	Not Observed
	M24	60	Yes; May not be during high flows	122	Vacant	No	Trickle	Not Observed	--	Not Observed
	M26	24	No (Submerged)	13	SF Residential	Yes	Unknown (submerged)	Not Observed	--	Not Observed
	M27	42	Yes; May not be during high flows	82	Vacant	No	Yes	Not Observed	--	Not Observed
	M28	24	Yes	11	SF Residential	Yes	Yes	Not Observed	0.90	Not Observed
	M34	30	Yes	15	Vacant	No	No	Not Observed	--	Not Observed

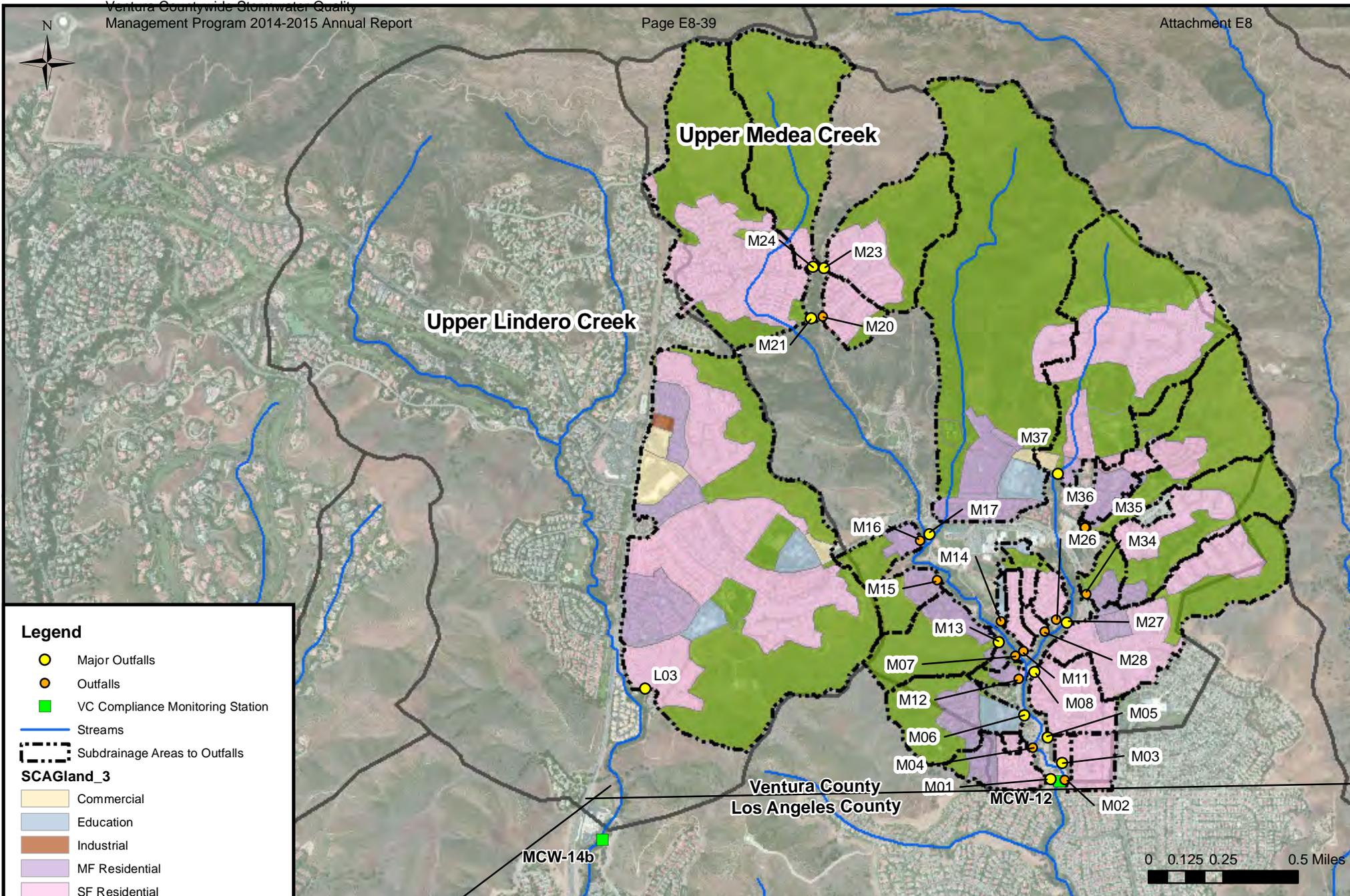
Subwatershed	Outfall ID	Site Selection Criteria								
		Diameter (in)	Accessible?	Drainage Area (ac)	Predominant Land Use ^a	Are Land Uses to the Outfall Representative of Unincorporated County Urban Land Uses Within the Subwatershed?	Dry Weather Flow Status		Average Dry Weather Flowrate (gpm) ^a	Human Marker Detected ^b
							Upper MCW Dry Weather Source Identification Study (2014)	Illicit Connections and Illicit Discharges Field Screening Effort (2012)		
	M35	48	Yes	85	Vacant	No	Not Observed	Not Observed	--	Not Observed
	M36	30	Yes	32	MF Residential	No	Not Observed	Not Observed	--	Not Observed
	M37	66	Yes	201	SF Residential/ Vacant	Yes	Not Observed	Not Observed	--	Not Observed
Upper Lindero Creek	L03	108	Yes	475	SF Residential/ Vacant	Yes	Yes	Not Observed	89.32	No

*Partially buried

^aAverage base flow from Ventura County's Upper MCW Dry Weather Source ID Study (2014)

^bHuman marker identification from Malibu Creek Watershed Dry Weather Source Identification Study Memorandum Report (November, 2014)

^c"Not observed" means no field screening data or GIS-based data are available.



Legend

- Major Outfalls
- Outfalls
- VC Compliance Monitoring Station
- Streams
- Subdrainage Areas to Outfalls
- SCAGland_3**
- Commercial
- Education
- Industrial
- MF Residential
- SF Residential
- Vacant
- Lakes
- Drainage Area to Monitoring Station

**Bacteria TMDL Outfall Monitoring Plan
Ventura County, CA**

**Figure B-1. Malibu Creek Watershed
Unincorporated County Outfalls and
Drainage Areas in Upper Lindero and
Upper Medea Subwatersheds**

Appendix C: Selected Outfall Cut Sheets

Site ID	Type	Photo	Size	Drainage Area Acreage	Land Use Profile
M02	Outfall		30"	18	100% SF Residential

Site ID	Type	Photo	Size	Drainage Area Acreage	Land Use Profile
L03	outfall		108"	475	4% Commercial 3% Education 1% Industrial 12% MF Residential 40% SF Residential 40% Vacant

Appendix D:

Example Outfall Monitoring Observation Log Form

FIELD OBERVATION SHEET AND WATER QUALITY SAMPLING

Location ID: _____

Sample ID: _____

Date: _____

Staff: _____

Time of arrival: _____

Time of sample collection: _____

Parameter	Observations
Weather Conditions / Air Temperature	
Rainfall Measurement Over Last 72 Hours at Gauge 317	
Site Conditions (presence of wildlife, trash/debris, suspicious discharges, etc.)	
Flow Present in Outfall?	
Estimated Flowrate	
Flow Characteristics (color/appearance)	
Sample Temperature	
pH	
Turbidity	
Dissolved Oxygen	
Specific Conductance	
Sample Preservatives	
Other	