

# Santa Margarita River Lagoon Monitoring Project

## Data Usability and Assessment Review Laboratory Data

**Final**

June 2009

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# Acronyms

%R	percent recovery
°C	degrees Centigrade
BOR	Bureau of Reclamation
CDM	CDM Federal Programs Corporation
CRG	CRG Marine Laboratories
DNQ	detected not quantifiable
DQI	data quality indicators
DQOs	data quality objectives
EPA	U.S. Environmental Protection Agency
LCS	laboratory control sample
MDL	method detection limit
mg/L	milligrams per liter
MS/MSDs	matrix spike/matrix spike duplicates
MSI	UC Santa Barbara Marine Science Institute Laboratory
NC	not calculable
ND	nondetect
PARCCS	precision, accuracy, representativeness, comparability, completeness, and sensitivity
QA	quality assurance
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RL	reporting limit
RPD	relative percent difference
SCCWRP	Southern California Coastal Water Research Project
SDG	sample delivery group
SDRWQCB	San Diego Regional Water Quality Control Board
SOP	standard operating procedures
SQL	sample quantitation limit
TDN	total dissolved nitrogen
TMDL	Total Maximum Daily Load
TN	total nitrogen
UGA	University of Georgia Analytical Chemistry Laboratory

# Section 1

## Introduction

### 1.1 Data Usability and Assessment Review

The San Diego Regional Water Quality Control Board (SDRWQCB) issued RWQCB Investigative Order R9-2006-0076 in 2006, requiring development of Total Maximum Daily Loads (TMDLs) for a number of coastal water bodies in San Diego County.

The Santa Margarita Lagoon, at the mouth of the Santa Margarita River in Camp Pendleton, California is one of the identified water bodies potentially impaired for eutrophication. In response to the Investigative Order, the Southern California Coastal Water Research Project (SCCWRP) developed a Work Plan for the lagoon and other potentially impaired water bodies identified by Region 9, containing parameter lists and measurement frequencies designed to meet TMDL model requirements.

CDM Federal Programs Corporation (CDM) was contracted by the Santa Margarita Lagoon Dischargers, through the Bureau of Reclamation (BOR), to perform data collection and monitoring of the Santa Margarita Lagoon. A Quality Assurance Project Plan (QAPP), Santa Margarita Lagoon Monitoring for the RWQCB Investigative Order R9-2006-0076, San Diego County, California, Revision 1 (CDM September 2007) was prepared and approved prior to initiation of the data collection effort.

CDM performed field activities to support the Santa Margarita Lagoon Monitoring Project. Sampling was conducted during eight sampling events: storm water event 1 (January 5, 2008), 2 (January 27, 2008), and 3 (November 26, 2008); dry weather event Index 1 (January and February 2008), Index 2 (March and April 2008), Index 3 (July 2008), Index 4 (September 2008); and the sediment sampling event (December 4, 2008).

The purpose of this assessment is to evaluate the data collected and determine whether they meet the quality objectives outlined in the QAPP. This report details the quality assurance/quality control (QA/QC) activities conducted, describes the data verification, data validation and data usability review, and summarizes the review results.

## Section 2

# Usability Summary

Samples were collected and analyzed in accordance with the work plan except for some field changes enacted during the investigations. These changes and deviations did not negatively impact the usability of the data but gaps in data may be identified based on these deviations as presented in Section 4.1.

The data reported in this draft usability report is usable as reported with the data validation qualifiers added. Sample results that were rejected "R" are not usable.

## Section 3

# Quality Assurance Objectives

QA objectives for measuring data are expressed in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity (PARCCS). The QA objectives provide a mechanism for ongoing control and evaluating and measuring data quality throughout the project.

A review of the collected data is necessary in order to identify if data measurement objectives established in the seven-step data quality objective (DQO) process have been met. In general the following data measurement objectives were considered:

- Specification of particular analytical method and reporting detection limit requirements
- Identification of the appropriate laboratory analytical QC requirements
- Verify if appropriate levels of other PARCCS criteria for the data has been met
- Delineation of specific sample-handling issues or other project-specific issues

The data validation review of the QA objectives verifies if the collected data are of sufficient quality to support their intended use.

# Section 4

## Summary of Field and Laboratory QA Activities

CDM performed sampling and monitoring of various parameters at four sample locations: Mass Emission, Segment 1, Segment 2, and Ocean Inlet, as described in Section 6.2 of the QAPP. Monitoring for this project was conducted for wet weather sources and within-lagoon sampling; and for dry weather sources and within-lagoon sampling.

CDM completed sampling activities in accordance with the approved QAPP. A summary of the data collected and the analysis performed is presented in Tables 4-1 through 4-5. Samples were collected and shipped to CRG Marine Laboratories (CRG), UC Santa Barbara Marine Science Institute (MSI) Laboratory, and University of Georgia (UGA) Analytical Chemistry Laboratory under subcontract to SCCWRP. The QAPP and associated attachments defined the procedures to be followed and the data quality requirements for the field program.

### 4.1 Deviations from Field Procedures

Due to conditions encountered in the field, some deviations were made from the QAPP during the fieldwork portion of the Santa Margarita River Lagoon monitoring sampling. The following deviations were encountered during the sampling events:

- Stormwater Event 1: Pollutagraph samples 9 and 10 at Mass Emission site; and Ocean Inlet samples during high and low tides were not collected due to equipment error.
- Stormwater Event 2: No deviations were reported for this sampling event.
- Index Event 1: On Day 2, Ocean Inlet samples were not collected for low tide conditions. A vehicle flat tire caused the field crew to be delayed and miss low tide conditions.
- Index Event 2: No deviations were reported for this sampling event.
- Index Event 3: The Storm Drain site was dry for this sampling event. No samples were collected at this site. The Mass Emissions Site was intermittently dry for this sampling event. No samples were collected on days two and three during the Index period.
- Index 4 Event: The Storm Drain site was entirely dry for this Index sampling period. No samples were collected. The Mass Emissions Site was completely dry during this Index sampling period. No samples were collected.

- Storm Water Event 3: Limited sample was collected at Segment 1 High tide due to equipment error. Pumped volume was less than programmed (sent 50 percent full bottles to CRG).

Samples collected at the Ocean Inlet High tide was limited due to sampling equipment being knocked over by extremely high tide and swell. The remaining volume (50 percent) was submitted to CRG.

With limited time remaining before tidal shift, sampling staff was not permitted immediate access to the Ocean Inlet due to security access issues. As a result of this delay, the Ocean Inlet Low sample collection deviated from the QAPP. Actual sample collected was a 2-hour composite collected every 15 minutes by hand (versus 3-hour composite). Hand sampling was required due to the limitation of tubing length and the low tide characteristics.

Duplicates were collected at Segment 1 and Segment 2 during low tide. Duplicates could not be collected at Site 1 high tide due to insufficient volume.

- Sediment Sampling Event: No deviations were reported for this sampling event.

None of the deviations compromised the quality of the data. Data gaps resulting from the samples that could not be collected may ultimately impact project objectives depending on the uses of the data or impacts to the modeling. Further data collection activities may need to be implemented.

## 4.2 Field Quality QA/QC

Field QC samples such as matrix spike/matrix spike duplicates (MS/MSDs), field duplicates, and field blanks were collected at the frequency described in the QAPP to determine the quality of the field data. For the entire project, 235 field duplicates, 110 field blank samples, and 20 MS/MSD samples were collected.

Field QA/QC objectives were accomplished through the use of appropriate sampling techniques and collection of field duplicates and field blanks.

Analytical QA/QC was assessed by applicable laboratory QC checks, such as method blanks, sample custody tracking, sample preservation, adherence to holding times, laboratory control samples (LCSs), and MS/MSDs.

## 4.3 Laboratory Methods

Samples were analyzed using the following methods:

- Method SM 10200H - Chlorophyll-a
- Method SM 2540D - Total Suspended Solids
- Method SM 5210B - Carbonaceous Biochemical Oxygen Demand
- Method SM 4500-NH3-G - Ammonia
- Method SM 4500-NO3-F - Nitrate/Nitrite

- Method SM 4500-NO2-B - Nitrite
- Method SM 4500P C - Orthophosphate
- Method SM 4500P-J - Total Phosphorus
- Method SM 4500P-J - Total Dissolved Phosphorus
- Method SM 4500P-J - Total Nitrogen
- Method SM 4500P-J - Total Dissolved Nitrogen
- Method ASTM D-422, EPA 1995, Plumb 1981 - %fines, %sand/silt/clay
- Method EPA 9060 - % Organic Carbon, % Organic Nitrogen
- Method Nelson 1987 - % Total Phosphorus

All the methods used for these sampling events met project objectives as specified in the QAPP.

# Section 5

## Data Validation Procedures

Data validation was conducted by qualified CDM data validators. Where specific guidance was not available, the data was evaluated in a conservative manner consistent with industry standards using professional experience. The analyses were validated using the following documents, as applicable to each method:

- U.S. Environmental Protection Agency (EPA), Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- EPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update I, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; and
- Standard Methods for the Examination of Water and Wastewater, 21st Edition, American Public Health Association 2005.

The data validation narratives indicate that the sample analyses generally met the QC criteria cited in the methods. Results associated with QC outliers were qualified by the data validators.

### 5.1 Qualifier Definitions

The following definitions provide explanations of the qualifiers assigned to results in the data review process.

- J Estimated data due to exceeded quality control criteria.
- U Analyte was analyzed for but not detected.
- UJ Nondetect result is estimated due to exceeded quality control criteria.
- R Data is rejected.
- ND Non-detect (used by the laboratories for this project)
- DNQ Detected not quantifiable (used by the laboratories for this project)

# Section 6

## Data Quality Indicators

Data Quality Indicators (DQI) criteria were established to ensure precision, accuracy, representativeness, comparability, completeness, and sensitivity of analysis for the analytical fractions and for the media sampled. Analytical QC procedures are detailed in the most current revisions of SW-846 methodologies and laboratory specific criteria. Analytical precision, accuracy, and sensitivity DQOs required for this project are provided in the laboratory SOWs.

The DQIs provide a mechanism for on-going control, to evaluate and measure data quality throughout the project. These criteria are defined in the sections below. Individual sample delivery group (SDGs) validation reports with specific sample detail are provided in Attachment 1.

### 6.1 Precision

Precision is a quantitative term that estimates the reproducibility of a set of replicate measurements under a given set of conditions. It is defined as a measurement of mutual agreement between measurements of the same property, and is expressed in terms of relative percent difference (RPD) between duplicate determinations.

RPD is calculated as follows:

$$\text{RPD} = \text{absolute value } [(C1-C2)/\{(C1+C2)/2\}] \times 100\%$$

Where: C1 = Concentration of split sample #1  
C2 = Concentration of split sample #2

The laboratory analytical precision for the reported data was determined by review of MS/MSD, LCS/LCSD and laboratory duplicate results.

Field analytical precision was determined from the review of the field duplicate results. The field duplicate samples were collected in the same manner as the original samples but were collected in separate, individual containers, given separate sample identifiers and treated as individual samples by the laboratory.

Analytical precision cannot be determined if the reported value is less than the reporting limit (nondetect). Therefore when an analyte is not detected in either duplicate sample, the RPD result is reported as not calculable (NC).

The laboratory duplicate RPD criterion is 20 percent and the field duplicate RPD criterion is 25 percent for water samples and 20 percent for sediment samples. Duplicate results for concentrations close to the detection limits are reviewed based on their absolute differences as compared to their respective quantitation limit values. When the analyte concentration is less than 5 times the reporting limit in either

sample, the criteria used is the absolute difference between the two values which should be less than the reporting limit.

The following laboratory and field analytical RPDs were outside criteria. The data validators qualified the data as discussed below, as required by validation guidelines.

- Storm Water 1 Event: The laboratory duplicate RPD for chlorophyll-a (46 percent) in CRG report CDM001 exceeded the QC RPD limit. Associated samples were qualified as estimated "J/UJ." The field duplicate RPD results were outside of criteria for the following analytes: chlorophyll a; and total suspended solids. For this sampling event only 1 field duplicate pair was collected.
- Storm Water 2 Event: RPD results were all within QC criteria for both the laboratory and field duplicate results.
- Index 1 Event: Laboratory duplicate RPD results were all within QC criteria. The field duplicate RPD results were outside of criteria for the following analytes: chlorophyll-a in 2 of the 4 duplicate pairs (50 percent within criteria); total suspended solids for 1 of the 4 duplicate pairs (75 percent within criteria); ammonia for 2 of the 6 duplicate pairs (67 percent within criteria); nitrate + nitrite for 3 of the 6 duplicate pairs (50 percent within criteria); nitrite for 4 of the 6 duplicate pairs (34 percent within criteria); orthophosphate for 3 of the 6 duplicate pairs (50 percent within criteria); total nitrogen for 1 of the 6 duplicate pairs (84 percent within criteria); and total phosphorus for 1 of the 5 duplicate pairs (80 percent within criteria). The parent sample and the field duplicate sample were qualified as estimated "J."
- Index 2 Event: The laboratory duplicate RPD for chlorophyll-a (38 percent) in CRG report CDM001i exceeded the RPD QC limit. Associated samples were qualified as estimated "J/UJ." The field duplicate RPD results were outside of criteria for the following analytes: chlorophyll-a in 1 of the 5 duplicate pairs (80 percent within criteria); total suspended solids for 2 of the 6 field duplicate pairs (67 percent within criteria); nitrate + nitrite for 1 of the 7 duplicate pairs (86 percent within criteria); orthophosphate for 2 of the 7 duplicate pairs (72 percent within criteria); total dissolved phosphorus for 1 of the 7 field duplicate pairs (86 percent within criteria); total nitrogen for 3 of the 7 duplicate pairs (58 percent within criteria); and total phosphorus for 2 of the 7 duplicate pairs (72 percent within criteria). The parent sample and the field duplicate sample were qualified as estimated "J."
- Index 3 Event: The laboratory duplicate RPDs for total suspended solids (39 percent, 40 percent, and 65 percent) for samples analyzed by CRG were outside of criteria for various samples within this sampling event. Associated samples were estimated "J/UJ." The field duplicate RPD results were outside of criteria for the following analytes: chlorophyll-a for 1 of the 3 duplicate pairs (67 percent within criteria); total suspended solids for 2 of the 4 duplicate pairs (50 percent within criteria); ammonia for 1 of the 3 duplicate pairs (67 percent within criteria);

orthophosphate for 3 of the 3 duplicate pairs (0 percent within criteria); and total phosphorus for 1 of the 3 duplicate pairs (67 percent within criteria). The parent sample and the field duplicate sample were qualified as estimated "J."

- **Index 4 Event:** The laboratory duplicate RPD for chlorophyll-a (40 percent) in CRG report CDM001w was outside of criteria. The chlorophyll-a (38 percent) and total suspended solid (75 percent) RPD results for CRG report CDM001y were outside criteria. Associated samples were estimated "J/UJ." All other laboratory RPD results were within appropriate control limits. The field duplicate RPD results were outside of criteria for the following analytes: ammonia for 3 of the 4 duplicate pairs (25 percent within criteria); and orthophosphate for 1 of the 4 duplicate pairs (75 percent within criteria). The parent sample and the field duplicate sample were qualified as estimated "J."
- **Storm Water Event 3:** Laboratory duplicate RPD results were all within QC criteria. The field duplicate RPD results were outside of criteria for the following analytes: ammonia for 1 of the 2 duplicate pairs (50 percent within criteria); total dissolved phosphorus in 1 of the 2 duplicate pairs (50 percent within criteria); and total nitrogen in 1 of the 2 duplicate pairs (50 percent within criteria). The parent sample and the field duplicate sample were qualified as estimated "J."
- **Sediment Sampling Event:** Laboratory RPD results were all within QC criteria. The field duplicate RPD results were outside of criteria for percent fines in 1 of the 2 duplicate pairs (50 percent within criteria). The parent sample and the field duplicate sample were qualified as estimated "J."

Field duplicate results are shown on Table 6-1. As stated above, the qualifiers shown on the table have been applied to the parent sample and field duplicate samples only.

Table 6-2 quantifies by percentages the field duplicate results that were within criteria.

## 6.2 Accuracy

Accuracy is the degree of agreement of a measurement with an accepted reference or true value, and is a measure of the bias in a system. Accuracy of the data was assessed by comparing LCS recovery, MS recovery, and other applicable laboratory QC. Accuracy is expressed as a percent recovery, which was calculated by:

$$\text{Percent Recovery} = \frac{(\text{Total Analyte Found} - \text{Analyte Originally Present}) \times 100}{\text{Analyte Added}}$$

Accuracy results assist in identifying the type and magnitude of effects that contribute to the systemic error introduced via field and/or laboratory procedures. CDM validators reviewed the laboratories' data for accuracy, through the reported MS and LCS recoveries. Recoveries outside criteria are summarized below. The data validators qualified the data as required by the validation guidance.

- Storm Water 1 Event: All reported laboratory percent recovery (%R) results were within criteria.
- Storm Water 2 Event: All reported laboratory %R results were within criteria.
- Index 1 Event: All reported laboratory %R results were within criteria.
- Index 2 Event: All reported laboratory %R results were within criteria.
- Index 3 Event: All reported laboratory %R results were within criteria.
- Index 4 Event: All reported laboratory %R results were within criteria for CRG and MSI data. For UGA data, two MS samples for total dissolved phosphorus and three MS samples for total phosphorus had %Rs that were outside of criteria. Associated sample results were estimated "J/UJ."
- Storm Water Event 3: All reported laboratory %R results were within criteria.
- Sediment Sampling Event: All reported laboratory %R results were within criteria.

CDM validators also reviewed the sample collection and handling documentation to evaluate field sampling affects on accuracy. The validation evaluated/reviewed specific analytical QC measure of analytical accuracy and matrix influences.

### **Sample Preservation and Holding Times**

Sample preservation, handling, and holding times are evaluated during the validation process. It is noted that by agreement between SCCWRP and SDRWQCB, samples for nutrient analyses were permitted to be filtered and frozen, increasing the holding time from 48 hours to 28 days. Preservation criteria ( $\pm 4$  degrees Centigrade [ $^{\circ}\text{C}$ ]) and holding times as specified in the QAPP were met for all samples except for the following:

- Storm Water 1 Event: One cooler temperature for CRG Laboratory SDG CDM001 was received at 8  $^{\circ}\text{C}$ , slightly above the criteria. The samples were received by the laboratory shortly after collection and as a result stabilization of the temperature of the samples was potentially not reached. These samples were appropriately preserved once received by the laboratories. No qualifications are recommended as sample integrity has not been compromised due to the slightly higher cooler temperatures. Samples analyzed by UGA for total dissolved nitrogen, total nitrogen, total dissolved phosphorous, and total phosphorous were analyzed outside of the 28 day holding time criteria. All results were estimated "J/UJ."
- Storm Water 2 Event: One cooler temperature for CRG Laboratory SDG CDM001 was received at 8  $^{\circ}\text{C}$ , slightly above the criteria. The samples were received by the laboratory shortly after collection and as a result stabilization of the temperature of the samples was potentially not reached. Samples were appropriately preserved

once received by the laboratories. No qualifications are recommended as sample integrity has not been compromised due to the slightly higher cooler temperatures.

- Index 1 Event: One cooler temperature for SDG CDM001c (CRG Laboratory) was received at 8 °C, slightly above the criteria. The samples were received by the laboratory shortly after collection and as a result stabilization of the temperature of the samples was potentially not reached. Samples were appropriately preserved once received by the laboratories. No qualifications are recommended as sample integrity has not been compromised due to the slightly higher cooler temperatures. Samples analyzed by MSI and collected on 1/30/08 and 1/31/08 were analyzed outside of the 28 day holding time criteria. All results for ammonia, orthophosphate, nitrate/nitrite, and nitrite were estimated "J/UJ." Samples analyzed by UGA for total dissolved nitrogen, total nitrogen, total dissolved phosphorous, and total phosphorous were analyzed outside of the 28 day holding time criteria. All results were estimated "J/UJ."
- Index 2 Event: Eight cooler temperatures were slightly above the criteria for the following CRG Laboratory SDGs. For SDG CDM001i, the cooler temperatures were 3.7 °C and 11 °C. These samples were received by the laboratory within approximately 7 hours of collection. For SDG CDM001j the cooler temperatures were 3.7 °C and 12 °C. These samples were received by the laboratory within approximately 7 hours of collection. For SDG CDM001k, the cooler temperature was 12 °C. The samples were received by the laboratory within approximately 7 hours of collection. For SDG CDM001l, there was no cooler temperature recorded. Samples were received by the laboratory within approximately 3 hours of collection. For SDG CDM001n, the cooler temperature was 12 °C. Samples were received by the laboratory within approximately 10 hours of collection. For SDG CDM001o the cooler temperature was 12 °C. Samples were received by the laboratory within approximately 10 hours of collection. As a result of the expedited delivery of the sample coolers, the stabilization of the temperature of the samples was potentially not reached. Samples were appropriately preserved once received by the laboratories. No qualifications are recommended as sample integrity has not been compromised due to the slightly higher cooler temperatures. UGA samples for total dissolved nitrogen, total nitrogen, total dissolved phosphorous, and total phosphorous were analyzed outside of the 28 day holding time criteria. All results were estimated "J/UJ."
- Index 3 Event: Three cooler temperatures were slightly above the criteria for the following CRG Laboratory SDGs. For SDG CDM001s, the cooler temperature was 10 °C. For SDG CDM001t, the cooler temperature was 9 °C. For SDG CDM001u, the cooler temperature was 7 °C. For SDG CDM001v, the cooler temperature was 7 °C. These samples were received by the laboratory shortly after collection and as a result stabilization of the temperature of the samples was potentially not reached. Samples were appropriately preserved once received by the laboratories. No qualifications are recommended as sample integrity has not been compromised due to the slightly higher cooler temperatures. For the samples analyzed by UGA

laboratory, no cooler temperature was reported with the database but samples were shipped frozen. Samples analyzed by UGA for total dissolved nitrogen, total nitrogen, total dissolved phosphorous, and total phosphorous were analyzed outside of the 28 day holding time criteria. All results were estimated "J/UJ." Samples analyzed by MSI and collected between 7/21 and 7/24/08 for ammonia, nitrate/nitrite, nitrite, and orthophosphate were analyzed outside of the 28 day holding time criteria. Associated results were estimated "J/UJ."

- Index 4 Event: Four cooler temperatures were slightly above the criteria for the following CRG Laboratory SDGs. For SDG CDM001w, the cooler temperature was 8 °C. For SDG CDM001x, the cooler temperature was 7 °C. For SDG CDM001y, the cooler temperature was 9 °C. For SDG CDM001z, the cooler temperature was 9 °C. For SDG CDM001aa, the cooler temperature was 8 °C. The samples were received by the laboratory shortly after collection so stabilization of the temperature of the samples was potentially not reached. Samples were appropriately preserved once received by the laboratories. No qualifications are recommended as sample integrity has not been compromised due to the slightly higher cooler temperatures. For samples sent to UGA and MSI laboratories, no cooler temperatures were reported with the database but samples were shipped frozen. Samples analyzed by UGA and collected between 9/29 and 10/1/08 for total dissolved nitrogen, total nitrogen, total dissolved phosphorous, and total phosphorous were analyzed outside of the 28 day holding time criteria. Associated results were estimated "J/UJ."
- Storm Water Event 3: All holding times and preservation criteria was met for samples analyzed by CRG. For samples sent to UGA and MSI laboratories, no cooler temperature was reported with the database but samples were shipped frozen. All samples analyzed by UGA during this event for total dissolved nitrogen, total nitrogen, total dissolved phosphorous, and total phosphorous were analyzed outside of the 28 day holding time criteria. All results were estimated "J/UJ."
- Sediment Sampling Event: All holding times and preservation criteria were met for the sediment analyses.

## **Total Dissolved Nitrogen and Total Nitrogen Evaluation**

During the study, samples were collected for total and dissolved nitrogen by method SM4500P-J. A review of the early results (Index 1 through Index 3) showed obvious problems (sampling or analytical) with the total nitrogen (TN) and total dissolved nitrogen (TDN) results. The TDN results were consistently reported above the levels measured in the TN samples. All of the TDN samples were filtered in the field prior to submission to the laboratories.

An evaluation was conducted by Weston Solutions, who were participating in a parallel lagoon monitoring effort in San Diego County, prior to the fourth Index dry sample period. De-ionized water was processed through a variety of commercially

available 0.45 µm filters (Fischer and Whatman) in both the field and laboratory. Weston Solutions produced a report that discusses these results. A single page of this report was provided to CDM. A conclusion of this study included:

- The use of Whatman filters without pre-rinsing led to an increase of approximately 0.04 milligrams per liter (mg/L) nitrogen in the TDN samples.

In addition to total nitrogen contributions from the filtering apparatus, (CDM used disposable filters), variability in the sampling and decreased analytical precision by the laboratories for nitrogen concentrations near the reporting limits can play an important role in the observations of TDN concentrations reported at higher concentrations than TN concentrations. Precision of the analytical method is usually measured through the analysis of LCS/LCSDs. Typical control limits for LCS recoveries are +/- 80 percent for the LCS and +/- 20 RPD between the LCS and LCSD. These ranges in laboratory precision could account for some of the variability of TDN and TN results for sample pairs with results within +/-20 percent RPD and contribution of nitrogen in the samples from the filters. A total of 252 out of the 352 of the TDN results were reported above the TN results. If all of the nitrogen in the samples were contained in the dissolved phase, approximately 50 percent of the TDN results would be slightly higher and 50 percent would be slightly lower than the TN results. As a result of this analysis and further discussions with the Stakeholder group, all TDN results collected for this project have been rejected and qualified with an "R."

### 6.3 Blank Contamination

As stated in the work plan, equipment rinsate blanks were to be prepared and submitted for analysis with primary samples. The equipment rinsate blank consisted of analyte-free water used to rinse sampling equipment as the last step in the decontamination process. This QC sample serves as a check for effectiveness of the decontamination process.

Source blanks consisted of target analyte-free water provided by the laboratory or deionized water used by sampling personnel for equipment decontamination. The analyte-free water is placed into the sampling container and analyzed for the same parameters as the primary samples. This QC sample serves as a check of the cleanliness of the water used for decontamination.

During the first sampling event it was found to be more efficient and effective to use disposable sampling equipment for sample collection. For Stormwater Events 1 and 2 and Index Events 1 and 2, no field blanks were collected. All the sample equipment for these events were dedicated to the sampling location or were disposable and were used for one sample and then discarded. For the remaining sample events, field blanks were collected but the equipment used during these last sampling events was also disposable. The field blanks collected for the remaining sampling events essentially served no purpose. Because disposable sampling equipment was used the

need for decontamination rinsate blanks and source blanks had been eliminated. These blanks were collected to fulfill the requirements of the Work Plan and QAPP.

Table 6-3 shows the target analytes detected in the field blanks associated with Index 3 and 4 events and Storm Water Event 3. Table 6-4 quantifies the field blank concentrations by event, media and analyte. Because disposable (one time use) equipment was used, data qualification is not appropriate.

Laboratory method blanks are analyzed to identify possible contamination introduced by sample handling, preparation, and/or analysis.

- Storm Water 1 Event: No field blanks were collected for this event. No analytes were detected in the laboratory blanks.
- Storm Water 2 Event: No field blanks were collected for this event. No analytes were detected in the laboratory blanks.
- Index 1 Event: No field blanks were collected for this event. No analytes were detected in the laboratory blanks.
- Index 2 Event: No field blanks were collected for this event. No analytes were detected in the laboratory blanks.
- Index 3 Event: Low level detections of chlorophyll a (2 out of 3 blanks), ammonia (3 out of 3 blanks), nitrate + nitrite (2 out of 3 blanks), nitrite (3 out of 3 blanks), orthophosphate (3 out of 3 blanks), total dissolved nitrogen (3 out of 3 blanks), total dissolved phosphorus (3 out of 3 blanks), total nitrogen (3 out of 3 blanks), and total phosphorus (1 out of 3 blanks) were measured in the field blanks collected with this event (Tables 6-3 and 6-4). No target analytes were detected in the laboratory blanks.
- Index 4 Event: Low level detections of total suspended solids (1 out of 6 blanks), ammonia (3 out of 3 blanks), orthophosphate (2 out of 3 blanks), total dissolved nitrogen (6 out of 6 blanks), total dissolved phosphorus (3 out of 6 blanks), total nitrogen (5 out of 6 blanks), and total phosphorus (3 out of 6 blanks) were measured in the field blanks collected with this event (Tables 6-3 and 6-4). No target analytes were detected in the laboratory blanks.
- Storm Water Event 3: Low level detections of carbonaceous biochemical oxygen demand (1 out of 1 blank), ammonia (1 out of 1 blank), nitrate + nitrite (1 out of 1 blank), nitrite (1 out of 1 blank), total dissolved nitrogen (1 out of 1 blank), total dissolved phosphorus (1 out of 1 blank), total nitrogen (1 out of 1 blank), and total phosphorus (1 out of 1 blank) were measured in the field blanks collected with this event (Tables 6-3 and 6-4). No target analytes were detected in the laboratory blanks.

- Sediment Sampling Event: No laboratory or field blank samples were analyzed with the carbon, nitrogen, % sand, and % fines. For the % total phosphorus sediment analysis, laboratory blanks were analyzed with the samples and all concentrations were measured below the reporting limits. Field blanks were not collected for % total phosphorus.

# Section 7

## Representativeness, Comparability, and Sensitivity

Representativeness and comparability are achieved by using approved, documented sampling procedures and analytical methodologies. By following the approved QAPP for stormwater and dry weather sampling and soil sampling, sampling events should yield results representative of environmental conditions at the time of sampling. Similarly, reasonable comparability of analytical results for this, and future sampling events, can be achieved if the same approved analytical methods and sampling procedures are employed.

A review of reported sample result detection limits compared to the QAPP requirements ensures the collected data meets project objectives for sensitivity.

### 7.1 Representativeness

Representativeness is a qualitative term that expresses the degree to which the sample data accurately and precisely represent the environmental conditions corresponding to the location and depth interval of sample collection. Requirements and procedures for sample collection are designed to maximize sample representativeness.

Representativeness can be monitored by reviewing field documentation and/or by performing field audits. Chain of custodies and field notes were reviewed by the field team leader for all sampling events. The field team leader also performed audits of the sampling activities including checking paperwork and sampling methods.

Appropriate laboratory QA/QC requirements were described in the QAPP to ensure that the laboratory analytical results were representative of true field conditions.

Field sampling accuracy was attained through strict adherence to the approved final work plan and by using approved analytical methods for sample analyses. Based on this, the data should represent as near as possible the actual field conditions at the time of the sampling.

By using EPA approved sampling procedures, analytical methodologies, and written standard operating procedures (SOPs), as presented in the QAPP, this and future sampling events should yield results representative of environmental conditions at the time of sampling.

Representativeness, as defined above, has met the applicable requirements for field work and laboratory analyses. Deviations to the planned sampling activities were minimal and did not compromise the quality of the data to represent conditions within the project area. Therefore, the data collected are suitable for a representative characterization of the project area.

## 7.2 Comparability

Comparability is a qualitative term that expresses the confidence with which a data set can be compared with another. Strict adherence to standard sample collection procedures, analytical detection limits, and analytical methods assures that data are comparable. This comparability is independent of laboratory personnel, data reviewers, or sampling personnel. Comparability criteria are met for the project if, based on data review, the sample collection and analytical procedures are determined to have been followed, or defined to show that variations did not affect the values reported.

To ensure comparability of data generated for the site, standard sample collection procedures and approved analytical methods were utilized by CDM. Sample analyses were performed by the subcontract laboratories using the equivalent methodology. Utilizing such procedures and methods enables the current data to be comparable with the previous data sets generated with similar methods.

For the purposes of this data usability report, comparability has been met for the water samples for Stormwater Events 1, 2, 3 and Index Events 1 through 4 and the sediment samples.

## 7.3 Sensitivity

Sensitivity is related to the ability to compare analytical results with project-specific levels of interest, such as delineation levels or action levels. Analytical quantitation limits for the various sample analytes should be below the level of interest to allow an effective comparison.

### Detection Limits

Each analytical method used during the monitoring sampling was chosen because it has a reporting limit (RL) at or below the level of concern. For each analyte, the QAPP provided a RL that the laboratory was to achieve to provide analytical results at or below regulatory comparison criteria (see Table 7-1).

The RL is generally equal to or greater than the method detection limit (MDL). The RLs are set above MDLs to allow for sample matrix interferences and minimize false positives.

Development of the MDL is detailed in 40 CFR part 136 Appendix B as "the minimum concentration of a substance that can be measured and reported with a 99 percent confidence that the analyte concentration is greater than zero..." Generated by statistical analysis of multiple analyses of a low level standard, MDLs represent the best fundamental measurement of instrument sensitivity and the basis for establishing reporting limits.

Reporting limits are a compromise between analytical sensitivity and precision. Setting low RLs can lead to poorly defensible data due to false positive (Type I)

and/or false negative (Type II) errors, whereas elevated RLs can hamper site characterization. Laboratory determinations of MDLs are performed on non-typical samples (e.g., distilled water) leading to idealized limits. Confidence in detection limits increases with instrument signal level above the MDL, and higher limits mean better precision.

Laboratory results are reported according to rules that provide established certainty of detection and reporting limits. The result for an analyte is flagged with a "U" if that analyte was not detected (i.e., was not present at a concentration above a stated limit). For the purposes of this report, the laboratories reported a nondetect value as a negative number with a nondetect (ND) qualifier. If an analyte is present at a concentration between the MDL and the RL, the analytical result was flagged as detected not quantifiable (DNQ), indicating an estimated quantity. Qualifying the result as an estimated concentration reflects increased uncertainty in the reported value.

Although the RL of some analyte groups are set high to avoid Type I (e.g., SVOCs) and Type II errors, these limits provide a conservative picture of the nature and extent of contamination and the associated risk.

Table 7-1 presents an evaluation of all nondetect results as compared to RLs, as cited in the QAPP. Detection limits for the specific events are discussed below:

- Storm Water 1 Event: Detection limits were either at or below the required project quantitation limits for all methods.
- Storm Water 2 Event: Detection limits were either at or below the required project quantitation limits for all methods.
- Index 1 Event: Detection limits were either at or below the required project quantitation limits for all methods.
- Index 2 Event: Detection limits were either at or below the required project quantitation limits for all methods.
- Index 3 Event: Detection limits were either at or below the required project quantitation limits for all methods.
- Index 4 Event: Detection limits were either at or below the required project quantitation limits for all methods.
- Storm Water Event 3: Detection limits were either at or below the required project quantitation limits for all methods.
- Sediment Sampling Event: Detection limits were either at or below the required project quantitation limits for all methods.

## 7.4 Data Completeness

Completeness of the field program is defined as the percentage of samples planned for collection as listed in the QAPP versus the actual samples collected during the field program (see equation A).

Completeness for acceptable data is defined as the percentage of acceptable data obtained judged to be valid versus the total quantity of data generated (see equation B.) Acceptable data includes both data which passes all the QC criteria (unqualified data) and data that may not pass all of the QC criteria but had appropriate corrective actions taken (qualified but useable data).

$$A. \quad \% \text{ Field Completeness} = Cx \frac{100}{n}$$

Where: C = actual number of samples collected  
n = total number of samples planned

$$B. \quad \% \text{ Analytical Completeness} = Vx \frac{100}{n'}$$

Where: V = number of measurements judged valid  
n' = total number of measurements made

The list of samples collected and parameters analyzed are shown on Tables 4-1 through 4-5. Table 7-2 discusses the completeness goals by analyte and events. Below is a summary of the sample collection activities per sampling event.

- Storm Water 1 Event: Pollutagraph samples 9 and 10 at Mass Emission site; and Ocean Inlet samples during high and low tides were not collected due to equipment error.
- Storm Water 2 Event: All samples were collected in accordance with the QAPP. Forty-nine analyses could not be completed due to broken bottles during shipment.
- Index 1 Event: On Day 2, Ocean Inlet samples were not collected for low tide conditions. A vehicle flat tire caused the field crew to be delayed and miss the low tide conditions. Eight analyses could not be completed due to broken bottles during shipment.
- Index 2 Event: All samples were collected in accordance with the QAPP.
- Index 3 Event: The Storm Drain site was dry for this sampling event so no samples were collected in this area. The Mass Emission site was intermittently dry for this sampling event so no samples were collected on days two and three.
- Index 4 Event: The Storm Drain site was dry for this sampling event so no samples were collected in this area. The Mass Emissions Site was completely dry during this sampling event so no samples were collected in this area. The remaining samples were collected in accordance with the QAPP.

- Storm Water Event 3: All samples were collected in accordance with the QAPP and all analyses could be performed despite equipment problems noted in Section 3.1.
- Sediment Sampling Event: All samples were collected in accordance with the QAPP. Two analyses could not be completed due to samples being spilled at the laboratory.

The overall completeness goal for this project was 90 percent for all validated project data.

The completeness of the field program was above 90 percent for the actual number of samples collected versus the total number of samples planned for all analyses.

The completeness for acceptable data achieved was 91 percent for the number of measurements judged to be valid versus the total number of measurements made. One hundred percent of the total dissolved nitrogen results were rejected due to filter sampling issues, as discussed previously.

The completeness goals for both the number of samples collected and the number of measurements evaluated to be valid were met for the majority of the analyses and samples collected.

## Section 8

# Assessment of Data Usability and Reconciliation with QAPP Goals

Table 8.1 provides a summary of all qualifiers applied to the samples collected for this investigation as well as the reasons the results were qualified. In general, there were 3,389 sample results excluding field duplicates. A total of 54 samples were not analyzed due to the sample bottles being broken en route to the laboratories.

Out of the 3,335 (all sample results analyzed) 1,406 results were qualified based on the validation criteria. A total of 1,080 detected results were qualified as estimated "J" of which 49 were due to field duplicate criteria, 993 were due to holding time exceedances, 72 were due to laboratory duplicate criteria, and 71 were due to MS/MSD criteria.

A total of 31 nondetect results were qualified as estimated "UJ." Of these, 30 were estimated due to holding time exceedances, 1 was estimated due to laboratory duplicate criteria, 30 had holding time exceedances and 7 had MS/MSD exceedances.

A total of 298 total dissolved nitrogen results were rejected "R" due to unquantifiable nitrogen signature due to filtering methodology. Two hundred and forty-four of these results were also outside of holding time criteria.

Tables 8-2 to 8-9 further define the parameters analyzed and the results that were qualified by sampling event.

Table 8-10 summarizes the DQOs and the levels achieved for the analytical parameters. In general, the majority of the DQOs were met for the samples collected. All of the total dissolved nitrogen results are suspect due to the reasons discussed previously and have been rejected accordingly. Data that could not be collected may result in data gaps for the TMDL modeling activities. Further sampling may be necessary.

Most of the data reported is suitable for its intended use as stated in the QAPP with the exception of the dissolved nitrogen results that have been qualified as rejected. Detection limits were met for all analyses. The achievement of the completeness goal for usable data provides sufficient data for project decisions.

# Section 9

## References

CDM Federal Programs. 2007. Quality Assurance Project Plan, Santa Margarita Lagoon Monitoring for the RWQCB Investigative Order R9-2006-0076, Revision 1, San Diego County, California, September.

EPA (U.S. Environmental Protection Agency). 2004. Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October.

\_\_\_\_\_. 1999. Contract Laboratory Program National Functional Guidelines for Organic Data Review, October.

\_\_\_\_\_. 1996. SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update I, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December.

Standard Methods for the Examination of Water and Wastewater, 21st Edition, American Public Health Association. 2005.

**Attachment 1**  
**Specific Data Evaluation Reports and**  
**Qualified Form Is for each Sampling Event**

**Table 4-1  
Santa Margarita River  
Samples Collected and Analyzed for Storm Water Events 1, 2 and 3**

Lab	CRG																	
Sample Location ID	Cabonaceous Biological Oxygen Demand						Chlorophyll a						Total Suspended Solids					
	High Tide			Low Tide			High Tide			Low Tide			High Tide			Low Tide		
	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3
Polutagraph 1*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 2*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 3*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 4*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 5*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 6*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 7*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 8*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 9*	EQ	X	X	---	---	---	EQ	X	X	---	---	---	EQ	X	X	---	---	---
Polutagraph 10*	EQ	X	X	---	---	---	EQ	X	X	---	---	---	EQ	X	X	---	---	---
Ocean Inlet	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X
Segment 1	X	XX	X	XX	X	X	X	XX	X	XX	X	XX	X	XX	X	XX	X	XX
Segment 2	X	X	X	X	X	X	X	X	X	X	X	XX	X	X	X	X	X	XX
<b>TOTAL</b>	44						44						44					

Key:  
 \* = samples taken hourly, not based on tidal flow  
 X = Sample Collected at this Location  
 XX = Field Duplicate Taken  
 XBKN = Duplicate sample collected but did not arrive at the lab intact  
 BKNX = Duplicate sample collected, primary sample did not arrive at the lab intact  
 --- = Sample Not Collected  
 BKN = Sample collected but broken en route to laboratory. No product recovered.  
 EQ = Equipment error

**Table 4-1**  
**Santa Margarita River**  
**Samples Collected and Analyzed for Storm Water Events 1, 2 and 3**

Lab	MSI																	
Sample Location ID	Ammonium-N						Nitrate + Nitrite-N						Orthophosphate					
	High Tide			Low Tide			High Tide			Low Tide			High Tide			Low Tide		
	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3
Polutagraph 1*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 2*	X	BKN	X	---	---	---	X	BKN	X	---	---	---	X	BKN	X	---	---	---
Polutagraph 3*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 4*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 5*	X	BKN	X	---	---	---	X	BKN	X	---	---	---	X	BKN	X	---	---	---
Polutagraph 6*	X	BKN	X	---	---	---	X	BKN	X	---	---	---	X	BKN	X	---	---	---
Polutagraph 7*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 8*	X	BKN	X	---	---	---	X	BKN	X	---	---	---	X	BKN	X	---	---	---
Polutagraph 9*	EQ	X	X	---	---	---	EQ	X	X	---	---	---	EQ	X	X	---	---	---
Polutagraph 10*	EQ	BKN	X	---	---	---	EQ	BKN	X	---	---	---	EQ	BKN	X	---	---	---
Ocean Inlet	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X
Segment 1	X	XBKN	X	XX	BKN	XX	X	XBKN	X	XX	BKN	XX	X	XBKN	X	XX	BKN	XX
Segment 2	X	BKN	X	X	X	XX	X	BKN	X	X	X	XX	X	BKN	X	X	X	XX
<b>TOTAL</b>	37						37						37					

Key:  
 \* = samples taken hourly, not based on tidal flow  
 X = Sample Collected at this Location  
 XX = Field Duplicate Taken  
 XBKN = Duplicate sample collected but did not arrive at the lab intact  
 BKNX = Duplicate sample collected, primary sample did not arrive at the lab intact  
 --- = Sample Not Collected  
 BKN = Sample collected but broken en route to laboratory. No product recovered.  
 EQ = Equipment error

**Table 4-1  
Santa Margarita River  
Samples Collected and Analyzed for Storm Water Events 1, 2 and 3**

Lab		UGA																	
Sample Location ID	Nitrite						Total Nitrogen						Total Dissolved Nitrogen						
	High Tide			Low Tide			High Tide			Low Tide			High Tide			Low Tide			
	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	
Polutagraph 1*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---	
Polutagraph 2*	X	BKN	X	---	---	---	X	X	X	---	---	---	X	BKN	X	---	---	---	
Polutagraph 3*	X	X	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---	
Polutagraph 4*	X	X	X	---	---	---	X	X	X	---	---	---	X	BKN	X	---	---	---	
Polutagraph 5*	X	BKN	X	---	---	---	X	BKN	X	---	---	---	X	X	X	---	---	---	
Polutagraph 6*	X	BKN	X	---	---	---	X	X	X	---	---	---	X	X	X	---	---	---	
Polutagraph 7*	X	X	X	---	---	---	X	X	X	---	---	---	X	BKN	X	---	---	---	
Polutagraph 8*	X	BKN	X	---	---	---	X	BKN	X	---	---	---	X	X	X	---	---	---	
Polutagraph 9*	EQ	X	X	---	---	---	EQ	X	X	---	---	---	EQ	X	X	---	---	---	
Polutagraph 10*	EQ	BKN	X	---	---	---	EQ	X	X	---	---	---	EQ	BKN	X	---	---	---	
Ocean Inlet	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X	
Segment 1	X	XBKN	X	XX	BKN	XX	X	BKNX	X	XX	X	XX	X	XX	X	XX	X	XX	
Segment 2	X	BKN	X	X	X	XX	X	X	X	X	X	XX	X	BKN	X	X	X	XX	
<b>TOTAL</b>	37						41						39						

Key:  
 \* = samples taken hourly, not based on tidal flow  
 X = Sample Collected at this Location  
 XX = Field Duplicate Taken  
 XBKN = Duplicate sample collected but did not arrive at the lab intact  
 BKNX = Duplicate sample collected, primary sample did not arrive at the lab intact  
 --- = Sample Not Collected  
 BKN = Sample collected but broken en route to laboratory. No product recovered.  
 EQ = Equipment error

**Table 4-1  
Santa Margarita River  
Samples Collected and Analyzed for Storm Water Events 1, 2 and 3**

Lab	UGA											
Sample Location ID	Total Phosphorus						Total Dissolved Phosphorus					
	High Tide			Low Tide			High Tide			Low Tide		
	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3	SW #1	SW #2	SW #3
Polutagraph 1*	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 2*	X	X	X	---	---	---	X	BKN	X	---	---	---
Polutagraph 3*	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 4*	X	X	X	---	---	---	X	BKN	X	---	---	---
Polutagraph 5*	X	BKN	X	---	---	---	X	X	X	---	---	---
Polutagraph 6*	X	X	X	---	---	---	X	X	X	---	---	---
Polutagraph 7*	X	XX	X	---	---	---	X	BKN	X	---	---	---
Polutagraph 8*	X	BKN	X	---	---	---	X	X	X	---	---	---
Polutagraph 9*	EQ	X	X	---	---	---	EQ	X	X	---	---	---
Polutagraph 10*	EQ	X	X	---	---	---	EQ	BKN	X	---	---	---
Ocean Inlet	EQ	X	X	EQ	X	X	EQ	X	X	EQ	X	X
Segment 1	X	BKNX	X	XX	X	XX	X	XX	X	XX	X	XX
Segment 2	X	X	X	X	X	XX	X	BKN	X	X	X	XX
<b>TOTAL</b>	41						39					

Key:  
 \* = samples taken hourly, not based on tidal flow  
 X = Sample Collected at this Location  
 XX = Field Duplicate Taken  
 XBKN = Duplicate sample collected but did not arrive at the lab intact  
 BKNX = Duplicate sample collected, primary sample did not arrive at the lab intact  
 --- = Sample Not Collected  
 BKN = Sample collected but broken en route to laboratory. No product recovered.  
 EQ = Equipment error

**Table 4-5  
Santa Margarita River  
Samples Collected and Analyzed for Index 4 Event**

Lab	CRG																																			
Sample Location ID	Cabonaceous Biological Oxygen Demand												Chlorophyll a												Total Suspended Solids											
	High Tide						Low Tide						High Tide						Low Tide						High Tide			Low Tide								
	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6
Mass Emmision*	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ocean Inlet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Segment 1	XX	XX	X	X	X	X	X	X	XX	XX	X	X	XX	XX	X	X	X	X	X	X	XX	XX	X	X	XX	XX	X	X	X	X	X	X	XX	XX	X	X
Segment 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Storm Drain	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Transect 1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Transect 2	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Transect 3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Transect 4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Transect 5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Transect 6	---	---	---	XX	---	---	---	---	---	---	---	---	---	---	---	XX	---	---	---	---	---	---	---	---	---	---	---	XX	---	---	---	---	---	X	---	---
Transect 7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Transect 8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	XX	---	---
Transect 9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	XX	---	---	---	---	---	---	---	---	---	---	---	XX	---	---	---	---	---	X	---	---
Transect 10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Transect 11	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Transect 12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	---	---	---	---	---	---	X	---	---	---	---	---	X	---	---
Field Blank*	X	X	X	X	X	X	---	---	---	---	---	---	X	X	X	X	X	X	---	---	---	---	---	---	X	X	X	X	X	X	---	---	---	---	---	---
<b>TOTAL</b>	48												66												66											

Key:  
 \* = At ME Site, only one sample is taken; not based on tidal flow; Completely dry conditions during Index 4 period  
 X = Sample Collected at this Location  
 XX = Field Duplicate Taken  
 --- = Sample Not Collected  
 BKN- Sample collected but broke en route to laboratory. No product recovered.  
 LB = Sample lost during lab centrifugation; bottle broke

**Table 4-5**  
**Santa Margarita River**  
**Samples Collected and Analyzed for Index 4 Event**

Lab	MSI																																															
Sample Location ID	Ammonium-N												Nitrate + Nitrite-N												Orthophosphate												Nitrite											
	High Tide						Low Tide						High Tide						Low Tide						High Tide						Low Tide																	
	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6						
Mass Emmission*	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ocean Inlet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Segment 1	XX	XX	X	X	X	X	X	X	XX	XX	X	X	XX	XX	X	X	X	X	X	X	XX	XX	X	X	XX	XX	X	X	X	X	XX	XX	X	X	X	X	XX	XX	X	X	X	X	X	X	X	X	X	X
Segment 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Storm Drain	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Transect 1	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 2	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 3	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 4	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 5	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 6	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---
Transect 7	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 8	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---
Transect 9	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---
Transect 10	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 11	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 12	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Field Blank*	X	X	X	X	LB	X	---	---	---	---	---	---	X	X	X	X	LB	X	---	---	---	---	---	---	X	X	X	X	LB	X	---	---	---	---	---	---	X	X	X	X	LB	X	---	---	---	---	---	---
<b>TOTAL</b>	65												65												65												65											

Key:  
 \* = At ME Site, only one sample is taken; not based on tidal flow; Completely dry conditions during Index 4 period  
 X = Sample Collected at this Location  
 XX = Field Duplicate Taken  
 --- = Sample Not Collected  
 BKN- Sample collected but broke en route to laboratory. No product recovered.  
 LB = Sample lost during lab centrifugation; bottle broke

**Table 4-5  
Santa Margarita River  
Samples Collected and Analyzed for Index 4 Event**

Lab	UGA																																															
Sample Location ID	Total Nitrogen												Total Dissolved Nitrogen												Total Phosphorus												Total Dissolved Phosphorus											
	High Tide						Low Tide						High Tide						Low Tide						High Tide						Low Tide																	
	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6	D1	D2	D3	D4	D5	D6						
Mass Emmission*	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ocean Inlet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Segment 1	XX	XX	X	X	X	X	X	X	XX	XX	X	X	XX	XX	X	X	X	X	X	X	XX	XX	X	X	XX	XX	X	X	X	X	XX	XX	X	X	X	X	XX	XX	X	X	X	X	X	X	X	X	X	X
Segment 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Storm Drain	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Transect 1	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 2	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 3	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 4	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 5	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 6	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---
Transect 7	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 8	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---
Transect 9	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---	---	---	XX	---	---	---	---	---	X	---	---	---
Transect 10	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 11	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Transect 12	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---	---	---	X	---	---	---
Field Blank*	X	X	X	X	X	X	---	---	---	---	---	---	X	X	X	X	X	X	---	---	---	---	---	---	X	X	X	X	X	X	---	---	---	---	---	---	X	X	X	X	X	X	---	---	---	---	---	---
<b>TOTAL</b>	66												66												66												66											

Key:  
 \* = At ME Site, only one sample is taken; not based on tidal flow; Completely dry conditions during Index 4 period  
 X = Sample Collected at this Location  
 XX = Field Duplicate Taken  
 --- = Sample Not Collected  
 BKN- Sample collected but broke en route to laboratory. No product recovered.  
 LB = Sample lost during lab centrifugation; bottle broke

**Table 6-1  
Santa Margarita River  
Field Duplicate Results**

Lab	Event	Analyte Name	Lab Sample ID	Result	Duplicate Lab Sample ID	Duplicate Result	Unit	RPD	Qualifier
CRG	Index 1	Carbonaceous Biochemical Oxygen Demand	SM-I1D3-S2H-1	-1	SM-I1D3-S2H-2	-1	mg/L	NC	
CRG	Index 1	Carbonaceous Biochemical Oxygen Demand	SM-I1D4-S1H-1	-2	SM-I1D4-S1H-2	5.9	mg/L	NC	
CRG	Index 1	Carbonaceous Biochemical Oxygen Demand	SM-I1D5-S1H-1	4	SM-I1D5-S1H-2	-2	mg/L	NC	
CRG	Index 1	Carbonaceous Biochemical Oxygen Demand	SM-I1-TR1H-1	-2	SM-I1-TR1H-2	-2	mg/L	NC	
CRG	Index 1	Chlorophyll a	SM-I1D3-S2H-1	4.5	SM-I1D3-S2H-2	7.1	mg/m3	44.83	J
CRG	Index 1	Chlorophyll a	SM-I1D5-S1H-1	29.4	SM-I1D5-S1H-2	18.7	mg/m3	44.49	J
CRG	Index 1	Chlorophyll a	SM-I1-TR1H-1	12.8	SM-I1-TR1H-2	14.6	mg/m3	13.14	
CRG	Index 1	Chlorophyll a	SM-I1-TR9L-1	7.1	SM-I1-TR9L-2	5.3	mg/m3	29.03	None
CRG	Index 1	Total Suspended Solids	SM-I1D3-S2H-1	9.5	SM-I1D3-S2H-2	8.5	mg/L	11.11	
CRG	Index 1	Total Suspended Solids	SM-I1D5-S1H-1	270	SM-I1D5-S1H-2	66	mg/L	121.43	J
CRG	Index 1	Total Suspended Solids	SM-I1-TR1H-1	4.7	SM-I1-TR1H-2	8	mg/L	51.97	None
CRG	Index 1	Total Suspended Solids	SM-I1-TR9L-1	8.7	SM-I1-TR9L-2	6.3	mg/L	32.00	None
MSI	Index 1	Ammonia	SM-I1D3-S1H-1	0.04	SM-I1D3-S1H-2	0.03	mg/L	19.61	
MSI	Index 1	Ammonia	SM-I1D4-S1H-1	0.095	SM-I1D4-S1H-2	0.29	mg/L	102.16	J
MSI	Index 1	Ammonia	SM-I1D5-S1H-1	0.58	SM-I1D5-S1H-2	0.47	mg/L	19.49	
MSI	Index 1	Ammonia	SM-I1D6-S1H-1	0.36	SM-I1D6-S1H-2	0.34	mg/L	5.62	
MSI	Index 1	Ammonia	SM-I1-TR1H-1	0.0029	SM-I1-TR1H-2	0.003	mg/L	4.88	
MSI	Index 1	Ammonia	SM-I1-TR9L-1	0.02	SM-I1-TR9L-2	0.04	mg/L	54.55	J
MSI	Index 1	Nitrate + Nitrite	SM-I1D3-S1H-1	5.379	SM-I1D3-S1H-2	3.63	mg/L	38.88	J
MSI	Index 1	Nitrate + Nitrite	SM-I1D4-S1H-1	2.56	SM-I1D4-S1H-2	3.84	mg/L	39.82	J
MSI	Index 1	Nitrate + Nitrite	SM-I1D5-S1H-1	15.86	SM-I1D5-S1H-2	15.93	mg/L	0.44	
MSI	Index 1	Nitrate + Nitrite	SM-I1D6-S1H-1	27.26	SM-I1D6-S1H-2	29.51	mg/L	7.94	
MSI	Index 1	Nitrate + Nitrite	SM-I1-TR1H-1	0.03	SM-I1-TR1H-2	0.03	mg/L	5.41	
MSI	Index 1	Nitrate + Nitrite	SM-I1-TR9L-1	2.30	SM-I1-TR9L-2	3.04	mg/L	27.82	J
MSI	Index 1	Nitrite	SM-I1D3-S1H-1	0.02	SM-I1D3-S1H-2	0.02	mg/L	42.86	J
MSI	Index 1	Nitrite	SM-I1D4-S1H-1	0.01	SM-I1D4-S1H-2	0.02	mg/L	51.85	J
MSI	Index 1	Nitrite	SM-I1D5-S1H-1	0.13	SM-I1D5-S1H-2	0.23	mg/L	53.70	J
MSI	Index 1	Nitrite	SM-I1D6-S1H-1	0.62	SM-I1D6-S1H-2	0.39	mg/L	45.64	J
MSI	Index 1	Nitrite	SM-I1-TR1H-1	0.0028	SM-I1-TR1H-2	0.0014	mg/L	66.67	None
MSI	Index 1	Nitrite	SM-I1-TR9L-1	0.01	SM-I1-TR9L-2	0.01	mg/L	3.82	
MSI	Index 1	Orthophosphate	SM-I1D3-S1H-1	0.15	SM-I1D3-S1H-2	0.12	mg/L	21.18	
MSI	Index 1	Orthophosphate	SM-I1D4-S1H-1	0.09	SM-I1D4-S1H-2	0.07	mg/L	26.42	J
MSI	Index 1	Orthophosphate	SM-I1D5-S1H-1	0.12	SM-I1D5-S1H-2	0.20	mg/L	50.00	J
MSI	Index 1	Orthophosphate	SM-I1D6-S1H-1	0.27	SM-I1D6-S1H-2	0.20	mg/L	26.32	J
MSI	Index 1	Orthophosphate	SM-I1-TR1H-1	0.02	SM-I1-TR1H-2	0.02	mg/L	0.00	
MSI	Index 1	Orthophosphate	SM-I1-TR9L-1	0.09	SM-I1-TR9L-2	0.11	mg/L	13.37	
UGA	Index 1	Total Dissolved Nitrogen	SM-I1D3-S1H-1	5.74	SM-I1D3-S1H-2	7.62	mg/L	NC	
UGA	Index 1	Total Dissolved Nitrogen	SM-I1D4-S1H-1	5.21	SM-I1D4-S1H-2	6.08	mg/L	NC	
UGA	Index 1	Total Dissolved Nitrogen	SM-I1D5-S1H-1	33.18	SM-I1D5-S1H-2	31.93	mg/L	NC	
UGA	Index 1	Total Dissolved Nitrogen	SM-I1D6-S1H-1	85.96	SM-I1D6-S1H-2	80.75	mg/L	NC	
UGA	Index 1	Total Dissolved Nitrogen	SM-I1-TR1H-1	0.42	SM-I1-TR1H-2	0.48	mg/L	NC	
UGA	Index 1	Total Dissolved Nitrogen	SM-I1-TR9L-1	6.59	SM-I1-TR9L-2	4.48	mg/L	NC	
UGA	Index 1	Total Dissolved Phosphorus	SM-I1D3-S1H-1	0.15	SM-I1D3-S1H-2	0.13	mg/L	13.70	
UGA	Index 1	Total Dissolved Phosphorus	SM-I1D4-S1H-1	0.12	SM-I1D4-S1H-2	0.14	mg/L	16.81	
UGA	Index 1	Total Dissolved Phosphorus	SM-I1D5-S1H-1	0.22	SM-I1D5-S1H-2	0.28	mg/L	24.56	
UGA	Index 1	Total Dissolved Phosphorus	SM-I1D6-S1H-1	0.36	SM-I1D6-S1H-2	0.37	mg/L	1.68	
UGA	Index 1	Total Dissolved Phosphorus	SM-I1-TR1H-1	0	SM-I1-TR1H-2	0.0028	mg/L	200.00	NA
UGA	Index 1	Total Dissolved Phosphorus	SM-I1-TR9L-1	0.11	SM-I1-TR9L-2	0.14	mg/L	25.04	None
UGA	Index 1	Total Nitrogen	SM-I1D2-S1H-1	3.57	SM-I1D2-S1H-2	3.93	mg/L	9.56	
UGA	Index 1	Total Nitrogen	SM-I1D3-S1H-1	4.05	SM-I1D3-S1H-2	5.17	mg/L	24.16	
UGA	Index 1	Total Nitrogen	SM-I1D4-S1H-1	6.54	SM-I1D4-S1H-2	6.40	mg/L	2.14	
UGA	Index 1	Total Nitrogen	SM-I1D5-S1H-1	49.12	SM-I1D5-S1H-2	31.79	mg/L	42.83	J
UGA	Index 1	Total Nitrogen	SM-I1-TR1H-1	0.45	SM-I1-TR1H-2	0.43	mg/L	4.56	
UGA	Index 1	Total Nitrogen	SM-I1-TR9L-1	2.30	SM-I1-TR9L-2	2.79	mg/L	19.26	
UGA	Index 1	Total Phosphorus	SM-I1D3-S1H-1	0.15	SM-I1D3-S1H-2	0.17	mg/L	12.08	
UGA	Index 1	Total Phosphorus	SM-I1D4-S1H-1	0.14	SM-I1D4-S1H-2	0.13	mg/L	11.04	
UGA	Index 1	Total Phosphorus	SM-I1D6-S1H-1	0.35	SM-I1D6-S1H-2	0.37	mg/L	-6.89	
UGA	Index 1	Total Phosphorus	SM-I1-TR1H-1	0	SM-I1-TR1H-2	0.01	mg/L	200.00	None
UGA	Index 1	Total Phosphorus	SM-I1-TR9L-1	0.11	SM-I1-TR9L-2	0.05	mg/L	81.52	J
CRG	Index 2	Biochemical Oxygen Demand	SM-I2D1-S1L-1	1.8	SM-I2D1-S1L-2	-0.58	mg/L	NC	None
CRG	Index 2	Biochemical Oxygen Demand	SM-I2D2-S1H-1	1.4	SM-I2D2-S1H-2	-0.58	mg/L	NC	None
CRG	Index 2	Biochemical Oxygen Demand	SM-I2D4-S1H-1	-0.58	SM-I2D4-S1H-2	-0.58	mg/L	NC	
CRG	Index 2	Carbonaceous Biochemical Oxygen Demand	SM-I2D3-S1H-1	-2	SM-I2D3-S1H-2	-2	mg/L	NC	
CRG	Index 2	Carbonaceous Biochemical Oxygen Demand	SM-I2D5-S1H-1	-2	SM-I2D5-S1H-2	-2	mg/L	NC	
CRG	Index 2	Chlorophyll a	SM-I2D1-S1L-1	18.8	SM-I2D1-S1L-2	15.2	mg/m3	21.18	
CRG	Index 2	Chlorophyll a	SM-I2D2-S1H-1	16.7	SM-I2D2-S1H-2	18.7	mg/m3	11.30	
CRG	Index 2	Chlorophyll a	SM-I2D3-S1H-1	16	SM-I2D3-S1H-2	16	mg/m3	0.00	
CRG	Index 2	Chlorophyll a	SM-I2D4-S1H-1	10.7	SM-I2D4-S1H-2	9.3	mg/m3	14.00	
CRG	Index 2	Chlorophyll a	SM-I2-TR3H-1	32.9	SM-I2-TR3H-2	24.9	mg/m3	27.68	J
CRG	Index 2	Total Suspended Solids	SM-I2D1-S1L-1	44.5	SM-I2D1-S1L-2	81.3	mg/L	58.51	J

**Table 6-1**  
**Santa Margarita River**  
**Field Duplicate Results**

Lab	Event	Analyte Name	Lab Sample ID	Result	Duplicate Lab Sample ID	Duplicate Result	Unit	RPD	Qualifier
CRG	Index 2	Total Suspended Solids	SM-I2D3-S1H-1	4	SM-I2D3-S1H-2	4.7	mg/L	16.09	
CRG	Index 2	Total Suspended Solids	SM-I2D4-S1H-1	6.7	SM-I2D4-S1H-2	5.70	mg/L	16.13	
CRG	Index 2	Total Suspended Solids	SM-I2D5-S1H-1	4.3	SM-I2D5-S1H-2	4.3	mg/L	0.00	
CRG	Index 2	Total Suspended Solids	SM-I2-TR3H-1	15	SM-I2-TR3H-2	25.4	mg/L	51.49	J
MSI	Index 2	Ammonia	SM-I2D1-S1L-1	0.56	SM-I2D1-S1L-2	0.57	mg/L	1.50	
MSI	Index 2	Ammonia	SM-I2D2-S1H-1	0.032	SM-I2D2-S1H-2	0.035	mg/L	8.33	
MSI	Index 2	Ammonia	SM-I2D3-S1H-1	0.034	SM-I2D3-S1H-2	0.035	mg/L	4.08	
MSI	Index 2	Ammonia	SM-I2D4-S1H-1	0.035	SM-I2D4-S1H-2	0.038	mg/L	7.69	
MSI	Index 2	Ammonia	SM-I2D5-S1H-1	0.039	SM-I2D5-S1H-2	0.032	mg/L	19.61	
MSI	Index 2	Ammonia	SM-I2-TR3L-1	0.050	SM-I2-TR3L-2	0.046	mg/L	8.70	
MSI	Index 2	Ammonia	SM-I2-TR7L-1	0.027	SM-I2-TR7L-2	0.027	mg/L	0.00	
MSI	Index 2	Nitrate + Nitrite	SM-I2D1-S1L-1	34	SM-I2D1-S1L-2	36	mg/L	5.71	
MSI	Index 2	Nitrate + Nitrite	SM-I2D2-S1H-1	0.57	SM-I2D2-S1H-2	0.53	mg/L	6.86	
MSI	Index 2	Nitrate + Nitrite	SM-I2D3-S1H-1	0.50	SM-I2D3-S1H-2	0.50	mg/L	0.56	
MSI	Index 2	Nitrate + Nitrite	SM-I2D4-S1H-1	0.28	SM-I2D4-S1H-2	0.27	mg/L	2.56	
MSI	Index 2	Nitrate + Nitrite	SM-I2D5-S1H-1	0.20	SM-I2D5-S1H-2	0.16	mg/L	23.08	
MSI	Index 2	Nitrate + Nitrite	SM-I2-TR3L-1	0.33	SM-I2-TR3L-2	0.24	mg/L	30.96	J
MSI	Index 2	Nitrate + Nitrite	SM-I2-TR7L-1	0.44	SM-I2-TR7L-2	0.45	mg/L	1.88	
MSI	Index 2	Nitrite	SM-I2D1-S1L-1	1.3	SM-I2D1-S1L-2	1.4	mg/L	2.37	
MSI	Index 2	Nitrite	SM-I2D2-S1H-1	0.008	SM-I2D2-S1H-2	0.008	mg/L	0.00	
MSI	Index 2	Nitrite	SM-I2D3-S1H-1	0.008	SM-I2D3-S1H-2	0.007	mg/L	18.18	
MSI	Index 2	Nitrite	SM-I2D4-S1H-1	0.007	SM-I2D4-S1H-2	0.006	mg/L	22.22	
MSI	Index 2	Nitrite	SM-I2D5-S1H-1	0.004	SM-I2D5-S1H-2	0.004	mg/L	0.00	
MSI	Index 2	Nitrite	SM-I2-TR3L-1	0.006	SM-I2-TR3L-2	0.004	mg/L	28.57	None
MSI	Index 2	Nitrite	SM-I2-TR7L-1	0.007	SM-I2-TR7L-2	0.007	mg/L	0.00	
MSI	Index 2	Orthophosphate	SM-I2D1-S1L-1	0.61	SM-I2D1-S1L-2	0.64	mg/L	5.94	
MSI	Index 2	Orthophosphate	SM-I2D2-S1H-1	0.10	SM-I2D2-S1H-2	0.074	mg/L	25.45	J
MSI	Index 2	Orthophosphate	SM-I2D3-S1H-1	0.087	SM-I2D3-S1H-2	0.093	mg/L	6.90	
MSI	Index 2	Orthophosphate	SM-I2D4-S1H-1	0.053	SM-I2D4-S1H-2	0.074	mg/L	34.15	J
MSI	Index 2	Orthophosphate	SM-I2D5-S1H-1	0.10	SM-I2D5-S1H-2	0.093	mg/L	6.45	
MSI	Index 2	Orthophosphate	SM-I2-TR3L-1	0.11	SM-I2-TR3L-2	0.10	mg/L	12.12	
MSI	Index 2	Orthophosphate	SM-I2-TR7L-1	0.10	SM-I2-TR7L-2	0.11	mg/L	8.70	
UGA	Index 2	Total Dissolved Nitrogen	SM-I2D1-S1L-1	44.626	SM-I2D1-S1L-2	50.3468	mg/L	NC	
UGA	Index 2	Total Dissolved Nitrogen	SM-I2D2-S1H-1	7.2513	SM-I2D2-S1H-2	3.8648	mg/L	NC	
UGA	Index 2	Total Dissolved Nitrogen	SM-I2D3-S1H-1	7.8375	SM-I2D3-S1H-2	4.0219	mg/L	NC	
UGA	Index 2	Total Dissolved Nitrogen	SM-I2D4-S1H-1	4.78	SM-I2D4-S1H-2	1.15	mg/L	NC	
UGA	Index 2	Total Dissolved Nitrogen	SM-I2D5-S1H-1	2.6967	SM-I2D5-S1H-2	1.0875	mg/L	NC	
UGA	Index 2	Total Dissolved Nitrogen	SM-I2-TR3H-1	0.6654	SM-I2-TR3H-2	0.8595	mg/L	NC	
UGA	Index 2	Total Dissolved Nitrogen	SM-I2-TR7L-1	1.0742	SM-I2-TR7L-2	0.8012	mg/L	NC	
UGA	Index 2	Total Dissolved Phosphorus	SM-I2D1-S1L-1	0.7493	SM-I2D1-S1L-2	0.6884	mg/L	8.47	
UGA	Index 2	Total Dissolved Phosphorus	SM-I2D2-S1H-1	0.1497	SM-I2D2-S1H-2	0.1152	mg/L	26.05	J
UGA	Index 2	Total Dissolved Phosphorus	SM-I2D3-S1H-1	0.1243	SM-I2D3-S1H-2	0.1245	mg/L	0.16	
UGA	Index 2	Total Dissolved Phosphorus	SM-I2D4-S1H-1	0.1053	SM-I2D4-S1H-2	0.0913	mg/L	14.24	
UGA	Index 2	Total Dissolved Phosphorus	SM-I2D5-S1H-1	0.098	SM-I2D5-S1H-2	0.1116	mg/L	12.98	
UGA	Index 2	Total Dissolved Phosphorus	SM-I2-TR3H-1	0.1043	SM-I2-TR3H-2	0.0965	mg/L	7.77	
UGA	Index 2	Total Dissolved Phosphorus	SM-I2-TR7L-1	0.1235	SM-I2-TR7L-2	0.107	mg/L	14.32	
UGA	Index 2	Total Nitrogen	SM-I2D1-S1L-1	24.64	SM-I2D1-S1L-2	42.91	mg/L	54.10	J
UGA	Index 2	Total Nitrogen	SM-I2D2-S1H-1	0.89	SM-I2D2-S1H-2	0.96	mg/L	7.79	
UGA	Index 2	Total Nitrogen	SM-I2D3-S1H-1	1.00	SM-I2D3-S1H-2	0.89	mg/L	11.06	
UGA	Index 2	Total Nitrogen	SM-I2D4-S1H-1	0.77	SM-I2D4-S1H-2	0.63	mg/L	21.02	
UGA	Index 2	Total Nitrogen	SM-I2D5-S1H-1	0.69	SM-I2D5-S1H-2	0.53	mg/L	27.55	J
UGA	Index 2	Total Nitrogen	SM-I2-TR3H-1	0.79	SM-I2-TR3H-2	0.62	mg/L	25.11	J
UGA	Index 2	Total Nitrogen	SM-I2-TR7L-1	0.89	SM-I2-TR7L-2	0.85	mg/L	4.62	
UGA	Index 2	Total Phosphorus	SM-I2D1-S1L-1	0.78	SM-I2D1-S1L-2	0.75	mg/L	3.96	
UGA	Index 2	Total Phosphorus	SM-I2D2-S1H-1	0.09	SM-I2D2-S1H-2	0.12	mg/L	30.17	J
UGA	Index 2	Total Phosphorus	SM-I2D3-S1H-1	0.13	SM-I2D3-S1H-2	0.13	mg/L	4.38	
UGA	Index 2	Total Phosphorus	SM-I2D4-S1H-1	0.12	SM-I2D4-S1H-2	0.12	mg/L	1.85	
UGA	Index 2	Total Phosphorus	SM-I2D5-S1H-1	0.104	SM-I2D5-S1H-2	0.14	mg/L	28.24	J
UGA	Index 2	Total Phosphorus	SM-I2-TR3H-1	0.102	SM-I2-TR3H-2	0.11	mg/L	9.25	
UGA	Index 2	Total Phosphorus	SM-I2-TR7L-1	0.12	SM-I2-TR7L-2	0.13	mg/L	10.24	
CRG	Index3	Carbonaceous Biochemical Oxygen Demand	SM-I3-TR6H-1	-2.00	SM-I3-TR6H-2	-2.00	mg/L	NC	
CRG	Index3	Chlorophyll a	SM-I3-TR6H-1	8.40	SM-I3-TR6H-2	6.70	mg/m3	22.52	
CRG	Index3	Chlorophyll a	SM-I3-TR8L-1	13.80	SM-I3-TR8L-2	12.00	mg/m3	13.95	
CRG	Index3	Chlorophyll a	SM-I3-TR9H-1	9.30	SM-I3-TR9H-2	5.30	mg/m3	54.79	J
CRG	Index3	Total Suspended Solids	SM-I3D3-S1H-1	20.80	SM-I3D3-S1H-2	56.30	mg/L	92.09	J
CRG	Index3	Total Suspended Solids	SM-I3-TR6H-1	5.70	SM-I3-TR6H-2	2.50	mg/L	78.05	None
CRG	Index3	Total Suspended Solids	SM-I3-TR8L-1	3.50	SM-I3-TR8L-2	4.50	mg/L	25.00	None
CRG	Index3	Total Suspended Solids	SM-I3-TR9H-1	8.50	SM-I3-TR9H-2	6.50	mg/L	26.67	J
MSI	Index3	Ammonia	SM-I3-TR6H-1	0.04	SM-I3-TR6H-2	0.04	mg/L	13.33	
MSI	Index3	Ammonia	SM-I3-TR8L-1	0.65	SM-I3-TR8L-2	0.37	mg/L	54.40	J

**Table 6-1**  
**Santa Margarita River**  
**Field Duplicate Results**

Lab	Event	Analyte Name	Lab Sample ID	Result	Duplicate Lab Sample ID	Duplicate Result	Unit	RPD	Qualifier
MSI	Index3	Nitrate + Nitrite	SM-I3-TR8L-1	0.15	SM-I3-TR8L-2	0.14	mg/L	9.62	
MSI	Index3	Nitrate + Nitrite	SM-I3-TR9H-1	0.01	SM-I3-TR9H-2	0.01	mg/L	0.00	
MSI	Index3	Nitrate	SM-I3D3-S1H-1	0.04	SM-I3D3-S1H-2	0.04	mg/L	3.64	
MSI	Index3	Nitrite	SM-I3-TR8L-1	0.01	SM-I3-TR8L-2	0.01	mg/L	11.76	
MSI	Index3	Nitrite	SM-I3-TR9H-1	0.01	SM-I3-TR9H-2	0.01	mg/L	0.00	
MSI	Index3	Orthophosphate	SM-I3D3-S1H-1	0.09	SM-I3D3-S1H-2	0.13	mg/L	40.00	J
MSI	Index3	Orthophosphate	SM-I3-TR8L-1	0.07	SM-I3-TR8L-2	0.04	mg/L	66.67	J
MSI	Index3	Orthophosphate	SM-I3-TR9H-1	0.25	SM-I3-TR9H-2	0.18	mg/L	30.22	J
UGA	Index3	Total Dissolved Nitrogen	SM-I3D3-S1H-1	2.56	SM-I3D3-S1H-2	2.75	mg/L	NC	
UGA	Index3	Total Dissolved Nitrogen	SM-I3-TR8L-1	1.64	SM-I3-TR8L-2	0.92	mg/L	NC	
UGA	Index3	Total Dissolved Nitrogen	SM-I3-TR9H-1	0.60	SM-I3-TR9H-2	0.62	mg/L	NC	
UGA	Index3	Total Dissolved Phosphorus	SM-I3D3-S1H-1	0.15	SM-I3D3-S1H-2	0.15	mg/L	1.91	
UGA	Index3	Total Dissolved Phosphorus	SM-I3-TR8L-1	0.07	SM-I3-TR8L-2	0.05	mg/L	37.80	None
UGA	Index3	Total Dissolved Phosphorus	SM-I3-TR9H-1	0.23	SM-I3-TR9H-2	0.22	mg/L	6.90	
UGA	Index3	Total Nitrogen	SM-I3D3-S1H-1	1.51	SM-I3D3-S1H-2	1.69	mg/L	11.28	
UGA	Index3	Total Nitrogen	SM-I3-TR8L-1	0.56	SM-I3-TR8L-2	0.52	mg/L	7.84	
UGA	Index3	Total Nitrogen	SM-I3-TR9H-1	0.60	SM-I3-TR9H-2	0.58	mg/L	3.30	
UGA	Index3	Total Phosphorus	SM-I3D3-S1H-1	0.24	SM-I3D3-S1H-2	0.18	mg/L	26.33	J
UGA	Index3	Total Phosphorus	SM-I3-TR8L-1	0.09	SM-I3-TR8L-2	0.09	mg/L	4.74	
UGA	Index3	Total Phosphorus	SM-I3-TR9H-1	0.24	SM-I3-TR9H-2	0.20	mg/L	16.50	
CRG	Index4	Carbonaceous Biochemical Oxygen Demand	SM-I4D1-S1H-1	-2	SM-I4D1-S1H-2	-2	mg/L	NC	
CRG	Index4	Carbonaceous Biochemical Oxygen Demand	SM-I4D3-S1L-1	-1	SM-I4D3-S1L-2	-1	mg/L	NC	
CRG	Index4	Carbonaceous Biochemical Oxygen Demand	SM-I4D4-S1L-1	-2	SM-I4D4-S1L-2	-2	mg/L	NC	
CRG	Index4	Chlorophyll a	SM-I4D1-S1H-1	4	SM-I4D1-S1H-2	4	mg/m3	0.00	
CRG	Index4	Chlorophyll a	SM-I4D3-S1L-1	1.3	SM-I4D3-S1L-2	2.7	mg/m3	70.00	None
CRG	Index4	Chlorophyll a	SM-I4-TR8L-1	3.1	SM-I4-TR8L-2	3.6	mg/m3	14.93	
CRG	Index4	Chlorophyll a	SM-I4D4-S1L-1	-1	SM-I4D4-S1L-2	2.7	mg/m3	NC	
CRG	Index4	Total Suspended Solids	SM-I4D1-S1H-1	5	SM-I4D1-S1H-2	9	mg/L	57.14	None
CRG	Index4	Total Suspended Solids	SM-I4D3-S1L-1	3	SM-I4D3-S1L-2	4	mg/L	28.57	None
CRG	Index4	Total Suspended Solids	SM-I4-TR8L-1	2.7	SM-I4-TR8L-2	3.7	mg/L	31.25	None
CRG	Index4	Total Suspended Solids	SM-I4D4-S1L-1	3.5	SM-I4D4-S1L-2	2.3	mg/L	41.38	None
MSI	Index4	Ammonia	SM-I4D1-S1H-1	0.028014	SM-I4D1-S1H-2	0.0406203	mg/L	36.73	J
MSI	Index4	Ammonia	SM-I4D3-S1L-1	0.0616308	SM-I4D3-S1L-2	0.0350175	mg/L	55.07	J
MSI	Index4	Ammonia	SM-I4-TR8L-1	0.0084042	SM-I4-TR8L-2	0.0070035	mg/L	18.18	
MSI	Index4	Ammonia	SM-I4D4-S1L-1	0.0644322	SM-I4D4-S1L-2	0.5196597	mg/L	155.88	J
MSI	Index4	Nitrate + Nitrite	SM-I4D1-S1H-1	2.185092	SM-I4D1-S1H-2	2.185092	mg/L	0.00	
MSI	Index4	Nitrate + Nitrite	SM-I4D3-S1L-1	0.1848924	SM-I4D3-S1L-2	0.1764882	mg/L	4.65	
MSI	Index4	Nitrate + Nitrite	SM-I4-TR8L-1	0.0448224	SM-I4-TR8L-2	0.0434217	mg/L	3.17	
MSI	Index4	Nitrate + Nitrite	SM-I4D4-S1L-1	0.0336168	SM-I4D4-S1L-2	0.0504252	mg/L	40.00	None
MSI	Index4	Nitrite	SM-I4D1-S1H-1	0.0602301	SM-I4D1-S1H-2	0.0630315	mg/L	4.55	
MSI	Index4	Nitrite	SM-I4D3-S1L-1	0.0196098	SM-I4D3-S1L-2	0.0168084	mg/L	15.38	
MSI	Index4	Nitrite	SM-I4D4-S1L-1	0.0028014	SM-I4D4-S1L-2	0.0056028	mg/L	66.67	None
MSI	Index4	Orthophosphate	SM-I4D1-S1H-1	0.0805324	SM-I4D1-S1H-2	0.0960194	mg/L	17.54	
MSI	Index4	Orthophosphate	SM-I4D3-S1L-1	0.092922	SM-I4D3-S1L-2	0.0867272	mg/L	6.90	
MSI	Index4	Orthophosphate	SM-I4-TR8L-1	0.1424804	SM-I4-TR8L-2	0.1486752	mg/L	4.26	
MSI	Index4	Orthophosphate	SM-I4D4-S1L-1	0.0185844	SM-I4D4-S1L-2	0.030974	mg/L	50.00	J
UGA	Index4	Total Dissolved Nitrogen	SM-I4D1-S1H-1	6.8636	SM-I4D1-S1H-2	8.7262	mg/L	NC	
UGA	Index4	Total Dissolved Nitrogen	SM-I4D3-S1L-1	1.1325	SM-I4D3-S1L-2	1.1387	mg/L	NC	
UGA	Index4	Total Dissolved Nitrogen	SM-I4-TR8L-1	0.8407	SM-I4-TR8L-2	0.7478	mg/L	NC	
UGA	Index4	Total Dissolved Nitrogen	SM-I4D4-S1L-1	1.0787	SM-I4D4-S1L-2	1.7104	mg/L	NC	
UGA	Index4	Total Dissolved Phosphorus	SM-I4D1-S1H-1	0.1273	SM-I4D1-S1H-2	0.1504	mg/L	16.64	
UGA	Index4	Total Dissolved Phosphorus	SM-I4D3-S1L-1	0.1096	SM-I4D3-S1L-2	0.1253	mg/L	13.37	
UGA	Index4	Total Dissolved Phosphorus	SM-I4-TR6H-2	0.1642	SM-I4-TR6H-MSMSD	0.1519	mg/L	7.78	
UGA	Index4	Total Dissolved Phosphorus	SM-I4-TR8L-1	0.194	SM-I4-TR8L-2	0.1695	mg/L	13.48	
UGA	Index4	Total Dissolved Phosphorus	SM-I4D4-S1L-1	0.0578	SM-I4D4-S1L-2	0.0589	mg/L	1.89	
UGA	Index4	Total Nitrogen	SM-I4D1-S1H-1	7.4257	SM-I4D1-S1H-2	7.8591	mg/L	5.67	
UGA	Index4	Total Nitrogen	SM-I4D3-S1L-1	1.2508	SM-I4D3-S1L-2	1.3148	mg/L	4.99	
UGA	Index4	Total Nitrogen	SM-I4-TR8L-1	0.7899	SM-I4-TR8L-2	0.647	mg/L	19.89	
UGA	Index4	Total Nitrogen	SM-I4D4-S1L-1	0.4634	SM-I4D4-S1L-2	0.4897	mg/L	5.52	
UGA	Index4	Total Phosphorus	SM-I4D1-S1H-1	0.1216	SM-I4D1-S1H-2	0.137	mg/L	11.91	
UGA	Index4	Total Phosphorus	SM-I4D3-S1L-1	0.1392	SM-I4D3-S1L-2	0.1325	mg/L	4.93	
UGA	Index4	Total Phosphorus	SM-I4-TR8L-1	0.2048	SM-I4-TR8L-2	0.1837	mg/L	10.86	
UGA	Index4	Total Phosphorus	SM-I4D4-S1L-1	0.0657	SM-I4D4-S1L-2	0.0681	mg/L	3.59	
MSI	Stormwater 1	Ammonia	SM-W1-S11L-1	0.01	SM-W1-S11L-3	0.01	mg/L	0.00	
CRG	Stormwater 1	Carbonaceous Biochemical Oxygen Demand	SM-W1-S11L-1	3.2	SM-W1-S11L-3	2.3	mg/L	32.73	None
CRG	Stormwater 1	Chlorophyll a	SM-W1-S11L-1	42.7	SM-W1-S11L-3	26.7	mg/m3	46.11	J
MSI	Stormwater 1	Nitrate + Nitrite	SM-W1-S11L-1	1.807	SM-W1-S11L-3	1.835	mg/L	1.54	
MSI	Stormwater 1	Nitrite	SM-W1-S11L-1	0.025	SM-W1-S11L-3	0.032	mg/L	24.56	
MSI	Stormwater 1	Orthophosphate	SM-W1-S11L-1	0.162	SM-W1-S11L-3	0.174	mg/L	7.14	
UGA	Stormwater 1	Total Dissolved Nitrogen	SM-W1-S11L-1	4.5940	SM-W1-S11L-3	4.8704	mg/L	NC	

**Table 6-1  
Santa Margarita River  
Field Duplicate Results**

Lab	Event	Analyte Name	Lab Sample ID	Result	Duplicate Lab Sample ID	Duplicate Result	Unit	RPD	Qualifier
UGA	Stormwater 1	Total Nitrogen	SM-W1-S11L-1	2.4079	SM-W1-S11L-3	2.3862	mg/L	0.91	
UGA	Stormwater 1	Total Phosphorus	SM-W1-S11L-1	0.2177	SM-W1-S11L-3	0.2223	mg/L	2.09	
CRG	Stormwater 1	Total Suspended Solids	SM-W1-S11L-1	228	SM-W1-S11L-3	356	mg/L	43.84	J
CRG	Stormwater 2	Carbonaceous Biochemical Oxygen Demand	SM-W2-S1H-1	-2	SM-W2-S1H-2	-2	mg/L	NC	
CRG	Stormwater 2	Chlorophyll a	SM-W2-S1H-1	14.80	SM-W2-S1H-2	14.8	mg/m3	0.00	
MSI	Stormwater 2	Nitrate + Nitrite	SM-W2-S1H-1	2.65	SM-W2-S1H-2	-88	mg/L	NC	
MSI	Stormwater 2	Orthophosphate	SM-W2-S1H-1	0.15	SM-W2-S1H-2	-88	mg/L	NC	
UGA	Stormwater 2	Total Dissolved Nitrogen	SM-W2-S1H-1	13.46	SM-W2-S1H-2	BKN	mg/L	NA	
UGA	Stormwater 2	Total Dissolved Phosphorus	SM-W2-S1H-1	BKN	SM-W2-S1H-2	BKN	mg/L	NA	
UGA	Stormwater 2	Total Nitrogen	SM-W2-S1H-1	BKN	SM-W2-S1H-2	BKN	mg/L	NA	
UGA	Stormwater 2	Total Phosphorus	SM-W2-S1H-1	BKN	SM-W2-S1H-2	BKN		NA	
CRG	Stormwater 3	Carbonaceous Biochemical Oxygen Demand	SM-W3-S1L-1	-2	SM-W3-S1L-2	-2	mg/L	NC	
CRG	Stormwater 3	Carbonaceous Biochemical Oxygen Demand	SM-W3-S2L-1	2.4	SM-W3-S2L-2	-2	mg/L	NC	
CRG	Stormwater 3	Chlorophyll a	SM-W3-S1L-1	1.3	SM-W3-S1L-2	1.8	mg/m3	32.26	None
CRG	Stormwater 3	Chlorophyll a	SM-W3-S2L-1	4.5	SM-W3-S2L-2	4.3	mg/m3	4.55	
CRG	Stormwater 3	Total Suspended Solids	SM-W3-S1L-1	4.3	SM-W3-S1L-2	4	mg/L	7.23	
CRG	Stormwater 3	Total Suspended Solids	SM-W3-S2L-1	1.8	SM-W3-S2L-2	4.3	mg/L	81.97	None
MSI	Stormwater 3	Ammonia	SM-W3-S1L-1	0.017	SM-W3-S1L-2	0.055	mg/L	105.56	J
MSI	Stormwater 3	Ammonia	SM-W3-S2L-1	0.099	SM-W3-S2L-2	0.084	mg/L	16.39	
MSI	Stormwater 3	Nitrate + Nitrite	SM-W3-S1L-1	0.43	SM-W3-S1L-2	0.40	mg/L	7.23	
MSI	Stormwater 3	Nitrate + Nitrite	SM-W3-S2L-1	0.076	SM-W3-S2L-2	0.059	mg/L	25.19	None
MSI	Stormwater 3	Nitrite	SM-W3-S1L-1	0.008	SM-W3-S1L-2	0.007	mg/L	13.33	
MSI	Stormwater 3	Nitrite	SM-W3-S2L-1	0.004	SM-W3-S2L-2	0.003	mg/L	28.57	None
MSI	Stormwater 3	Orthophosphate	SM-W3-S1L-1	0.040	SM-W3-S1L-2	0.037	mg/L	7.79	
MSI	Stormwater 3	Orthophosphate	SM-W3-S2L-1	0.12	SM-W3-S2L-2	0.096	mg/L	22.22	
UGA	Stormwater 3	Total Dissolved Nitrogen	SM-W3-S1L-1	0.8294	SM-W3-S1L-2	1.5735	mg/L	NC	
UGA	Stormwater 3	Total Dissolved Nitrogen	SM-W3-S2L-1	1.0676	SM-W3-S2L-2	0.7942	mg/L	NC	
UGA	Stormwater 3	Total Dissolved Phosphorus	SM-W3-S1L-1	0.1320	SM-W3-S1L-2	0.1575	mg/L	17.62	
UGA	Stormwater 3	Total Dissolved Phosphorus	SM-W3-S2L-1	0.2134	SM-W3-S2L-2	0.1448	mg/L	38.30	J
UGA	Stormwater 3	Total Nitrogen	SM-W3-S1L-1	0.8112	SM-W3-S1L-2	0.9264	mg/L	13.26	
UGA	Stormwater 3	Total Nitrogen	SM-W3-S2L-1	1.4615	SM-W3-S2L-2	0.7090	mg/L	69.34	J
UGA	Stormwater 3	Total Phosphorus	SM-W3-S1L-1	0.1590	SM-W3-S1L-2	0.1820	mg/L	13.49	
UGA	Stormwater 3	Total Phosphorus	SM-W3-S2L-1	0.1698	SM-W3-S2L-2	0.2051	mg/L	18.83	
UGA	Sediment	Percent Total Phosphorus	SS02-F1	0.0339	SS02-F3	0.0266	%	24.13	
UGA	Sediment	Percent Total Phosphorus	SS15-F1	0.0171	SS15-F3	0.0147	%	15.09	
MSI	Sediment	Total Organic Carbon/Total Nitrogen Ratio	SS02-F1	7.65	SS02-F3	7.84	%	2.45	
MSI	Sediment	Total Organic Carbon/Total Nitrogen Ratio	SS15-F1	6.47	SS15-F3	6.71	%	3.64	
MSI	Sediment	Percent Sand	SS02-F1	82.8	SS02-F3	91.9	%	10.42	
MSI	Sediment	Percent Sand	SS15-F1	*	SS15-F3	96.50	%	NA	
UGA	Sediment	Percent Fines	SS02-F1	17.20	SS02-F3	8.10	%	71.94	J
UGA	Sediment	Percent Fines	SS15-F1	*	SS15-F3	3.50	%	NA	

BKN = bottle broken, insufficient volume for analysis

negative numbers signify non-detects

None = If sample results are less than 5X the reporting limit and the absolute difference between the samples is less than the reporting

limit - no qualifiers are applied

NA = not applicable

NC = not calculable - sample result nondetect or rejected

**Table 6-2  
Percentage of Field Duplicates Within Control Limits**

Lab	Event	Analyte Name	Number of Duplicate Pairs	Average RPD	Percent within +/- 25% (water) 20% (sediment) or absolute difference criteria
CRG	Index 1	Carbonaceous Biochemical Oxygen Demand	4	NC	NA
CRG	Index 1	Chlorophyll a	4	32.87	50
CRG	Index 1	Total Suspended Solids	4	54.13	75
MSI	Index 1	Ammonia	6	34.38	67
MSI	Index 1	Nitrate + Nitrite	6	20.05	50
MSI	Index 1	Nitrite	6	44.09	34
MSI	Index 1	Orthophosphate	6	22.88	50
UGA	Index 1	Total Dissolved Nitrogen	6	NC	NA
UGA	Index 1	Total Dissolved Phosphorus	6	46.96	100
UGA	Index 1	Total Nitrogen	6	17.08	84
UGA	Index 1	Total Phosphorus	5	59.55	80
CRG	Index 2	Biochemical Oxygen Demand	3	NC	NA
CRG	Index 2	Carbonaceous Biochemical Oxygen Demand	2	NC	NA
CRG	Index 2	Chlorophyll a	5	14.83	80
CRG	Index 2	Total Suspended Solids	6	25.04	67
MSI	Index 2	Ammonia	7	7.13	100
MSI	Index 2	Nitrate + Nitrite	7	10.23	86
MSI	Index 2	Nitrite	7	10.19	100
MSI	Index 2	Orthophosphate	7	14.24	72
UGA	Index 2	Total Dissolved Nitrogen	7	NC	NA
UGA	Index 2	Total Dissolved Phosphorus	7	12.00	86
UGA	Index 2	Total Nitrogen	7	21.61	58
UGA	Index 2	Total Phosphorus	7	12.00	72
CRG	Index 3	Carbonaceous Biochemical Oxygen Demand	1	NC	NA
CRG	Index 3	Chlorophyll a	3	30.42	67
CRG	Index 3	Total Suspended Solids	3	55.45	50
MSI	Index 3	Ammonia	3	23.69	67
MSI	Index 3	Nitrate + Nitrite	2	4.81	100
MSI	Index 3	Nitrite	3	5.13	100
MSI	Index 3	Orthophosphate	3	45.63	0
UGA	Index 3	Total Dissolved Nitrogen	3	NC	NA
UGA	Index 3	Total Dissolved Phosphorus	3	15.54	100
UGA	Index 3	Total Nitrogen	3	7.48	100
UGA	Index 3	Total Phosphorus	3	15.86	67
CRG	Index 4	Carbonaceous Biochemical Oxygen Demand	3	NC	NA
CRG	Index 4	Chlorophyll a	2	28.31	100
CRG	Index 4	Total Suspended Solids	1	39.59	100
MSI	Index 4	Ammonia	4	66.47	25
MSI	Index 4	Nitrate + Nitrite	3	11.96	100
MSI	Index 4	Nitrite	2	28.87	100
MSI	Index 4	Orthophosphate	4	19.67	75
UGA	Index 4	Total Dissolved Nitrogen	4	NC	NA
UGA	Index 4	Total Dissolved Phosphorus	5	10.63	100
UGA	Index 4	Total Nitrogen	4	9.02	100

**Table 6-2  
Percentage of Field Duplicates Within Control Limits**

Lab	Event	Analyte Name	Number of Duplicate Pairs	Average RPD	Percent within +/- 25% (water) 20% (sediment) or absolute difference criteria
UGA	Index 4	Total Phosphorus	4	7.82	100
MSI	Stormwater 1	Ammonia	1	0.00	100
CRG	Stormwater 1	Carbonaceous Biochemical Oxygen Demand	1	32.73	100
CRG	Stormwater 1	Chlorophyll a	1	46.11	0
MSI	Stormwater 1	Nitrate + Nitrite	1	1.54	100
MSI	Stormwater 1	Nitrite	1	24.56	100
MSI	Stormwater 1	Orthophosphate	1	7.14	100
UGA	Stormwater 1	Total Dissolved Nitrogen	1	NC	NA
UGA	Stormwater 1	Total Dissolved Phosphorus	1	4.49	100
UGA	Stormwater 1	Total Nitrogen	1	0.91	100
UGA	Stormwater 1	Total Phosphorus	1	2.09	100
CRG	Stormwater 1	Total Suspended Solids	1	43.84	0
CRG	Stormwater 2	Carbonaceous Biochemical Oxygen Demand	1	NC	NA
CRG	Stormwater 2	Chlorophyll a	1	0.00	100
MSI	Stormwater 2	Nitrate + Nitrite	1	NC	NA
MSI	Stormwater 2	Orthophosphate	1	NC	NA
UGA	Stormwater 2	Total Dissolved Nitrogen	1	NC	NA
UGA	Stormwater 2	Total Dissolved Phosphorus	1	NC	NA
UGA	Stormwater 2	Total Nitrogen	1	NC	NA
UGA	Stormwater 2	Total Phosphorus	1	NC	NA
CRG	Stormwater 3	Carbonaceous Biochemical Oxygen Demand	2	NC	NA
CRG	Stormwater 3	Chlorophyll a	1	18.40	100
CRG	Stormwater 3	Total Suspended Solids	1	44.60	100
MSI	Stormwater 3	Ammonia	2	60.97	50
MSI	Stormwater 3	Nitrate + Nitrite	2	16.21	100
MSI	Stormwater 3	Nitrite	2	20.95	100
MSI	Stormwater 3	Orthophosphate	2	15.01	100
UGA	Stormwater 3	Total Dissolved Nitrogen	2	NC	NA
UGA	Stormwater 3	Total Dissolved Phosphorus	2	27.96	50
UGA	Stormwater 3	Total Nitrogen	2	41.30	50
UGA	Stormwater 3	Total Phosphorus	2	16.16	100
UGA	Sediment	Percent Total Phosphorus	2	19.61	100
MSI	Sediment	Total Organic Carbon/Total Nitrogen Ratio	2	3.05	100
UGA	Sediment	Percent Sand	2	10.42	100
UGA	Sediment	Percent Fines	2	71.94	50

NA = not applicable

NC = not calculable

**Table 6-3**  
**Santa Margarita River**  
**Field Blank Results**

Lab	Event	SampleID	AnalyteName	Unit	Result	ResultQualCode	MDL	RL
CRG	Index3	SM_I3D4-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-2	ND	2	2
CRG	Index3	SM_I3D5-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-2	ND	2	2
CRG	Index3	SM_I3D6-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-2	ND	2	2
CRG	Index3	SM_I3D4-FB-1	Chlorophyll a	mg/m3	3.2		1	2
CRG	Index3	SM_I3D5-FB-1	Chlorophyll a	mg/m3	-1	ND	1	2
CRG	Index3	SM_I3D6-FB-1	Chlorophyll a	mg/m3	1.3	DNQ	1	2
CRG	Index3	SM_I3D4-FB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
CRG	Index3	SM_I3D5-FB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
CRG	Index3	SM_I3D6-FB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
MSI	Index3	SM_I3D4-FB-1	Ammonia	mg/L	0.1736868		0.001	0.004
MSI	Index3	SM_I3D5-FB-1	Ammonia	mg/L	0.0308154		0.001	0.004
MSI	Index3	SM_I3D6-FB-1	Ammonia	mg/L	0.0196098		0.001	0.004
MSI	Index3	SM_I3D4-FB-1	Nitrate + Nitrite	mg/L	0.0112056	DNQ	0.007	0.02
MSI	Index3	SM_I3D5-FB-1	Nitrate + Nitrite	mg/L	0.0070035	DNQ	0.007	0.02
MSI	Index3	SM_I3D6-FB-1	Nitrate + Nitrite	mg/L	-0.02	ND	0.007	0.02
MSI	Index3	SM_I3D4-FB-1	Nitrite	mg/L	0.0042021		0.001	0.004
MSI	Index3	SM_I3D5-FB-1	Nitrite	mg/L	0.0028014	DNQ	0.001	0.004
MSI	Index3	SM_I3D6-FB-1	Nitrite	mg/L	0.0028014	DNQ	0.001	0.004
MSI	Index3	SM_I3D4-FB-1	Orthophosphate	mg/L	0.0216818		0.003	0.009
MSI	Index3	SM_I3D5-FB-1	Orthophosphate	mg/L	0.0030974	DNQ	0.003	0.009
MSI	Index3	SM_I3D6-FB-1	Orthophosphate	mg/L	0.0030974	DNQ	0.003	0.009
UGA	Index3	SM_I3D5-FB-1	Total Dissolved Nitrogen	mg/L	1.5627		0.0028	0.1
UGA	Index3	SM_I3D6-FB-1	Total Dissolved Nitrogen	mg/L	1.887		0.0028	0.1
UGA	Index3	SM_I3D4-FB-1	Total Dissolved Nitrogen	mg/L	0.7492		0.0028	0.1
UGA	Index3	SM_I3D4-FB-1	Total Dissolved Phosphorus	mg/L	0.0021		0.0021	0.05
UGA	Index3	SM_I3D5-FB-1	Total Dissolved Phosphorus	mg/L	0.0364		0.0021	0.05
UGA	Index3	SM_I3D6-FB-1	Total Dissolved Phosphorus	mg/L	0.0165		0.0021	0.05
UGA	Index3	SM_I3D4-FB-1	Total Nitrogen	mg/L	0.0948		0.0028	0.1
UGA	Index3	SM_I3D5-FB-1	Total Nitrogen	mg/L	0.0747		0.0028	0.1
UGA	Index3	SM_I3D6-FB-1	Total Nitrogen	mg/L	0.1079		0.0028	0.1
UGA	Index3	SM_I3D4-FB-1	Total Phosphorus	mg/L	-0.05	ND	0.0021	0.05
UGA	Index3	SM_I3D5-FB-1	Total Phosphorus	mg/L	0.011		0.0021	0.05
UGA	Index3	SM_I3D6-FB-1	Total Phosphorus	mg/L	-0.05	ND	0.0021	0.05
CRG	Index4	SM-I4D1-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-2	ND	2	2
CRG	Index4	SM-I4D2-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-2	ND	2	2
CRG	Index4	SM-I4D3-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-1	ND	0.58	1

**Table 6-3**  
**Santa Margarita River**  
**Field Blank Results**

Lab	Event	SampleID	AnalyteName	Unit	Result	ResultQualCode	MDL	RL
CRG	Index4	SM-I4D4-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-2	ND	2	2
CRG	Index4	SM-I4D5-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-2	ND	2	2
CRG	Index4	SM-I4D6-FB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	-2	ND	2	2
CRG	Index4	SM-I4D6-FB-1	Chlorophyll a	mg/m3	-1	ND	1	2
CRG	Index4	SM-I4D1-FB-1	Chlorophyll a	mg/m3	-1	ND	1	2
CRG	Index4	SM-I4D2-FB-1	Chlorophyll a	mg/m3	-1	ND	1	2
CRG	Index4	SM-I4D3-FB-1	Chlorophyll a	mg/m3	-1	ND	1	2
CRG	Index4	SM-I4D4-FB-1	Chlorophyll a	mg/m3	-1	ND	1	2
CRG	Index4	SM-I4D5-FB-1	Chlorophyll a	mg/m3	-1	ND	1	2
CRG	Index4	SM-I4D1-FB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
CRG	Index4	SM-I4D2-FB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
CRG	Index4	SM-I4D3-FB-1	Total Suspended Solids	mg/L	0.5		0.5	5
CRG	Index4	SM-I4D4-FB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
CRG	Index4	SM-I4D5-FB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
CRG	Index4	SM-I4D6-FB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
MSI	Index4	SM-14D1-FB-1	Ammonia	mg/L	0.1050525		0.001	0.004
MSI	Index4	SM-14D2-FB-1	Ammonia	mg/L	-88		0.001	0.004
MSI	Index4	SM-14D3-FB-1	Ammonia	mg/L	0.0042021		0.001	0.004
MSI	Index4	SM-14D4-FB-1	Ammonia	mg/L	-88		0.001	0.004
MSI	Index4	SM-I4D5-FB-1	Ammonia	mg/L	-88		0.001	0.004
MSI	Index4	SM-14D6-FB-1	Ammonia	mg/L	0.1834917		0.001	0.004
MSI	Index4	SM-14D1-FB-1	Nitrate + Nitrite	mg/L	-0.02	ND	0.007	0.02
MSI	Index4	SM-14D2-FB-1	Nitrate + Nitrite	mg/L	-88		0.007	0.02
MSI	Index4	SM-14D3-FB-1	Nitrate + Nitrite	mg/L	-0.02	ND	0.007	0.02
MSI	Index4	SM-14D4-FB-1	Nitrate + Nitrite	mg/L	-88		0.007	0.02
MSI	Index4	SM-I4D5-FB-1	Nitrate + Nitrite	mg/L	-88		0.007	0.02
MSI	Index4	SM-14D6-FB-1	Nitrate + Nitrite	mg/L	-0.02	ND	0.007	0.02
MSI	Index4	SM-14D1-FB-1	Nitrite	mg/L	-0.004	ND	0.001	0.004
MSI	Index4	SM-14D2-FB-1	Nitrite	mg/L	-88		0.001	0.004
MSI	Index4	SM-14D3-FB-1	Nitrite	mg/L	-0.004	ND	0.001	0.004
MSI	Index4	SM-14D4-FB-1	Nitrite	mg/L	-88		0.001	0.004
MSI	Index4	SM-I4D5-FB-1	Nitrite	mg/L	-88		0.001	0.004
MSI	Index4	SM-14D6-FB-1	Nitrite	mg/L	-0.004	ND	0.001	0.004
MSI	Index4	SM-14D1-FB-1	Orthophosphate	mg/L	-0.009	ND	0.003	0.009
MSI	Index4	SM-14D2-FB-1	Orthophosphate	mg/L	-88		0.003	0.009
MSI	Index4	SM-14D4-FB-1	Orthophosphate	mg/L	-88		0.003	0.009

**Table 6-3**  
**Santa Margarita River**  
**Field Blank Results**

Lab	Event	SampleID	AnalyteName	Unit	Result	ResultQualCode	MDL	RL
MSI	Index4	SM-14D3-FB-1	Orthophosphate	mg/L	0.0030974	DNQ	0.003	0.009
MSI	Index4	SM-14D5-FB-1	Orthophosphate	mg/L	-88		0.003	0.009
MSI	Index4	SM-14D6-FB-1	Orthophosphate	mg/L	0.2601816		0.003	0.009
UGA	Index4	SM-14D4-FB-1	Total Dissolved Nitrogen	mg/L	1.2355		0.0028	0.1
UGA	Index4	SM-14D5-FB-1	Total Dissolved Nitrogen	mg/L	0.6651		0.0028	0.1
UGA	Index4	SM-14D1-FB-1	Total Dissolved Nitrogen	mg/L	5.7532		0.0028	0.1
UGA	Index4	SM-14D2-FB-1	Total Dissolved Nitrogen	mg/L	0.3765		0.0028	0.1
UGA	Index4	SM-14D3-FB-1	Total Dissolved Nitrogen	mg/L	0.0427		0.0028	0.1
UGA	Index4	SM-14D6-FB-1	Total Dissolved Nitrogen	mg/L	0.1098		0.0028	0.1
UGA	Index4	SM-14D4-FB-1	Total Dissolved Phosphorus	mg/L	-0.05	ND	0.0021	0.05
UGA	Index4	SM-14D1-FB-1	Total Dissolved Phosphorus	mg/L	0.0123		0.0021	0.05
UGA	Index4	SM-14D2-FB-1	Total Dissolved Phosphorus	mg/L	0.0178		0.0021	0.05
UGA	Index4	SM-14D3-FB-1	Total Dissolved Phosphorus	mg/L	0.0153		0.0021	0.05
UGA	Index4	SM-14D5-FB-1	Total Dissolved Phosphorus	mg/L	-0.05	ND	0.0021	0.05
UGA	Index4	SM-14D6-FB-1	Total Dissolved Phosphorus	mg/L	-0.05	ND	0.0021	0.05
UGA	Index4	SM-14D4-FB-1	Total Nitrogen	mg/L	-0.1	ND	0.0028	0.1
UGA	Index4	SM-14D5-FB-1	Total Nitrogen	mg/L	0.062		0.0028	0.1
UGA	Index4	SM-14D1-FB-1	Total Nitrogen	mg/L	0.03		0.0028	0.1
UGA	Index4	SM-14D2-FB-1	Total Nitrogen	mg/L	0.0271		0.0028	0.1
UGA	Index4	SM-14D3-FB-1	Total Nitrogen	mg/L	0.0427		0.0028	0.1
UGA	Index4	SM-14D6-FB-1	Total Nitrogen	mg/L	0.1599		0.0028	0.1
UGA	Index4	SM-14D4-FB-1	Total Phosphorus	mg/L	-0.05	ND	0.0021	0.05
UGA	Index4	SM-14D1-FB-1	Total Phosphorus	mg/L	0.0165		0.0021	0.05
UGA	Index4	SM-14D2-FB-1	Total Phosphorus	mg/L	0.0179		0.0021	0.05
UGA	Index4	SM-14D3-FB-1	Total Phosphorus	mg/L	0.0174		0.0021	0.05
UGA	Index4	SM-14D5-FB-1	Total Phosphorus	mg/L	-0.05	ND	0.0021	0.05
UGA	Index4	SM-14D6-FB-1	Total Phosphorus	mg/L	-0.05	ND	0.0021	0.05
CRG	Stormwater 3	SM-W3-SB-1	Carbonaceous Biochemical Oxygen Demand	mg/L	10		2	2
CRG	Stormwater 3	SM-W3-SB-1	Chlorophyll a	mg/m3	-1	ND	1	2
CRG	Stormwater 3	SM-W3-SB-1	Total Suspended Solids	mg/L	-0.5	ND	0.5	5
MSI	Stormwater 3	SM-W3-SB-1	Ammonia	mg/L	0.003	DNQ	0.001	0.004
MSI	Stormwater 3	SM-W3-SB-1	Nitrate + Nitrite	mg/L	0.010	DNQ	0.007	0.02
MSI	Stormwater 3	SM-W3-SB-1	Nitrite	mg/L	0.003	DNQ	0.001	0.004
MSI	Stormwater 3	SM-W3-SB-1	Orthophosphate	mg/L	-0.003	ND	0.003	0.009
UGA	Stormwater 3	SM-W3-SB-1	Total Dissolved Nitrogen	mg/L	0.3933		0.0028	0.1
UGA	Stormwater 3	SM-W3-SB-1	Total Dissolved Phosphorus	mg/L	0.0419		0.0022	0.05

**Table 6-3**  
**Santa Margarita River**  
**Field Blank Results**

<b>Lab</b>	<b>Event</b>	<b>SampleID</b>	<b>AnalyteName</b>	<b>Unit</b>	<b>Result</b>	<b>ResultQualCode</b>	<b>MDL</b>	<b>RL</b>
UGA	Stormwater 3	SM-W3-SB-1	Total Nitrogen	mg/L	0.8866		0.0028	0.1
UGA	Stormwater 3	SM-W3-SB-1	Total Phosphorus	mg/L	0.0580		0.0022	0.05

ND = nondetect

DNQ = detected not quantifiable

"-" = indicates a nondetect result

**Table 6-4**  
**Santa Margarita River**  
**Summary of Field Blank Detects**

Lab	Event	Analyte	Number of Blank Samples	Number of Detections	Range of Detects	Number of Nondetects	Number of Results < Reporting Limit but >MDL
CRG	Index3	Carbonaceous Biochemical Oxygen Demand	3	0	NA	3	0
CRG	Index3	Chlorophyll a	3	2	1.3 - 3.2 mg/m3	1	1
CRG	Index3	Total Suspended Solids	3	0	NA	3	0
MSI	Index3	Ammonia	3	3	0.0196098 - 0.1736868 mg/L	0	0
MSI	Index3	Nitrate + Nitrite	3	2	0.0070035 - 0.0112056 mg/L	1	2
MSI	Index3	Nitrite	3	3	0.0028014 - 0.0042021 mg/L	0	2
MSI	Index3	Orthophosphate	3	3	0.0030974 - 0.0216818 mg/L	0	2
UGA	Index3	Total Dissolved Nitrogen	3	3	0.7492 - 1.887 mg/L	0	0
UGA	Index3	Total Dissolved Phosphorus	3	3	0.0021 - 0.0364 mg/L	0	0
UGA	Index3	Total Nitrogen	3	3	0.0747 - 0.1079 mg/L	0	0
UGA	Index3	Total Phosphorus	3	1	0.011 mg/L	2	0
CRG	Index4	Carbonaceous Biochemical Oxygen Demand	6	0	NA	6	0
CRG	Index4	Chlorophyll a	6	0	NA	6	0
CRG	Index4	Total Suspended Solids	6	1	0.5 mg/L	5	0
MSI	Index4	Ammonia	3	3	0.0042021 - 0.1834917 mg/L	3	0
MSI	Index4	Nitrate + Nitrite	3	0	NA	3	0
MSI	Index4	Nitrite	3	0	NA	3	0
MSI	Index4	Orthophosphate	3	2	0.0030974 - 0.2601816 mg/L	1	1
UGA	Index4	Total Dissolved Nitrogen	6	6	0.0427 - 5.7532 mg/L	0	0
UGA	Index4	Total Dissolved Phosphorus	6	3	0.0123 - 0.0178 mg/L	3	0
UGA	Index4	Total Nitrogen	6	5	0.0271 - 0.1599 mg/L	1	0
UGA	Index4	Total Phosphorus	6	3	0.0165 - 0.0179 mg/L	3	0
CRG	Stormwater 3	Carbonaceous Biochemical Oxygen Demand	1	1	10 mg/L	0	0
CRG	Stormwater 3	Chlorophyll a	1	0	NA	1	0
CRG	Stormwater 3	Total Suspended Solids	1	0	NA	1	0
MSI	Stormwater 3	Ammonia	1	1	0.003	0	1
MSI	Stormwater 3	Nitrate + Nitrite	1	1	0.01 mg/L	0	1
MSI	Stormwater 3	Nitrite	1	1	0.003 mg/L	0	1
MSI	Stormwater 3	Orthophosphate	1	0	NA	1	0
UGA	Stormwater 3	Total Dissolved Nitrogen	1	1	0.3933 mg/L	0	0
UGA	Stormwater 3	Total Dissolved Phosphorus	1	1	0.0419 mg/L	0	0
UGA	Stormwater 3	Total Nitrogen	1	1	0.8866 mg/L	0	0
UGA	Stormwater 3	Total Phosphorus	1	1	0.0580 mg/L	0	0

NA - All results nondetect

MDL - Method detection limit

mg/m3 - micrograms per meter cubed

mg/L - micrograms per liter

**Table 7-1**  
**Santa Margarita River**  
**Comparison of Reporting Limits to Screening Criteria for Non-Detects in Water Samples**

<b>Index 1</b>										
Analyte	Method	Units	Number of Samples Collected <sup>1</sup>		Number of Non-Detects	Method Detection Limit (MDL) for Non-Detects	Reporting Limit (RL)	Number of MDLs > RLs	Project Quantitation Limit	Number of MDLs > Project Quantitation Limit
Ammonia	SM 4500-NH3 G	mg/L	70	68	0	NA	0.004	0	0.05	NA
Carbonaceous Biochemical Oxygen Demand	EPA 405.1	mg/L	28	28	26	2	2	0	2	0
Carbonaceous Biochemical Oxygen Demand	SM 5210 B	mg/L	23	23	22	1	1	0	2	0
Chlorophyll a	SM 10200 H	mg/m <sup>3</sup>	75	75	3	1	2	0	2	0
Nitrate + Nitrite	SM 4500-NO3 F	mg/L	70	68	0	NA	0.02	0	0.05	NA
Nitrite	SM 4500-NO2-B	mg/L	70	68	0	NA	0.004	0	NA	NA
Orthophosphate	SM 4500-P C	mg/L	70	68	0	NA	0.009	0	NA	NA
Total Dissolved Nitrogen	SM 4500P-J	mg/L	75	75	0	NA	0.1	0	0.1	NA
Total Nitrogen	SM 4500P-J	mg/L	72	72	0	NA	0.1	0	0.1	NA
Total Dissolved Phosphorus	SM 4500P-J	mg/L	72	72	3	0.02	0.05	0	0.05	0
Total Phosphorus	SM 4500P-J	mg/L	71	71	1	0.02	0.05	0	0.05	0
Total Suspended Solids	SM 2540 D	mg/L	81	81	2	0.5	5	0	0.5	0

<b>Index 2</b>										
Analyte	Method	Units	Number of Samples Collected <sup>1</sup>	Number of Samples Analyzed <sup>1</sup>	Number of Non-Detects	Method Detection Limit (MDL) for Non-Detects	Reporting Limit (RL)	Number of MDLs > RLs	Project Quantitation Limit	Number of MDLs > Project Quantitation Limit
Ammonia	SM 4500-NH3 G	mg/L	72	72	1	0.001	0.004	0	0.05	0
Carbonaceous Biochemical Oxygen Demand	EPA 405.1	mg/L	31	31	24	2	2	0	2	0
Carbonaceous Biochemical Oxygen Demand	SM 5210 B	mg/L	26	26	10	0.58	1	0	2	0
Chlorophyll a	SM 10200 H	mg/m <sup>3</sup>	76	76	0	NA	2	0	2	NA
Nitrate + Nitrite	SM 4500-NO3 F	mg/L	72	72	0	NA	0.02	0	0.05	NA
Nitrite	SM 4500-NO2-B	mg/L	72	72	8	0.001	0.004	0	NA	NA
Orthophosphate	SM 4500-P C	mg/L	72	72	0	NA	0.009	0	NA	NA
Total Dissolved Nitrogen	SM 4500P-J	mg/L	71	71	0	NA	0.1	0	0.1	NA
Total Nitrogen	SM 4500P-J	mg/L	72	72	0	NA	0.1	0	0.1	NA
Total Dissolved Phosphorus	SM 4500P-J	mg/L	71	71	0	NA	0.05	0	0.05	NA
Total Phosphorus	SM 4500P-J	mg/L	71	71	0	NA	0.05	0	0.05	NA
Total Suspended Solids	SM 2540 D	mg/L	77	77	0	NA	5	0	0.5	NA

**Table 7-1**  
**Santa Margarita River**  
**Comparison of Reporting Limits to Screening Criteria for Non-Detects in Water Samples**

<b>Index 3</b>										
Analyte	Method	Units	Number of Samples Collected <sup>1</sup>	Number of Samples Analyzed <sup>1</sup>	Number of Non-Detects	Method Detection Limit (MDL) for Non-Detects	Reporting Limit (RL)	Number of MDLs > RLs	Project Quantitation Limit	Number of MDLs > Project Quantitation Limit
Ammonia	SM 4500-NH3 G	mg/L	67	67	1	0.001	0.004	0	0.05	0
Carbonaceous Biochemical Oxygen Demand	EPA 405.1	mg/L	---	---	---	---	---	---	---	---
Carbonaceous Biochemical Oxygen Demand	SM 5210 B	mg/L	50	50	45	2	2	0	2	0
Chlorophyll a	SM 10200 H	mg/m <sup>3</sup>	78	78	1	1	2	0	2	0
Nitrate + Nitrite	SM 4500-NO3 F	mg/L	67	67	10	0.007	0.02	0	0.05	0
Nitrite	SM 4500-NO2-B	mg/L	67	67	11	0.001	0.004	0	NA	NA
Orthophosphate	SM 4500-P C	mg/L	67	67	0	NA	0.009	0	NA	NA
Total Dissolved Nitrogen	SM 4500P-J	mg/L	67	67	0	NA	0.1	0	0.1	NA
Total Nitrogen	SM 4500P-J	mg/L	67	67	0	NA	0.1	0	0.1	NA
Total Dissolved Phosphorus	SM 4500P-J	mg/L	67	67	1	0.002	0.05	0	0.05	0
Total Phosphorus	SM 4500P-J	mg/L	67	67	1	0.002	0.05	0	0.05	0
Total Suspended Solids	SM 2540 D	mg/L	79	79	1	0.5	5	0	0.5	0

<b>Index 4</b>										
Analyte	Method	Units	Number of Samples Collected <sup>1</sup>	Number of Samples Analyzed <sup>1</sup>	Number of Non-Detects	Method Detection Limit (MDL) for Non-Detects	Reporting Limit (RL)	Number of MDLs > RLs	Project Quantitation Limit	Number of MDLs > Project Quantitation Limit
Ammonia	SM 4500-NH3 G	mg/L	63	63	1	0.001	0.004	0	0.05	0
Carbonaceous Biochemical Oxygen Demand	EPA 405.1	mg/L	---	---	---	---	---	---	---	---
Carbonaceous Biochemical Oxygen Demand	SM 5210 B	mg/L	45	45	30	0.058 to 2	1 to 2	0	2	0
Chlorophyll a	SM 10200 H	mg/m <sup>3</sup>	70	70	10	1	2	0	2	0
Nitrate + Nitrite	SM 4500-NO3 F	mg/L	63	63	38	0.007	0.02	0	0.05	0
Nitrite	SM 4500-NO2-B	mg/L	63	63	44	0.001	0.004	0	NA	NA
Orthophosphate	SM 4500-P C	mg/L	63	63	2	0.003	0.009	0	NA	NA
Total Dissolved Nitrogen	SM 4500P-J	mg/L	63	63	0	NA	0.1	0	0.1	NA
Total Nitrogen	SM 4500P-J	mg/L	63	63	0	NA	0.1	0	0.1	NA
Total Dissolved Phosphorus	SM 4500P-J	mg/L	63	63	6	0.002	0.05	0	0.05	0
Total Phosphorus	SM 4500P-J	mg/L	63	63	1	0.002	0.05	0	0.05	0
Total Suspended Solids	SM 2540 D	mg/L	71	71	0	NA	5	0	0.5	NA

**Table 7-1**  
**Santa Margarita River**  
**Comparison of Reporting Limits to Screening Criteria for Non-Detects in Water Samples**

<b>Stormwater 1</b>										
Analyte	Method	Units	Number of Samples Collected <sup>1</sup>	Number of Samples Analyzed <sup>1</sup>	Number of Non-Detects	Method Detection Limit (MDL) for Non-Detects	Reporting Limit (RL)	Number of MDLs > RLs	Project Quantitation Limit	Number of MDLs > Project Quantitation Limit
Ammonia	SM 4500-NH3 G	mg/L	13	13	0	NA	0.004	0	0.05	NA
Carbonaceous Biochemical Oxygen Demand	EPA 405.1	mg/L	---	---	---	---	---	---	---	---
Carbonaceous Biochemical Oxygen Demand	SM 5210 B	mg/L	13	13	6	1	1	0	2	0
Chlorophyll a	SM 10200 H	mg/m <sup>3</sup>	14	14	0	NA	2	0	2	NA
Nitrate + Nitrite	SM 4500-NO3 F	mg/L	13	13	0	NA	0.02	0	0.05	NA
Nitrite	SM 4500-NO2-B	mg/L	13	13	0	NA	0.004	0	NA	NA
Orthophosphate	SM 4500-P C	mg/L	13	13	0	NA	0.009	0	NA	NA
Total Dissolved Nitrogen	SM 4500P-J	mg/L	13	13	0	NA	0.1	0	0.1	NA
Total Nitrogen	SM 4500P-J	mg/L	13	13	0	NA	0.1	0	0.1	NA
Total Dissolved Phosphorus	SM 4500P-J	mg/L	13	13	0	NA	0.05	0	0.05	NA
Total Phosphorus	SM 4500P-J	mg/L	13	13	0	NA	0.05	0	0.05	NA
Total Suspended Solids	SM 2540 D	mg/L	13	13	0	NA	5	0	0.5	NA

<b>Stormwater 2</b>										
Analyte	Method	Units	Number of Samples Collected <sup>1</sup>	Number of Samples Analyzed <sup>1</sup>	Number of Non-Detects	Method Detection Limit (MDL) for Non-Detects	Reporting Limit (RL)	Number of MDLs > RLs	Project Quantitation Limit	Number of MDLs > Project Quantitation Limit
Ammonia	SM 4500-NH3 G	mg/L	17	9	0	NA	0.004	0	0.05	NA
Carbonaceous Biochemical Oxygen Demand	EPA 405.1	mg/L	17	17	17	2	2	0	2	0
Carbonaceous Biochemical Oxygen Demand	SM 5210 B	mg/L	---	---	---	---	---	---	---	---
Chlorophyll a	SM 10200 H	mg/m <sup>3</sup>	18	18	1	1	2	0	2	0
Nitrate + Nitrite	SM 4500-NO3 F	mg/L	17	9	0	NA	0.02	0	0.05	NA
Nitrite	SM 4500-NO2-B	mg/L	17	9	0	NA	0.004	0	NA	NA
Orthophosphate	SM 4500-P C	mg/L	17	9	0	NA	0.009	0	NA	NA
Total Dissolved Nitrogen	SM 4500P-J	mg/L	17	12	0	NA	0.1	0	0.1	NA
Total Nitrogen	SM 4500P-J	mg/L	17	14	0	NA	0.1	0	0.1	NA
Total Dissolved Phosphorus	SM 4500P-J	mg/L	17	12	0	NA	0.05	0	0.05	NA
Total Phosphorus	SM 4500P-J	mg/L	18	15	0	NA	0.05	0	0.05	NA
Total Suspended Solids	SM 2540 D	mg/L	18	18	0	NA	5	0	0.5	NA

**Table 7-1**  
**Santa Margarita River**  
**Comparison of Reporting Limits to Screening Criteria for Non-Detects in Water Samples**

Stormwater 3										
Analyte	Method	Units	Number of Samples Collected <sup>1</sup>	Number of Samples Analyzed <sup>1</sup>	Number of Non-Detects	Method Detection Limit (MDL) for Non-Detects	Reporting Limit (RL)	Number of MDLs > RLs	Project Quantitation Limit	Number of MDLs > Project Quantitation Limit
Ammonia	SM 4500-NH3 G	mg/L	18	18	0	NA	0.004	0	0.05	NA
Carbonaceous Biochemical Oxygen Demand	EPA 405.1	mg/L	---	---	---	---	---	---	---	---
Carbonaceous Biochemical Oxygen Demand	SM 5210 B	mg/L	18	18	17	2	2	0	2	0
Chlorophyll a	SM 10200 H	mg/m <sup>3</sup>	20	20	3	1	2	0	2	0
Nitrate + Nitrite	SM 4500-NO3 F	mg/L	18	18	0	NA	0.02	0	0.05	NA
Nitrite	SM 4500-NO2-B	mg/L	18	18	5	0.001	0.004	0	NA	NA
Orthophosphate	SM 4500-P C	mg/L	18	18	0	NA	0.009	0	NA	NA
Total Dissolved Nitrogen	SM 4500P-J	mg/L	18	18	0	NA	0.1	0	0.1	NA
Total Nitrogen	SM 4500P-J	mg/L	18	18	0	NA	0.1	0	0.1	NA
Total Dissolved Phosphorus	SM 4500P-J	mg/L	18	18	0	NA	0.05	0	0.05	NA
Total Phosphorus	SM 4500P-J	mg/L	18	18	0	NA	0.05	0	0.05	NA
Total Suspended Solids	SM 2540 D	mg/L	19	19	2	0.5	5	0	0.5	0

## Key:

NA = Not Applicable

--- = No samples analyzed for the given method

## Notes:

1. Difference between samples collected and samples analyzed represent quantity of samples not analyzed (i.e. broken bottles)

RL - reporting limit

MDL - method reporting limit

mg/L - milligram per liter

mg/m<sup>3</sup> - milligram per meter cubed

**Table 7-2  
Santa Magarita River  
Completeness Summary**

Analyte	Wet Weather Sources and Within Lagoon Sampling											Dry Weather Sources and Within Lagoon Sampling										Total Planned	Actual Total	Percent Complete
	Analytical Method (1)	Target Reporting Limit	Planned Pollutagraph Sampling	Actual Pollutagraph Sampling	Planned Lagoon Storm Sampling	Actual Lagoon Storm Sampling	Planned Ocean Inlet Sampling	Actual Ocean Inlet Sampling	Planned Post-Storm Sediment Sampling	Actual Post-Storm Sediment Sampling	Planned SD Sampling	Actual SD Sampling	Planned Index Lagoon Segment Sampling	Actual Index Lagoon Segment Sampling	Planned Index Ocean Inlet Sampling	Actual Index Ocean Inlet Sampling	Planned Index ME Site Sampling	Actual Index ME Site Sampling	Planned Index Transect Sampling	Actual Index Transect Sampling				
Total Suspended Solids	SM 2540-D	0.5 mg/L	30	30	12	16	6	4	--	--	4	2	96	141	48	54	24	20	96	117	316	384	122	
Total Nitrogen	USGS I-4650-03	0.1 mg/L	30	26	12	15	6	4	--	--	4	2	96	132	48	51	24	17	96	108	316	355	112	
Total Phosphorus	USGS I-4650-03	0.05 mg/L	30	26	12	16	6	4	--	--	4	2	96	130	48	51	24	17	96	106	316	352	111	
Total Dissolved Nitrogen	USGS I-2650-03	0.1 mg/L	30	0	12	0	6	0	--	--	4	0	96	0	48	0	24	0	96	0	316	0	0	
Total Dissolved Phosphorus	USGS I-2650-03	0.05 mg/L	30	24	12	15	6	4	--	--	4	2	96	129	48	51	24	17	96	107	316	349	110	
Orthophosphate	SM 4500-P C	0.009 mg/L	30	23	12	13	6	4	--	--	4	2	96	129	48	51	24	17	96	108	316	347	110	
Nitrite	SM 4500-NO2-B	0.004 mg/L	30	23	12	13	6	4	--	--	4	2	96	126	48	51	24	17	96	107	316	343	109	
Nitrate + Nitrite-N	SM 4500-NO3+NO2 F	0.05 mg/L	30	23	12	13	6	4	--	--	4	2	96	126	48	51	24	17	96	108	316	344	109	
Ammonium-N	SM 4500-NH3 G SM 4500-NH3 F	0.05 mg/L 0.05 mg/L	30	23	12	13	6	4	--	--	4	2	96	126	48	51	24	17	96	109	316	345	109	
Chlorophyll a	EPA 445.0	2 µg/L	30	29	12	19	6	3	--	--	4	2	96	151	48	50	24	16	96	108	316	378	120	
Carbonaceous Biological Oxygen Demand (CBOD)	EPA 405.1 SM 5210B	2 mg/L	30	28	12	16	6	4	--	--	4	2	96	132	48	51	24	16	24	27	244	276	113	
% Fines	ASTM D-422 (1963)(2) EPA (1995)(3) Plumb (1981) (4)	1%	--	--	--	--	--	--	15	15	--	--	--	--	--	--	--	--	--	--	15	13	87	
% Sand/Silt/Clay	ASTM D-422 (1963)(2) EPA (1995)(3) Plumb (1981) (4)	1%	--	--	--	--	--	--	15	15	--	--	--	--	--	--	--	--	--	--	15	15	100	
% Organic Carbon	EPA 9060	0.01%	--	--	--	--	--	--	15	15	--	--	--	--	--	--	--	--	--	--	15	15	100	
% Total Nitrogen	EPA 9060	0.01%	--	--	--	--	--	--	15	15	--	--	--	--	--	--	--	--	--	--	15	15	100	
% Total Phosphorus	Nelson (1987)(5)	0.01%	--	--	--	--	--	--	15	15	--	--	--	--	--	--	--	--	--	--	15	15	100	

**Table 8-1**  
**Santa Margarita River**  
**Sample Qualification Summary**

Total Normal Samples, excluding field duplicates	3389
No Result due to breakage:	54
Samples Qualified	1406
Total J (Estimated)	1080
field duplicate exceeded 25% RPD (stormwater) or 20%(sediment)	49
Holding Time Exceeded	933
Lab Dup exceeds 30%	72
MS/MSD Exceeds 120%	71
Total UJ (Estimated nondetect)	31
Holding Time Exceeded	30
Lab Dup exceeds 30%	1
MS/MSD Exceeds 120%	7
Total R (Rejected)	298
Holding time exceeds 28 days. Result rejected as total nitrogen result is less.	183
Holding time exceeds 28 days. Result rejected due to unquantifiable nitrogen signature due to filtering methodology.	53
Result rejected as total nitrogen result is less.	30
Result rejected due to unquantifiable nitrogen signature due to filtering methodology.	23
Holding time exceeds 28 days. Result rejected as total nitrogen result is less.	7
Result rejected as total nitrogen result is less.	1

**Table 8-2**  
**Santa Margarita River**  
**Summary of Stormwater 1 Qualifiers By Analyte**

Analyte	# Samples	#Qualified	% Qualified	Qualifier	Reason
Ammonia	13	0	0%	--	--
Carbonaceous Biochemical Oxygen Demand	13	0	0%	--	--
Chlorophyll a	14	14	100%	J	14- lab dup 46% exceeded 30% RPD criterion.
Nitrate + Nitrite	13	0	0%	--	--
Nitrite	13	0	0%	--	--
Orthophosphate	13	0	0%	--	--
Total Dissolved Nitrogen	13	13	100%	R	13-Holding time exceeds 28 days. Result rejected as total nitrogen result is less
Total Dissolved Phosphorus	13	13	100%	J	13-Holding time exceeds 28 days.
Total Nitrogen	13	13	100%	J	13-Holding time exceeds 28 days.
Total Phosphorus	13	13	100%	J	13-Holding time exceeds 28 days.
Total Suspended Solids	13	2	15%	J	2-RPD exceeds 30% criteria for duplicate field sample

**Table 8-3**  
**Santa Margarita River**  
**Summary of Stormwater 2 Qualifiers by Analyte**

Analyte	# Samples	#Qualified	% Qualified	Qualifier	Reason
Ammonia	9	0	0%	--	--
Carbonaceous Biochemical Oxygen Demand	17	0	0%	--	--
Chlorophyll a	18	0	0%	--	--
Nitrate + Nitrite	17	1	6%	J	1-RPD exceeds 30% in duplicate field sample.
Nitrite	9	0	0%	--	--
Orthophosphate	9	1	11%	--	1-RPD exceeds 30% criteria for duplicate field sample.
Total Dissolved Nitrogen	12	12	100%	R	8- Result rejected as total nitrogen result is less. 4-Result rejected due to unquantifiable nitrogen signature due to filtering methodology.
Total Dissolved Phosphorus	12	0	0%	--	--
Total Nitrogen	14	0	0%	--	--
Total Phosphorus	15	0	0%	--	--
Total Suspended Solids	18	0	0%	--	--

**Table 8-4**  
**Santa Margarita River**  
**Summary of Index 1 Qualifiers by Analyte**

Analyte	# Samples	#Qualified	% Qualified	Qualifier	Reason
Ammonia	73	17	23%	J	13- Holding time exceeded 28 days 4-RPD exceeds 30% criteria for duplicate field sample.
Carbonaceous Biochemical Oxygen Demand	51	2	4%	J	2-RPD in field duplicate sample exceeds 30%
Chlorophyll a	75	4	5%	J	4-RPD exceeds 30% criteria for duplicate field sample.
Nitrate + Nitrite	73	17	23%	J	13- Holding time exceeded 28 days 4-RPD exceeds 30% criteria for duplicate field sample.
Nitrite	73	15	21%	J	7-Holding time exceeds 28 days. 2-RPD exceeds 30% in duplicate field sample
Orthophosphate	73	15	21%	J	13- Holding time exceeded 28 days 2-RPD exceeds 30% in duplicate field sample
Total Dissolved Nitrogen	75	75	100%	R	62-Holding time exceeds 28 days. Result rejected as total nitrogen result is less.
					11-Holding time exceeds 28 days. Result rejected due to unquantifiable nitrogen signature due to filtering methodology.
					2-Result rejected as total nitrogen result is less.
Total Dissolved Phosphorus	75	75	100%	J	72-Holding time exceeds 28 days.
				UJ	72-Holding time exceeds 28 days.
Total Nitrogen	78	78	100%	J	76-Holding time exceeds 28 days. 2- RPD exceeds 30% in duplicate field sample. Holding time exceeds 28 days.
Total Phosphorus	74	74	100%	J	71-Holding time exceeds 28 days. 2-RPD exceeds 30% in duplicate field sample. Holding time exceeds 28 days.
				UJ	1-Holding time exceeds 28 days.
Total Suspended Solids	81	6	7%	J	6-RPD exceeds 30% criteria for duplicate field sample.

**Table 8-5**  
**Santa Margarita River**  
**Summary of Index 2 Qualifiers by Analyte**

Analyte	# Samples	#Qualified	% Qualified	Qualifier	Reason
Ammonia	75	0	0%	--	--
Carbonaceous Biochemical Oxygen Demand	59	0	0%	--	--
Chlorophyll a	78	9	12%	J	9-lab dup 38% exceeded 30% RPD criterion
Nitrate + Nitrite	75	2	3%	J	2- RPD exceeds 30% in duplicate field sample.
Nitrite	75	0	0%	--	--
Orthophosphate	75	2	3%	J	2-RPD exceeds 30% in duplicate field sample
Total Dissolved Nitrogen	74	74	100%	R	52-Holding time exceeds 28 days. Result rejected as total nitrogen result is less
					14- Holding time exceeds 28 days. Result rejected due to unquantifiable nitrogen signature due to filtering methodology.
					8-Result rejected as total nitrogen result is less.
Total Dissolved Phosphorus	74	74	100%	J	74-Holding time exceeds 28 days.
Total Nitrogen	75	75	100%	J	74-Holding time exceeds 28 days. 2-RPD exceeds 30% in duplicate field sample. Holding time exceeds 28
Total Phosphorus	74	74	100%	J	74-Holding time exceeds 28 days.
Total Suspended Solids	79	4	5%	J	4-RPD exceeds 30% criteria for duplicate field sample.

**Table 8-6**  
**Santa Margarita River**  
**Summary of Index 3 Qualifiers by Analyte**

Analyte	# Samples	#Qualified	% Qualified	Qualifier	Reason
Ammonia	74	46	62%	J	44-Holding time exceeded 28 days 2- RPD exceeds 30% in duplicate field sample. Holding time exceeds 28
				UJ	1-Holding time exceeded 28 days
Carbonaceous Biochemical Oxygen Demand	53	0	0%	--	--
Chlorophyll a	81	2	2%	J	2- RPD exceeds 30% in duplicate field sample.
Nitrate + Nitrite	74	52	70%	J	43- Holding time exceeded 28 days
				UJ	9- Holding time exceeded 28 days
Nitrite	74	51	69%	J	42- Holding time exceeded 28 days
				UJ	9- Holding time exceeded 28 days
Orthophosphate	74	48	65%	J	42- Holding time exceeded 28 days 6- RPD exceeds 30% in duplicate field sample. Holding time exceeds 28
				R	55-Holding time exceeds 28 days. Result rejected as total nitrogen result is less 14-Holding time exceeds 28 days. Result rejected due to unquantifiable nitrogen signature due to filtering methodology 2-Result rejected as total nitrogen result is less.
Total Dissolved Nitrogen	71	71	100%	R	14-Holding time exceeds 28 days. Result rejected due to unquantifiable nitrogen signature due to filtering methodology 2-Result rejected as total nitrogen result is less.
Total Dissolved Phosphorus	74	74	100%	J	73-Holding time exceeds 28 days. 1- (37.8029) RPD Above Criteria, Holding time exceeds 28 days.
				J	73-Holding time exceeds 28 days. 1-(94.1166) RPD Above Criteria. Holding time exceeds 28 days.
Total Nitrogen	74	74	100%	J	71-Holding time exceeds 28 days. 1-(78.0488) RPD Above Criteria
				UJ	3-Holding time exceeds 28 days.
Total Phosphorus	74	74	100%	J	37-Laboratory Duplicate Criteria High 2-RPD exceeds 30% criteria for duplicate field sample.
				UJ	2- Laboratory Duplicate Criteria High

**Table 8-7**  
**Santa Margarita River**  
**Summary of Index 4 Qualifiers per Analyte**

Analyte	# Samples	#Qualified	% Qualified	Qualifier	Reason
Ammonia	75	6	8%	J	6-RPD exceeds 30% criteria for duplicate field sample.
Carbonaceous Biochemical Oxygen Demand	54	0	0%	--	--
Chlorophyll a	80	25	31%	J	23- lab dup exceeded 30% RPD criterion
				UJ	2- lab dup exceeded 30% RPD criterion
Nitrate + Nitrite	74	0	0%	--	--
Nitrite	73	0	0%	--	--
Orthophosphate	74	2	3%	J	2- RPD exceeds 30% criteria for duplicate field sample.
Total Dissolved Nitrogen	73	73	100%	R	12-Holding time exceeds 28 days. Results estimated due to nitrogen issue.
					12- Holding time exceeds 28 days. Result rejected due to unquantifiable nitrogen signature due to filtering methodology
					31-Result rejected as total nitrogen result is less.
					22-Result rejected due to unquantifiable nitrogen signature due to filtering methodology
Total Dissolved Phosphorus	73	22	30%	J	13- Holding time exceeds 28 days. MS/MSD %R exceeds 120%
				UJ	9- Holding time exceeds 28 days. MS/MSD %R exceeds 120%
Total Nitrogen	73	22	30%	J	22-Holding time exceeds 28 days.
Total Phosphorus	73	73	100%	J	18-Holding time exceeds 28 days. MS/MSD %R exceeds 120%
				UJ	51-MS/MSD %R exceeds 120%
Total Suspended Solids	81	4	5%	J	3-Holding time exceeds 28 days. MS/MSD %R exceeds 120%
				J	4-lab dup (75%) exceeds 30% criteria

**Table 8-8**  
**Santa Margarita River**  
**Summary of Stormwater 3 Qualifiers by Analyte**

Analyte	# Samples	#Qualified	% Qualified	Qualifier	Reason
Ammonia	18	2	11%	J	2-Field duplicate RPD exceeded 25% criterion.
Carbonaceous Biochemical Oxygen Demand	18	0	0%	--	--
Chlorophyll a	20	0	0%	--	--
Nitrate + Nitrite	18	0	0%	--	--
Nitrite	18	0	0%	--	--
Orthophosphate	18	0	0%	--	--
Total Dissolved Nitrogen	17	17	100%	R	7-Holding time exceeds 28 days. Result rejected due to nitrogen issue. 10-Holding time exceeds 28 days. Result rejected as total nitrogen result is less
Total Dissolved Phosphorus	18	18	100%	J	16-Holding time exceeds 28 days. 2-RPD exceeds 25% criteria for duplicate field sample. Holding time exceeds 28 days
Total Nitrogen	18	18	100%	J	16-Holding time exceeds 28 days. 2-RPD exceeds 25% criteria for duplicate field sample. Holding time exceeds 28 days
Total Phosphorus	18	18	100%	J	18-Holding time exceeds 28 days.
Total Suspended Solids	19	0	0%	--	--

**Table 8-9**  
**Santa Margarita River**  
**Sediment Qualifiers by Analyte**

Analyte	# Samples	#Qualified	% Qualified	Qualifier	Reason
Percent Fines	13	2	15%	J	2-Field duplicate RPD exceeded 20% criterion.
Percent Sands	13	0	0%	--	--
Total Organic Carbon	15	0	0%	--	--
Total Organic Nitrogen	15	0	0%	--	--
Total Phosphorus	15	0	0%	--	--

**Table 8-10**  
**Santa Margarita River**  
**Data Quality Objectives Summary**

Sampling Event	Analyte	Precision		Accuracy		Comparability	
		DQO	Achieved RPD MS/MSD LCS/LCSD Laboratory Duplicate Field Duplicate	DQO	Achieved %R MS LCS Blanks	DQO	Achieved
Stormwater 1	Ammonia	Laboratory RPDs 20%, Field RPDs 30%	100%	Standard Reference Materials within 95% confidence interval stated by provider of material. If not available then with 80% to 120% of true value. Matrix Spike or control limits at + 3 standard deviations based on actual laboraotry data	100%	Data is comparable to similar sampling events	100%
	Carbonaceous Biochemical Oxygen Demand		100%		100%		100%
	Chlorophyll a		0% (laboratory duplicate) 100% all other		100%		100%
	Nitrate + Nitrite		100%		100%		100%
	Nitrite		100%		100%		100%
	Orthophosphate		100%		100%		0% (holding times)
	Total Dissolved Nitrogen		100%		0% (holding times)		100%
	Total Dissolved Phosphorus		100%		0% (holding times)		100%
	Total Nitrogen		100%		0% (holding times)		100%
	Total Phosphorus		100%		0% (holding times)		100%
	Total Suspended Solids		85%		100%		100%
Stormwater 2	Ammonia	Laboratory RPDs 20%, Field RPDs 30%	100%	Standard Reference Materials within 95% confidence interval stated by provider of material. If not available then with 80% to 120% of true value. Matrix Spike or control limits at + 3 standard deviations based on actual laboraotry data	100%	Data is comparable to similar sampling events	100%
	Carbonaceous Biochemical Oxygen Demand		100%		100%		100%
	Chlorophyll a		100%		100%		100%
	Nitrate + Nitrite		94%		100%		100%
	Nitrite		100%		100%		100%
	Orthophosphate		100%		100%		100%
	Total Dissolved Nitrogen		100%		100%		100%
	Total Dissolved Phosphorus		100%		100%		100%
	Total Nitrogen		100%		100%		100%
	Total Phosphorus		100%		100%		100%
	Total Suspended Solids		100%		100%		100%
Index 1	Ammonia	Laboratory RPDs 20%, Field RPDs 30%	95% (field duplicates)	Standard Reference Materials within 95% confidence interval stated by provider of material. If not available then with 80% to 120% of true value. Matrix Spike or control limits at + 3 standard deviations based on actual laboraotry data	83% (holding times)	Data is comparable to similar sampling events	100%
	Carbonaceous Biochemical Oxygen Demand		96% (field duplicates)		100%		100%
	Chlorophyll a		95% (field duplicates)		100%		100%
	Nitrate + Nitrite		95% (field duplicates)		83% (holding times)		100%
	Nitrite		97% (field duplicates)		91% (holding times)		100%
	Orthophosphate		97% (field duplicates)		83% (holding times)		100%
	Total Dissolved Nitrogen		97% (field duplicates)		3% (holding times)		100%
	Total Dissolved Phosphorus		100%		4% (holding times)		100%
	Total Nitrogen		97% (field duplicates)		0% (holding times)		100%
	Total Phosphorus		97% (field duplicates)		0% (holding times)		100%
	Total Suspended Solids		93% (field duplicates)		100%		100%
Index 2	Ammonia	Laboratory RPDs 20%, Field RPDs 30%	100%	Standard Reference Materials within 95% confidence interval stated by provider of material. If not available then with 80% to 120% of true value. Matrix Spike or control limits at + 3 standard deviations based on actual laboraotry data	100%	Data is comparable to similar sampling events	100%
	Carbonaceous Biochemical Oxygen Demand		100%		100%		100%
	Chlorophyll a		88% (laboratory duplicates)		100%		100%
	Nitrate + Nitrite		97% (field duplicates)		100%		100%
	Nitrite		100%		100%		100%
	Orthophosphate		97% (field duplicates)		100%		100%
	Total Dissolved Nitrogen		89% (field duplicates)		0% (holding times)		100%
	Total Dissolved Phosphorus		100%		0% (holding times)		100%
	Total Nitrogen		97% (field duplicates)		1% (holding times)		100%
	Total Phosphorus		100%		0% (holding times)		100%
	Total Suspended Solids		95% (field duplicates)		100%		100%

**Table 8-10**  
**Santa Margarita River**  
**Data Quality Objectives Summary**

Sampling Event	Analyte	Precision		Accuracy		Comparability	
		DQO	Achieved RPD MS/MSD LCS/LCSD Laboratory Duplicate Field Duplicate	DQO	Achieved %R MS LCS Blanks	DQO	Achieved
<b>Index 3</b>	Ammonia	Laboratory RPDs 20%, Field RPDs 30%	97% (field duplicates)	Standard Reference Materials within 95% confidence interval stated by provider of material. If not available then with 80% to 120% of true value. Matrix Spike or control limits at + 3 standard deviations based on actual laboraotry data	38% (holding times)	Data is comparable to similar sampling events	100%
	Carbonaceous Biochemical Oxygen Demand		100%		100%		100%
	Chlorophyll a		98% (field duplicates)		100%		100%
	Nitrate + Nitrite		100%		30% (holding times)		100%
	Nitrite		100%		31% (holding times)		100%
	Orthophosphate		92% (field duplicates)		35% (holding times)		100%
	Total Dissolved Nitrogen		97% (field duplicates)		0% (holding times)		0% (total versus dissolved discrepancy)
	Total Dissolved Phosphorus		99% (MS/MSD RPD)		0% (holding times)		100%
	Total Nitrogen		99% (MS/MSD RPD)		0% (holding times)		100%
	Total Phosphorus		100%		0% (holding times)		100%
	Total Suspended Solids		100%		100%		100%
<b>Index 4</b>	Ammonia	Laboratory RPDs 20%, Field RPDs 30%	92% (field duplicates)	Standard Reference Materials within 95% confidence interval stated by provider of material. If not available then with 80% to 120% of true value. Matrix Spike or control limits at + 3 standard deviations based on actual laboraotry data	100%	Data is comparable to similar sampling events	100%
	Carbonaceous Biochemical Oxygen Demand		100%		100%		100%
	Chlorophyll a		69% (laboratory duplicates)		100%		100%
	Nitrate + Nitrite		100%		100%		100%
	Nitrite		100%		100%		100%
	Orthophosphate		97% (field duplicates)		100%		100%
	Total Dissolved Nitrogen		97% (field duplicates)		78% (holding times)		0% (total versus dissolved discrepancy)
	Total Dissolved Phosphorus		100%		0% (MS %R and holding times)		100%
	Total Nitrogen		100%		70% (holding times)		100%
	Total Phosphorus		100%		71% (MS %R), 71% (holding times)		100%
	Total Suspended Solids		95% (laboratory duplicates)		100%		100%
<b>Stormwater 3</b>	Ammonia	Laboratory RPDs 20%, Field RPDs 30%	89% (field duplicates)	Standard Reference Materials within 95% confidence interval stated by provider of material. If not available then with 80% to 120% of true value. Matrix Spike or control limits at + 3 standard deviations based on actual laboraotry data	100%	Data is comparable to similar sampling events	100%
	Carbonaceous Biochemical Oxygen Demand		100%		100%		100%
	Chlorophyll a		100%		100%		100%
	Nitrate + Nitrite		100%		100%		100%
	Nitrite		100%		100%		100%
	Orthophosphate		100%		100%		100%
	Total Dissolved Nitrogen		89% (field duplicates)		0% (holding times)		0% (total versus dissolved discrepancy)
	Total Dissolved Phosphorus		90% (field duplicates)		0% (holding times)		100%
	Total Nitrogen		90% (field duplicates)		0% (holding times)		100%
	Total Phosphorus		100%		0% (holding times)		100%
	Total Suspended Solids		100%		100%		100%
<b>Sediment</b>	Percent Fines	Replicates within 20%, Field RPDs 50%	100%	Standard Reference Materials within 95% confidence interval stated by provider of material. If not available then with 80% to 120% of true value. Laboratory Control Samples within 25%of stated values	100%	Data is comparable to similar sampling events	100%
	Percent Sands		100%		100%		100%
	Total Organic Carbon		100%		100%		100%
	Total Organic Nitrogen		100%		100%		100%
	Total Phosphorus		100%		100%		100%

RPD - relative percent difference  
MS/MSD - matrix spike/matrix spike duplicate  
LCS/LCSD - laboratory control sample/laboratory control sample duplicate  
DQO - data quality objective

**Santa Margarita Lagoon, California  
Sampling Event SW1  
Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: CDM001  
 Laboratory: CRG Marine Laboratories, Inc and Calscience Environmental Laboratories, Inc.  
 Analysis/Methods: Chlorophyll-a - Method SM 10200 H  
Total Suspended Solids - Method SM 2540 D  
Biochemical Oxygen Demand - Method SM 5210 B - Calscience

Samples in SDG: Listed on the Form I's

**Precision:**

Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil)  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 20\%$ )

**Yes No N/A**  
See FD Table  
No

Comments (note deviations):

**Laboratory Duplicate**

Chlorophyll-a

46% - criteria (30)

**Qualifier**  
J/UJ

**Associated Sample/ Qualification**

SM-W1-S11H-1 SM-W1-PG11-6  
 SM-W1-S21H-1 SM-W1-PG11-7  
 SM-W1-PG11-1 SM-W1-PG11-8  
 SM-W1-PG11-2 SM-W1-S11L-1  
 SM-W1-PG11-3 SM-W1-S11L-3  
 SM-W1-PG11-4 SM-W1-S21L-1  
 SM-W1-PG11-5

**Accuracy:**

Laboratory Blanks criteria met (within control limits)?

**Yes No N/A**  
Yes

Comments (note deviations):

**Representativeness:**

Were sampling procedures and design criteria met?  
 Were holding times met?  
 Were preservation criteria met? ( C  $\pm$  C )  
 Were Chain-of-Custody records complete and provided in data package?  
 Were contaminants present in blanks?

**Yes No N/A**  
Yes  
Yes\*  
Yes\*\*  
Yes  
Yes

Comments (note deviations):

\* Samples for BOD were prepared within 48 hours and analyzed within 7 days  
 \*\* Cooler temperatures were 3.1 and 8 degrees C. The 8 degree cooler was slightly outside of temperature requirements. No qualifications are recommended.

**Comparability:**

Does data compare with similar analysis and data sets?  
 Comments (note deviations):

**Yes No N/A**  
Yes

**Completeness (90%):**

Are all data in this SDG useable?  
 Comments (note deviations):

**Yes No N/A**  
Yes

Do all data in this SDG meet the Data Quality Objectives?

Yes

Comments:

Validator: Cherie Zakowski  
 Reviewer: Kim Zilis

Date: 5/20/2008  
 Date: 6/13/2008

**Santa Margarita Lagoon, California**  
**Sampling Event SW2**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: CDM001b  
Laboratory: CRG Marine Laboratories, Inc  
Analysis/Methods: Chlorophyll-a - Method SM 10200 H  
Total Suspended Solids - Method SM 2540 D  
Biochemical Oxygen Demand - Method EPA 405.1

Samples in SDG: Listed on the Form I's

**Precision:**

Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil)  
Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 20\%$ )

Yes No N/A  
See FD Table  
Yes

Comments (note deviations):

**Accuracy:**

Laboratory Blanks criteria met (within control limits)?

Yes No N/A  
Yes

Comments (note deviations):

**Representativeness:**

Were sampling procedures and design criteria met?  
Were holding times met?  
Were preservation criteria met? (  $C \pm C$  )  
Were Chain-of-Custody records complete and provided in data package?  
Were contaminants present in blanks?  
Comments (note deviations):

Yes No N/A  
Yes  
Yes  
Yes\*  
Yes  
Yes

\* Cooler temperature was 8 degrees C. The 8 degree cooler was slightly outside of temperature requirements. No qualifications are recommended.

**Comparability:**

Does data compare with similar analysis and data sets?  
Comments (note deviations):

Yes No N/A  
Yes

**Completeness (90%):**

Are all data in this SDG useable?  
Comments (note deviations):

Yes No N/A  
Yes

Do all data in this SDG meet the Data Quality Objectives?

Yes

Comments:

Validator: Cherie Zakowski  
Reviewer: Kim Zilis

Date: 5/20/2008  
Date: 6/13/2008

**Santa Margarita Lagoon, California**  
**Sampling Event - Storm Water #3**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: CDM001ac  
 Laboratory: CRG Marine Laboratories, Inc  
 Analysis/Methods: Carbonaceous Biochemical Oxygen Method SM 5210B  
 Chlorophyll-a Method SM 10200H  
 Total Suspended Solids Method SM 2540D

Samples in SDG: See Form 1's

**Precision:**

Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil)  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 20\%$ )

**Yes No N/A**  
See FD Table  
Yes

Comments (note deviations): RPD level of 30% was reported as passing from lab

**Accuracy:**

Laboratory Blanks criteria met (within control limits)?

Yes

Comments (note deviations):

**Representativeness:**

Were sampling procedures and design criteria met?  
 Were holding times met?  
 Were preservation criteria met? ( C  $\pm$  C )  
 Were Chain-of-Custody records complete and provided in data package?  
 Were contaminants present in blanks?  
 Comments (note deviations):

**Yes No N/A**  
Yes  
Yes  
Yes  
Yes  
No

**Comparability:**

Does data compare with similar analysis and data sets?  
 Comments (note deviations):

**Yes No N/A**  
Yes

**Completeness (90%):**

Are all data in this SDG useable?  
 Comments (note deviations):

**Yes No N/A**  
Yes

Do all data in this SDG meet the Data Quality Objectives?

Yes

Comments:

Field blanks were collected. Results are provided on the field blank table. No qualifications were applied to the data. Field blanks were collected for informational purposes only.

Validator: Cherie Zakowski  
 Reviewer: Kim Zilis

Date: 1/18/2008  
 Date: 1/19/2008

**Santa Margarita Lagoon, California  
Sampling Event  
Data Evaluation Worksheet**

Sampling Event: Index 1, Index 2, Stormwater 1, and Stormwater 2  
 Laboratory: University of California Santa Barbara- Marine Science Institute  
 Analysis/Methods: Ammonia  
Nitrate+Nitrite  
Nitrite  
Orthophosphate

Samples in SDG: See Lab Data Sheet MSI.xls

**Precision:**

Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm$  25% water and  $\pm$  20% soil) Yes No N/A  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm$  20%) See FD Table  
Yes

Comments (note deviations):

**Accuracy:**

Matrix Spike/Matrix Spike Duplicates criteria met? (frequency 20% and control limits-lab defined) Yes No N/A  
 Laboratory Control Sample criteria met? NA  
 Laboratory Blanks criteria met (within control limits)? Yes  
Yes

Comments (note deviations):

**MS/MSD** Matrix spike recoveries could not be determined

**Representativeness:**

Were sampling procedures and design criteria met? Yes No N/A  
 Were holding times met? Yes  
 Were contaminants present in blanks? No  
 Comments (note deviations): No

The holding time for Nitrite analysis is 48 hours. Nitrite analysis for all samples was performed at least 2 weeks after sample collection. In accordance with the QAPP, Stakeholders and SCCWRP are permitted to filter and freeze nutrient samples to increase the holding time to 28 days. The nitrite data has been estimated. The following analytes were outside of holding time for Index 1 samples.

	Qualifier	Samples
Nitrite	>28 days	J/UJ
Ammonia	>28 days	See database
Orthophosphate	>28 days	J/UJ
Nitrate/nitrite	>28 days	See database

**Comparability:**

Does data compare with similar analysis and data sets? Yes No N/A  
 Comments (note deviations): Yes

**Completeness (90%):**

Are all data in this SDG useable? Yes No N/A  
 Comments (note deviations): No  
Nitrite analysis was performed outside of holding times and the data was qualified.

Do all data in this SDG meet the Data Quality Objectives? Yes

Comments:

Validator: Cherie Zakowski  
 Reviewer: Kim Zilis

Date: 6/18/2008  
 Date: 6/24/2008

**Santa Margarita Lagoon, California  
Sampling Event - Storm Water #3  
Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: Storm Water #3  
 Laboratory: MSI Marine Laboratories, Inc  
 Analysis/Methods: Ammonia  
 Nitrate+Nitrite  
 Nitrite  
 Orthophosphate  
 Samples in SDG: See database

**Precision:**  
 Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil) Yes No N/A  
See FD Table  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 20\%$ ) Yes  
 Comments (note deviations):

**Accuracy:**  
 Matrix Spike/Matrix Spike Duplicates criteria met? (frequency 20% and control limits-lab defined) Yes No N/A  
Yes  
 Laboratory Control Sample criteria met? Yes  
 Laboratory Blanks criteria met (within control limits)? Yes  
 Comments (note deviations):

**Representativeness:**  
 Were sampling procedures and design criteria met? Yes No N/A  
Yes  
 Were holding times met? Yes  
 Were preservation criteria met? (  $C \pm C$  ) Yes\*  
 Were Chain-of-Custody records complete and provided in data package? No  
 Were contaminants present in blanks? No  
 Comments (note deviations):  
 \*No cooler temp was included in database - samples were shipped frozen.

**Comparability:**  
 Does data compare with similar analysis and data sets? Yes No N/A  
Yes  
 Comments (note deviations):

**Completeness (90%):**  
 Are all data in this SDG useable? Yes No N/A  
Yes  
 Comments (note deviations):

Do all data in this SDG meet the Data Quality Objectives? Yes  
 Comments:

Validator: Jessica Jeppson Date: 2/11/2009  
 Reviewer: Cherie Zakowski Date: 2/15/2009





**Santa Margarita Lagoon, California**  
**Sampling Event Index 1**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: CDM001c, CDM001d, CDM001e, CDM001f, CDM001g, CDM001h  
 Laboratory: CRG Marine Laboratories, Inc, Calscience Environmental Laboratories, Inc.  
 Analysis/Methods: Chlorophyll-a - Method SM 10200 H  
Total Suspended Solids - Method SM 2540 D  
Biochemical Oxygen Demand - Method EPA 405.1 by CRG - CDM001c, CDM001f, CDM001g  
Biochemical Oxygen Demand - Method SM 5210B by Calscience - CDM001d, CDM001e, CDM001h

Samples in SDG: Listed on the Form I's

**Precision:**

Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil)  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 20\%$ )

**Yes No N/A**  
See FD Table  
Yes

Comments (note deviations):

**Accuracy:**

Laboratory Blanks criteria met (within control limits)?

**Yes No N/A**  
Yes

Comments (note deviations):

**Representativeness:**

Were sampling procedures and design criteria met?  
 Were holding times met?  
 Were preservation criteria met? ( C  $\pm$  C)  
 Were Chain-of-Custody records complete and provided in data package?  
 Were contaminants present in blanks?

**Yes No N/A**  
Yes  
Yes  
Yes  
Yes  
Yes

Comments (note deviations):

Comments (note deviations): CDM001c - Cooler temperature was 8 degrees C. The 8 degree cooler was slightly outside of temperature requirements. No qualifications are recommended.  
CDM001g and CDM001H - cooler temperature as received by CRG not reported.  
SM-11D3-S2H-2 on the COC for SDG CDM001e was labeled on the sample bottle as SM-11D3-S1H-2.  
Data was reported in accordance with the COC identification.  
The laboratory resubmitted reports for CDM001f and CDM001g correcting the dates for the BOD analysis.

**Comparability:**

Does data compare with similar analysis and data sets?  
 Comments (note deviations):

**Yes No N/A**  
Yes

**Completeness (90%):**

Are all data in this SDG useable?  
 Comments (note deviations):

**Yes No N/A**  
Yes

Do all data in this SDG meet the Data Quality Objectives?

Yes

Comments:

Validator: Cherie Zakowski  
 Reviewer: Kim Zilis

Date: 5/20/2008  
 Date: 6/13/2008

**Santa Margarita Lagoon, California**  
**Sampling Event Index 2**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: CDM001i, CDM001j, CDM001k, CDM001l, CDM001m, CDM001n, CDM001o  
 Laboratory: CRG Marine Laboratories, Inc.; Calscience Environmental Laboratories, Inc.  
 Analysis/Methods: Chlorophyll-a - Method SM 10200 H  
Total Suspended Solids - Method SM 2540 D  
Biochemical Oxygen Demand - Method EPA 405.1 - CRG CDM001k, CDM001l, CDM001n, CDM001o  
Biochemical Oxygen Demand - Method SM 5210B - Calscience CDM001i, CDM001j, CDM001m

Samples in SDG: Listed on the Form I's

**Precision:** **Yes No N/A**  
 Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil) See FD Table  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 20\%$ ) No

Comments (note deviations):

Laboratory Duplicate	Qualifier	Associated Sample/ Qualification
CDM001i - Chlorophyll-a 38% (30)	J/UJ	SM-I2D1-S1H-1 SM-I2D1-S2L-1 SM-I2D1-S2H-1 SM-I2D1-O1L-1 SM-I2D1-O1H-1 SM-I2D1-ME-1 SM-I2D1-S1L-1 SM-I2D1-S1L-2

**Accuracy:** **Yes No N/A**  
 Laboratory Blanks criteria met (within control limits)? Yes

Comments (note deviations):

**Representativeness:** **Yes No N/A**  
 Were sampling procedures and design criteria met? Yes  
 Were holding times met? Yes  
 Were preservation criteria met? ( C  $\pm$  C ) Yes\*  
 Were Chain-of-Custody records complete and provided in data package? Yes  
 Were contaminants present in blanks? Yes  
 Comments (note deviations):

CDM001i - Cooler temperatures were 3.7 and 11 degrees C. The 11 degree cooler was slightly outside of temperature requirements. No qualifications are recommended as samples were received within approximately 7 hours of collection.  
CDM001j - Cooler temperatures were 3.7 and 12 degrees C. The 12 degree cooler was slightly outside of temperature requirements. No qualifications are recommended as samples were received within approximately 7 hours of collection.  
CDM001k - Cooler temperature was 12 degrees C. The 12 degree cooler was slightly outside of temperature requirements. No qualifications are recommended as samples were received within approximately 7 hours of collection.  
CDM001l - Cooler temperature not found. Samples were received by the laboratory within 3 hours of collection.  
CDM001n - Cooler temperature was 12 degrees C. The 12 degree cooler was slightly outside of temperature requirements. No qualifications are recommended as samples were received within approximately 10 hours of collection.  
CDM001o - Cooler temperature was 12 degrees C. The 12 degree cooler was slightly outside of temperature requirements. No qualifications are recommended as samples were received within approximately 10 hours of collection.  
The laboratory resubmitted the report for CDM001k correcting the dates for the BOD analysis.

**Comparability:** **Yes No N/A**  
 Does data compare with similar analysis and data sets? Yes  
 Comments (note deviations): \_\_\_\_\_

**Completeness (90%):** **Yes No N/A**  
 Are all data in this SDG useable? Yes  
 Comments (note deviations): \_\_\_\_\_

Do all data in this SDG meet the Data Quality Objectives? Yes

Comments:

Validator: Cherie Zakowski Date: 5/20/2008  
 Reviewer: Kim Zilis Date: 6/13/2008

**Santa Margarita Lagoon, California**  
**Sampling Event-Index 3**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: CDM001p, CDM001q, CDM001r, CDM001s, CDM001t, CDM001u, CDM001v,  
 Laboratory: CRG Marine Laboratories, Inc  
 Analysis/Methods: Carbonaceous Biochemical Oxygen Method SM 5210B  
 Chlorophyll-a Method SM 10200H  
 Total Suspended Solids Method SM 2540D

Samples in SDG: See Form 1's

**Precision:**

Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil)  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 20\%$ )

**Yes No N/A**  
 See FD Table  
No

Comments (note deviations): RPD level of 30% was reported as passing from lab

<b>Laboratory Duplicate</b>				<b>Qualifier</b>	<b>Associated Sample Qualification</b>		
PB	5624012	Total Suspended Solids	39% -criteria (30)	J/UJ	SM-I3-TR1H-1	SM-I3-TR1L-1	SM-I3-TR11L-1
		Total Suspended Solids	40% - criteria (30)	J/UJ	SM-I3-TR2H-1	SM-I3-TR2L-1	SM-I3-TR12L-1
					SM-I3-TR3H-1	SM-I3-TR3L-1	SM-I3-TR6H-2
					SM-I3-TR4H-1	SM-I3-TR4L-1	SM-I3-TR9H-2
					SM-I3-TR5H-1	SM-I3-TR5L-1	SM-I3-TR8L-2
					SM-I3-TR6H-1	SM-I3-TR6L-1	SM-I3-TR10H-1
					SM-I3-TR7H-1	SM-I3-TR7L-1	SM-I3-TR11H-1
					SM-I3-TR8H-1	SM-I3-TR8L-1	SM-I3-TR12H-1
					SM-I3-TR9H-1	SM-I3-TR9L-1	SM-I3-TR10L-1
		PB	5624007	Total Suspended Solids	65% -criteria (30)	J/UJ	SM-I3D5-S1H-1
					SM-I3D5-S2H-1	SM-I3D5-S1L-2	
					SM-I3D5-O1H-1	SM-I3D5-ME-1	
					SM-I3D5-S1L-1	SM-I3D5-FB-1	
					SM-I3D5-S2L-1		

**Accuracy:**

Laboratory Blanks criteria met (within control limits)?

**Yes No N/A**  
Yes

Comments (note deviations):

**Representativeness:**

Were sampling procedures and design criteria met?  
 Were holding times met?  
 Were preservation criteria met? ( C  $\pm$  C )  
 Were Chain-of-Custody records complete and provided in data package?  
 Were contaminants present in blanks?

**Yes No N/A**  
Yes  
Yes\*  
Yes\*\*  
Yes  
No

Comments (note deviations): \*Samples for BOD were prepared and analyzed within 24 hours  
 \*\*Coolers were received at temperatures of 3°C, 6°C, 4°C, 10°C, 9°C, 7°C and 7°C, however no action was taken

**Comparability:**

Does data compare with similar analysis and data sets?

**Yes No N/A**  
Yes

Comments (note deviations):

**Completeness (90%):**

Are all data in this SDG useable?

**Yes No N/A**  
Yes

Comments (note deviations):

Do all data in this SDG meet the Data Quality Objectives?

Yes

Comments:

Field blanks were collected. Results are provided on the field blank table. No qualifications were applied to the data. Field blanks were collected for informational purposes only.

Validator: Jessica Jeppson  
 Reviewer: Cherie Zakowski

Date: 9/17/2008  
 Date: 9/23/2008

**Santa Margarita Lagoon, California**  
**Sampling Event-Index 3**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: Index 3  
 Laboratory: MSI Marine Laboratories, Inc  
 Analysis/Methods: Ammonia  
Nitrate+Nitrite  
Nitrite  
Orthophosphate

Samples in SDG: See database

**Precision:**  
 Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil) Yes No N/A  
 See FD Table  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 20\%$ ) No

Comments (note deviations): RPD level of 30% was reported as passing from lab

PB	Sample ID	Analyte	Dup	Original	%RPD	Qualifier	Samples
AL2684	SM-I3D2-S1H-2	Nitrite		0.03	0.049	37.23988341	No qualifier - difference between the samples is less than 2xCRDL

NOTE: not sure if all samples are qualified based on lab dup but put it in the database and highlighted the samples with yellow.  
 Not sure if ND gets a UJ qualifier.

**Accuracy:**  
 Matrix Spike/Matrix Spike Duplicates criteria met? (frequency 20% and control limits-lab defined) Yes No N/A  
 Yes  
 Laboratory Control Sample criteria met? Yes  
 Laboratory Blanks criteria met (within control limits)? Yes

Comments (note deviations): Pcontrol assumed to be LCS.

**Representativeness:**  
 Were sampling procedures and design criteria met? Yes No N/A  
 Yes  
 Were holding times met? No  
 Were preservation criteria met? (  $C \pm C$  ) Yes\*  
 Were Chain-of-Custody records complete and provided in data package? No  
 Were contaminants present in blanks? No

Comments (note deviations):  
\*No cooler temp was included in database

Holding Times	Qualifier	Samples
Nitrate + Nitrite	> 28 days	J/UJ
Nitrite	> 28 days	J/UJ
Orthophosphate	> 28 days	J/UJ
Ammonia	>28 days	J/UJ

**Comparability:**  
 Does data compare with similar analysis and data sets? Yes No N/A  
 Yes  
 Comments (note deviations): \_\_\_\_\_

**Completeness (90%):**  
 Are all data in this SDG useable? Yes No N/A  
 Yes  
 Comments (note deviations): \_\_\_\_\_

Do all data in this SDG meet the Data Quality Objectives? Yes

Comments: Field blanks were collected. Results are provided on the field blank table. No qualifications were applied to the data. Field blanks were collected for informational purposes only.

Validator: Jessica Jeppson Date: 9/28/2008  
 Reviewer: Cherie Zakowski Date: 9/28/2008

**Santa Margarita Lagoon, California**  
**Sampling Event-Index 3**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: Index 3  
 Laboratory: UGA Marine Laboratories, Inc  
 Analysis/Methods: Total Phosphorus 4500J  
Total Dissolved Phosphorus 4500J  
Total Nitrogen 4500J  
Total Dissolved Nitrogen 4500J

Samples in SDG: See Form 1's

**Precision:** Yes No N/A  
 Field Duplicates RPD criteria met? (frequency 10% and control limits ± 25% water and ± 20% soil) See FD Table  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits ± 20%) Yes

Comments (note deviations): RPD level of 30% was reported as passing from lab

**Accuracy:** Yes No N/A  
 Matrix Spike/Matrix Spike Duplicates criteria met? (frequency 20% and control limits-lab defined) Yes  
 Laboratory Control Sample criteria met? Yes  
 Laboratory Blanks criteria met (within control limits)? Yes

Comments (note deviations):

**Representativeness:** Yes No N/A  
 Were sampling procedures and design criteria met? No  
 Were holding times met? No  
 Were preservation criteria met? ( C ± C ) Yes\*  
 Were Chain-of-Custody records complete and provided in data package? No  
 Were contaminants present in blanks? No

Comments (note deviations): \*No cooler temp was included in database

Holding Times	Qualifier	Samples
Total Dissolved Nitrogen	> 28 days J/UJ	See database
Total Nitrogen	> 28 days J/UJ	See database
Total Dissolved Phosphorous	> 28 days J/UJ	See database
Total Phosphorous	> 28 days J/UJ	See database

NOTE: All samples exceeded holding times for all analytes.

**Sampling Procedures**

All total dissolved nitrogen results were rejected R due to unquantifiable nitrogen signature due to filtering methodology. The R qualifier replaces the J/UJ qualifier in the database.

**Comparability:** Yes No N/A  
 Does data compare with similar analysis and data sets? Yes  
 Comments (note deviations): \_\_\_\_\_

**Completeness (90%):** Yes No N/A  
 Are all data in this SDG useable? Yes  
 Comments (note deviations): \_\_\_\_\_

Do all data in this SDG meet the Data Quality Objectives? Yes

Comments: Field blanks were collected. Results are provided on the field blank table. No qualifications were applied to the data. Field blanks were collected for informational purposes only.

Validator: Jessica Jeppson Date: 9/28/2008  
 Reviewer: Cherie Zakowski Date: 9/28/2008

**Santa Margarita Lagoon, California**  
**Sampling Event-Index 4**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: CDM001w, CDM001x, CDM001y, CDM001z, CDM001aa, CDM001ab  
 Laboratory: CRG Marine Laboratories, Inc  
 Analysis/Methods: Carbonaceous Biochemical Oxygen Method SM 5210B  
 Chlorophyll-a Method SM 10200H  
Total Suspended Solids Method SM 2540D

Samples in SDG: See Form 1's

**Precision:**

Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil)  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 30\%$  [lab criteria])

**Yes No N/A**  
See FD Table  
No

Comments (note deviations): RPD level of 30% was reported as passing from lab

**Laboratory Duplicate**

Laboratory Duplicate		Qualifier	Associated Sample Qualification
CDM001W			
PB	5705012 Chlorophyll-a	40% -criteria (30)	J/UJ SM-I4D1-S1H-1 SM-I4D1-S2H-1 SM-I4D1-O1H-1 SM-I4D1-S1L-1 SM-I4D1-S2L-1 SM-I4D1-O1L-1 SM-I4D1-S1H-2 SM-I4D1-FB-1
CDM001Y			
PB	5705019 Chlorophyll-a	38% -criteria (30)	J/UJ SM-I4-TR11H-1 SM-I4-TR7L-1 SM-I4-TR6H-2 SM-I4-TR12H-1 SM-I4-TR8L-1 SM-I4-TR11-1 SM-I4-TR10L-1 SM-I4-TR2L-1 SM-I4-TR11L-1 SM-I4-TR3L-1 SM-I4-TR12L-1 SM-I4-TR4L-1 SM-I4-TR9H-2 SM-I4-TR5L-1 SM-I4-TR8L-2 SM-I4-TR6L-1 SM-I4-TR9L-MSMSD
CDM001Y			
PB	5724031 Total Suspended Solids	75% -criteria (30)	J/UJ SM-I4-TR12L-1 SM-I4-TR9H-2 SM-I4-TR8L-2 SM-IR-TR-6H-2

Comments (note deviations):

\*Assumed SM-I4-TR6H-MSMSD and SM-I4-TR9L-MSMSD were MS samples and SM-I4-TR6H-2 was a MSD sample. The RPD for SM-I4-TR6H MS/MSD for total suspended sediments was outside a criteria of 30%. However percent recoveries were not provided so no action was taken.

**Accuracy:**

Laboratory Blanks criteria met (within control limits)?

Yes

Comments (note deviations):

**Representativeness:**

Were sampling procedures and design criteria met?  
 Were holding times met?  
 Were preservation criteria met? ( C  $\pm$  C )  
 Were Chain-of-Custody records complete and provided in data package?  
 Were contaminants present in field blanks?

**Yes No N/A**  
Yes  
Yes  
Yes\*\*  
Yes  
No

Comments (note deviations):

\*\*Coolers were received at temperatures of 8°C, 7°C, 9°C, 9°C, 8°C, and 5°C, however no action was taken  
Field blanks were collected. Results are provided on the field blank table. No qualifications were applied to the data. Field blanks were collected for informational purposes only.

**Comparability:**

Does data compare with similar analysis and data sets?

**Yes No N/A**  
Yes

Comments (note deviations):

**Completeness (90%):**

Are all data in this SDG useable?

**Yes No N/A**  
Yes

Comments (note deviations):

Do all data in this SDG meet the Data Quality Objectives?

Yes

Comments:

Validator: Jessica Jeppson Date: 11/13/2008  
 Reviewer: Cherie Zakowski Date: 1/12/2009

**Santa Margarita Lagoon, California**  
**Sampling Event-MSI - Index 4**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number: Index 4  
 Laboratory: MSI Marine Laboratories, Inc  
 Analysis/Methods: Ammonia  
Nitrate+Nitrite  
Nitrite  
Orthophosphate

Samples in SDG: See database

**Precision:** **Yes No N/A**  
 Field Duplicates RPD criteria met? (frequency 10% and control limits ± 25% water and ± 20% soil) See FD Table  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits ± 20%) No\*

Comments (note deviations): \*Five replicates were done for AL2739 and one replicate AL2745. No action was taken for the less than the 20% frequency. All lab duplicates were within the 20% control limits.

**Accuracy:** **Yes No N/A**  
 Matrix Spike/Matrix Spike Duplicates criteria met? (frequency 20% and control limits-lab defined) No\*  
 Laboratory Control Sample criteria met? Yes\*  
 Laboratory Blanks criteria met (within control limits)? Yes

Comments (note deviations): \*Pcontrol assumed to be LCS. Eight samples were run for AL2739 but none were run for AL2745. No action was taken for the lack of a LCS for AL2745.  
 \*Three MS/MSD were done for AL2739 and AL2745. No action was taken for the less than the 20% frequency. All MS/MSD were within the 20% control limits.

**Representativeness:** **Yes No N/A**  
 Were sampling procedures and design criteria met? Yes  
 Were holding times met? Yes  
 Were preservation criteria met? ( C ± C ) Yes\*  
 Were Chain-of-Custody records complete and provided in data package? No  
 Were contaminants present in blanks? No

Comments (note deviations): \*No cooler temp was included in database  
Per verbal communication with the sampling team, samples were frozen, hence a 28 day holding time is applicable.

**Comparability:** **Yes No N/A**  
 Does data compare with similar analysis and data sets? Yes  
 Comments (note deviations): \_\_\_\_\_

**Completeness (90%):** **Yes No N/A**  
 Are all data in this SDG useable? Yes  
 Comments (note deviations): \_\_\_\_\_

Do all data in this SDG meet the Data Quality Objectives? Yes

Comments: \_\_\_\_\_

Validator: Jessica Jeppson Date: 1/15/2009  
 Reviewer: Cherie Zakowski Date: 1/18/2009

**Santa Margarita Lagoon, California**  
**Sampling Event-UGA Index 4**  
**Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number:  
 Laboratory:  
 Analysis/Methods:

Index 4  
 UGA Marine Laboratories, Inc  
 Total Phosphorus 4500J  
 Total Dissolved Phosphorus 4500J  
 Total Nitrogen 4500J  
 Total Dissolved Nitrogen 4500J

Samples in SDG: See database

**Precision:**

Field Duplicates RPD criteria met? (frequency 10% and control limits  $\pm 25\%$  water and  $\pm 20\%$  soil)  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits  $\pm 30\%$  [lab limits])

**Yes No N/A**  
 See FD table  
No\*

Comments (note deviations):

RPD level of 30% was reported as passing from lab  
 Samples were within the control limits but not within the 20% frequency. Only 12 dups were run

PB 1	Sample ID	Analyte	Dup	Original	%RPD	Qualifier	Samples
11/17/08	SM-I4D4-O1H	Total Dissolved Phosphorus	0.00	0.0205	Not calculable	None	See database

Note: The RPD is not calculable when one result is nondetect.

**Accuracy:**

Matrix Spike/Matrix Spike Duplicates criteria met? (frequency 20% and control limits-lab defined)  
 Laboratory Control Sample criteria met?  
 Laboratory Blanks criteria met (within control limits)?

**Yes No N/A**  
No\*  
Yes  
Yes

Comments (note deviations):

	MS/MSD	Analyte	Result (mg/L)	Expected (mg/L)	MS/MSD %R	Qualifier	Associated Samples
PB 1 11/17/2008	SM-I4-D5-SIL-MSMSD	Total Dissolved Phosphorus	0.048	0.0394	122.1 (80-120%)	J/UJ	see database
PB1 11/17/2008	SM-I4D6-SIL-MSMSD	Total Phosphorus	0.0466	0.036	129.3 (80-120%)	J/UJ	see database
		Total Dissolved Phosphorus	0.034	0.271	125.5 (80-120%)	J/UJ	see database
PB 1 10/15/2008	SM-I4-TR6H-MSMSD	Total Phosphorus	0.1075	0.0838	128.4 (80-120%)	J/UJ	see database
PB 1 10/15/2008	SM-I4-TR9L-MSMSD	Total Phosphorus	0.1638	0.1293	126.7 (80-120%)	J/UJ	see database

**Representativeness:**

Were sampling procedures and design criteria met?  
 Were holding times met?  
 Were preservation criteria met? ( C  $\pm$  C )  
 Were Chain-of-Custody records complete and provided in data package?  
 Were contaminants present in blanks?  
 Comments (note deviations):

**Yes No N/A**  
No  
No  
Yes\*  
No  
No

\*No cooler temp was included in database

Holding Times	Qualifier	Samples
Total Dissolved Nitrogen	> 28 days J/UJ	See database
Total Nitrogen	> 28 days J/UJ	See database
Total Dissolved Phosphorous	> 28 days J/UJ	See database
Total Phosphorous	> 28 days J/UJ	See database

NOTE: All samples exceeded holding times for all analytes.

**Sampling Procedures**

All total dissolved nitrogen results were rejected R due to unquantifiable nitrogen signature due to filtering methodology.  
 The R qualifier replaces the J/UJ qualifier in the database.

**Comparability:**

Does data compare with similar analysis and data sets?

**Yes No N/A**  
Yes

Comments (note deviations):

---

**Completeness (90%):**

**Yes No N/A**

Are all data in this SDG useable?

Yes

Comments (note deviations):

---

Do all data in this SDG meet the Data Quality Objectives?

Yes

Comments:

---

Validator:

Jessica Jeppson

Date: 1/16/2009

Reviewer:

Cherie Zakowski

Date: 1/18/2009

**Santa Margarita Lagoon, California  
Sampling Event - Sediment  
Data Evaluation Worksheet**

Sample Delivery Group (SDG) Number:  
Laboratory:  
Analysis/Methods:

Sediment  
UGA Marine Laboratories, Inc/MSI  

---

Percent of Total Phosphorus  
Carbon/Nitrogen Ratio  
Percent Sand/Percent Fines  

---

Samples in SDG:	SS01-F1	SS08-F1	SS015-F1
	SS02-F1	SS09-F1	SS02-F3
	SS03-F1	SS010-F1	SS15-F3
	SS04-F1	SS011-F1	
	SS05-F1	SS012-F1	
	SS06-F1	SS013-F1	
	SS07-F1	SS014-F1	

**Precision:** **Yes No N/A**  
 Field Duplicates RPD criteria met? (frequency 10% and control limits ± 25% water and ± 20% soil) See FD table  
 Laboratory Duplicates RPD criteria met? (frequency 20% and control limits ± 20%) Yes

Comments (note deviations):

**Accuracy:** **Yes No N/A**  
 Matrix Spike/Matrix Spike Duplicates criteria met? (frequency 20% and control limits-lab defined) Yes  
 Laboratory Control Sample criteria met? Yes  
 Laboratory Blanks criteria met (within control limits)? Yes

**Representativeness:** **Yes No N/A**  
 Were sampling procedures and design criteria met? Yes  
 Were holding times met? Yes  
 Were preservation criteria met? ( C ± C ) Yes  
 Were Chain-of-Custody records complete and provided in data package? Yes  
 Were contaminants present in blanks? No  
 Comments (note deviations):

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Comparability:** **Yes No N/A**  
 Does data compare with similar analysis and data sets? Yes  
 Comments (note deviations):

\_\_\_\_\_  
 \_\_\_\_\_

**Completeness (90%):** **Yes No N/A**  
 Are all data in this SDG useable? Yes  
 Comments (note deviations):

\_\_\_\_\_  
 \_\_\_\_\_

Do all data in this SDG meet the Data Quality Objectives? Yes

Comments:  
 \_\_\_\_\_

Validator: Cherie Zakowski Date: 5/10/2009  
 Reviewer: Todd Burgess Date: 5/11/2009