ADAPATIVE MANAGEMENT REPORT

Lower Los Angeles River Watershed

Downey • Long Beach • Lakewood • Lynwood
Paramount • Pico Rivera • Signal Hill • South Gate
Los Angeles County Flood Control District

June 29, 2017

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I. Introduction

The Lower Los Angeles River Watershed Management Program (LLAR WMP) was developed to implement the requirements of Los Angeles Regional Water Quality Control Board Orders R4-2012-0175 and R4-2014-0024 (the LA County area-wide MS4 NPDES Permit and the Long Beach MS4 NPDES Permit, respectively) on a watershed scale. This WMP is a collaborative effort of the LLAR Watershed Management Group (WMG), which consists of nine agencies: Downey, Lakewood, Long Beach, Lynwood, Paramount, Pico Rivera, Signal Hill, South Gate, and the Los Angeles County Flood Control District (LACFCD). Figure 1 is a map of the WMG members and LLAR drainage area.

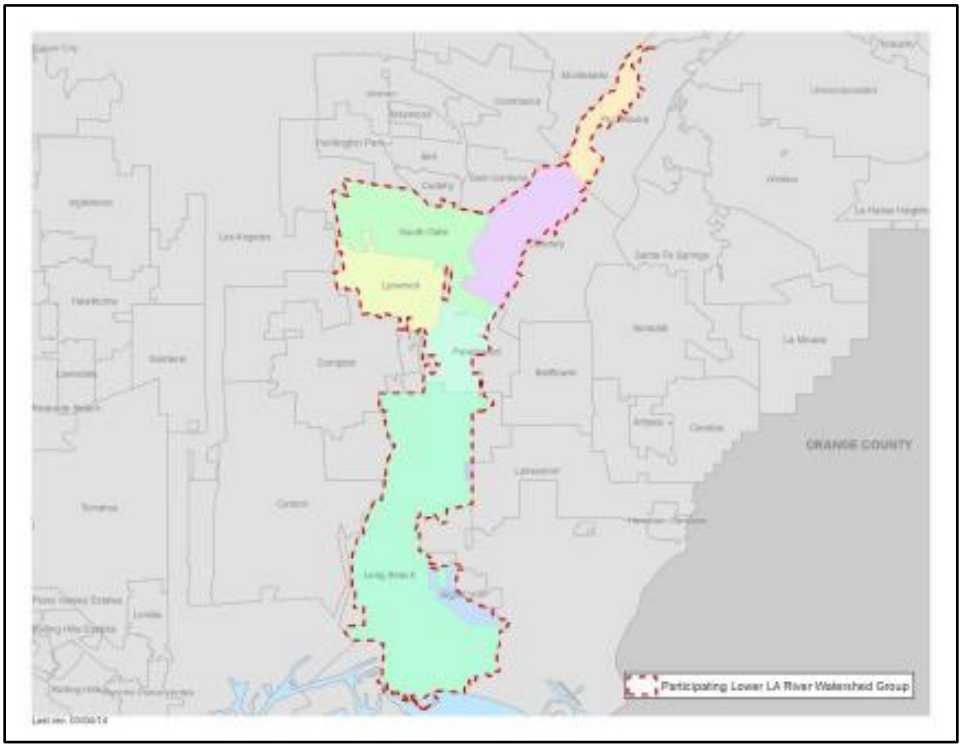

Figure 1. Map of WMG members and LLAR drainage area

The LLAR WMP was approved April 28, 2015. As outlined in the Los Angeles County MS4 Permit and Long Beach MS4 Permit, every two years from the date of approval the WMP[1], the WMG shall implement an Adaptive Management Process (AMP). The purpose of the AMP is to adapt the WMP to become more effective. The basis for evaluating effectiveness is included in the MS4 Permits and summarized in Attachment A. This basis serves as the structure of this report.

[1]This first Adaptive Management report is to be submitted to the Regional Board along with the Report of Waste Discharge.

II. Progress Toward Achieving Improved Water Quality

This section addresses progress towards achieving improved water quality in MS4 Permit discharges. The section is divided into progress toward Total Maximum Daily Loads (TMDLs) limits and progress toward other water quality priority (WQP) pollutants. Progress is determined through an evaluation of monitoring results and watershed control measures. The results of this section are considered in the WMP Modifications section of this report.

A. Progress Toward TMDLs

This section addresses progress toward achieving TMDL limits. At the time of the development of the WMP all of the following TMDLS were in effect:

- Los Angeles River Nitrogen and Related Effects TMDL (Nitrogen TMDL)
- Los Angeles River Bacteria TMDL (Bacteria TMDL)
- Long Beach City Beaches and Los Angeles Estuary Bacteria TMDL (Estuary Bacteria TMDL)
- Los Angeles River Metals TMDL (Metals TMDL)
- Los Angeles River Trash TMDL (Trash TMDL)
- Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants TMDL (Harbor Toxics TMDL)

1. TMDL Milestones

The WMP includes interim and final milestones to achieve water quality based effluent limitations (WQBELs) and/or receiving water limitations for applicable TMDLs. Major recent and upcoming milestones include:

- Final compliance with the Trash TMDL by September 30, 2016.
- Milestones set by the Metals TMDL: 31% wet weather compliance by September 30, 2017 (by total drainage area served), 75% dry weather compliance by January 11, 2020, 100% dry/50% wet weather compliance by January 11, 2024, and 100% wet weather compliance by January 11, 2028. The 31% wet weather compliance milestone is a goal developed as part of the WMP in order to provide an interim milestone within the MS4 Permit term, as the existing TMDL milestones were outside of this term (2012 and 2020).
- Milestones set by the Bacteria TMDL for dry weather to be achieved through the Load Reduction Strategy (LRS) approach outlined in the LA County MS4 Permit. The Permit provides varying timelines to develop and implement the LRSs and achieve the numeric limits, depending on the specific segment of the LA River.
- Milestones set by the Estuary Bacteria TMDL for dry weather also to be achieved through an LRS approach, which provides milestones for the development and implementation of the LRS, as well as achievement of the numeric limit (April 28, 2017, October 28, 2021, and October 28, 2024 respectively.) The LRS approach also incorporates a second phase, if necessary.
- Milestones set by the Bacteria TMDL for wet weather: Final compliance by March 23, 2037 (final compliance incorporates allowable exceedance days and drainage area-specific high flow suspension). The Reasonable Assurance Analysis (RAA) in the WMP predicts that control measures implemented to meet the Metals TMDL interim and final limits will serve as the primary compliance mechanism for the wet weather Bacteria TMDL.
- The WMP incorporated an interim 31% pollutant reduction milestone of September 30, 2017, for progress toward achieving compliance with remaining numeric targets for WQPs, including TMDL future limits.

2. TMDL Progress

Progress towards achieving TMDL milestones is measured in part by the Coordinated Integrated Monitoring Program (CIMP). The CIMP developed by the LLAR WMG included phased implementation of monitoring with one receiving water and one stormwater outfall monitoring station location implemented during the first year (reporting year 2015-2016) and three outfall monitoring station locations added during the second year of the monitoring program (reporting year 2016-2017). See Figure 2 for all monitoring stations locations within the LLAR watershed.

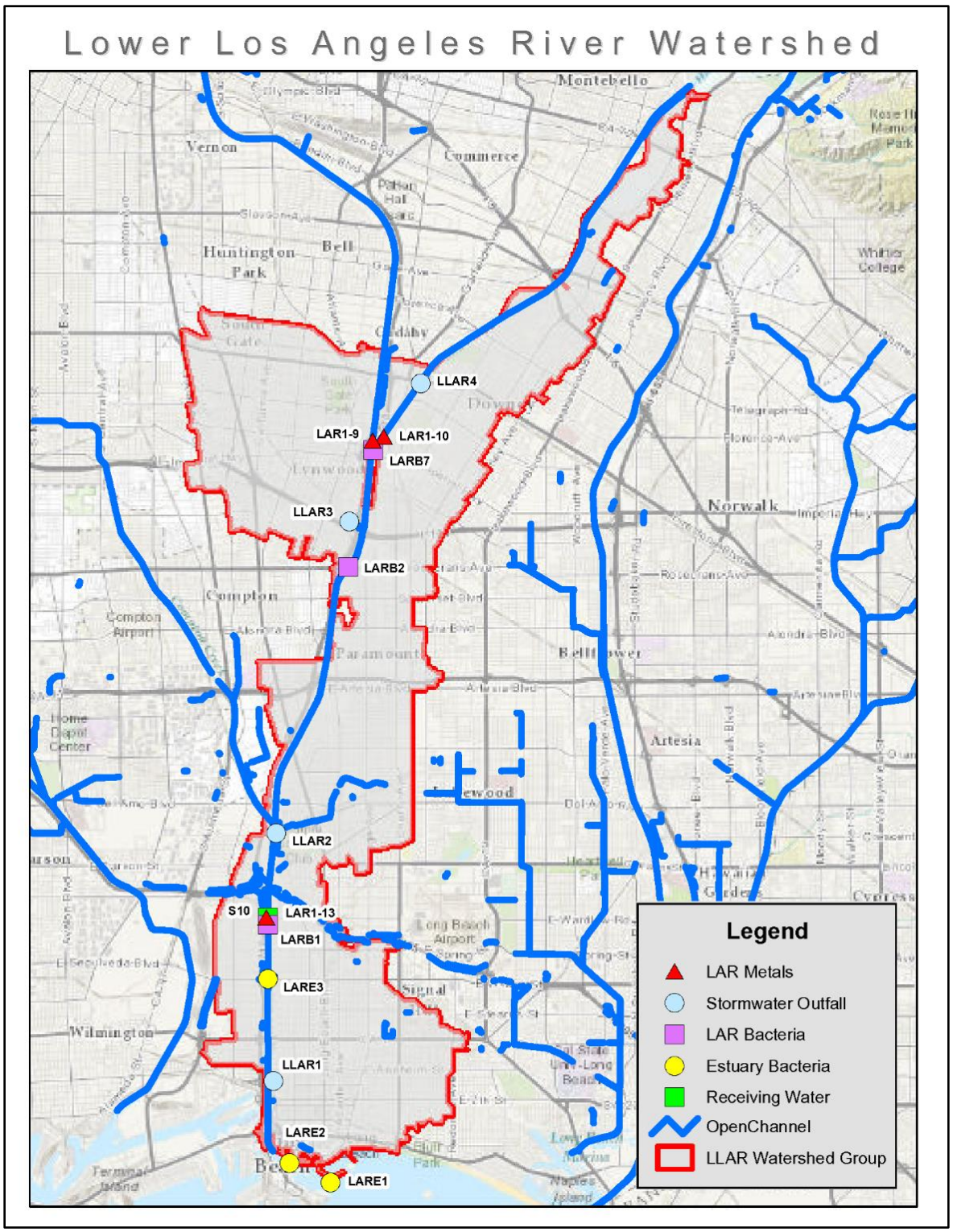

Figure 2. Monitoring station locations in the LLAR watershed.

a) Progress Based on Historic Water Quality Monitoring Trends

At the time of submittal of this Adaptive Management report to the Regional Board, the CIMP will have been implemented for two reporting years (2015-2016 and 2016-2017). However the water quality monitoring data from 2016-2017 is pending validation and as such has not yet been evaluated in this report. Although there is insufficient data to assess trends in water quality under the CIMP, historic water quality monitoring data exists for receiving water monitoring site S10. The following is a short discussion on trends for Category 1 Water Quality Priorities (WQPs) – copper, lead, zinc, and E. coli for S10 from 2006 to 2016.

- Copper – Total copper concentrations show evidence of decreasing over time. Dissolved copper concentrations suggest evidence of declining concentrations since 2010. No exceedances were observed for dry weather events.
- Lead – During dry weather, the highest concentrations of total and dissolved lead concentrations were in 2010-2011, since then the concentrations have decreased. No exceedances were observed during this period, and overall values are less than water quality objectives.
- Zinc – Total zinc concentrations have shown evidence of a slight increase over time. Dissolved zinc concentrations; however, show a decreasing pattern similar to dissolved lead. Dry weather concentrations peaked around 2010-2011 but have tended to decrease since that time. No exceedances were observed for dry weather events.
- E. coli – Dry weather data for this particular indicator bacteria goes back to 2012. The time frame is too brief and the data too variable to evaluate trends.

b) CIMP and TMDL Control Measure Implementation Review

This section summarizes the status and progress towards meeting applicable TMDL limits based on 2015-2016 CIMP monitoring data.

(1) Nitrogen TMDL

The WMG monitors for compliance with Nitrogen TMDL at receiving water monitoring station location, S10. On March 23, 2004 Waste Load Allocations (WLAs) to minor dischargers, which include MS4 discharges, were applied to the Nitrogen TMDL. The MS4 Permit requires compliance with WQBELs for all segments of the LA River upon the effective the date of the current MS4 Permit. Water quality monitoring data indicates compliance with numeric limits in the receiving waters, see Figure 3, Figure 4, and Figure 5. No additional watershed control measures are being considered in the WMP in order to maintain compliance. As stated in the WMP "The LA River Nitrogen TMDL recommended implementation alternative allowed time for NPDES permitted Publically Owned Treatment Plants (POTWs) that discharge into the LA River to complete an upgrade of treatment facilities to nitrification/denitrification facilities without increasing current ammonia, nitrate and nitrite loads in the interim period. As the nitrification/denitrification facilities came on board, the reductions in ammonia and nitrate loads significantly reduced impairments caused by nutrient effects. These upgrades, in combination with the control measures the Watershed Group is implementing, appear to be effectively meeting the targets of the TMDL." As such these existing watershed control measures implemented to date will continue.

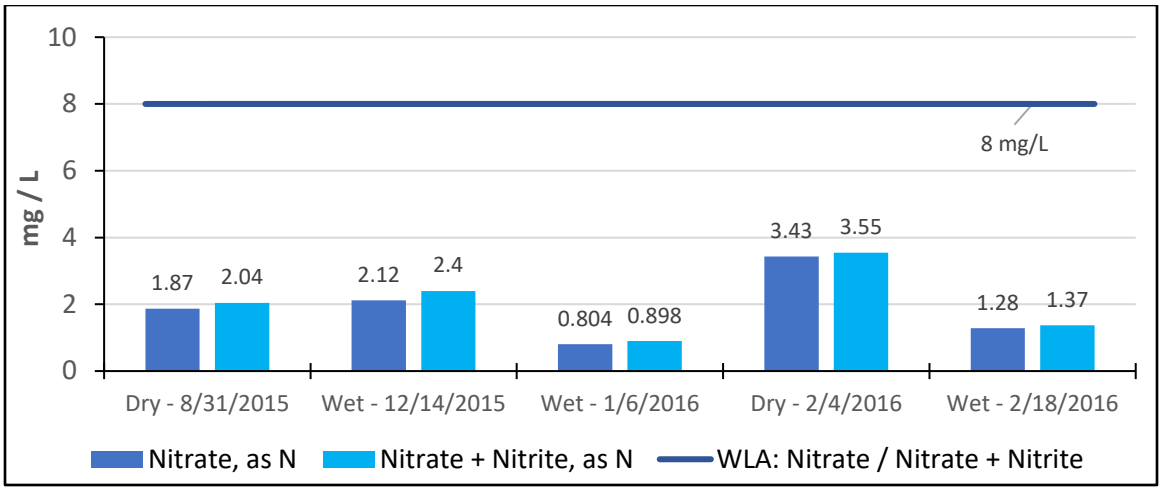

Figure 3. Monitoring results at S10 for nitrate and nitrate + nitrite.

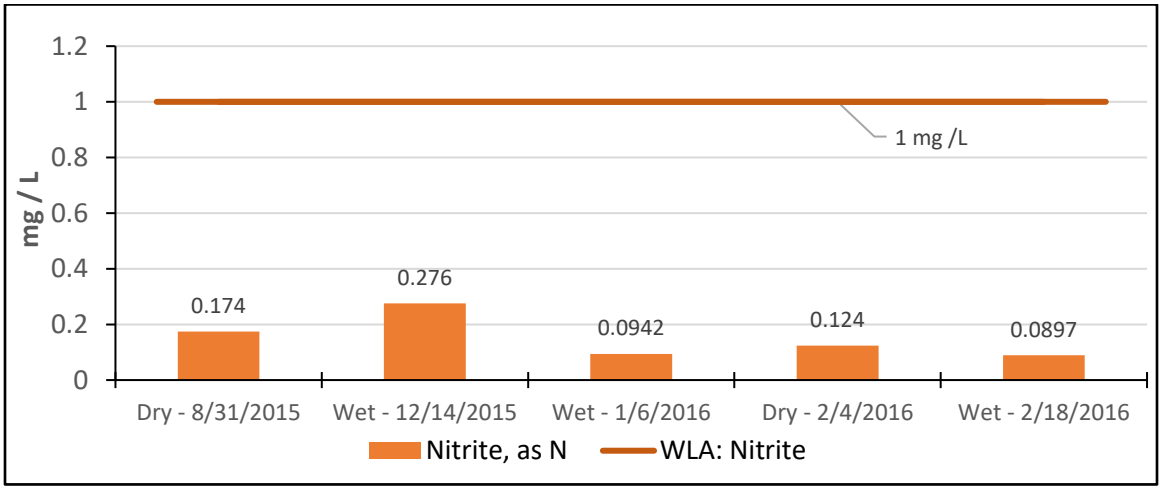

Figure 4. Monitoring results at S10 sampling station for nitrite.

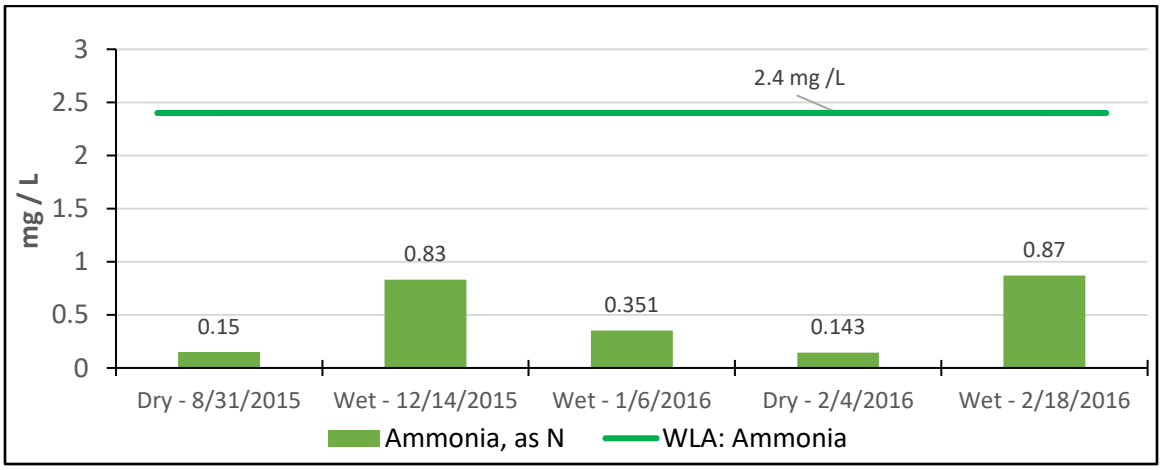

Figure 5. Monitoring results at S10 sampling station for ammonia.

(2) Bacteria TMDL

Receiving water monitoring for the Bacteria TMDL was conducted monthly during dry weather conditions at three monitoring station locations, LARB1, LARB2, and LARB7. Limits applicable to each location were met during seven out of ten surveys, see Figure 6, Figure 7, and Figure 8. There were exceedances at all three locations for the sampling event on October 22, 2015. E. coli was monitored in wet weather at S10 on December 14, 2015, and at LLAR2 on January 5, 2016. The S10 results exceeded the water quality objective.

Progress on achieving dry weather Bacteria TMDL limits from sources within the LLAR is being addressed through the implementation of Load Reduction Strategies (LRSs). The LRSs assess bacteria loading from flowing MS4 outfalls within the LLAR watershed. The WMG submitted to the Regional Board LRSs for Segments A and B of the LA River (segment lengths are defined in the Bacteria TMDL) as well as the Rio Hondo Channel. The compliance schedule for each LRS is listed in the MS4 Permit and in Section 3 of the WMP. Refer to each segments' LRS Report for detailed regarding results and implementation. See Table 1 for a brief summary of results. Notably, the LRS studies conducted within the LLAR watershed along the mainstem of the LA River did not detect "priority" MS4 outfalls. That is, no outfall requires dry weather diversion from the LA River mainstem in order to achieve applicable Bacteria TMDL loading limits.

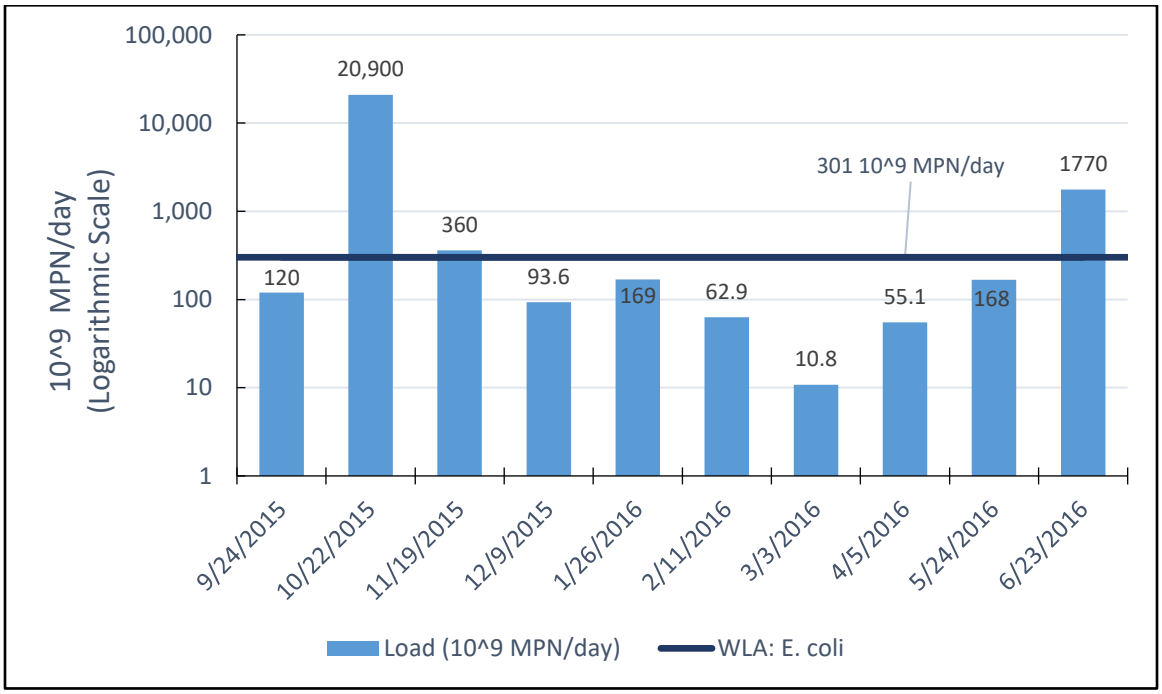

Figure 6. Monitoring results at LARB1 for E. Coli.

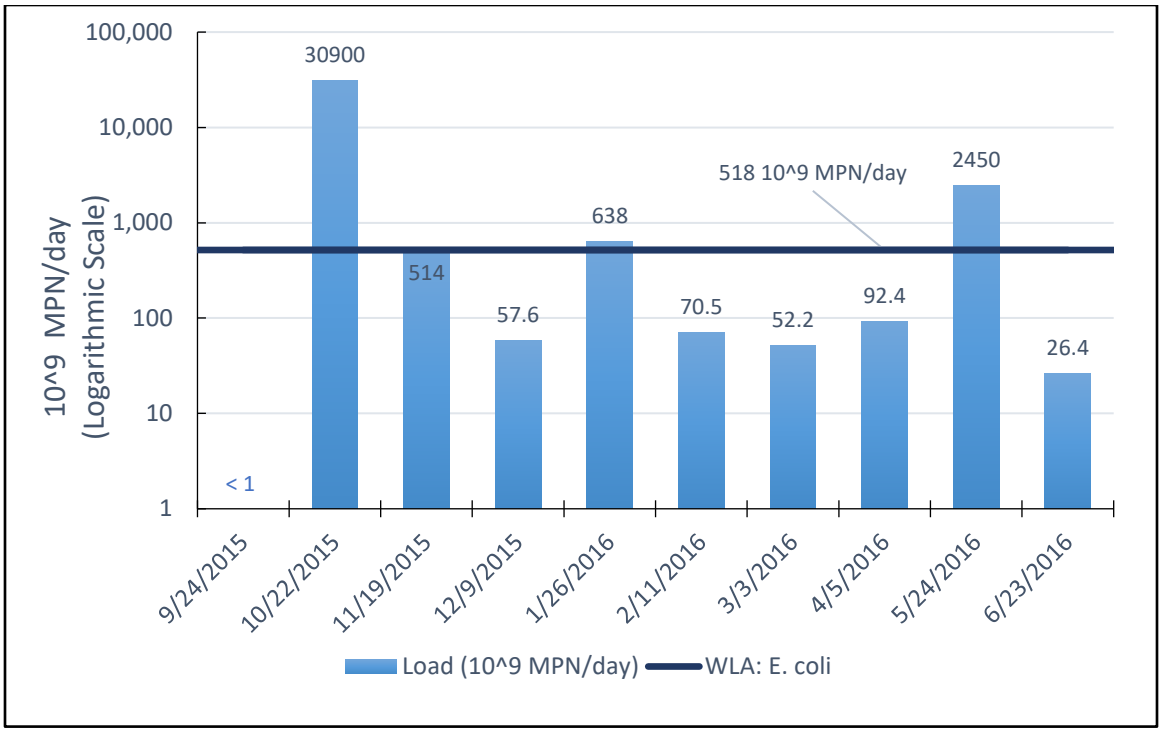

Figure 7. Monitoring results at LARB2 for E. Coli.

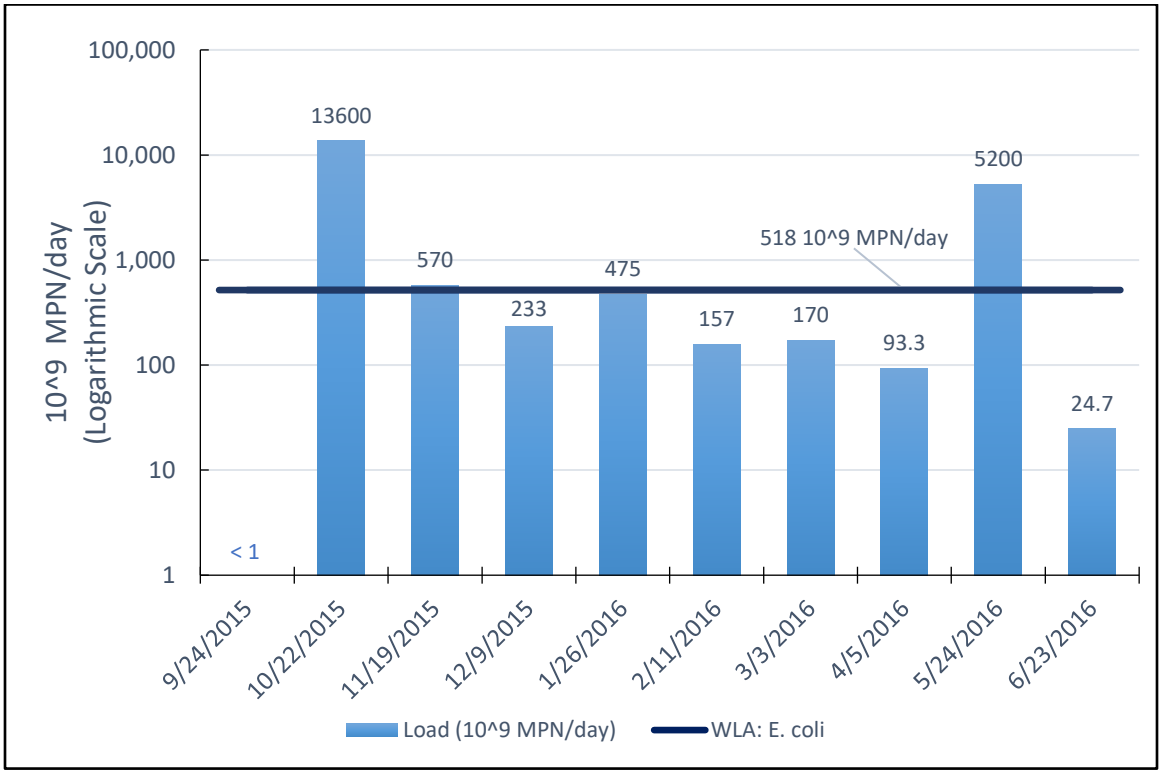

Figure 8. Monitoring results at LARB7 for E. Coli.

Table 1. LRS status for the Los Angeles River Watershed Bacteria TMDL.

Segment	Agencies	Action	Deadline	LRS Result	Next Actions
Segment B, 2014-2022: LLAR (main channel) between Rosecrans Avenue and Patata Street RR Bridge	South Gate, Downey, Lynwood, Paramount, LACFCD	Submit Load Reduction Strategy (LRS) to Regional Board	September 23, 2014[2]	Zero priority outfalls; Two outlier outfalls	Investigate sources of two outlier outfalls and complete implementation of LRS by March 23, 2019. Achieve interim or (final) WLA and submit report to Regional Board by March 2022.
Segment A, 2014-2024: LLAR (main channel) between Willow Avenue and Rosecrans Avenue	Lakewood, Long Beach, Lynwood, Paramount, Signal Hill, LACFCD	Submit Load Reduction Strategy (LRS) to Regional Board	September 23, 2016[3]	No priority outfalls; No outlier outfalls	Achieve interim (or final) WLA and submit report to Regional Board by March 23, 2024.
Rio Hondo 2014-2023: LLAR Agencies discharging to Rio Hondo	Pico Rivera, South Gate, Downey, LACFCD	Submit Load Reduction Strategy (LRS) to Regional Board	March 23, 2016[4]	Three priority outfalls; Two outlier outfalls	Complete implementation of LRS by September 23, 2020. Priority Outfalls will be addressed through action plans (i.e. dry wells and/or source control) and conduct source investigations of outlier outfalls.
Compton Creek 2014-2025: LLAR Agencies with discharges entering Compton Creek	Long Beach, Lynwood, South Gate, LACFCD	Submit Load Reduction Strategy (LRS) to Regional Board	March 23, 2018	LRS has not been completed	TBD

[2] If compliance targets are not being met, submit new LRS by March 23, 2023 to begin second phase
[3] If compliance targets are not being met, submit new LRS by March 23, 2025 to begin second phase
[4] If compliance targets are not being met, submit new LRS by September 23, 2024 to begin second phase

(3) Estuary Bacteria TMDL

The compliance schedule for the Estuary Bacteria TMDL was established in the WMP. The Estuary Bacteria TMDL also incorporates the Long Beach City Beaches, this portion is being addressed through a separate WMP. The Estuary was monitored four times in 2015-2016 at three monitoring station locations at its upstream and downstream limits: LARE1, LARE2, and LARE3. See Figure 2 for Estuary Bacteria TMDL monitoring station locations. Limits for LARE1 and LARE2 are based on marine water quality criteria for total coliform, fecal coliform and enterococcus bacteria. The limit for upstream sampling location, LARE3, is based on freshwater quality criteria for E. coli, see Table 2. Samples are analyzed for marine and freshwater bacteria due to the range of conditions within the Estuary. Similar to the Bacteria TMDL monitoring results, there were exceedances at all three locations on October 22, 2015. For enterococcus, LARE1 exceeded once and LARE2 exceeded twice. LARE3 exceeded once for E. Coli. Figure 9, 10 and 11 summarize monitoring results for each location against applicable limits. Note the Estuary Bacteria TMDL incorporates allowable exceedance days during winter dry and wet conditions.

Progress on achieving dry weather TMDL compliance is being addressed through the implementation of a LRS. The compliance schedule of the LRS are listed in Section 3 of the WMP. See Table 3 for a summary of current status. Notably the LRS study did not detect "priority" MS4 outfalls. That is, no outfall requires dry weather diversion from the Estuary to order to achieve applicable TMDL loading limits.

Table 2. TMDL WLAs for Los Angeles Estuary Bacteria TMDL.

Station		LARE1	LARE2	LARE3
Matrix		Marine	Marine	Freshwater
Constituent TMDL WLAs (MPN/100ml)	Fecal Coliform	400	400	Not Applicable
	Enterococcus	104	104	Not Applicable
	Total Coliform	10,000	10,000	Not Applicable
	E. coli	Not Applicable	Not Applicable	235

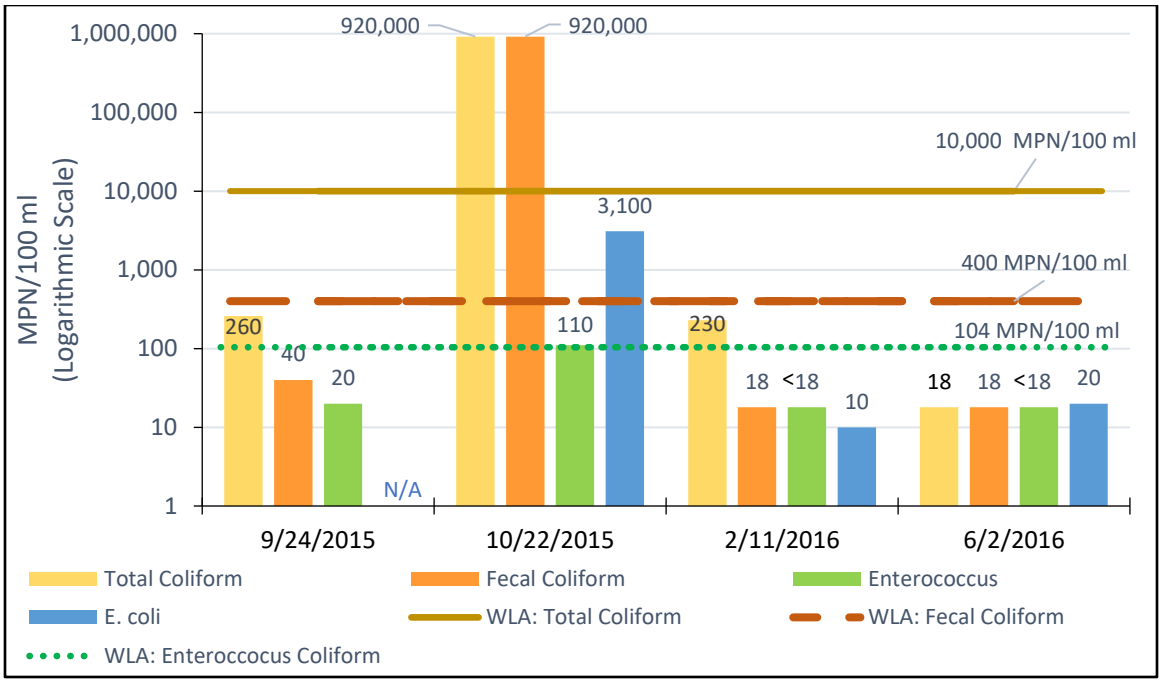

Figure 9. Monitoring results at LARE1 for total coliform, fecal coliform, enterococcus, and E. Coli.

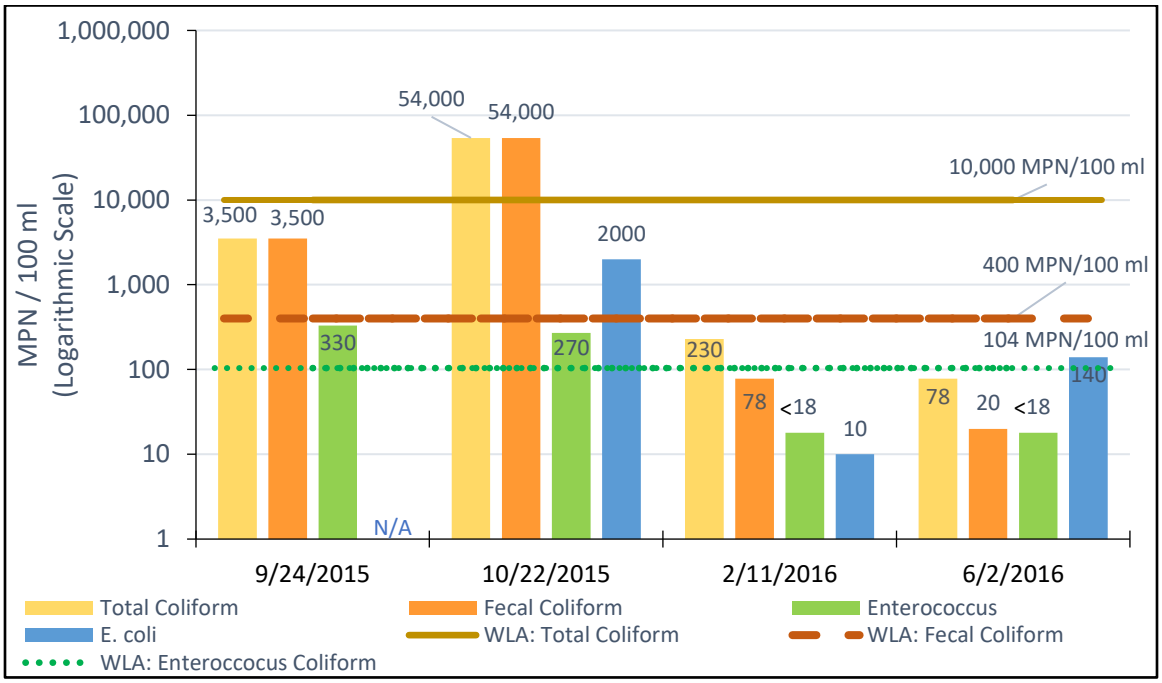

Figure 10. Monitoring results at LARE2 for total coliform, fecal coliform, enterococcus, and E. Coli.

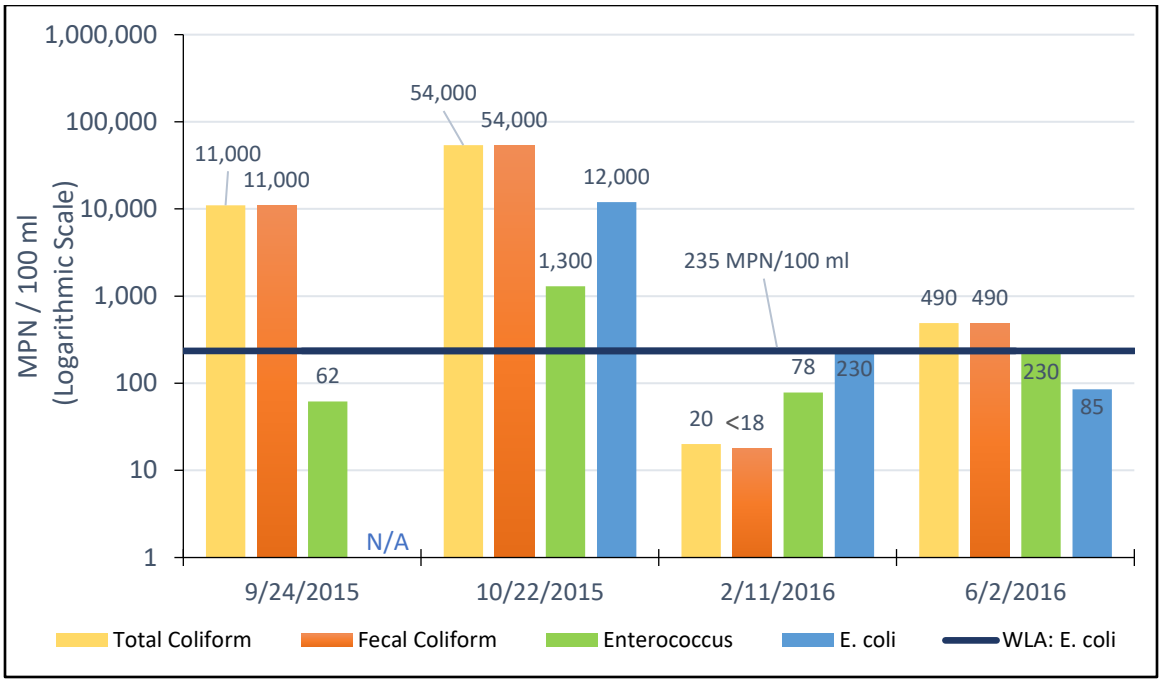

Figure 11. Monitoring results at LARE3 for total coliform, fecal coliform, enterococcus, and E. Coli.

Table 3. LRS status for the Los Angeles Estuary Bacteria TMDL.

Segment	Agencies	Action	Deadline	LRS Result	Next Actions
Estuary, 2017-2031: LLAR (main channel) between Willow Avenue and Queensway Bay	Long Beach, Signal Hill, and LACFCD	Submit Load Reduction Strategy (LRS) to Regional Board	April 28, 2017	Zero priority outfalls; Zero outlier outfalls	Achieve interim (dry-weather) WQBEL and submit report to Regional Board by October 28, 2024.

(4) Metals TMDL

TMDL numeric targets were met for 100% of dry and wet weather samples collected for total recoverable cadmium, copper, and, lead, and 50% for total recoverable zinc in wet-weather, see Figure 12 through Figure 16. After accounting for hardness, there were no exceedances for dissolved metals (including zinc). These results satisfy the compliance schedule outlined in the TMDL Milestones section of this report.

The RAA and Chapter 5 of the WMP provide a compliance plan to achieve Metals TMDL limits. The RAA considers existing watershed control measures and predicts the need for a significant number of additional control measures to meet the final 2028 milestone. The 2015-2016 CIMP results for metals may be an indication that more progress has been made toward achieving Metals TMDL limits than assumed in the RAA. However, an evaluation of trends are not possible at this time due to the limited data available.

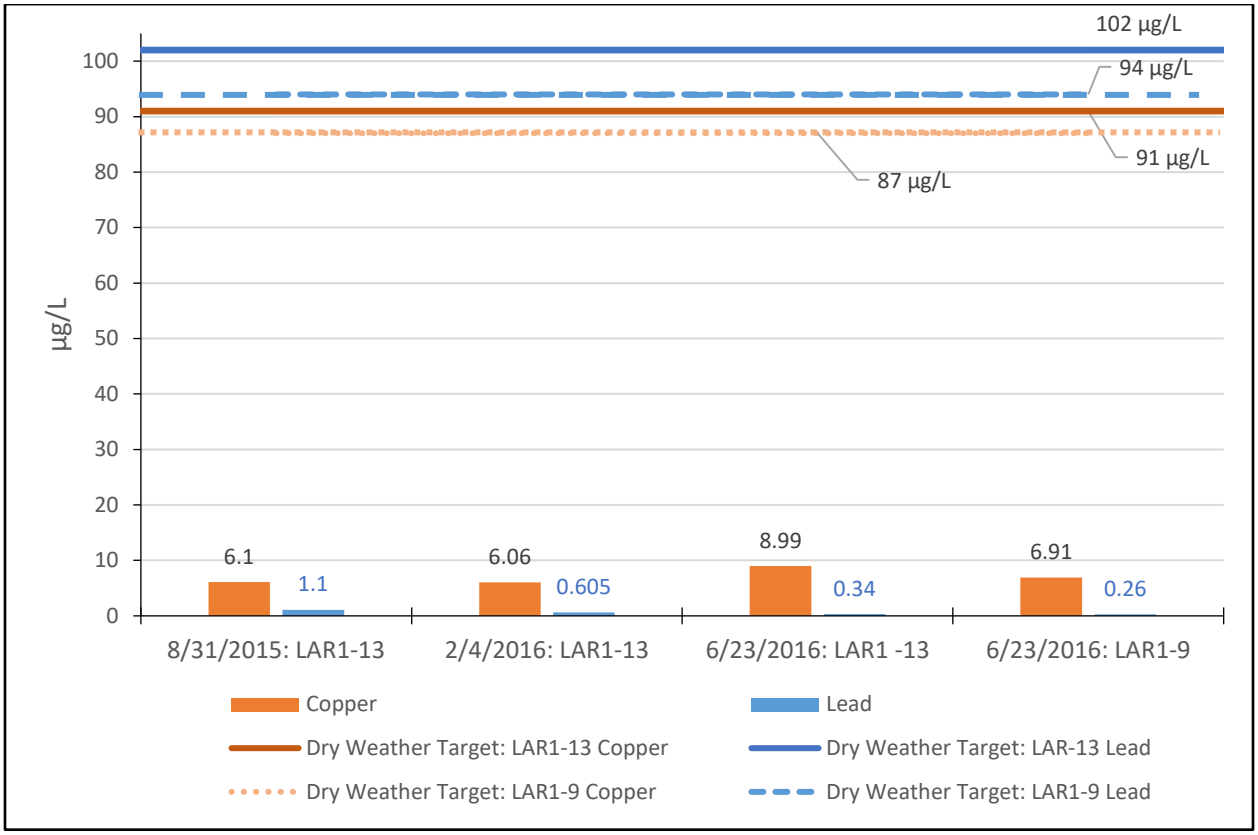

Figure 12. Monitoring results at LAR-13 and LAR1-9 for total copper and total lead during dry weather. Numeric targets are adjusted based on the 50th percentile hardness values multiplied by the applicable water-effect ratio (WER).

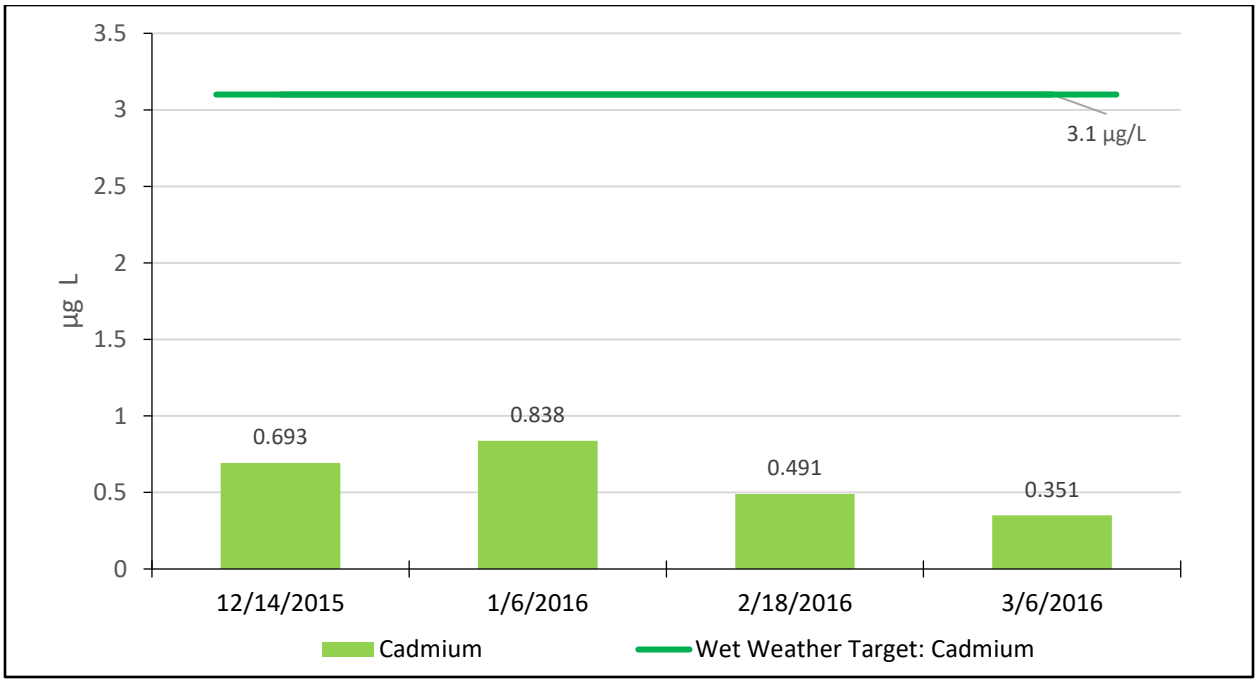

Figure 13. Monitoring results at S10 for total cadmium during wet weather.
Numeric targets are adjusted based on the 50th percentile hardness values multiplied by the applicable water-effect ratio (WER).

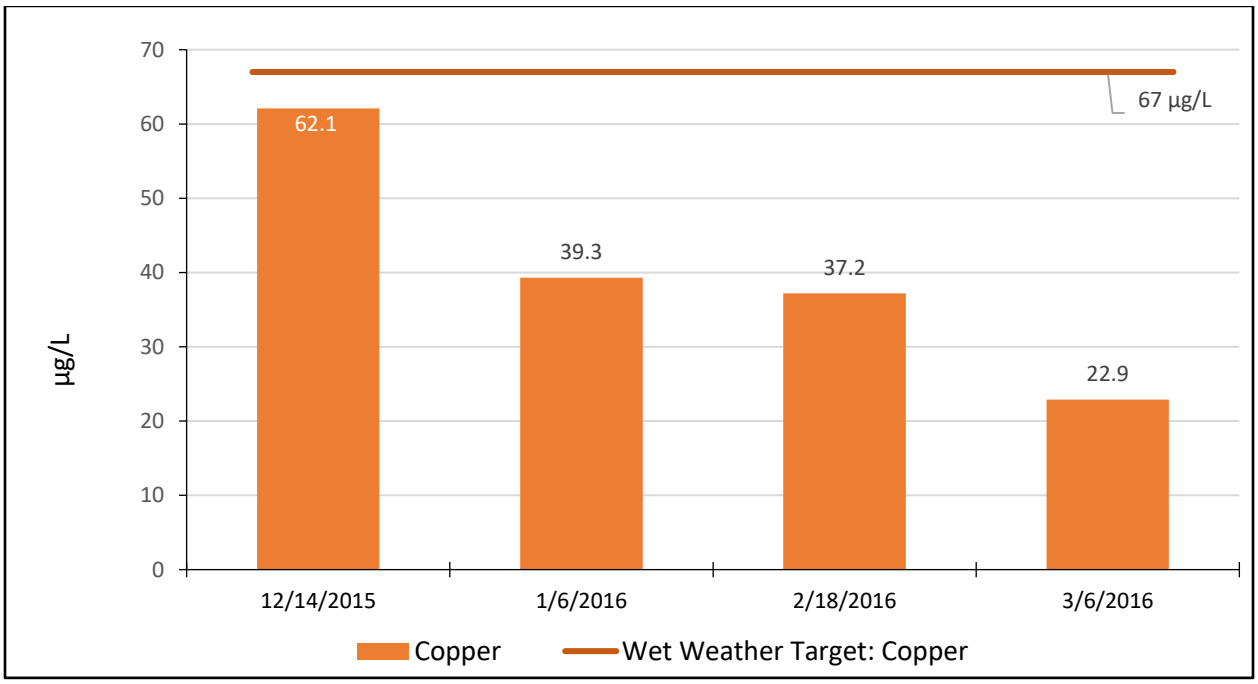

Figure 14. Monitoring results at S10 for total copper during wet weather.
Numeric targets are adjusted based on the 50th percentile hardness values multiplied by the applicable water-effect ratio (WER).

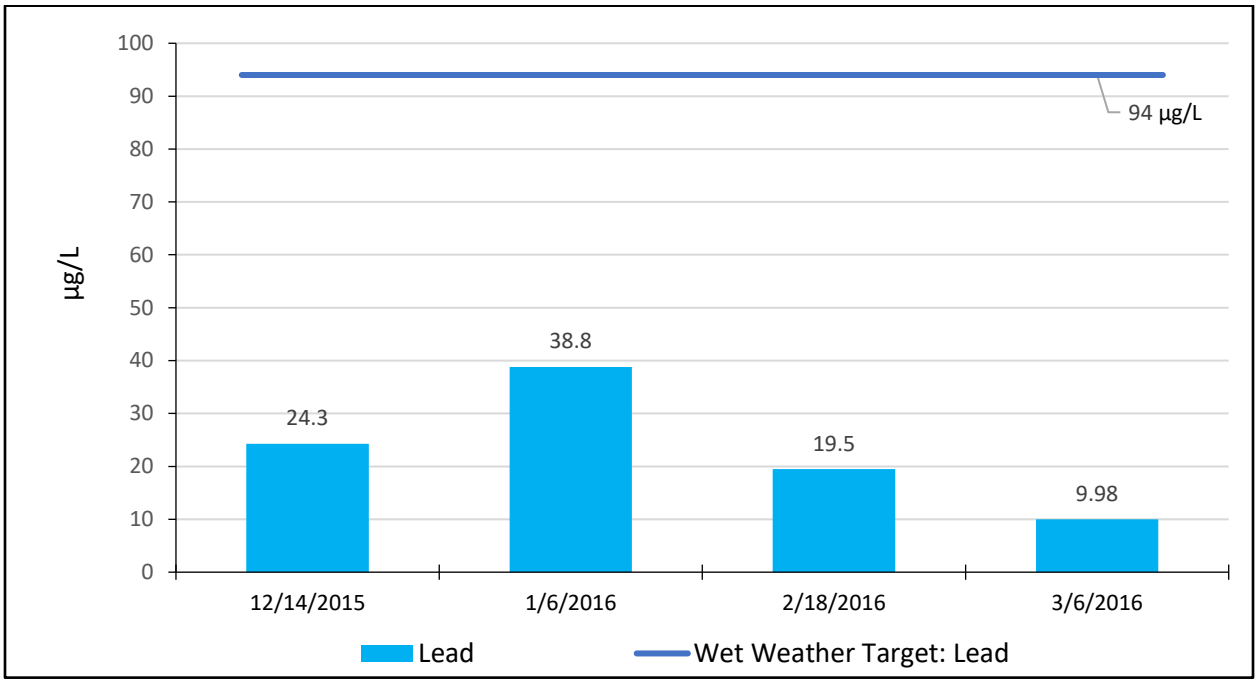

Figure 15. Monitoring results at S10 for total lead during wet weather.
Numeric targets are adjusted based on the 50th percentile hardness values multiplied by the applicable water-effect ratio (WER).

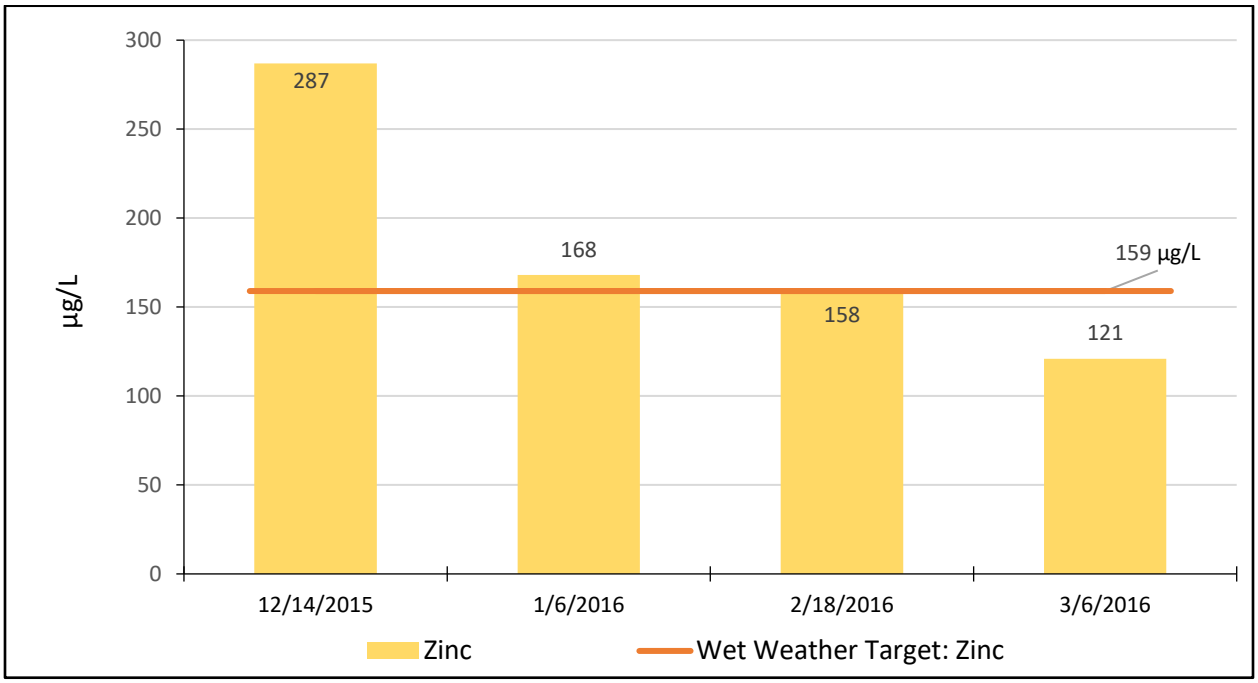

Figure 16. Monitoring results at S10 for total zinc during wet weather.
Numeric targets are adjusted based on the 50th percentile hardness values multiplied by the applicable water-effect ratio (WER).

(5) Trash TMDL

The final numeric compliance deadline for the Trash TMDL was September 30, 2016. An Amendment to the Trash TMDL was adopted which provided alternative demonstrations of compliance. WMG members are separately reporting the results of Trash TMDL monitoring and compliance.

Each Permittee submitted an alternative compliance plan along with their 2015-2016 Individual Annual Report. Refer to these plans for further information.

(6) Harbor Toxics TMDL

The Harbor Toxics TMDL requires monitoring at S10, just north of the river-estuary interface. This monitoring has been implemented and has been a shared effort with the majority of upstream Permittees. The Harbor Toxics TMDL has not established WLAs for the upstream portions of the LLAR River so the LLAR WMG is using the sediment, interim concentration based allocations for the Los Angeles River Estuary.

Table 4. Harbor Toxics TMDL monitoring results for wet and dry weather at S10

Constituent (dry weight µg/g)	Evaluatory Guidelines[5]	8/31/2015 (Dry)	1/5/2016 (Wet)	2/18/2016 (Wet)
Total Copper	53.0	66.0	113.0	413.0
Total Lead	46.7	36.0	124.0	288.0
Total Zinc	183.5	455.0	467.0	1308.0
Total DDT	0.254	ND*	0.0221	0.0969
Total PAHs	4.36	ND*	3.35	8.32
Total PCBs	0.683	ND*	0.13	0.251

* Not Detectable

[5] Interim Effluent Limits (IEL) are provided as a reference but the data represent only the first year of monitoring. Compliance with IELs will be addressed after the first three years of monitoring.

B. Progress Toward Achieving Receiving Water Limitations

Progress toward achieving TMDL targets through implementation of watershed control measures is addressed in the previous section. This section addresses other watershed WQPs, toxicity monitoring, and other constituents monitored as listed in the CIMP.

1. CIMP Data Review and Compliance Status

The WMP incorporated an interim 31% pollutant reduction milestone by September 31, 2017, for progress toward achieving compliance with water quality objectives for all WQPs. The 2015-2016 CIMP results indicated no applicable water quality objective exceedances for Category 2 and 3 WQPs. As such the CIMP results indicate compliance with the milestone.

a) Toxicity

Two wet events and one dry event were sampled for toxicity in 2015-2016 at S10. All samples passed the TST test for survival and reproduction.

b) Municipal Action Levels at LLAR2: Wet Weather Outfall Monitoring

Only one storm event provided sufficient flow to be monitored at LLAR2 outfall (Dominguez Gap Pump Station) during the 2015-2016 monitoring season. See Table 5 for a comparison of monitoring data from the January 5, 2016 storm event at LLAR2 against Municipal Action Levels (MALs). In all cases monitoring results were below MALs, see Table 5.

Control measures implemented to achieve compliance with the TMDLs are predicted in the WMP to result in compliance with water quality objectives for other WQPs listed in Section 2 of the WMP. It is also predicted that these objectives will be met at an accelerated rate when compared to TMDL deadlines. The 2015-2016 CIMP results appear to reinforce these predictions. However it is too early in the CIMP program to reliably assess water quality trends and definitive conclusions are not possible at this time.

Table 5. LLAR2 wet weather outfall monitoring data.

Parameter	MLA	Wet 1 - (1/5/2016)
pH	6-9	7.16
Total Suspend Solids (mg/L)	254.1	86.0
Chemical Oxygen Demand (mg/L)	247.5	46.0
Kjeldahl Nitrogen (mg/L)	4.59	2.46
Nitrate/Nitrite-N (mg/L)	1.85	0.95
Total Cadmium (ug/L)	2.52	0.13
Total Copper (ug/L)	71.12	13.7
Total Lead (ug/L)	102.0	10.8
Total Nickel (ug/L)	27.43	3.21
Total Zinc (ug/L)	641.3	178.0
Total Mercury (ug/L)	0.32	0.0119

III. Achievement of Interim Milestones

The WMP includes many interim and final milestones with completion dates ranging from the approval date of the WMP to 2037. This section provides an update on WMP milestones not already addressed in the prior sections of this report, ranging from WMP adoption to June 30, 2017.

A. Minimum Control Measures and Non-stormwater Discharge Measure Milestones

The Minimum Control Measures (MCMs) and Non-stormwater Discharge Measures (NSWDs) are baseline Watershed Control Measures (WCMs) required for all Permittees. The MCMs and NSWDs are defined in the MS4 Permit and are generally implemented individually by each Permittee. The objectives of the MCMs are:

- Result in a significant reduction in pollutants discharged into receiving waters
- Satisfy the requirements of 40 CFR §122.26(d)(2)(iv)

The WMG members are implementing the MCMs and NSWDs as set forth in the MS4 Permits.

B. Targeted Control Measures

Targeted Control Measures (TCMs) are supplemental enhancements of the required MCMs. TCMs are designed to reduce pollutant loading to meet interim and final compliance milestones for WQBELs and receiving water limitations. TCMs are divided into structural and non-structural control measures.

1. Structural Targeted Control Measures

The RAA places an emphasis on structural control measures, such as Best Management Practices (BMPs) to address pollutant load reduction to meet WQBELs and receiving water limitations. Structural BMPs are constructed on the ground controls designed to capture runoff and filter, treat or infiltrate water back into the ground. There are two main types of structural BMPs; Distributed and Regional. Distributed BMPs are small scale BMPs designed to capture runoff from a small drainage area. Regional BMPs are large scale BMPs designed to capture stormwater from many acres of land. The WMG is planning to continue implementing both type of BMPs to meet WQBELs and receiving water limitations. The following is an update on active and planned structural BMP projects within the LLAR watershed.

a) Proposition 84 Projects

The Cities of Lynwood, Pico Rivera, and South Gate, along with eight other cities in neighboring watersheds, were awarded a $1,037,000 grant from the Prop 84 Multi- Agency/Multi-Watershed Project to incorporate Low Impact Development (LID) BMPs into Major Transportation Corridors. The project allows the Cities to install tree box filters, bioretention tree wells, and a bioswale. The locations within the LLAR watershed are listed in Table 6. These LID BMPs are located in high volume transportation corridors where high concentrations of metals are typically found[6]. In addition to addressing metals, the LID BMPs in high traffic roadways will also capture and treat bacteria-laden stormwater flows originating from residential, commercial, industrial, and recreational areas.

Table 6. Proposition 84 funded LID BMPs in the LLAR watershed

Jurisdiction	Type of BMP	Location
Lynwood	Filterra Tree Box Filters	Fernwood Avenue and Santa Fe Avenue
		Northwest corner of Clark Street and Wright Road
		Southwest corner of Clark Street and Wright Road
	Bioretention Tree Wells	12308 Edgebrook Avenue
		12337 Edgebrook Avenue
		5543 Rayborn Street
		11077 Eve Avenue
		3861 Lilita Street
		3965 Palm Avenue
		3957 Palm Avenue
		Santa Fe Avenue and E 108th Street in the City Poclet Park
		2719 E 109th Street
		2734 E 110th Street
Pico Rivera	Filterra Tree Box Filters	On the Eastside of Paramount Boulevard, North of Mines Avenue
		On the Eastside of Paramount Boulevard, South of Mines Avenue
South Gate	Filterra Tree Box Filters	On the Northside of Glady Street, West of Garfield Avenue
		Northeast corner of State Street and Independence Avenue

[6] Duong,Trang T.T., & Lee, Byeong-Kyu, Determining contamination level of heavy metals in road dust from busy traffic areas with different characteristics. Journal of Environmental Management: 92(3). March 2011

b) Tier 1 Stormwater Treatment Corridor

The WMP's RAA has proposed to construct Regional BMPs in the WMG's approach to compliance. To determine the best locations for the Regional BMPs a feasibility study was completed in early 2016, and potential locations were ranked. The 2017 Regional Tier 1 Project Implementation Plan includes the top eleven projects. These eleven separate water treatment projects, located mostly in parks along the LLAR, would form a regional scale stormwater treatment corridor, see Figure 17 and Table 7 below for locations, status, and current funding of projects.

Geotechnical testing at the future sites of the regional BMPs is underway. All of these projects would improve water quality in the watershed through biofiltration, expand regional stormwater capture, groundwater storage in order to meet future water supply demands of the Central Groundwater Basin, and reduce water usage through the implementation of water conservation landscape irrigation measures.

Table 7. Regional Stormwater Treatment Corridor Tier 1 projects

Project	Site	Jurisdiction	Max BMP Capacity (acre-feet)	Cost	Status[7]
1	Furman Park	Downey	20	$15.56 million	Soil suitable for infiltration
2	Apollo Park	Downey	13.2	$12.7 million	Soil suitable for infiltration
3	Urban Orchard	South Gate	8.5	$14 million	$9 million awarded. Additional funding sought to convert Bandini channel to soft bottom. Partnership with Trust for Public Lands and Rivers and Mountains Conservancy.
4	Parque dos Rios	South Gate	TBD	TBD	Limited funding received. Water Conservation Authority is currently greening the north portion.
5	Lynwood City Park	Lynwood	12	$12 million	Soil suitable for infiltration
6	Spane Park	Paramount	5	$9 million	Infiltration study pending
7	DeForest Park	Long Beach	15-35	$7.5 million	Funded. Construction underway, estimated to be completed in 2018
8	Dominguez Gap	Long Beach		---	Completed
9	View Park (Creston)	Signal Hill	2.4	$300,000	Soil suitable for infiltration
10	Signal Hill Library Park	Signal Hill	1.2	$1.5 million	Soil suitable for infiltration
11	Long Beach MUST	Long Beach	337,800 gallons a day	$28 million	$28 million awarded. Design underway

[7] Status as of December 31, 2016

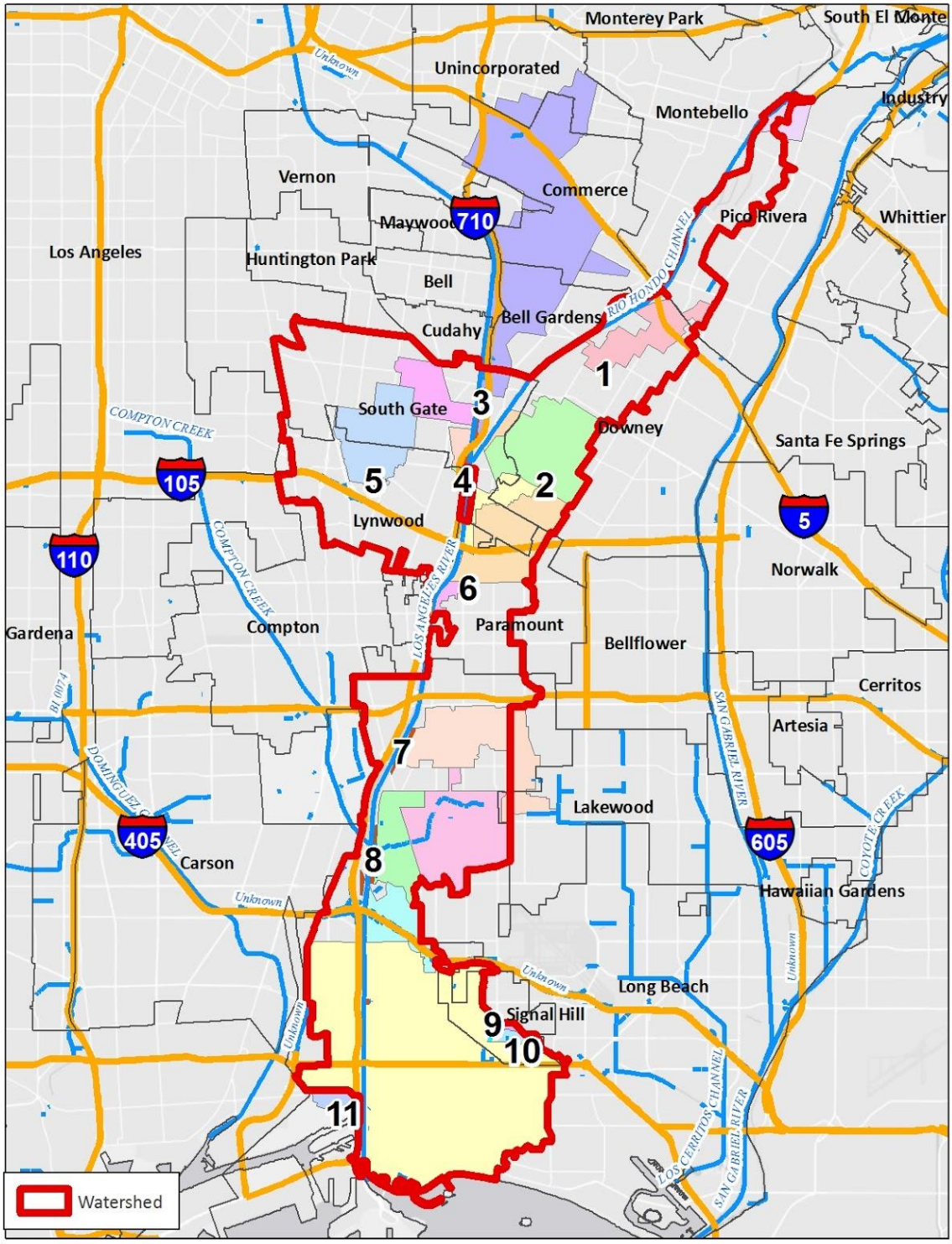

Figure 17. Regional Stormwater Treatment Corridor Tier 1 project locations and triburiaty areas.

2. Non-Structural Targeted Control Measures

Non-structural TCMs are source control and institutional BMPs that address different pollutants with varying degrees of effectiveness. At the time of the development of the WMP, WMG members (with the exception of the LACFCD) selected which TCMs to plan or potentially implement. Table 8 demonstrates the updated planned and potential TCMs of each agency at the time of the Adaptive Management report.

The responses for each agency under Table 8 are defined as follows:

C – Completed TCM. The TCM is currently implemented.

X – Planned TCM. Under the presumption that 1) the TCM will likely not require approval of the governing body and 2) the governing body approves adequate staff/budget (if necessary), the TCM will be implemented.

P – Potential TCM. The TCM is under consideration by the agency; however, implementation is contingent upon yet to be determined factors. These factors include approval by the governing body, additional time needed to inform the governing body and/or relevant staff and approval of service contracts. As such, implementation cannot be assured at this time.

P_{AM} – Adaptive Management Potential TCM. At the time of the 2017 Adaptive Management the TCM is *newly* under consideration by the agency; however, implementation is contingent upon yet to be determined factors. These factors include approval by the governing body, additional time needed to inform the governing body and/or relevant staff and approval of service contracts. As such implementation cannot be assured at this time. See WMP Modifications for further information.

AM – Adaptively Managed out TCM. At the time of the development of the WMP this TCM was planned to be or potentially implemented by the agency and is now being adaptively managed out of the WMP. See WMP Modifications for further information.

Table 8. Nonstructural Targeted Control Measures

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency									
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Downey	LACFCD	Lakewood	Long Beach	Lynwood	Paramount	Pico Rivera	Signal Hill	South Gate
	Planning and Land Development																
1	TCM-PLD-1	Train staff/councils to facilitate LID and Green Streets implementation	◈	◈	◈	◈	◈	C	N/A	C	C	C	C	C	C	C
2	TCM-PLD-2	Ordinance requires LID BMPs for projects below MS4 Permit thresholds	◆	◆	◈	◆	◆	C	N/A		C				C	C
	Existing Development																
3	TCM-ICF-1 (MCM-ICF-3)	Prioritize facilities/inspections based on water quality priorities	◈	◈	◈	◈	◈	C	N/A	C	C	C	C	C	C	C
4	TCM-TSS-1	Exposed soil ordinance	◈	◈	◈	◆	◇	C[8]	N/A		P		P	P	X	P_{AM}
5	TCM-TSS-2	Erosion repair and slope stabilization on private property	◈	◈	◈	◆	◇		N/A		P		P	P	X	
6	TCM-TSS-3	Private parking lot sweeping ordinance	◆	◆	◆	◆	◇	C	N/A		P		C		C	

[8] The City of Downey completed this TCM before the development of the WMP and was omitted in the original WMP as an error.

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency								
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Downey	LACFCD	Lakewood	Long Beach	Lynwood	Paramount	Pico Rivera	Signal Hill	South Gate
7	TCM-TSS-4	Sweeping of private roads and parking lots	◆	◆	◆	◆	◇	X	N/A		P		P		X	
8	TCM-TSS-5	Negotiations with regulated utilities for erosion control within R.O.W.	◈	◈	◈	◆	◇				**Watershed Group**					
9	TCM-RET-1	Encourage retrofitting of downspouts (downspout disconnect)	◈	◈	◈	◈	◆	C	N/A		C	C	C	C		C
	Dry weather runoff reduction															
10	TCM-NSWD-1	Incentives for irrigation reduction practices	◆	◆	◈	◆	◆	C	N/A	C	C	C	C	C	C	C
	Public Information and Participation															
11	TCM-PIP-1	Refocused outreach to target audiences and water quality priorities	◆	◆	◆	◆	◆				**Watershed Group**					
	Public Agency Activities															
12	TCM-PAA-1	Upgraded sweeping equipment (e.g. regenerative)	◆	◆	◆	◆	◇	C	N/A	C	C	C	C	C	C	C
13	TCM-PAA-2	Adopt Sewer System Management Plan (SSMP)	◆	◆	◇	◇	◇	C	N/A	C	C	C	C	C	C	C
14	TCM-PAA-3	Increased street sweeping frequency or routes	◆	◆	◆	◆	◇	P	N/A			AM	AM			

#	WCM Category/ID	WCM	BMP effectiveness with respect to WQPs					Agency								
			Category I	Category II	Category III	Sediment reduction	Volume or flow reduction	Downey	LACFCD	Lakewood	Long Beach	Lynwood	Paramount	Pico Rivera	Signal Hill	South Gate
15	TCM-TSS-6	Erosion repair and slope stabilization on public property and right of way	◈	◈	◈	◆	◇	C	N/A		X		P		X	
	Reporting/Adaptive Management															
16	TCM-MRP-1	Enhanced tracking through use of online GIS MS4 Permit database	◈	◈	◈	◈	◈	C		C	C	C	C	P	C	C
	Jurisdictional Stormwater Management															
17	TCM-SWM-1	Prepare guidance documents to aid in implementation of MS4 Permit MCMs	◈	◈	◈	◈	◈	C	X	C	C	C	C	C	C	C
	Initiatives															
18	TCM-INI-1	Copper reduction through implementation of SB 346	◆	◆	◆	◇	◇	X	X	X	X	X	X	X	X	X
19	TCM-INI-2	Lead reduction through implementation of SB 757	◆	◆	◆	◇	◇	X	X	X	X	X	X	X	X	X
20	TCM-INI-3	Support zinc reduction in tires through safer consumer product regulations	◆	◆	◆	◇	◇				**Watershed Group**					
21	TCM-INI-4	Apply for grant funding for stormwater quality/capture projects	◆	◆	◈	◆	◆	C	X		C	C	C	C	C	C

◆ Primary pollutant reduction ◈ Secondary pollutant reduction ◇ Pollutant not addressed

C – Completed/Implemented TCM X – Planned TCM **P** – Potential TCM $\mathbf{P_{AM}}$ – Adaptive Management Potential TCM **AM** – Adaptively Managed Out TCM

IV. WMP Modifications

The WMG will not make significant modifications to the WMP at this time. This decision is based on the following:

- One year of CIMP water quality monitoring data is insufficient to make the predictions needed to justify significant modifications.
- The CIMP water quality monitoring results did not indicate new water quality concerns.
- In some respects the CIMP results indicated a level of achievement higher than that predicted in the WMP.
- The control measures listed in the WMP already address the WQPs that did exceed in 2015-2016 (E. coli and zinc).

The following describes minor modifications to the nonstructural TCMs by individual WMG members.

A. Changes to Control Measures

This section addresses minor changes and associated rational of non-structural control measures by individual jurisdictions. Pending approval by the Regional Baird the WMG will modify the WMP to the incorporate these changes.

1. City of Lynwood: Increased Street Sweeping Routes/Frequency (TCM-PAA-3)

At the time of the development of the WMP, the City of Lynwood elected to potentially[9] implement increased street sweeping and/or frequency. As a part of the Adaptive Management process the City of Lynwood is deciding to no longer pursue increasing street sweeping routes and/or frequency.

The MS4 Permit requires high trash generating areas, all streets in Lynwood, to be swept twice per month. The City currently sweeps residential, industrial, public/educational facilities and open/recreation, streets once a week. The current sweeping schedule for these areas employed by the City exceeds the MS4 Permit requirements by 200%. The City currently sweeps commercial streets three times per week. The current sweeping schedule for commercial streets employed by the City is exceeds the MS4 Permit requirements by 600%. The current schedule is sufficient to address the need for street cleaning of all areas.

Additionally the City implements other control measures which are expected to reduce pollutant loading. The City uses regenerative sweepers which are more efficient at cleaning debris from the street than traditional street sweepers. To ensure street sweeping is most efficient, cars are not allowed to be parked in the path of the street sweeper. This ensures as much debris as possible is cleaned from the street.

The City has also employed additional efforts to combat trash discharge to the MS4. The final compliance deadline for the Trash TMDL was September 30, 2016. The City has installed 579 Full Capture Devices and 29 Partial Capture Devices of the 628 catch basins within the City. The capture devices installed in these

[9] A potential control measure at the time of the WMP was described as "This is under consideration by the agency, however implementation is contingent upon yet to be determined factors. These factors include approval by the governing body, additional time needed to inform the governing body and/or relevant staff and approval of service contracts. As such implementation cannot be assured at this time. If the Potential TCM is not adopted by the agency within the first two years of the implementation of the WMP, it will be reconsidered through the adaptive management process."

catch basins account for 96.17% of the total catch basins draining to the Los Angeles River in the City. For more information regarding the City's trash controls see their Alternative Compliance Plan.

The measures described above are expected to significantly reduce pollutant loading. At this time the City has determined it is infeasible to further increase the routes and/or frequency of street sweeping because the street sweeping measures taken by the City are already above the MS4 Permit requirement. Since this is the case the City has elected to adaptively manage this potential control measure out of the WMP. The current measures employed by the City are sufficient to address the needs of street sweeping.

2. City of Paramount: Increased Street Sweeping Routes/Frequency (TCM-PAA-3)

At the time of the development of the WMP, the City of Paramount elected to implement increased street sweeping and/or frequency. As a part of the Adaptive Management process the City of Paramount is deciding to no longer pursue increasing street sweeping routes and/or frequency.

The MS4 Permit requires high trash generating areas, all streets in Paramount, to be swept twice per month. The City currently sweeps commercial, residential, industrial, public/educational facilities and open/recreation, streets once a week. The current sweeping schedule for these areas employed by the City exceeds the MS4 Permit requirements by 200%. The City currently sweeps major thoroughfares throughout the City twice times per week. The current sweeping schedule for major thoroughfares employed by the City is exceeds the permit requirements by 400%. The current schedule is sufficient to address the need for street cleaning of all areas.

To supplement the current street sweeping schedule the City has also implemented additional control measures, exceeding MS4 Permit requirements. In addition all City owned parking lots are swept once a week. The City has also adopted an ordinance requiring all private parking lots with 25 or more motor vehicle parking spots to be swept regularly (TCM-TSS-3). These additional control measures further reduce the need for increased street sweeping.

Additionally, the City implements other control measures which are expected to reduce pollutant loading. The City uses regenerative sweepers which are more efficient at cleaning debris from the street than traditional street sweeper. To ensure street sweeping is most efficient cars are not allowed to be parked in the path of the street sweeper. This ensures as much debris as possible is cleaned from the street.

The City has also employed additional efforts to combat trash discharge to the MS4. The final compliance deadline for the Trash TMDL was September 30, 2016. The City has installed 327 Full Capture Devices and 8 Partial Capture Devices of the 346 catch basins within the LLAR area of the City. The capture devices installed in these catch basins account for 96.49% of the total catch basins draining to the Los Angeles River in the City draining to the Los Angeles River in the City. For more information regarding the City's trash controls see their Alternative Compliance Plan.

The measures described above are expected to significantly reduce pollutant loading. At this time the City has determined it is infeasible to further increase the routes and/or frequency of street sweeping because the street sweeping measures taken by the City are already above the MS4 Permit requirement. Since this is the case the City has elected to adaptively manage this control measure out of the WMP. The current measures employed by the City are sufficient to address the needs of street sweeping.

3. City of South Gate: Exposed soil ordinance (TCM-TSS-1)

At the time of the development of the WMP, the City of South Gate elected to adopt an exposed soil ordinance. As a part of the Adaptive Management process the City of South Gate has elected to *potentially* pursue adopting an exposed soil ordinance.

The purpose of the exposed soil ordinance is to reduce the amount of sediment discharge from vacant lots. If adopted, the ordinance would require landowners of exposed vacant parcels to implement measures (such a vegetative perimeters) on their property to prevent sediment discharge. The City has reviewed a sample ordinance, and sample Vacant Parcel Erosion and Sediment Control Manual. The City is currently determining feasibility of adopting such an ordinance.

At the time of the development of the WMP, the amount of copper and zinc in runoff (both naturally occurring in soils) were among the top-priority pollutants in the LLAR watershed. One approach to metal pollutant reduction is to reduce the sediment discharge by adopting an exposed soil ordinance.

Since the development of the WMP, the City has taken additional measures to reduce sediment discharge and in effect reduce zinc and copper pollutant loading. One approach is to implement regional BMP projects, these projects would be constructed with pre-treatment systems to remove sediment as well as pollution that adheres to sediment. Also, the City is committed to creating a structural environment that encourages vehicle alternatives through projects like the Garfield Avenue Complete Street Infrastructure Project. Through these projects, as well as others, South Gate will connect their community to the revitalization of the Los Angeles River. This project will benefit the entire Los Angeles Region by improving water quality and recharge, and increasing inner-city access to green spaces through a connective bikeway network along the banks of the entire Los Angeles River.

The 2016 a Regional Tier 1 Project Implementation Plan which is a large scale project to develop eleven separate water treatment projects, located mostly in parks along the LLAR watershed, into a regional scale stormwater treatment corridor. The City is participating in the regional treatment corridor, with potential stormwater infiltration BMPs to be built in two locations.

- Urban Orchard Project: $9 million dollars in funding has been secured through the Rivers and Mountains Conversancy (RMC) and Proposition 1 grants. An additional $5 million is needed to complete the project by converting Bandini Channel to soft bottom and intercept low flows from the main channel of the Los Angeles River. Once completed, Urban Orchard will be capable of treating runoff from over 4,000 acres with a 2-3 acre-feet infiltration vault, also a 2 acre-feet reservoir vault will be constructed to store reclaimed water. Once operational, the project will have the capabilities to capture and infiltrate of over 60 acre-feet annually. The project will collect runoff from currently blighted impoverished areas including: the Cities of South Gate, Bell Gardens, Commerce, Bell, Cudahy and unincorporated areas of Los Angeles County (East Los Angeles). As conceptually designed, Urban Orchard will have pre-treatment systems capable of removing a substantial amount of sediment.

- Parque dos Rios Project: $1.5 million dollars in funding has been secured through Water Conservation Authority (WCA). The City is working with the WCA to incorporate a stormwater capture program as part of the project. If the site were to incorporate stormwater treatment, potential BMPs included are: bio-swales, vortex pre-treatment systems, dry wells, and infiltration

vaults. These potential BMPs in Parque dos Rios would be capable of collecting and treating runoff from over 700 acres which includes the Cities of South Gate and Lynwood.

Another potential Regional BMP projects downstream will also capture and treat runoff from the City. This projects have been identified as ideal candidates for a regional project, and grants to fund this project are currently being sought:

- Lynwood City Park: Once funded and completed, the Lynwood City Park site could have a capacity to treat 12 acre-feet of stormwater. This project will receive runoff from a portion of the City of South Gate.

All of these regional BMP projects would improve water quality in the City as well as the entire watershed through biofiltration, expand regional stormwater capture and groundwater storage in order to meet future water supply demands of the Central Groundwater Basin, and reduce water usage through the implementation of water conservation landscape irrigation measures.

The exposed soil ordinance was originally developed to reduce the pollutant loading of zinc. A significant source of zinc in urban areas are small zinc particulates produced from the wear and tear of vehicular tire treads and brake pads[10]. To address this particular zinc source, South Gate is committed to reducing vehicle use by creating a structural environment that encourages more bicycling in the City.

South Gate is currently working to implement its Master Bicycle Transportation Plan. This includes adding new bicycle lanes on Alexandra Avenue, and improving existing bicycle paths. Additionally, South Gate is currently seeking funds for the development of 48.5 miles of diverse bicycle roadways. To connect these facilities in a citywide network, South Gate is also seeking funds for bicycle and pedestrian bridges access and intersection improvements.

The City has begun implement additional bike lanes in an effort to reduce the negative environmental effects of vehicles, including zinc loading. The Garfield Complete Streets Infrastructure Project has secured a total of $1.68 million in funding through various grants. This project consists of Class II/III bike lanes, roadway medians, and traffic calming measures. These aspects will provide a bicyclist and pedestrian-safe connection to major shopping and recreational hubs in the City. The project's aim is to reduce residents' dependency on vehicles.

To ensure that the bike-friendly roads and accommodating facilities are used, South Gate will also develop a public education program to highlight the benefits and encourage residents to bike to work, school, or for leisure. The projects described above will physically create a traffic calming effect. The City's' plan to create a connected, integrated bicycling system will encourage more citizens to travel using alternatives to the car, decreasing urban zinc pollutant loading.

The City of South Gate plans to implement regional BMP projects and encourage the use of bicycles, both of these measures will effectively negate the need to immediately adopt an exposed soil ordinance. At this time, South Gate is electing to make TCM-TSS-1, adopting an exposed soil, a potential TCM. The other implementation actions the City of South Gate is taking is adequate to address WQPs.

[10] TDC Environmental LLC for California Stormwater Quality Association, Zinc Sources in California Urban Runoff, Revised April 2015

4. Project Status Updates

Pending approval by the Regional Board, the WMG will incorporate minor modifications to the WMP to reflect status updates on applicable projects, such as the completion of the Gateway Prop 84 project.

B. Changes to Compliance Deadlines and Interim Milestones

The WMG does not request changes to compliance deadlines and interim milestones at this time.

C. Re-Evaluate Watershed Water Quality Priorities

There is insufficient monitoring data at this point to justify changes to the existing WQPs described in Section 2 of the WMP.

V. Availability of New Information

The WMG is aware of the proposed updates to the 303(d) List. Once approved by the regulating authorities, the WMG will update the list of WQPs accordingly, if applicable. If necessary, the watershed control measures will also be modified to address the modified WQPs. These changes would be formalized in the next Adaptive Management report.

VI. Recommendations from Regional Water Board and Public

During the public draft period of the WMP, prior to final approval, the WMG received comments on the WMP from the Regional Board and the public. Recommendations stemming from those comments were considered by the WMG, and either incorporated or otherwise addressed in the approved WMP. Since this period the WMG has not received additional comments or recommendations that are not already addressed by the WMP.

Attachment A: Adaptive Management Guidelines

1. **Adapting the WMP to become more effective based on the following:**
    a. Progress toward achieving interim and/or final water quality-based effluent limitations and/or receiving water limitations.
    b. Progress toward achieving improved water quality in MS4 discharges and achieving receiving water limitations through implementation of the watershed control measures based on an evaluation of outfall-based monitoring data and receiving water monitoring data.
    c. Achievement of interim milestones.
    d. Re-evaluation of the water quality priorities identified for the WMA based on more recent water quality data for discharges from the MS4 and the receiving water(s) and a reassessment of sources of pollutants in MS4 discharges.
    e. Availability of new information and data from sources other than the Permittees' monitoring program(s) within the WMA that informs the effectiveness of the actions implemented by the Permittees.
    f. Regional Water Board recommendations.
    g. Recommendations for modifications to the Watershed Management Program solicited through a public participation process.

2. **Based on the results of the adaptive management process, Permittees shall report modifications to:**
    a. New compliance deadlines and interim milestones (with the exception of those compliance deadlines established in a TMDL)

3. **Report the following:**
    a. On-the-ground structural control measures completed.
    b. Non-structural control measures completed.
    c. Monitoring data that evaluates the effectiveness of implemented control measures in improving water quality.
    d. Comparison of the effectiveness of the control measures to the results projected by the RAA.
    e. Comparison of control measures completed to date with control measures projected to be completed to date pursuant to the WMP.
    f. Control measures proposed to be completed in the next two years pursuant to the WMP and the schedule for completion of those control measures.
    g. Status of funding and implementation for control measures proposed to be completed in the next two years.