

**APPENDIX A**

**SCRIPPS WATERSHED**  
**FINAL QUALITY ASSURANCE PROJECT PLAN**

**GROUP A ELEMENTS: PROJECT MANAGEMENT**

**1.0 TITLE AND APPROVAL SHEETS**

---

**Scripps Watershed  
FINAL Quality Assurance Project Plan  
Comprehensive Load Reduction Plan (CLRP)**

**June 2013**

**Submitted to:  
City of San Diego  
Transportation and Storm Water Department**

**Submitted by:  
AMEC Environment & Infrastructure, Inc.  
San Diego, California**

**QAPP Revision Number: 2.0**

# APPROVAL SIGNATURES

## PROJECT ORGANIZATION:

| Title:                                | Name:                 | Signature: | Date*: |
|---------------------------------------|-----------------------|------------|--------|
| City of San Diego Contract<br>Manager | Andre Sonksen         | _____      | _____  |
| AMEC Project QA Officer               | Jay Shrake            | _____      | _____  |
| AMEC Project Manager                  | Roshan Christoph      | _____      | _____  |
| Laboratory Project Manager            | Hai Van               | _____      | _____  |
| Insert Title of Person Here           | Insert Name of Person | _____      | _____  |
| Insert Title of Person Here           | Insert Name of Person | _____      | _____  |
| Insert Title of Person Here           | Insert Name of Person | _____      | _____  |

## REGIONAL BOARD (SWRCB):

| Title: | Name: | Signature: | Date*: |
|--------|-------|------------|--------|
| NA     | NA    | _____      | _____  |
| _____  | _____ | _____      | _____  |
| _____  | _____ | _____      | _____  |

\* This is a contractual document. The signature dates indicate the earliest date when the project can start.

## TABLE OF CONTENTS

|   | <b>Page</b> |
|---|-------------|
| ACRONYMS AND ABBREVIATIONS .....                              | V           |
| 1.0 TITLE AND APPROVAL SHEETS.....                            | I           |
| 2.0 DISTRIBUTION LIST.....                                    | 2-1         |
| 3.0 PROJECT/TASK ORGANIZATION .....                           | 3-1         |
| 3.1 Involved Parties and Roles .....                          | 3-1         |
| 3.2 Quality Assurance Officer Role .....                      | 3-2         |
| 3.3 Persons Responsible for QAPP Update and Maintenance.....  | 3-2         |
| 3.4 Organizational Chart and Responsibilities.....            | 3-2         |
| 4.0 PROBLEM DEFINITION/BACKGROUND .....                       | 4-1         |
| 4.1 Problem Statement .....                                   | 4-1         |
| 4.2 Decisions or Outcomes.....                                | 4-2         |
| 4.3 Water Quality or Regulatory Criteria.....                 | 4-2         |
| 5.0 PROJECT/TASK DESCRIPTION .....                            | 5-1         |
| 5.1 Work Statement and Products .....                         | 5-1         |
| 5.1.1 Compliance Monitoring.....                              | 5-1         |
| 5.1.2 Optional Monitoring .....                               | 5-1         |
| 5.1.3 Reporting.....  | 5-1         |
| 5.2 Monitored Constituents and Measurement Techniques .....   | 5-1         |
| 5.3 Project Schedule.....                                     | 5-2         |
| 5.4 Geographical Setting .....                                | 5-2         |
| 5.5 Constraints.....  | 5-5         |
| 6.0 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA..... | 6-1         |
| 7.0 SPECIAL TRAINING NEEDS/CERTIFICATION .....                | 7-1         |
| 7.1 Specialized Training or Certifications .....              | 7-1         |
| 7.2 Training and Certification Documentation .....            | 7-1         |
| 7.3 Training Personnel.....                                   | 7-1         |
| 8.0 DOCUMENTS AND RECORDS .....                               | 8-1         |
| 9.0 SAMPLING DESIGN .....                                     | 9-1         |
| 9.1 Project Description and General Design .....              | 9-1         |
| 9.2 Monitoring Locations.....                                 | 9-1         |
| 9.3 Wet Weather Sampling.....                                 | 9-5         |
| 9.4 Dry Weather Sampling.....                                 | 9-5         |
| 9.5 Monitoring Logistics .....                                | 9-5         |
| 9.6 Laboratory Distribution.....                              | 9-6         |
| 10.0 SAMPLING METHODS .....                                   | 10-1        |
| 10.1 Field Observations and Documentation .....               | 10-1        |
| 10.2 Wet and Dry Weather Grab Sampling.....                   | 10-2        |
| 10.2.1 Sample Handling.....                                   | 10-2        |
| 11.0 SAMPLE HANDLING AND CUSTODY.....                         | 11-1        |
| 12.0 ANALYTICAL METHODS.....                                  | 12-5        |
| 13.0 QUALITY CONTROL.....                                     | 13-1        |
| 13.1 Quality Control Types .....                              | 13-1        |
| 13.2 Field Quality Control Samples.....                       | 13-1        |
| 13.3 Laboratory Quality Control .....                         | 13-2        |

|      |  |      |
|------|--|------|
| 14.0 | INSPECTION/ACCEPTANCE OF CONSUMABLES AND SUPPLIES..... | 14-1 |
| 15.0 | INSTRUMENT CALIBRATION .....                           | 15-1 |
| 16.0 | NON-DIRECT MEASUREMENTS .....                          | 16-1 |
| 17.0 | DATA MANAGEMENT .....                                  | 17-1 |
| 17.1 | Field Observations.....                                | 17-1 |
| 17.2 | Analytical Data.....                                   | 17-1 |
| 18.0 | ASSESSMENT AND RESPONSE ACTIONS .....                  | 18-1 |
| 19.0 | REPORTS TO MANAGEMENT.....                             | 19-1 |
| 20.0 | DATA REVIEW, VERIFICATION, AND VALIDATION.....         | 20-1 |
| 21.0 | VERIFICATION AND VALIDATION METHODS .....              | 21-1 |
| 21.1 | Data Verification and Validation Responsibilities..... | 21-1 |
| 21.2 | Process for Data Verification and Validation .....     | 21-1 |
| 22.0 | RECONCILIATION WITH USER REQUIREMENTS.....             | 22-1 |
| 23.0 | REFERENCES.....  | 23-1 |

## LIST OF TABLES

---

|             |  |      |
|-------------|--|------|
| Table 3-1.  | Personnel Responsibilities.....  | 3-2  |
| Table 5-1.  | Master List of Analytical Constituents .....                                     | 5-2  |
| Table 5-2.  | Project Schedule for Fiscal Year 2013.....                                       | 5-2  |
| Table 6-1.  | Data Quality Objectives .....  | 6-1  |
| Table 6-2.  | Measurement Quality Objectives for Laboratory Data.....                          | 6-2  |
| Table 7-1.  | Specialized Personnel Training or Certification.....                             | 7-1  |
| Table 8-1.  | Documents and Record Retention, Archival, and Disposition Information....        | 8-1  |
| Table 9-1.  | Scope of Compliance Monitoring .....   | 9-1  |
| Table 9-2.  | Sampling Sites .....   | 9-2  |
| Table 10-1. | Sampling Locations and Sampling Methods .....                                    | 10-1 |
| Table 11-1. | Sample Handling and Custody .....  | 11-1 |
| Table 12-1. | Laboratory Analytical Methods.....   | 12-5 |
| Table 13-1. | Field QC .....   | 13-2 |
| Table 13-2. | Laboratory Quality Control.....  | 13-2 |
| Table 14-1. | Inspection/Acceptance Testing Requirements for Consumables and Supplies<br>..... | 14-1 |
| Table 18-1. | Management Reports .....   | 19-1 |

## LIST OF FIGURES

---

|             |  |                                    |
|-------------|--|------------------------------------|
| FIGURE 3-1. | ORGANIZATIONAL CHART.....                          | 3-3                                |
| FIGURE 5-1. | SCRIPPS WATERSHED.....                             | 5-4                                |
| FIGURE 9-1. | SCRIPPS WATERSHED MONITORING LOCATIONS             | <b>ERROR! BOOKMARK NOT DEFINED</b> |
| FIGURE 9-1. | SCRIPPS WATERSHED MONITORING LOCATIONS (CONTINUED) | 9-3                                |
| FIGURE 9-2. | MONITORING LOCATIONS.....                          | 9-4                                |

## ACRONYMS AND ABBREVIATIONS

|                 |  |
|-----------------|--|
| µs/cm           | Microsiemens Per Centimeter  |
| 303(d) List     | Clean Water Act (CWA) Section 303(D) List Of Water Quality Limited Segments  |
| AB411           | Assembly Bill 411  |
| Bacteria TMDL   | <i>A Resolution Amending The Water Quality Control Plan For The San Diego Basin (9) To Incorporate Revised Total Maximum Daily Loads For Indicator Bacteria Project I-Twenty Beaches And Creeks In The San Diego Region (Including Tecolote Creek)</i> |
| Basin Plan      | State Water Resources Control Board's San Diego Region Basin Plan  |
| BMP             | Best Management Practice   |
| BPA             | Basin Plan Amendment   |
| Caltrans        | California Department Of Transportation  |
| CFS             | Cubic Feet Per Second  |
| CLRP            | Comprehensive Load Reduction Plan  |
| COC             | Chain-of-Custody   |
| CWA             | Clean Water Act  |
| DHS             | Department Of Health Services  |
| DQO             | Data Quality Objective   |
| EDD             | Electronic Data Deliverable  |
| ELAP            | Environmental Laboratory Accreditation Program   |
| ft              | Feet   |
| ft <sup>2</sup> | Square Feet  |
| ft/s            | Feet Per Second  |
| FIB             | Fecal Indicator Bacteria   |
| ID              | Identification   |
| JPEG            | Joint Photographic Experts Group   |
| LA              | Load Allocation  |
| MES             | Mass Emission Station  |
| mL              | Millimeter   |
| MLS             | Mass Loading Station   |
| MPN             | Most Probable Number   |
| MS4             | Municipal Separate Storm Sewer System  |
| *.pdf           | Portable Document Format   |
| QA              | Quality Assurance  |
| QAPP            | Quality Assurance Project Plan   |
| QC              | Quality Control  |
| RL              | Reporting Limit  |
| RPD             | Relative Percent Difference  |
| SDRWQCB         | San Diego Regional Water Quality Control Boards  |
| SOP             | Standard Operating Procedure   |
| SWAMP           | Surface Water Ambient Monitoring Program   |

|       |   |
|-------|---|
| TBD   | To Be Determined                              |
| TMDL  | Total Maximum Daily Load                      |
| USEPA | United States Environmental Protection Agency |
| USGS  | United States Geological Survey               |
| WAS   | Watershed Assessment Station                  |
| WLA   | Waste Load Allocation                         |
| WQO   | Water Quality Objective                       |
| WURMP | Watershed Urban Runoff Management Program     |

This page intentionally left blank



## 2.0 DISTRIBUTION LIST

---

| Title:                     | Name (Affiliation):               | Tel. No.:    | QAPP No.: |
|----------------------------|-----------------------------------|--------------|-----------|
| Contract Manager           | Andre Sonksen (City of San Diego) | 858-         |           |
| Project QA Officer         | Jay Shrake (AMEC)                 | 858-514-6459 |           |
| Project Manager            | Roshan Christoph (AMEC)           | 858-514-6475 |           |
| Laboratory Project Manager | Hai Van                           |              |           |
|                            |                                   |              |           |
|                            |                                   |              |           |
|                            |                                   |              |           |

Laboratory Managers will receive an electronic copy of the QAPP.

This page intentionally left blank

### 3.0 PROJECT/TASK ORGANIZATION

---

#### 3.1 Involved Parties and Roles

The SDRWQCB issued Resolution No. R9-2010-0001, *A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Revised Total Maximum Daily Loads (TMDL) for Indicator Bacteria Project I-Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*, herein referred to as the Bacteria TMDL. The Bacteria TMDL identifies the Responsible Party for the Scripps Watershed as the City of San Diego (excluding owners and operators of small MS4s and controllable nonpoint sources). The City of San Diego will implement the Consolidated Load Reduction Plan (CLRP) Monitoring Program.

The City of San Diego, consultants, and laboratory staff will have the following roles and responsibilities (Table 3-1):

- **Contract Manager:** Andre Sonksen is the Contract Manager for the City of San Diego. The Contract Manager will be responsible for establishing contracts with the selected consultants and/or laboratories to implement the Compliance Monitoring Program and act as the liaison between the Responsible Parties and consultants. He will oversee dry weather monitoring activities conducted by the City and act as QA Officer for the dry weather program.
- **AMEC Quality Assurance (QA) Officer:** Jay Shrake is the AMEC Project QA Officer. The AMEC Project QA Officer will be responsible for overseeing the project QA activities independently from the Project Manager to ensure that project implementation is being conducted in accordance with this QAPP.
- **Wet Weather Sampling Project Manager:** Roshan Christoph is the AMEC Project Manager. The AMEC Project Manager will be responsible for overseeing the day-to-day activities of implementing the San Diego River CLRP Compliance Monitoring Program.
- **Weck Laboratories Laboratory QA Officer/Project Manager:** Hai Van Nguyen is the Laboratory Project Manager as well as the QA Officer. Hai Van Nguyen holds a position independent of data generation with Weck Laboratories. Weck Laboratories will be performing wet weather sample analyses.
- **City of San Diego Laboratory QA Officer/Project Manager:** Laila Othman is the Laboratory Project Manager as well as the QA Officer. Laila Othman holds a position independent of data generation with the City of San Diego Public Utilities Department, Wastewater Operations, Environmental Monitoring & Technical Services, Marine-Microbiology Laboratory (herein referred to as the City of San Diego EM&TS Laboratory). Laila oversees the laboratory staff at the City's EM&TS laboratory that will be performing dry weather sample analyses.

**Table 3-1.  
 Personnel Responsibilities**

| Name             | Organizational Affiliation | Role/Responsibility   | Contact Information |
|------------------|----------------------------|-----------------------|---------------------|
| Andre Sonksen    | City of San Diego          | Contract Manager      |                     |
| Roshan Christoph | AMEC                       | Project Manager       |                     |
| Jay Shrake       | AMEC                       | Project QA Officer    |                     |
| Hai Van          | Weck                       | Laboratory QA Officer |                     |
|                  |                            |                       |                     |

### 3.2 Quality Assurance Officer Role

The Project QA Officer position is independent of data generation. The QA officer will ensure that the QA and quality control (QC) procedures set in place in this document will be properly applied throughout the sampling activities and analysis. The Project QA Officer will coordinate with the project managers and QA officers of participating laboratories to ensure all QA and QC procedures within this QAPP are understood and followed by participating labs.

### 3.3 Persons Responsible for QAPP Update and Maintenance

The Project Manager and Project QA Officer are responsible for maintaining this QAPP. Changes and updates to this QAPP may be made by the Project Manager and Project QA Officer. The Project Manager will be responsible for making the changes and ensuring these updates are provided to each of the participating agencies and the SDRWQCB as listed in Table 3-1. Previous versions of the QAPP should be removed so as to avoid any confusion with the most current version of the QAPP.

### 3.4 Organizational Chart and Responsibilities

Figure 3-1 presents the organization chart for the Scripps CLRP Monitoring Program.

**Figure 3-1. Organizational Chart**

To be determined at a later date by the Responsible Party.

This page intentionally left blank

## 4.0 PROBLEM DEFINITION/BACKGROUND

---

### 4.1 Problem Statement

The Bacteria TMDL has identified MS4s and Caltrans as point sources that have been assigned Waste Load Allocations (WLAs). The Basin Plan Amendment (BPA), which is Attachment A of the Bacteria TMDL, outlines an implementation plan that includes a compliance schedule and a description of minimum monitoring requirements to assess compliance with the TMDLs, WLAs, and Load Allocations (LAs). The City of San Diego has developed this QAPP as part of the CLRP for the Scripps Watershed.

The CLRP Monitoring Program is designed to fulfill the monitoring requirements of the TMDL and generate data to support the Scripps CLRP. The CLRP Monitoring Program is described in detail in the Monitoring Plan. The goals of the CLRP Monitoring Program include the following:

- To assess progress toward meeting the Bacteria TMDL numeric targets and WLAs.
- To characterize potential sources of approved TMDL pollutants and other constituents.
- To support the selection and evaluation of potential best management practices (BMPs).

The following four principal types of monitoring will be conducted to address the goals of the Scripps CLRP Monitoring Program.

- Compliance Monitoring is required by the Bacteria TMDL to demonstrate progress toward meeting TMDL requirements including numeric targets and WLAs.
- Optional Monitoring is not required by the TMDL; however if sufficient funds are available, it may be implemented by the Responsible Party to better understand water quality conditions in the receiving water and support the goals of compliance monitoring. Optional Monitoring may be added to (and removed from) the compliance monitoring effort as deemed appropriate by the Responsible Party.
- Follow-up Monitoring will be implemented to characterize the source, magnitude, and duration of exceedances of bacteria water quality objectives (WQOs) in the receiving water based on the results of compliance monitoring.
- Special Studies will be implemented based on the available data and resources to address management questions regarding adopted TMDLs, and 303(d) Listed pollutants. Special Studies may require the development of separate agreements and funding opportunities between the Responsible Parties, when applicable.

The purpose of this QAPP is to outline the methodology and data requirements to meet the goals of the Scripps CLRP Monitoring Program and address specific monitoring requirements of the Compliance Monitoring and Optional Monitoring components scheduled to be implemented during Fiscal Year 2013.

## **4.2 Decisions or Outcomes**

The data generated by this project will be used to track water quality at the compliance monitoring locations during wet and dry weather conditions. Compliance monitoring is designed to meet the receiving water monitoring requirements of the BPA. Compliance monitoring will evaluate data collected including the approved Bacteria TMDL pollutants and other optional field parameters.

The general approach and specific design elements of the project are driven by the following monitoring questions.

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

## **4.3 Water Quality or Regulatory Criteria**

The TMDL defines the numeric targets and WLAs for the Responsible Party. Data collected as part of the Scripps CLRP Monitoring Program will be utilized to evaluate progress and attainment of TMDL targets and WLAs. The receiving water limitation, WLAs, and LAs for the Scripps Watershed are provided in Tables 1-5 and 1-6 of the Monitoring Plan per the Bacteria TMDL.



## **5.0 PROJECT/TASK DESCRIPTION**

---

### **5.1 Work Statement and Products**

This QAPP reflects the compliance monitoring, optional monitoring, and reporting components of the Scripps CLRP Monitoring Program.

#### **5.1.1 Compliance Monitoring**

The TMDL identifies thirteen points along the pacific shoreline within the Scripps HA as the targeted segment for indicator bacteria. Compliance monitoring is designed to meet the receiving water monitoring requirements of the TMDL. Compliance monitoring, including wet and dry weather sampling, will be conducted each year at the compliance monitoring locations. The wet and dry weather monitoring components are described below:

- Wet weather monitoring will be conducted to characterize the bacteria concentrations and loading during representative storm events. Wet weather monitoring will be conducted for three storm events each wet season (October 1 – April 30).
- Dry weather monitoring will be conducted throughout the year to characterize non-storm flow conditions. Dry weather monitoring will occur at the compliance monitoring locations monthly during the wet season and weekly during the dry season (May 1 – September 30).

#### **5.1.2 Optional Monitoring**

All optional monitoring is considered above and beyond the requirements of the BPAs and the data needed to answer the compliance monitoring questions. Optional monitoring is presented in the QAPP so that the procedures are available should the Responsible Party decide to conduct the monitoring. If optional monitoring is conducted, it would be implemented concurrently with the compliance monitoring to supplement that data set.

#### **5.1.3 Reporting**

The Lead Agency will compile the project data and provide an annual CLRP Monitoring Summary to SDRWQCB.

### **5.2 Monitored Constituents and Measurement Techniques**

Samples will be analyzed for fecal indicator bacteria (FIB). Analysis of FIB, including *Enterococcus*, fecal coliform, and total coliform, are required for compliance with the TMDL. Table 5-1 provides a master list of analytical constituents as well as SWAMP requirements. The Lead Agency will select an Environmental Laboratory Accreditation Program (ELAP)-certified laboratory to conduct FIB analysis. Common methods for FIB analysis include multi-tube fermentation, membrane filtration, and Enterolert® by IDEXX Laboratories (for *Enterococcus* only).

The laboratory shall conduct the appropriate dilutions to generate results and avoid greater than values. The following ranges are applicable to all methods and are obtained by performing dilutions, when appropriate.

**Table 5-1.  
 Master List of Analytical Constituents**

| Constituents              | Method                                  | Target Reporting Limit <sup>(a)</sup> | Sampling Type |
|---------------------------|---|---------------------------------------|---------------|
| <i>Indicator Bacteria</i> |   |                                       |               |
| <i>Enterococcus</i>       | SM 9230B*/<br>Enterolert <sup>(b)</sup> | 1 colonies/100 mL                     | D,W           |
| Fecal coliform            | SM 9222D                                | 2 MPN/100 mL                          | D,W           |
| Total coliform            | SM 9222B                                | 2 MPN/100 mL                          | D,W           |

Notes:

<sup>(a)</sup> The target reporting limits are consistent with methodology of the Assembly Bill 411 program to facilitate overlap with that program. However, reporting limits may be lower depending on the lab used to conduct the analysis.

TBD To be determined by the Responsible Party.

D designates dry weather sampling.

W designates wet weather sampling.

### 5.3 Project Schedule

Compliance monitoring is scheduled to begin June 27, 2013, 60 days after adoption of the MS4 Permit. Table 5-2 provides the schedule for the annual activities for the Scripps CLRP Monitoring Program to be implemented in Fiscal Year 2014 including work plans, monitoring, and reporting. Program deliverables are described in Section 3 of the Monitoring Plan.

**Table 5-2.  
 Project Schedule for Fiscal Year 2014**

| Activity              | Date (MM/DD/YY)                |                                | Deliverable   |
|-----------------------|--------------------------------|--------------------------------|---|
|                       | Anticipated Date of Initiation | Anticipated Date of Completion |   |
| QAPP/Monitoring Plan  | Submitted herein               | Submitted herein               | QAPP/Monitoring Plan  |
| Compliance Monitoring | 6/27/13                        | 6/30/14                        | NA  |
| <b>Reporting</b>      | <b>NA</b>                      | <b>6/1/14</b>                  | <b>Annual CLRP Monitoring Summary to be included in the Annual Report</b> |

Notes:

NA Not applicable

### 5.4 Geographical Setting

The Scripps Watershed (Figure 5-1) is located in La Jolla, California, within the City of San Diego jurisdictional boundary. The watershed is 8,445 acres and is composed of primarily residential and institutional land uses (e.g., the University of California, San Diego campus). Sub-drainages within the watershed's boundaries drain west into two Areas of Special Biological Significance (ASBS): the San Diego–Scripps State Marine Conservation Area (ASBS 31) and the La Jolla State Marine Conservation Area (ASBS 29).

The majority of the runoff within the watershed is conveyed through a network of storm drains before it is discharged at several locations along the beach. The central and largest portion of the watershed drains to a single storm drain outfall that discharges at Avenida de la Playa. Since 1983, the California Ocean Plan has prohibited the discharge of waste into ASBS along the California Coast, unless the State Water Resources Control Board (State Board) grants an exception to dischargers. As part of the exception process, the State Board has produced a guidance document for monitoring discharges to ASBS as part of the Program Final Environmental Impact Report (PFEIR). Attachment B of Appendix 1 of the PFEIR is the Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges (Special Protections Document) (SWQCB, 2012). The Special Protections Document is currently in draft form, although it is likely to be finalized in the near future. The Special Protections Document is intended to define the terms and conditions that limit storm water discharge to the 34 ASBS along the California Coast. The City of San Diego is listed as the responsible entity for discharges into ASBS 29, the La Jolla State Marine Conservation Area, and has applied to the State Board for an exception to the ASBS discharge requirements.

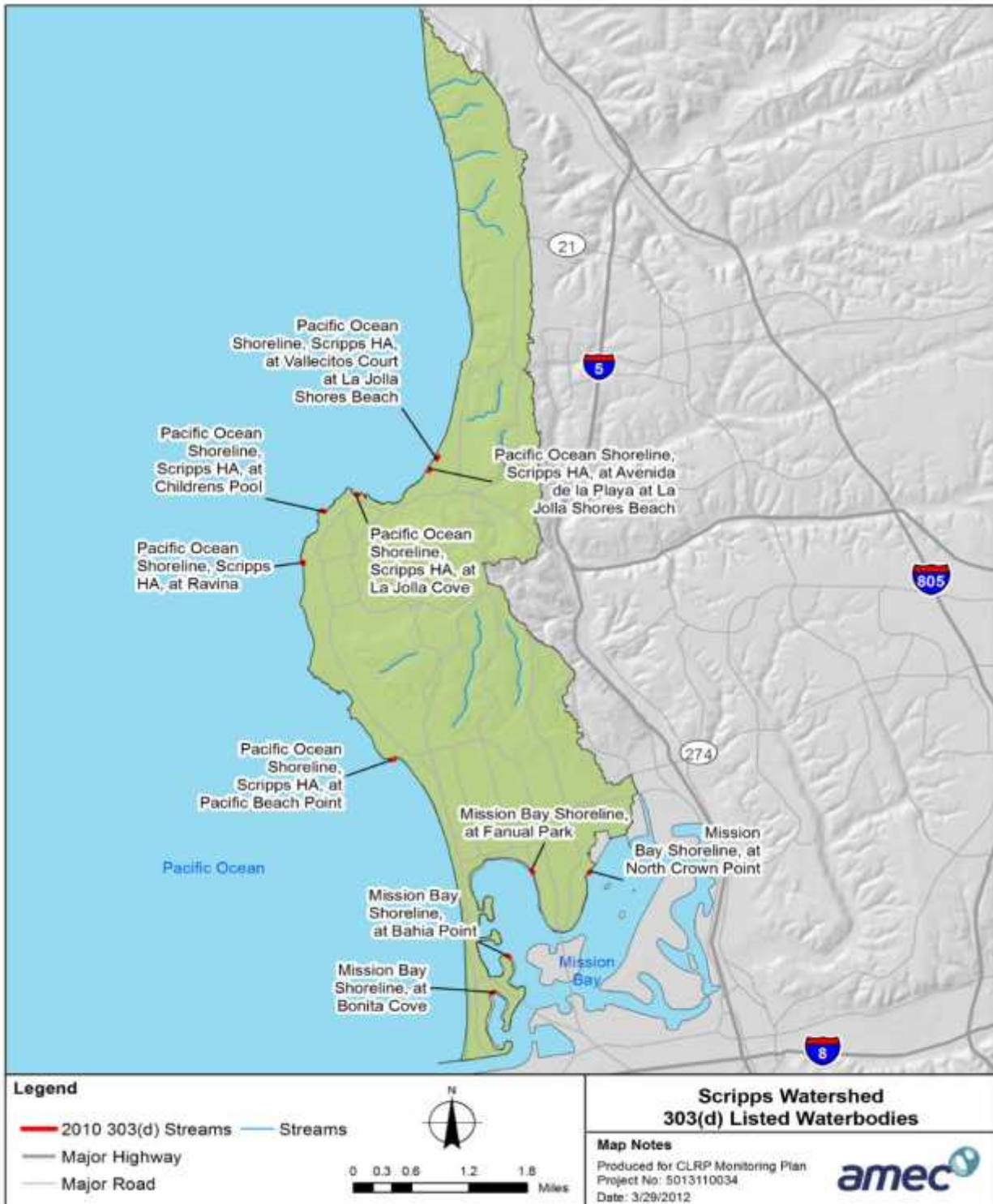


Figure 5-1. Scripps Watershed

## 5.5 Constraints

This program has the following procedural and logistical constraints:

- Laboratories will employ multiple dilutions in an effort to meet lower detection limits. However, method detection limits (MDLs) and reporting limits (RLs) may increase as a result of those dilutions.
- Wet weather monitoring will occur within 24 hours of the end of the majority of precipitation. AMEC will use precipitation data as recorded for Lindbergh Field station by the National Oceanographic and Atmospheric Administration (NOAA) National Weather Service (NWS) to initiate sample collection.
- During wet weather, AMEC will use an AMEC runner or laboratory courier in order to meet holding time requirements.
- Field teams will not be mobilized during or near certain holidays if the mobilization or laboratory analyses should continue through that holiday. This includes the following dates:

### 2013

- Independence Day: July 4, 2013
- Labor Day: September 2, 2013
- Thanksgiving: November 28 and 29, 2013
- Christmas: December 24 and 25, 2013
- New Year's Eve: December 31, 2013

### 2014

- New Year's Day: January 1, 2014
- Memorial Day: May 26, 2014

This page intentionally left blank

## 6.0 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

Data quality will be assessed using data quality objectives (DQOs) such as accuracy, precision, and completeness. The applicable DQOs are provided for each analysis type in Table 6-1. Measurement quality objectives for laboratory analyses are provided in Table 6-2. Details on DQOs and how they are measured are provided below.

**Table 6-1.  
 Data Quality Objectives**

| Measurement or Analysis Type     | Applicable Data Quality Indicators |
|----------------------------------|------------------------------------|
| Laboratory – Bacteria (Required) | Accuracy, Precision, Completeness  |

Accuracy is a measurement of the closeness of a test value to the true or reference value. Accuracy can be measured in the laboratory using positive and negative controls.

Precision is a measurement of the repeatability of test measurements. Precision can be measured in the laboratory using laboratory replicates. Precision can be measured in the field using field duplicates. Relative percent differences (RPDs) will be calculated to determine the precision between duplicate samples. This calculation is shown below:

$$RPD = \frac{abs[x_1 - x_2]}{0.5 \times (x_1 + x_2)} \times 100$$

Where:  $x_1$  is the primary sample concentration;  $x_2$  is the duplicate sample concentration. However, it has been suggested in USEPA studies that a RPD of less than or equal to 50% for field duplicates would be more appropriate for bacteriological methods given the spatial variability of bacteria concentrations in surface waters.

Completeness is a measurement of the percentage of project-specific data that are valid. Percent completeness will be calculated by dividing the number of useable sample results by total number of sample results planned. This calculation is shown below:

$$Completeness = \frac{\text{ActualNumberofSamplesCollected(ValidResults)}}{\text{ProjectRequiredTotalSamplesPlanned(NumberofSampleResultsPlanned)}} \times 100$$

Representativeness describes the degree to which the results of analyses represent the samples collected and the samples represent the environment from which they were taken. Sites were selected to best represent the TMDL listed segment. Samples will be collected to be representative of the water body by following the sample collection procedures described in Section 10.

**Table 6-2.  
 Measurement Quality Objectives for Laboratory Data**

| Group    | Parameter           | Accuracy  | Precision <sup>(a)</sup> | Target Reporting Limit <sup>(b)</sup> | Completeness |
|----------|---------------------|---|--------------------------|---------------------------------------|--------------|
| Bacteria | <i>Enterococcus</i> | Positive control and reference material = 80-120% recovery. Negative control = no growth on filter. | Lab Replicate RPD<25%    | 10 colonies/ 100 mL                   | 90%          |
| Bacteria | Fecal coliform      | Positive control and reference material = 80-120% recovery. Negative control = no growth on filter. | Lab Replicate RPD<25%    | 20 MPN/ 100 mL                        | 90%          |
| Bacteria | Total coliform      | Positive control and reference material = 80-120% recovery. Negative control = no growth on filter. | Lab Replicate RPD<25%    | 20 MPN/ 100 mL                        | 90%          |

Notes:

<sup>(a)</sup> Not applicable, if native concentration of either sample is less than Reporting Limit (RL).

<sup>(b)</sup> The target reporting limits are consistent with methodology of the Assembly Bill 411 program to facilitate overlap with that program. However, reporting limits may be lower depending on the lab used to conduct the analysis.

RPD Relative Percent Difference

mL milliliters



## 7.0 SPECIAL TRAINING NEEDS/CERTIFICATION

### 7.1 Specialized Training or Certifications

All project field staff members are required to receive training on sampling standard operation procedures (SOP) and safety procedures prior to engaging in any field activities. Field staff will annually review the following:

- Sampling in accordance with the QAPP
- Safety procedures, site hazards, and safety awareness in accordance with the Sampling Agency's Health and Safety Plan.

The bacteria analysis will be performed by a California DHS ELAP-certified analytical laboratory.

### 7.2 Training and Certification Documentation

The Sampling Agency will maintain records of training as detailed in Table 7-1. Documentation includes the date of training, the topic, the instructor name, and list of trainees.

**Table 7-1.  
 Specialized Personnel Training or Certification**

| Specialized Training Course Title or Description | Training Provider | Personnel Receiving Training/Organizational Affiliation | Location of Records & Certification <sup>(a)</sup>                      |
|--|-------------------|---|---|
| Sampling SOPs and Health and Safety Training     | Sampling Agency   | Sampling Agency Field Staff                             | City of San Diego for dry weather and AMEC<br>San Diego for wet weather |

Notes:

<sup>(a)</sup> If training records and/or certification are on file elsewhere, then document their location.

### 7.3 Training Personnel

Field staff will be trained on proper procedures for sampling, post-sampling processing, and sample handling in accordance with the QAPP and Monitoring Plan. The Sampling Agency's Project Manager are responsible for training employees prior to the start of sampling, and to conduct any training sessions as needed throughout the course of the program.

Trained laboratory analysts will perform sample analysis for this program

This page intentionally left blank

## 8.0 DOCUMENTS AND RECORDS

Documentation and record keeping are essential to project organization, consistency, and data verification. There are many types of documents and records required by this project. Table 8-1 identifies the document and record types, where they will be retained and archived, and what will be their respective dispositions. Final and revised versions of the QAPP will be distributed to the Responsible Party (Section 3.0), analytical laboratory, and the sampling agency.

**Table 8-1.  
 Documents and Record Retention, Archival, and Disposition Information**

| Documentation Category  | Identify Type Needed  | Retention                                   | Archival  | Disposition     |
|-------------------------|---|---|---|-----------------|
| Project Plans           | QAPP  | Project Manager /SDRWQCB                    | Document/Portable Document Format (*.pdf)               | Minimum 5 years |
|                         | Monitoring Plan   | Project Manager /SDRWQCB                    | Document/*.pdf  | Minimum 5 years |
| Sampling Records        | Water Sampling Field Data Sheets/ Electronic Data Deliverable (EDD) | Sampling Agency                             | Field Notebook/ *.pdf/ Excel Spreadsheet                | Minimum 5 years |
|                         | Training Records  | Sampling Agency                             | Field Notebook/ *.pdf                                   | Minimum 5 years |
|                         | Photographs   | Sampling Agency                             | Field Notebook/ Joint Photographic Experts Group (JPEG) | Minimum 5 years |
| Analytical Records      | Chain-of-Custody  | Analytical Laboratory                       | Field Notebook/ *.pdf                                   | Minimum 5 years |
|                         | Laboratory Reports  | Analytical Laboratory                       | *.pdf /Microsoft Excel spreadsheet                      | Minimum 5 years |
|                         | EDD   | Analytical Laboratory                       | Excel spreadsheet or Database                           | Minimum 5 years |
| Data Records            | Corrective Action Forms   | Sampling Agency/ Analytical Laboratory      | *.pdf   | Minimum 5 years |
| CLRP Monitoring Summary | Final Report  | Sampling Agency, Responsible Party, SDRWQCB | Document/*.pdf  | Minimum 5 years |

This page intentionally left blank

## GROUP B: DATA GENERATION AND ACQUISITION

### 9.0 SAMPLING DESIGN

This section provides an overview of the sampling design. The sampling design is provided in detail within the Monitoring Plan.

#### 9.1 Project Description and General Design

The scope of compliance monitoring accounts for the frequency and type of sampling activities of the existing Health and Safety Code Section 115880 monitoring program required by Assembly Bill 411 (AB411) in order to facilitate overlap of monitoring efforts and resources. Table 9-1 provides the general scope of Scripps Compliance Monitoring Program.

**Table 9-1.  
 Scope of Compliance Monitoring**

| Number of Monitoring Locations | Wet Weather Monitoring          |                      | Dry Weather Monitoring<br>06/24/13 to 9/30/13 and<br>04/1/14-10/31/13 |  | Dry Weather Monitoring<br>10/01/13 to 03/31/14 |                      |
|--------------------------------|---------------------------------|----------------------|---|--|--|----------------------|
|                                | Grab Samples Per Event Per Site | Monitoring Frequency | Grab Samples Per Event Per Site                                       | Monitoring Frequency                         | Grab Samples Per Event Per Site                | Monitoring Frequency |
| 13                             | 1                               | 3 storms             | 1   | Weekly<br>(minimum<br>5 events<br>per month) | 1  | monthly              |

#### 9.2 Monitoring Locations

The Bacteria TMDL requires receiving water compliance monitoring to occur at the same thirteen sites monitored under the AB411 Monitoring Program or under the City of San Diego's Coastal Storm Drain Monitoring Program. Table 9-2 provides monitoring location information and Figure 9-1 provides photographic images of the thirteen Scripps Watershed monitoring locations. A watershed overview map of the monitoring locations is provided in Figure 9-2

**Table 9-2.  
 Sampling Sites**

| <b>Site ID</b> | <b>Site Name</b>                         | <b>Site Type</b>        | <b>Latitude</b> | <b>Longitude</b> |
|----------------|--|-------------------------|-----------------|------------------|
| EH-320         | La Jolla Shores Beach at Vallecitos      | Pacific Ocean Shoreline | 32.8556         | -117.2581        |
| FM-080         | La Jolla Shores Beach at Ave de la Playa | Pacific Ocean Shoreline | 32.8546         | -117.2589        |
| EH-310         | Children's Pool at Casa Beach            | Pacific Ocean Shoreline | 32.8475         | -117.2782        |
| EH-300         | Whispering Sands Beach at Ravina Street  | Pacific Ocean Shoreline | 32.8394         | -117.2817        |

Notes:

(a) City ID number reflected since County ID number is unavailable. All other site IDs are County ID numbers.

|   |  |
|---|--|
| <p data-bbox="240 310 743 340">EH-320 – La Jolla Shores at Vallecitos</p>  | <p data-bbox="850 273 1409 340">FM-080 – La Jolla Shores at Avenida de la Playa</p>  |
| <p data-bbox="328 718 662 747">EH-310 – Children’s Pool</p>               | <p data-bbox="834 718 1425 747">EH-300 – Whispering Sands at Ravina Street</p>      |

**Figure 9-1. Scripps Watershed Monitoring Locations (continued)**



Figure 9-2. Monitoring Locations



### **9.3 Wet Weather Sampling**

Wet weather monitoring will target three storms with a trigger rainfall of 0.2 inches or greater between October 1 and April 30. The NOAA NWS website will be used to track the forecast and initiate mobilization based on recorded rainfall amounts at Lindbergh Field. One grab sample will be collected per storm at each site within 24 hours of the end of precipitation. The grab sample will be collected at the compliance monitoring locations listed in Table 10-1 and analyzed for FIB analysis. Per the MS4 Permit Appendix E.6, a minimum of the first storm of the season is required to be monitored. The three storms will be targeted to occur during the early, mid, and late-season of the wet weather season to characterize seasonal changes, or during the following months to the maximum extent practicable:

- Storm 1 (Early season): October – November
- Storm 2 (Mid-season): December – January
- Storm 3 (Late-season): February – April

### **9.4 Dry Weather Sampling**

Dry weather monitoring will occur at the compliance monitoring locations listed in Table 10-1 once per month during the wet season and weekly during the dry season. Dry weather sampling will occur on a dry weather day, which is defined as having an antecedent dry period of 72 hours with less than 0.1 inches of rainfall. Sampling may be conducted on any day of the month as long as the criterion for a dry weather day is met. One grab sample will be collected and analyzed for FIB during each dry weather event.

It should be noted when paired outfalls at the compliance locations are flowing and they may be sampled to characterize dry weather flows as they occur. During dry weather monitoring, if a paired outfall is flowing and the flow reaches the receiving waters then collect a sample to be analyzed for the same suite of FIB. Spend some time to track and identify the potential source of the flow. Do not compromise the holding time of the other samples. If necessary, return the following day or week. Make necessary arrangements with the laboratory if you want to submit additional samples.

### **9.5 Monitoring Logistics**

Wet weather and dry weather sampling will consist of one staff team with two field scientists collecting one grab sample for each sampling event. Field staff will deliver samples to the laboratory courier at a designated meeting location or directly to the laboratory within the 6-hour holding time. Sample runners independent of the sampling team may be used instead of the sampling field staff during wet weather monitoring to deliver samples to the courier or laboratory. If samples are delivered to couriers during dry or wet weather events, meeting locations will be utilized to exchange samples between the couriers and sampling field staff (or runners). After receiving samples, the couriers will deliver samples to the laboratory to meet bacteria holding times.

## **9.6 Laboratory Distribution**

Laboratories will be ready to receive, preserve, and analyze bacteria samples as necessary according to this QAPP as they are delivered during wet weather and dry weather sampling. Sample delivery times for wet weather events may include weekends and 24-hour delivery (holidays excluded). However, sample collection may be timed by the Sampling Agency so that sample collection and delivery will occur during daylight hours. Timing of sample collection and delivery during the daytime is possible since sampling may occur within any time during the 24 hours of the end of precipitation. Dry weather samples will be delivered to the laboratory during business hours Monday through Friday (holidays excluded). Additional details regarding the sampling handling and distribution is provided in Section 11.

This page intentionally left blank

## 10.0 SAMPLING METHODS

Table 10-1 presents the sampling locations and methods for the monitoring site. Samples will be collected and analyzed for the bacterial analysis listed in Table 5-1. The collection of samples will adhere to sampling protocols outlined in “Standard Operating Procedures (SOP) for the Collection of Bacteria Samples from Storm Drains and Receiving Waters (Creeks, Lagoons, Bays, and Ocean)” used by the San Diego Copermittees for the Coastal Storm Drain and Lagoon Monitoring (County of San Diego, 2007).

**Table 10-1.  
 Sampling Locations and Sampling Methods**

| Sampling Type | Number of Sites | Station Code | Matrix     | Depth (inches) | Constituent Category | Maximum # Samples per Site <sup>(a)</sup> | Sample Type | Sampling SOP # |
|---------------|-----------------|--------------|------------|----------------|----------------------|---|-------------|----------------|
| Wet Weather   | 4               | EH-300       | Salt-water | 4 to 8         | Bacteria             | 5 <sup>(b)</sup>                          | Grab        | (d)            |
|               |                 | EH-310       |            |                |                      |   |             |                |
|               |                 | EH-320       |            |                |                      |   |             |                |
|               |                 | FM-080       |            |                |                      |   |             |                |
| Dry Weather   | 4               | EH-300       | Salt-water | 4 to 8         | Bacteria             | 14 <sup>(c)</sup>                         | Grab        | (d)            |
|               |                 | EH-310       |            |                |                      |   |             |                |
|               |                 | EH-320       |            |                |                      |   |             |                |
|               |                 | FM-080       |            |                |                      |   |             |                |

Notes:

<sup>(a)</sup> Maximum number of samples includes field duplicates and field blanks.

<sup>(b)</sup> One sample per storm (3 storms per year), 1 field blank, 1 field duplicate.

<sup>(c)</sup> One sample per month during the wet season (6 months per year) and weekly sampling during dry season (6 months), 1 field blank, 1 field duplicate.

<sup>(d)</sup> Standard Operating Procedures (SOP) for the Collection of Bacteria Samples for Storm Drains and Receiving Waters (Creeks, Lagoons, Bays, and Oceans)” (County of San Diego, 2007).

### 10.1 Field Observations and Documentation

Field observations will be recorded during each monitoring event to record site conditions and actions taken during sampling. Field data sheets will be used to record general observations and potential sources of bacteria located within the vicinity of the site. General observations include weather, debris/trash observed, color and clarity of the water, odor, and any other conditions of interest. Potential sources of bacteria will be identified, including human-related sources, activities, and natural sources.

The following general information should be recorded on a field data sheet during each site visit:

- Site identification (ID)
- Monitoring project name
- Water quality observations
- Grab sample IDs

- Field team personnel
- Weather conditions
- Runoff characteristics
- Grab sample date/time
- Swell direction
- Miscellaneous comments

## 10.2 Wet and Dry Weather Grab Sampling

Grab samples will be representative of the environmental conditions of the site and will adhere to the sampling protocols outlined in “Standard Operating Procedures (SOP) for the Collection of Bacteria Samples from Storm Drains and Receiving Waters (Creeks, Lagoons, Bays, and Ocean)” (County of San Diego, 2007). Grab samples will be collected at the surf line at a location that is approximately 1 foot in water height, or at a level between the ankle and knee of the sampler. Prior to sampling, the field staff should observe the direction of the ocean swell. The direction of the ocean swell should be documented on the field data sheet.

The field staff will wade into the surf carefully in a manner that does not disturb the sediment until he or she reaches approximately 1 foot in water column height, or a level that reaches the middle of sampler’s shinbone. During an incoming wave, not outgoing wave, the sampling staff will extend the sampling pole as far as practicable to avoid collection of suspended sediment caused by the sampler. The sample container will be submersed into the water column, facing downward, to mid-depth (approximately 4 to 8 inches) and turned slightly upwards while moving the bottle horizontally through the water until full to eliminate cross contamination from the sampling equipment. Sampling will occur at mid-depth of the water column, just below the water surface, so as to avoid surface scum and sediment from the bottom. If surface residue, sediment, or debris enters the sample bottle, the sample will be discarded and re-sampled with a new, sterile bottle.

### 10.2.1 Sample Handling

The following sample handling protocols will be followed when collecting samples to minimize the possibility of contamination. Further information regarding sample handling and custody is provided in Table 11-1.

- Field personnel will be thoroughly trained in the proper use of sample collection gear.
- Unused (new), clean, powder-free nitrile gloves will be worn while collecting samples and will be replaced with new, clean gloves between samples and sites.
- Previously unused (new) sample bottles of the recommended type will be employed. Sample bottles and bottle caps will be protected from contact with solvents, dust, or other contaminants during storage and bottle handling.
- Field personnel will make an effort, within reason, to prevent large gravel and uncharacteristic floating debris from entering the sample containers. Personnel will also make an effort to not disturb sediments that may be at the bottom of the channel.
- The inside of the sampling container and lids will not be touched during preparation and sampling activities.

- New bags of previously unopened ice will be used to cool samples following sample collection.
- FIB samples will be collected directly into a sterilized polyethylene or polypropylene container.

Once sample containers are filled, they will be promptly placed on ice, in a clean cooler (maximum temperature of 6 degrees Celsius), in the dark and transported to the laboratory for processing to meet holding times.

This page intentionally left blank

## 11.0 SAMPLE HANDLING AND CUSTODY

All bottles will be pre-labeled with the following information:

- Project name
- Date
- Time
- Sampling location name and number
- Sample matrix
- Collector's initials
- Sample ID number
- Analysis name.

Grab samples will be marked with a unique sample ID that will be used to track the sample throughout its analyses. These sample IDs are also entered directly on to field and laboratory data sheets. All field observations and processed sample information will be recorded and transcribed to Microsoft Excel spreadsheets. Hard copies of these field and laboratory data sheets will be maintained by the responsible agency.

Once sample containers are filled, they will be placed on ice, in a cooler, in the dark and transported to the laboratory for processing. The Chain-of-Custody (COC) will accompany the collected water samples. Sampled water will be kept below 6 degrees Celsius and transferred to an analytical laboratory within holding times. COC forms for the samples will be completed and transported with the samples to the analytical laboratory. Transportation will be coordinated to ensure that all samples are handled and analyzed within the proper holding time. Sample holding times are in table 11-1. Custody of all samples will be transferred from the field personnel to laboratories.

**Table 11-1.  
 Sample Handling and Custody**

| Analysis            | Container   | Minimum Sample Volume <sup>(a)</sup> | Initial Preservation             | Holding Time |
|---------------------|---|--------------------------------------|----------------------------------|--------------|
| <i>Enterococcus</i> | Factory-sealed, pre-sterilized, 150 mL sterile plastic (high density polyethylene or polypropylene) container | 150 mL                               | < 6°C in the dark <sup>(b)</sup> | 6 hours      |
| Fecal coliform      |   |                                      |                                  |              |
| Total coliform      |   |                                      |                                  |              |

Notes:

- <sup>(a)</sup> Minimum sample volume is representative of total volume needed to analyze all three FIB.
- <sup>(b)</sup> Sodium thiosulfate may be used if chlorine is suspected in the water. Sodium thiosulfate is used for chlorine elimination.



This page intentionally left blank

## 12.0 ANALYTICAL METHODS

The laboratory analyses and the analytical methods are provided in Table 12-1. The laboratory will be certified by the California DHS ELAP.

**Table 12-1.  
 Laboratory Analytical Methods**

| Analyte        | Laboratory     | Project Action Limits-<br>MPN/100mL <sup>(a)(b)</sup> |             | Project Reporting Limit (per 100mL) <sup>(c)</sup> | Analytical Method                   |                              |
|----------------|----------------|---|-------------|--|-------------------------------------|------------------------------|
|                |                | Dry Weather   | Wet Weather |  | Analytical Method/SOP               | Modified for Method (yes/no) |
| Enterococcus   | EM&TS and Weck | 35(0%)  | 104(22%)    | 10 colonies  | SM 9230B*/Enterolert <sup>(b)</sup> | No                           |
| Fecal Coliform | EM&TS and Weck | 200(0%)   | 400(22%)    | 20 MPN   | SM 9222D                            | No                           |
| Total Coliform | EM&TS and Weck | 1,000(0%)   | 10,000(22%) | 20 MPN   | SM 9222B                            | No                           |

Notes:

<sup>(a)</sup> Indicator Bacteria TMDL, Receiving Water Limitation for Scripps Watershed

<sup>(b)</sup> The number preceding the parenthesis is the water quality objective. The number in parenthesis is the allowable exceedance frequency.

<sup>(c)</sup> The target reporting limits are consistent with methodology of the Assembly Bill 411 program to facilitate overlap with that program. However, reporting limits may be lower depending on the lab used to conduct the analysis.

This page intentionally left blank

## **13.0 QUALITY CONTROL**

---

This section addresses QA/QC activities associated with both field sampling and laboratory analyses. The field QC samples are used to evaluate potential contamination and sampling error introduced prior to submittal of samples to the analytical laboratory. Laboratory QA/QC activities provide information needed to assess laboratory contamination, analytical precision, and analytical accuracy. If any QA/QC standards are not met, the appropriate corrective actions will be taken in accordance with Section 22 of this document and the laboratories' QA Manuals. The Project Manager is responsible for making decisions on corrective actions pertaining to laboratory analysis. If issues are identified by Sampling Agency's staff, the Laboratory Project Manager or Sampling Agency's Project Manager will be notified immediately and documentation of the issue and the corrective action will be made.

### **13.1 Quality Control Types**

A set of QC samples will be submitted to the laboratory based on the frequencies noted in Table 10-1. The analytical laboratory may also require more QC samples if one type of analysis is to be run in more than one batch. The main types of QC samples that will be utilized for this study include field blanks, field duplicates, laboratory replicates, and positive and negative controls.

The field blanks, duplicate samples, and laboratory replicates may be collected from different sites during a particular sampling event. The number and frequency of field QC samples to be collected are presented in Table 13-1. Field QC samples will be submitted blind to the analytical laboratory. For laboratory replicates, additional sample volumes will be collected and it will be clearly identified on the COC.

### **13.2 Field Quality Control Samples**

#### **Field Blanks**

Field blanks are samples of reagent-grade, analyte-free, deionized water collected in the field to verify the field conditions and air deposition are non-contaminating during field sampling activities. Field blanks will be analyzed for the same suite of analyses as regular samples. The project frequency for field blanks is 5 percent of the total sample count. Concentrations of field blanks should be below the Reporting Limit (RL) for each analyte.

#### **Field Duplicates**

Duplicate samples consist of two distinct samples (an original and a duplicate) of the same matrix collected at the same time and location using the same sampling technique. Field duplicate samples will be collected by filling two grab sample containers at the same time, or in rapid sequence. The purpose of field duplicates is to measure the consistency of field sampling. The project frequency for field duplicates is 5 percent of samples. The result for each field duplicate will be compared to the sample result to estimate a RPD between the two sample results. The RPD between the two results will be calculated using the RPD equation provided in Section 6.0.

Table 13-1 presents summary of field quality control criteria.

**Table 13-1.  
 Field QC**

| Field QC        | Frequency                 | Acceptance Limits                                |
|-----------------|---------------------------|--|
| Field Blank     | 5% of all project samples | Concentrations should be below the RL.           |
| Field Duplicate | 5% of all project samples | RPD range of 0-25% <sup>(a)</sup> <sup>(b)</sup> |

Notes:

<sup>(a)</sup> For coliforms: within 95% confidence interval as defined by IDEXX Laboratories.

<sup>(b)</sup> NA if native concentration of either sample is less than the RL.

### 13.3 Laboratory Quality Control

Laboratory QC samples include laboratory duplicates, positive and negative controls as described below. Laboratory QC sample results will be provided in a laboratory report and SWAMP compatible electronic data deliverable (EDD) with a batch ID number to correlate with the corresponding environmental sample data set. Table 13-2 describes the frequency and types of quality control samples for each constituent category.

- Laboratory Replicate** – For a laboratory replicate, a sample is prepared and analyzed twice to assess the repeatability (precision). 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. A minimum of one laboratory replicate will be analyzed per batch.
- Positive and Negative Controls** – A negative control is created as a separate plate count after the buffered rinse water is filtered and incubated the same way as a sample. There should be no bacteria growth on the filter after incubation. It is used to detect laboratory bacterial contamination of the sample. A positive control is created as a separate plate count after a water sample known to contain bacteria (such as wastewater treatment plant influent) is filtered and incubated the same way as a sample. There should be bacteria growth on the filter after incubation. It is used to detect procedural errors or the presence of contaminants in the laboratory analysis that might inhibit bacteria growth (USEPA, 2012).

**Table 13-2.  
 Laboratory Quality Control**

| Constituent Category           | Method Blanks  |  |
|--------------------------------|--|--|
|                                | Frequency  | Acceptance Limits  |
| Laboratory Replicate           | One per 20 samples or analytical batch, whichever is more frequent | RPD < 25% <sup>(a)</sup>   |
| Positive and Negative Controls | Per batch of bottles or reagents                                   | Positive Control = 80-120% Recovery;<br>Negative Control = No growth on filter |

Note:

<sup>(a)</sup> Not applicable if native concentration of either sample is less than reporting limits.

## 14.0 INSPECTION/ACCEPTANCE OF CONSUMABLES AND SUPPLIES

---

All glassware, sample bottles, and collection equipment will be inspected prior to use. All ordered supplies will be examined for damage as they are received. Bottles and caps will be inspected for damage prior to sampling, and only sound bottles with intact threads will be used. The container caps will be tested for tightness prior to transport of samples.

The Sampling Agency will ensure sufficient field supplies are on hand prior to the start of sampling for each period. Field supplies will be stored at the Sampling Agency's offices. Laboratory supplies will be stored at the laboratories conducting the work. Table 14-1 presents the acceptance criteria for consumables and supplies that will be used for this study.

**Table 14-1.**  
**Inspection/Acceptance Testing Requirements for Consumables and Supplies**

| <b>Project-Related Supplies/Consumables</b> | <b>Inspection/Testing Specifications</b> | <b>Acceptance Criteria</b> | <b>Frequency</b> | <b>Responsible Individual</b> |
|---|--|----------------------------|------------------|-------------------------------|
| Pre-cleaned sample containers               | Open container                           | Lids screwed on bottles    | 100%             | Sampling Agency               |
| Laboratory glassware                        | Dirty                                    | Clean                      | 100%             | Laboratories                  |

This page intentionally left blank

## **15.0 INSTRUMENT CALIBRATION**

---

There are no field measurements included in the Scripps Compliance Monitoring Program or under optional monitoring at this time. This section is included as a place holder for future optional monitoring.



This page intentionally left blank

## **16.0 NON-DIRECT MEASUREMENTS**

---

There are no non-direct measurements that will be fundamental to the success of this study.

This page intentionally left blank

## **17.0 DATA MANAGEMENT**

---

Data will be submitted in a standardized SWAMP-compatible format. The Sampling Agency will compile the monitoring data and the Laboratory will compile analytical data. A final data will be provided to the Responsible Party.

### **17.1 Field Observations**

The Sampling Agency will review all Field Data Sheets for completeness, maintain the original hardcopies, and scan electronic copies to portable document format (\*.pdf) for storage in the project file. Field data sheets will be transcribed into an electronic spreadsheet. Photographs of the monitoring sites taken by field personnel will be uploaded into the project file within three business days of field visits. Field team members will name the photographs using the site ID and the date the photo was taken. Copies of field data sheets and photographs for each event will be submitted to the Project Manager with the quarterly sampling summary.

### **17.2 Analytical Data**

Laboratories will provide data in \*.pdf, hardcopy, and SWAMP-compatible EDD. A SWAMP-compatible EDD will ensure that the data files can be uploaded to the SWAMP regional database. The Project Manager will review all lab reports and EDDs for accuracy, completeness, and SWAMP compatibility. Analytical results will be submitted to the Project Manager within three weeks of submittal of samples.

Within two weeks of receipt, the Project Manager will screen preliminary data deliverables for the following major items:

- A 100-percent check between electronic data provided by the laboratory and the hard copy reports.
- Conformity check between the COC Forms and laboratory reports.
- A check for laboratory data report completeness.
- A check for typographical errors on the laboratory reports.
- A check for suspect values, data qualifiers, and review of laboratory QC data.

This page intentionally left blank

## GROUP C: ASSESSMENT AND OVERSIGHT

### 18.0 ASSESSMENT AND RESPONSE ACTIONS

---

The Project Manager will be responsible for the day-to-day oversight of monitoring activities, laboratory analyses, and/or data reporting. Any failures (e.g., instrument failures) that occur during data collection and/or laboratory analyses will be the responsibility of the field crew or laboratory conducting the work, respectively. It is the responsibility of the Laboratory's QA Officer and Sampling Agency's Project Manager to report any assessments and proposed corrective actions to the Lead Agency's Project Manager. The Project Manager will relay deviations to the Project's QA Officer. The Project's QA Officer has the authority to stop all sampling and analytical work if the deviations noted are considered detrimental to data quality. The following section describes how deviations from the QAPP will be identified.

Three types of assessments will be performed as part of this project to ensure that the sampling and analysis activities are in accordance with the approved QAPP. Assessment activities and results will be documented in writing first by field or laboratory reports, then in final reporting. They are as follows:

- **Surveillance of Sample Collection Activities:** The Sampling Agency's Project Manager will be responsible for oversight of sampling activities and will review field datasheets to verify that the samples were collected in accordance with QAPP requirements. If the Sampling Agency identifies any of the field activities to be in violation of QAPP requirements, the Project Manager will be contacted immediately. The Project Manager has the authority to stop field activities until corrective actions are successfully implemented. Corrective actions may include additional training to improve field team performance and QAPP compliance, or appropriate re-sampling of sites, as needed. Any corrective actions will be documented. Any actions necessary will be communicated to the Project Manager. Assessment of wet weather sample collection will occur by the Sampling Agency's Project Manager once per field season; while assessment of dry weather sample collection will occur at the beginning and end of dry weather collection.
- **Data Quality Assessment:** Each Laboratory Manager will be responsible for providing a summary of QC data to the Sampling Agency's Project Manager. If it is determined that the precision and accuracy objectives were not met, the Sampling Agency's Project Manager will notify the Laboratory Manager. Laboratory techniques will be reviewed to minimize errors, and samples will be re-analyzed, if possible.
- **Assessment of Data Entry:** Once the performance criteria are met, the Sampling Agency's Project Manager will review data files to ensure that errors are detected and corrected. The Project Manager will retain original data files and qualified data will be retained in the Stakeholder's database. Data are qualified in the database according to SWAMP protocols.

This page intentionally left blank

## 19.0 REPORTS TO MANAGEMENT

---

AMEC will provide post-wet event sampling summaries to the the City of San Diego Project Manager as a status of monitoring activities.

The City of San Diego will generate an Annual CLRP Monitoring Summary, which will be included in the following WURMP Annual Report as an appendix.

The project reports are detailed within the Monitoring Plan. Table 18-1 presents the management reports.

**Table 18-1.  
 Management Reports**

| <b>Type of Report</b>              | <b>Frequency<br/>(Daily, weekly,<br/>monthly, quarterly,<br/>annually, etc.)</b> | <b>Projected<br/>Delivery Dates</b> | <b>Person(s)<br/>Responsible for<br/>Report<br/>Preparation</b> | <b>Report<br/>Recipients<sup>(a)</sup></b> |
|------------------------------------|--|-------------------------------------|---|--|
| Wet Weather<br>Sampling<br>Summary | Post-event Summary   | Post-event<br>Summary               | Project Manager,<br>AMEC  | City of San Diego                          |
| CLRP Monitoring<br>Summary         | Annual   | June 30, 2014                       | Project Manager,<br>AMEC  | City of San Diego                          |



This page intentionally left blank

## **GROUP D: DATA VALIDATION AND USABILITY**

### **20.0 DATA REVIEW, VERIFICATION, AND VALIDATION**

---

All analytical data will be reviewed and compared to the DQOs described in Section 6 of this QAPP, along with the applicable QA/QC practices. If results fail to meet any DQO, the Sampling Agency's Project Manager will flag them for further review. Batch QC samples will be reviewed to determine the potential cause of failure to meet the DQO. Data will be separated into three categories: data meeting all DQOs (acceptable data), data failing precision or recovery criteria (further investigation warranted), and data failing to meet accuracy criteria (further investigation warranted).

If further investigation is warranted based on data failing precision or recovery criteria, all aspects of the data will be assessed for data quality by the Project Manager. At that point, the data will either be accepted or rejected. If accepted, the data will be flagged with a "J" qualifier per the United States Environmental Protection Agency (USEPA) specifications (USEPA, 2002). If data fails to meet accuracy criteria, or the cause of the failure cannot be identified and rectified, the data will be excluded from the results. All rejected data will be retained in the Project database, and qualified as "rejected". The ultimate decision of whether to accept or reject a data point will be made by the Project Manager in consultation with the Project QA Officer.

If the analysis for more than ten percent of data fails to meet the DQO, the Project Manager and Project QA Officer will meet to discuss the appropriateness of the DQO and any potential modifications. All proposed modifications of DQOs will require a reissuance of the QAPP.

This page intentionally left blank

## **21.0 VERIFICATION AND VALIDATION METHODS**

---

Data verification is the process of evaluating the completeness, correctness, and conformance of the dataset against the method, procedural, or contractual requirements. The goal of data validation is to evaluate whether the data quality goals established during the planning phase have been achieved. Data quality indicators will be continuously monitored by the analyst producing the data (i.e., field and lab personnel), as well as the Laboratory or Sampling Agency's Project Manager throughout the project to ensure that corrective actions are taken in a timely manner. Data validation is an analyte-specific and sample-specific process that extends verification to determine the analytical quality of the dataset. Laboratory and field personnel responsible for conducting QC analysis will be responsible for documenting when data do not meet measurement quality objectives as determined by data quality indicators.

### **21.1 Data Verification and Validation Responsibilities**

Data collected in the field will be verified by the Project Manager. The laboratories will maintain COCs and sample manifests.

Verification and validation of laboratory data is the responsibility of the laboratory section supervisor and Project Manager. Laboratories will maintain analytical reports including QC documentation. The Laboratory QA Officer will perform checks of all of its records.

The Project QA Officer and Project Manager are responsible for oversight of field data and laboratory data obtained from the contracted laboratory and sampling agency. 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 Project Manager in consultation with the Laboratory QA Officer and/or Sampling Agency's Project Manager. Any corrections require a unanimous agreement that the correction is appropriate.

### **21.2 Process for Data Verification and Validation**

Data verification and validation for 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 and field data (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 COC forms, and secure storage of samples.
- Verification that all samples recorded on COC forms were received by the laboratory.

Data verification and validation for the sample analysis activities will include all of the following:

- Verification that appropriate methodology has been followed.
- Verification that instrument calibrations have been adequately conducted.
- Verification that QC samples meet performance criteria.
- Verification that analytical results are complete.
- Verification that documentation is 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.
- Verification that correct data types correspond to database fields (i.e., text for text, integers for integers, number for numbers, dates for dates, times for times, etc.).

## **22.0 RECONCILIATION WITH USER REQUIREMENTS**

---

Water quality data collected during this project will provide a means of determining compliance with the Bacteria TMDL. The results of this project will provide valuable information for evaluating compliance with numeric targets and load allocations defined in the TMDL. Data from this study will also be used to support decisions regarding possible amendments to the TMDL and implementation of management measures and best management practices.

The data will be qualified if QA issues are identified. Statistics and reporting of standard deviation and relative error will be used to quantify the uncertainty associated with the data. Uncertainty and limitations on data use will be described in the Annual CLRP Monitoring Summary.

This page intentionally left blank

## **23.0 REFERENCES**

---

County of San Diego, 2011. San Diego County Municipal Copermittees 2009-2010 Receiving Waters and Urban Runoff Monitoring. Final Report. Prepared by Weston. Prepared for County of San Diego. January 2011.

San Diego County Municipal Copermittees 2005-2006 Coastal Storm Drain Monitoring. Appendix C: Sample Collection Standard Operating Procedures: Standard Operating Procedures (SOP) for the Collection of Bacteria Samples from Storm Drains and Receiving Waters (Creeks, Lagoons, Bays, and Ocean). Final Report. January 2007.

State Water Resources Control Board (SWQCB), 2012. Program Final Environmental Impact Report (PFEIR): Attachment B of Appendix I- Special Protections for Areas of Special Biological Significance, Governing Point Source Discharges of Storm Water and Nonpoint Source Waste Discharges. February, 2012.

USEPA, 2002. Guidance on Environmental Data Verification and Data Validation. U.S. Environmental Protection Agency Quality System Series: EPA QA/G-8. November 2002.

USEPA, 2012. Water Monitoring and Assessment: Quality Assurance, Quality Control, and Quality Assessment Measures. <<http://water.epa.gov/type/rsl/monitoring/132.cfm>> March 2012.



This page intentionally left blank