# Los Angeles River Upper Reach 2 Watershed Management Area

## Coordinated Integrated Monitoring Plan

**June 27, 2014**

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# Coordinated Integrated Monitoring Program

## 5/16/14 DRAFT

**Prepared for:**

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## Acronyms

| | |
|---|---|
| AL | Action Limit |
| BMP | Best Management Practice |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFU | Colony Forming (Microbial) Unit |
| CIMP | Coordinated Integrated Monitoring Program |
| CTR | California Toxics Rule |
| CWA | Clean Water Act |
| DO | Dissolved Oxygen |
| EO | Executive Officer |
| GIS | Geographic Information System |
| HUC | Hydrologic Unit Code |
| IC/ID | Illicit Connection/Illicit Discharge |
| LACFCD | Los Angeles County Flood Control District |
| LACSD | Los Angeles County Sanitation Districts |
| LAR | Los Angeles River |
| LARWQCB | Los Angeles Regional Water Quality Control Board |
| MAL | Municipal Action Limit |
| MES | Mass Emission Station |
| MRP | Monitoring and Reporting Program |
| MS4 | Municipal Separate Storm Sewer System |
| NPDES | National Pollutant Discharge Elimination System |
| NSW | Non-Stormwater |
| NSWD | Non-Stormwater Discharge |
| QAPP | Quality Assurance Project Program |
| RAA | Reasonable Assurance Analysis |
| RWL | Receiving Water Limitation |
| SCCWRP | Southern California Coastal Water Research Project |
| SMC | Stormwater Monitoring Coalition |
| SSC | Suspended Sediment Concentration |
| TIE | Toxicity Identification Evaluation |
| TMDL | Total Maximum Daily Load |
| TSS | Total Suspended Solids |
| UR2 | Upper Reach 2 |
| USEPA | United States Environmental Protection Agency |
| WBPC | Water Body- Pollutant Combination |
| WDR | Waste Discharge Requirements |
| WLA | Waste Load Allocation |
| WMA | Watershed Management Area |
| WMP | Watershed Management Program |
| WQO | Water Quality Objectives |
| WQBEL | Water Quality-Based Effluent Limitation |

# Executive Summary

XXX

# 1.0 Introduction

On November 8, 2012, the Regional Water Quality Control Board, Los Angeles Region (Regional Board or LARWQCB) adopted Order No. R4-2012-0175, *Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges within the Coastal Watersheds of Los Angeles County, Except those Discharges Originating from the City of Long Beach MS4*, herein the MS4 Permit or Permit and became effective on December 28, 2012. The purpose of the Permit is to ensure the MS4s in the County of Los Angeles are not causing or contributing to exceedances of water quality objectives set to protect the beneficial uses in the receiving waters in the Los Angeles region. The Permit encourages Watershed Management Areas (WMA) to customize their stormwater programs through the development and implementation of a Watershed Management Program (WMP) and Coordinated Integrated Monitoring Program (CIMP) Plans to achieve compliance with certain receiving water limitations (RWLs) and water quality-based effluent limits (WQBELs). This document presents the CIMP for the Los Angeles River Upper Reach 2 Sub-watershed (LAR UR2) WMA.

In accordance to Attachment E of the 2012 MS4 Permit are requirements for the Monitoring and Reporting Program (MRP). The stated primary objectives for the MRP are listed in Part II.A of the MRP are as follows:

- Assess the chemical, physical, and biological impacts of MS4 discharges on receiving waters;
- Assess compliance with RWLs and WQBELs established to implement Total Maximum Daily Load (TMDL) wet-weather and dry-weather waste load allocations (WLAs);
- Characterize pollutant loads in MS4 discharges;
- Identify sources of pollutants in MS4 discharges; and
- Measure and improve the effectiveness of pollutant controls implemented under the Permit.

Extensive default monitoring requirements are specified in the MRP. However, per the MRP, the LAR UR2 WMA has the option to develop a CIMP that utilizes alternative approaches to meet the primary objectives of the MRP. Additionally, the CIMP includes TMDL monitoring requirements, to unify efforts, and to provide consistent observations of the watershed conditions.

[Insert Group's legal language] - *It is The City of Vernon's opinion that it is necessary to insert language into the WMP and CIMP related to the pending determination on the Petitions filed with the SWRCB related to the 2012 MS4 Permit.*

## 1.1 Los Angeles River Upper Reach 2 Watershed Management Area Watershed Overview

Located in the Los Angeles Watershed, **Figure 1**, LAR UR2 WMA includes the incorporated cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon and the Los Angeles County Flood Control District (LACFCD), as shown in **Figure 2**. The total area in LAR UR2 WMA is approximately 13,223 acres. The most prevalent land uses are industrial and residential. Commercial and open space constitutes minor portions of the jurisdictions within LAR UR2 WMA. Approximate land area and land use summaries are listed in **Table 1** and presented in **Figure 3**.

| Table 1 Land Use Summaries | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Land Use | Bell | Bell Gardens | Commerce | Cudahy | Huntington Park | Maywood | Vernon | LAR UR2 WMA Total |
| | % of Total | | | | | | | |
| Commercial | 12.46% | 29.07% | 10.90% | 9.19% | 15.11% | 12.89% | 5.62% | 12.46% |
| Industrial | 35.11% | 11.88% | 69.32% | 9.77% | 15.15% | 12.12% | 87.66% | 49.29% |
| HDSFR | 4.98% | 50.94% | 3.83% | 65.10% | 48.97% | 68.43% | 0% | 21.49% |
| MFR | 36.13% | 0% | 4.69% | 0% | 0% | 1.90% | 0% | 5.83% |
| Agriculture | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0.01% |
| Educational | 0% | 0% | 0% | 3.17% | 0% | 2.49% | 0% | 0.35% |
| Transportation | 0% | 0% | 0% | 0% | 2.68% | 0% | 0% | 0.31% |
| Open Space | 11.31% | 8.11% | 11.27% | 12.77% | 18.09% | 1.91% | 6.71% | 10.26% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

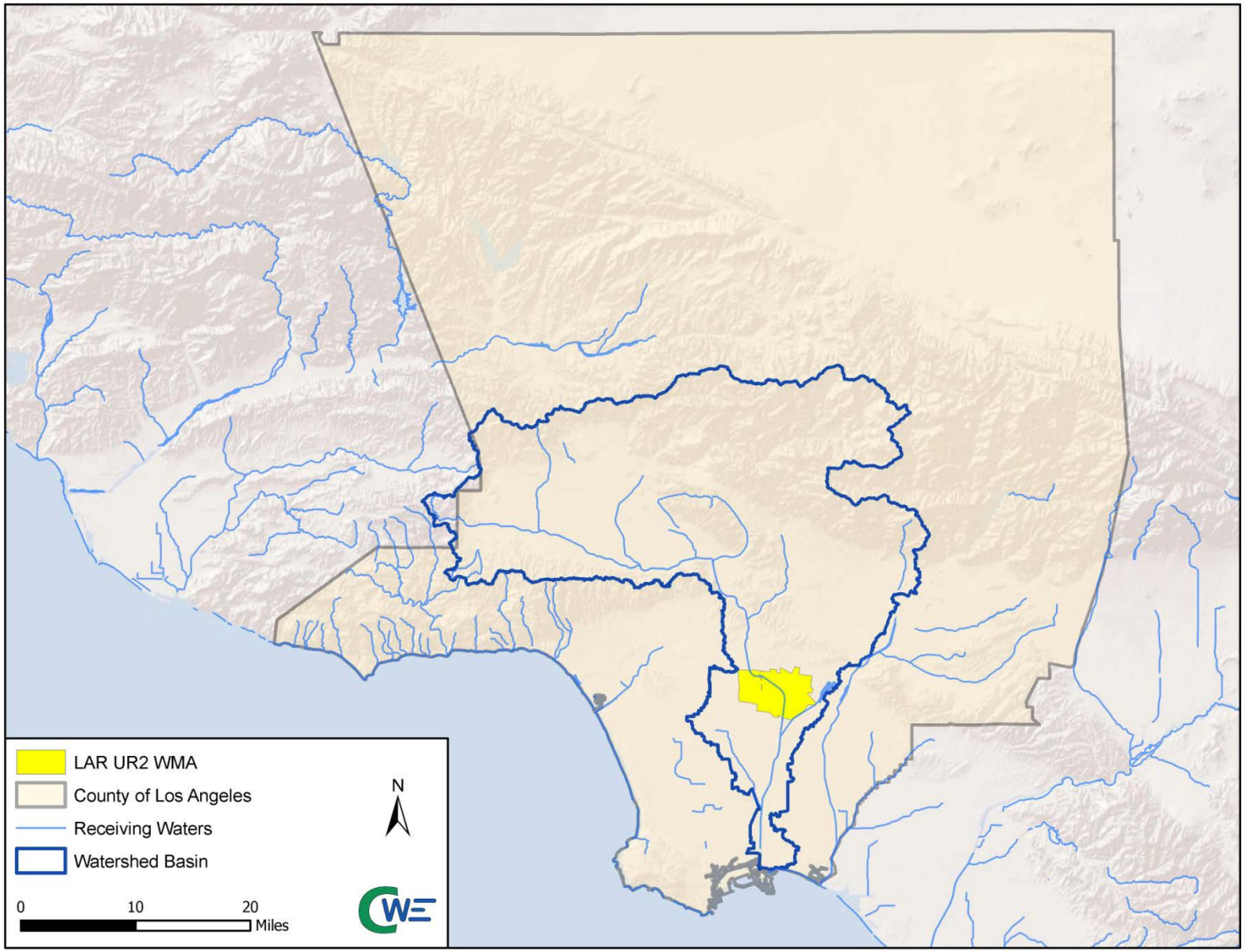


**Figure 1 Los Angeles River Upper Reach 2 Watershed Management Area within Los Angeles Basin**

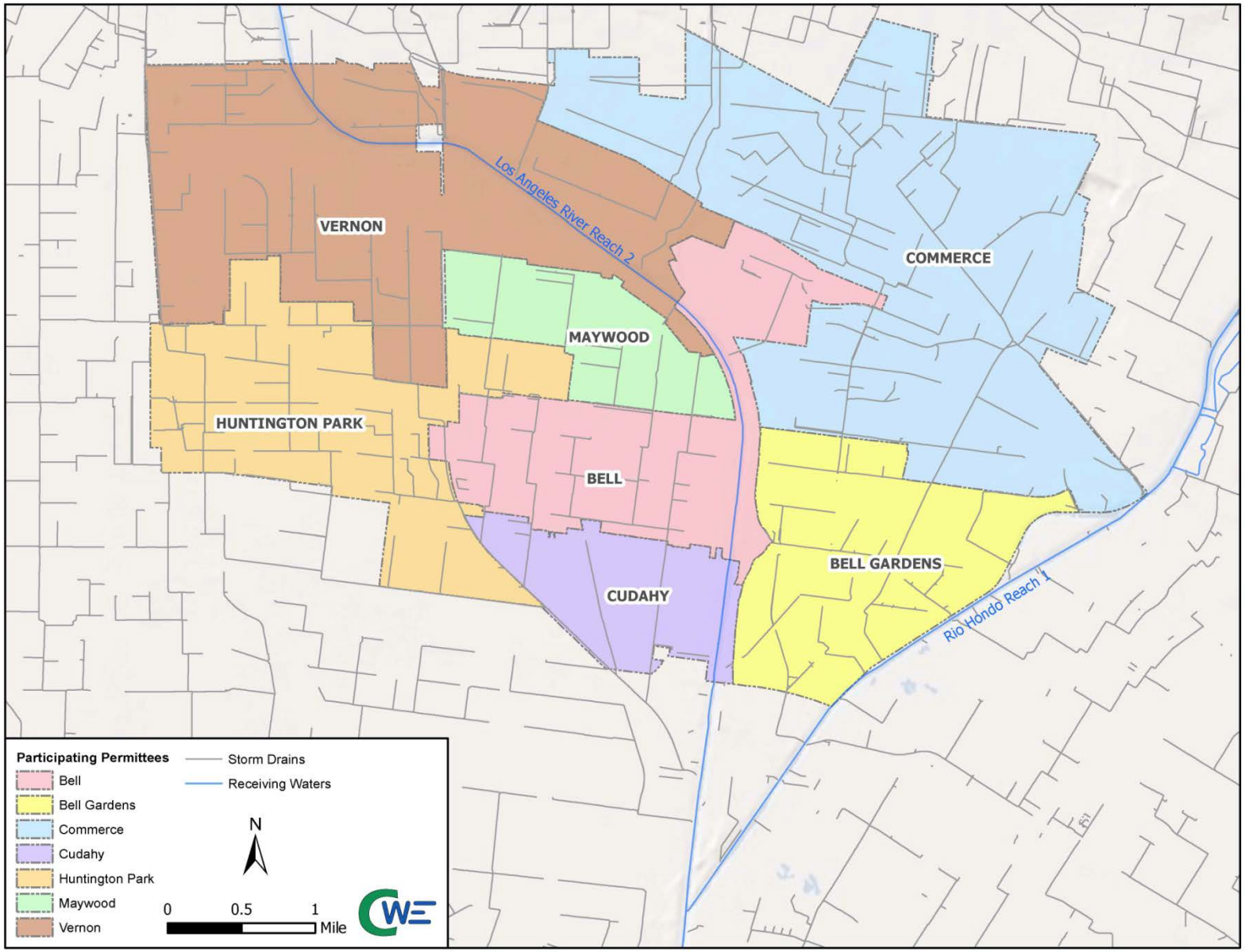


**Figure 2 Participating Permittees**

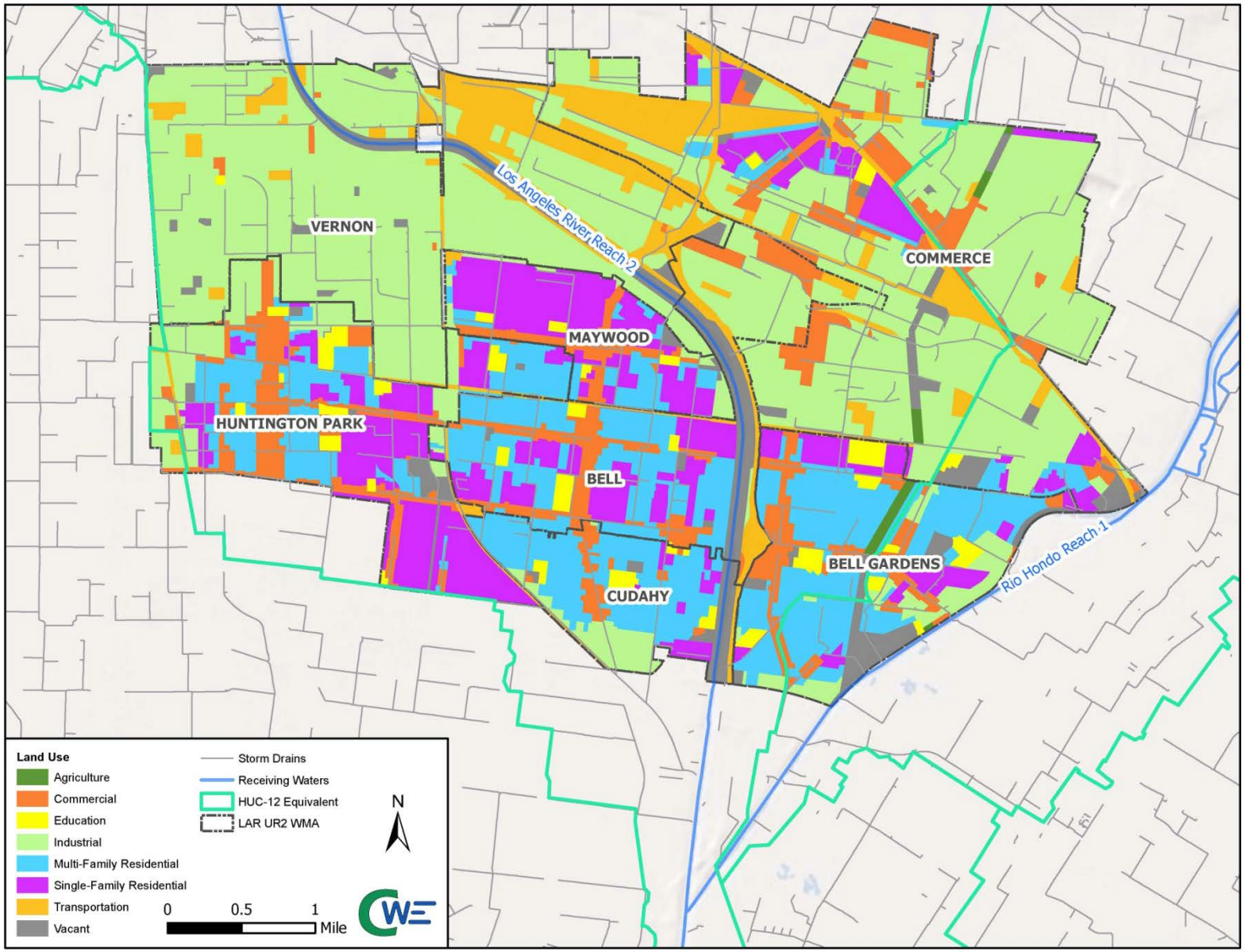


**Figure 3 Land Use**

The LAR UR2 WMA is located within Reach 2, in the lower half of Los Angeles River Watershed, starting at East 26th Street in the City of Vernon and ending at Patata Street in City of Cudahy. The LAR UR2 WMA Cities of Bell Gardens and Commerce line the western bank of Rio Hondo Reach 1, a 120 square mile Los Angeles River tributary. The receiving waters defined by the Basin Plan within the LAR UR2 WMA include:

- Los Angeles River, Reach 2
- Rio Hondo, Reach 1

The Los Angeles River flows 51 miles from the Santa Monica Mountains at the western end of the San Fernando Valley to the Long Beach Harbor and into the Pacific Ocean. Including tributaries, the 824 square mile watershed includes a total stream length of about 837 miles and 4.6 square miles of lake area. The northern watershed includes steep easily eroded undeveloped mountainous areas in the Angeles National Forest and large urban areas in the midsection and south.

Los Angeles River Reach 2 begins at the Arroyo Seco confluence and ends at the Compton Creek confluence. The primary Reach 2 tributary is the Rio Hondo. The Rio Hondo drains a large portion of the eastern Los Angeles Watershed. The Rio Hondo below Whittier Narrows, flows into Rio Hondo Reach 2. Flows in Rio Hondo Reach 2 are normally diverted to the adjacent Rio Hondo Spreading Grounds and used to recharge the central basin groundwater aquifer. During sustained storm periods, Rio Hondo flows, in excess of spreading ground capacity or when the water quality is very turbid, drain into Rio Hondo Reach 1 which then drain into the Los Angeles River.

Attachment B of the MS4 Permit, mapped United States Geological Survey Hydrologic Units, and other features, based on Hydrologic Unit Codes (HUC-12) watershed boundaries. In-lieu of these specified boundaries, the March 26, 2014 Regional Board Reasonable Assurance Analysis (RAA) Guidelines allows EWMP group to use HUC-12 equivalent watersheds, prepared by the LACFCD. Using the LACFCD HUC-12 layer and numbering conventions, the LACFCD HUC-12 boundaries, relevant to the LAR UR2 WMA, are shown in **Figure 4** and identified as follows:

- Compton Creek – Los Angeles River (180701050402)
- Chavez Ravine – Los Angeles River (180701050401)
- Alhambra Wash – Rio Hondo (180701050303)

The LAR UR2 WMA jurisdictional boundaries, HUC-12, MS4 drainage system, and outfall locations are shown in **Figure 5.**

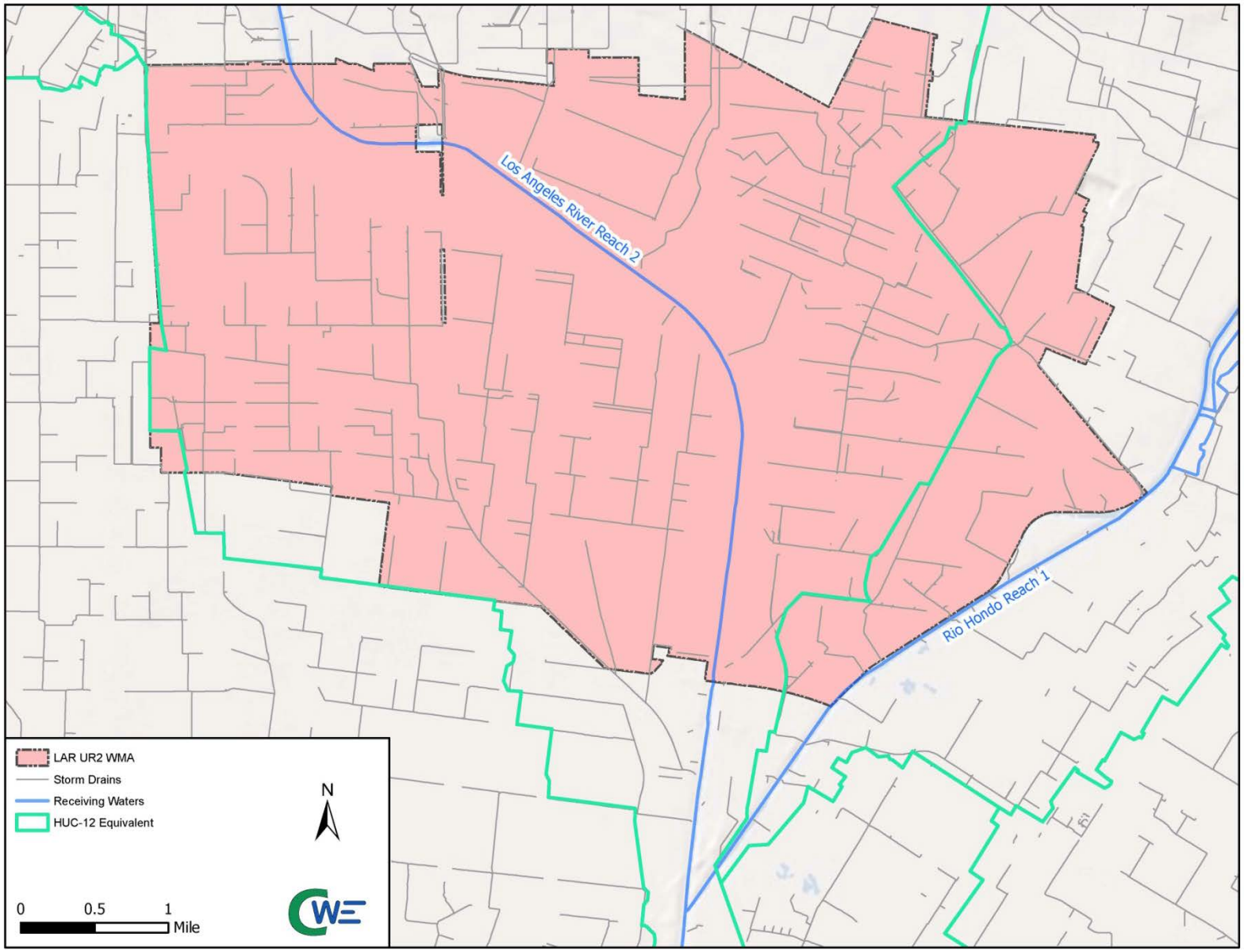


**Figure 4 HUC-12 Subwatersheds**

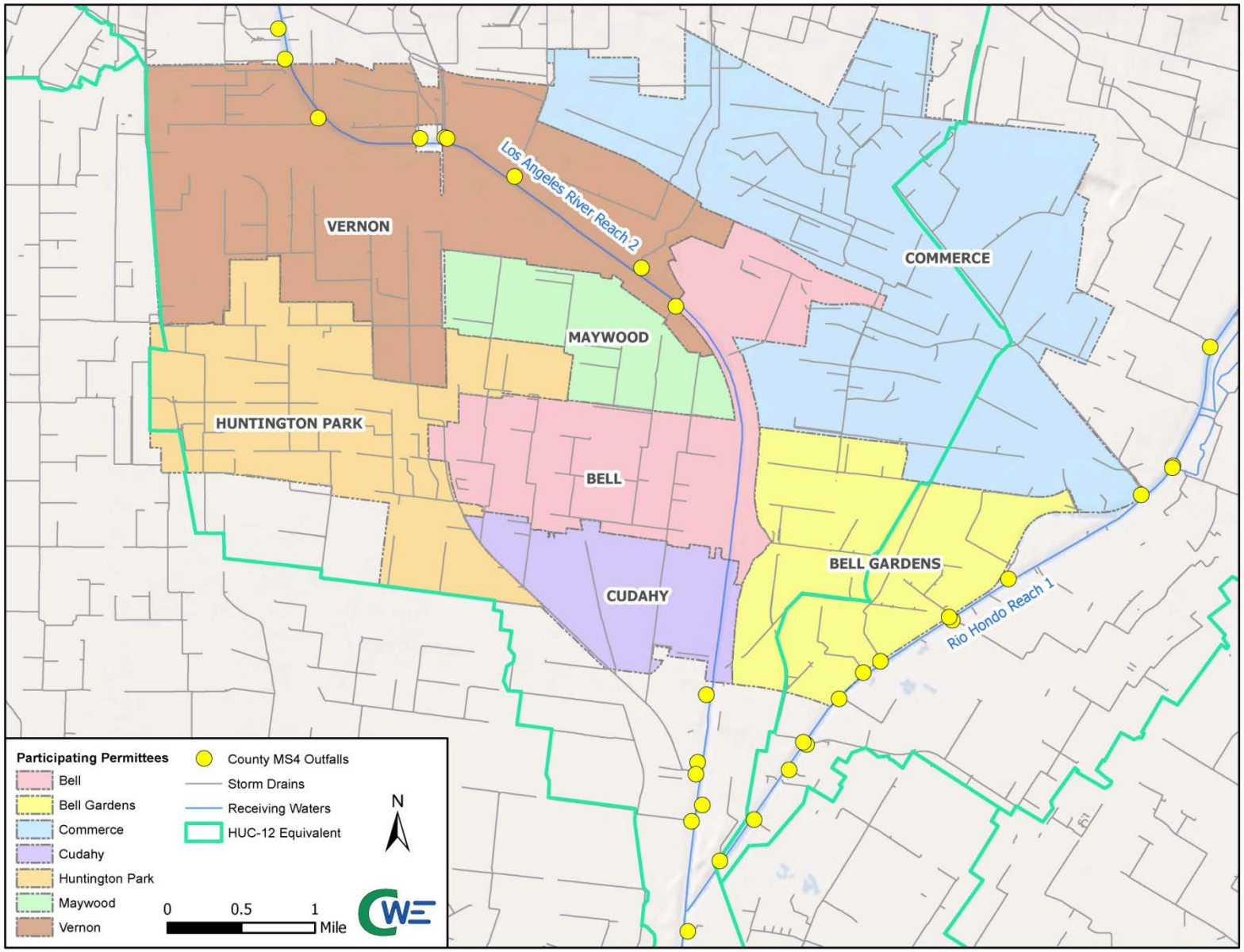


**Figure 5 Participating Permittees with HUC-12, MS4 Drainage System and Outfalls**

## 1.2 Water Quality Priorities

Based on the water quality characterization, the water body–pollutant combinations (WBPCs) are classified into one of three categories, in accordance with Section IV.C.5(a)ii of the Permit. The three categories, as defined by the Permit, are as follows:

- Category 1: WBPC subject to TMDL
- Category 2: WBPC on 2010 Clean Water Act (CWA) 303(d) List
- Category 3: WBPC with RWL exceedances

Water quality priorities are then identified based on the WBPC categories compliance deadlines as outlined in Part VI.C.5 of the MS4 Permit. Water quality priorities, as defined by the Permit, are as follows:

- Priority 1(a) – TMDLs controlling pollutants for which there are WQBELs and/or RWLs with interim or final compliance deadlines within the permit term or TMDL compliance deadlines that have already passed and limitations have not been achieved.
- Priority 1(b) – TMDLs controlling pollutants for which the WQBELs and/or RWLs with interim or final compliance deadlines between September 6, 2012 and October 25, 2017.
- Priority 2 – All other controlling pollutants for which data indicate impairment or exceedances of RWLs in the receiving water and the findings from the source assessment implicates discharges from the MS4 shall be considered the second highest priority.

This categorization process is intended to prioritize WBPCs in order to guide the implementation of structural and institutional best management practices (BMPs) and monitoring activities in the CIMP. Through this process, the Priority 1 WBPC has been identified as nutrients and trash. **Table 2** lists the identified water quality priorities, WBPCs categories, and compliance deadlines for the LAR UR2 WMA.

**Table 2 Identified Water Quality Priorities**

| Priority | Category | Pollutant | Water Body | | Compliance Deadline |
|---|---|---|---|---|---|
| | | | Los Angeles River Reach 2 | Rio Hondo Reach 1 | |
| 1a | 1 | Ammonia ($NH_3$-N) | x | x | 23-Mar-04 |
| | 1 | Nitrate ($NO_3$-N) | x | x | 23-Mar-04 |
| | 1 | Nitrite ($NO_2$-N) | x | x | 23-Mar-04 |
| | 1 | $NO_3$-N+$NO_2$-N | x | x | 23-Mar-04 |
| 1b | 1 | Trash | x | x | September 30, 2016 (effectively 10/1/15) |
| 2 | 1 | *E.coli* Dry-Weather | x | x | March 23, 2022 (Group Interim Single sample/Final WQBEL) |
| | 1 | Copper Dry-Weather | x | x | 11-Jan-24 |
| | 1 | Lead Dry-Weather | x | x | 11-Jan-24 |
| | 1 | Zinc Dry-Weather | | x | 11-Jan-24 |
| | 1 | Copper Wet-Weather | x | x | 11-Jan-28 |
| | 1 | Lead Wet-Weather | x | x | 11-Jan-28 |
| | 1 | Zinc Wet-Weather | x | x | 11-Jan-28 |
| | 1 | Cadmium Wet-Weather | x | x | 11-Jan-28 |
| | 1 | *E.coli* Wet-Weather | x | x | 23-Mar-37 |

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| Table 2 Identified Water Quality Priorities | | | | | |
|---|---|---|---|---|---|
| | | | Water Body | | |
| Priority | Category | Pollutant | Los Angeles River Reach 2 | Rio Hondo Reach 1 | Compliance Deadline |
| | 2 | Oil | x | | N/A |
| | 2 | Coliform Bacteria* | | x | N/A |
| | 2 | Toxicity | | x | N/A |
| | 3 | None | | | N/A |

As part of the adaptive management process, categorization of WBPCs may be adjusted based on data obtained from monitoring, source evaluations, and BMP implementation. Data collected as part of the approved CIMP may result in future Category 3 designations in instances when receiving water limits are exceeded and MS4 discharges are identified as contributing to such exceedances. Under these conditions, the appropriate agencies will adhere to Section VI.C.2.a.iii of the Permit.

Additional details and supporting information for monitoring to address priorities can be found in the WMP.

## 1.3 Total Maximum Daily Load Monitoring Requirements

One of the regulatory mechanisms for planning how to eliminate water quality impairments, especially those associated with the National Pollutant Discharge Elimination System (NPDES) Permit, is the development and implementation of a TMDL, which may be issued by the Regional Board, United States Environmental Protection Agency (USEPA), or proposed by Permittees, for approval by those regulatory agencies. MS4 Permit Attachment O, identifies four TMDLs that affect Reach 2 of the Los Angeles River and the LAR UR2 WMA. These TMDLs, along with their Board resolution number and most recent amendment effective or significant revision dates are:

- Los Angeles River Bacteria TMDL – Resolution 2010-007 and became effective on March 23, 2012
- Los Angeles River and Tributary Metals TMDL – Resolution 2007-014 and became effective on October 29, 2008, and Resolution 2010-003 effective on November 3, 2011
- Los Angeles River Nitrogen Compounds and Related Effects TMDL – Resolution 2003-009 and became effective on March 23, 2004. Site Specific Objectives (SSOs) for Ammonia were approved by the State Water Resources Control Board (SWRCB) June 4, 2013
- Los Angeles River Trash TMDL – adopted Resolution 2007-012 and became effective on September 23, 2008.

The WLAs, RWLs, and WQBELs for these TMDLs are presented and summarized in the subsections below, as well as in Attachment O of the MS4 Permit.

### 1.3.1 Los Angeles River Bacteria TMDL

The Los Angeles River Bacteria TMDL was adopted by the LARWQCB as Resolution 2010-007 and became effective on March 23, 2012. Ambient monitoring, monitoring to assess attainment with WLAs, monitoring to support Load Reduction Strategies (LRS) or alternative compliance strategies, and monitoring to support wet-weather implementation plans are requirements for the Permittees listed in the LAR Bacteria TMDL. A CMP was required for submittal by March 23, 2013 to detail how the Permittees will conduct monitoring including the number and location of sites (at least one per water body covered by the Bacteria TMDL), measurements (e.g., *E. coli*), sample collection methods, and monitoring frequencies.

Attachment O, Section D4 of the 2012 MS4 Permit, presents the monitoring requirements for the Los Angeles River Bacteria TMDL. The TMDL has multiple implementation phases, wet and dry compliance schedules, WLAs expressed as WQBELs and RWLs, and requires the development of a Load Reduction Strategies (LRS). **Table 3** summarizes the final WQBELs and RWLs applicable to the LAR UR2 WMA.

**Table 3 Los Angeles River Bacteria TMDL WQBEL**

| Constituent | Effluent Limitation (MPN or cfu) | | Final Compliance Date | |
|---|---|---|---|---|
| | Daily Maximum | Geometric Mean | Wet Weather | Dry Weather |
| E. coli | 235/100 mL | 126/100 mL | March 23, 2037 | March 23, 2022 |

The interim dry weather WQBELs are group-based and shared among the Permittees within a drainage area. However, they may be distributed based on proportion of drainage area, upon approval of the Regional Board. **Table 4** presents the group interim dry-weather WQBEL for the LAR UR2 WMA.

**Table 4 Grouped Interim Dry Weather Single Sample Bacteria WQBEL**

| River Segment of Tributary | Daily Maximum E. coli Load ($10^9$ MPN/day) | First Phase Compliance Date | Second Phase Compliance Date |
|---|---|---|---|
| Los Angeles River Segment B (Rosecrans to Figueroa) | 518 | March 23, 2022 | September 23 2028 |
| Rio Hondo | 2 | September 23, 2023 | March 23, 2030 |

In addition to WQBELs for MS4 discharges, the Los Angeles River Bacteria TMDL includes a RWL that is attributable to all MS4 NPDES Permittees, including the City of Long Beach and Caltrans. This RWL is assessed as a limit on the number of days, or weeks, per year, where the RWL are not achieved. The final compliance dates, for the annually assessed grouped single sample bacteria RWL, are March 23, 2022 for dry weather and March 23, 2037 for wet weather. These requirements can be found in **Table 5**, while the numeric water quality objective is shown on **Table 6**.

**Table 5 Grouped Final Single Sample Bacteria RWLs**

| Time Period | Annual Allowable Exceedance Days of the Single Sample Objective (days) | |
|---|---|---|
| | Daily Sampling | Weekly Sampling |
| Dry Weather | 5 | 1 |
| Non-HFS[1] Waterbodies Wet Weather | 15 | 2 |
| HFS[1] Waterbodies Wet Weather | 10 (not including HFS days) | 2 (not including HFS days) |

[1] HFS stands for high flow suspension as defined in Chapter 2 of the Basin Plan

**Table 6 Los Angeles River Bacteria TMDL Geometric Mean RWL**

| Constituent | Geometric Mean (MPN or cfu) |
|---|---|
| E. coli | 126/100 mL |

The distinction that these water quality objectives are expressed annually maybe an important distinction, as Permit Part VI.A.13.g states that for some WQBELs that are expressed as annual effluent limitations, such as those for trash, violations may only be assessed annually; however Part VI.C.1.d.(i) states that

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WMPs must "achieve applicable WQBELs in Part VI.E and Attachments L through R pursuant to the corresponding compliance schedules."

### 1.3.2 Los Angeles River and Tributaries Metal TMDL

The Los Angeles River and Tributaries Metals TMDL was adopted by the Regional Board as Resolution 2007-014 and became effective on October 29, 2008. The TMDL assesses compliance based on the load or concentration of several metals in comparison to California Toxic Rule values, during dry and wet weather conditions. Dry weather is defined as days when the maximum daily flow in the Los Angeles River is less than 500 cubic feet per second (cfs) as measured at the Wardlow Street gauge station in Long Beach. Since metal toxicity is correlated to bioavailability, as assessed by water hardness, the permit and TMDL WQBELs values were determined using total to dissolved "translator" values, prepared by the United States Environmental Protection Agency (USEPA), weather, and water body specific hardness data, which results in a relatively significant variability in a WQBEL among the various water body and weather combinations. Local water characteristics, such as organic content, may result in Water Effect Ratios (WERs) and Site Specific Objectives (SSOs) that alter the preliminary toxicity assessment used in developing a TMDL and may change the final numeric WQBELs.

**Table 7** through **Table 10** lists the applicable LAR UR2 WMA final WQBELs, subject to any future basin plan amendments, established by the Los Angeles River and Tributaries Metals TMDL and identified in Attachment O, Section C.2 and C.3 of the MS4 Permit. **Table 7** lists the grouped (shared) dry weather final WQBELs, expressed as total recoverable metals daily loads. Dry weather flows in Rio Hondo Reach 1, have normally been much lower than the TMDL estimate of 0.5 cfs, however TMDL watershed compliance has generally been first assessed based on concentration, rather than load.

**Table 7 Dry Weather Final WQBELs Expressed as Total Recoverable Metals**

| Waterbody | Effluent Limitations Daily Maximum (kg/day) | | |
|---|---|---|---|
| | Copper | Lead | Zinc |
| LA River Reach 2 | WER[1] x 0.53 | WER[1] x 0.33 | -- |
| Rio Hondo Reach 1 | WER[1] x 0.01 | WER[1] x 0.006 | WER[1] x 0.16 |

[1] WER(s) have a default value of 1.0 unless site-specific WER(s) are approved via the Basin Plan Amendment process

Concentration based dry-weather WQBEL applicable to the LAR UR2 WMA are summarized in **Table 8**. Ambient water quality monitoring is implemented through the Los Angeles River Metals TMDL Coordinated Monitoring Program (LAR MTMDL CMP).

**Table 8 Concentration Based Dry Weather Final WQBELs Expressed as Total Recoverable Metals**

| Waterbody | Effluent Limitations Daily Maximum (µg) | | |
|---|---|---|---|
| | Copper | Lead | Zinc |
| LA River Reach 2 | WER[1] x 22 | WER[1] x 11 | -- |
| Rio Hondo Reach 1 | WER[1] x 13 | WER[1] x 5.0 | WER[1] x 131 |

[1] WER(s) have a default value of 1.0 unless site-specific WER(s) are approved via the Basin Plan Amendment process

Load and approximate concentration based wet weather WQBELs applicable to the LAR UR2 WMA are summarized in **Table 9**. Since the TMDL includes both WL and WLAs, and multiple discharge groups, the

WQBEL concentration for MS4 Permittees varies with the volume of runoff measured at Wardlow Street, but the rightmost column is a serviceable first order estimate.

**Table 9 Wet Weather Final WQBEL Expressed as Total Recoverable Metals**

| Constituent | Effluent Limitations Daily Maximum (kg/day) | Approximate Effluent Limitation (µg/L) |
|---|---|---|
| Cadmium | WER[1] x 2.8 x $10^{-9}$ x daily volume (L) - 1.8 | WER[1] x 2.8 |
| Copper | WER[1] x 1.5 x $10^{-8}$ x daily volume (L) - 9.5 | WER[1] x 15 |
| Lead | WER[1] x 5.6 x $10^{-8}$ x daily volume (L) - 3.85 | WER[1] x 56 |
| Zinc | WER[1] x 1.4 x $10^{-7}$ x daily volume (L) - 83 | WER[1] x 140 |

**Table 10** outlines the interim and final Metals TMDL WQBELs schedule which Permittees are expected to comply through the WMP and RAA development process. Since the LAR UR2 WMA is located within Reach 2, it should be noted that the June 29, 2012 Implementation Study, funded by the Permittees, identifies Watershed Control Measures to achieve the interim and final WQBELs. Among the more important measures was State Senate Bill 346, chaptered in September 2010, which called for phased elimination of copper from automotive brake pads. A similar effort to reduce the zinc content in automotive tires has also been initiated, but is many years from being chaptered.

**Table 10 Schedule of Interim and Final WQBELs for Los Angeles River Metals TMDL**

| Deadline | Total Drainage Area Served by the MS4 required to meet the water quality-based effluent limitations (%) | |
|---|---|---|
| | Dry Weather | Wet Weather |
| January 11, 2012 | 50 | 25 |
| January 11, 2020 | 75 | - |
| January 11, 2024 | 100 | 50 |
| January 11, 2028 | 100 | 100 |

Along with most other Los Angeles River Watershed municipalities, the LAR UR2 WMA Permittees supported a study to develop Copper WER and Lead Recalculation SSOs that is with the Regional Board for approval as a Basin Plan Amendment. If the Basin Plan Amendment is approved, the study suggests for copper, in both dry and wet weather, a final WER of 3.971 and 9.691 should be adopted for LAR Reach 2 and the Rio Hondo, respectively. The lead recalculation study suggest an increase in the dry weather WQBEL from 11 to 94 µg/L for LAR Reach 2, while the dry weather WQBEL would rise from 5 to 37 µg/L for the Rio Hondo. In wet weather, the lead WQBEL should increase from 62 to 94 µg/L in both of these water bodies. Favorable translators between total and dissolved metal concentrations were also determined by these studies, but are not explicitly referenced in the MS4 Permit so their eventual impact is unclear at this time. As a result of these studies and legislative efforts, the LAR Metals TMDL has probably moved from a regional to specific outfall priority.

### 1.3.3 Los Angeles River Nitrogen Compounds and Related Effects TMDL

The LAR Nutrients TMDL was adopted by the LARWQCB as Resolution 2003-009 and became effective on March 23, 2004. SSOs for Ammonia were approved by the State Water Resources Control (SWRCB) Board on June 4, 2013. This TMDL has been primarily addressed by Publically Owned Treatment Works (POTW), or Water Recovery Plants (WRP), and MS4 Permittee discharges do not appear to cause or contribute to the exceedance of the applicable RWLs. **Table 11** lists the currently effective TMDL WQBELs, as identified in Attachment O, Section B.2 of the MS4 Permit, which the LAR UR2 WMA Permittee discharges would be expected to comply with.

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| Table 11 LAR Nitrogen Compounds and Related Effects TMDL Final WQBELs | | | | | |
|---|---|---|---|---|---|
| Water Body | $NH_3$-N (mg/L) | | $NO_3$-N (mg/L) | $NO_2$-N (mg/L) | $NO_3$-N+$NO_2$-N (mg/L) |
| | One-hour Average | Thirty-day Average | Thirty-day Average | Thirty-day Average | Thirty-day Average |
| Los Angeles River below LAG | 8.7 | 2.4 | 8.0 | 1.0 | 8.0 |
| Rio Hondo Reach 1 and 2 | 10.1 | 2.3 | 8.0 | 1.0 | 8.0 |

### 1.3.4 Los Angeles River Watershed Trash TMDL

The litigation and implementation history of the Los Angeles River Watershed Trash TMDL is complex, however the current TMDL was adopted by the Los Angeles Regional Water Quality Control Board as Resolution 2007-012, which became effective on September 23, 2008. Simplistically, TMDL compliance is assessed based on Daily Generation Rate (DGR) studies, the remainder of the catchment not protected by Full Capture Certified Devices (FCCDs), or a combination of both metrics. The LAR UR2 WMA Permittees have generally chosen to track the installation of FCCDs, such as Connector Pipe Screens (CPS). **Table 12** and **Table 13** lists (in gallons and pounds) interim and final DGR estimated residual WQBELs from Attachment O Section A.3 of the 2012 MS4 Permit, while the allowable remainder of the catchment unprotected by FCCDs is identified in parentheses within the table header rows.

| Table 12 LAR Watershed Trash TMDL Effluent Limitations per Storm Year (gallons of uncompressed trash) | | | | | | |
|---|---|---|---|---|---|---|
| Permittees | Baseline | 2012 (30%) | 2013 (20%) | 2014 (10%) | 2015 (3.3%) | 2016 (0%) |
| Bell | 16026 | 4808 | 3205 | 1603 | 529 | 0 |
| Bell Gardens | 13500 | 4050 | 2700 | 1350 | 446 | 0 |
| Commerce | 58733 | 17620 | 11747 | 5873 | 1938 | 0 |
| Cudahy | 5935 | 1781 | 1187 | 594 | 196 | 0 |
| Huntington Park | 19159 | 5748 | 3832 | 1916 | 632 | 0 |
| Maywood | 6129 | 1839 | 1226 | 613 | 202 | 0 |
| Vernon | 47203 | 14161 | 9441 | 4720 | 1558 | 0 |

| Table 13 LAR Watershed Trash TMDL Effluent Limitations per Storm Year (pounds of drip dry trash) | | | | | | |
|---|---|---|---|---|---|---|
| Permittees | Baseline | 2012 (30%) | 2013 (20%) | 2014 (10%) | 2015 (3.3%) | 2016 (0%) |
| Bell | 25337 | 7601 | 5067 | 2534 | 836 | 0 |
| Bell Gardens | 23371 | 7011 | 4674 | 2337 | 771 | 0 |
| Commerce | 85481 | 25644 | 17096 | 8548 | 2821 | 0 |
| Cudahy | 10061 | 3018 | 2012 | 1006 | 332 | 0 |
| Huntington Park | 30929 | 9279 | 6186 | 3093 | 1021 | 0 |
| Maywood | 10549 | 3165 | 2110 | 1055 | 348 | 0 |
| Vernon | 66814 | 20044 | 13363 | 6681 | 2205 | 0 |

The final WQBEL of zero trash discharged, or catchment area unprotected, is to be achieved for the 2016 storm year that begins on October 1, 2015 and ends on September 30, 2016. During the current period from, October 1, 2013 to September 30, 2014, 90% of the baseline study trash volume or weight must be captured based on DGR study analysis and only 10% estimated to have been discharged. Alternatively, 90% of a Permittee catchment may be protected by FCCDs, leaving 10% unprotected.

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With the assistance of a grant to the Gateway Water Management Authority (GWMA), over 2,700 FCCDs were installed throughout the LAR UR2 WMA catchment area by December 31, 2011, as summarized in **Table 14**. Installation of FCCDs in the remaining catch basins was not permitted by the Los Angeles County Flood Control District (LACFCD), due to hydraulic constraints, and no additional FCCDs were reported as installed since 2011. Permit Part VI.A.13.g states that for some WQBELs that are expressed as annual effluent limitations, such as those for trash, violations may only be assessed annually; however Part VI.C.1.d.(i) states that WMPs must "achieve applicable WQBELs in Part VI.E and Attachments L through R pursuant to the corresponding compliance schedules." While other implementation strategies can be identified, approximately 337 FCCDs would need to be installed within the LAR UR2 WMA, by October 1, 2015, to comply with the final TMDL WQBEL schedule and requirements for development and approval of a WMP. We consider this TMDL to be a relatively short term high priority for the Permittees.

**Table 14 Installation of FCCDs Within the LAR UR2 WMA by December 31, 2011**

| Permittees | Number of LAR Catch Basins | Number of FCCDs Installed | Percent of Catch Basins Protected |
|---|---|---|---|
| Bell | 259 | 238 | 92% |
| Bell Gardens | 271 | 248 | 92% |
| Commerce | 659 | 545 | 83% |
| Cudahy | 147 | 130 | 88% |
| Huntington Park | 522 | 442 | 85% |
| Maywood | 178 | 151 | 85% |
| Vernon | 902 | 847 | 94% |

## 1.4 Existing and Past Monitoring Programs

A review of existing monitoring programs within the LAR UR2 WMA was conducted to establish and assess the magnitude of water quality challenges. **Figure 6** presents the location of the existing or past monitoring locations near LAR UR2 WMA. The following summaries characterize specific water quality data, pollutant priorities and study findings relevant to the LAR UR2 WMA.

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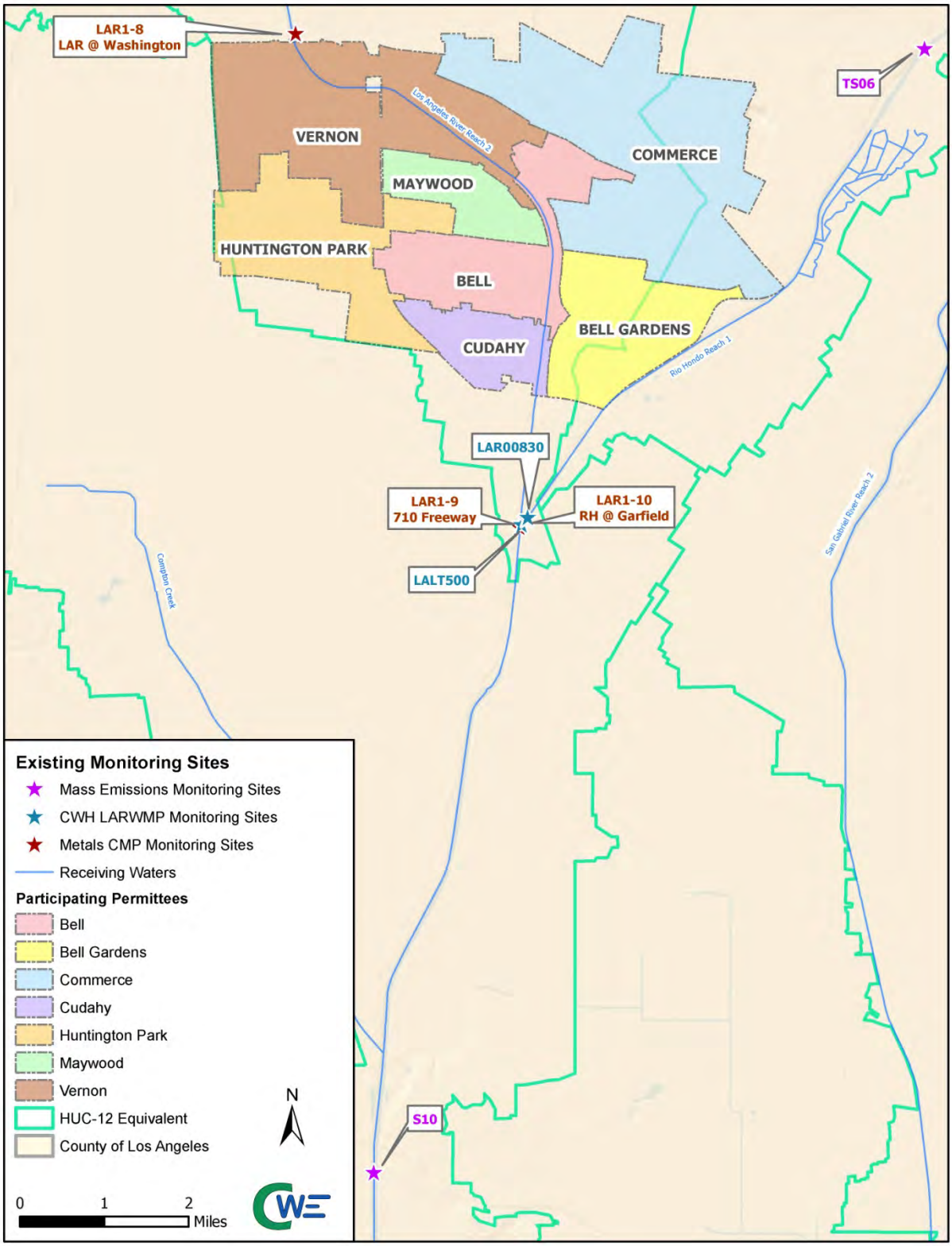


**Figure 6 Existing Monitoring Sites**

### 1.4.1 LA County Annual Stormwater Monitoring (2002-2012)

The Los Angeles County Department of Public Works Annual Stormwater Monitoring Report (LACDPW SMR) presents stormwater quality findings for each July to June storm season. The 2002–2003, 2003–2004, 2005–2006, 2006–2007, 2007–2008, 2008–2009, 2009–2010, 2010-2011 and 2011-2012 monitoring reports addressed the following programs and associated elements:

- Core Monitoring Program – mass emission, tributary, water column toxicity, shoreline, and trash monitoring.
- Regional Monitoring Program – estuary sampling and bioassessment.
- Special studies – New Development Impacts Study in the Santa Clara Watershed, Peak Discharge Impact Study and BMP Effectiveness Study.

**Figure 6** shows the LA River (S10) Core Monitoring program, mass emission station nearest the LAR UR2 WMA, and the Rio Hondo Channel tributary monitoring station (TS06) studied during the 2002-2003 and 2003-2004 storm seasons. The S10 station is located at the existing stream gauge station (i.e., Stream Gauge F319-R) between Willow Street and Wardlow Road in the City of Long Beach and was chosen to avoid tidal influences. The Rio Hondo Channel monitoring station TS06 is located on Beverly Boulevard, downstream of Whittier Narrows dam, at the USGS – U.S. Army Corps of Engineers (ACOE) Stream gage No. 1102300 or E327-R and upstream of the LAR UR2 WMA.

A minimum of three wet weather and two dry weather events were monitored for all sites during each annual storm season. Grab samples were collected and analyzed for conventional pollutants and bacteria during both dry and wet weather events. Additionally, composite samples were collected for both dry and wet weather events and were analyzed for general minerals, metals, semi-volatiles, chlorinated pesticides, organophosphate pesticides, herbicides, PCBs and TSS.

### 1.4.2 Council for Watershed Health: Los Angeles River Watershed Monitoring

The Council for Watershed Health (CWH) coordinates the Los Angeles River Watershed Monitoring Program (LARWMP) to assess Watershed health based on five broad objectives: Are stream conditions improving; Are specific critical site conditions improving; Do discharges meet WQOs; Is it safe to swim; and Are locally caught fish safe to eat. The CWH LARWMP collects water samples and performs bioassessments throughout the watershed using a stratified randomized sampling scheme that separates the watershed into natural, urban and mainstem portions from which random samples may be taken to facilitate comparisons. Sampling occurs annually, during the late spring or early summer, and the water is analyzed for general chemistry (nutrients), metals (total and dissolved), organophosphorus, and pyrethroid pesticides. The CWH responded to our request for monitoring data from 2009 – 2012, which was then reviewed. The most recent monitoring sites near the LAR UR2 WMA are LALT500, located at the LAR and Rio Hondo confluence, and LAR00830, which is located within Rio Hondo. As shown in **Figure 6**, both site are located directly downstream of the LAR UR2 WMA.

### 1.4.3 LA River Metals TMDL Coordinated Monitoring Plan and Ambient Monitoring Submittal (2010-2011, 2011-2012)

At its July 17, 2006 meeting, the Los Angeles River Watershed Management Committee recommended formation of a Los Angeles River Metals TMDL Technical Committee (TC) and tasked the group with preparation of a Coordinated Monitoring Plan (CMP). The CMP includes both ambient (Tier I) and effectiveness monitoring (Tier II). The Tier I ambient monitoring program collects monthly samples at thirteen locations. Tier I monitoring site LAR1-8, LAR1-9, and LAR1-10, shown in **Figure 6**, are located adjacent to the LAR UR2 WMA and the data from these sites have given the LAR UR2 WMA a better understanding of the distribution of metals concentrations in the adjacent WMAs.

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### 1.4.4 LA River Copper Water-Effect Ratio (WER) and Lead Recalculation Site Specific Objectives (SSO) Study

The California Toxic Rule (CTR) and MS4 Permit allows WER SSO, that reflect local water column conditions, to be developed so long as they provide equivalent aquatic life protection to that intended in the "Guidelines for deriving numerical national Water Quality Criteria" (USEPA 1985). If the WER value for a pollutant exceeds 1, site water reduces the toxic effect of that pollutant, while a WER of less than 1, signals that the toxic effect in site water is greater than in laboratory water. Once a WER is approved, ambient acute and chronic CTR criteria are adjusted by multiplication by the locally developed WER value. Similarly, the values in CTR may be recalculated based on new laboratory studies of the toxicity of a pollutant, as occurred for lead. The primary purposes of this study were to determine one or more WER value for copper in the Los Angeles River and some major tributaries, along with the determination of new criteria for lead based on recalculations.

The results suggest that appropriate wet and dry weather copper WERs, for the Rio Hondo and Los Angeles River, would be about 9.691 and 3.971 respectively, resulting in substantially higher, but equally protective, water quality objectives for the watershed Permittees.

## 1.5 CIMP Overview

The CIMP has been designed to provide the information necessary to guide management decisions in addition to providing a means to measure compliance with the Permit and is composed of six elements:

1. Receiving Water Monitoring;
2. Stormwater (SW) Outfall Monitoring;
3. Non-Stormwater (NSW) Outfall Monitoring;
4. New Development/Redevelopment Effectiveness Tracking;
5. Special Studies; and
6. Regional Studies.

The CIMP will address all of the elements above and will be discussed in the following sections below.

### 1.5.1 Receiving Water Monitoring

Receiving water monitoring is intended to assess whether water quality objectives are being achieved, beneficial uses supported, and tracking trends in constituent concentrations over time. One receiving water monitoring site was selected. **Section 2** discusses LAR UR2 WMA's receiving water monitoring program.

### 1.5.2 Stormwater Outfall Monitoring

Stormwater outfall monitoring assesses compliance with municipal action limits (MALs), WQBELs derived from TMDL WLAs, as well as the potential to have caused or contributed exceedances of RWLs derived from TMDL WLAs or receiving water quality objectives.

Majority of storm drains within the LAR URS WMA generally drain south. Seven stormwater outfall monitoring sites were selected. The seven monitoring sites comprise about 79% of the catchment area of the LAR UR2 WMA. The selected sites are representative of a combination of the HUC-12s, jurisdictions, and/or land uses within each catchment area which they have been chosen to represent. A synopsis of each potential outfall's catchment area, along with an analysis of its land use/zoning characteristics is summarized in **Section 4**.

### 1.5.3 Non-Stormwater Outfall Program

To further fulfill the Permit requirements, the MRP requires Permittees to implement a non-stormwater outfall based screening and monitoring program. The Non-Stormwater Outfall Screening and Monitoring Program (Non-Stormwater Program) is focused on non-stormwater discharges to receiving waters from MS4 outfalls.

The Non-Stormwater Program will collect information necessary to identify significant non-stormwater discharges and conduct the screening process and prioritization prior to non-stormwater outfall monitoring. Additional details of the Non-Stormwater Program are presented in **Section 5**.

### 1.5.4 New Development and Redevelopment Effectiveness Tracking

The New Development/Re-Development Effectiveness Tracking is required to identify the information necessary for data management and annual compliance reporting. Each jurisdiction will be individually responsible for tracking Permit requirements, based on their specific operational procedures and internal processes. The LAR UR2 WMA will maintain an informational database record for each new development/re-development project subject to the minimum control measure (MCM) and their adopted Low Impact Development (LID) Ordinance. In addition LAR UR2 WMA will implement a tracking system for new development/re-development projects that have been conditioned for post-construction BMPs. **Section 6** presents the new development and redevelopment effectiveness tracking system for the LAR UR2 WMA.

### 1.5.5 Regional Studies

One Regional Study is identified in the MRP: Southern California Stormwater Monitoring Coalition (SMC), which is overseen by the Southern California Coastal Water Research Project (SCCWRP). The LAR UR2 WMA will participate and support several SMC research studies including the most recent SMC study, bioassessment monitoring. The LAR UR2 WMA will coordinate with SCCWRP and participate in regional studies. **Section 7** presents the regional studies approach for the LAR UR2 WMA.

### 1.5.6 Special Studies

The MRP requires each Permittee to be responsible for conducting special studies required in an effective TMDL or an approved TMDL Monitoring Plan. Special studies options are further discussed in **Section 8**.

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# 2.0 Receiving Water Monitoring Approach

As outlined in the MRP, receiving water monitoring is intended to assess whether water quality objectives are being achieved, beneficial uses supported, and tracking trends in constituent concentrations over time. The requirements in the MRP include receiving water monitoring sites at previously designated County of Los Angeles Department of Public Works (LACDPW) mass emission stations (MES), TMDL receiving water compliance points, and additional receiving water locations representative of the impacts from MS4 discharges.

Through the evaluation of previously-utilized and existing receiving water monitoring sites, as summarized in **Section 1**, no existing MES were located within the LAR UR2 WMA. Additionally, other existing receiving water monitoring sites located in relation to the LAR UR2 WMA are non-existent. The existing downstream MES and other surrounding monitoring site were not considered as they would be ineffective for characterizing local discharges, as they are located further downstream of the LAR UR2 WMA and receive significant tributary flows that are unrepresentative of the group. New receiving water monitoring locations were selected and are summarized in the following sections.

## 2.1 Receiving Water Monitoring Objectives

The objectives of the receiving water monitoring include the following (Part II.E.1 of the MRP):

- Determine whether the receiving water limitations are being achieved;
- Assess trends in pollutant concentrations over time, or during specified conditions; and
- Determine whether the designated beneficial uses are fully supported as determined by water chemistry, as well as aquatic toxicity and bioassessment monitoring.

## 2.3 Receiving Water Monitoring Sites

The primary objective of receiving water monitoring is to assess trends in pollutant concentrations over time, or during specified conditions. To address the receiving water monitoring objectives and WBPCs, one receiving water monitoring site was selected, LAR-UR2-RW, to represent the Los Angeles River, Reach 2. Receiving water monitoring site in the Rio Hondo, Reach 1 was not selected. In lieu of a receiving water monitoring site, for the Rio Hondo, an outfall site was selected in place of a receiving water site. Additional information is summarized below. **Figure 7** presents the approximate locations of the receiving water monitoring site for LAR UR2 WMA. Fact sheets summary for each receiving water monitoring site is presented in **Appendix A**.

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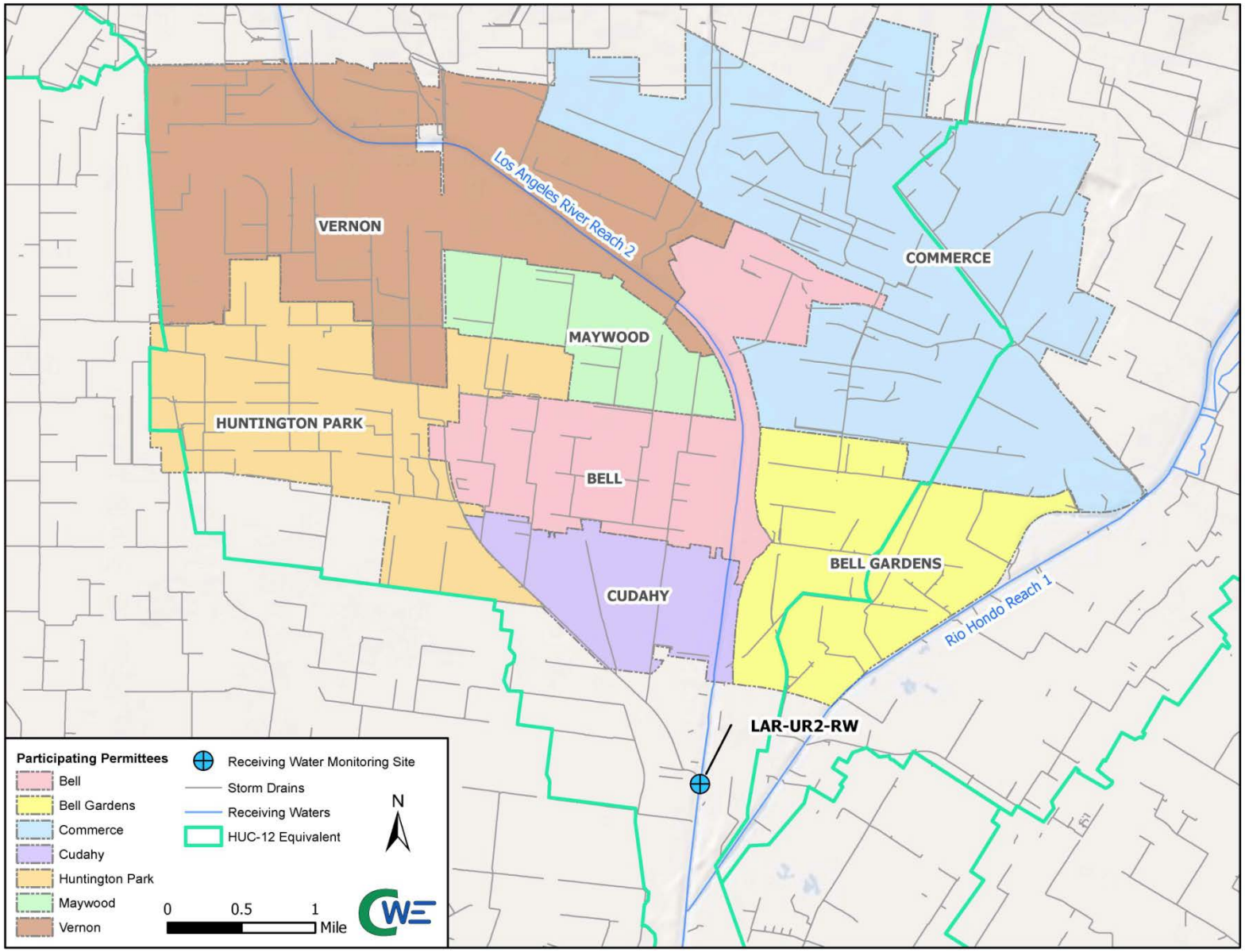


**Figure 7 Receiving Water Monitoring Site Location**

### 2.3.1 Los Angeles River (LAR-UR2-RW)

LAR-UR2-RW will be located in the City of South Gate, near the railroad trestle, or extension of Tweedy Boulevard. Sampling data from this location will assess the impact of LAR UR2 WMA MS4 discharges on the receiving water. LAR-UR2-RW monitoring site is slightly downstream of the LAR UR2 WMA and receives discharges from the City of South Gate, which is not a LAR UR2 WMA member, it is immediately downstream of major outfalls on both the east and west sides of the Los Angeles River that drains from over 60% of the LAR UR2 WMA. Collection of samples will be done utilizing a fixed continuous autosampler.

Upstream receiving water monitoring will be coordinated with the Upper Los Angeles Watershed Group (ULARWG). ULARWG has identified a monitoring site that is located in the City of Los Angeles at Washington Boulevard, just upstream of LAR UR2 WMA. Water quality data at this location would be valuable for assessing the true impact of LAR UR2 WMA discharges on the receiving water. **Table 15** provides a summary of information for LAR-UR2-RW.

**Table 15 LAR-UR2-RW Receiving Water Monitoring Site Summary**

| Site ID | Water Body/Location | LFD | Coordinates | |
|---|---|---|---|---|
| | | | Latitude | Longitude |
| LAR-UR2-RW | Los Angeles River/ near the railroad trestle, or extension of Tweedy Boulevard | No | 33.940550 | -118.174528 |

### 2.3.2 Rio Hondo

Receiving water monitoring site in the Rio Hondo in Reach 1 was not selected for the LAR UR2 WMA. Within the LAR UR2 WMA, the Rio Hondo is located on the entire eastern jurisdictional boundary. Adjacent to the LAR UR2 WMA, flows are completely comingled with runoff from Lower Los Angeles River Watershed (LLRW) group's cities of Pico Rivera and Downey. The discharge from these cities would confound the assessment of receiving water quality for the LAR UR2 WMA. The Los Angeles River Metals TMDL CMP has demonstrated that during dry-weather there is normally no dry-weather flow present in the Rio Hondo. During wet-weather, flows in this area are primarily derived from upstream areas which would need to assess their own receiving water quality. In lieu of selecting a receiving water monitoring site, the group has selected an outfall to monitor the discharges rather than receiving water conditions in the Rio Hondo. Stormwater outfall monitoring site, LAR-UR2-RHO, is representative of the LAR UR2 WMA Rio Hondo catchment, allowing direct water quality and pollutant load assessments. LAR-UR2-RHO encompasses about 74% of the total LAR UR2 WMA Rio Hondo catchment area. LAR-UR2-RHO is discussed further in **Section 4.2.1.**

## 2.4 TMDL Monitoring

TMDLs monitoring requirements, as discussed in **Section 1**, within the LAR UR2 WMA are as follows:

- Los Angeles River Bacteria TMDL – Resolution 2010-007 and became effective on March 23, 2012
- Los Angeles River and Tributary Metals TMDL – Resolution 2007-014 and became effective on October 29, 2008, and Resolution 2010-003 effective on November 3, 2011
- Los Angeles River Nitrogen Compounds and Related Effects TMDL – Resolution 2003-009 and became effective on March 23, 2004. Site Specific Objectives (SSOs) for Ammonia were approved by the State Water Resources Control Board (SWRCB) June 4, 2013
- Los Angeles River Trash TMDL – adopted Resolution 2007-012 and became effective on September 23, 2008.

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To satisfy TMDL monitoring requirements, LAR UR2 WMA will monitoring each specific TMDL constituents at all proposed receiving water, stormwater outfall-based and non-stormwater outfall-based monitoring sites. Additional monitoring requirements are summarized in the sections below.

### 2.4.1 Los Angeles River Bacteria TMDL

The LAR UR2 WMA is in the process of developing and submitting a Load Reduction Strategy (LRS) plan. Submittal of this plan will be separate from the CIMP. Until the LRS has been developed and approved by the Regional Board, LAR UR2 WMA will commence monitoring for *E. coli* at the proposed monitoring sites and frequency for each CIMP monitoring program (Receiving Water, Stormwater Outfall and Non-stormwater outfall).

### 2.4.2 Los Angeles River and Tributary Metals TMDL

The existing Los Angeles River Metals TMDL Coordinated Monitoring Plan (CMP) is expected to be replaced by the incoming proposed CIMPs and IMPs, pending Regional Board Approval. Currently, the Metals CMP includes a three-tiered assessment of jurisdictional progress towards attainment of wet and dry weather water quality objectives. Three Tier I monitoring sites, near but not within the LAR UR2 WMA, are monitored monthly as grab sample. One site is located directly above the City of Vernon. Two other Tier I monitoring sites are located immediately above the confluence of the Rio Hondo and Los Angeles River. These sites receive runoff from, and are about one and a half miles downstream of, the LAR UR2 WMA.

The LAR UR2 WMA will continue to participate and cooperate in the CMP. Prior to the end of the CMP, LAR UR2 WMA will initiate Los Angeles River and Tributary Metals TMDL monitoring at the monitoring locations and frequency proposed in this CIMP.

### 2.4.3 Los Angeles River Nitrogen Compounds and Related Effects TMDL

Outside of POTW or WRP, monitoring requirements for the Los Angeles River Nitrogen Compounds and Related Effects TMDL were not identified. To meet the TMDL monitoring requirements, the LAR UR2 WMA will monitoring for these listed TMDL constituents per the CIMP monitoring sites and frequencies.

### 2.4.4 Los Angeles River Trash TMDL

Los Angeles River Trash TMDL does not require monitoring, and the LAR UR2 WMA is not required to conduct any type of monitoring if it is complying with the WLAs through the implementation of BMPs. Each individual LAR UR2 WMA permittees have submitted compliance strategy through the development of BMP installation schedules, based on the DGR studies. To show compliance, a progress report based on installation of structural BMPs, such as full capture or partial capture systems, institutional controls, or any BMPs, is to be included in each individual LAR UR2 WMA permittees Annual Report.

## 2.5 Monitored Parameters and Frequency

Each constituent required for monitoring by the MRP is addressed by the receiving water monitoring site LAR-UR2-RW. Wet- and dry-weather monitoring frequency, parameters, and duration will be addressed in the following sections. Parameters for monitoring were based on the water quality priorities, as discussed in **Section 1.2**. Additional analytical and monitoring procedures are presented in the Generic Quality Assurance Project Program (QAPP) Plan in **Appendix B**.

### 2.5.1 Wet-weather

For receiving water monitoring within LAR UR2 WMA, wet-weather will be defined as when the flow within the receiving water is at least 20 percent greater than the base flow. Wet-weather samples will be collected using a fixed continues autosampler and sampled three times a year for all parameters except for aquatic toxicity which will be performed twice a year, per Part VI.C.1.a of the MRP. Wet-weather monitoring will target the first significant rain event of the storm year (July 1 to June 30) with a predicted rainfall of at least 0.25 inch at a seventy percent probability of rain fall at least 24 hours prior to the event start time. LAR UR2 WMA will target at least two subsequent wet-weather events that forecast sufficient rainfall and runoff. Sampling events will be separated by a minimum of three day of dry conditions (less than 0.1 inch of rain each day). Wet-weather receiving water monitoring will be performed in a close coordination with stormwater outfall monitoring to be reflective of potential impacts from MS4 discharges. Parameters to be collected and sampling frequency to meet to the receiving water monitoring requirements of the MPR are summarized in **Table 16**. Wet-weather receiving water monitoring will be conducted for the duration of the MS4 permit.

### 2.5.1 Dry-weather

Dry-weather, for LAR UR2 WMA receiving water monitoring, will be defined as when the flow is less than 20 percent greater than the base flow. Dry-weather receiving water monitoring will be conducted two times per year for all parameters except aquatic toxicity, which will be monitored once per year, as outlined in Part VI.D.1.a of the MRP. A summary of constituents and monitoring frequency for the receiving water monitoring sites is presented in **Table 16**. Dry-weather receiving water monitoring will be conducted for the duration of the MS4 permit.

**Table 16 Summary of Constituents to be Monitored at Receiving Water Monitoring Sites and Annual Frequency (wet/dry)(1)**

| Constituents | Site ID<br>LAR-UR2-RW |
|---|---|
| Flow and field parameters(2) | 3/2 |
| Pollutants identified in Table E-2 of the MRP(3) | 1(4)/1(4) |
| Aquatic Toxicity and<br>Toxicity Identification Evaluation (TIE) | 2/1 |
| *E. coli* | 3/2(5) |
| Cadmium(6) | 3/2 |
| Copper(6) | |
| Lead(6) | |
| Zinc(6) | |
| Ammonia | |
| Nitrate - N | |
| Nitrite - N | |
| Nitrate-N + Nitrite-N | |
| Oil | |

1. Annual frequency listed as number of wet-weather/dry-weather events per year, respectively (e.g., 3/2 signifies three wet weather and two dry weather events per year).
2. Field parameters are defined as DO, pH, temperature, and specific conductivity.
3. All pollutants identified in Table E-2 of the MRP not already explicitly addressed by monitoring at this site. An analysis will be conducted to determine which Table E-2 pollutants potentially could not be monitored during the first year due to previous results indicating that the pollutant was either never detected or has never exceeded a water quality objective at this site.
4. Monitoring frequency only applies during the first year of monitoring. For pollutants identified in Table E-2 of the MRP that are not detected at the Method Detection Limit (MDL) or the result is below the lowest applicable water quality objective, additional monitoring will not be conducted (i.e., the monitoring frequency will become 0/0). For pollutants detected above the lowest applicable water quality objective, future monitoring will be conducted at the

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frequency specified in the MRP (i.e., the monitoring frequency will become 3/2).

5. *E. coli* will be monitored at each receiving water event. Full implementation of LAR Bacteria TMDL monitoring will be addressed in a separate plan.
6. TSS and Metals will be monitored when metals are monitored.

# 3.0 GIS Database

To meet the requirements of Part VII of the MRP, a map(s) and/or database of the MS4 storm drains, channels, and outfalls must be submitted with the CIMP and include the following information (Part VII.A of the MRP):

1. Surface water bodies within the Permittee(s) jurisdiction
2. Sub-watershed (HUC-12) boundaries
3. Land use overlay
4. Effective Impervious Area (EIA) overlay (if available)
5. Jurisdictional boundaries
6. The location and length of all open channel and underground pipes 18 inches in diameter or greater (with the exception of catch basin connector pipes)
7. The location of all dry-weather diversions
8. The location of all major MS4 outfalls within the Permittee's jurisdictional boundary. Each major outfall shall be assigned an alphanumeric identifier, which must be noted on the map
9. Notation of outfalls with significant NSW discharges (to be updated annually)
10. Storm drain outfall catchment areas for each major outfall within the Permittee(s) jurisdiction
11. Each mapped MS4 outfall shall be linked to a database containing descriptive and monitoring data associated with the outfall. The data shall include:

    a. Ownership
    b. Coordinates
    c. Physical description
    d. Photographs of the outfall, where possible, to provide baseline information to track operation and maintenance needs over time
    e. Determination of whether the outfall conveys significant NSW discharges
    f. Stormwater and NSW monitoring data

Attachment A of the MS4 Permit defines major MS4 outfall (or "major outfall") as a municipal separate storm sewer outfall that discharges from a single pipe with an inside diameter of 36 inches or more or its equivalent (discharge from a single conveyance other than circular pipe which is associated with a drainage area of more than 50 acres); or for municipal separate storm sewers that receive stormwater from lands zoned for industrial activity (based on comprehensive zoning plans or the equivalent), an outfall that discharges from a single pipe with an inside diameter of 12 inches or more or from its equivalent (discharge from other than a circular pipe associated with a drainage area of 2 acres or more) (40 CFR § 122.26(b)(5)).

Available Geographic Information System (GIS) data were reviewed to determine whether components 1 through 11.f from the list specified in the MRP were available for submittal. Based on the review of the GIS data, components 1 through 11.f from the list specified in the MRP were divided into available information or pending information and schedule for completion, **Section 3.2** and **3.3**, respectively.

## 3.1 Program Objectives

Each year, storm drains, channels, outfalls map and associated database for the LAR UR2 WMA are required to be updated to incorporate the most recent characterization data for outfalls with significant non-stormwater discharge.

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## 3.2 Available Information

The LAR UR2 WMA reviewed Part VII.A of the MRP and gathered the available information for the group. The following data are readily available for submittal as a map and/or in a database (note, the numbering corresponds to the item number in the Permit list):

1. Surface water bodies within the Permittee(s) jurisdiction
2. Sub-watershed (HUC-12) boundaries
3. Land use overlay
5. Jurisdictional boundaries
6. The location and length of all open channel and underground pipes 18 inches in diameter or greater (with the exception of catch basin connector pipes)
7. The location of all dry-weather diversions
8. The location of all major MS4 outfalls within the Permittee's jurisdictional boundary
11. Each mapped MS4 outfall shall be linked to a database containing descriptive and monitoring data associated with the outfall. The data shall include:

    b. Coordinates
    c. Physical description
    d. Photographs of the outfall, where possible, to provide baseline information to track operation and maintenance needs over time
    f. Stormwater and NSW monitoring data.

In addition, some of the following data are readily available but have data gaps that will be addressed through review of existing information or will be generated based on additional data processing (i.e., Non-Stormwater Outfall Screening and Inventory) by the LAR UR2 WMA Permittees:

10. Storm drain outfall catchment areas for each major outfall within the Permittee(s) jurisdiction
11. Each mapped MS4 outfall shall be linked to a database containing descriptive and monitoring data associated with the outfall. The data shall include:

    a. Ownership

**Figure 2** through **Figure 5** presents the available database information, listed above, for the LAR UR2 WMA.

## 3.3 PENDING INFORMATION AND SCHEDULE FOR COMPLETION

From the review, the following data are not currently available for submittal as a map and/or in a database, but scheduled for completion:

4. Effective Impervious Area (EIA) overlay
9. Notation of outfalls with significant NSW discharges (to be updated annually)
11. Each mapped MS4 outfall shall be linked to a database containing descriptive and monitoring data associated with the outfall. The data shall include:

    e. Determination of whether the outfall conveys significant NSW discharges

Completion of the data, listed above, is in progress and will be collected through the implementation of the CIMP, specifically the Non-Stormwater Outfall Monitoring Program.

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# 4.0 Stormwater Outfall Monitoring Approach

Stormwater outfall monitoring assesses compliance with municipal action limits (MALs), WQBELs derived from TMDL WLAs, as well as the potential to have caused or contributed exceedances of RWLs derived from TMDL WLAs or receiving water quality objectives. The majority of LAR UR2 WMA storm drains generally drains south through multiple jurisdictions. An analysis of land use per HUC-12, drainage area and LAR UR2 WMA was conducted for each monitoring site.

## 4.1 Program Objectives

As outlined in the MRP (Part VIII.A of the MRP), stormwater discharges from the MS4 shall be monitored at outfalls and/or alternative access points such as manholes, or in channels representative of the land uses within the Permittee's jurisdiction to support meeting the three objectives of the stormwater outfall based monitoring program:

1. Determine the quality of a Permittee's discharge relative to municipal action levels, as described in Attachment G of the MS4 Permit;
2. Determine whether a Permittee's discharge is in compliance with applicable stormwater WQBELs derived from TMDL WLAs; and
3. Determine whether a Permittee's discharge causes or contributes to an exceedance of receiving water limitations.

Each stormwater outfall monitoring site was evaluated and assessed on how representative they are of the surrounding land use of the LAR UR2 WMA, jurisdictions, and the HUC-12. Each zoning category provided by the RAA guidance manual was fit into one of the following eight land use categories:

- Agricultural;
- Industrial;
- Single Family Residential;
- Open Space
- Commercial;
- Education;
- Multi-Family Residential; and
- Transportation

## 4.2 Stormwater Outfall Monitoring Sites

The Permit provides monitoring site "default" requirements, one site per HUC-12 per jurisdiction, for achieving stormwater outfall monitoring objectives. The MS4 Permit also allows for alternative approach to increase the cost efficiency and effectiveness of the monitoring program. The LAR UR2 WMA has chosen an alternative to the default Permit approach. Seven stormwater outfall monitoring sites, as shown in **Figure 8**, were selected as part of the alternative approach. The seven monitoring sites comprise about 79% of the catchment area of the LAR UR2 WMA. The selected sites are representative of a combination of the HUC-12s, jurisdictions, and/or land uses within each drainage area which they have been chosen to represent. LAR UR2 WMA Stormwater outfall samples will be collected upstream of the outfalls at manholes, utilizing a portable autosampler. One stormwater outfall monitoring site (LAR-UR2-RHO) will be monitored at every wet-weather event and the remaining six stormwater outfall monitoring sites will be monitored on a rotation basis, where one site to the north and one site to the south will be monitored per storm event. A synopsis of each potential outfall catchment area, along with an analysis of its land use/zoning characteristics are summarized below. **Table 17** provides a summary for the seven stormwater outfall monitoring sites.

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| Table 17 Stormwater Outfall Monitoring Site Summary | | | | | | |
|---|---|---|---|---|---|---|
| **Outfall ID** | **Tributary HUC-12 Area** | **Jurisdiction Where Site is Located** | **Jurisdictions Draining to the Site** | **Facility** | **Latitude** | **Longitude** |
| *Fixed Site* | | | | | | |
| LAR-UR2-RHO | Alhambra Wash - Rio Hondo | Bell Gardens | Bell Gardens, Commerce | Manhole | 33.959003 | -118.154614 |
| *Rotating Sites* | | | | | | |
| LAR-UR2-DRO | Chavez Ravine - Los Angeles River | Vernon | Vernon | Manhole | 34.008539 | -118.205166 |
| LAR-UR2-EO | Chavez Ravine - Los Angeles River | Bell Gardens | Bell, Bell Gardens, Commerce, Vernon | Outfall | 33.956663 | -118.169102 |
| LAR-UR2-NO | Chavez Ravine - Los Angeles River | Vernon | Bell, Commerce, Vernon | Manhole | 33.996050 | -118.180775 |
| LAR-UR2-WO | Chavez Ravine - Los Angeles River | Cudahy | Bell, Cudahy, Huntington Park, Maywood, Vernon | Manhole | 33.955146 | -118.179975 |
| LAR-UR2-NVO | Chavez Ravine - Los Angeles River | Vernon | Commerce, Vernon | Manhole | 34.007733 | -118.194464 |
| LAR-UR2-FWO | Chavez Ravine - Los Angeles River | Cudahy | Bell, Cudahy, Huntington Park, Maywood, Vernon | Manhole | 33.956591 | -118.186050 |

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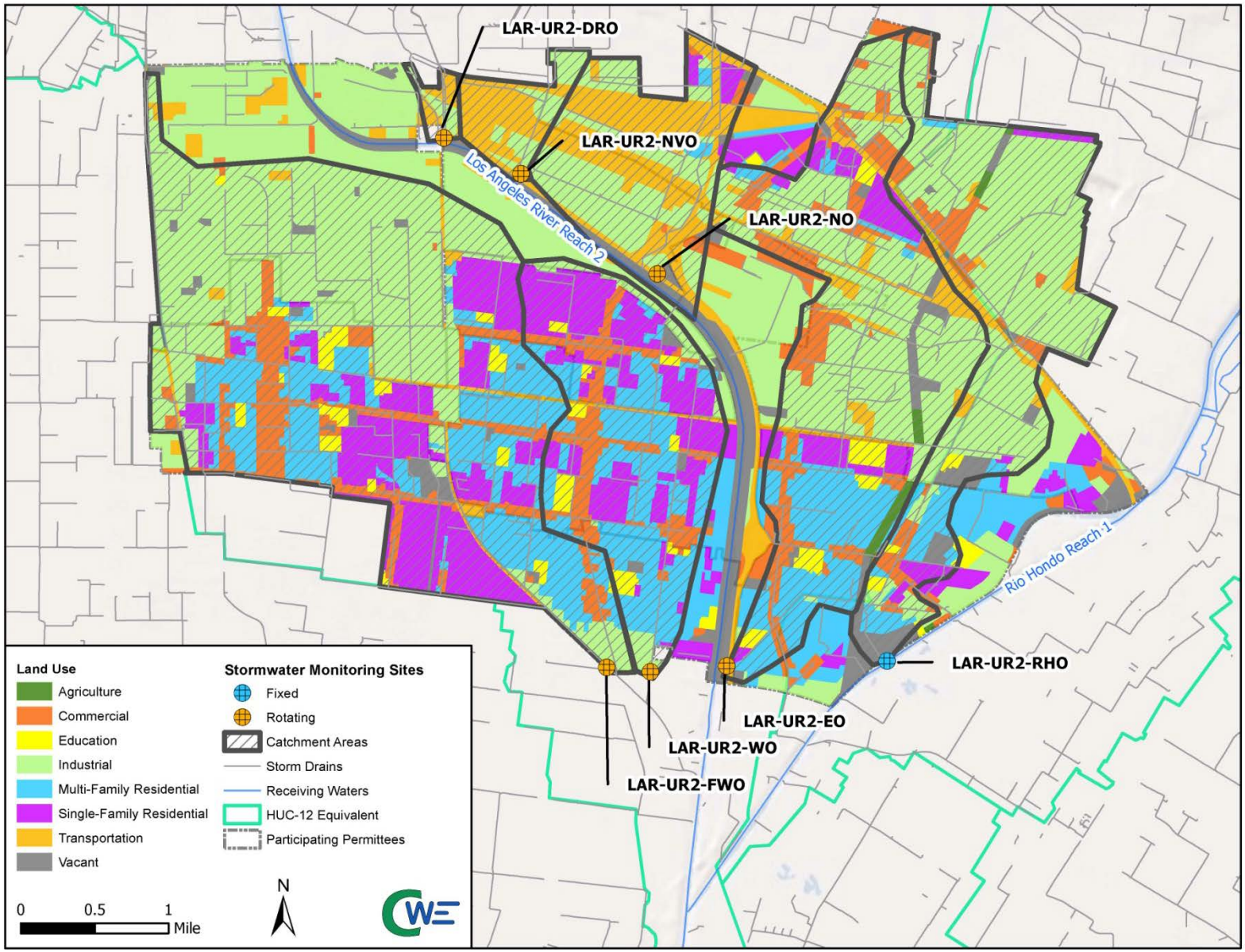


**Figure 8 Stormwater Outfall Monitoring Sites Location**

### 4.2.1 LAR-UR2-RHO

As discussed in **Section 2.3.2**, receiving water monitoring in the Rio Hondo will not be conducted. Alternatively, stormwater outfall monitoring site LAR-UR2-RHO, illustrated in **Figure 9**, has been selected to represent the MS4 discharge to the Rio Hondo. LAR-UR2-RHO receives runoff from the Rio Hondo catchment area, which encompasses about 71% of the total LAR UR2 WMA Rio Hondo tributary area. This outfall is classified as the WMA's "fixed outfall site" which means that it will be sampled at every wet-weather event.

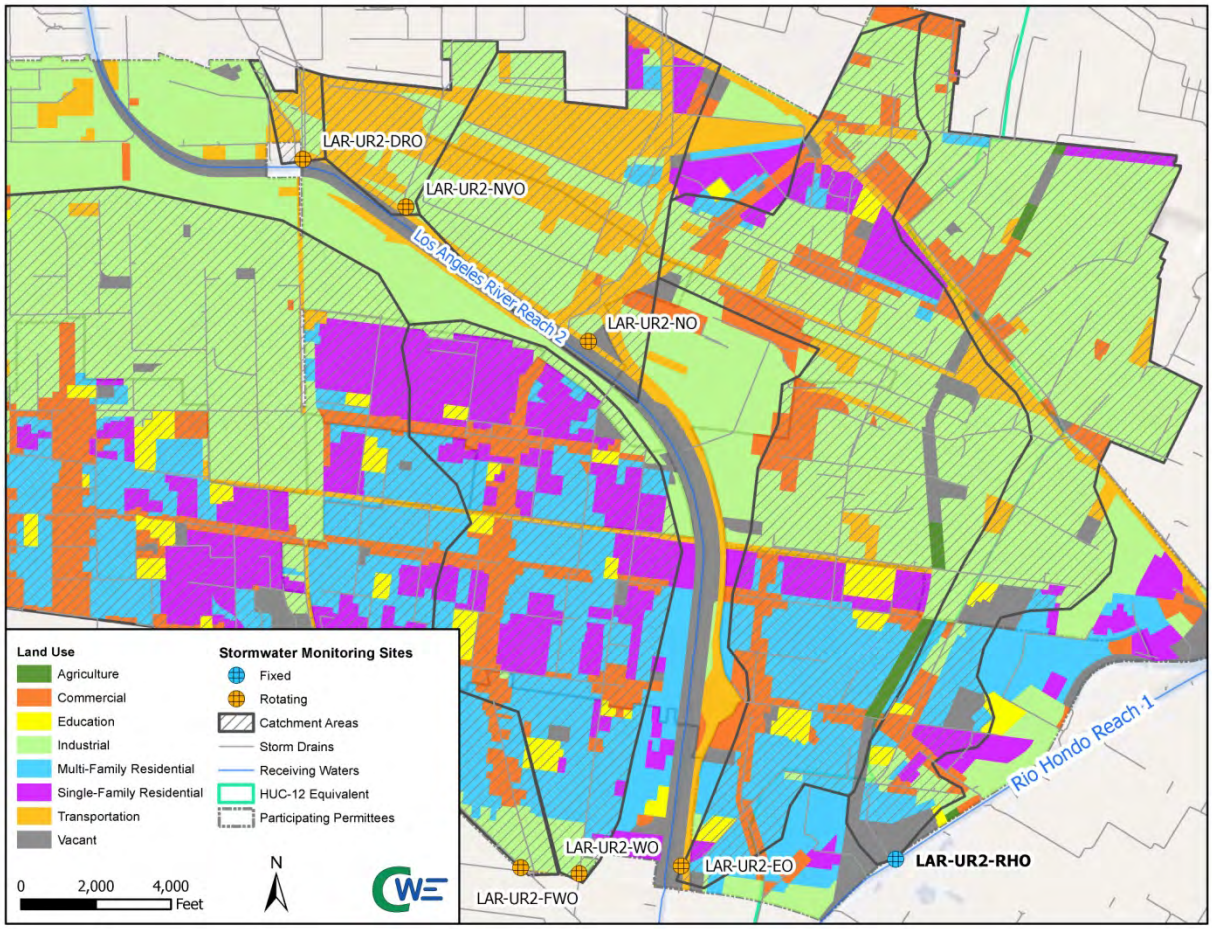


**Figure 9 LAR-UR2-RHO Stormwater Outfall Monitoring Site**

Samples for LAR-UR2-RHO will be collected at the BI0539 – Line A – Bell Gardens storm drain in a manhole site located in a parking lot of John Anson Ford Park near the intersection of Park Lane and Gillard Avenue in the City of Bell Gardens. LAR-UR2-RHO monitoring site receives runoff from the Cities of Bell Gardens and Commerce, and discharges into the Rio Hondo. In addition to representing MS4 discharge to the Rio Hondo, LAR-UR2-RHO was selected to represent the Alhambra Wash - Rio Hondo HUC-12 portion within LAR UR2 WMA. An analysis was conducted, presented in **Table 18**, to determine the land use composition of the catchment area to monitoring site LAR-UR2-RHO as well as the land use composition of the portion of LAR UR2 WMA tributary to the Rio Hondo. The comparison shows that samples collected at the monitoring site would be representative of the total LAR UR2 WMA draining to the Rio Hondo.

| Table 18 LAR-UR2-RHO Tributary Area | | |
|---|---|---|
| **Land Use Designation** | **% Catchment total** | **% of LAR UR2 WMA** |
| Commercial | 24.14% | 12.46% |
| Industrial | 55.25% | 49.29% |
| HDSFR | 8.23% | 21.49% |
| MFR | 1.11% | 5.83% |
| Agriculture | 0% | 0.01% |
| Educational | 0% | 0.35% |
| Transportation | 0% | 0.31% |
| Open Space | 11.28% | 10.26% |

Based on the findings from the comparative analysis, there is no necessity or value in conducting receiving water monitoring in the Rio Hondo for the LAR UR2 WMA. Under these circumstances, the most definitive source of LAR UR2 WMA water quality data to the Rio Hondo receiving water would be the data provided by the LAR-UR2-RHO stormwater outfall monitoring site. A summary of LAR-UR2-RHO stormwater monitoring sites information is presented in **Table 19**.

| Table 19 LAR-UR2-RHO Stormwater Outfall Monitoring Site Summary | | | | | | |
|---|---|---|---|---|---|---|
| **Outfall ID** | **Tributary HUC-12 Area** | **Jurisdiction Where Site is Located** | **Jurisdictions Draining to the Site** | **Facility** | **Latitude** | **Longitude** |
| LAR-UR2-RHO | Alhambra Wash - Rio Hondo | Bell Gardens | Bell Gardens, Commerce | Manhole | 33.959003 | -118.154614 |

### 4.2.2 Rotating Stormwater Outfall Monitoring Sites

LAR UR2 WMA has decided to rotate monitoring between the six stormwater outfall sites that are representative of the entire watershed. The six rotating stormwater outfall sites will be sampled in conjunction with the receiving water site and the "fixed" LAR-UR2-RHO stormwater outfall monitoring site. Two stormwater outfall monitoring site will be monitored at each storm event, where one site to the north and one site to the south will be monitored. Each group of monitoring sites will be monitored once per year and will rotate between the first, second and third storm event. **Table 20** presents the preliminary rotation schedule for the six stormwater outfall monitoring sites.

| Table 20 Stormwater Outfall Monitoring Rotation Schedule | | | | | | |
|---|---|---|---|---|---|---|
| **Outfall ID** | **Storm Year** | | | | | |
| | **2014-2015** | **2015-2016** | **2016-2017** | **2017-2018** | **2018-2019** | **2019-2020** |
| *Group 1* | | | | | | |
| LAR-UR2-DRO | 1 | 2 | 3 | 1 | 2 | 3 |
| LAR-UR2-EO | | | | | | |
| *Group 2* | | | | | | |
| LAR-UR2-NO | 2 | 3 | 1 | 2 | 3 | 1 |
| LAR-UR2-WO | | | | | | |
| *Group 3* | | | | | | |
| LAR-UR2-NVO | 3 | 1 | 2 | 3 | 1 | 2 |
| LAR-UR2-FWO | | | | | | |

1 - First storm event
2 - Second storm event
3 - Third storm event

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#### *4.2.3.1 LAR-UR2-DRO (Downey Road)*

The stormwater outfall monitoring site LAR-UR2-DRO, presented in **Figure 10**, receives runoff from the BI5206 – Los Angeles storm drain, which primarily drains from the non WMA group member, City of Los Angeles, and a small portion of the City of Vernon. Samples for LAR-UR2-DRO will be collected, utilizing portable autosamplers, in a manhole located on the sidewalk on the southwest corner of Bandini Boulvard and South Downey Road. Stormwater outfall monitoring site LAR-UR2-DRO is located in the Chavez Ravine - Los Angeles River HUC-12 area.

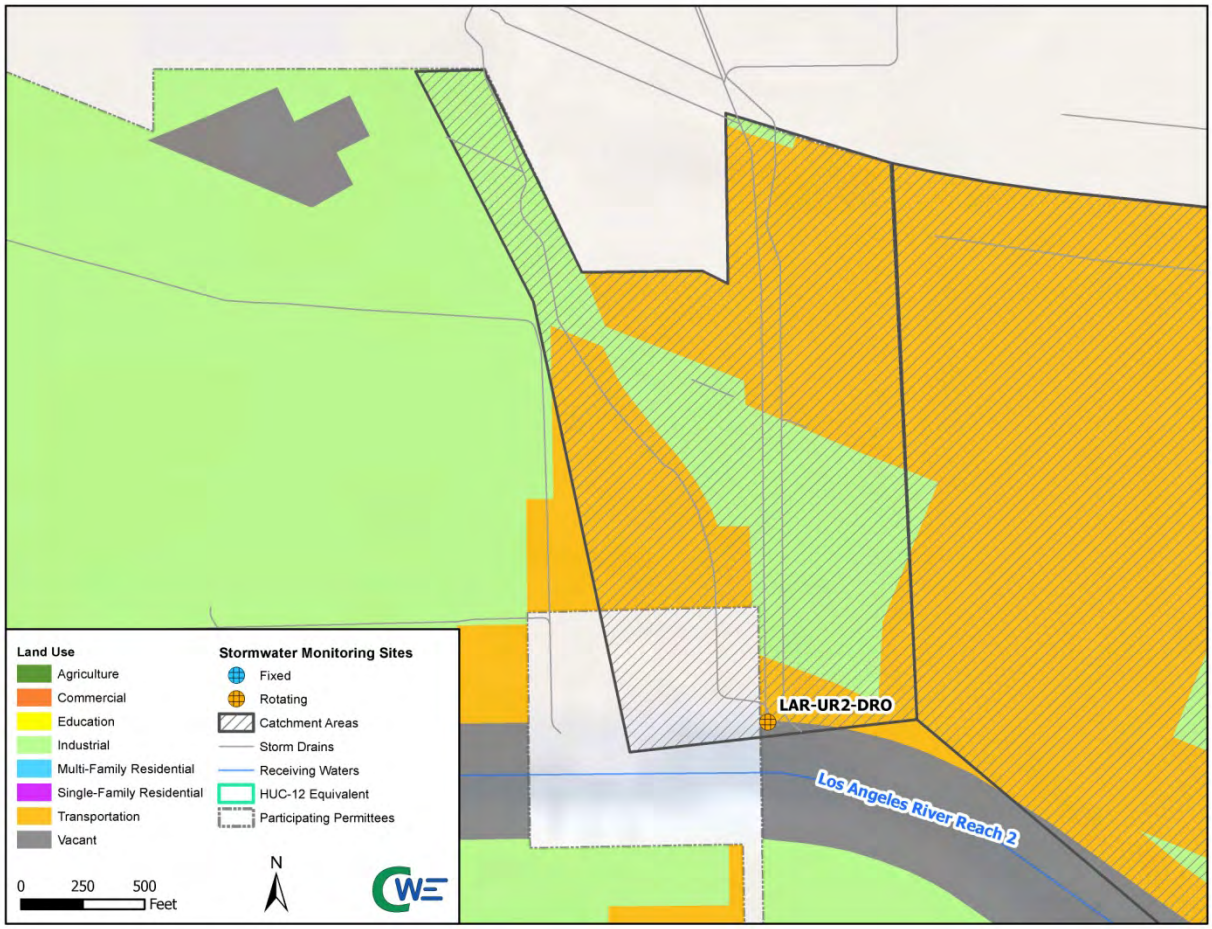


**Figure 10 LAR-UR2-DRO Stormwater Outfall Monitoring Site**

An analysis comparing the land use composition within the LAR UR2 WMA portion of the LAR-UR2-DRO catchment area, to that of the greater LAR UR2 WMA, indicates the LAR-UR2-DRO area is not representative of the LAR UR2 WMA or the City of Vernon. However, from the comparative analysis, stormwater outfall monitoring site LAR-UR2-DRO is representative entirely of the industrial land use category. Based on these findings, water quality data from LAR-UR2-DRO will be used to represent the findings for the industrial land use category in the LAR UR2 WMA. **Table 21** presents the land use comparative analysis of the LAR-UR2-DRO tributary area. A summary of stormwater outfall monitoring site LAR-UR2-DRO is found in **Table 22**.

| Table 21 LAR-UR2-DRO Tributary Area | | | |
|---|---|---|---|
| **Land Use Designation** | **% Catchment Area** | **% Vernon** | **% of LAR UR2 WMA** |
| Commercial | 0% | 5.62% | 12.46% |
| Industrial | 100.00% | 87.66% | 49.29% |
| HDSFR | 0% | 0% | 21.49% |
| MFR | 0% | 0% | 5.83% |
| Agriculture | 0% | 0% | 0.01% |
| Education | 0% | 0% | 0.35% |
| Transportation | 0% | 0% | 0.31% |
| Open Space | 0% | 6.71% | 10.26% |

HDSFR = High Density Single Family Residential

MFR = Multi-Family Residential/Mixed Residential

| Table 22 LAR-UR2-DRO Stormwater Outfall Monitoring Site Summary | | | | | | |
|---|---|---|---|---|---|---|
| **Outfall ID** | **Tributary HUC-12 Area** | **Jurisdiction Where Site is Located** | **Jurisdictions Draining to the Site** | **Facility** | **Latitude** | **Longitude** |
| LAR-UR2-DRO | Chavez Ravine - Los Angeles River | Vernon | Vernon | Manhole | 34.008539 | -118.205166 |

#### *4.2.2.2 LAR-UR2-EO (East Los Angeles River)*

Stormwater outfall monitoring site LAR-UR2-EO receives runoff from the DDI 23 storm drain, which receives drainage from the Cities of Bell, Bell Gardens, Commerce and a small portion of Vernon. Samples for LAR-UR2-EO will be collected over the outfall, which can be accessed in the channel near 8287 Jaboneria Road in the City of Bell Gardens. LAR UR2 WMA will install portable autosamples over the outfall prior to the storm event to collect the samples for LAR-UR2-EO. Monitoring site LAR-UR2-EO is located in the Chavez Ravine - Los Angeles River HUC-12 area.

**Table 23** presents an analysis comparing the land use composition within the LAR-UR2-EO catchment area, to that of the whole LAR UR2 WMA. From the analysis, drainage from LAR-UR2-EO is representative of the LAR UR2 WMA as a whole. Land use categories commercial, industrial, high density single family residential as well as open space are well represented in the LAR-UR2-EO catchment area.

| Table 23 LAR-UR2-EO Tributary Area | | |
|---|---|---|
| **Land Use Designation** | **% Catchment total** | **% of LAR UR2 WMA** |
| Commercial | 11.78% | 12.46% |
| Industrial | 51.74% | 49.29% |
| HDSFR | 24.89% | 21.49% |
| MFR | 1.62% | 5.83% |
| Agriculture | 0% | 0.01% |
| Education | 0% | 0.35% |
| Transportation | 0% | 0.31% |
| Open Space | 9.97% | 10.26% |

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HDSFR = High Density Single Family Residential
MFR = Multi-Family Residential/Mixed Residential

A summary of stormwater outfall monitoring site LAR-UR2-EO is found in **Table 24**. **Figure 11** illustrates the catchment area of LAR-UR2-EO as well as the monitoring site location in relation to the LAR UR2 WMA.

**Table 24 LAR-UR2-EO Stormwater Outfall Monitoring Site Summary**

| Outfall ID | Tributary HUC-12 Area | Jurisdiction Where Site is Located | Jurisdictions Draining to the Site | Facility | Latitude | Longitude |
|---|---|---|---|---|---|---|
| LAR-UR2-EO | Chavez Ravine - Los Angeles River | Bell Gardens | Bell, Bell Gardens, Commerce, Vernon | Outfall | 33.956663 | -118.169102 |

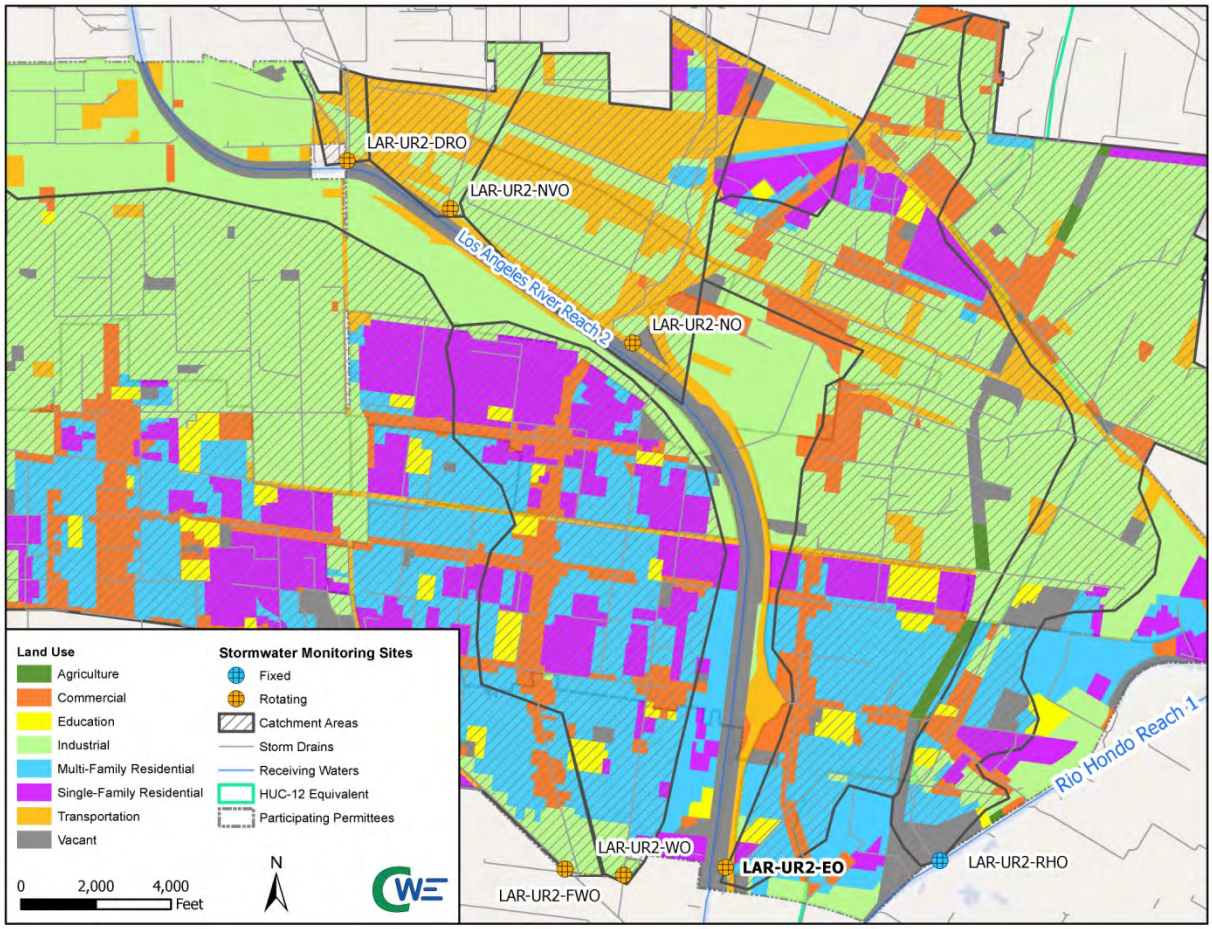


**Figure 11 LAR-UR2-EO Stormwater Outfall Monitoring Site**

### *4.2.3.3 LAR-UR2-NO (North Los Angeles River)*

Stormwater Outfall Monitoring Site LAR-UR2-NO, presented in **Figure 12**, is located in the Chavez Ravine - Los Angeles River HUC-12 area. LAR-UR2-NO receives runoff from the BI 0014 – U3 – DDI 22 storm drain line. The Cities of Commerce, Vernon and a small portion of Bell drains to LAR-UR2-NO. Samples

for LAR-UR2-NO will be collected by a portable autosampler, installed in a manhole located in lane number 3 on South Atlantic Boulevard in the City of Vernon.

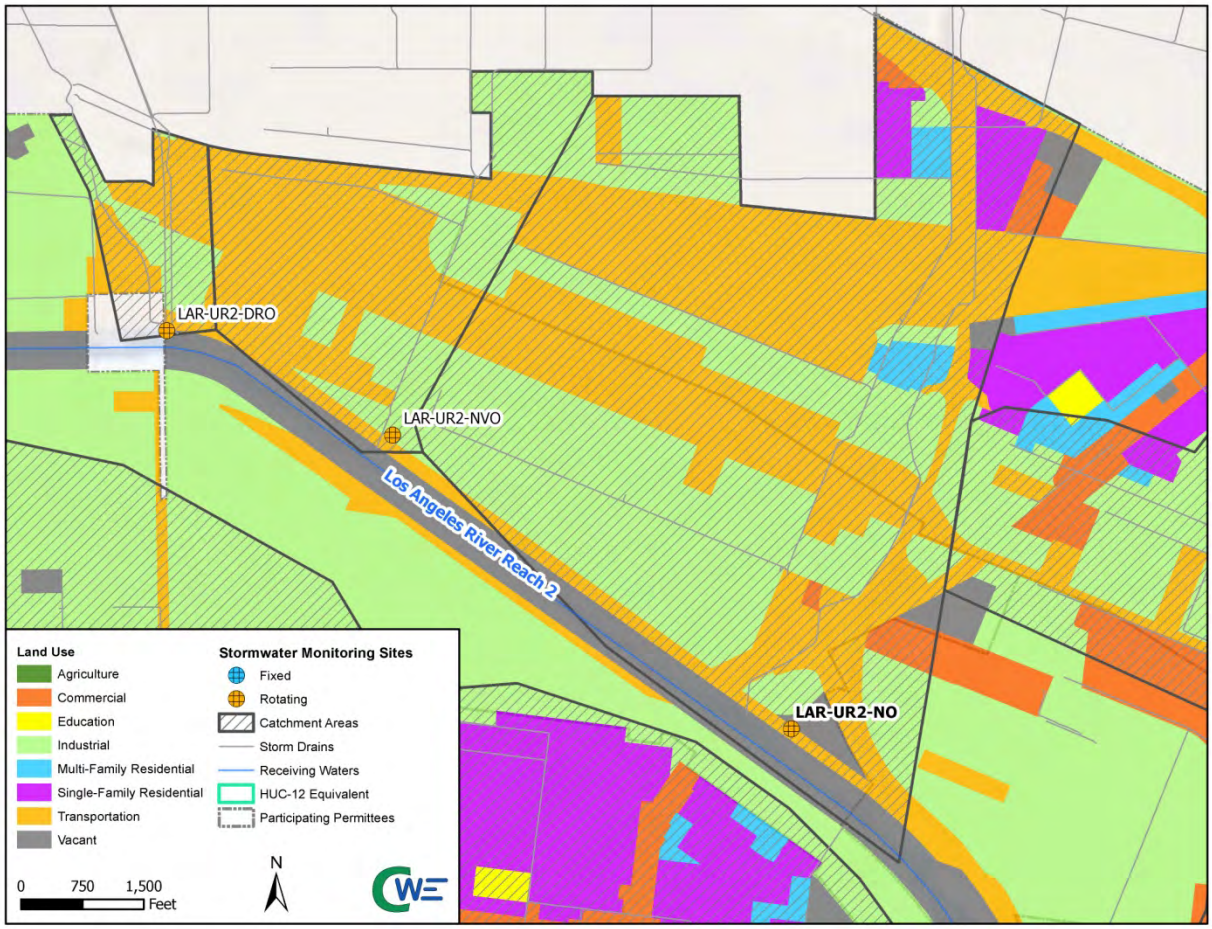


**Figure 12 LAR-UR2-NO Stormwater Outfall Monitoring Site**

Land use composition within the LAR-UR2-NO catchment area was compared to the total land use composition of all the LAR UR2 WMA. **Table 25** presents the findings from the land use analysis. From the analysis, LAR-UR2-NO area is not representative of the LAR UR2 WMA. However, LAR-UR2-NO is more comparable to the Cities of Commerce and Vernon, which is relatively dense in industrial land use and makes up approximately 86% of the catchment area. Based on these comparisons, samples collected at LAR-UR2-NO will be represented of the industrial land uses for the Cities of Commerce and Vernon.

**Table 25 LAR-UR2-NO Tributary Area**

| Land Use Designation | % Catchment Area | % Commerce | % Vernon | % of LAR UR2 WMA |
|---|---|---|---|---|
| Commercial | 1.89% | 10.90% | 5.62% | 12.46% |
| Industrial | 86.16% | 69.32% | 87.66% | 49.29% |
| HDSFR | 0.39% | 3.83% | 0% | 21.49% |
| MFR | 2.95% | 4.69% | 0% | 5.83% |
| Agriculture | 0% | 0% | 0% | 0.01% |
| Education | 0% | 0% | 0% | 0.35% |

| | | | | |
|---|---|---|---|---|
| Transportation | 0% | 0% | 0% | 0.31% |
| Open Space | 8.61% | 11.27% | 6.71% | 10.26% |

HDSFR = High Density Single Family Residential

MFR = Multi-Family Residential/Mixed Residential

A summary of stormwater outfall monitoring site LAR-UR2-NO is presented in **Table 26**.

**Table 26 LAR-UR2-NO Stormwater Outfall Monitoring Site Summary**

| Outfall ID | Tributary HUC-12 Area | Jurisdiction Where Site is Located | Jurisdictions Draining to the Site | Facility | Latitude | Longitude |
|---|---|---|---|---|---|---|
| LAR-UR2-NO | Chavez Ravine - Los Angeles River | Vernon | Bell, Commerce, Vernon | Manhole | 33.996050 | -118.180775 |

### *4.2.2.4 LAR-UR2-WO (West Los Angeles River)*

Stormwater outfall monitoring site LAR-UR2-WO, **Figure 13**, receives runoff from the BI 001 – U1 Line A – East Compton Creek, which primarily drains the Cities of Bell, Cudahy, Maywood and a small portion of Huntington Park. Stormwater outfall monitoring site LAR-UR2-WO is located in the Chavez Ravine - Los Angeles River HUC-12 area. Samples for LAR-UR2-WO will be collected in a manhole, via portable autosampler, at the T-intersection of Wilcox Avenue and Patata Street.

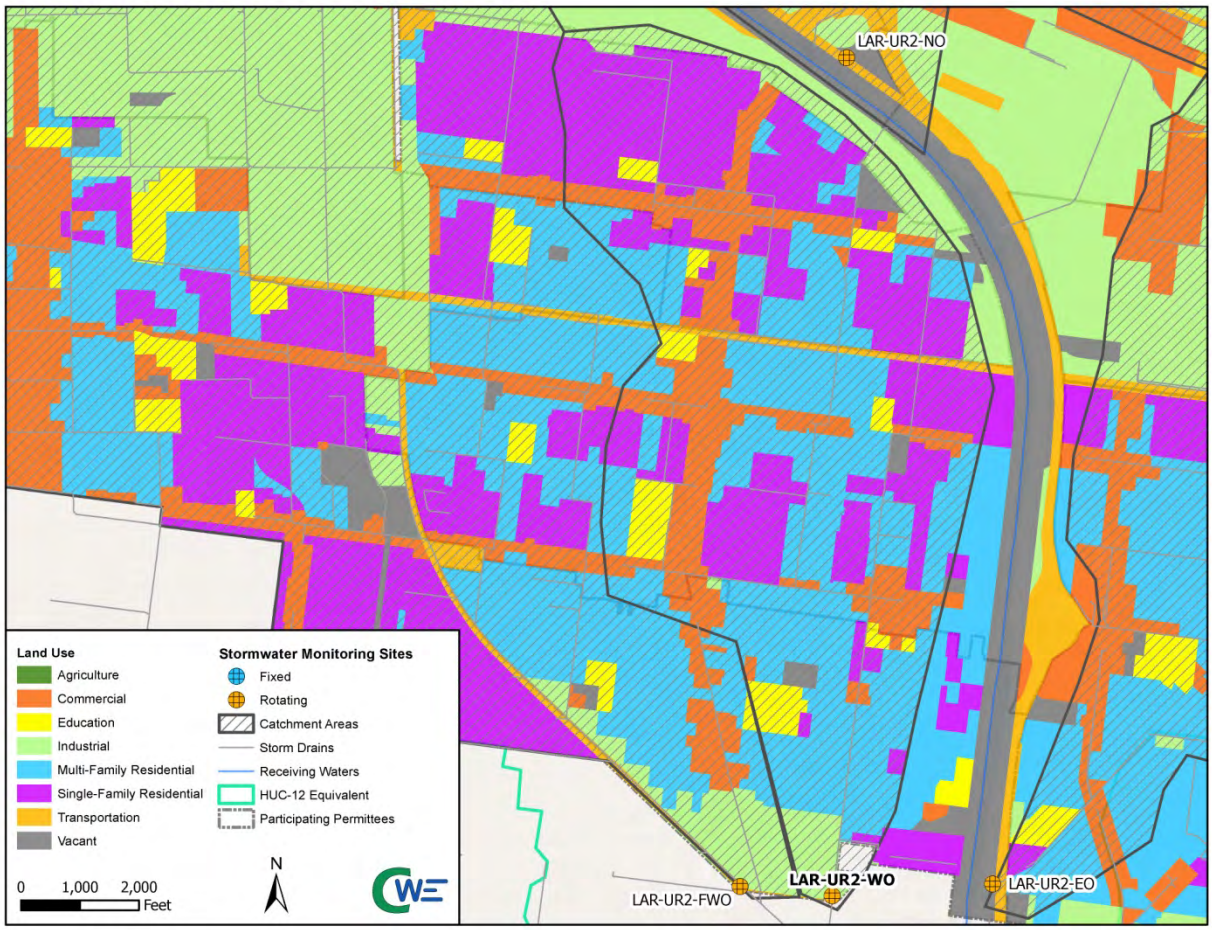

**Figure 13 LAR-UR2-WO Stormwater Outfall Monitoring Site**

An analysis comparing land use composition within the LAR-UR2-WO catchment area, to that of the greater LAR UR2 WMA, **Table 27**, indicates the LAR-UR2-WO area is not representative of the LAR UR2 WMA as a whole, but has a high percentage of high density single family and multi-family/mixed residential land uses making up approximately 72% of the area. From these comparisons, LAR-UR2-WO will be used to represent the high density single family and multi-family/mixed residential land uses within LAR UR2 WMA.

**Table 27 LAR-UR2-WO Tributary Area**

| Land Use Designation | % Catchment Area | % of LAR UR2 WMA |
|---|---|---|
| Commercial | 17.29% | 12.46% |
| Industrial | 7.32% | 49.29% |
| HDSFR | 41.96% | 21.49% |
| MFR | 29.69% | 5.83% |
| Agriculture | 0% | 0.01% |
| Education | 2.18% | 0.35% |
| Transportation | 0.00% | 0.31% |
| Open Space | 1.56% | 10.26% |

HDSFR = High Density Single Family Residential
MFR = Multi-Family Residential/Mixed Residential

A summary of stormwater outfall monitoring site LAR-UR2-WO attributes are presented in **Table 28.**

**Table 28 LAR-UR2-WO Stormwater Outfall Monitoring Site Summary**

| Outfall ID | Tributary HUC-12 Area | Jurisdiction Where Site is Located | Jurisdictions Draining to the Site | Facility | Latitude | Longitude |
|---|---|---|---|---|---|---|
| LAR-UR2-WO | Chavez Ravine - Los Angeles River | Cudahy | Bell, Cudahy, Huntington Park, Maywood, Vernon | Manhole | 33.955146 | -118.179975 |

#### *4.2.3.5 LAR-UR2-NVO (North Vernon)*

The LAR-UR2-NVO stormwater outfall monitoring site, **Figure 14**, receives runoff from the DDI 26 storm drain, which receives discharge from the Cities of Vernon and a small portion of Commerce. Stormwater outfall monitoring site LAR-UR2-NVO is located in the Chavez Ravine - Los Angeles River HUC-12 area. Samples for LAR-UR2-NVO will be collected, utilizing portable autosamplers, in a manhole located in the center median near 3890 East 26th Street in the City of Vernon.

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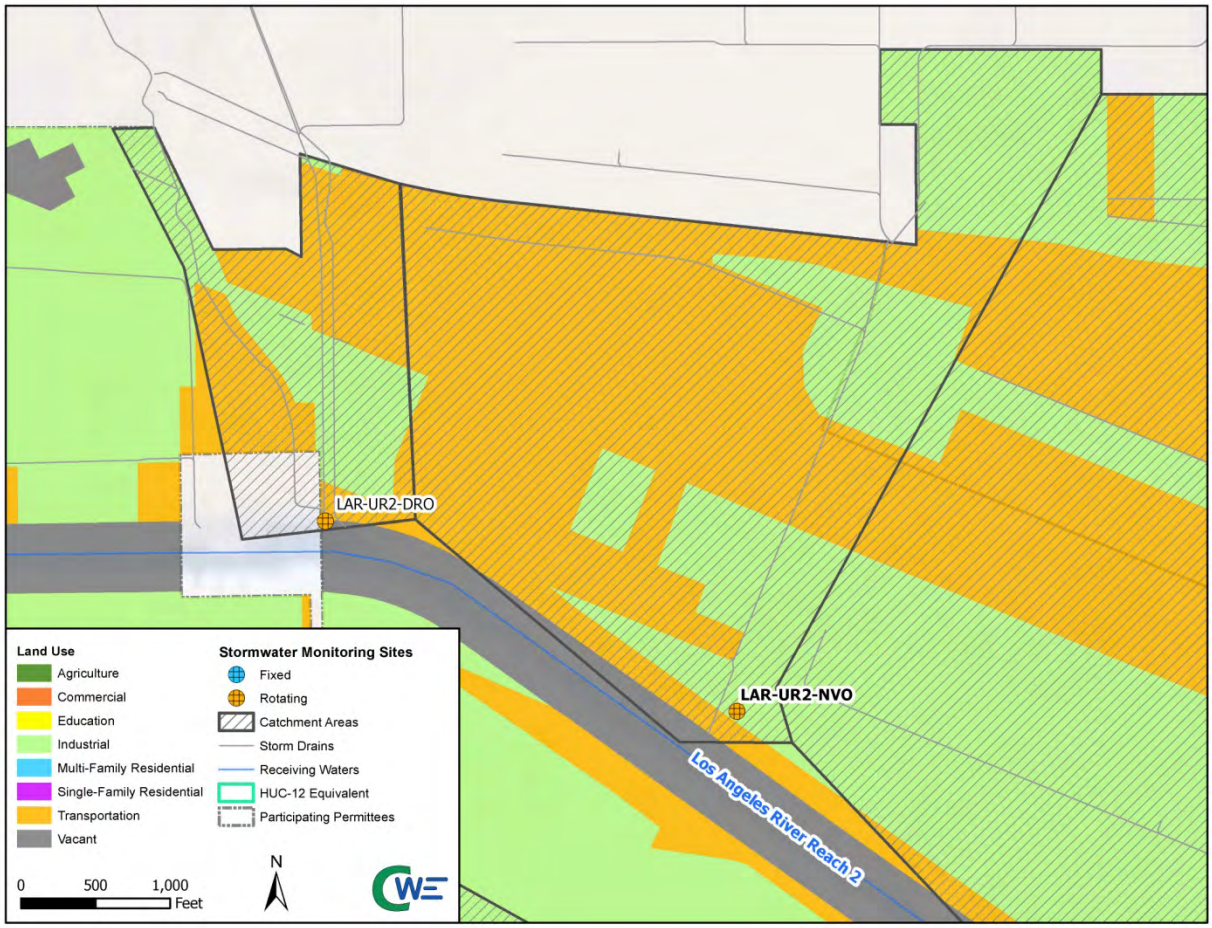


**Figure 14 LAR-UR2-NVO Stormwater Outfall Monitoring Site**

An analysis comparing the land use composition within the LAR-UR2-NVO catchment area, **Table 29**, to that of the greater LAR UR2 WMA, indicates the LAR-UR2-NVO area is not representative of the LAR UR2 WMA. Further analysis indicates LAR-UR2-NVO is however like the Cities of Commerce and Vernon, relatively dense in industrial land use categories which make up approximately 98% of the area. Based on these findings, water quality data from LAR-UR2-NVO will be used to represent the industrial land use category in the LAR UR2 WMA

**Table 29 LAR-UR2-NVO Tributary Area**

| Land Use Designation | % Catchment Area | % Commerce | % Vernon |
|---|---|---|---|
| Commercial | 0% | 10.90% | 5.62% |
| Industrial | 97.89% | 69.32% | 87.66% |
| HDSFR | 0% | 3.83% | 0% |
| MFR | 0% | 4.69% | 0% |
| Agriculture | 0% | 0% | 0% |
| Education | 0% | 0% | 0% |
| Transportation | 0% | 0% | 0% |
| Open Space | 2.11% | 11.27% | 6.71% |

HDSFR = High Density Single Family Residential

MFR = Multi-Family Residential/Mixed Residential

A summary of attributes for stormwater outfall monitoring site LAR-UR2-NO is presented in **Table 30** .

**Table 30 LAR-UR2-NVO Stormwater Outfall Monitoring Site Summary**

| Outfall ID | Tributary HUC-12 Area | Jurisdiction Where Site is Located | Jurisdictions Draining to the Site | Facility | Latitude | Longitude |
|---|---|---|---|---|---|---|
| LAR-UR2-NVO | Chavez Ravine - Los Angeles River | Vernon | Commerce, Vernon | Manhole | 34.007733 | -118.194464 |

### *4.2.2.6 LAR-UR2-FWO (Far West Los Angeles River)*

LAR-UR2-FWO, **Figure 15**, stormwater outfall monitoring site receives runoff from the East Compton Creek No. 1 storm drain, which primarily receives discharge from the Cities of Cudahy, Huntington Park, Maywood, Vernon and a small portion of Bell. Samples for LAR-UR2-FWO will be collected using a portable autosamplers in a manhole locate on Salt Lake Avenue in the City of Cudahy, between Ardine Street and Atlantic Avenue. Stormwater outfall monitoring site LAR-UR2-FWO is located in the Chavez Ravine - Los Angeles River HUC-12 area.

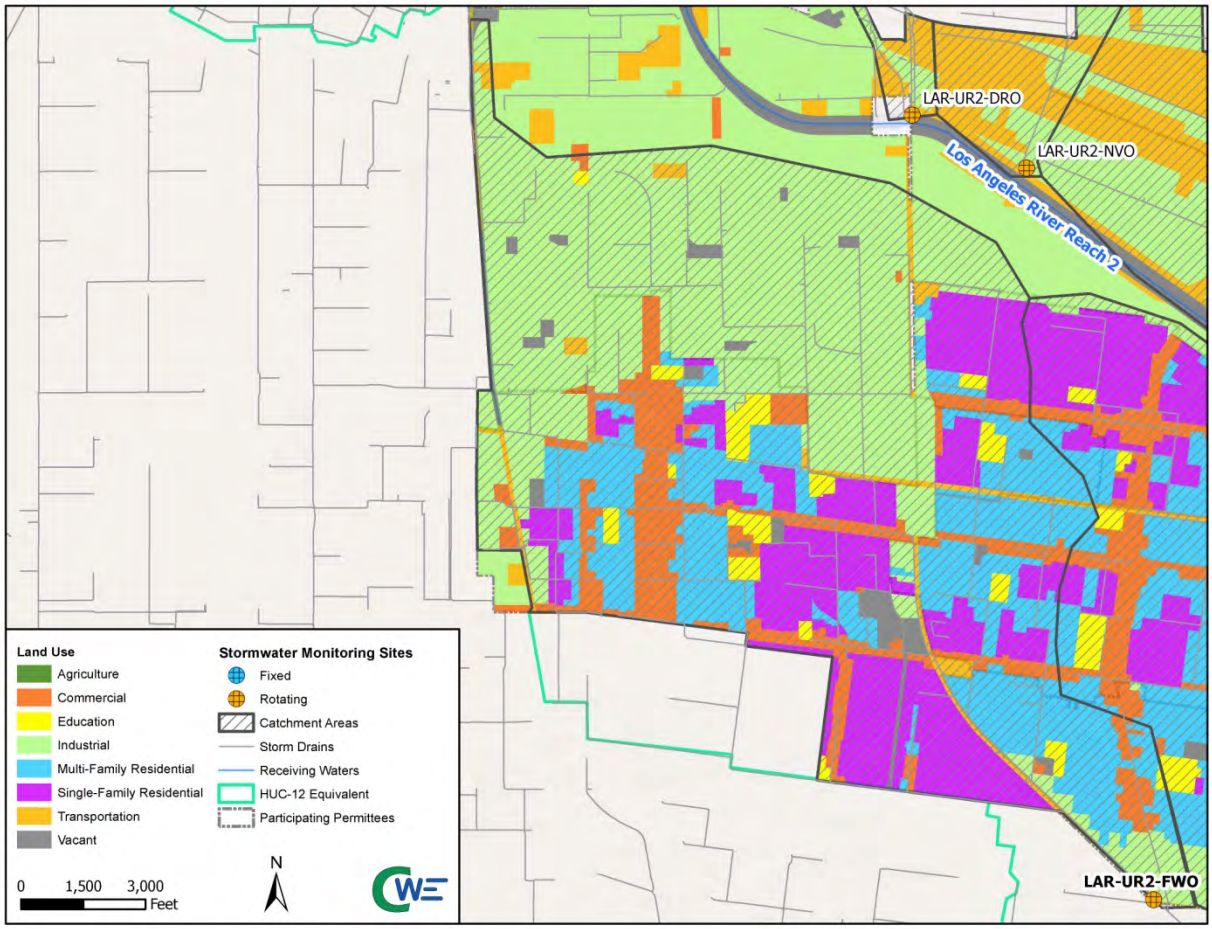


**Figure 15 LAR-UR2-FWO Stormwater Outfall Monitoring Site**

Land use composition within the LAR-UR2-FWO catchment area was compared to the total land use composition of all the LAR UR2 WMA. **Table 31** presents the findings from the land use analysis. From the analysis, LAR-UR2-FWO catchment area to that of the greater LAR UR2 WMA, indicates the LAR-UR2-FWO area is representative of the area as a whole. Land use categories commercial, industrial, high density single family residential as well as open space are well represented in the LAR-UR2-FWO catchment area. A summary of attributes for stormwater outfall monitoring site LAR-UR2-NO is presented in **Table 32**.

**Table 31 LAR-UR2-FWO Tributary Area**

| Land Use Designation | % Catchment total | % of LAR UR2 WMA |
|---|---|---|
| Commercial | 12.51% | 12.46% |
| Industrial | 40.81% | 49.29% |
| HDSFR | 30.97% | 21.49% |
| MFR | 6.73% | 5.83% |
| Agriculture | 0% | 0.01% |
| Education | 0.30% | 0.35% |
| Transportation | 1.14% | 0.31% |
| Open Space | 7.54% | 10.26% |

HDSFR = High Density Single Family Residential
MFR = Multi-Family Residential/Mixed Residential

**Table 32 LAR-UR2-FWO Stormwater Outfall Monitoring Site Summary**

| Outfall ID | Tributary HUC-12 Area | Jurisdiction Where Site is Located | Jurisdictions Draining to the Site | Facility | Latitude | Longitude |
|---|---|---|---|---|---|---|
| LAR-UR2-FWO | Chavez Ravine - Los Angeles River | Cudahy | Bell, Cudahy, Huntington Park, Maywood, Vernon | Manhole | 33.956591 | -118.186050 |

## 4.3 Monitored Frequency and Parameters

Stormwater outfall monitoring sites will be monitored for three storm events per year, prior to receiving water monitoring, for all required constituents except aquatic toxicity. Aquatic toxicity will be monitored when triggered by recent receiving water toxicity monitoring, where a toxicity identification evaluation (TIE) on the observed receiving water toxicity test was inconclusive. The requirements for monitored constituents at each outfall are outlined in the MRP Section VIII.B.1.c and presented in **Table 33**. Parameters in Table E-2 of the MRP, will not be identified as exceeding applicable water quality objectives until after the first year of receiving water monitoring. Monitoring for the selected sites would occur for at least the duration of the Permit term, unless an alternative site is warranted, per the adaptive management process, as presented in **Section 10**. Additional analytical and monitoring procedures are discussed in **Appendix B**.

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| Table 33 List of Constituents and Annual Frequency for Stormwater Outfall Monitoring | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Site ID | | | | | | |
| Constituent | LAR-UR2-RHO | LAR-UR2-EO | LAR-UR2-FWO | LAR-UR2-WO | LAR-UR2-NO | LAR-UR2-NVO | LAR-UR2-DRO |
| Flow, hardness, pH, dissolved oxygen, temperature, specific conductivity, and TSS | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Table E-2 pollutants detected above relevant objectives | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Aquatic Toxicity and Toxicity Identification Evaluation (TIE)[1] | | | | | | | |
| *E. coli* | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Cadmium | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Copper | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Lead | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Zinc | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Ammonia | | 3 | 3 | 3 | 3 | 3 | 3 |
| Nitrate - N | | 3 | 3 | 3 | 3 | 3 | 3 |
| Nitrite - N | | 3 | 3 | 3 | 3 | 3 | 3 |
| Nitrate-N + Nitrite-N | | 3 | 3 | 3 | 3 | 3 | 3 |
| Oil | | 3 | 3 | 3 | 3 | 3 | 3 |
| Coliform Bacteria | 3 | | | | | | |

1. Toxicity is only monitored from outfalls when triggered by recent receiving water toxicity monitoring where a TIE on the observed receiving water toxicity test was inconclusive. If toxicity is observed at the outfall a TIE must be conducted.
2. E. coli will be monitored at each stormwater outfall monitoring event. Full implementation of LAR Bacteria TMDL monitoring will be addressed in a separate plan.

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# 5.0 Non-stormwater Outfall Monitoring Approach

The Non-Stormwater Outfall Screening and Monitoring Program is focused on dry-weather discharges to receiving waters from major outfalls. The program fills two roles: (1) to provide assessment of whether the non-stormwater discharges are potentially impacting the receiving water, and (2) to determine whether significant non-stormwater discharges are allowable. The non-stormwater outfall program is complimentary to the IC/ID minimum control measure. Non-stormwater outfall monitoring sites will be determined after outfall screening, determination of discharge significance, and source identification. The outfall screening and monitoring process is intended to prioritize outfalls for assessment and, where appropriate, scheduling of BMPs to address the non-stormwater flows.

## 5.1 Program Objectives

The objectives of the non-stormwater outfall program include the following (Part II.E.3 of the MRP):

a. Determine whether a Permittee's discharge is in compliance with applicable non-stormwater WQBELs derived from TMDL WLAs;
b. Determine whether a Permittee's discharge exceeds non-stormwater action levels, as described in Attachment G of the MS4 Permit;
c. Determine whether a Permittee's discharge contributes to or causes an exceedance of receiving water limitations; and
d. Assist a Permittee in identifying illicit discharges as described in Part VI.D.10 of the MS4 Permit.

Additionally, the outfall screening and monitoring process is intended to meet the following objectives (Part IX.A of the MRP):

1. Develop criteria or other means to ensure that all outfalls with significant non-stormwater discharges are identified and assessed during the term of this MS4 Permit.
2. For outfalls determined to have significant non-stormwater flow, determine whether flows are the result of illicit connection/illicit discharge (IC/IDs), authorized or conditionally exempt non-stormwater flows, natural flows, or from unknown sources.
3. Refer information related to identified IC/IDs to the IC/ID Elimination Program (Part VI.D.10 of the MS4 Permit) for appropriate action.
4. Based on existing screening or monitoring data or other institutional knowledge, assess the impact of non-stormwater discharges (other than identified IC/IDs) on the receiving water.
5. Prioritize monitoring of outfalls considering the potential threat to the receiving water and applicable TMDL compliance schedules.
6. Conduct monitoring or assess existing monitoring data to determine the impact of non-stormwater discharges on the receiving water.
7. Conduct monitoring or other investigations to identify the source of pollutants in non-stormwater discharges.
8. Use results of the screening process to evaluate the conditionally exempt non-stormwater discharges identified in Parts III.A.2 and III.A.3 of the MS4 Permit and take appropriate actions pursuant to Part III.A.4.d of the MS4 Permit for those discharges that have been found to be a source of pollutants. Any future reclassification shall occur per the conditions in Parts III.A.2 or III.A.6 of the MS4 Permit.
9. Maximize the use of Permittee resources by integrating the screening and monitoring process into existing or planned Integrated Monitoring Program (IMP) and/or CIMP efforts.

The outfall screening and investigations must be completed prior to initiating monitoring at an individual outfall. A flowchart of the program is presented as **Figure 16**. Detailed discussion of each element is provided in the following subsections.

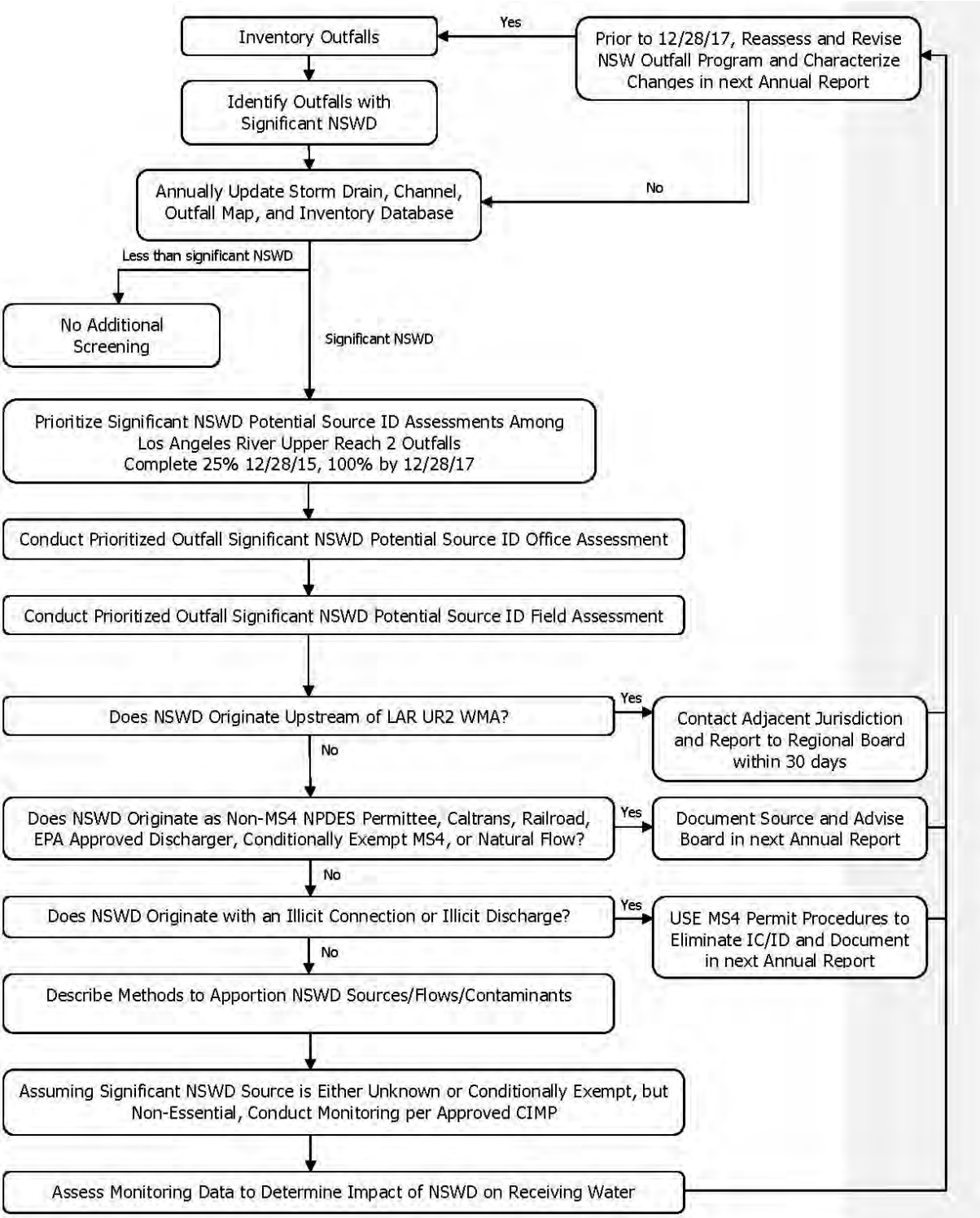


**Figure 16 Non-stormwater Outfall Monitoring Program Flow Chart**

## 5.2 Outfall Screening and Identify Outfalls with Significant Non-Stormwater Discharge

In December 2013, a field survey was conducted in the Los Angeles River and Rio Hondo within the LAR UR2 WMA to allow for the identification of outfalls. Based on a review of the available information, identification of significant non-stormwater discharges is not available at this time. Under this task, the LAR UR2 WMA will undertake one additional outfall screening to evaluate all major outfalls within its jurisdiction. The major outfalls for the LAR UR2 WMA are defined as follows:

- 36-inch or larger pipes with a drainage area of more than 50 acres, and
- 12-inch or larger pipes from industrial zoned areas with a drainage area of 2 acres or more.

In order to collect data to determine significant non-stormwater outfalls, the LAR UR2 WMA will perform one outfall screening during the first year after CIMP approval. The outfall screening is necessary to collect the information to identify outfalls exhibiting significant non-stormwater discharges and to develop the information needed for the inventory of outfalls with significant non-stormwater discharges. The LAR UR2 WMA will screen for flow and collect a sample for analytical monitoring. At this time, LAR UR2 WMA has not determined what analytical methods will be analyzed; however, the methods will most likely include the following:

- Bacteria - *E. coli*;
- Metals; and
- Nutrients.

All outfalls within the LAR UR2 WMA area will be visited during the screening process. A standard field data collection form will be used, consisting of:

- Channel bottom, visual estimate of flow rate
- Whether discharge ponds, or reaches the receiving water
- Clarity
- Presence of odors and foam
- Analytical sampling

Additionally, outstanding information for the MS4 inventory database will be collected, including, at a minimum, geographically referenced photographs, as discussed in **Section 3**. **Table 34** outlines the LAR UR2 WMA screening process. Based on the estimated flow rate and the preponderance of the analytical data, the outfalls will be ranked and the top 20% will be identified as outfalls with significant non-stormwater discharges.

**Table 34 Non-Stormwater Outfall Screening Process Utilizing Flow and WQO Exceedances for Determining Significant Non-Stormwater Discharge**

| Component | Description |
|---|---|
| Characteristics for Defining Significant Non-Stormwater Discharges | The top 20% of the ranked outfalls will be determined to be significant non-stormwater discharges. The ranking score is the sum of the following criteria: |
| | 1. Does the non-stormwater discharge reach the receiving water during dry-weather? If yes, give a score of 1 and continue through the ranking criteria. |
| | 2. WQO Exceedances: for each outfall monitored during the non-stormwater outfall screening process, a score will be given to the outfall depending on whether an exceedance of WQO will observed during monitoring. A score of 1 will be give for each exceedance of |

| | |
|---|---|
| | WQO, and 0 for meeting criteria. |
| Data Collection | Data that would need to be collected include accurate flow measurements AND Analytical Methods (To be determined). Additionally, information needed to complete the inventory would be collected. |
| Timeline | The screening process will occur within 90 day of approval of the CIMP. |

## 5.3 Inventory MS4 Outfalls

An inventory of MS4 Outfalls will be develop and maintain by the LAR UR2 WMA after outfall screening. The LAR UR2 WMA inventory database, will include available existing data from past outfall screening efforts, monitoring, and initiated data collection efforts. The data within the database will include the physical attributes MS4 outfalls determined to have significant non-stormwater discharges as well as requiring no further assessment. If the MS4 outfall requires no further assessment, the inventory will include the rationale for the determination of no further action required based on the following:

- The outfall does not have flow;
- The outfall does not have a known significant non-stormwater discharge; or
- Discharges observed were determined to be exempt during the source identification (**Section 5.5**).

The inventory will be recorded in the database as required in Part VII.A of the MRP. Each year, the inventory will be updated to incorporate the most recent characterization data for outfalls with significant non-stormwater discharges. The following physical attributes of outfalls with significant non-stormwater discharges will be included in the inventory and should be collected as part of the screening process:

- Date and time of last visual observation or inspection;
- Outfall alpha-numeric identifier;
- Description of outfall structure including size (e.g., diameter and shape);
- Description of receiving water at the point of discharge (e.g., concrete channel);
- Latitude/longitude coordinates;
- Nearest street address;
- Parking, access, and safety considerations;
- Photographs of outfall condition;
- Photographs of significant non-stormwater discharge (or indicators of discharge) unless safety considerations preclude obtaining photographs;
- Estimation of discharge rate;
- All diversions either upstream or downstream of the outfall;
- Observations regarding discharge characteristics such as turbidity, odor, color, presence of debris, floatables, or monitoring characteristics that could aid in pollutant source identification; and
- Monitoring data.

## 5.4 Prioritized Source Identification

Once the significant non-stormwater outfalls have been identified through the screening process and incorporated into the inventory, Part IX.E of the MRP requires Permittees to prioritize outfalls for further source investigations. The LAR UR2 WMA proposes the following alternative prioritization criteria to be utilized:

1. Outfalls in the top 20% with the highest ranking score, and
2. Outfalls for which monitoring data exist and indicate recurring exceedances of one or more of the Action Levels identified in Attachment G of the Permit.

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Once the prioritization is completed, a source identification of identified significant non-stormwater outfall will be achieved. The LAR UR2 WMA proposes the following schedule:

- Complete 25% of outfalls in the top 20% – within 3 year of the effective date of the MS4 NPDES Permit (December 28, 2015); and
- Complete 100% of outfalls in the top 20% – within 5 years of the effective date of the MS4 NPDES Permit (December 28, 2017)

## 5.5 Source Identification of Significant Non-Stormwater Discharge

Based on the prioritized list of major outfalls with significant non-stormwater discharge, source identification will be conducted to identify the source(s) or potential source(s) of non-stormwater discharge.

Part IX.A.2 of the MRP requires Permittees to classify the source identification results into the following types and summarized in **Table 35**:

A. IC/IDs: If the source is determined to be an illicit discharge, the Permittee must implement procedures to eliminate the discharge consistent with IC/ID requirements (Permit Part VI.D.10) and document actions.
B. Authorized or conditionally exempt non-stormwater discharges: If the source is determined to be an NPDES permitted discharge, a discharge subject to Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or a conditionally exempt essential discharge, the group member must document the source. For non-essential conditionally exempt discharges, the group member must conduct monitoring consistent with Part IX.G of the MRP to determine whether the discharge should remain conditionally exempt or be prohibited.
C. Natural flows: If the source is determined to be natural flows, the Permittee must document the source.
D. Unknown sources: If the source is unknown, the Permittee must conduct monitoring consistent with Part IX.G of the MRP.

**Table 35 Summary of Source Identification Types**

| Type | Follow-up | Action Required by Permit |
|---|---|---|
| A. Illicit Discharge or Connection | Refer to IC/ID program | Implement control measures and report in annual report. Monitor if cannot be eliminated. |
| B. Authorized or Conditionally Exempt Discharges[1] | Document and identify if essential or non-essential | Monitor non-essential discharges |
| C. Natural Flows | End investigation | Document and report in annual report |
| D. Unknown | Refer to IC/ID program | Monitor |
| E. Upstream of LAR UR2 WMA | End investigation | Inform upstream WMA and the Regional Board in writing within 30 days of identifying discharge. |

1 Discharges authorized by a separate NPDES permit, a discharge subject to a Record of Decision approved by USEPA pursuant to section 121 of CERCLA, or is a conditionally exempt NSW discharge addressed by other requirements. Conditionally exempt NSW discharges addressed by other requirements are described in detail in Part III.A. Prohibitions – NSW Discharges of the Permit.

Source identification will be conducted using site-specific procedures based on the characteristics of the non-stormwater discharge. Investigations could include:

- Performing field measurements to characterize the discharge;
- Following dry-weather flows from the location where they are first observed in an upstream direction along the conveyance system; and
- Compiling and reviewing available resources, including past monitoring and investigation data, land use/MS4 maps, aerial photography, and property ownership information.

Where the source identification has determined the non-stormwater source to be authorized, natural, or essential conditionally-exempt flows, the outfall will require no further assessment and will move onto the next highest priority outfall. However, if the source identification determines that the source of the discharge is non-essential conditionally exempt, an ID, or is unknown, then further investigation will be conducted to eliminate the discharge or to demonstrate that it is not causing or contributing to receiving water impairments and will be added to the monitoring list until non-stormwater discharge is eliminated.
In some cases, source investigations may ultimately lead to prioritized programmatic or structural BMPs. Where the LAR UR2 WMA has determined that they will address the non-stormwater discharge through modifications to programs or by structural BMP implementation, the LAR UR2 WMA will incorporate the approach into the implementation schedule developed in the WMP, and the outfall can be eliminated from the monitoring list.

## 5.6 Monitoring of Non-Stormwater Outfalls Exceeding Criteria

As outlined in the MRP (Part II.E.3), outfalls with significant non-stormwater discharges that remain unaddressed after source investigation shall be monitored to meet the following objectives:

a. Determine whether a Permittee's discharge is in compliance with applicable dry-weather WQBELs derived from TMDL WLAs;
b. Determine whether the quality of a Permittee's discharge exceeds non-stormwater action levels, as described in Attachment G of the Permit; and
c. Determine whether a Permittee's discharge causes or contributes to an exceedance of receiving water limitations.

Thus, outfalls that have been determined to convey significant non-stormwater discharges where the source identification concluded that the source is attributable to a continued ID (Type A from **Table 35**, non-essential conditionally exempt (Type B from **Table 35**), or unknown (Type D from **Table 35**) must be monitored. Monitoring will begin within 90 days of completing the source identification.

### 5.6.1 Non-Stormwater Outfall Monitoring Sites

The information to determine the number and location of outfalls requiring monitoring is not available at this time. After the outfall inventory, identification of outfalls with significant non-stormwater discharge, prioritization, and source identification process, outfalls identified to require monitoring will be monitored per the permit requirements.

### 5.6.2 Monitored Parameters and Frequency

After the outfall screening and determining which outfalls have significant non-stormwater flows, non-stormwater monitoring sites will be monitored for two events per year to coordinate with receiving water dry-weather monitoring. Coordination with receiving water monitoring will allow for an evaluation of whether the non-stormwater discharges are causing or contributing to any observed exceedances of water quality objectives in the receiving water. Significant non-stormwater outfalls will be monitored for all required constituents, per receiving water bodies, as outlined in Part IX.G.1.a-e of the MRP, except toxicity. Toxicity monitoring is only required when triggered by recent receiving water toxicity monitoring

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where a TIE on the observed receiving water toxicity test was inconclusive. An overview of the constituents to be monitored and the corresponding frequency is listed in **Table 36**. Outfalls on the monitoring list will be monitored for at least the duration of the Permit term, or until the non-stormwater discharge is eliminated. Additional analytical and monitoring procedures are discussed in Appendix A.

**Table 36 List of Constituents and Annual Frequency for Non-stormwater Outfall Monitoring**

| Constituent | Receiving Water Bodies of Outfalls | |
|---|---|---|
| | Los Angeles River | Rio Hondo |
| Flow, hardness, pH, dissolved oxygen, temperature, specific conductivity, and TSS | 2 | 2 |
| Table E-2 pollutants detected above relevant objectives | 2 | 2 |
| Aquatic Toxicity and Toxicity Identification Evaluation (TIE)[1] | | |
| *E. coli* | 2 | 2 |
| Copper | 2 | 2 |
| Lead | 2 | 2 |
| Zinc | 2 | 2 |
| Ammonia | 2 | |
| Nitrate - N | 2 | |
| Nitrite - N | 2 | |
| Nitrate-N + Nitrite-N | 2 | |
| Oil | 2 | |
| Coliform Bacteria | | 2 |

1. Toxicity is only monitored from outfalls when triggered by recent receiving water toxicity monitoring where a TIE on the observed receiving water toxicity test was inconclusive. If toxicity is observed at the outfall a TIE must be conducted.
2. E. coli will be monitored at each non-stormwater outfall monitoring event. Full implementation of LAR Bacteria TMDL monitoring will be addressed in a separate plan.

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# 6.0 New Development/Re-Development Effectiveness

New Development/Re-Development Effectiveness Tracking is used for tracking information data about new and re-development activities. To meet the MRP requirements of Permit Attachment E, Part X.A, the LAR UR2 WMA will maintain an informational database record for each new development/re-development project subject to the minimum control measure (MCM) requirements in Part VI.D.7 of the Permit and their adopted Low Impact Development (LID) Ordinance. The database should track the following information:

1. Name of the Project and Developer,
2. Mapped project location (preferably linked to the Geographic Information System (GIS) storm drain map),
3. Issuance date of the project Certificate of Occupancy,
4. 85$^{th}$ percentile 24-hour storm event for project design (inches),
5. 95$^{th}$ percentile 24-hour storm event for projects draining to natural water bodies (inches),
6. Other design criteria required to meet hydromodification requirements for drainages to natural water bodies,
7. Project design storm (inches per 24 hours),
8. Project design storm volume (gallons or MGD),
9. Percent of design storm volume to be retained onsite,
10. Design volume for water quality mitigation treatment BMPs (if any),
11. If flow through, water quality treatment BMPs are approved, provide the one-year, one-hour storm intensity as depicted on the most recently issued isohyetal map published by the Los Angeles County Hydrologist,
12. Percent of design storm volume to be infiltrated at an off-site mitigation or groundwater replenishment project site,
13. Percent of design storm volume to be retained or treated with biofiltration at an off-site retrofit project,
14. Location and maps (preferably linked to the GIS storm drain map) of off-site mitigation, groundwater replenishment, or retrofit sites, and
15. Documentation of issuance of requirements to the developer.

Until the WMP is approved by the Regional Board or the Executive Officer, the LAR UR2 WMA is only required to implement and track MCM information in its existing stormwater management program per Part V.C.4.d.i.In addition to the requirements in Part X.A of the MRP, Part VI.D.7.d.iv of the Permit requires that the LAR UR2 WMA implement a tracking system for new development/re-development projects that have been conditioned for post-construction BMPs. The following information is to be tracked using GIS or another electronic system:

1. Municipal Project ID
2. State Waste Discharge Identification (WDID) Number
3. Project Acreage
4. BMP Type and Description
5. BMP Location (coordinates)
6. Date of Acceptance
7. Date of Maintenance Agreement
8. Maintenance Records
9. Inspection Date and Summary
10. Corrective Action
11. Date Certificate of Occupancy Issued
12. Replacement or Repair Date

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The procedures for reviewing projects, tracking data, and reporting are different for each jurisdiction and may even be different across departments within the same jurisdiction. Due to the complexity of land development processes across jurisdictions, data management and tracking procedures will vary by jurisdiction. The LAR UR2 WMA will develop a complete tracking system that works for their individual needs and internal processes. This will include SOPs and reporting templates that provide consistent data sets between participating permittees of the LAR UR2 WMA.

## 6.1 Program Objectives

The objective of the New Development/Re-Development Effectiveness Tracking is to assess whether post-construction Best Management Practice (BMP), as outlined in permits issued by the Permittees, are implemented and to ensure the volume of stormwater associated with the design storm is retained onsite, as required by Part VI.D.7.c.i. of the Permit. The New Development/Re-Development Effectiveness Tracking will gather necessary data to assess whether construction MCM, LID ordinances', and BMPs are effective and being implemented.

## 6.2 Existing New Development/Re-Development Tracking Procedures

Within the LAR UR2 WMA, each jurisdiction has a unique approach to tracking some or the entire 27 required development program tracking elements (15 elements identified in Attachment E.X.A and 12 elements in Part VI.D.7.d.iv.). For private development projects, a Building Department, or a variation of, is typically the entity responsible for collecting and recording the program tracking elements. In contrast, public improvement projects are normally the responsibility of a Public Works Department.

Based on a review of the existing new development/re-development tracking procedure for the different jurisdictions within the LAR UR2 WMA, additional effort will be needed to track the 27 program tracking elements required by the Permit. Information has currently been recorded and stored differently across jurisdictions, with some using commonly available software packages, such as Microsoft Office products and GIS, and others using proprietary software programs, such as Plan Check and Inspection System (PCIS), or in some instances paper files. LAR UR2 WMA members will need to develop or modify their current tracking systems to setting up a centrally located spreadsheet template that includes the required information fields for each project that can be tracked separately by the individual jurisdiction's proprietary software system if integrated accordingly. Each jurisdiction will dedicate resources to develop a complete tracking system that works for their individual needs and internal processes.

## 6.3 Special Consideration for Data Management and Reporting

Need Input on how to track redevelopment if no central repository and every agency handles differently.

A fundamental step in establishing individual data management protocols consists of developing a recommended standard operating procedure (SOP) and determining the responsible department/division within each jurisdiction for collecting, reviewing, and reporting the data. The SOP developed by each jurisdiction will consist of written instructions regarding documentation of routine activities and delineation of the primary steps in the land development approval process, relevant data generated at each step, and procedures for "handoff" of the project to the next group. Development and use of an SOP is an integral part of successful data management as it provides information to perform a task properly, and facilitates consistency in the quality and integrity of the tracking data.

### 6.3.1 Data Management

Each jurisdiction will conduct tracking that will meet the Permit requirements and facilitate reporting. The data management protocols will include:

- Designing and testing data entry sheets for the required information fields identified in **Section 6.1**;

- Describing the procedures and identifying the departments/divisions responsible for inputting data, assessing accuracy and consistency, and coordinating follow up actions when questions arise;
- Strategy for checking and validating data entry, including identifying departments/divisions responsible for managing and safeguarding data, performing data entry, supervising the data entry, and ensuring quality control of the data; and
- Specifying procedures for routinely and safely archiving data files.

Data collection for development review processes generally consist of the following similar steps:

- **Planning** – Project proponents submit an application to agency planning department to determine whether or not the project meets jurisdictional requirements. When required, the project may require a public hearing for conditions and entitlements. Project conditions may include water quality related requirements.
- **Building** – Projects may be conditioned subject to engineering, community services, or building department review and approval of plans or technical reports. During review, required water quality BMP designs are reviewed and accepted. When a building and/or grading permit is issued, project construction usually proceeds without further discretionary approvals.
- **Construction** – During construction, approved BMPs are implemented then verified by the jurisdiction's inspector prior to issuance of a Certificate of Occupancy.
- **Post-Construction Inspections** – Once constructed, inspection and verification of maintenance is transferred to the jurisdiction's water quality program manager.

Relevant project data is collected during each phase of the development review process described above. Based on this general process and information gathered through the questionnaire, **Table 7-1** illustrates data collection opportunities throughout the planning, building, construction, and post-construction inspection processes for requirements in Part VI.D.7 of the Permit.

### 6.3.2 Additional Data

To facilitate annual assessment and reporting and future Reasonable Assurance Analyses (RAA) input data compilation, the LAR UR2 WMA may also track the following information:

- Do any modified MCMs apply to this project?
- Assessor's Identification Number (AIN)
- Street address
- Revised land use (based on City/County Land Use Categories)
- BMP maintenance funding source
- Tributary area to each BMP

### 6.3.3 Reporting

Development of a LAR UR2 WMA data collection template and established SOPs will aid in future analyses and annual reporting. The example data collection template provided includes the information to be tracked for each project and is presented in **Tables 7-2.**

Annual Assessment and Reporting requirements to be included in an Annual Report are outlined in Part XVIII.A.1 through A.7 of the MRP. Relevant to New Development/Re-Development Effectiveness Tracking, each permittees within LAR UR2 WMA is required to annually track, analyze, and report on the following stormwater control measures in Part XVIII.A.1:

- Estimate the cumulative change in percent effective impervious area (EIA) since the effective date of the Permit and, if possible, the estimated change in the stormwater runoff volume during the 85$^{th}$ percentile storm event.

- Summarize new development/re-development projects constructed within the Permittee's jurisdictional area during the reporting year.
- Summarize retrofit projects that reduced or disconnected impervious area from the MS4 during the reporting year.
- Summarize other projects designed to intercept stormwater runoff prior to discharge to the MS4 during the reporting year.
- For the projects summarized above, estimate the total runoff volume retained onsite by the implemented projects.
- Summarize actions taken in compliance with Total Maximum Daily Load (TMDL) implementation plans or approved Watershed Management Programs to implement TMDL provisions in Part VI.E and Attachments L-R of the Permit.
- Summarize riparian buffer/wetland restoration projects completed during the reporting year. For riparian buffers include width, length and vegetation type; for wetland include acres restored, enhanced or created.
- Summarize other MCMs implemented during the reporting year, as deemed relevant.
- Provide status of all multi-year efforts that were not completed in the current year and will therefore continue into the subsequent year(s). Additionally, if any of the requested information cannot be obtained, the Permittee shall provide a discussion of the factor(s) limiting its acquisition and steps that will be taken to improve future data collection efforts.

The LAR UR2 WMA is also required to track, evaluate, and provide an effectiveness assessment of stormwater control measures per Attachment E, Part XVIII.A.2:

- Summarize rainfall for the reporting year. Summarize the number of storm events, highest volume event (inches/24 hours), highest number of consecutive days with measureable rainfall, total rainfall during the reporting year compared to average annual rainfall for the subwatershed. Precipitation data may be obtained from the Los Angeles County Department of Public Works rain gauge stations available at http://www.ladpw.org/wrd/precip/.
- Provide a summary table describing rainfall during stormwater outfall and wet-weather receiving water monitoring events. The summary description shall include the date, time that the storm commenced and the storm duration in hours, the highest 15-minute recorded storm intensity (converted to inches/hour), the total storm volume (inches), and the time between the storm event sampled and the end of the previous storm event.
- Where control measures were designed to reduce impervious cover or stormwater peak flow and flow duration, provide hydrographs or flow data of pre- and post-control activity for the 85$^{th}$ percentile, 24-hour rain event, if available.
- For natural drainage systems, develop a reference watershed flow duration curve and compare it to a flow duration curve for the subwatershed under current conditions.
- Provide an assessment as to whether the quality of stormwater discharges as measured at designed outfalls is improving, staying the same or declining. The Permittee may compare water quality data from the reporting year to previous years with similar rainfall patterns, conduct trends analysis, or use other means to develop and support its conclusions (e.g., use of non-stormwater action levels or municipal action levels as provided in Attachment G of the Permit).
- Provide an assessment as to whether wet-weather receiving water quality within the jurisdiction of the Permittee is improving, staying the same or declining, when normalized for variations in rainfall patterns. The Permittee may compare water quality data from the reporting year to previous years with similar rainfall patterns, conduct trends analysis, draw from regional bioassessment studies, or use other means to develop and support its conclusions.
- Provide status of all multi-year efforts, including TMDL implementation, that were not completed in the current year and will continue into the subsequent year(s). Additionally, if any of the requested information cannot be obtained, the Permittee shall provide a discussion of the factor(s) limiting its acquisition and steps that will be taken to improve future data collection efforts.

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Additional reporting elements required are identified in Part VI.D.7 of the Permit and include:

- A summary of total offsite project funds raised to date and a description (including location, general design concept, volume of water expected to be retained, and total estimated budget) of all pending public offsite projects.
- A list of mitigation project descriptions and estimated pollutant and flow reduction analyses.
- A comparison of the expected aggregate results of alternative compliance projects to the results that would otherwise have been achieved by retaining onsite the stormwater quality design volume.

Part XV.A of the MRP requires each Permittee or group to submit an Annual Report to the Regional Board by December 15th of each year. The annual reporting period is from July 1st through June 30th and information reported will cover approved and constructed projects that have been issued occupancy permits.

## 6.4 Summary of New Development/Re-development Effectiveness Tracking

New Development/Re-Development Effectiveness Tracking is used for tracking information data in regards to new and re-development activities and their associated post-construction BMPs. The information is stored and will be submitted in an annual compliance report. Each jurisdiction will be individually responsible for tracking Permit requirements, based on their specific operational procedures and internal processes.

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# 7.0 Regional Studies

The MRP identifies one regional study: the SMC Regional Watershed Monitoring Program. The SMC is a collaborative effort between SCCWRP, State Water Board's Surface Water Ambient Monitoring Program (SWAMP), three Southern California Regional Water Quality Control Boards, and several county stormwater agencies. SCCWRP acts as a facilitator to organize the monitoring program, conducts the data analysis, and prepares monitoring results reports. The goal of the SMC is to develop a monitoring program on a regional level for Southern California's coastal streams and rivers.

Prior to the initiation of the SMC Regional Watershed Monitoring Program, in-stream monitoring in southern California was currently conducted by over a dozen different organizations, each of which had disparate monitoring programs that varied in design, frequency, and the indicators selected for measurement. Even where the monitoring designs were similar, the field techniques, laboratory methods, and quality assurance requirements were often not comparable, making region-wide assessments impossible. In addition, the lack of an integrated information management system precluded data sharing among programs. To address these problems, SCCWRP helped the SMC design and implement a coordinated and regional watershed monitoring program. The SMC works with local programs in the region, to facilitate greater data collection and provide a regional context to address site- and watershed-specific questions.

## 7.1 PROGRAM OBJECTIVES

The SMC Regional Watershed Monitoring Program seeks to coordinate and leverage existing monitoring efforts to produce regional estimates of condition, improve data comparability and quality assurance, and maximize data availability while conserving monitoring expenditures. This program addresses watersheds, rather than the marine environment. The primary goal of this project is to implement an ongoing, large-scale regional monitoring program for southern California's coastal streams and rivers. The monitoring program addresseses three main questions:

1. What is the condition of streams in our region?
2. What are the stressors that affect stream condition?
3. Are conditions getting better or worse?

## 7.2 REGIONAL STUDY PARTICIPATION

The MRP states that each Permittee shall be responsible for supporting the monitoring described at the sites within the watershed management area(s) that overlap with the Permittee's jurisdictional area. One program initiated under the SMC is the Regionally Consistent and Integrated Freshwater Stream Bioassessment Monitoring Program (Bioassessment Program), which included six monitoring sites that were monitored annually within the WMP Group area. The SMC initiated the Bioassessment Program in 2009 and are structured to occur in cycles of five years. Sampling under the 2009 cycle concluded in 2013. The next five-year cycle is scheduled to begin in 2015, with additional special study monitoring scheduled to occur in 2014.

The LAR UR2 WMA will continue to participate in the Biosassessment Program being managed by the SMC, through LACFCD. The LACFCD will contribute necessary resources to implement the bioassement monitoring requrement of the MS4 permit on behalf of all permitees in Los Angeles County during the current permit cycle. Initiated in 2008, the SMC's Regional Bioassement Program is designed to run over a five-year cycle. Monitoring under the first cycle concluded in 2013, with reporting of findings and additional special studies planned to occur in 2014. SMC, including LACFCD, is currently working on designing the bioassessment monitoring program for the next five-year cycle, which is scheduled to run from 2015 to 2019.

# 8.0 Special Studies

LAR UR2 WMA is responsible for conducting special studies that are required in an effective TMDL or an approved TMDL Monitoring Plan applicable to a watershed that is within the LAR UR2 WMA's jurisdictional boundary. At this time there are no special studies required by any of the TMDLs within the LAR UR2 WMA. LAR UR2 WMA will take into consideration the optional special studies, but have no interest in implementing them at this time.

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# 9.0 Adaptive Management

An adaptive management approach provides a structured process that allows for taking action under uncertain conditions based on the best available science, closely monitoring and evaluating outcomes, and re-evaluating and adjusting decisions as more information is collected.

The CIMP, as with the WMP, is to be implemented as an adaptive process. As new program elements are implemented and data are gathered over time, the WMP and CIMP will undergo revision to reflect the most current understanding of the watershed and present a sound approach to addressing changing conditions. As such, the WMP and CIMP will employ an adaptive management process that will allow the two programs to evolve over time.

## 9.1 Annual Assessment and Reporting

Part XVIII.A of the MRP details the annual assessment and reporting that is required as part of the annual report. The annual assessment and reporting is composed of seven parts, which are the following:

1. Stormwater Control Measures
2. Effectiveness Assessment of Stormwater Control Measures
3. Non-stormwater Control Measures
4. Effectiveness Assessment of Non-stormwater Control Measures
5. Integrated Monitoring Compliance Report
6. Adaptive Management Strategies
7. Supporting Data and Information

Based on the findings of the annual assessment, revisions to the CIMP will be included as part of the Adaptive Management Strategies.

## 9.2 CIMP Revision Process

Implementation of the CIMP is used to gather data on receiving water conditions and stormwater/non-stormwater quality to assess the effectiveness of the WMP. As part of the adaptive management process, re-evaluation of the CIMP will need to be conducted to better inform the LAR UR2 WMA of ever changing conditions of the watershed. Each program of the CIMP will be re-evaluated for the following:

- **Monitored site locations:** as water quality priorities change and certain WBPCs are being addressed or identified, monitoring site locations may need to be added or changed.
- **Monitoring constituents**: eliminate or reduced monitoring of certain constituents. If constituents were initially detected during initiation of the CIMP and are not being addressed by a watershed control measure.
- **Monitoring frequency**: increased or decreased based on the evaluation of RWL, WQBELs, non-stormwater action levels.

Based on the re-evaluation, CIMP revisions will be made and submitted to the Regional Board for approval in conjunction with the WMPs every two years.

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# 10.0 Reporting

Analysis and reporting of data is integral part of communicating to the Regional Board of whether the CIMP is meeting MRP objectives. The MRP, establishes NPDES permit monitoring, reporting, and recordkeeping requirements, including those for large MS4s, based on federal Clean Water Act (CWA) section 308(a) and Code of Federal Regulations (40 CFR) sections 122.26(d)(2)(i)(F), (iii)(D), 122.41(h)-(l), 122.42(c), and 122.48. In addition, California Water Code (CWC) section 13383 authorizes the Regional Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The sections below will outline the CIMP reporting process for the LAR UR2 WMA.

## 10.1 Documents and Records

Consistent with the Part XIV.A of the MRP requirements, LAR UR2 WMA will retain records of all monitoring information, including: all calibration, major maintenance records, all original lab and field data sheets, all original strip chart recordings for continuous monitoring instrumentations, copies of all reports required by the permit, and records of data used to complete the application for the permit for a period of at least 3 years from the date of the sample, measurement, report, or application.

Records of monitoring will include:

1. The date, time of sampling or measurements, exact place, weather conditions, and rain fall amount;
2. The individual(s) who performed the sampling or measurements;
3. The date(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used;
6. The results of such analyses; and
7. The data sheets showing toxicity test results.

### 10.1.1 Event Summary Reports

At the conclusion of each monitoring event for receiving water (wet- and dry-weather), stormwater outfall, and non-stormwater outfall monitoring, or all of the above, an event summary report for the LAR UR2 WMA will be produced and submitted annually as an attachment with the Integrated Monitoring Compliance Report. The event summary report will give an overview of what was conducted during the monitoring event the result findings from the monitoring events, summary exceedances, and the monitoring records as mentioned above.

### 10.1.2 Semi-Annual Analytical Data Reports

Monitoring results data will be submitted semi-annually, as stated in Part XIV.L of the MRP. The transmitted data will be in the most recent update of the Southern California Municipal Storm Water Monitoring Coalition's (SMC) Standardized Data Transfer Formats (SDTFs) and sent electronically to the LARWQCB Stormwater site to MS4stormwaterRB4@waterboards.ca.gov. The SMC SDTFs can be found at the Southern California Coastal Water Research Project (SCCWRP) web page http://www.sccwrp.org/data/DataSubmission.aspx. The submitted monitoring data should highlight the following:

1. Exceedances of applicable WQBELs,
2. Receiving water limitations,
3. Action levels, and/or
4. Aquatic toxicity thresholds for all test results, with corresponding sampling dates per receiving water monitoring station.

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## 10.2 Monitoring Reports

Part XVIII.A.5, of the MPR presents the requirements of the Integrated Monitoring Compliance Report (IMCR) that will be included and submitted on an annual basis as part of the Annual Report. As discussed in **Section 9**, the IMCR is one of seven parts of the Annual Assessment and Reporting.

The IMCR will include the following information as required by the MRP:

- Summary of exceedances against all applicable RWL, WQBELs, non-stormwater action levels, and aquatic toxicity thresholds for:
    1. Receiving water monitoring – Wet- and dry-weather;
    2. Stormwater outfall monitoring; and
    3. Non-stormwater outfall monitoring.
- Summary of actions taken:
    1. To address exceedances for WQBELs, non-stormwater action levels, or aquatic toxicity for stormwater and non-stormwater outfall monitoring.
    2. To determine whether MS4 discharges contributed to RWL exceedances and efforts taken to control the discharge causing the exceedances to the receiving water.
- If aquatic toxicity was confirmed and a TIE was conducted, identify the toxic chemicals determined by the TIE, and include all relevant data to allow the Regional Board to review the adequacy and findings of the TIE.

The IMCR will be submitted as part of the Annual Assessment Report to the Regional Board by December 15th of each year, for at least the duration of the Permit term. As indicated above, event summary reports will be attached to the IMCR.

## 10.3 SIGNATORY AND CERTIFICATION REQUIREMENTS

Part V.B of Attachment D of the Permit presents the Signatory and Certification Requirements and states:

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below [40 CFR section 122.41(k)(1)].
2. All applications submitted to the Regional Water Board shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer includes: (i) the chief executive officer of the agency (e.g., Mayor), or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., City Manager, Director of Public Works, City Engineer, etc.).[40 CFR section 122.22(a)(3)].
3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
    a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above [40 CFR section 122.22(b)(1)];
    b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) [40 CFR section 122.22(b)(2)]; and
    c. The written authorization is submitted to the Regional Water Board [40 CFR section 122.22(b)(3)].

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4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative [40 CFR section 122.22(c)].
5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." [40 CFR section 122.22(d)].

All required signatures and statements will be included as an attachment of the Annual Report, which will be submitted to the Regional Board by December 15th of each year, for at least the duration of the Permit term.

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# 11.0 Schedule for CIMP Implementation

As stated in Part IV.C.6 of the MRP, the LAR UR2 WMA's CIMP will commence within 90 days after approval by the Executive Officer of the Regional Board. For eight of the sites, portable equipment will be used allowing for the monitoring to begin, on a rotational basis as described in **Section 4**. Implementation of the CIMP for the one monitoring site in Los Angeles River is subject to the availability and approval of construction permits from LACFCD and Army Corps of Engineers. If the availability and approval of permits are not obtained before the 90 day deadline, the LAR UR2 WMA will inform the Regional Board on the progress of obtaining the permits. Monthly updates will be provided to the Regional Board until the permits are obtained. Monitoring at the one monitoring site in Los Angeles River will commence within 30 days after the approval of required permits. LAR UR2 WMA has been informed, from other permittees, the installation process, which includes permitting, can take a minimum of 18 months.

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# 12.0 Quality Assurance Project Program Plan

A final Quality Assurance Project Program (QAPP) Plan will be prepared once a monitoring program contract is issued. This is necessary as the QAPP should identify specific individuals, contact points, Analytical Method Detection and Reporting Limits that are Sampling Consultant and Analytical Laboratory specific. A generic QAPP is attached to the CIMP as **Appendix B**, while a Summary of Laboratory Capabilities in Relation to Permit Minimum Levels can be found within **Appendix C**.

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## 13.0 References

(http://www.waterboards.ca.gov/losangeles/water_issues/programs/tmdl/)

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# Appendix A

# Monitoring Site Summary Fact Sheet

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# Attachment B
# Monitoring Site Fact Sheet

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## Summary Sheet for LAR-UR2-RW

| | |
|---|---|
| **Watershed:** Los Angeles River | **Monitoring Type:** Receiving Water |
| **Latitude:** 33.940550 | **Longitude:** -118.174528 |
| **Thomas Guide Grid:** | **Nearest Street Address:** |
| **Site Description:** LARRW1 is a receiving water monitoring location in the City of South Gate, near the railroad trestle, or extension of Tweedy Boulevard. It is immediately downstream of major outfalls on both the east and west sides of the river that drains from over 60% of the LAR UR2 WMA. This sampling location is selected to characterize the impact of the MS4 to Los Angeles River, Reach 2. | |
| **Site Location:** Please see **Figure 2** | |
| **Site View:** | |

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## Summary Sheet for LAR-UR2-RHO

| | | |
|---|---|---|
| **Watershed:** Los Angeles River | **Monitoring Type:** Stormwater Outfall | |
| **Latitude:** | **Longitude:** | |
| **Represented Area:** Cities of Bell Gardens and Commerce | | |
| **Thomas Guide Grid:** | **Drainage System:** Rio Hondo | |
| **Outfall Shape:** | **HUC-12:** | |
| **Outfall Type:** | **Nearest Street Address:** | |
| **Land Use** | **Tributary to RHO** | **Tributary to Rio Hondo by LAR UR2 WMA** |
| | **% of Total** | **% of Total** |
| Agricultural | | |
| Commercial | 24.14% | 21.23% |
| Industrial | 55.25% | 50.33% |
| Education | | |
| Single Family Residential | 8.23% | 14.42% |
| Multi-Family Residential | 1.11% | 3.63% |
| Open Space | 11.28% | 10.39% |
| Transportation | | |
| Total | 100.01% | 100.00% |
| **Jurisdictions** | | |
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| **Site Description:** RHO encompasses about 70% of the total LAR UR2 WMA Rio Hondo tributary area, allowing direct water quality and pollutant load assessments. It is located south of the City of Bell Gardens... | | |
| **Site Location:** Please See **Figure X** | | |
| **Site View:** | | |

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## Summary Sheet for LAR-UR2-EO

| | | |
|---|---|---|
| **Watershed:** Los Angeles River | **Monitoring Type:** Stormwater Outfall | |
| **Latitude:** 33.956663 | **Longitude:** -118.169102 | |
| **Represented Area:** Cities of Bell Gardens, Commerce, and Vernon | | |
| **Thomas Guide Grid:** pg.705 F3 | **Drainage System:** | |
| **Outfall Shape:** | **Outfall Type:** | |
| **Nearest Street Address:** 8317 Jaboneria Rd., Bell Gardens, CA 90201 | | |
| **Land Use** | **Tributary to ELARO** | **LAR UR2 WMA** |
| | **% of Total** | **% of Total** |
| Agricultural | | 0.01% |
| Commercial | 11.78% | 12.46% |
| Industrial | 51.74% | 49.29% |
| Education | | 0.35% |
| Single Family Residential | 24.89% | 21.49% |
| Multi-Family Residential | 1.62% | 5.83% |
| Open Space | 9.97% | 10.26% |
| Transportation | | 0.31% |
| Total | 100.00% | 100.00% |
| **Jurisdictions** | | |
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| | | |
| **Site Description:** Stormwater outfall monitoring site ELARO is located in a residential area in Bell Gardens. Sample location at OF-SMB-2 will be samples at a manhole located near the intersection of Jaboneria Road and Fostoria Street. | | |
| **Site Location:** Please See **Figure X** | | |
| **Site View:** | | |

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## Summary Sheet for LAR-UR2-FWO

| | | |
|---|---|---|
| **Watershed:** Los Angeles River | **Monitoring Type:** Stormwater Outfall | |
| **Latitude:** | **Longitude:** | |
| **Represented Area:** Cities of Cudahy, Huntington Park, Maywood, Vernon, and Bell | | |
| **Thomas Guide Grid:** | **Drainage System:** | |
| **Outfall Shape:** | **Outfall Type:** | |
| **Nearest Street Address:** | | |
| **Land Use** | **Tributary to FWLARO** | **LAR UR2 WMA** |
| | **% of Total** | **% of Total** |
| Agricultural | | 0.01% |
| Commercial | 12.51% | 12.46% |
| Industrial | 40.81% | 49.29% |
| Education | 0.30% | 0.35% |
| Single Family Residential | 30.97% | 21.49% |
| Multi-Family Residential | 6.73% | 5.83% |
| Open Space | 7.54% | 10.26% |
| Transportation | 1.14% | 0.31% |
| Total | 100.00% | 100.00% |
| **Jurisdictions** | | |
| | | |
| | | |
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| | | |
| **Site Description:** Outfall monitoring location FWLARO is located on the southern boundary of the City of Cudahy. It receives runoff from the Far West LAR... | | |
| **Site Location:** Please See **Figure X** | | |
| **Site View:** | | |

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## Summary Sheet for LAR-UR2-WO

| | |
|---|---|
| **Watershed:** Los Angeles River | **Monitoring Type:** Stormwater Outfall |
| **Latitude:** 33.955159 | **Longitude:** -118.179977 |
| **Represented Area:** Cities of Bell, Cudahy, and Maywood | |
| **Thomas Guide Grid:** pg 675 E3 | **Drainage System:** |
| **Outfall Shape:** | **Outfall Type:** Manhole |
| **Nearest Street Address:** 8354 Wilcox Ave, Cudahy, CA 90201 | |

| Land Use | Tributary to WLARO % of Total | LAR UR2 WMA % of Total |
|---|---|---|
| Agricultural | | 0.01% |
| Commercial | 17.29% | 12.46% |
| Industrial | 7.32% | 49.29% |
| Education | 2.18% | 0.35% |
| Single Family Residential | 41.96% | 21.49% |
| Multi-Family Residential | 29.69% | 5.83% |
| Open Space | 1.56% | 10.26% |
| Transportation | 0.00% | 0.31% |
| Total | 100.00% | 100.00% |
| **Jurisdictions** | | |
| | | |
| | | |
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| | | |

**Site Description:** WLARO is located at the intersection of Wilcox Avenue and Patata Street in the City of Cudahy. Minimal traffic control is required for the manhole located in the eastbound lane of Patata Street.

**Site Location:** Please See **Figure X**

**Site View:**

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## Summary Sheet for LAR-UR2-NO

| | | | |
|---|---|---|---|
| **Watershed:** Los Angeles River | **Monitoring Type:** Stormwater Outfall | | |
| **Latitude:** | **Longitude:** | | |
| **Represented Area:** Cities of Commerce, Vernon, and Bell | | | |
| **Thomas Guide Grid:** | **Drainage System:** | | |
| **Outfall Shape:** | **Outfall Type:** | | |
| **Nearest Street Address:** | | | |
| **Land Use** | **Tributary to NLARO** | **Commerce** | **Vernon** |
| | **% of Total** | **% of Total** | **% of Total** |
| Agricultural | | | |
| Commercial | 1.89% | 10.90% | 5.62% |
| Industrial | 86.16% | 69.32% | 87.66% |
| Education | | | |
| Single Family Residential | 0.39% | 3.83% | |
| Multi-Family Residential | 2.95% | 4.69% | |
| Open Space | 8.61% | 11.27% | 6.71% |
| Transportation | | | |
| Total | 100.00% | 100.00% | 100.00% |
| **Jurisdictions** | | | |
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| **Site Description:** WLARO is located at the intersection of Wilcox Avenue and Patata Street in the City of Cudahy. Minimal traffic control is required for the manhole located in the eastbound lane of Patata Street. | | | |
| **Site Location:** Please See **Figure X** | | | |
| **Site View:** | | | |

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## Summary Sheet for LAR-UR2-NVO

| | | |
|---|---|---|
| **Watershed:** Los Angeles River | **Monitoring Type:** Stormwater Outfall | |
| **Latitude:** | **Longitude:** | |
| **Represented Area:** Cities of Vernon and Commerce | | |
| **Thomas Guide Grid:** | **Drainage System:** | |
| **Outfall Shape:** | **Outfall Type:** | |
| **Nearest Street Address:** | | |
| **Land Use** | **Tributary to NVO** | **Vernon** |
| | **% of Total** | **% of Total** |
| Agricultural | | 5.71% |
| Commercial | | 5.62% |
| Industrial | 97.89% | 81.96% |
| Education | | |
| Single Family Residential | | |
| Multi-Family Residential | | |
| Open Space | 2.11% | 6.71% |
| Transportation | | |
| Total | 100.00% | 100.00% |
| **Jurisdictions** | | |
| | | |
| | | |
| | | |
| | | |
| **Site Description:** NVO is located _____. | | |
| **Site Location:** Please See **Figure X** | | |
| **Site View:** | | |

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## Summary Sheet forLAR-UR2-DRO

| | | |
|---|---|---|
| **Watershed:** Los Angeles River | **Monitoring Type:** Stormwater Outfall | |
| **Latitude:** | **Longitude:** | |
| **Represented Area:** Cities of Commerce, Vernon, and Bell | | |
| **Thomas Guide Grid:** | **Drainage System:** | |
| **Outfall Shape:** | **Outfall Type:** | |
| **Nearest Street Address:** | | |
| **Land Use** | **Tributary to DRO** | **Vernon** |
| | **% of Total** | **% of Total** |
| Agricultural | | 5.71% |
| Commercial | | 5.62% |
| Industrial | 100.00% | 81.96% |
| Education | | |
| Single Family Residential | | |
| Multi-Family Residential | | |
| Open Space | | 6.71% |
| Transportation | | |
| Total | 100.00% | 100.00% |
| **Jurisdictions** | | |
| | | |
| | | |
| | | |
| | | |
| **Site Description:** DRO is located _____. | | |
| **Site Location:** Please See **Figure X** | | |
| **Site View:** | | |

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# Appendix B

# Generic Quality Assurance Project Program (QAPP) Plan

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# Los Angeles River Upper Reach 2 Watershed Management Area

# Quality Assurance Project Plan (QAPP)

## 5/15/14 DRAFT

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**Prepared for:**

**Los Angeles Gateway Region Integrated Regional Water Management Authority**
**16401 Paramount Boulevard, Paramount CA 90641**
**TEL (626) 485-0338**

**On Behalf of the Cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, and Vernon and the Los Angeles County Flood Control District**

Prepared by:

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June 27, 2014

## Approval Signatures

**Agency**

| Title: | Name: | Signature: | Date: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

**Project Team**

| Title: | Name: | Signature: | Date: |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
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# Group A Elements: Project Management

## 3. Distribution List

The individuals listed in Table 3-1 will receive a copy of the approved Quality Assurance Project Plan.

**Table 3-1 Distribution List**

| Title | Name (Affiliation) | Tel. No.: | No. of copies |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

## 4. Project/Task Organization

### 4.1 Involved parties and roles

This section identifies the management elements of the monitoring project plan. It includes a description of the staff organization, tasks involved in implementing the plan, and roles and responsibilities of the contributing parties.

**Table 4-1 Personnel Responsibilities**

| Name | Organizational Affiliation | Title | Contact Information (Telephone and e-mail address) |
|---|---|---|---|
| | | Project Director | |
| | | Project Manager | |
| | | QA Officer | |
| | | Sampling Manager | |
| | | Laboratory Manager | |
| | | Laboratory QA Specialist | |

The Project Director will review, evaluate and approve the study design and sample site locations, coordinate with other monitoring efforts, and provides technical oversight for the project staff. The Director will report findings to the Regional Water Board and serve as the correspondence between parties.

The Project Manager is responsible for providing technical assistance for the preparation of field sampling and coordination of laboratory activities. The Project Manager will oversee all daily activities involved in the project. Duties include overseeing the collection and storage of samples, assisting in the implementation of field components, managing laboratory activities, budget management, scheduling and coordinating tasks within the project.

The Quality Assurance (QA) Officer will ensure that the QAPP guidelines are being followed during sampling, laboratory analysis and reporting, data management, data storage, and data analysis.

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The Sampling Manager is responsible for implanting and coordinating monitoring activities. Duties include developing a schedule for the field team, maintaining adequate supplies and equipment, conducting sampling, and ensuring proper sample preservation and shipment to appropriate laboratories.

The Laboratory Manager will oversee all analyses performed in the laboratory. Duties include conducting and overseeing laboratory analysis, recording results, coordinating with the Sampling and Project Manager, and signing results to the project team.

The Laboratory QA Specialist will ensure that QAPP guidelines are being followed from within the lab. The QA Specialist will review SOPs and QAPP procedures with the laboratory team and request corrective action when necessary.

## 4.2 Quality Assurance Officer role

The Quality Assurance Officer will be responsible for the oversight of the QAPP and ensuring that quality assurance and control of procedures in sampling, analysis, monitoring and management are appropriate and updated. The Quality Assurance Officer will work with team members to clarify and confirm procedures. The Quality Assurance Officer will report all findings to the Project Manager, including all requests for corrective action. The Quality Assurance Officer may stop all actions, including those conducted by any laboratory, if there are significant deviations from required practices or if there is evidence of a systematic failure.

## 4.3 Persons responsible for QAPP Update and Maintenance

The Project Manager and QA Officer are responsible for creating and maintaining this QAPP. Changes and updates to this QAPP may be made by the Project Manager and QA Officer. The Project Manager will be responsible for making the changes and making sure these updates are provided to each of the participating agencies. Previous versions of the QAPP should be deleted from project files to avoid any confusion as to current versions of the QAPP.

## 4.4 Organizational chart and responsibilities

Figure 4-1 shows the organization of management staff participating in the monitoring project. The project team, including the Director, Manager, and Sampling Manager, are responsible for deliverables.

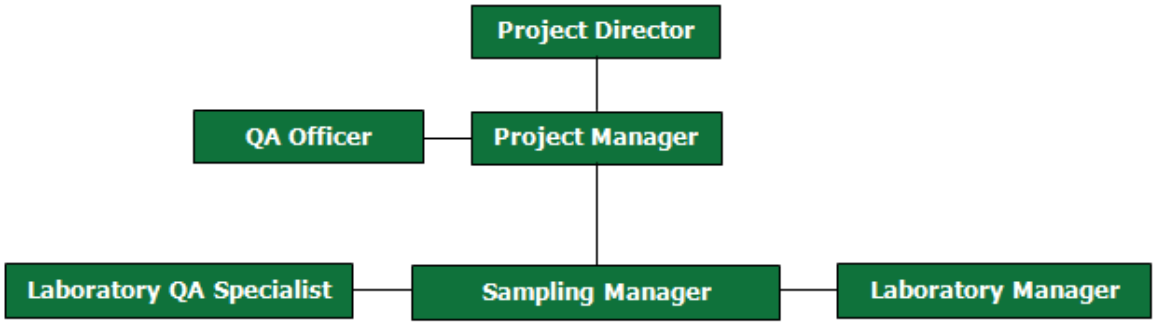


**Figure 4-1 Organizational Chart**

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# 5. Problem Definition/Background

## 5.1 Problem Statement

On November 8, 2012, the California Regional Water Quality Control Board, Los Angeles Region reissued the National Pollutant Discharge Elimination System (NPDES) Permit No. CAS004001, by adopting Order No. R4-2012-0175, *Waste Discharge Requirements for Municipal Separate Storm Sewer System (MS4) Discharges Within the Coastal Watersheds of Los Angeles County, Except Those Discharges Originating From The City of Long Beach MS4* (MS4 Permit). The primary purpose of the MS4 Permit is to ensure that discharges from the MS4 are not failing water quality objectives, Waste Load Allocations (WLAs), Receiving Water Limitations (RWLs), and Water Quality Based Effluent Limitations (WQBELs), developed to protect receiving water beneficial uses in Los Angeles County, human health and aquatic ecosystems. The Los Angeles River Upper Reach 2 Watershed Management Group (LAR UR2 WMG) is undertaking this task, a Coordinated Integrated Monitoring Plan (CIMP), in order to assess the discharge water quality of included MS4s whose effluent flows into receiving water bodies. The CIMP is intended to comply with Order No. R4-2012-0175. The Monitoring and Reporting Program (MRP) establishes requirements for appropriate monitoring, reporting, and recordkeeping of discharge data.

## 5.2 Decisions or outcomes

The monitoring of pollutants will allow the LAR UR2 WMG to assess compliance with the MS4 permit requirements within its respective watershed management area (WMA). Data collected will be applied to TMDLs based on Water Quality Based Effluent Limits (WQBELs) and/or Receiving Water Limits (RWLs). Pollutant loads from MS4 discharges can be identified and characterized so that the value of controls can be measured. Control measures can then be refined to reduce the pollutant discharge into receiving waters. Ultimately, this will improve the quality and enhance beneficial use of the receiving waters.

## 5.3 Water quality or regulatory criteria

### *5.3.1 Water Quality TMDLs*

The LAR UR2 WMG is responsible for four TMDL groups under Los Angeles Regional Water Quality Control Board Order No. R4-2012-0175:

- Los Angeles River Watershed Trash TMDL
- Los Angeles River Nitrogen Compounds and Related TMDL
- Los Angeles River and Tributaries Metals TMDL
- Los River Watershed Bacteria TMDL

The LAR Watershed Trash TMDL, shown in Table 5-1 and 5-2, specifies a reduction in WQBEL per year, with zero trash discharged no later than September 30, 2016 and every year thereafter. Permittees may comply via any legal method.

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| Table 5-1 LAR Watershed Trash TMDL Effluent Limitations per Storm Year (gallons of uncompressed trash) | | | | | | |
|---|---|---|---|---|---|---|
| **Permittees** | **Baseline** | **2012 (30%)** | **2013 (20%)** | **2014 (10%)** | **2015 (3.3%)** | **2016 (0%)** |
| Bell | 16026 | 4808 | 3205 | 1603 | 529 | 0 |
| Bell Gardens | 13500 | 4050 | 2700 | 1350 | 446 | 0 |
| Commerce | 58733 | 17620 | 11747 | 5873 | 1938 | 0 |
| Cudahy | 5935 | 1781 | 1187 | 594 | 196 | 0 |
| Huntington Park | 19159 | 5748 | 3832 | 1916 | 632 | 0 |
| Maywood | 6129 | 1839 | 1226 | 613 | 202 | 0 |
| Vernon | 47203 | 14161 | 9441 | 4720 | 1558 | 0 |

| Table 5-2 LAR Watershed Trash TMDL Effluent Limitations per Storm Year (pounds of drip dry trash) | | | | | | |
|---|---|---|---|---|---|---|
| **Permittees** | **Baseline** | **2012 (30%)** | **2013 (20%)** | **2014 (10%)** | **2015 (3.3%)** | **2016 (0%)** |
| Bell | 25337 | 7601 | 5067 | 2534 | 836 | 0 |
| Bell Gardens | 23371 | 7011 | 4674 | 2337 | 771 | 0 |
| Commerce | 85481 | 25644 | 17096 | 8548 | 2821 | 0 |
| Cudahy | 10061 | 3018 | 2012 | 1006 | 332 | 0 |
| Huntington Park | 30929 | 9279 | 6186 | 3093 | 1021 | 0 |
| Maywood | 10549 | 3165 | 2110 | 1055 | 348 | 0 |
| Vernon | 66814 | 20044 | 13363 | 6681 | 2205 | 0 |

Nitrogen compound limitations are detailed in Table 5-3.

| Table 5-3 LAR Nitrogen Compounds and Related Effects TMDL Final WQBELs | | | | | |
|---|---|---|---|---|---|
| **Water Body** | **$NH_3$-N (mg/L)** | | **$NO_3$-N (mg/L)** | **$NO_2$-N (mg/L)** | **$NO_3$-N+$NO_2$-N (mg/L)** |
| | **One-hour Average** | **Thirty-day Average** | **Thirty-day Average** | **Thirty-day Average** | **Thirty-day Average** |
| Los Angeles River below LAG | 8.7 | 2.4 | 8.0 | 1.0 | 8.0 |
| Rio Hondo Reach 1 and 2 | 10.1 | 2.3 | 8.0 | 1.0 | 8.0 |

Tables 5-4 and 5-6 detail the total daily allowable load. In lieu of determining daily loads for dry weather, permittees may also use concentration based limitations based on Table 5-5.

| Table 5-4 Dry Weather Final WQBELs Expressed as Total Recoverable Metals | | | |
|---|---|---|---|
| **Waterbody** | **Effluent Limitations Daily Maximum (kg/day)** | | |
| | **Copper** | **Lead** | **Zinc** |
| LA River Reach 2 | WER[1] x 0.53 | WER[1] x 0.33 | -- |
| Rio Hondo Reach 1 | WER[1] x 0.01 | WER[1] x 0.006 | WER[1] x 0.16 |

[1] WER(s) have a default value of 1.0 unless site-specific WER(s) are approved via the Basin Plan Amendment process

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| Table 5-5 Concentration Based Dry Weather Final WQBELs Expressed as Total Recoverable Metals | | | |
|---|---|---|---|
| **Waterbody** | **Effluent Limitations Daily Maximum (µg)** | | |
| | **Copper** | **Lead** | **Zinc** |
| LA River Reach 2 | WER[1] x 22 | WER[1] x 11 | -- |
| Rio Hondo Reach 1 | WER[1] x 13 | WER[1] x 5.0 | WER[1] x 131 |

[1] WER(s) have a default value of 1.0 unless site-specific WER(s) are approved via the Basin Plan Amendment process

| Table 5-6 Wet Weather Final WQBEL Expressed as Total Recoverable Metals | | |
|---|---|---|
| **Constituent** | **Effluent Limitations Daily Maximum (kg/day)** | **Approximate Effluent Limitation (µg/L)** |
| Cadmium | WER[1] x $2.8 \times 10^{-9}$ x daily volume (L) - 1.8 | WER[1] x 2.8 |
| Copper | WER[1] x $1.5 \times 10^{-8}$ x daily volume (L) - 9.5 | WER[1] x 15 |
| Lead | WER[1] x $5.6 \times 10^{-8}$ x daily volume (L) - 3.85 | WER[1] x 56 |
| Zinc | WER[1] x $1.4 \times 10^{-7}$ x daily volume (L) - 83 | WER[1] x 140 |

### *5.3.2 Clean Water Act 303(d) List of Water Quality Limited Segments*

Receiving water pollutant impairments on the Clean Water Act (CWA) 303(d) list or State Integrated Report, but not currently addressed by a TMDL, include the following for the LAR UR2 WMG receiving water bodies:

- **Los Angeles River Reach 2**
  - **Oil** – This constituent has an estimated TMDL completion date of 2019. Los Angeles River, Reach 2 (from Carson to Figueroa Street) currently has a single 303(d) listing, with an estimated TMDL completion date of 2019. The pollutant is oil with a qualitative water quality objective of no visible sheen due to oil and grease. Since oil tends to be associated with parking lots and streets, it is likely that substantial reductions have already occurred since the 303(d) listing process was initiated. This is attributable to both street sweeping and the implementation of SUSMP based development standards. Furthermore, the installation of FCCDs, such as the CPSs required by the LAR Trash TMDL, are likely to also contribute to alleviating this impairment, since accumulating trash and organic matter will absorb oil, grease and trap particulates that oil and grease often bind to.
- **Rio Hondo Reach 1**
  - **Coliform Bacteria** – This constituent has an estimated completion date of 2019; however with the adoption of the Los Angeles River Bacteria TMDL this impairment is currently being addressed. Reach 1 of the Rio Hondo (confluence of Los Angeles River to Santa Ana Freeway), is currently 303(d) listed for coliform bacteria, with an estimated completion date of 2019, however the Los Angeles River Bacteria TMDL, should take precedent and result in a status revision during the next listing cycle.
  - **Toxicity** – This impairment condition has an estimated TMDL completion date of 2021; however other toxicity listings have been addressed as a specific toxicant, such as a metal, for which a TMDL has already been developed. It is unclear that a source assessment can be developed, or a pollutant reduction strategy implemented for a condition or unknown constituent. Reach 2 of the Rio Hondo, is currently 303(d) listed for toxicity, with an estimated TMDL completion date of 2021. For other LARWQCB water bodies, listings for toxicity were often subsequently associated with a toxicant such as metals, pesticides, or synthetic organics.

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### *5.3.3 Action Levels for Discharges to Inland Surface Waters, Enclosed Bays, and Estuaries*

Additional water quality objectives listed in the Basin Plan, California Toxics Rule (CTR) standards, non-stormwater Action Levels (ALs) and Municipal Action Levels (MALs) are list in Table 5-8.

**Table 5-8 Summary of Water Quality Objective Values**

| Constituent | Units | WQO | Limits | Acute | Chronic |
|---|---|---|---|---|---|
| Fecal Coliform | MPN/100mL | Basin Plan, AL | 400 | 400 | 400 |
| Fecal Enterococcus | MPN/100mL | MS4 Permit AL | 104 | -- | -- |
| Total Coliform | MPN/100mL | MS4 Permit AL | 10000 | -- | -- |
| 4-4'-DDD | µg/L | CTR | -- | 1.1 | 0.001 |
| Aldrin | µg/L | CTR | -- | 3 | -- |
| Dieldrin | µg/L | CTR | -- | 0.24 | 0.056 |
| Endosulfan I (alpha) | µg/L | CTR | -- | 0.22 | 0.056 |
| Endosulfan II (beta) | µg/L | CTR | -- | 0.22 | 0.056 |
| Endrin | µg/L | CTR | -- | 0.086 | 0.036 |
| Heptachlor | µg/L | Basin Plan, CTR | 0.01 | 0.52 | 0.0038 |
| Heptachlor Epoxide | µg/L | Basin Plan, CTR | 0.01 | 0.52 | 0.0038 |
| Methoxychlor | µg/L | Basin Plan | 30 | -- | -- |
| Toxaphene | µg/L | CTR | -- | 0.73 | 0.0002 |
| gamma-BHC (lindane) | µg/L | CTR | -- | 0.95 | -- |
| Cyanide | mg/L | Basin Plan, CTR | 0.15 | 0.022 | 0.0052 |
| Dissolved Oxygen | mg/L | Basin Plan | 5 | -- | -- |
| pH | pH units | Basin Plan, AL, MAL | 6.0-9.0 | 6.5-8.5 | 6.5-8.5 |
| Chemical Oxygen Demand | mg/L | MS4 Permit MAL | 247.5 | -- | -- |
| Chloride | mg/L | AL, Basin Plan | 190[a], 180[b] | -- | -- |
| Kjeldahl-N | mg/L | MS4 Permit MAL | 4.59 | -- | -- |
| Methylene Blue Active Substances (MBAS) | mg/L | Basin Plan | 500 | -- | -- |
| Nitrate (NO3) | mg/L | Basin Plan | 45 | -- | -- |
| Nitrate-N | mg/L | Basin Plan | 10 | -- | -- |
| Nitrite-N | mg/L | Basin Plan | 1 | -- | -- |
| Nitrogen, Total | mg/L | MS4 Permit MAL/AL | 1.85 | -- | -- |
| Phosphorus - Total (as P) | mg/L | MS4 Permit MAL | 0.8 | -- | -- |
| Sulfate | mg/L | Basin Plan | 350 | -- | -- |
| Total Dissolved Solids | mg/L | Basin Plan | 1500[a], 750[b] | -- | -- |
| Total Suspended Solids | mg/L | MS4 Permit MAL | 264.1 | -- | -- |
| Turbidity | NTU | MS4 Permit AL | 5 | -- | -- |
| Dissolved Arsenic | µg/L | CTR | -- | 340 | 150 |
| Total Cadmium | µg/L | MAL | 2.52 | -- | -- |
| Total Chromium | µg/L | MAL | 20.2 | -- | -- |
| Total Cyanide | µg/L | AL | 8.5 | -- | -- |
| Total Mercury | µg/L | AL | 0.10 | -- | -- |

| Table 5-8 Summary of Water Quality Objective Values | | | | | |
|---|---|---|---|---|---|
| **Constituent** | **Units** | **WQO** | **Limits** | **Acute** | **Chronic** |
| Total Nickel | µg/L | MAL | 27.43 | -- | -- |
| Total Selenium | µg/L | AL | 8.2 | -- | -- |
| Total Zinc | µg/L | TMDL, MAL | 641.3 | -- | -- |
| Atrazine | µg/L | Basin Plan | 1 | -- | -- |
| Simazine | µg/L | Basin Plan | 4 | -- | -- |
| 1-2-Dichlorobenzene | µg/L | Basin Plan | 600 | -- | -- |
| 1-4-Dichlorobenzene | µg/L | Basin Plan | 5 | -- | -- |
| Benzo(a)pyrene | µg/L | Basin Plan | 0.2 | -- | -- |
| Chlordane | -- | Basin Plan | 0.1 | -- | -- |

[a] – Los Angeles River Reach 2
[b] – Rio Hondo Reach1

# 6. Project/Task Description

## 6.1 Work Statement and Produced products

This project will monitor receiving waters and outfalls to ensure that discharges from the LAR UR2 WMA are in compliance with the Los Angeles County MS4 permit by the associated due dates. Results from the monitoring will be used to assess sources and determine corrective measures to be taken.

Dry weather receiving water monitoring will occur when flows in the receiving water are less than 20% than the base flow, and will occur two times per year, or more frequently if required by applicable TMDL Monitoring Plans. One of the monitoring events will occur during the critical dry weather event, which is defined as the month with the historically lowest flows or driest weather, which is July for the WMG.

Wet weather receiving water monitoring will occur when the National Weather Service predicted rainfall exceeds 0.25 inch with a 70% occurrence probability, at least 24 hours prior to the event start time. Local flows must also be at least 20% above base flow, or other requirements as defined by applicable TMDL Monitoring Plans. As required by the Permit, the LAR UR2 WMG will target the first storm event of the storm year and two subsequent storm events that are forecast to generate sufficient rainfall and runoff to meet program objectives. Sampling events will be separated by a minimum of 72 hours of dry conditions (less than 0.1 inch of rain on each day).

The following parameters will be monitored for the life of the permit:

- Pollutants assigned a receiving water limitation in Attachment O of Order No. R4-2012-0175
- Flow
- Pollutants identified in the CWA section 303(d)
- Field measurements
- Aquatic Toxicity

This monitoring will occur in the first year during the first significant rain event and in the first year's dry weather event. For all other parameters, analysis may conclude in the first year if the parameter is not detected at the Method Detection Limit or the result is below the lowest water quality objective. If the parameter exceeds the water quality objective, then it will continue to be monitored at the station where it was detected during the wet or dry weather events when it occurred.

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The results of the monitoring will be summarized in an Annual Report, submitted to the Regional Water Board Executive Officer, on December 15th of each year. The report will state the impact of the WMG's discharges into receiving water, compliance with permit limitations, the effectiveness of control measures, and a discussion on the progress of MS4 discharges and receiving water quality.

## 6.2 Constituents to be monitored and measurement techniques

Table 6-1 lists the constituents to be analyzed and the proposed method of analysis.

**Table 6-1 Water Analytical Constituents**

| Constituent | Matrix | Method |
|---|---|---|
| **Nutrients** | | |
| Oil and Grease | Water | |
| Total Phenols | Water | |
| Cyanide | Water | |
| pH | Water | |
| Temperature | Water | |
| Dissolved Oxygen | Water | |
| **BACTERIA (single sample limits)** | | |
| Total coliform (marine waters) | Water | |
| Enterococcus (marine waters) | Water | |
| Fecal coliform (marine & fresh waters) | Water | |
| E. coli (fresh waters) | Water | |
| **GENERAL** | | |
| Dissolved Phosphorus | Water | |
| Total Phosphorus | Water | |
| Turbidity | Water | |
| Total Suspended Solids | Water | |
| Total Dissolved Solids | Water | |
| Volatile Suspended Solids | Water | |
| Total Organic Carbon | Water | |
| Total Petroleum Hydrocarbon | Water | |
| Biochemical Oxygen Demand | Water | |
| Chemical Oxygen Demand | Water | |
| Total Ammonia-Nitrogen | Water | |
| Total Kjeldahl Nitrogen | Water | |
| Nitrate-Nitrite | Water | |
| Alkalinity | Water | |
| Specific Conductance | Water | |
| Total Hardness | Water | |
| MBAS | Water | |

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| | | |
|---|---|---|
| Chloride | Water | |
| Fluoride | Water | |
| Methyl tertiary butyl ether (MTBE) | Water | |
| Perchlorate | Water | |
| **METALS (Dissolved & Total)** | | |
| Aluminum | Water | |
| Antimony | Water | |
| Arsenic | Water | |
| Beryllium | Water | |
| Cadmium | Water | |
| Chromium (total) | Water | |
| Chromium (Hexavalent) | Water | |
| Copper | Water | |
| Iron | Water | |
| Lead | Water | |
| Mercury | Water | |
| Nickel | Water | |
| Selenium | Water | |
| Silver | Water | |
| Thallium | Water | |
| Zinc | Water | |
| **SEMIVOLATILE ORGANIC COMPOUNDS** | | |
| **ACIDS** | Water | |
| 2-Chlorophenol | Water | |
| 4-Chloro-3-methylphenol | Water | |
| 2,4-Dichlorophenol | Water | |
| 2,4-Dimethylphenol | Water | |
| 2,4-Dinitrophenol | Water | |
| 2-Nitrophenol | Water | |
| 4-Nitrophenol | Water | |
| Pentachlorophenol | Water | |
| Phenol | Water | |
| 2,4,6-Trichlorophenol | Water | |
| **BASE/NEUTRAL** | | |
| Acenaphthene | Water | |
| Acenaphthylene | Water | |
| Anthracene | Water | |
| Benzidine | Water | |
| 1,2 Benzanthracene | Water | |
| Benzo(a)pyrene | Water | |
| Benzo(g,h,i)perylene | Water | |
| 3,4 Benzoflouranthene | Water | |
| Benzo(k)flouranthene | Water | |
| Bis(2-Chloroethoxy) methane | Water | |

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| | | |
|---|---|---|
| Bis(2-Chloroisopropyl) ether | Water | |
| Bis(2-Chloroethyl) ether | Water | |
| Bis(2-Ethylhexl) phthalate | Water | |
| 4-Bromophenyl phenyl ether | Water | |
| Butyl benzyl phthalate | Water | |
| 2-Chloroethyl vinyl ether | Water | |
| 2-Chloronaphthalene | Water | |
| 4-Chlorophenyl phenyl ether | Water | |
| Chrysene | Water | |
| Dibenzo(a,h)anthracene | Water | |
| 1,3-Dichlorobenzene | Water | |
| 1,4-Dichlorobenzene | Water | |
| 1,2-Dichlorobenzene | Water | |
| 3,3-Dichlorobenzidine | Water | |
| Diethyl phthalate | Water | |
| Dimethyl phthalate | Water | |
| di-n-Butyl phthalate | Water | |
| 2,4-Dinitrotoluene | Water | |
| 2,6-Dinitrotoluene | Water | |
| 4,6 Dinitro-2-methylphenol | Water | |
| 1,2-Diphenylhydrazine | Water | |
| di-n-Octyl phthalate | Water | |
| Fluoranthene | Water | |
| Fluorene | Water | |
| Hexachlorobenzene | Water | |
| Hexachlorobutadiene | Water | |
| Hexachloro-cyclopentadiene | Water | |
| Hexachloroethane | Water | |
| Indeno(1,2,3-cd)pyrene | Water | |
| Isophorone | Water | |
| Naphthalene | Water | |
| Nitrobenzene | Water | |
| N-Nitroso-dimethyl amine | Water | |
| N-Nitroso-diphenyl amine | Water | |
| N-Nitroso-di-n-propyl amine | Water | |
| Phenanthrene | Water | |
| Pyrene | Water | |
| 1,2,4-Trichlorobenzene | Water | |
| **POLYCHLORINATED BIPHENYLS and PESTICIDES** | | |
| Aldrin | Water | |
| alpha-BHC | Water | |
| beta-BHC | Water | |
| delta-BHC | Water | |
| gamma-BHC (lindane) | Water | |

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| | | |
|---|---|---|
| alpha-chlordane | Water | |
| gamma-chlordane | Water | |
| 4,4'-DDD | Water | |
| 4,4'-DDE | Water | |
| 4,4'-DDT | Water | |
| Dieldrin | Water | |
| alpha-Endosulfan | Water | |
| beta-Endosulfan | Water | |
| Endosulfan sulfate | Water | |
| Endrin | Water | |
| Endrin aldehyde | Water | |
| Heptachlor | Water | |
| Heptachlor Epoxide | Water | |
| Toxaphene | Water | |
| Aroclor-1016 | Water | |
| Aroclor-1221 | Water | |
| Aroclor-1232 | Water | |
| Aroclor-1242 | Water | |
| Aroclor-1248 | Water | |
| Aroclor-1254 | Water | |
| Aroclor-1260 | Water | |
| **ORGANOPHOSPHATE PESTICIDES** | | |
| Atrazine | Water | |
| Chlorpyrifos | Water | |
| Cyanazine | Water | |
| Diazinon | Water | |
| Malathion | Water | |
| Prometryn | Water | |
| Simazine | Water | |
| **HERBICIDES** | | |
| 2,4-D | Water | |
| Glyphosate | Water | |
| 2,4,5-TP-SILVEX | Water | |

## 6.3 Project schedule

This area to contain a summary of the project schedule.

## 6.4 Geographical setting

The Los Angeles River begins in the Santa Monica Mountains at the western end of the San Fernando Valley. The river flows 51 miles through the Los Angeles Basin, exiting into the Pacific Ocean at Long Beach Harbor. Including tributaries, the 824 square mile watershed includes a total stream length of about 837 miles and 4.6 square miles of lake area. The LAR UR2 WMA is located near central Los Angeles County and consists of the cities of Bell, Bell Gardens, Commerce, Cudahy, Huntington Park, Maywood, Vernon, as well as Los Angeles County and Los Angeles County Flood Control District. The Los Angeles River Upper Reach 2 begins at the Arroyo Seco

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confluence and ends at the Compton Creek confluence, flowing through the LAR UR2 WMG cities of Bell, Cudahy, Maywood, and Vernon. Additionally, the Rio Hondo drains a large portion of the eastern watershed. The boundaries for the LAR UR2 WMA start at East 26th Street in the City of Vernon and ending at Patata Street in City of Cudahy. The LAR UR2 WMG Cities of Bell Gardens and Commerce line the western bank of Rio Hondo Reach 1, a 120 square mile Los Angeles River tributary. Figure 6-1 illustrates the LAR UR2 WMA municipal and jurisdictional boundaries in relation to Los Angeles River Reach 2 and Rio Hondo Reach 1.

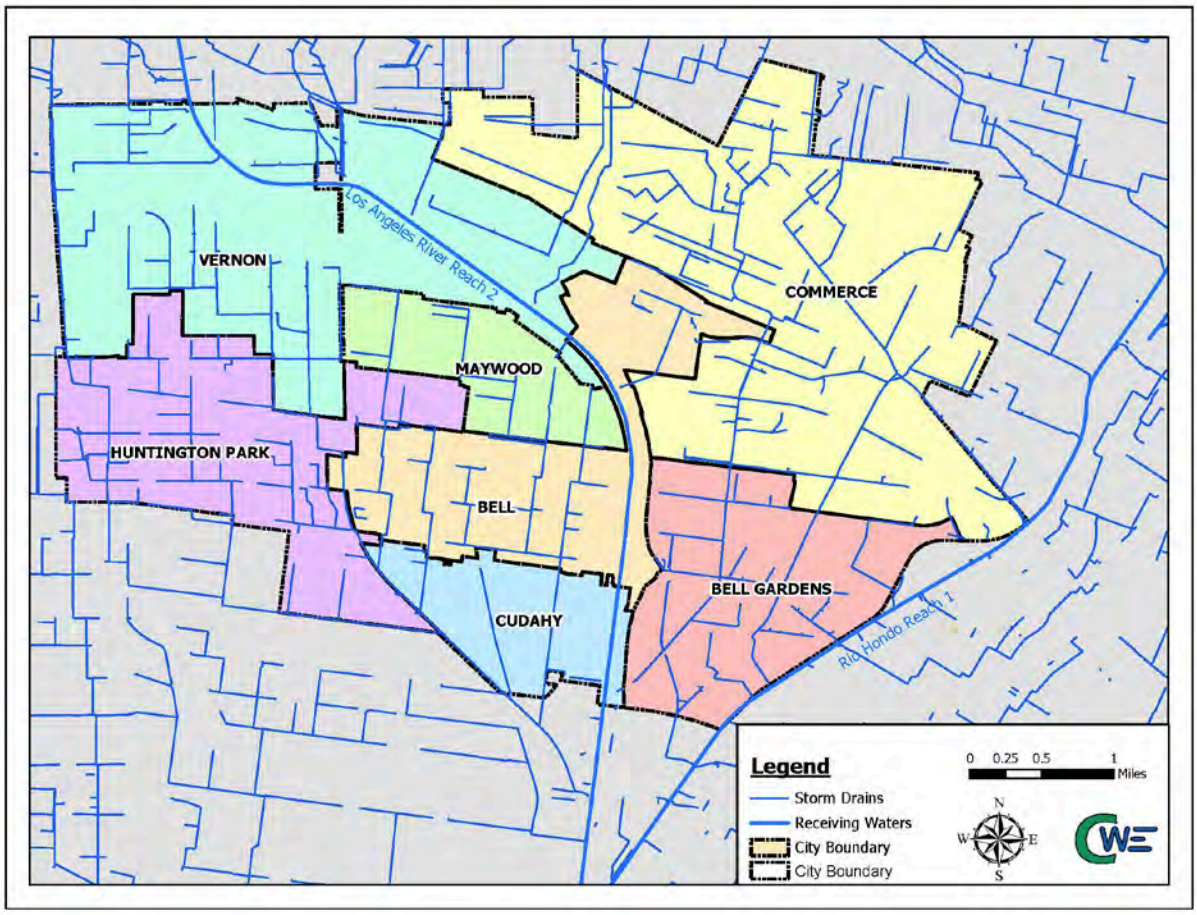


**Figure 6-1 Map of the LAR UR2 WMA**

## 6.5 Constraints

The sample locations will require further coordination with or permission of access from the cities involved and Los Angeles County Flood Control District. The managing organization will contact, coordinate, and complete any necessary paperwork and access permits.

Traffic control permits may be required to access the sample location in the right-of-way. Traffic Control Permits take an estimated five days to process and are valid for a limited time only. Traffic controls are necessary for the safety of the field crew and to minimize the overall impact to the flow of traffic on the city streets.

Safety of the field staff is always the primary concern, and therefore, samples will not be collected when a situation is deemed unsafe. Dry-weather conditions may prevent the collection of samples due to insufficient runoff. Wet-weather

# 7. Quality Objectives and Criteria for Measurement Data

Data quality indicators (DQIs) for this project will include the following:

- Accuracy
- Precision
- Comparability
- Completeness
- Representativeness

These data quality indicators will apply to individual measurements or analyses as indicated in Table 7-1 below.

**Table 7-1 Applicable Data Quality Indicators for Measurements and Analyses**

| Measurement or Analyses | Applicable DQIs |
|---|---|
| Field, Dissolved Oxygen | Accuracy, Precision, Completeness |
| Field, Temperature | Accuracy, Precision, Completeness |
| Field, Conductivity | Accuracy, Precision, Completeness |
| Field, pH | Accuracy, Precision, Completeness |
| Field, Alkalinity | Accuracy, Precision, Completeness |
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Accuracy is the measurement of a sample of known concentration and comparing the known value against the measured value. The accuracy of field measurements will be achieved by the calibration of the measuring device before every sampling event. The accuracy of chemical measurements will be checked by performing tests on a standard prior to and/or during sample analysis. A standard is a known concentration of a certain solution. Standards can be purchased from chemical or scientific supply companies. Standards might also be prepared by a professional partner (e.g., a commercial or research laboratory). The concentration of the standards will be unknown to the analyst until after measurements are determined. The concentration of the standards should also be within the mid-range of the equipment. Recovery measurements are determined by spiking a replicate sample in the laboratory with a known concentration of the analyte. Accuracy of the project data will be determined by the analysis of matrix spike/matrix spike duplicates (MS/MSD), laboratory control spikes (LCS), positive controls, standard reference materials (SRMs), and comparison to the accuracy objectives specified in Table 7-1.

Precision describes how well repeated measurements agree. Precision measurements will be determined by comparing results from matrix spike duplicates, blank spikes, laboratory replicates, and field duplicates

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to the precision objectives specified in Table 7-1. These duplicates will be collected for at least 5% of all samples. The evaluation of precision described here relates to repeated measurements/samples collected in the field (field duplicates) or the laboratory (laboratory replicates and MS/MSD).

Comparability is the measure of confidence that one data set can be compared to another and a combined decision can be made on the results. This is relevant for time series data, and will be satisfied by consistent standard operating procedures in the collection, handling, analysis, and QA/QC of the samples.

Completeness is the fraction of planned data that must be collected to fulfill the statistical criteria of the project. There are no statistical criteria that require a certain percentage of data. However, it is expected that 90 percent of all measurements could be taken when anticipated. This accounts for adverse weather conditions, safety concerns, and equipment problems. The project team will determine completeness by comparing the number of measurements planned to be collected with the number of measurements actually collected that were also deemed valid. An invalid measurement would be one that does not meet the sampling method requirements and the data quality objectives.

Representativeness is the measure of confidence that the sample data set represents the characteristic of the environmental condition of the effluent and receiving waters. This will be achieved by correct planning of monitoring sites, as well as sufficient and timely monitoring of outfalls and receiving waters during dry and wet weather events.

The data quality objectives (DQOs) are summarized in Tables 7-2 and 7-3.

**Table 7-2 Field Data Quality Objectives**

| Parameter | Measurement Device/Method | Accuracy | Precision | Completeness |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

**Table 7-3 Laboratory Data Quality Objectives**

| Group | Parameter | Units | Target Reporting Limit | Accuracy (Recovery) | Precision RPD | Completeness |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
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## 8. Special Training Needs/Certification

Field personnel will be properly trained in the use of monitoring equipment and clean sample handling techniques along with all appropriate health and safety protocols prior to conducting monitoring activities. Specifically, the following elements will be included in the training of all field personnel:

- Review of Health and Safety Plan

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- Field training

Personnel will have had prior experience performing field sampling and laboratory analyses for the type of water quality monitoring required. All Standard Operating Procedures for collection, records, handling, and analysis will be monitored by the QA/QC officers.

## 9. Documents and Records

All field observations will be recorded in standard Field Conditions Data Log sheets. The sheets will be reviewed for errors prior to leaving the sample site. Chain-of-custody (COC) forms will be completed for all water samples before the samples are delivered to the laboratory. Field sheets and COCs will be scanned and stored as an electronic PDF by the Project Manager for a minimum of five (5) years from the time the MRP is completed. Additionally, the records saved shall include the following information:

- Site identification and location
- Date and time that sampling or measurements were taken
- Individual(s) who performed the sampling or measurements
- Analytical methods used
- Results of analyses
- Data sheets showing toxicity test results

The Laboratory Manager receives the analytical results in original hard copy from the laboratory, verifies completeness, and logs the date of receipt. The originals are then transferred to the Project Manager and filed with all other original project documentation in order to maintain complete project records. In addition to hard copies, the laboratory will also provide analytical data in electronic format. Laboratory data will be maintained and managed with Microsoft Excel and/or Microsoft Access. Following project completion, the Project Manager will file a copy of the database with the original project documentation. An electronic copy of the database, along with the field forms, will also be provided to Los Angeles County for their records.

The Project Manager will distribute copies of this QAPP electronically to the individuals listed in the Section 3 Distribution List. Hard copies of the QAPP will be available upon request. Updates to this QAPP will be distributed to the same individuals, and all previous versions will be discarded from the project file. A hard copy of the QAPP will be filed with the remaining project documentation.

**Table 9-1 Document and Record Retention, Archival, and Disposition Information**

| Records | Identify Type Needed | Retention | Archival | Disposition |
|---|---|---|---|---|
| Project Plan | Monitoring and Reporting Program | Paper/Electronic | Document | Minimum 5 years |
| | QAPP | Paper/Electronic | Document | Minimum 5 years |
| Field Data | Field Conditions Data Log Sheets | Paper/Electronic | Project File/PDFs | Minimum 5 years |
| | Photographs | Electronic | Project File | Minimum 5 years |
| Sample Collection Records | Chain-of-Custody | Paper/Electronic | Project File | Minimum 5 years |
| | Calibration and Maintenance | Paper | Project File | Minimum 3 years |
| | Original strip charts | Paper/Electronic | Project File | Minimum 3 years |
| Analytical Records | Lab Notebooks | Paper | Notebook | Minimum |

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| Table 9-1 Document and Record Retention, Archival, and Disposition Information | | | | |
|---|---|---|---|---|
| **Records** | **Identify Type Needed** | **Retention** | **Archival** | **Disposition** |
| | | | | 5 years |
| | Lab Reports (include COCs) | Electronic | Notebook/Excel | Minimum 5 years |
| | Electronic Data File | Electronic | Database | Minimum 5 years |
| Assessment Records | QA/QC Assessment | Paper/Electronic | Document | Minimum 5 years |
| | Final Report | Paper/Electronic | Document | Minimum 5 years |

# Group B: Data Generation and Acquisition

## 10. Sampling Process Design

The information contained in this section provides a general overview and references the appropriate section of the MRP plan. To obtain more detailed information, see the referenced section of the MRP plan.

**Section __** of the LAR UR2 WMG Coordinated Integrated Monitoring Plan (CIMP) provides a complete description of the receiving water monitoring approach, including the necessary requirementsrationale for site selection,sampling logistics, and sampling quantities. The Los Angeles River and Rio Hondo River are the receiving water bodies for the WMG.

**Section __** of the CIMP provides a complete description of the stormwater outfall monitoring approach, including the necessary requirements, rationale for site selection, sampling logistics, and sampling quantities.

**Section __** of the CIMP provides a complete description of the non-stormwater outfall monitoring approach, including the necessary requirements, rationale for site selection, sampling logistics, and sampling quantities.

## 11. Sampling Method

Details of the Sampling Method are discussed in **Section xx** of the CIMP. This section will summarize QA/QC procedures related to sampling.

When appropriate, monitoring, sampling, and sample preservation will be conducted according to procedures approved in 40 CFR Part 136. All other methods will be approved of in advance and utilize standardized procedures from the EPA. In-situ measurements will be taken for pH, conductivity, turbidity, temperature, and dissolved oxygen. Samples for laboratory analysis will be stored in an ice cooler at or below 4$^{o}$C in appropriate labeled containers, not to exceed specified holding times.

Grab samples will be performed for the analysis of all constituents. All sampling and storage procedures will adhere to the guidelines found in EPA method 1669. Samples will be collected by-hand, when possible, or by using an extension pole with a bottle attachment. If necessary, a portable battery-powered peristaltic pump, with properly cleaned tubing, will be used to collect the samples during low-flow conditions, where the extension pole is not effective. All sampling equipment will be properly

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cleaned prior to each sampling event. When using the extension pole, ultrapure de-ionized water will be used to rinse off any residual site water from the apparatus. If the peristaltic pump is used, a new properly cleaned length of tubing will be used at each sampling location to avoid cross-contamination of the samples.

A two-person team will conduct all sampling events. The sampling team will have access to a cellular phone in order to alert rescue agencies should an accident occur. Sampling will be postponed if the sampling team determines that the conditions are unsafe. Failure to collect a sample due to safety concerns or technical issues will be promptly reported to the Project Manager, who will determine if any corrective action is needed and make arrangements to collect a replacement sample, if possible. The QA Officer will document sampling failures and the effectiveness of corrective actions.

Field data sheets will be completed during each sampling event. Observations and photographs will be made for qualitative measurements. Observed water quality characteristics include: meteorological conditions, odor, clarity, deposits, and floatable matter.

# 12. Sample Handling and Custody

## 12.1 Sample Handling

The laboratory will provide appropriate sample containers according to Table 12-1. All samples will be pre-labeled with the project name, site ID, sample type, bottle number, sampler name, preservative, and analysis. All sample bottles will also be pre-labeled with a unique Sample ID to track the sample throughout its analyses. At the time of sample collection, the sample labels will be completed in the field with the date and time. The Sample IDs will also be entered directly onto the Field Conditions Data Log Sheets and the COC Forms. The COC forms will accompany the collection of all samples.

The following sample handling protocols will be followed when collecting samples to minimize the possibility of contamination:

- Previously unused sample bottles will be employed. Sample bottles and bottle caps will be protected from contact with solvents, dust, or other contaminants during storage and bottle handing.
- The grab sampler will make an effort, within reason, to prevent large gravel and uncharacteristic floating debris from entering the sample containers. The sampler will also make an effort to not stir up sediments at the bottom of the storm drain.
- The inside of the sampling container will not be touched to the maximum extent practicable during preparation and sampling activities.
- Vehicle engines will be turned off during sampling activities to minimize exposure of samples to exhaust fumes.
- All samples will be collected in accordance with clean sampling techniques.
- Manual water grab samples will be collected by inserting the transfer container under or down current of the direction of flow, with the container opening facing upstream.
- Once sample containers are filled, they will be promptly placed on ice, in a clean cooler (target temperature 6 degrees Celsius), in the dark and transported to the laboratory for processing to

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meet holding times. All necessary pre-processing for analysis, such as filtration and acidification, will take place in the laboratory by certified personnel.

- After the field crew collects and delivers the samples to the laboratory, the laboratory will conduct the analysis within appropriate holding times. These field and laboratory activities will be coordinated to make sure all samples are handled within the proper holding time.

After the laboratory receives the water samples, the laboratory technicians will dispense the sample contents into containers that contain the required volume specified in Table 12-1. The laboratory will preserve the water samples using the appropriate preservative and the laboratory will conduct the analysis within the maximum holding time limits. Following completion of analyses, the laboratory will dispose of expired samples in a manner appropriate to local discharge laws.

**Table 12- 1 Sample Handling and Custody**

| Constituent | Container Type | Minimum Sample Volume | Preservation | Holding Time |
|---|---|---|---|---|
| **Nutrients (Water Analysis)** | | | | |
| | | | | |

## 12.2 Chain of Custody

The laboratory will supply the Chain-of-Custody (COC) forms that will be utilized by the sampling team. COC procedures will be used for all samples throughout the collection, transport, and analytical process to ensure the most accurate results. COCs will be pre-printed along with the bottle labels and will contain the same data as the labels. The COCs will be completed in the field with dates, times, and sample team names, and will be cross-checked with the bottles to make sure proper samples have been collected. Documentation of sample handling and custody will include the following:

- Sample identification;
- Type of sample;
- Sample collection date and time;
- Any special notations on sample characteristics or analysis;
- Analyses to be performed;
- Initials of the sampling team member that collected the sample; and
- Date the sample was delivered to/sent to the laboratory.

The COC forms for the samples will be transported with the samples to the analytical laboratory. Sampled water will be kept properly chilled and transferred to an analytical laboratory within specified holding times. When custody of the samples is transferred to the laboratory, the COC will be signed and dated, and a PDF copy will be sent from the laboratory. An example COC form is included in Appendix . The COCs will be reviewed by personnel at the receiving laboratory to make sure no samples have been lost in transport. The laboratory will also verify that each sample has been received within the appropriate holding times. COC records will be included in the final reports prepared by the analytical laboratory and are considered an integral part of the report. Analytical methods and detection limits for this project are listed in Table 13-1. The detection limits described in Table 7-2 are target detection limits.

# 13. Analytical Methods

## 13.1 Field Water Quality Measurements

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Temperature, pH, dissolved oxygen, turbidity and conductivity will be measured on-site in the same period as grab sampling. The instrument will be calibrated before use and used according to the manufacturer's instructions. After use, the instrument will be cleaned in preparation for the next sampling event. Maintenance will also be performed per the manufacturer's instructions, and the instrument will be stored to prevent fouling of the probes.

This section to contain information on the field equipment specifications.

## 13.2 Laboratory Water Quality Measurements

Multiple ELAP-accredited laboratories were surveyed in order to determine their capabilities in analysis of the required constituents. This section contains a sample of the proposed laboratory methods to be used in the water quality analysis, along with the Method Detection Limit (MDL) and Reporting Limit (RL). Please refer to Appendix ? for a complete summary of the laboratories surveyed and their reported methods and analytical limits.

Table 13-1 summarizes the analytical procedures used in this project by ES Babcock Laboratory, one of the surveyed laboratories. The highlighted cells represent limits which do not meet the Minimum Levels (MLs) stated in Table E.2 of the MS4 permit. For Minimum Levels that are met by the MDL but not by the RL, the labs may report this data flagged with a "J" qualifier to signify that it is an estimate. Of the Analytical Methods proposed by each laboratory, a number have not been approved under the stipulations placed in Attachment E, XIV.A.1.d of the MS4 permit. These methods are to be approved for use prior to laboratory selection.

Of the laboratories surveyed in Appendix ?, none were able to comprehensively report at the Minimum Levels stated in Table E.2 of the MS4 permit. However, the individual requirements of the Watershed Management Group may render the Minimum Levels irrelevant if the maximum loads or limitations are greater than the MLs. For example, ES Babcock Laboratory can only report to as low as 5 mg/L for Total Suspended Solids. The permit ML for Total Suspended Solids is 2 mg/L, thus ES Babcock cannot report at such a limit. But if the TMDL for the runoff is still met by the laboratory's reporting limit, then the permit ML does not need to apply.

**Table 13-1 Laboratory Analytical Methods Sample**

| Analyte | Laboratory/ Organization | Analytical Method | | Achievable Laboratory Limits | | |
|---|---|---|---|---|---|---|
| | | Analytical Method/SOP | Modified for Method | MDL | RL | Unit |
| **Conventional Pollutants** | | | | | | |
| Oil and Grease | ES Babcock | EPA 1664A | No | 0.92 | 2.5 | mg/L |
| Total Phenols | ES Babcock | EPA 420.4 | No | 0.016 | 0.02 | mg/L |
| Cyanide | ES Babcock | SM 4500-CN- E | No | 0.0049 | 0.005 | mg/L |
| pH | Field Test | N/A | N/A | N/A | N/A | N/A |
| Temperature | Field Test | N/A | N/A | N/A | N/A | N/A |
| Dissolved Oxygen | Field Test | N/A | N/A | N/A | N/A | N/A |
| **BACTERIA (single sample limits)** | | | | | | |
| Total coliform (marine waters) | ES Babcock | SM9221B | No | 2 | 2 | MPN/ 100ml |
| Enterococcus (marine waters) | ES Babcock | SM 9230B | No | 2 | 2 | MPN/ 100ml |

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| | | | | | | |
|---|---|---|---|---|---|---|
| Fecal coliform (marine & fresh waters) | ES Babcock | SM 9221E | No | 2 | 2 | MPN/ 100ml |
| E. coli (fresh waters) | ES Babcock | SM 9221E | No | 2 | 2 | MPN/ 100ml |
| **GENERAL** | | | | | | |
| Dissolved Phosphorus | ES Babcock | SM 4500-P B | No | 0.014 | 0.05 | mg/L |
| Total Phosphorus | ES Babcock | SM 4500-P B | No | 0.014 | 0.05 | mg/L |
| Turbidity | Field Test | N/A | N/A | N/A | N/A | N/A |
| Total Suspended Solids | ES Babcock | SM 2540D | No | 2.8 | 5 | mg/L |
| Total Dissolved Solids | ES Babcock | SM 2540C | No | 5.5 | 10 | mg/L |
| Volatile Suspended Solids | ES Babcock | EPA 160.4 | No | 5 | 5 | mg/L |
| Total Organic Carbon | ES Babcock | SM 5310B | No | 0.16 | 0.7 | mg/L |
| Total Petroleum Hydrocarbon | ES Babcock | EPA 418.1 | No | 0.5 | 1 | mg/L |
| Biochemical Oxygen Demand | ES Babcock | SM 5210 B | No | 1 | 2 | mg/L |
| Chemical Oxygen Demand | ES Babcock | SM 5220 D | No | 6.3 | 10 | mg/L |
| Total Ammonia-Nitrogen | ES Babcock | SM 4500-NH3 C | No | 0.059 | 0.1 | mg/L |
| Total Kjeldahl Nitrogen | ES Babcock | EPA 351.2 | No | 0.063 | 0.1 | mg/L |
| Nitrate-Nitrite | ES Babcock | SM 4500-NO3 F | No | 0.11 | 0.2 | mg/L |
| Alkalinity | ES Babcock | SM 2320B | No | 1.7 | 3 | mg/L |
| Specific Conductance | Field Test | N/A | N/A | N/A | N/A | N/A |
| Total Hardness | ES Babcock | SM 2340B/EP | No | 0.5 | 3 | mg/L |
| MBAS | ES Babcock | SM 5540C | No | 0.035 | 0.05 | mg/L |
| Chloride | ES Babcock | EPA 300.0 | No | 1 | 1 | mg/L |
| Fluoride | ES Babcock | SM 4500-F C | No | 0.05 | 0.1 | mg/L |
| Methyl tertiary butyl ether (MTBE) | ES Babcock | EPA 624 | No | 0.00043 | 0.003 | mg/L |
| Perchlorate | ES Babcock | EPA 314.0 | No | 0.49 | 4 | µg/L |
| **METALS (Dissolved & Total)** | | | | | | |
| Aluminum | ES Babcock | EPA 200.7 | No | 25 | 100 | µg/L |
| Antimony | ES Babcock | EPA 200.8 | No | 0.25 | 0.5 | µg/L |
| Arsenic | ES Babcock | EPA 200.8 | No | 0.5 | 1 | µg/L |
| Beryllium | ES Babcock | EPA 200.8 | No | 0.25 | 0.5 | µg/L |
| Cadmium | ES Babcock | EPA 200.8 | No | 0.12 | 0.25 | µg/L |
| Chromium (total) | ES Babcock | EPA 200.8 | No | 0.4 | 0.5 | µg/L |
| Chromium (Hexavalent) | ES Babcock | EPA 218.6 | No | 0.013 | 1 | µg/L |
| Copper | ES Babcock | EPA 200.8 | No | 0.4 | 0.5 | µg/L |
| Iron | ES Babcock | EPA 200.7 | No | 2.3 | 50 | µg/L |
| Lead | ES Babcock | EPA 200.8 | No | 0.25 | 0.5 | µg/L |
| Mercury | ES Babcock | EPA 200.8 | No | 0.033 | 0.2 | µg/L |
| Nickel | ES Babcock | EPA 200.8 | No | 0.5 | 1 | µg/L |
| Selenium | ES Babcock | EPA 200.8 | No | 0.5 | 1 | µg/L |
| Silver | ES Babcock | EPA 200.8 | No | 0.12 | 0.25 | µg/L |
| Thallium | ES Babcock | EPA 200.8 | No | 0.5 | 1 | µg/L |

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| | | | | | | |
|---|---|---|---|---|---|---|
| Zinc | ES Babcock | EPA 200.8 | No | 0.66 | 1 | µg/L |
| **SEMIVOLATILE ORGANIC COMPOUNDS** | | | | | | |
| **ACIDS** | | | | | | |
| 2-Chlorophenol | ES Babcock | EPA 625 | No | 1.8 | 2 | µg/L |
| 4-Chloro-3-methylphenol | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| 2,4-Dichlorophenol | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| 2,4-Dimethylphenol | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| 2,4-Dinitrophenol | ES Babcock | EPA 625 | No | 1.6 | 5 | µg/L |
| 2-Nitrophenol | ES Babcock | EPA 625 | No | 2.1 | 10 | µg/L |
| 4-Nitrophenol | ES Babcock | EPA 625 | No | 1.1 | 5 | µg/L |
| Pentachlorophenol | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| Phenol | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| 2,4,6-Trichlorophenol | ES Babcock | EPA 625 | No | 1.9 | 10 | µg/L |
| **BASE/NEUTRAL** | | | | | | |
| Acenaphthene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Acenaphthylene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Anthracene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Benzidine | ES Babcock | EPA 625 | No | 5 | 5 | µg/L |
| 1,2 Benzanthracene | ES Babcock | EPA 625 | No | 0.05 | 0.05 | µg/L |
| Benzo(a)pyrene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Benzo(g,h,i)perylene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| 3,4 Benzoflouranthene | ES Babcock | EPA 625 | No | 0.05 | 0.05 | µg/L |
| Benzo(k)flouranthene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Bis(2-Chloroethoxy) methane | ES Babcock | EPA 625 | No | 1.8 | 5 | µg/L |
| Bis(2-Chloroisopropyl) ether | ES Babcock | EPA 625 | No | 1.9 | 2 | µg/L |
| Bis(2-Chloroethyl) ether | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| Bis(2-Ethylhexl) phthalate | ES Babcock | EPA 625 | No | 2.3 | 5 | µg/L |
| 4-Bromophenyl phenyl ether | ES Babcock | EPA 625 | No | 1.6 | 5 | µg/L |
| Butyl benzyl phthalate | ES Babcock | EPA 625 | No | 1.6 | 10 | µg/L |
| 2-Chloroethyl vinyl ether | ES Babcock | EPA 625 | No | 1 | 5 | µg/L |
| 2-Chloronaphthalene | ES Babcock | EPA 625 | No | 1.8 | 10 | µg/L |
| 4-Chlorophenyl phenyl ether | ES Babcock | EPA 625 | No | 1.8 | 5 | µg/L |
| Chrysene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Dibenzo(a,h)anthracene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| 1,3-Dichlorobenzene | ES Babcock | EPA 624 | No | 0.15 | 0.5 | µg/L |
| 1,4-Dichlorobenzene | ES Babcock | EPA 624 | No | 0.072 | 0.5 | µg/L |
| 1,2-Dichlorobenzene | ES Babcock | EPA 624 | No | 0.2 | 0.5 | µg/L |
| 3,3-Dichlorobenzidine | ES Babcock | EPA 625 | No | 2.1 | 5 | µg/L |
| Diethyl phthalate | ES Babcock | EPA 625 | No | 1.8 | 2 | µg/L |
| Dimethyl phthalate | ES Babcock | EPA 625 | No | 1.7 | 2 | µg/L |
| di-n-Butyl phthalate | ES Babcock | EPA 625 | No | 1.9 | 10 | µg/L |

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|---|---|---|---|---|---|---|
| 2,4-Dinitrotoluene | ES Babcock | EPA 625 | No | 1.8 | 5 | µg/L |
| 2,6-Dinitrotoluene | ES Babcock | EPA 625 | No | 1.9 | 5 | µg/L |
| 4,6 Dinitro-2-methylphenol | ES Babcock | EPA 625 | No | 1.8 | 5 | µg/L |
| 1,2-Diphenylhydrazine | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| di-n-Octyl phthalate | ES Babcock | EPA 625 | No | 2.6 | 10 | µg/L |
| Fluoranthene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Fluorene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Hexachlorobenzene | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| Hexachlorobutadiene | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| Hexachloro-cyclopentadiene | ES Babcock | EPA 625 | No | 1.7 | 5 | µg/L |
| Hexachloroethane | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| Indeno(1,2,3-cd)pyrene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Isophorone | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| Naphthalene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Nitrobenzene | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| N-Nitroso-dimethyl amine | ES Babcock | EPA 625 | No | 1.4 | 5 | µg/L |
| N-Nitroso-diphenyl amine | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| N-Nitroso-di-n-propyl amine | ES Babcock | EPA 625 | No | 1.7 | 5 | µg/L |
| Phenanthrene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| Pyrene | ES Babcock | EPA 625 SIM | No | 0.05 | 0.05 | µg/L |
| 1,2,4-Trichlorobenzene | ES Babcock | EPA 625 | No | 1 | 1 | µg/L |
| **POLYCHLORINATED BIPHENYLS and PESTICIDES** | | | | | | |
| Aldrin | ES Babcock | EPA 608 | No | 0.005 | 0.005 | µg/L |
| alpha-BHC | ES Babcock | EPA 608 | No | 0.01 | 0.01 | µg/L |
| beta-BHC | ES Babcock | EPA 608 | No | 0.005 | 0.005 | µg/L |
| delta-BHC | ES Babcock | EPA 608 | No | 0.005 | 0.005 | µg/L |
| gamma-BHC (lindane) | ES Babcock | EPA 608 | No | 0.02 | 0.02 | µg/L |
| alpha-chlordane | ES Babcock | EPA 608 | No | 0.045 | 0.1 | µg/L |
| gamma-chlordane | ES Babcock | EPA 608 | No | 0.045 | 0.1 | µg/L |
| 4,4'-DDD | ES Babcock | EPA 608 | No | 0.016 | 0.05 | µg/L |
| 4,4'-DDE | ES Babcock | EPA 608 | No | 0.01 | 0.05 | µg/L |
| 4,4'-DDT | ES Babcock | EPA 608 | No | 0.01 | 0.01 | µg/L |
| Dieldrin | ES Babcock | EPA 608 | No | 0.01 | 0.01 | µg/L |
| alpha-Endosulfan | ES Babcock | EPA 608 | No | 0.011 | 0.02 | µg/L |
| beta-Endosulfan | ES Babcock | EPA 608 | No | 0.01 | 0.01 | µg/L |
| Endosulfan sulfate | ES Babcock | EPA 608 | No | 0.044 | 0.05 | µg/L |
| Endrin | ES Babcock | EPA 608 | No | 0.01 | 0.01 | µg/L |
| Endrin aldehyde | ES Babcock | EPA 608 | No | 0.01 | 0.01 | µg/L |
| Heptachlor | ES Babcock | EPA 608 | No | 0.01 | 0.01 | µg/L |
| Heptachlor Epoxide | ES Babcock | EPA 608 | No | 0.01 | 0.01 | µg/L |
| Toxaphene | ES Babcock | EPA 608 | No | 0.5 | 0.5 | µg/L |
| Aroclor-1016 | ES Babcock | EPA 608 | No | 0.5 | 0.5 | µg/L |

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|---|---|---|---|---|---|---|
| Aroclor-1221 | ES Babcock | EPA 608 | No | 0.5 | 0.5 | µg/L |
| Aroclor-1232 | ES Babcock | EPA 608 | No | 0.42 | 0.5 | µg/L |
| Aroclor-1242 | ES Babcock | EPA 608 | No | 0.41 | 0.5 | µg/L |
| Aroclor-1248 | ES Babcock | EPA 608 | No | 0.28 | 0.5 | µg/L |
| Aroclor-1254 | ES Babcock | EPA 608 | No | 0.5 | 0.5 | µg/L |
| Aroclor-1260 | ES Babcock | EPA 608 | No | 0.5 | 0.5 | µg/L |
| **ORGANOPHOSPHATE PESTICIDES** | | | | | | |
| Atrazine | ES Babcock | EPA 525.2 | No | 0.063 | 0.5 | µg/L |
| Chlorpyrifos | ES Babcock | EPA 8270C | No | 1.2 | 4 | µg/L |
| Cyanazine | ES Babcock | N/A | N/A | N/A | N/A | N/A |
| Diazinon | ES Babcock | EPA 525.2 | No | 0.25 | 0.25 | µg/L |
| Malathion | ES Babcock | EPA 8270C | No | 0.073 | 4 | µg/L |
| Prometryn | ES Babcock | EPA 525.2 | No | 0.079 | 2 | µg/L |
| Simazine | ES Babcock | EPA 525.2 | No | 0.061 | 1 | µg/L |
| **HERBICIDES** | | | | | | |
| 2,4-D | ES Babcock | EPA 8151A | No | 0.17 | 10 | µg/L |
| Glyphosate | ES Babcock | EPA 547 | No | 4.5 | 25 | µg/L |
| 2,4,5-TP-SILVEX | ES Babcock | EPA 8151A | No | 0.15 | 1 | µg/L |

## 14. Quality Control

This section describes the Quality Assurance/Quality Control procedures associated in the analysis of field samples.

Table 14-1 summarizes the quality control checks to be utilized in this project.

**Table 14-1 Quality Control Activities**

| QC Check | Information Provided |
|---|---|
| **Blanks** | |
| Bottle blank | Cleanliness |
| Field blank | Transport, storage, and field handling bias |
| Equipment blank | Contaminated equipment |
| Method blank | Response of an entire laboratory system |
| Reagent Blank | Contaminated Reagent |
| **Spikes** | |
| Matrix Spike | Analytical (preparation + analysis) bias |
| Matrix spike replicate | Analytical bias and precision |
| Analysis matrix spike | Instrument bias |
| Surrogate spike | Analytical bias |
| Calibration Check Samples | Calibration drift and memory effect |
| Span check | Calibration drift and memory effect |
| Mid-range check | Calibration drift and memory effect |
| **Replicates, splits, etc** | |

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| | |
|---|---|
| Field collocated samples | Sampling + measurement precision |
| Field replicates | Precision of all steps after acquisition |
| Field splits | Shipping + inter-laboratory precision |
| Laboratory splits | Inter-laboratory precision |
| Laboratory replicates | Analytical precision |
| Analysis replicates | Instrument precision |

## 14.1 Field Sampling

Field Quality Assurance/Quality Control will make use of field blanks and duplicates. These checks will be collected and prepared at random.

Field blanks will be used to ensure that field conditions, field sampling activities, and air deposition are non-contaminating. Field blanks will be submitted blind to the laboratory. Sample bottles are filled with reagent-grade, analyte-free deionized water in the field during a sampling event.

Field duplicates will be used to evaluate sampling error introduced by both field sampling and laboratory analyses. Field duplicates are submitted blind to the laboratory. Procedures for collecting field duplicates should be the same as those used for collecting field samples. Duplicates of manual grab samples will be collected by filling two grab sample containers at the same time, or in rapid sequence. For duplicates, the Relative Percent Difference (RPD) will be calculated as following:

RPD = 100% * [Largest – Smallest] / Average

The RPD will be compared with values listed in Section 7 to determine the sufficiency of the samples.

## 14.2 Laboratory Quality Assurance/Quality Control

Laboratory control checks will include the use of laboratory replicates, method blanks, matrix spikes and matrix spike duplicates, laboratory control samples, and Standard Reference Material (SRM). The frequencies of these checks are listed in Table 14-2.

Laboratory replicates split the sample into two portions so that the same sample is analyzed twice. Once the replicate analyses have been completed, the results are evaluated by calculating the RPD between the two sets of results. This serves as a measure of the reproducibility, or precision, of the sample analysis. Typically, duplicate results should fall within an accepted RPD range, depending upon the analysis.

In addition to the RPD between duplicates, the percent recovery for matrix spike samples will be calculated. The calculation is as follows:

R = (Cs – C) / S * 100
Where R = percent recovery, Cs = spike sample concentration, C = sample background concentration, and S = concentration of analyte added to the sample.

The values will be compared against those listed in Table 7-3 to determine the sufficiency of the samples.

A method blank is an analysis of a known clean sample matrix that has been subjected to the same complete analytical procedure as the field sample to determine if potential contamination has been

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introduced during processing. Blank analysis results are evaluated by checking against reporting limits for that analyte. Results obtained should be less than the reporting limits for each analysis.

Matrix spikes and matrix spike duplicates (MS/MSDs) involve adding a known amount of the chemical(s) of interest to one of the actual samples being analyzed. One sample is split into three separate portions. One portion is analyzed to determine the concentration of the analyte in question in an un-spiked state. The other two portions are spiked with a known concentration of the analytes of interest. The recovery of the spike, after accounting for the concentration of the analyte in the original sample, is a measure of the accuracy of the analysis. By determining spike duplicate recoveries, another measure of precision is accomplished. An additional precision measure is made by calculating the RPD of the duplicate spike recoveries. Both the RPD values and spike recoveries are compared against accepted and known method dependent acceptance limits. Analyses outside these limits are subject to corrective action.

The laboratory control sample procedure involves spiking known amounts of the analyte of interest into a known, clean, sample matrix to assess the possible matrix effects on spike recoveries. High or low recoveries of the analytes in the matrix spikes may be caused by interferences in the sample. Laboratory control samples assess these possible matrix effects since the LCS is known to be free from interferences.

SRMs may be used in lieu of laboratory control samples. An SRM is a sample containing a known and certified amount of the analyte of interest and is typically analyzed with the analyst not knowing the analyte concentration. SRMs are typically purchased from independent suppliers who prepare them and certify the analyte concentrations. Results are evaluated by comparing results obtained against the known quantity and the acceptable range of results supplied by the manufacturer.

**Table 14-2 Laboratory Quality Control Sample Frequency**

| QA/QC Sample Type | Minimum Sampling Frequency | Acceptance Limits |
|---|---|---|
| Laboratory Replicate/Split | One per batch or per 20 samples (5%), per sampling event. | The relative percent difference between the primary sample result and duplicate sample result should meet the objective for precision listed in Table 7-3. |
| Method Blank | One per batch or per 20 samples (5%). | Procedural blanks should be below 10x the MDL. |
| Matrix Spike/Matrix Spike Duplicate | One per batch or per 20 samples (5%), per sampling event. | The percent recovery should be within the accuracy acceptance limits listed in Table 7-3. |
| Laboratory Control Spike | One per batch or per 20 samples (5%). | The percent recovery should be within the accuracy acceptance limits listed in Table 7-3. |
| Standard Reference Material | One per batch or per 20 samples (5%). | The percent recovery should be within the accuracy acceptance limits listed in Table 7-3. |

## 14.3 Review of procedures

Data collected from the aforementioned processes will be regularly reviewed against the Data Quality Objectives in Section 7. In the event of suspect data or failed checks, corrective action will be taken. This corrective action will be to verify the procedures done and review analytical techniques. If any issues are found, errors will be corrected when possible. The sample will also be re-analyzed when possible.

# 15. Instrument/Equipment Testing, Inspection, and Maintenance

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All field testing equipment used in monitoring and sampling will be tested, operated, and maintained according to the manufacturer's specifications and associated SOPs. Probes will be inspected for any deficiencies and corrective action will be taken for any problems that arise. All equipment will also be cleaned and inspected before and after each sampling event. Field personnel will be trained in the operation and maintenance of instruments and equipment.

Laboratories will test, inspect, and maintain equipment in accordance with laboratory SOPs and QA procedures, which include those specified by the manufacturer. The laboratory will document and resolve any issues that arise. The Laboratory Manager will oversee testing, inspection, and maintenance of laboratory equipment. The Project QA Officer will review all laboratory procedures to ensure compliance with project requirements.

## 16. Instrument/Equipment Calibration and Frequency

All instruments and equipment will be calibrated daily or prior to each usage event according to the manufacturer's specifications and/or associated SOPs. Calibration will be done by trained personnel. If the calibration is unsuccessful, the instrument will be cleaned and parts will be replaced until calibration is successful. If calibration cannot be completed successfully, the Project Director will be notified and any sampling or analysis will be postponed until the problem is resolved. Any affected data will be flagged. Documentation of all calibration will be maintained in a log book appropriate to the equipment.

## 17. Inspection/Acceptance of Supplies and Consumables

All glassware, sample bottles, and collection equipment will be inspected upon receipt and prior to use. Supplies will be sourced from the the accredited laboratory. The Sampling Manager and Laboratory Manager will oversee the inventory of sampling supplies and reorder when necessary. Logs will be maintained for all supplies used and any deficiencies will be recorded.

Upon receipt, buffer solutions, standards, reagents, and field test kits used will be inspected for leaks or broken seals. Reagents will be replaced before they exceed the manufacturer's recommended shelf life. Bottles and glassware will be inspected for sterility and structural integrity prior to use. All inspections will occur according to individual SOPs. Test organisms will be maintained and inspected for health prior to testing.

## 18. Non-Direct Measurements

**Section __** of the CIMP details existing and past monitoring programs relevant to the region. Based on the review of past monitoring programs, monitoring data for the LAR UR2 WMA is limited. Due to the limitations, compliance evaluation cannot be achieved. LAR UR2 WMA will analyze all constituents listed in Table E-2. Photo documentation, topographical maps, land use, and hydrological maps from Los Angeles County and individual cities within LAR UR2 WMA will be requested for use when appropriate.

All of the study data will be generated directly by the CIMP. However, any new data involving water quality and flow from other sources will be reviewed against the data quality objectives listed in Section 7 of this document and only data which meet all of the criteria will be used when appropriate. The SOP and QAPP involved for the external sources will also be reviewed to ensure that the data is valid. Questionable data will be rejected. Data obtained from this method will be integrated with study data to evaluate compliance with the MS4 permit.

## 19. Data Management

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The Sampling Manager will be responsible for the proper management of field measurement and observation data. The Sampling Manager will review all Field Conditions Data Log Sheets for completeness and maintain the original hardcopies in the project file. All data sheets will be signed by the Sampling Manager after review. The Field Conditions Data Log Sheet responses will also be manually entered into an electronic version of the Field Conditions Data Log Sheet and these fields will be saved into a database. The data will be checked for accuracy before being saved in the database. Photographs of the monitoring sites taken by field personnel will be uploaded into the project file. Field team members will name the photographs using the photograph naming convention developed specifically for this project.

The Laboratory Manager will be responsible for the proper management of laboratory data. The laboratory will conduct quality control checks on the data per laboratory QA/QC procedures, and record the data electronically. The results of the analysis will be sent to Project Manager in the form of a hard copy and electronic copy. The Project Manager will review the data for completeness and errors. The results will then be filed with the project data and recorded in the database. All original documentation such as lab notes will be kept with project files in a secure location.

# Group C: Assessment and Oversight

## 20. Assessment and Response Actions

The Project Manager will oversee day-to-day activities within the project. The QA Officer will oversee all QA/QC activities within the project and ensure that procedures are being followed. The Sampling Manager will regularly review procedures in reference to the QAPP to ensure that all elements of it are being implemented correctly. The use of approved equipment and methods when obtaining water samples and conducting field measurements will be verified for proper techniques following SOPs in cleaning, inspection, maintenance, calibration, and sampling. Equipment quality and record keeping techniques will also be reviewed. All documentation will be reviewed before leaving the sample sites to ensure that the data is complete and accurate. If there are any issues presented, the Sampling Manager will review the necessary procedures with the field technician(s) and take any necessary corrective action. The sample will be re-collected and noted, if possible. If not, the error will be noted in the sample documents. In the event of a situation that may affect the integrity of the data, the field technician(s) will contact the Project Manager or QA Officer to determine the corrective actions necessary. The issue and actions taken will be documented in the project file.

The Laboratory QA Specialist will periodically review procedures in the analysis of samples and verify proper techniques following SOPs in cleaning, inspection, maintenance, calibration, and analysis. Equipment and record keeping will also be reviewed. The QA Specialist will also review QA/QC of all data generated from analysis in the lab. If in any case the data is deemed erroneous, the samples will be re-analyzed when possible, and the error will be noted with the analysis results. The QA Specialist will review procedures and take corrective action for issues that lead to the error. The Project Manager will be notified of any issues that occur in the laboratory. All actions taken will be documented and submitted to the QA officer for filing.

The QA officer will manage all activities and has the authority to halt all sampling and analytical work if deviations are detrimental to the quality of the data. The QA Officer may follow up and inspect results when deemed necessary.

## 21. Reports to Management

The field monitoring data, calibration records, and other quality assurance/quality control forms will be reviewed for completeness, correctness and other errors by the Project Manager on a regular basis. The

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laboratory results will be reviewed by the Laboratory Manager prior to the release of results to the Project Manager and consultant team. The laboratory submission will be signed as a confirmation of completeness and correctness of the procedures and results of the analysis.

Results of monitoring from each receiving water or outfall based monitoring station conducted in accordance with the Standard Operating Procedures under Standard Provision 14 of Attachment E will be submitted semi-annually to the Regional Water Board's Storm Water website. Results in excess of limitations, action levels, and aquatic toxicity thresholds will be highlighted. The data will be in the Southern California Municipal Storm Water Monitoring Coalition's Standardized Data Transfer Format. Additionally, the results will be included in an annual monitoring report to be submitted to the Regional Water Board Executive Officer.

**Table 21-1 Reports to Management**

| Type of Report | Frequency | Projected Delivery Date (s) | Person(s) Responsible for Preparation | Report Recipients |
|---|---|---|---|---|
| xxx | XXX | XXX | XXX | |
| XXX | XXX | XXX | XXX | |
| XXX | XXX | XXX | XXX | |

# Group D: Data Validation and Usability

## 22. Data Review, Verification and Validation

Data generated by project activities will be reviewed against the Data Quality Objectives listed in Element 7 and the quality assurance/quality control practices cited in Elements 14, 15, 16 and 17. The field and laboratory personnel, as well as the QA Officers will be responsible for verifying that the sample collection, handling, and analysis were done in accordance with the approved QAPP. Field and laboratory personnel will review any calculation, transcription, recording, and transformation of the data for correctness and completeness. In addition, the QA officer will be primarily responsible for reviewing the data for completeness and compliance with necessary requirements such as method or contractual specifications.

If the data meets all quality and QA/QC objectives, the data will be qualified as acceptable for the project. If the results fail to meet any Data Quality Objectives, the results will be flagged by the Laboratory QA Specialist and/or the Project QA Officer for further review. Batch QA samples will be reviewed to determine the potential cause of failure to meet the DQO. If the cause cannot be readily ascertained, reserve samples will be reanalyzed, provided they are within the appropriate sample holding time. If samples fail to meet the DQOs a second time, or the cause of failure cannot be identified and rectified, the data will be excluded from the study results. All rejected data will be retained in the project database, qualified as rejected data. Data that is only accepted after further review will be flagged as such.

## 23. Verification and Validation Methods

Data verification is the process of evaluating the complete, correctness, and conformance of the dataset against the method, procedural, or contractual requirements. Data quality indicators will be continuously monitored by the analyst producing the data (field and lab personnel), as well as the Reporting and Laboratory Manager and Sampling Manager, with assistance from the QA Officer, throughout the project to make sure corrective actions are taken in a timely manner. Laboratory and field personnel responsible

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for conducting QA analysis will be responsible for documenting when data does not meet measurement quality objectives as determined by data quality indicators.

In coordination with the QA Officer, the Sampling Manager will validate and verify field measurements and activities (sample collection and handling) and the Laboratory QA Specialist will validate and verify laboratory analysis (sample analysis and handling). Following sample delivery, the laboratory will maintain COCs and sample manifests. Laboratory validation and verification of the data generated is the responsibility of the laboratory. The Laboratory Manager maintains analytical reports in a database format as well as all QA/QC documentation for the laboratory. The Laboratory QA Specialist will perform checks of all of its records.

The Laboratory Manager and Sampling manager are responsible for oversight of data collection and the initial analysis of the raw data obtained from the field and the contracted laboratory. All data records will be checked visually and recorded as checked by initials and dates. Reconciliation and correction of any data that fails to meet the DQOs will be done by the responsible manager in consultation with the project QA Officer and the Project Manager. Any corrections require a unanimous agreement that the correction is appropriate.

Data verification and validation for field sample collection and handling activities will consist of the following tasks:

- Verification that the sampling activities, sample locations, number of samples collected, and type of analysis performed is in accordance with QAPP requirements.
- Documentation of any field changes or discrepancies.
- Verification that the field activities (including sample location, sample type, sample date and time, name of field personnel. etc) were properly documented.
- Verification of proper completion of sample labels and COCs forms, and secure storage of samples.

Data verification and validation for the laboratory sample analysis and handling activities will include the following tasks:

- Verification that all samples recorded on COCs forms were received by the laboratory.
- Verification that the appropriate analytical methodology has been followed.
- Verification that QC samples meet performance criteria.
- Verification that analytical results and documentation are complete.

Verification and validation of data entry includes:

- Sorting data to identify missing or mistyped (too large or too small) values.
- Double-checking all typed values.
- Data is entered in the proper format for each database fields (i.e., text for text, integers for integers, number for numbers, dates for dates, times for times, etc.).

## 24. Reconciliation with User Requirements

The data quality will be evaluated according to this document with respect to the sampling design, sampling methods, field and laboratory analyses, quality control, and maintenance. By properly following the guidelines in this document and references, the data quality will be validated. If samples or procedures used in this study fail to meet the guidelines listed in this document, the data will be flagged and reported to the Project Manager. The limitations and assumptions of the data will be provided to the end-user to allow the user to determine the data's usefulness.

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The end-user will use this data to determine the compliance of the MS4 discharges within the management area. This data will help to characterize pollutant loads and identify the sources responsible for pollutants. The results will identify areas where the permittees must refine and improve pollutant control measures. Any pollutants found in excess of maximum levels will require continuous monitoring for the remainder of the life of the permit. A summary of this will be published in an annual report, to be submitted to the Regional Water Board.

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## References

http://www.waterboards.ca.gov/rwqcb4/water_issues/programs/stormwater/municipal/la_ms4/2012/Order%20R4-2012-0175%20-%20A%20Final%20Order%20revised.pdf

Appendix
Example empty sheets of Field Log data, COC, SOPs, checklists, and details of methods

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# Appendix C

# Summary of Laboratory Capabilities in Relation to Permit Minimum Levels

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| Analytical Method | Analyte | Permit ML | Unit | Footnote | Advanced Technology Laboratories | | | | CalScience Laboratories | | | ES Babcock | | | Orange Coast | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Comment | PQL | MDL | MRL | MDL | RL | MDL | Comment | MRL | MDL | Comment | MRL | MDL | Comment |
| | **Conventional Pollutants** | | | | | | | | | | | | | | | | |
| EPA 1664A | Oil and Grease | 5 | mg/L | | 2 | 1.9 | 5 | 0.718 | | | | 2.5 | 0.92 | | | | |
| EPA 413.2 | Oil and Grease | 5 | mg/L | | | | | | 1 | 0.33 | | | | | | | |
| SM 5220B | Oil and Grease | 5 | mg/L | | | | 5 | 0.718 | | | | | | | 5 | 2.64 | |
| EPA 420.1 | Total Phenols | 0.1 | mg/L | | 0.03 | 0.02 | | | 0.1 | 0.046 | | | | | 0.5 | 0.033 | 0.1 possible |
| EPA 420.4 | Total Phenols | 0.1 | mg/L | | | | | | | | | 0.02 | 0.016 | | | | |
| SM 4500-CN- E | Cyanide | 0.005 | mg/L | | 0.0005 | 0.00019 | 0.005 | 0.0017 | 0.001 | 0.00069 | | 0.005 | 0.0049 | | 0.02 | 0.0059 | |
| ASTM D7511 | Cyanide | 0.005 | mg/L | | | | | | | | | | | | | | |
| SM 4500-H+ B | pH | 0 - 14 | pH | Field test | **0.1** | **0.1** | | | 0.01 | 0.01 | | 1 | 1 | | 0-14 | 0-14 | |
| SM 2550B | Temperature | N/A | C | Field test | N/A | N/A | | | | | | 1 | 1 | | | | |
| SM 4500-O G | Dissolved Oxygen | Sensitivity to 5 | mg/L | Field test | 1 | 1 | | | 0.01 | 0.01 | | 0.1 | 0.1 | | 0.1 | 0.1 | |
| | **BACTERIA (single sample limits)** | | | | | | | | | | | | | | | | |
| SM9221B | Total coliform (marine waters) | 10,000 | MPN/100ml | | | | 2 | | 1 | 1 | | 2 | 2 | | | | contract |
| SM9221B/E | Enterococcus (marine waters) | 104 | MPN/100ml | | | | | | 1 | 1 | | | | | | | contract |
| SM 9230B | Enterococcus (marine waters) | 104 | MPN/100ml | | | | | | | | | 2 | 2 | | | | contract |
| SM 9221E | Fecal coliform (marine & fresh waters) | 400 | MPN/100ml | | | | 2 | | | | | 2 | 2 | | | | contract |
| SM9230B | Fecal coliform (marine & fresh waters) | 400 | MPN/100ml | | | | | | 1 | 1 | | | | | | | contract |
| SM 9221E | E. coli (fresh waters) | 235 | MPN/100ml | | | | | | | | | 2 | 2 | | | | contract |
| SM9221B/F | E. coli (fresh waters) | 235 | MPN/100ml | | | | 2 | | 1 | 1 | | | | | | | contract |
| | **GENERAL** | | | | | | | | | | | | | | | | |
| SM 4500-P E | Dissolved Phosphorus | 0.05 | mg/L | | | | 0.01 | 0.007 | | | | | | | | | |
| SM 4500-P E | Dissolved Phosphorus | 0.05 | mg/L | | 0.01 | 0.01 | | | 0.1 | 0.026 | | | | | 0.05 | 0.0076 | |
| SM 4500-P B | Dissolved Phosphorus | 0.05 | mg/L | | | | | | | | | 0.05 | 0.014 | | | | |
| SM 4500-P E | Total Phosphorus | 0.05 | mg/L | | 0.01 | 0.01 | | | 0.1 | 0.022 | | | | | 0.05 | 0.0076 | |
| SM 4500-P B | Total Phosphorus | 0.05 | mg/L | | | | | | | | | 0.05 | 0.014 | | | | |
| EPA 365.4 | Total Phosphorus | 0.05 | mg/L | | | | 0.01 | 0.0068 | | | | | | | | | |
| SM 2130 B | Turbidity | 0.1 | NTU | Field test | | | 0.1 | N/A | 0.05 | 0.044 | | 0.2 | 0.1 | | | | |
| EPA 180.1 | Turbidity | 0.1 | NTU | Field test | 0.1 | 0.1 | | | | | | | | | 0.5 | 0.064 | |
| SM 2540D | Total Suspended Solids | 2 | mg/L | | 1 | 1 | 5 | N/A | 1 | 0.95 | | 5 | 2.8 | may reach with J flag or out of reach | 2 | 2 | |
| SM 2540C | Total Dissolved Solids | 2 | mg/L | | 10 | 10 | 1 | N/A | 1 | 0.82 | | 10 | 5.5 | may reach with J flag or out of reach | 10 | 7.99 | |
| SM 2540E | Volatile Suspended Solids | 2 | mg/L | | 10 | 5 | 5 | N/A | 1 | 1 | | | | | | | |
| EPA 160.4 | Volatile Suspended Solids | 2 | mg/L | | 10 | 5 | | | | | | 5 | 5 | may reach with J flag or out of reach | 5 | 3.1 | |
| SM 5310B | Total Organic Carbon | 1 | mg/L | | 0.3 | 0.09 | 0.2 | 0.047 | 0.5 | 0.24 | | 0.7 | 0.16 | | 1 | 0.388 | |
| EPA 1664A | Total Petroleum Hydrocarbon | 5 | mg/L | | 2 | 0.61 | 1 | 0.72 | 1 | 0.8 | | | | | 5 | | |
| EPA 418.1 | Total Petroleum Hydrocarbon | 5 | mg/L | | | | | | 1 | 0.95 | | 1 | 0.5 | | | | |
| SM 5210 B | Biochemical Oxygen Demand | 2 | mg/L | | 5 | 5 | 1 | N/A | 1 | 0.58 | | 2 | 1 | | 2 | 2 | |
| EPA 410.4 | Chemical Oxygen Demand | 20-900 | mg/L | | 5 | 4.4 | 3 | N/A | | | | | | | 15 | 3.5 | |
| SM 5220 C | Chemical Oxygen Demand | 20-900 | mg/L | | | | | | 5 | 4.8 | | | | | | | |
| SM 5220 D | Chemical Oxygen Demand | 20-900 | mg/L | | | | 3 | 1.1 | | | | 10 | 6.3 | | | | |
| SM 4500-NH3 C | Total Ammonia-Nitrogen | 0.1 | mg/L | | 0.03 | 0.02 | 0.1 | 0.029 | 0.1 | 0.067 | | 0.1 | 0.059 | | 0.05 | 0.0345 | |
| EPA 351.2 | Total Kjeldahl Nitrogen | 0.1 | mg/L | | 0.1 | 0.05 | 0.1 | 0.055 | 0.2 | 0.047 | | 0.1 | 0.063 | | 0.1 | | |
| SM4500-NH3 C | Total Kjeldahl Nitrogen | 0.1 | mg/L | | 0.1 | 0.05 | | | | | | | | | 0.1 | | |
| SM 4500-NO3 F | Nitrate-Nitrite | 0.1 | mg/L | | 0.1 | 0.03 | 0.1 | 0.033 | 0.1 | 0.029 | | 0.2 | 0.11 | may reach with J flag or out of reach | 0.1 | | |
| SM 2320B | Alkalinity | 2 | mg/L | | 5 | 1.6 | 3 | N/A | | | | 3 | 1.7 | may reach with J flag or out of reach | 2 | 4.75 | |
| EPA 120.1 | Specific Conductance | 1 | umho/cm | ?Field test | 0.1 | 0.1 | 1 | N/A | | | | | | | 10 | 0.44 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SM 2510 B | Specific Conductance | 1 | umho/cm | ?Field test | | | | | 1 | 0.5 | | 1 | 1 | | | | |
| SM 2340C | Total Hardness | 2 | mg/L | | 2 | 0.45 | | | 2 | 0.99 | | | | | 1 | 0.799 | |
| SM 2340B/EP | Total Hardness | 2 | mg/L | | | | | | | | | 3 | 0.5 | may reach with J flag or out of reach | | | |
| EPA 200.7 | Total Hardness | 2 | mg/L | | | | 0.1 | 0.0455 | | | | | | | | | |
| SM 5540C | MBAS | 0.5 | mg/L | | 0.05 | 0.02 | 0.05 | 0.0055 | 0.1 | 0.064 | | 0.05 | 0.035 | | 0.05 | 0.0477 | |
| EPA 300.0 | Chloride | 2 | mg/L | | 0.5 | 0.05 | 1 | 0.45 | 1 | 0.12 | | 1 | 1 | | 0.1 | 0.033 | |
| EPA 300.0 | Fluoride | 0.1 | mg/L | | 0.1 | 0.06 | | | 0.1 | 0.025 | | | | | 0.1 | 0.015 | |
| SM 4500-F C | Fluoride | 0.1 | mg/L | | | | 0.1 | 0.015 | | | | 0.1 | 0.05 | | | | |
| EPA 624 | Methyl tertiary butyl ether (MTBE) | 1 | mg/L | | 0.0005 | 0.000259 | | | 0.0005 | 0.000059 | 524.2 | 0.003 | 0.00043 | | | | |
| EPA 8260B | Methyl tertiary butyl ether (MTBE) | 1 | mg/L | | | | 0.5 | 0.1 | | | | | | | 1 | 0.2 | |
| EPA 314.0 | Perchlorate | 4 | µg/L | | 2 | 0.91 | 2 | 0.18 | | | | 4 | 0.49 | | 2 | 0.391 | |
| EPA 331.0 (M) | Perchlorate | 4 | µg/L | | | | | | 0.1 | 0.021 | | | | | | | |
| | **METALS (Dissolved & Total)** | | | | | | | | | | | | | | | | |
| EPA 200.8 | Aluminum | 100 | µg/L | | 5 | 7.6 | 5 | 2.9 | | | | | | | 5 | 0.354 | |
| EPA 200.7 | Aluminum | 100 | µg/L | | | | | | | | | 100 | 25 | | | | |
| EPA 1640 | Aluminum | 100 | µg/L | | | | | | 1 | 0.227 | | | | | | | |
| EPA 200.8 | Antimony | 0.5 | µg/L | | 0.5 | 0.11 | 0.5 | 0.34 | | | | 0.5 | 0.25 | | 0.5 | 0.0155 | |
| EPA 1640 | Antimony | 0.5 | µg/L | | | | | | 0.05 | 0.0154 | | | | | | | |
| EPA 200.8 | Arsenic | 1 | µg/L | | 1 | 0.93 | 0.1 | 0.041 | | | | 1 | 0.5 | | 0.5 | 0.277 | |
| EPA 1640 | Arsenic | 1 | µg/L | | | | | | 0.03 | 0.0122 | | | | | | | |
| EPA 200.8 | Beryllium | 0.5 | µg/L | | 0.5 | 0.11 | 0.5 | 0.36 | | | | 0.5 | 0.25 | | 0.1 | 0.0122 | |
| EPA 1640 | Beryllium | 0.5 | µg/L | | | | | | 0.5 | 0.0635 | | | | | | | |
| EPA 200.8 | Cadmium | 0.25 | µg/L | | 0.5 | 0.07 | 0.25 | 0.025 | | | | 0.25 | 0.12 | | 0.1 | 0.0169 | |
| EPA 1640 | Cadmium | 0.25 | µg/L | | | | | | 0.03 | 0.00567 | | | | | | | |
| EPA 218.6 | Chromium (Hexavalent) | 5 | µg/L | | 0.2 | 0.06 | 0.2 | 0.027 | | | | 1 | 0.013 | | 0.3 | | |
| EPA 7199 | Chromium (Hexavalent) | 5 | µg/L | | | | | | 1 | 0.067 | | | | | | | |
| EPA 200.8 | Chromium (total) | 0.5 | µg/L | | 0.5 | 0.21 | 0.5 | 0.17 | | | | 0.5 | 0.4 | | 0.5 | 0.0702 | |
| EPA 1640 | Chromium (total) | 0.5 | µg/L | | | | | | 0.5 | 0.164 | | | | | | | |
| EPA 200.8 | Copper | 0.5 | µg/L | | 1 | 0.18 | 0.5 | 0.33 | | | | 0.5 | 0.4 | | 0.1 | 0.0375 | |
| EPA 1640 | Copper | 0.5 | µg/L | | | | | | 0.03 | 0.00898 | | | | | | | |
| EPA 200.8 | Iron | 100 | µg/L | | 10 | 5.7 | 10 | 0.61 | | | | | | | 10 | 1.86 | |
| EPA 200.7 | Iron | 100 | µg/L | | | | | | | | | 50 | 2.3 | | | | |
| EPA 1640 | Iron | 100 | µg/L | | | | | | 0.5 | 0.0634 | | | | | | | |
| EPA 200.8 | Lead | 0.5 | µg/L | | 1 | 0.08 | 0.1 | 0.034 | | | | 0.5 | 0.25 | | 0.1 | 0.0745 | |
| EPA 1640 | Lead | 0.5 | µg/L | | | | | | 0.03 | 0.0135 | | | | | | | |
| EPA 245.1 | Mercury | 0.5 | µg/L | | 0.2 | 0.06 | | | | | | | | | | | |
| EPA 200.8 | Mercury | 0.5 | µg/L | | | | 0.2 | 0.091 | | | | | | | 1 | 0.02 | |
| EPA 200.8 | Mercury | 0.5 | µg/L | | | | | | | | | 0.2 | 0.033 | | | | |
| EPA 7470A | Mercury | 0.5 | µg/L | | | | | | 0.2 | 0.0453 | | | | | | | |
| EPA 200.8 | Nickel | 1 | µg/L | | 1 | 0.12 | 1 | 0.05 | | | | 1 | 0.5 | | 0.5 | 0.0326 | |
| EPA 1640 | Nickel | 1 | µg/L | | | | | | 0.05 | 0.00607 | | | | | | | |
| EPA 200.8 | Selenium | 1 | µg/L | | 5 | 0.28 | 1 | 0.14 | | | | 1 | 0.5 | | 0.5 | 0.18 | |
| EPA 1640 | Selenium | 1 | µg/L | | | | | | 0.05 | 0.0121 | | | | | | | |
| EPA 200.8 | Silver | 0.25 | µg/L | | 0.5 | 0.08 | 0.25 | 0.2 | | | | 0.25 | 0.12 | | 0.5 | 0.0581 | |
| EPA 1640 | Silver | 0.25 | µg/L | | | | | | 0.05 | 0.00822 | | | | | | | |
| EPA 200.8 | Thallium | 1 | µg/L | | 0.5 | 0.09 | 1 | 0.21 | | | | 1 | 0.5 | | 0.5 | 0.0119 | |
| EPA 1640 | Thallium | 1 | µg/L | | | | | | 0.03 | 0.0087 | | | | | | | |
| EPA 200.8 | Zinc | 1 | µg/L | | 10 | 4.8 | 1 | 0.45 | | | | 1 | 0.66 | | 1 | 0.356 | |
| EPA 1640 | Zinc | 1 | µg/L | | | | | | 0.5 | 0.0736 | | | | | | | |
| | **SEMIVOLATILE ORGANIC COMPOUNDS** | | | | | | | | | | | | | | | | |

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| | **ACIDS** | | | | | | | | | | | | | | | | |
| EPA 625 | 2-Chlorophenol | 2 | µg/L | | 5 | 1.6 | 0.5 | 0.11 | 0.5 | 0.13 | | 2 | 1.8 | | | | |
| EPA 8270 | 2-Chlorophenol | 2 | µg/L | | | | | | | | | | | | 2 | 0.02 | |
| EPA 625 | 4-Chloro-3-methylphenol | 1 | µg/L | | 5 | 2.4 | 0.5 | 0.1 | 0.5 | 0.12 | | 1 | 1 | | | | |
| EPA 8270 | 4-Chloro-3-methylphenol | 1 | µg/L | | | | | | | | | | | | 1 | 0.06 | |
| EPA 625 | 2,4-Dichlorophenol | 1 | µg/L | | 5 | 2.1 | 0.5 | 0.1 | 0.5 | 0.12 | | 1 | 1 | | | | |
| EPA 8270 | 2,4-Dichlorophenol | 1 | µg/L | | | | | | | | | | | | 1 | 0.02 | |
| EPA 625 | 2,4-Dimethylphenol | 2 | µg/L | | 5 | 2 | 0.5 | 0.15 | 1 | 0.22 | | 1 | 1 | | | | |
| EPA 8270 | 2,4-Dimethylphenol | 2 | µg/L | | | | | | | | | | | | 2 | 0.06 | |
| EPA 625 | 2,4-Dinitrophenol | 5 | µg/L | | 50 | 3.5 | 1 | 0.27 | 5 | 1.3 | | 5 | 1.6 | | | | |
| EPA 8270 | 2,4-Dinitrophenol | 5 | µg/L | | | | | | | | | | | | 5 | 0.5 | |
| EPA 625 | 2-Nitrophenol | 10 | µg/L | | 10 | 3 | 0.5 | 0.21 | 0.5 | 0.11 | | 10 | 2.1 | | | | |
| EPA 8270 | 2-Nitrophenol | 10 | µg/L | | | | | | | | | | | | 5 | 0.02 | |
| EPA 625 | 4-Nitrophenol | 5 | µg/L | | 50 | 2.1 | 1 | 0.26 | 10 | 0.52 | | 5 | 1.1 | | | | |
| EPA 8270 | 4-Nitrophenol | 5 | µg/L | | | | | | | | | | | | 5 | 0.5 | |
| EPA 625 | Pentachlorophenol | 2 | µg/L | | 20 | 2.3 | 0.5 | 0.2 | 0.5 | 0.13 | | 1 | 1 | | | | |
| EPA 8151A | Pentachlorophenol | 2 | µg/L | | | | | | | | | 0.6 | 0.42 | | | | |
| EPA 515.3 | Pentachlorophenol | 2 | µg/L | | | | 0.2 | 0.011 | | | | | | | | | |
| EPA 8270 | Pentachlorophenol | 2 | µg/L | | | | | | | | | | | | 2 | 0.04 | |
| EPA 625 | Phenol | 1 | µg/L | | 10 | 0.78 | 0.5 | 0.1 | 0.5 | 0.06 | | 1 | 1 | | | | |
| EPA 8270 | Phenol | 1 | µg/L | | | | | | | | | | | | 1 | 0.02 | |
| EPA 625 | 2,4,6-Trichlorophenol | 10 | µg/L | | 10 | 3 | 0.5 | 0.14 | 0.5 | 0.15 | | 10 | 1.9 | | | | |
| EPA 8270 | 2,4,6-Trichlorophenol | 10 | µg/L | | | | | | | | | | | | 5 | 0.02 | |
| | **BASE/NEUTRAL** | | | | | | | | | | | | | | | | |
| EPA 625 | Acenaphthene | 1 | µg/L | | 10 | 0.72 | 0.01 | 0.004 | | | | | | | | | |
| EPA 625 SIM | Acenaphthene | 1 | µg/L | | | | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Acenaphthene | 1 | µg/L | | | | | | 0.2 | 0.021 | | | | | 0.05 | 0.03 | |
| EPA 625 | Acenaphthylene | 2 | µg/L | | 10 | 0.52 | 0.01 | 0.0023 | | | | | | | | | |
| 8310/8270SIM | Acenaphthylene | 2 | µg/L | | | | | | 0.2 | 0.018 | | | | | 0.05 | 0.005 | |
| EPA 625 SIM | Acenaphthylene | 2 | µg/L | | | | | | | | | 0.05 | 0.05 | | | | |
| EPA 625 | Anthracene | 2 | µg/L | | 10 | 0.54 | 0.01 | 0.002 | | | | | | | | | |
| EPA 625 SIM | Anthracene | 2 | µg/L | | | | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Anthracene | 2 | µg/L | | | | | | 0.2 | 0.034 | | | | | 0.05 | 0.02 | |
| EPA 625 | Benzidine | 5 | µg/L | | 5 | 1.2 | 5 | 1.4 | 5 | 2.2 | | 5 | 5 | | | | |
| 8270 | Benzidine | 5 | µg/L | | | | | | | | | | | | 5 | 0.2 | |
| EPA 625 | 1,2 Benzanthracene | 5 | µg/L | Benzo(a)Ant | 10 | 0.54 | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Benz(a)anthracene | 5 | µg/L | 1,2 Benzan | | | | | 0.2 | 0.024 | | | | | 0.05 | 0.02 | |
| EPA 625 | Benzo(a)pyrene | 2 | µg/L | | 10 | 1.8 | 0.01 | 0.0033 | | | | | | | | | |
| EPA 625 SIM | Benzo(a)pyrene | 2 | µg/L | | | | | | | | | 0.05 | 0.05 | | | | |
| EPA 525.2 | Benzo(a)pyrene | 2 | µg/L | | | | | | | | | 0.1 | 0.09 | | | | |
| 8310/8270SIM | Benzo(a)pyrene | 2 | µg/L | | | | | | 0.2 | 0.036 | | | | | 0.05 | 0.02 | |
| EPA 625 | Benzo(g,h,i)perylene | 5 | µg/L | | 10 | 0.76 | 0.01 | 0.0038 | | | | | | | | | |
| EPA 625 SIM | Benzo(g,h,i)perylene | 5 | µg/L | | | | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Benzo(g,h,i)perylene | 5 | µg/L | | | | | | 0.2 | 0.022 | | | | | 0.05 | 0.03 | |
| EPA 625 | 3,4 Benzoflouranthene | 10 | µg/L | Benzo(b)fluor | 10 | 0.58 | 10 | 0.00207 | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Benzo(b)fluoranthene | 10 | µg/L | 3,4 Benzofluoranth | | | | | 0.2 | 0.025 | | | | | 0.05 | 0.02 | |
| EPA 625 | Benzo(k)flouranthene | 2 | µg/L | | 10 | 0.62 | 0.01 | 0.0028 | | | | | | | | | |
| 8310/8270SIM | Benzo(k)fluoranthene | 2 | µg/L | | | | | | 0.2 | 0.023 | | | | | 0.05 | 0.02 | |
| EPA 625 SIM | Benzo(k)flouranthene | 2 | µg/L | | | | | | | | | 0.05 | 0.05 | | | | |
| EPA 625 | Bis(2-Chloroethoxy) methane | 5 | µg/L | | 10 | 0.58 | 0.5 | 0.1 | 0.5 | 0.066 | | 5 | 1.8 | | | | |
| 8270 | Bis(2-Chloroethoxy) methane | 5 | µg/L | | | | | | | | | | | | 5 | 0.07 | |

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| EPA 625 | Bis(2-Chloroisopropyl) ether | 2 | µg/L | | 2 | 1.2 | 0.5 | 0.12 | 0.5 | 0.068 | | 2 | 1.9 | | | | |
| 8270 | Bis(2-Chloroisopropyl) ether | 2 | µg/L | | | | | | | | | | | | 2 | 0.03 | |
| EPA 625 | Bis(2-Chloroethyl) ether | 1 | µg/L | | 5 | 1.2 | 0.5 | 0.15 | 0.5 | 0.096 | | 1 | 1 | | | | |
| 8270 | Bis(2-Chloroethyl) ether | 1 | µg/L | | | | | | | | | | | | 1 | 0.03 | |
| EPA 625 | Bis(2-Ethylhexyl) phthalate | 5 | µg/L | | 10 | 0.63 | 1 | 0.29 | 5 | 0.91 | | 5 | 2.3 | | | | |
| 8270 | Bis(2-Ethylhexyl) phthalate | 5 | µg/L | | | | | | | | | | | | 3 | 0.06 | |
| EPA 625 | 4-Bromophenyl phenyl ether | 5 | µg/L | | 10 | 0.54 | 0.5 | 0.1 | 5 | 1.4 | | 5 | 1.6 | | | | |
| 8270 | 4-Bromophenyl phenyl ether | 5 | µg/L | | | | | | | | | | | | 5 | 0.04 | |
| EPA 625 | Butyl benzyl phthalate | 10 | µg/L | | 10 | 0.56 | 0.5 | 0.1 | 5 | 1.2 | | 10 | 1.6 | | | | |
| 8270 | Butyl benzyl phthalate | 10 | µg/L | | | | | | | | | | | | 5 | 0.03 | |
| EPA 625 | 2-Chloroethyl vinyl ether | 1 | µg/L | | | | | | 1 | 0.36 | | 5 | 1 | may reach with J flag or out of reach | | | |
| EPA 624 | 2-Chloroethyl vinyl ether | 1 | µg/L | | 0.5 | 0.27 | 1 | 0.39 | | | | | | | | | |
| 8260 | 2-Chloroethyl vinyl ether | 1 | µg/L | | | | | | | | | | | | 1 | 0.2 | |
| EPA 625 | 2-Chloronaphthalene | 10 | µg/L | | 10 | 0.5 | 0.5 | 0.1 | 5 | 1.4 | | 10 | 1.8 | | | | |
| 8270 | 2-Chloronaphthalene | 10 | µg/L | | | | | | | | | | | | 5 | 0.04 | |
| EPA 625 | 4-Chlorophenyl phenyl ether | 5 | µg/L | | 10 | 0.59 | 0.5 | 0.23 | 5 | 1.3 | | 5 | 1.8 | | | | |
| 8270 | 4-Chlorophenyl phenyl ether | 5 | µg/L | | | | | | | | | | | | 5 | 0.05 | |
| EPA 625 | Chrysene | 5 | µg/L | | 10 | 0.56 | 0.01 | 0.0011 | | | | | | | | | |
| EPA 625 SIM | Chrysene | 5 | µg/L | | | | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Chrysene | 5 | µg/L | | | | | | 0.2 | 0.019 | | | | | 0.05 | 0.02 | |
| EPA 625 | Dibenzo(a,h)anthracene | 0.1 | µg/L | | 10 | 0.72 | 0.01 | 0.0031 | | | | | | | | | |
| EPA 625 SIM | Dibenzo(a,h)anthracene | 0.1 | µg/L | | | | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Dibenzo(a,h)anthracene | 0.1 | µg/L | | | | | | 0.2 | 0.027 | | | | | 0.05 | 0.01 | |
| EPA 625 | 1,3-Dichlorobenzene | 1 | µg/L | | 10 | 0.56 | 0.5 | 0.1 | 1 | 0.27 | | | | | | | |
| EPA 624 | 1,3-Dichlorobenzene | 1 | µg/L | | | | | | | | | 0.5 | 0.15 | | | | |
| 8270 | 1,3-Dichlorobenzene | 1 | µg/L | | | | | | | | | | | | 1 | 0.03 | |
| EPA 625 | 1,4-Dichlorobenzene | 1 | µg/L | | 10 | 0.66 | 0.5 | 0.1 | 1 | 0.29 | | 1 | 1 | | | | |
| EPA 624 | 1,4-Dichlorobenzene | 1 | µg/L | | | | | | | | | 0.5 | 0.072 | | | | |
| 8270 | 1,4-Dichlorobenzene | 1 | µg/L | | | | | | | | | | | | 1 | 0.03 | |
| EPA 625 | 1,2-Dichlorobenzene | 1 | µg/L | | 10 | 0.65 | 0.5 | 0.1 | 1 | 0.23 | | 2 | 1.8 | | | | |
| EPA 624 | 1,2-Dichlorobenzene | 1 | µg/L | | 0.5 | 0.44 | | | | | | 0.5 | 0.2 | | | | |
| 8270 | 1,2-Dichlorobenzene | 1 | µg/L | | | | | | | | | | | | 1 | 0.02 | |
| EPA 625 | 3,3-Dichlorobenzidine | 5 | µg/L | | 5 | 3.3 | 1 | 0.54 | 5 | 1.2 | | 5 | 2.1 | | | | |
| 8270 | 3,3'-Dichlorobenzidine | 5 | µg/L | | | | | | | | | | | | 5 | 0.4 | |
| EPA 625 | Diethyl phthalate | 2 | µg/L | | 10 | 0.55 | 0.5 | 0.1 | 0.5 | 0.1 | | 2 | 1.8 | | | | |
| 8270 | Diethyl phthalate | 2 | µg/L | | | | | | | | | | | | 2 | 0.03 | |
| EPA 625 | Dimethyl phthalate | 2 | µg/L | | 10 | 0.63 | 0.5 | 0.1 | 0.5 | 0.11 | | 2 | 1.7 | | | | |
| 8270 | Dimethyl phthalate | 2 | µg/L | | | | | | | | | | | | 2 | 0.03 | |
| EPA 625 | di-n-Butyl phthalate | 10 | µg/L | | 10 | 0.7 | 0.5 | 0.14 | 0.5 | 0.073 | | 10 | 1.9 | | | | |
| 8270 | Di-n-butyl phthalate | 10 | µg/L | | | | | | | | | | | | 5 | 0.05 | |
| EPA 625 | 2,4-Dinitrotoluene | 5 | µg/L | | 10 | 0.83 | 0.5 | 0.1 | 0.5 | 0.15 | | 5 | 1.8 | | | | |
| 8270 | 2,4-Dinitrotoluene | 5 | µg/L | | | | | | | | | | | | 5 | 0.02 | |
| EPA 625 | 2,6-Dinitrotoluene | 5 | µg/L | | 10 | 0.7 | 0.5 | 0.36 | 5 | 1.2 | | 5 | 1.9 | | | | |
| 8270 | 2,6-Dinitrotoluene | 5 | µg/L | | | | | | | | | | | | 5 | 0.05 | |
| EPA 625 | 4,6 Dinitro-2-methylphenol | 5 | µg/L | | 50 | 3.5 | 0.5 | 0.11 | 5 | 1.1 | | 5 | 1.8 | | | | |
| 8270 | 4,6-Dinitro-2-methylphenol | 5 | µg/L | | | | | | | | | | | | 5 | 0.03 | |
| EPA 625 | 1,2-Diphenylhydrazine | 1 | µg/L | | 10 | 0.62 | 0.5 | 0.1 | 0.5 | 0.098 | | 1 | 1 | | | | |
| 8270 | 1,2-Diphenylhydrazine | 1 | µg/L | | | | | | | | | | | | 1 | 0.06 | |
| EPA 625 | di-n-Octyl phthalate | 10 | µg/L | | 10 | 0.58 | 0.5 | 0.1 | 5 | 1.2 | | 10 | 2.6 | | | | |
| 8270 | Di-n-octyl phthalate | 10 | µg/L | | | | | | | | | | | | 5 | 0.02 | |
| EPA 625 | Fluoranthene | 0.05 | µg/L | | 10 | 0.56 | 0.01 | 0.0012 | | | | | | | | | |

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| EPA 625 SIM | Fluoranthene | 0.05 | µg/L | | 2 | 1.6 | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Fluoranthene | 0.05 | µg/L | | | | | | 0.2 | 0.027 | | | | | 0.05 | 0.009 | |
| EPA 625 | Fluorene | 0.1 | µg/L | | 10 | 0.53 | 0.01 | 0.0043 | | | | | | | | | |
| EPA 625 SIM | Fluorene | 0.1 | µg/L | | 2 | 1.6 | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Fluorene | 0.1 | µg/L | | | | | | 0.2 | 0.024 | | | | | 0.05 | 0.02 | |
| EPA 625 | Hexachlorobenzene | 1 | µg/L | | 10 | 0.78 | 0.5 | 0.15 | 0.5 | 0.19 | | 1 | 1 | | | | |
| 8270 | Hexachlorobenzene | 1 | µg/L | | | | | | | | | | | | 1 | 0.03 | |
| EPA 625 | Hexachlorobutadiene | 1 | µg/L | | 20 | 0.56 | 0.5 | 0.13 | 1 | 0.33 | | 1 | 1 | | | | |
| 8270 | Hexachlorobutadiene | 1 | µg/L | | | | | | | | | | | | 1 | 0.05 | |
| EPA 625 | Hexachloro-cyclopentadiene | 5 | µg/L | | 10 | 0.67 | 0.5 | 0.14 | 0.5 | 0.15 | | 5 | 1.7 | | | | |
| 8270 | Hexachloro-cyclopentadiene | 5 | µg/L | | | | | | | | | | | | 5 | 0.2 | |
| EPA 625 | Hexachloroethane | 1 | µg/L | | 10 | 0.69 | 0.5 | 0.1 | 1 | 0.3 | | 1 | 1 | | | | |
| 8270 | Hexachloroethane | 1 | µg/L | | | | | | | | | | | | 1 | 0.02 | |
| EPA 625 | Indeno(1,2,3-cd)pyrene | 0.05 | µg/L | | 10 | 1.5 | 0.01 | 0.0027 | | | | | | | | | |
| EPA 625 SIM | Indeno(1,2,3-cd)pyrene | 0.05 | µg/L | | 2 | 1.9 | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Indeno(1,2,3-cd)pyrene | 0.05 | µg/L | | | | | | 0.2 | 0.022 | | | | | 0.05 | 0.03 | |
| EPA 625 | Isophorone | 1 | µg/L | | 10 | 0.6 | 0.5 | 0.11 | 0.5 | 0.14 | | 1 | 1 | | | | |
| 8270 | Isophorone | 1 | µg/L | | | | | | | | | | | | 1 | 0.2 | |
| EPA 625 | Naphthalene | 0.2 | µg/L | | 10 | 0.46 | 0.01 | 0.0027 | | | | | | | | | |
| EPA 625 SIM | Naphthalene | 0.2 | µg/L | | 2 | 1.8 | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Naphthalene | 0.2 | µg/L | | | | | | 0.2 | 0.023 | | | | | 0.05 | 0.01 | |
| EPA 625 | Nitrobenzene | 1 | µg/L | | 10 | 0.65 | 0.5 | 0.11 | 1 | 0.24 | | 1 | 1 | | | | |
| 8270 | Nitrobenzene | 1 | µg/L | | | | | | | | | | | | 1 | 0.02 | |
| EPA 625 | N-Nitroso-dimethyl amine | 5 | µg/L | | 50 | 1.9 | 0.5 | 0.48 | 0.5 | 0.13 | | 5 | 1.4 | | | | |
| 8270 | N-Nitroso-dimethyl amine | 5 | µg/L | | | | | | | | | | | | 5 | 0.02 | |
| EPA 625 | N-Nitroso-diphenyl amine | 1 | µg/L | | 10 | 0.57 | 0.5 | 0.24 | 0.5 | 0.14 | | 1 | 1 | | | | |
| 8270 | N-Nitroso-diphenyl amine | 1 | µg/L | | | | | | | | | | | | 1 | 0.03 | |
| EPA 625 | N-Nitroso-di-n-propyl amine | 5 | µg/L | | 10 | 0.72 | 0.5 | 0.1 | 5 | 0.92 | | 5 | 1.7 | | | | |
| 8270 | N-Nitroso-di-n-propyl amine | 5 | µg/L | | | | | | | | | | | | 5 | 0.03 | |
| EPA 625 | Phenanthrene | 0.05 | µg/L | | 10 | 0.56 | 0.01 | 0.0024 | | | | | | | | | |
| EPA 625 SIM | Phenanthrene | 0.05 | µg/L | | 2 | 1.8 | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Phenanthrene | 0.05 | µg/L | | | | | | 0.2 | 0.031 | | | | | 0.05 | 0.02 | |
| EPA 625 | Pyrene | 0.05 | µg/L | | 10 | 0.57 | 0.01 | 0.0014 | | | | | | | | | |
| EPA 625 SIM | Pyrene | 0.05 | µg/L | | 2 | 1.6 | | | | | | 0.05 | 0.05 | | | | |
| 8310/8270SIM | Pyrene | 0.05 | µg/L | | | | | | 0.2 | 0.025 | | | | | 0.05 | 0.02 | |
| EPA 625 | 1,2,4-Trichlorobenzene | 1 | µg/L | | 10 | 0.53 | 0.5 | 0.1 | | | | 1 | 1 | | | | |
| 8270 | 1,2,4-Trichlorobenzene | 1 | µg/L | | | | | | 0.5 | 0.06 | | | | | 1 | 0.03 | |
| | **Chlorinated Pesticides** | | | | | | | | | | | | | | | | |
| EPA 608 | Aldrin | 0.005 | µg/L | | 0.02 | 0.003 | 0.005 | 0.00079 | 0.004 | 0.00065 | | 0.005 | 0.005 | | 0.1 | 0.0001 | |
| EPA 608 | alpha-BHC | 0.01 | µg/L | | 0.02 | 0.003 | 0.005 | 0.0025 | 0.004 | 0.00067 | | 0.01 | 0.01 | | 0.2 | 0.0002 | |
| EPA 608 | beta-BHC | 0.005 | µg/L | | 0.02 | 0.004 | 0.005 | 0.00054 | 0.004 | 0.0015 | | 0.005 | 0.005 | | 0.2 | 0.0009 | |
| EPA 608 | delta-BHC | 0.005 | µg/L | | 0.02 | 0.003 | 0.005 | 0.0006 | 0.004 | 0.00066 | | 0.005 | 0.005 | | 0.2 | 0.0003 | |
| EPA 608 | gamma-BHC (lindane) | 0.02 | µg/L | | 0.02 | 0.004 | 0.005 | 0.0025 | 0.004 | 0.00093 | | 0.02 | 0.02 | | 0.2 | 0.0002 | |
| EPA 608 | alpha-chlordane | 0.1 | µg/L | | 0.02 | 0.003 | 0.1 | 0.026 | 0.004 | 0.00062 | | 0.1 | 0.045 | "chlordane" | 0.1 | | |
| EPA 608 | gamma-chlordane | 0.1 | µg/L | | 0.02 | 0.003 | 0.1 | 0.026 | 0.004 | 0.0006 | | 0.1 | 0.045 | "chlordane" | 0.1 | | |
| EPA 608 | 4,4'-DDD | 0.05 | µg/L | | 0.05 | 0.004 | 0.005 | 0.00072 | 0.004 | 0.00061 | | 0.05 | 0.016 | | 0.05 | 0.0007 | |
| EPA 608 | 4,4'-DDE | 0.05 | µg/L | | 0.05 | 0.003 | 0.005 | 0.00061 | 0.004 | 0.00089 | | 0.05 | 0.01 | | 0.05 | 0.0002 | |
| EPA 608 | 4,4'-DDT | 0.01 | µg/L | | 0.05 | 0.004 | 0.005 | 0.0007 | 0.004 | 0.00059 | | 0.01 | 0.01 | | 0.01 | 0.002 | |
| EPA 608 | Dieldrin | 0.01 | µg/L | | 0.05 | 0.004 | 0.005 | 0.00097 | 0.004 | 0.00065 | | 0.01 | 0.01 | | 0.01 | 0.0002 | |
| EPA 608 | alpha-Endosulfan | 0.02 | µg/L | | 0.02 | 0.004 | 0.005 | 0.00089 | 0.004 | 0.00059 | | 0.02 | 0.011 | | 0.02 | 0.0002 | |
| EPA 608 | beta-Endosulfan | 0.01 | µg/L | | 0.05 | 0.004 | 0.005 | 0.0018 | 0.004 | 0.00065 | | 0.01 | 0.01 | | 0.01 | 0.0005 | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA 608 | Endosulfan sulfate | 0.05 | µg/L | | 0.05 | 0.004 | 0.005 | 0.00074 | 0.004 | 0.0006 | | 0.05 | 0.044 | | 0.05 | 0.0004 | |
| EPA 608 | Endrin | 0.01 | µg/L | | 0.05 | 0.003 | 0.005 | 0.00081 | 0.004 | 0.00062 | | 0.01 | 0.01 | | 0.01 | 0.002 | |
| EPA 608 | Endrin aldehyde | 0.01 | µg/L | | 0.05 | 0.005 | 0.005 | 0.00067 | 0.004 | 0.00064 | | 0.01 | 0.01 | | 0.01 | 0.002 | |
| EPA 608 | Heptachlor | 0.01 | µg/L | | 0.02 | 0.003 | 0.005 | 0.00069 | 0.004 | 0.00072 | | 0.01 | 0.01 | | 0.01 | 0.0003 | |
| EPA 608 | Heptachlor Epoxide | 0.01 | µg/L | | 0.02 | 0.004 | 0.005 | 0.00069 | 0.004 | 0.00068 | | 0.01 | 0.01 | | 0.01 | 0.0002 | |
| EPA 608 | Toxaphene | 0.5 | µg/L | | 2.5 | 0.36 | 0.1 | 0.035 | 0.05 | 0.0092 | | 0.5 | 0.5 | | 0.5 | 0.03 | |
| | **POLYCHLORINATED BIPHENYLS** | | | | | | | | | | | | | | | | |
| EPA 608 | Aroclor-1016 | 0.5 | µg/L | | 0.5 | 0.07 | 0.1 | 0.05 | 0.2 | 0.059 | | 0.5 | 0.5 | | 0.5 | | |
| EPA 608 | Aroclor-1221 | 0.5 | µg/L | | 0.5 | 0.07 | 0.1 | 0.063 | 0.2 | 0.057 | | 0.5 | 0.5 | | 0.5 | | |
| EPA 608 | Aroclor-1232 | 0.5 | µg/L | | 0.5 | 0.07 | 0.1 | 0.05 | 0.2 | 0.05 | | 0.5 | 0.42 | | 0.5 | | |
| EPA 608 | Aroclor-1242 | 0.5 | µg/L | | 0.5 | 0.07 | 0.1 | 0.05 | 0.2 | 0.025 | | 0.5 | 0.41 | | 0.5 | | |
| EPA 608 | Aroclor-1248 | 0.5 | µg/L | | 0.5 | 0.07 | 0.1 | 0.02 | 0.2 | 0.04 | | 0.5 | 0.28 | | 0.5 | | |
| EPA 608 | Aroclor-1254 | 0.5 | µg/L | | 0.5 | 0.07 | 0.1 | 0.05 | 0.2 | 0.045 | | 0.5 | 0.5 | | 0.5 | | |
| EPA 608 | Aroclor-1260 | 0.5 | µg/L | | 0.5 | 0.07 | 0.1 | 0.015 | 0.2 | 0.053 | | 0.5 | 0.5 | | 0.5 | | |
| | **ORGANOPHOSPHATE PESTICIDES** | | | | | | | | | | | | | | | | |
| EPA 525.2 | Atrazine | 2 | µg/L | | 0.1 | 0.1 | | | | | | 0.5 | 0.063 | | 0.1 | 0.034 | |
| EPA 8141B | Atrazine | 2 | µg/L | | | | | | 0.02 | 0.0044 | | | | | | | |
| EPA 8270C | Atrazine | 2 | µg/L | | | | 0.1 | 0.028 | | | | 4 | 1.4 | | | | |
| EPA 525.2 | Chlorpyrifos | 0.05 | µg/L | | | | | | | | | | | | 0.01 | 0.0069 | |
| EPA 8141B | Chlorpyrifos | 0.05 | µg/L | | 1 | 1 | | | 0.01 | 0.0026 | | | | | | | |
| EPA 8270C | Chlorpyrifos | 0.05 | µg/L | | | | 0.01 | 0.0029 | | | | 4 | 1.2 | may reach with J flag or out of reach | | | |
| EPA 525.2 | Cyanazine | 2 | µg/L | | 0.1 | 0.1 | | | | | | | | | | | |
| EPA 8141B | Cyanazine | 2 | µg/L | | | | | | 0.02 | 0.0035 | | | | | | | |
| EPA 8270C | Cyanazine | 2 | µg/L | | | | 0.1 | 0.036 | | | | | | | 0.1 | 0.024 | |
| EPA 525.2 | Diazinon | 0.01 | µg/L | | 0.1 | 0.1 | | | 0.01 | 0.0026 | | 0.25 | 0.25 | may reach with J flag or out of reach | 0.1 | 0.096 | |
| EPA 8141B | Diazinon | 0.01 | µg/L | | 1 | 1 | | | 0.01 | 0.0026 | | | | | | | |
| EPA 8270C | Diazinon | 0.01 | µg/L | | | | 0.01 | 0.0036 | | | | | | | | | |
| EPA 525.2 | Malathion | 1 | µg/L | | | | | | | | | | | | 0.01 | 0.0076 | |
| EPA 8141B | Malathion | 1 | µg/L | | 1 | 1 | | | 0.02 | 0.0055 | | | | | | | |
| EPA 8270C | Malathion | 1 | µg/L | | | | 0.01 | 0.0046 | | | | 4 | 0.073 | | | | |
| EPA 525.2 | Prometryn | 2 | µg/L | | 0.1 | 0.1 | | | | | | 2 | 0.079 | | 0.1 | 0.036 | |
| EPA 8141B | Prometryn | 2 | µg/L | | | | | | 0.02 | 0.0039 | | | | | | | |
| EPA 8270C | Prometryn | 2 | µg/L | | | | 0.1 | 0.019 | | | | | | | | | |
| EPA 525.2 | Simazine | 2 | µg/L | | 0.1 | 0.1 | 0.1 | 0.024 | | | | 1 | 0.061 | | 0.1 | 0.015 | |
| EPA 8141B | Simazine | 2 | µg/L | | | | | | 0.02 | 0.0045 | | | | | | | |
| EPA 8270C | Simazine | 2 | µg/L | | | | 0.1 | 0.024 | | | | 4 | 0.84 | | | | |
| | **HERBICIDES** | | | | | | | | | | | | | | | | |
| EPA 515.3 | 2,4-D | 10 | µg/L | | 0.4 | 0.4 | 10 | 0.074 | | | | | | | | | |
| EPA 8151A | 2,4-D | 10 | µg/L | | 0.5 | 0.5 | | | 5 | 1.8 | | 10 | 0.17 | | 2 | 0.083 | |
| EPA 547 | Glyphosate | 5 | µg/L | | 5 | 5 | 5 | 2.1 | 5 | 1.8 | Sub to Weck | 25 | 4.5 | may reach with J flag or out of reach | 5 | 1.8 | |
| EPA 8151A | 2,4,5-TP-SILVEX | 0.5 | µg/L | | 0.5 | 0.5 | | | 0.5 | 0.22 | | 1 | 0.15 | may reach with J flag or out of reach | 1 | 0.074 | |
| EPA 515.3 | 2,4,5-TP-SILVEX | 0.5 | µg/L | | 0.2 | 0.2 | 1 | 0.016 | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | Quote | | $3,154 | | $1,605 | | $2,350 | | | $3,250 | quote from dec '13 | | $2,045 | no bacteria |

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