

EXHIBIT 7 OF ATTACHMENT J

YEAR 2 NUTRIENT MONITORING FOR THE COUNTY UNINCORPORATED AREA OF THE MACHADO LAKE WATERSHED

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Year 2 Nutrient Monitoring for the County of Los Angeles Unincorporated Area of the Machado Lake Watershed

Submitted to:

California Regional Water Quality Control Board
Los Angeles Region
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November 19, 2014

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1.0 INTRODUCTION

The Machado Lake Total Maximum Daily Load (TMDL) was developed to protect beneficial uses within the watershed by addressing Machado Lake's nutrient-related beneficial use impairments, including: eutrophication, algae, ammonia, and odor. The Machado Lake Nutrient TMDL was established by the Los Angeles Regional Water Quality Control Board (Regional Board) and adopted on May 1, 2008. The U.S. Environmental Protection Agency (USEPA) approved the TMDL and became effective on March 11, 2009 and approved on April 8, 2009.

The Machado Lake Nutrient TMDL sets concentration-based wasteload allocations (WLAs) for in-lake or end-of-pipe compliance options. At the same time, it provides for a mass-based compliance option, with the condition that the parties who choose this option develop the equivalent mass-based WLA and method of compliance with the WLA through a Special Study. The County of Los Angeles (County) has opted for the mass-based WLA alternative and completed the Special Study called "*Machado Lake Nutrient TMDL Special Study: Characterization of Water Quality Conditions in the Unincorporated Areas of Los Angeles County within the Machado Lake Watershed*," Final Report dated September 12, 2011 (Los Angeles County Department of Public Works, 2011a).

In response to the TMDL, the County submitted a "*Machado Lake Multipollutant TMDL Monitoring and Reporting Program (MRP)*" and "*MRP Quality Assurance and Project Plan (QAPP) for the Unincorporated Areas of Los Angeles County within the Machado Lake Watershed*" in September of 2011. These documents specify the Wet Weather and Dry Weather sampling criteria and protocol. On April 25, 2012, the Regional Board approved the Nutrients TMDL portion of the Multipollutant MRP. Following the Nutrients TMDL approval on April 25, 2012, the County requested the modification of the Method Detection Limit (MDL) and the Reporting Limit for Ammonia and Total Orthophosphate in the approved MRP and QAPP, which were approved on September 5, 2012.

The Machado Lake Multipollutant TMDL Monitoring and Reporting Program (MRP) describes seven monitoring sites selected for sampling and measurement; three were dedicated for water quality sampling and measurements of field parameters (for both Wet and quarterly Dry Weather Monitoring Events) and the remaining four sites for only field parameter measurements (no water quality sampling required). The total number of nutrient sampling events required to meet the TMDL Nutrient monitoring is three Wet Weather and four Dry Weather Monitoring Events as requested by the Regional Board via email communication. The quarterly Dry Weather Monitoring Events are specified as follows:

- Quarter 1(Q1): March 25 – June 24
- Quarter 2 (Q2): June 25 – September 25
- Quarter 3 (Q3): September 26 – December 25
- Quarter 4 (Q4): December 26, 2013 – March 25

This is the Annual Monitoring Report (AMR) for Year 2 (2013-2014) Nutrients TMDL portion of the Multipollutant TMDL Monitoring and Reporting program. This report incorporates and

summarizes the procedures and results of the monitoring program and consists of the following sections:

- Program Overview – provides background information for the project and description of the monitoring sites.
- Monitoring Events and Frequencies – specifies the monitored storms during Year 2 and Dry Weather dates.
- Field Methods – describes the methodology used for data collection and data analysis
- Results and Analysis – describes results of the Year 2 monitoring program.
- Flow Estimation and Load Calculations – describes the methodology and provides the results of flow and load calculations.
- Summary – lists a summary of dry weather monitoring event flows and water quality results.
- Reference – provides a list of references used to prepare this AMR.

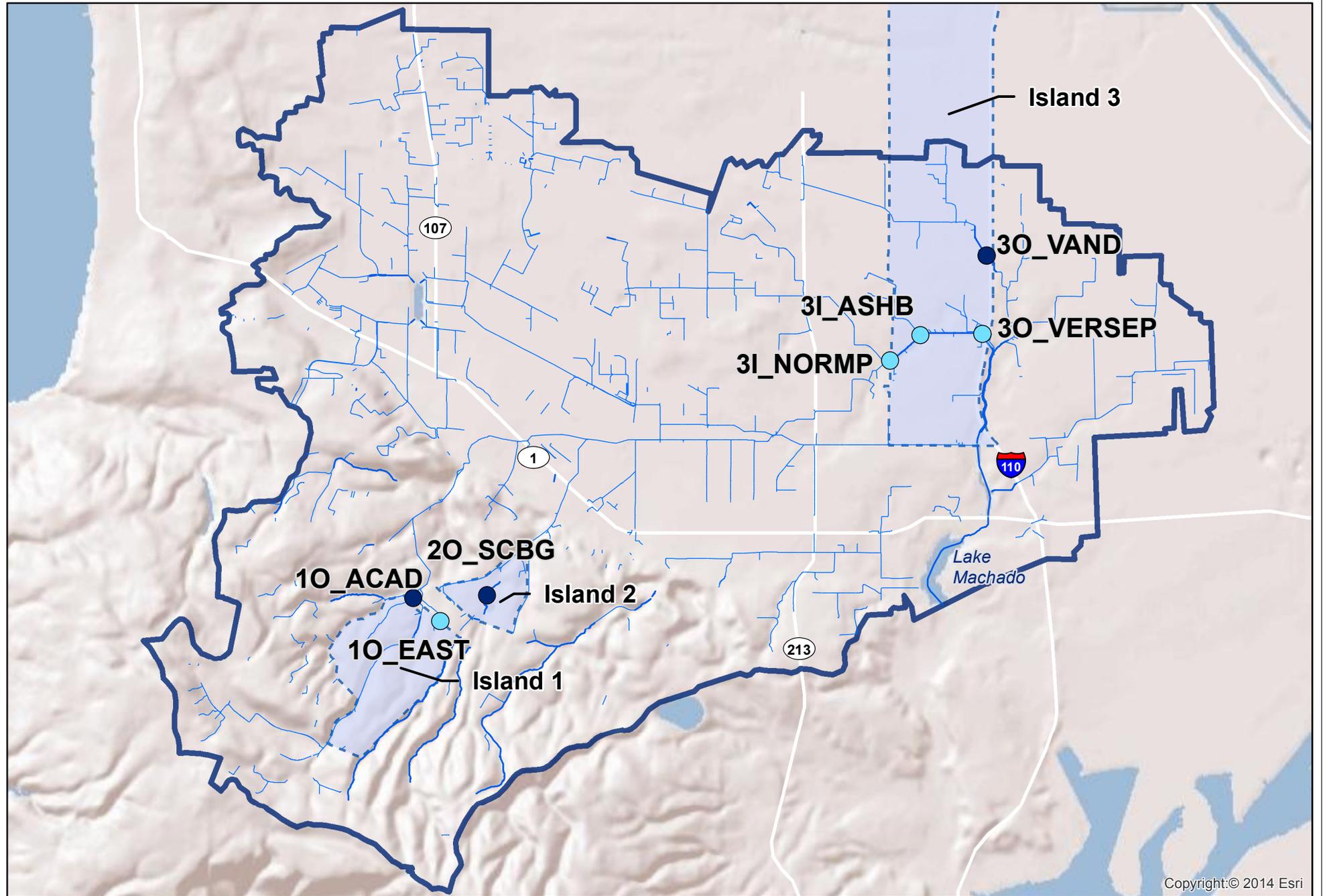
2.0 PROGRAM OVERVIEW

The purpose of the Machado Lake Nutrients TMDL MRP was to determine the nutrient wasteloads into Machado Lake from the unincorporated Los Angeles County (County) islands. This report will evaluate the loading entering into Machado Lake from the County Islands for the years of 2013 to 2014 and will evaluate if the total loading is under the Interim Limits set for the TMDL.

Within the Machado Lake watershed, there are three (3) unincorporated County lands. The MRP and QAPP approved a total of seven monitoring sites located at the inlets or outlets of the three County Islands, namely; County Islands 1, 2 and 3. There are two outlets for County Island 1 (1O_ACAD and 1O_EAST), one outlet for County Island 2 (2O_SCBG) and two inlets and two outlets for County Island 3 (inlets: 3I_ASHB and 3I_NORMP; outlets; 3O_VERSEP and 3O_VAND). The monitoring sites, their descriptions, and their relationship to the County Islands are described in **Table 1**. The County Islands are located on **Figure 1**, with monitoring locations in County Islands 1 and 2 displayed in **Figure 2** and monitoring location in County Island 3 displayed in **Figure 3**. **Table 2** lists a summary of the land use in each County Island. Drainage areas were determined by using GIS layers of detailed basins and flow paths of the Machado Lake watershed provided by the County of Los Angeles.

Table 1
Monitoring Site Descriptions

Site ID	County Island	Type	Nearest Intersection	Latitude	Longitude	Site Description
10_ACAD	1	Outlet	Academy Dr. and Palos Verdes Dr.	33.78302	-118.35374	Representative of County Island outlet and potentially residential land use. This site will be used to characterize loading from the County Island residential land uses.
10_EAST	1	Outlet	Eastvale Rd. and Palos Verdes Dr.	33.78073	-118.35087	Representative of County Island outlet and residential land use.
20_SCBG	2	Outlet	Crenshaw Blvd. and Palos Verdes Dr.	33.78303	-118.34534	Outlet of the South Coast Botanical Garden, the majority land use of the Island. This site will be used to characterize loading from the County Island residential land uses.
3I_NORMP	3	Inlet	Normandie Ave. and Pasatiempo Ln.	33.80613	-118.29830	Large drain into County Island 3. Associated Vermont/Sepulveda outlet drains large portion of County Island 3.
3I_ASHB	3	Inlet Proxy	Ashbridge Dr. and Pasatiempo Ln.	33.80861	-118.29586	Drains the combination of the two other small Island inlets to the associated Vermont/ Sepulveda Island outlet.
3O_VERSEP	3	Outlet	Vermont Ave. and Sepulveda Blvd.	33.80841	-118.28864	Drains large section of County Island 3.
3O_VAND	3	Outlet	Van Deene Ave. and 228th St.	33.81588	-118.28798	Drains large section of County Island. This site will be used to characterize loading from the County Island and evaluate loadings from other portions of the County without an associated outlet site.



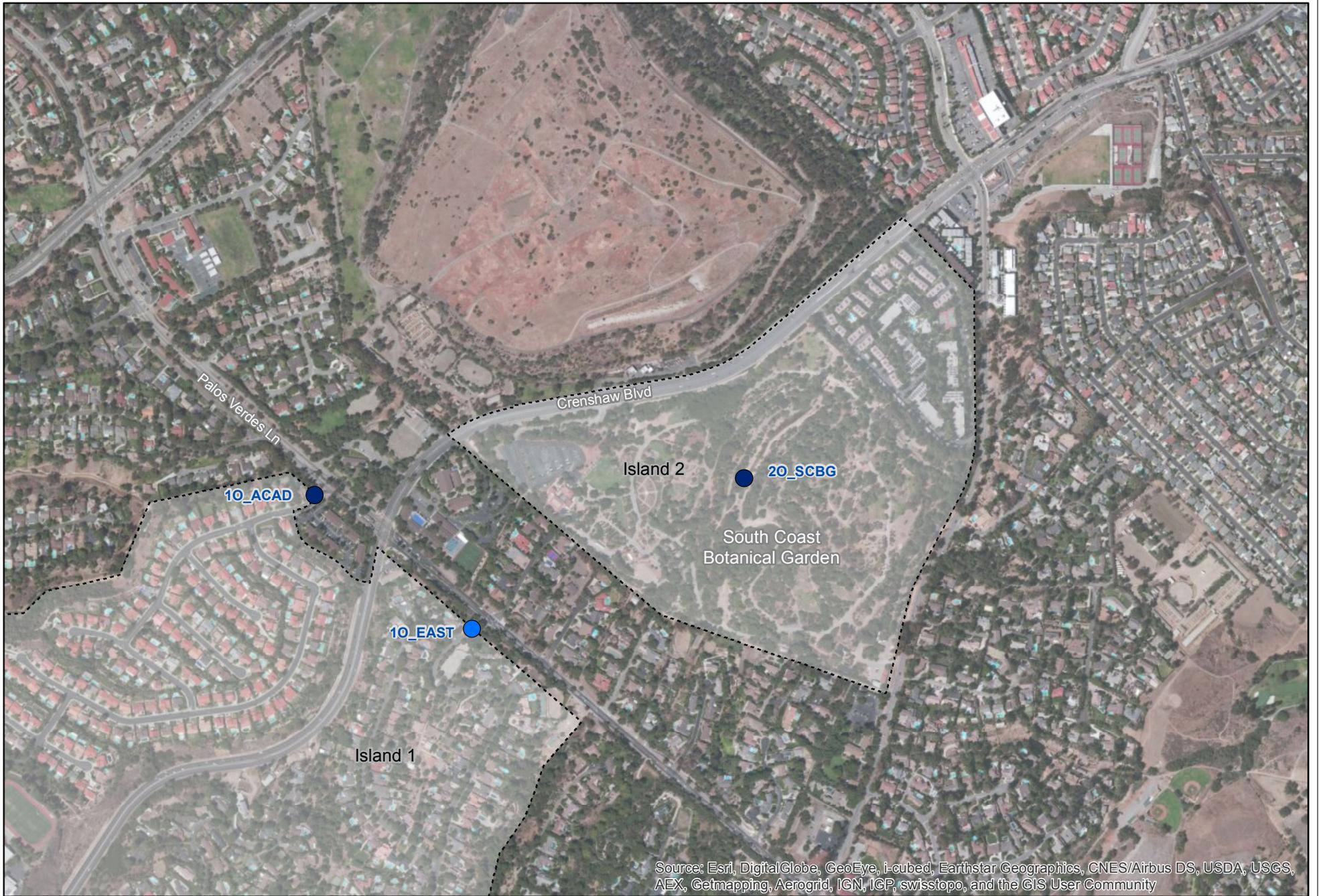
Key to Features

- Field Sampling and Measurements
- Field Measurements Only
- Storm Drain
- Lake Machado
- County Island
- Machado Lake Watershed

Document: \\Usps1s01\mun\clients\Los Angeles County DPW\On-Call Watershed & WQ Support\F21808105 Machado Lake Nutrient TMDL Monitoring\14 Electronic Files - Modeling\MXD\InletOutletFull_AA.mxd
Date: October 30, 2014

Machado Lake Watershed

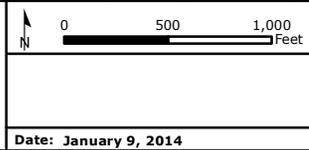
Figure 1



Key to Features

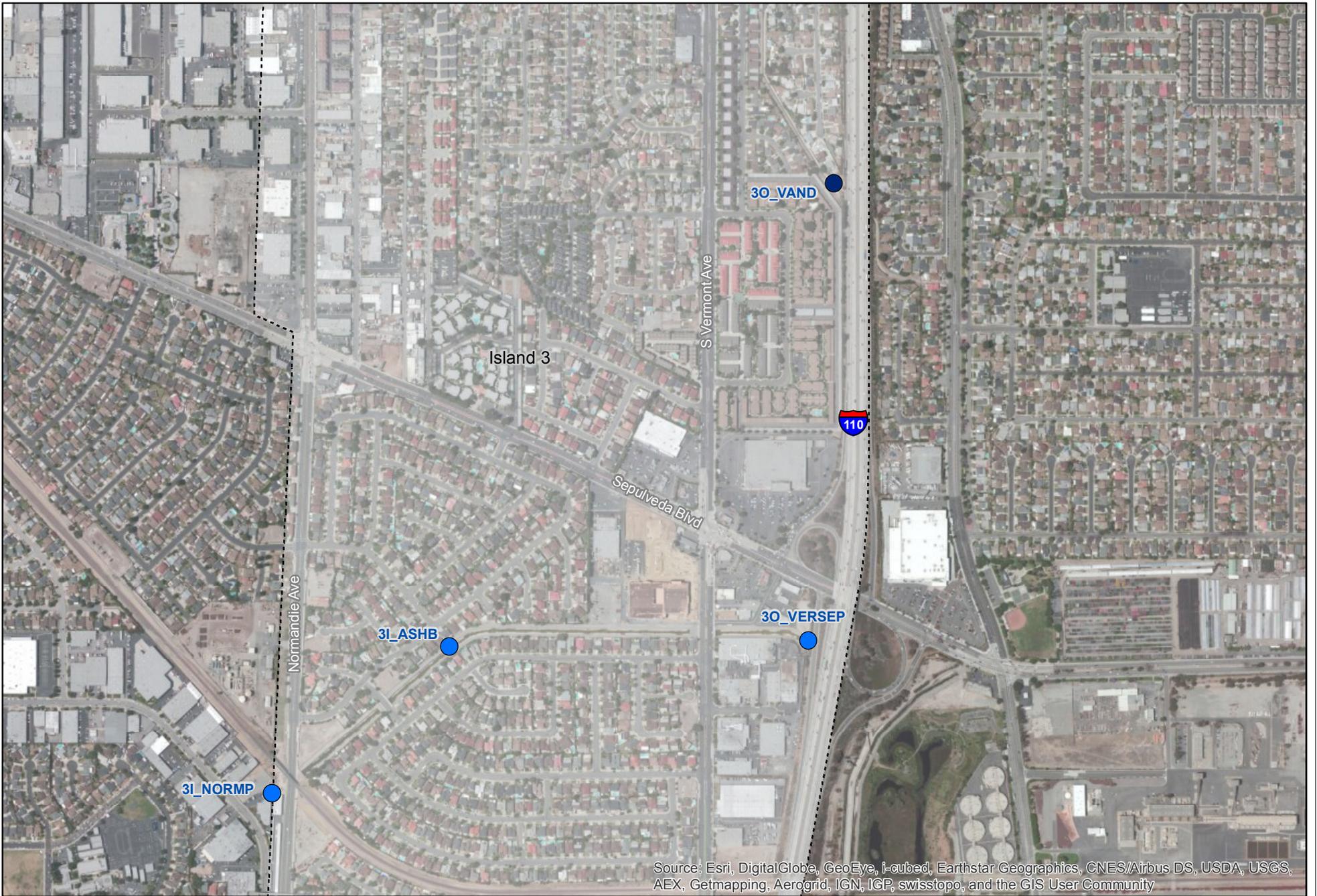
- Field Sampling and Measurements
- Field Measurements Only

--- Unincorporated County Boundary



Western Machado Lake Watershed

Figure 2



Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Key to Features

- Field Sampling and Measurements
- Field Measurements Only
- Unincorporated County Boundary



Eastern Machado Lake Watershed

Date: January 9, 2014

Figure 3

Table 2
Monitoring Site Drainage Areas and Majority Land Use³

Site ID	Type	Acres Drained			Percent (%) of Total Drainage Area Draining County Land	Majority Land Use of County Land Drained (%)
		County Land	Upstream of County Land	Total		
10_ACAD	Outlet	61	0	61	100	Residential - 65 (High Density Single Family [HDSF])
10_EAST	Outlet	54	0	54	100	Residential - 99 [HDSF - 99]
20_SCBG	Outlet	87	0	87	100	Open Space
3I_NORMP	Inlet	45 ¹	1,330	1,375	3.3 ²	NA
3I_ASHB	Inlet Proxy	48 ¹	197	244	19.7 ²	NA
3O_VERSEP	Outlet	292	1,527	1,818	16	Residential - 70 HDSF - 61 Multi Family Residence (MRF) - 5 Mobile Homes - 4]
3O_VAND	Outlet	339	326	665	51	Residential - 69 HDSF - 51 MRF - 14 Mobile Homes - 4]

(1) Complex drainage pattern results in a small area of County land draining to site.

(2) Inlet sites are not intended to measure County inputs

(3) Table based on *Year 1 Nutrient Monitoring for the County of Los Angeles Unincorporated Area of the Machado Lake Watershed, 2013*

As **Table 2** summarizes the acres drained for each monitoring site, **Table 3** includes the total acreage for each County Island. The monitoring sites within a County Island may have more or less total acres drained than the actual County Island depending on the flow channels.

Table 3
Total Acreage in Each County Island¹

County Island	Total Acreage	Average Percent (%) Impervious Cover	Acreage of Impervious Cover
County Island No. 1	335	37	124
County Island No. 2	105	27	28
County Island No. 3	812	64	520
Total	1,252	54	672

(1) Table based on *Year 1 Nutrient Monitoring for the County of Los Angeles Unincorporated Area of the Machado Lake Watershed, 2013*

3.0 FIELD METHODS

This section describes the field methods conducted during both Dry Weather and Wet Weather Monitoring Events. This section will include field methods for flow measurements, field parameter measurements, continuous monitoring using HOBO meters, analytical methods, and QA/QC procedures.

3.1 Field Parameters

Field parameter measurements consist of flow, pH, turbidity, conductivity, temperature, and dissolved oxygen. A multi-meter which can measure all of these parameters (besides flow) was used to measure the field parameters at all sites for the Dry Weather and Wet Weather Monitoring Events. These multi-parameter water quality meters are equipped to measure and log data simultaneously with a single probe. The multi-meter was calibrated prior to the use in the field per manufacturer's specifications. Samples used for field parameter measurements were collected in intermediate containers due to either low flow conditions or inaccessibility to lower probe into the storm water. The results of the field parameter measurements are presented in the results section of this report.

3.2 Flow Measurement

Instantaneous flow at each site is measured on the days of sampling events (Dry & Wet events) to verify the accuracy of the installed continuous flow measuring device (HOBO Meter). Instantaneous flow is calculated by using instantaneous velocity measured in the field and the cross sectional area which is measured during field events. The cross sectional area is calculated by measuring the depth and width of water.

Continuous flow monitoring using pressure transducer HOBO meters installed in the field is further described in the next subsection (**Section 3.3**).

During Wet Weather Monitoring Events, instantaneous velocity at each site was measured using a Marsh McBirney flowmeter (flowmeter). This electromagnetic flowmeter determines the velocity of the water at 60 percent of the height of the water (which is assumed to be the average velocity of the water). This flowmeter is commonly used to measure velocity in streams, channels, and storm drain systems. The flowmeter was attempted to be put in the middle of the channel or drain pipe to measure the velocity in the middle of the channel or drain pipe, or where safely feasible. However, for minimal flows, where the flow-meter could not be used, a float-method was utilized, where a floatable object such as a leaf was allowed to travel a marked distance and the travel time recorded. The series of float measurements can be found in the Field Log Sheets.

Instantaneous flow was determined by multiplying the velocity (measured by the flowmeter) by the profile area of the channel. The drain pipes (10_ACAD, 10_EAST, and 3I_ASHB) are circular in shape, and the profile area could be determined based on the height of the water and the radius. **Figure 4** shows the equation on how the area of flow was determined based upon

height of flow in the center of the channel (h) and the radius of the pipe (R). The geometry for 3I_NORMP and 3O_VAND are rectangular and the geometry for 3O_VAND is trapezoidal. Using these geometries and location specific measurements for each site, the profile area of flow can be calculated using the measured depth. **Figure 5** shows a schematic and the equations used to determine the area of flow and the instantaneous flow based upon height of water (h) during Wet Weather monitoring events.

During Dry Weather Monitoring Events, where flow was too low for the flowmeter to accurately read the velocity, a float method (an approved method by the MRP to measure low flow) was used to determine the velocity. The float method consists of measuring a discrete segment length and timing how long it takes a float, e.g., a leaf, to travel that distance. Although the float method may not be exact (drag can slow down the float, the float can get caught on debris or on the channel bottom due to low flow, or the float travels on the top of the water where the velocity is greatest), Section 8.2.2 of the MRP (page 30) addresses the use of the surface velocity by correcting with a coefficient to account for friction effects of the channel walls, which typically ranges from 0.60–0.90. Therefore, a value of 0.75 was used per the MRP. The methodology described in the QAPP on page 25 for determining the cross sectional area for shallow sheet flow was used at sites 3I_NORMP, 3O_VAND, and 3O_VERSEP (County, 2011c). The cross sectional area was determined in the drain pipes using the equation in **Figure 4**.

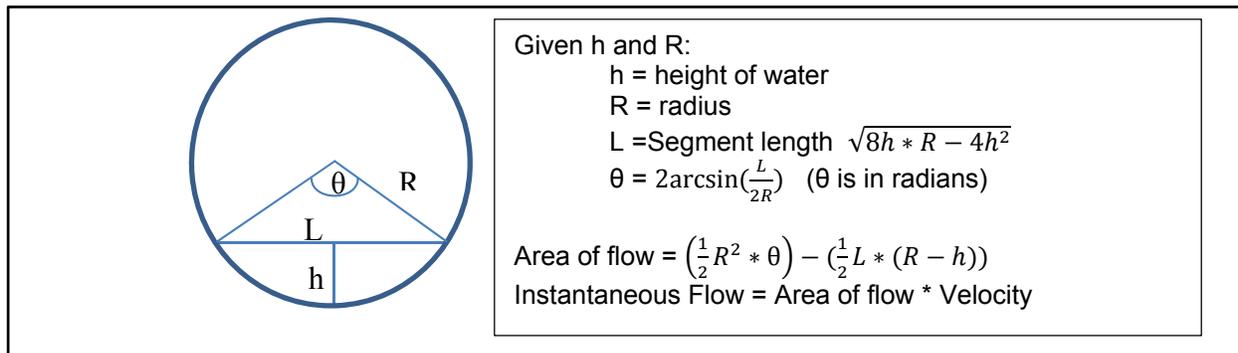


Figure 4
Geometry of Sites 10_ACAD, 10_EAST, and 3I_ASHB

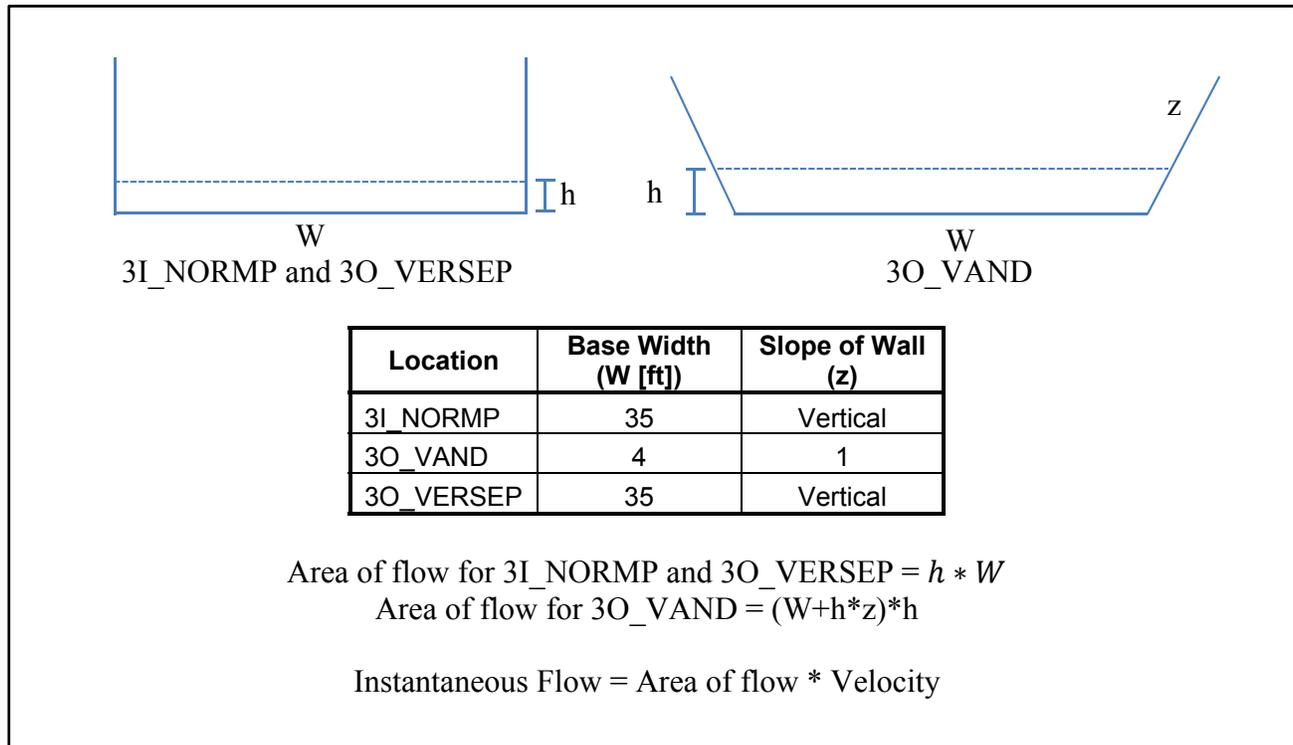


Figure 5
Geometry of Sites 3I_NORMP, 3O_VAND, and 3O_VERSEP (Not to Scale)

3.3 Continuous Monitoring

To more accurately estimate the flow, in-stream pressure transducer data loggers were installed in the channel for continuous flow monitoring at each site. HOBO water level logger meters continuously record time, temperature, and pressure data at each site. The HOBO meter in-stream measurements (at all locations) are then adjusted using a HOBO meter (located near 3I_ASHB) that records barometric pressure. The difference between the HOBO meter in-stream pressure and the barometric HOBO meter pressure is used to measure in-stream pressure which is converted to water height. At each of the seven monitoring sites the HOBO meters are set to collect data at a 10-minute interval. The HOBO meter pressure data can be coupled with the Manning's equation to estimate flow

3.3.1 HOBO Installation & Commissioning

The HOBO meters at location 10_ACAD, 10_EAST, 3I_NORMP, 3I_ASHB, and the barometric HOBO meter were installed in the field on November 14, 2013, and 2O_SCBG HOBO meter was installed in the field on November 18, 2013. The HOBO meters at 3O_VAND and 3O_VERSEP were installed on December 5, 2013. Each HOBO meter was installed under an aluminum housing with perforations in the housing to allow for the meters to be secured and protected in place against moving objects and debris while still having the capability to measure

the height of the flowing water through the perforations. A sample of the aluminum casing is shown in **Figure 6**.



Figure 6
Aluminum Housing for HOBO Meters

Site 2O_SCBG is a natural, irregularly shaped channel downstream of a pond (spillway) in the South Coast Botanical Garden. The site is typically dry during dry weather and wet weather conditions. The MRP/QAPP requires that during dry weather condition only a site visit is required to document the presence of any flow at the site (from the pond). However during wet weather conditions, in case there is a flow, water sampling and flow measurements are to be conducted. Due to the presence of big rocks and erodible soil conditions at the site, the HOBO meter required a special protection and security. Therefore, a subgrade metallic housing was installed (as shown in **Figure 7**) at a depth of 4 inches to house the HOBO meter. During a Wet Weather event, the box will fill with water until it is full. Additional flow measured by the meter and the height of the box will be subtracted from the height of the water measured by the HOBO meter.



Figure 7
HOBO Meter at 2O_SCBG within the Botanical Garden

3.4 Auto-Samplers

Portable TELEDYNE ISCO Samplers (auto-samplers) were used to collect flow weighted samples during the Wet Weather Monitoring Events. The auto-samplers at 1O_ACAD, 3O_VAND, and 2O_SCBG were set up before the storm event to obtain samples. The auto-samplers collected samples and stored these samples in 10 L intermediate bottles within the auto-sampler. The samples were then transferred to proper sample bottles provided by a laboratory for analysis. Samples were obtained during each storm event at 1O_ACAD and 3O_VAND and transferred to Physis Laboratories for analysis for all conventional parameters and nutrients except for Total Kjeldahl Nitrogen, which was analyzed by Associated Laboratories. Due to the lack of flow, no Wet Weather samples were obtained at 2O_SCBG.

3.5 Analytical Methods

According to the approved MRP/QAPP, during each event, water quality samples for nutrient analysis as well as field parameter measurements were obtained for the sites in accordance with **Table 4**. There was never any flow at 2O_SCBG, so no measurements were collected at this site.

Table 4
MRP approved Water Quality Samples (for Lab Analyses) & Field Measurements Sites

Site	Conventional ¹	Nutrients ²	Field Measurements ³
1O_ACAD	X	X	X
1O_EAST			X ⁴
2O_SCBG	X ^{4,5}	X ^{4,5}	X ^{4,5}
3I_NORMP			X
3I_ASHB			X
3O_VERSEP			X
3O_VAND	X	X	X

(1) Conventional: Total Suspended Solids and Total Dissolved Solids

(2) Nutrients: Total Kjeldahl Nitrogen, Nitrate as Nitrogen, Nitrite as Nitrogen, Ammonia as Nitrogen, Total Phosphorus, Dissolved Phosphorous, and Total Ortho-phosphate

(3) Field Measurements: Flow, pH, temperature, dissolved oxygen, turbidity, and electrical conductivity

(4) No flow during Dry Weather Events

(5) No flow during Wet Weather Events so no samples were collected

3.5.1 Conventional and Nutrient Constituent Procedures:

Conventional and nutrient samples were collected during Dry and Wet Weather Monitoring Events. Conventional and nutrient constituents, analytical methods, and quantitation limits are shown in **Table 5**.

Table 5
Conventional and Nutrient Constituents, Analytical Methods, and Detection and Reporting Limits

Constituent Class	Constituent	Analytical Method	Detection Limit (mg/L)	Reporting Limit (mg/L)
Conventional	Total Suspended Solids	SM 2540D	0.5	0.5
	Total Dissolved Solids	SM 2540C	0.1	5
Nutrients	Total Kjeldahl Nitrogen	EPA 353.2	0.06	0.4
	Nitrate as Nitrogen	EPA 300.0	0.01	0.05
	Nitrite as Nitrogen	SM 4500-NO ₂ B	0.01	0.05
	Total Nitrogen	Sum of TKN, Nitrate and Nitrite	NA	NA
	Ammonia as Nitrogen	SM 4500-NH ₃ D	0.02 ¹	0.06 ¹
	Total Phosphorus	SM 4500-P E	0.016	0.05
	Dissolved Phosphorus	SM 4500-P E	0.016	0.05
	Total Ortho-phosphate	SM 4500-P E	0.01 ¹	0.02 ¹

(1) Values adjusted by the Regional Board in September 2012

3.5.2 Field Parameter Measurement Procedures:

The project Reporting Limits for Field Parameter measurements are include in **Table 6**. The Horiba U-52 met the ranges as described in **Table 6**.

Table 6
Project Reporting Limits for Field Parameter Measurements

Parameter/Constituent	Range	Project Reporting Limit
Flow	-0.5 to +20 ft ³ /s	0.05 ft ³ /s
pH	0 to 14 standard units	Not Applicable
Temperature	-5 to 50 °C	Not Applicable
Dissolved Oxygen	0 to 50 mg/L	0.5 mg/L
Turbidity	0 to 3,000 NTU	0.2 NTU
Conductivity	0 to 10,000 µmhos/cm	2.5 µmhos/cm

3.6 Quality Assurance and Quality Control (QA/QC)

QA/QC measures are built into the monitoring and sampling procedures to assure collected data are credible. Field QA/QC procedures include the following:

- Proper collection, handling, and preservation of samples per the QAPP
- Maintenance of a field logs, and photographs (**Attachment 1** and **Attachment 2**)
- Field Blanks
- Field Duplicates
- Equipment Blanks

- Matrix Spike/Matrix Spike Duplicates
- Chain-of-custody (included in **Attachment 3**)

The QA/QC procedures conducted at the laboratory for this project include the following:

- Use of the lowest available method detection limits for trace elements.
- Analysis of method blanks and laboratory duplicates.
- Use of Matrix Spikes to test analytical accuracy and Matrix Spike Duplicates to test analytical precision.
- Routine analysis of standard reference materials and method blanks.
- Thorough cleaning of equipment used for auto-sampler to limit cross-contamination.

A component of QA/QC involves preparing Field Blanks, Equipment Blanks, and Field Duplicate samples.

- Field Blanks are de-ionized water samples provided by a laboratory which are poured into sample bottles at the site to determine if contamination occurs in the sampling process from “collection and handling, sample processing, analytical procedures, or the sample containers” (County, 2011c).
- Field Duplicates consist of another sample set from the same sample suit to determine if there is inconsistency in the accuracy of the laboratories analysis (County, 2011c).
- Equipment Blanks consist of running blank de-ionized water through the sampling equipment that will be used to collect samples. Equipment (the tubing and bottles) was sent to the laboratory for cleaning prior to any event.

Table 7 shows the location of QA/QC samples for Year 2. Locations were modified based on field conditions and no flow at 20_SCBG.

Table 7
QA/QC Locations

Sample Event Type and Number	Sample Sites ¹		
	10_ACAD	20_SCBG	30_VAND
Q1 Dry Weather	EB, FD	NF	FB
Q2 Dry Weather	EB	NF	FB, FD, MS/MSD
Q3 Dry Weather	FB, FD, MS/MSD	NF	
Q4 Dry Weather		NF	FB, FD, MS/MSD
Wet Weather 1		NF	TB, FD, MS/MSD
Wet Weather 2	FB, FD, MS/MSD	NF	
Wet Weather 3	EB	NF	EB, FB, FD, MS/MSD
Wet Weather 4	EB, FB, FD, MS/MSD	NF	EB

(1) FB = Field Blank, FD = Field Duplicate, MS/MSD = Matrix Spike/Matrix Spike Duplicate, TB = Travel Blank, EB = Equipment Blank, NF = No Flow was observed

4.0 MONITORING EVENTS AND FREQUENCIES

The County conducted four Dry Weather Monitoring and four Wet Weather Monitoring Events during Year 2 (2013-2014). The fourth Wet Weather Monitoring Event was conducted to capture the largest storm of the season.

4.1 Dry Weather Monitoring Events

Four (4) quarterly monitoring events were conducted in 2013-2014. Discrete instantaneous samples were collected at all the sites with flows (1O_EAST and 2O_SCBG, did not have any flow) for field parameter measurements and/or water quality lab analyses. Samples from 1O_ACAD (a confined space site) were retrieved with auto-sampler for the first two quarters (Q1 and Q2). Equipment blanks from the auto-sampler were also collected and analyzed, whenever the auto-sampler was used. The samples from the other sites were collected manually.

The Dry Weather Monitoring Event No. 1 (Quarter 1, Q1) was conducted on June 19, 2013. Water quality samples were collected at 1O_ACAD and 3O_VAND and were taken to the County Agricultural Commission Environmental/Toxicology Laboratory (County Ag Lab) for analysis. There was no flow at 2O_SCBG so no water quality samples were collected. Field parameter measurements (flow, turbidity, conductivity, DO, pH, and temperature) were performed at five (5) sites since 2O_SCBG and 1O_EAST had no flow; Site photos were taken at all the seven (7) sites; Field Blanks and Field Duplicates were collected at 3O_VAND. The Equipment Blanks were collected at 1O_ACAD. The sampling protocol was conducted in accordance with the QAPP. The sites where the QA/QC samples (Field Blanks, Equipment Blanks, Samples Duplicates, and MS/MSD) were obtained are noted in **Table 7** above.

The Q2 Dry Weather Monitoring Event was conducted on September 19, 2013. Water quality samples were conducted at 1O_ACAD and 3O_VAND and were taken to the County Ag Lab for analysis. There was no flow at 2O_SCBG so no water quality samples were collected. Field parameter measurements were performed at five (5) sites since 2O_SCBG and 1O_EAST had no flow. Site photos were taken at all the seven (7) sites (see **Attachment 2**). The Equipment Blanks were collected at 1O_ACAD. Field Blanks, Field Duplicates, and Matrix Spike/Matrix Spike Duplicates were all collected at 3O_VAND. The sampling and the Chain-of Custody protocol were conducted in accordance with the QAPP.

The Q3 Dry Weather Monitoring Event was conducted on December 10, 2013. During this event, water quality samples were taken from 1O_ACAD and 3O_VAND and sent to Physis laboratory for analysis. There was no flow at 2O_SCBG so no water quality samples were collected. Field Duplicates, Matrix Spike/Matrix Spike Duplicates, and Field Blanks were all taken at 1O_ACAD for quality assurance/quality control (QA/QC) analyses. Field parameter measurements were conducted at five (5) sites since 2O_SCBG and 1O_EAST had no flow and pictures were taken at all sites. During Q3 Dry Weather Monitoring Event the HOBO data was downloaded. The sampling and the Chain-of Custody protocol were conducted in accordance with the QAPP.

The Q4 Dry Weather Monitoring Event was performed on January 16, 2014. Water quality samples were conducted at 1O_ACAD and 3O_VAND and sent to Physis laboratory for analysis. There was no flow at 2O_SCBG so no water quality samples were collected. Field Duplicates, Matrix Spike/Matrix Spike Duplicates (MS/MSD), and Field Blanks were taken at 3O_VAND for quality assurance/quality control (QA/QC) analyses. Field parameter measurements were performed at five (5) sites since 2O_SCBG and 1O_EAST had no flow; photos were taken at each site, and the HOBO meter data was downloaded. The sampling and the Chain-of-Custody protocol were conducted in accordance with the QAPP.

4.2 Wet Weather Monitoring Events

Prior to each storm event, ISCO auto-samplers were installed to collect flow-weighted samples at 1O_ACAD, 2O_SCBG, and 3O_VAND. Based on the forecasts for each event, the auto-samplers were installed ahead of the time of the storm in order to capture the first runoff of the event. The sampling procedure, water quality sample volumes, aliquots and the measured Field Parameters data for each event are all recorded in the attached Field Log Sheets.

A total of four (4) storm events were conducted in the storm year. In all the four (4) events there was no flow at 2O_SCBG. All the samples for nutrients analyses were transported to Physis Laboratories for analyses, with the exception of Total Kjeldahl Nitrogen (TKN) where the samples were transferred to Associated Laboratory for analyses.

The Wet Weather Monitoring Event No.1 occurred on December 19, 2013, for the precipitation of 0.06 to 0.28 inches as measured by the nearby rain gauge stations. The storm duration was approximately 20 minutes near County Island 1 and County Island 2. Samples were collected 1O_ACAD and 3O_VAND. There was no flow at 1O_EAST and 2O_SCBG so no water field parameters measurements or water quality samples were obtained at the two sites. QA/QC procedures (Field Blanks, MS/MSD, and Duplicate Samples) were conducted at 3O_VAND. Field parameter measurements were conducted at the remaining five (5) sites.

Wet Weather Monitoring Event No.2 occurred on February 2, 2014, with rain gauge precipitation ranging between 0.08 to 0.17 inches by the nearby rain gauge stations. The storm duration was approximately 1.5 hours near County Island 1 and County Island 2. Field parameter measurements were collected at six (6) sites since 2O_SCBG had no flow. Flow-weighted composite samples were collected at both 1O_ACAD and 3O_VAND, and QA/QC procedures (Field Blanks, MS/MSD, and Duplicate Samples) were conducted at 1O_ACAD. The samples volumes and aliquots collected are noted in the Attachments.

Wet Weather Monitoring Event No.3 was conducted on February 27, 2014, with rain gauge precipitation ranging between 0.43 to 0.80 inches by the nearby rain gauge stations. The storm duration was approximately 2 hours near County Island 1 and County Island 2. Field parameter measurements were collected at six (6) sites since 2O_SCBG had no flow. Flow-weighted composite samples were collected at 1O_ACAD and 3O_VAND with an auto-sampler. QA/QC procedures (Field Blanks, MS/MSD, Equipment Blanks, and Duplicate Samples) were conducted at 3O_VAND and Equipment Blanks were also performed at 1O_ACAD. The samples volumes and aliquots collected are noted in the Attachments. The composited samples from each site were

brought to Physis laboratories, and Physis transferred the composited samples into smaller sample bottles to run their analysis, QA/QC analysis, and to transfer samples to Associated Laboratory for TKN analysis.

The Wet Weather Monitoring Event No. 4, which occurred on February 28, 2014, was an additional event, to capture the largest intensity storm of the season, in compliance with the approved MRP. The storm lasted intermittently for 3 days but the samples were collected during the first 24 hours of the storm. The recorded precipitation by the nearby rain gauges had a range of 1.03 to 2.48 inches for the entire storm, but the first 24 hour precipitation range was 0.95 to 1.39 inches. Field parameter measurements were collected at six (6) sites excluding 2O_SCBG where flow was not observed. The samples were then transferred to Physis (a state- certified lab) to conduct the analysis. QA/QC procedures (Field Blanks, MS/MSD, Equipment Blanks, and Duplicate Samples) were conducted at 1O_ACAD and Equipment Blanks were also performed at 3O_VAND. The sampling results are presented in **Table 8** and **Table 9** and the field measurement data are presented in **Tables 10** through **Table 15**.

5.0 RESULTS AND ANALYSIS

This section presents the results from the nutrient samples and field parameter measurements for Year 2 (2013-2014).

5.1 Conventional and Nutrient Constituent Results:

Conventional and nutrient constituent's analytical results for 2013-2014 are included in **Table 8** for 1O_ACAD and **Table 9** for 3O_VAND.

5.2 Field Parameter Measurement Results:

Field parameter measurement results for 2013-2014 are included in **Tables 10** through **Table 15** for six of the seven sites. 2O_SCBG has had no flow for the past two years and therefore there are no field parameter measurement results.

Table 8
10_ACAD Water Quality Data for Year 2 (2013-2014)

	Event Date	Total Suspended Solids	Total Dissolved Solids	Total Kjeldahl Nitrogen	Nitrate as Nitrogen	Nitrite as Nitrogen	Total Nitrogen¹	Ammonia as Nitrogen	Total Phosphorus	Dissolved Phosphorus	Total Ortho-Phosphate
Year 2 Dry Weather Monitoring Events	Yr2_Dry_Q1 6/19/13	ND	1,650	ND	1.67	ND	1.67	ND	0.176	0.144	0.137
	Yr2_Dry_Q2 9/19/13	7	1,430	1.12	1.5	ND	2.62	0.387	0.45	0.4	0.3
	Yr2_Dry_Q3 12/10/13	2.8	925	ND	1.06	ND	1.06	0.07	1.348	0.111	0.05
	Yr2_Dry_Q4 1/16/14	13.1	835	0.4	ND	ND	0.4	0.13	0.298	0.264	0.22
Year 2 Wet Weather Monitoring Events	Yr2_Wet_1 12/19/13	2.5	839	0.4	0.96	ND	1.36	0.12	0.25	0.213	0.21
	Yr2_Wet_2 2/2/14	38.8	179	2.8	1.99	0.04J ²	4.83	0.54	0.911	0.532	0.52
	Yr2_Wet_3 2/27/14	71	60	1.58	0.59	ND	2.17	0.35	0.643	0.273	0.35
	Yr2_Wet_4 2/28/14	28.8	180	1.58	0.5	0.03J ²	2.11	0.1	0.414	0.26	0.13

All constituents have units of mg/L

(1) Total Nitrogen is the sum of Total Kjeldahl Nitrogen, Nitrate, and Nitrite

(2) J flag indicated an analyte detected at a concentration below the Reporting Limit (RL) but above the Minimum Detection Limit (MDL), therefore, the reported value is estimated.

Table 9
30_VAND Water Quality Data for Year 2 (2013-2014)

	Event	Total Suspended Solids	Total Dissolved Solids	Total Kjeldahl Nitrogen	Nitrate as Nitrogen	Nitrite as Nitrogen	Total Nitrogen ¹	Ammonia as Nitrogen	Total Phosphorus	Dissolved Phosphorus	Total Ortho-Phosphate
Year 2 Dry Weather Monitoring Events	Yr2_Dry_Q1 6/19/13	ND	1,320	1.56	ND	ND	1.56	ND	0.291	0.205	0.151
	Yr2_Dry_Q2 9/19/13	53	634	1.64	0.331J ²	ND	0.46	1.971	0.22	0.08	0.07
	Yr2_Dry_Q3 12/10/13	14.8	513	0.6	1.0	0.03	1.63	ND	0.104	0.761	0.77
	Yr2_Dry_Q4 1/16/14	14.6 NH ³	1,048	0.9	0.49	ND	1.39	0.03J ²	0.346	0.285	0.22
Year 2 Wet Weather Monitoring Events	Yr2_Wet_1 12/19/13	19.6	145	2.69	1.72	0.09	4.5	0.9	0.541	0.403	0.47
	Yr2_Wet_2 2/2/14	82.7	213	5.95	4.08	0.07	10.1	1.33	0.94	0.617	0.54
	Yr2_Wet_3 2/27/14	81.3	80	3.45	1.35	0.05	4.85	0.79	0.618	0.226	0.32
	Yr2_Wet_4 2/28/14	50.8	100	1.43	0.52	0.05	2.00	0.11	0.355	0.169	0.23

All constituents have units of mg/L

(1) Total Nitrogen is the sum of Total Kjeldahl Nitrogen, Nitrate, and Nitrite

(2) J flag indicated an analyte detected at a concentration below the reporting limit and above the minimum detection limit, therefore, the reported value is estimated.

(3) Project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or relative percent difference were outside the specified acceptance limits

Table 10
10_ACAD Field Parameter Measurements

Parameter/ Constituent		Event Date	Time of Sample	Velocity	Depth at Center	Flow	Temperature	pH	Dissolved Oxygen	Dissolved Oxygen ¹	Turbidity	Conductivity
Units		-	-	ft/sec	Ft	cfs	°C	S.U.	mg/L DO	% Saturated	NTU	µmhos/cm
Year 2 Dry Weather Monitoring Events	Dry_Q1	6/19/13	10:15 A.M.	0.235	0.025	0.023	24.4	7.78	9.63	65.87	0.29	2,510
	Dry_Q2	9/19/13	9:35 A.M.	n/a	0.044	0.015	23	8.1	7.55	88.62	4.37	2,140
	Dry_Q3	12/10/13	7:57 A.M.	0.9675	0.042	0.020	9.23	6.49	5.75	50.35	0	1,750
	Dry_Q4	1/16/14	1:19 P.M.	0.225	0.125	0.025	19.26	8.52	5.48	59.57	0	929
Year 2 Wet Weather Monitoring Events	Wet_1	12/19/13	10:36 A.M.	0.5	0.046	0.011	18.56	6.17	11.38	121.97	8.4	850
	Wet_2	2/2/14	7:48 P.M.	5.7	0.166	0.95	17.3	6.72	7.82	84.1	62	347
	Wet_3	2/27/14	12:40 A.M.	13.12	0.75	19.8	10.66	6.33	13.13	118.47	80.3	165
	Wet_4	2/28/14	2:31 A.M.	9.35	0.42	6.04	9.83	6.95	13.63	124.5	39.8	58

(1) % Saturated dissolved Oxygen values are calculated using USGS DOTABLES (<http://water.usgs.gov/software/DOTABLES/>)

Table 11
10_EAST Field Parameter Measurements

Parameter/ Constituent		Event Date	Time of Sample	Velocity	Depth at Center	Flow	Temperature	pH	Dissolved Oxygen	Dissolved Oxygen ¹	Turbidity	Conductivity
Units		-	-	ft/sec	Ft	cfs	°C	S.U.	mg/L DO	% Saturated	NTU	µmhos/cm
Year 2 Dry Weather Monitoring Events	Dry_Q1	6/19/13	9:40 A.M.	-	-	-	-	-	-	-	-	-
	Dry_Q2	9/19/13	8:45 A.M.	-	-	-	-	-	-	-	-	-
	Dry_Q3	12/10/13	9:10 A.M.	-	-	-	-	-	-	-	-	-
	Dry_Q4	1/16/14	12:31 A.M.	-	-	-	-	-	-	-	-	-
Year 2 Wet Weather Monitoring Events	Wet_1	12/19/13	1:35 P.M.	-	-	-	-	-	-	-	-	-
	Wet_2	2/2/14	8:00 P.M.	4.62	0.02	0.03	15.9	7.34	6.68	69.9	192	792
	Wet_3	2/27/14	1:27 A.M.	10.32	0.33	4.02	9.83	6.69	12.47	110.06	241	160
	Wet_4	2/28/14	1:04 A.M.	5.9	0.16	0.83	10.36	6.38	14.92	137.8	52	158

(1) % Saturated dissolved Oxygen values are calculated using USGS DOTABLES (<http://water.usgs.gov/software/DOTABLES/>)

Note: No flow was observed for the days with dashes

Table 12
3I_NORMP Field Parameter Measurements

Parameter/ Constituent		Event Date	Time of Sample	Velocity	Depth at Center	Flow	Temperature	pH	Dissolved Oxygen	Dissolved Oxygen ¹	Turbidity	Conductivity
Units		-	-	ft/sec	Ft	cfs	°C	S.U.	mg/L DO	% Saturated	NTU	µmhos/cm
Year 2 Dry Weather Monitoring Events	Dry_Q1	6/19/13	12:00 P.M.	0.75	0.063	1.21	32	9.23	9.28	63.47	8.26	2,190
	Dry_Q2	9/19/13	12:00 P.M.	0.67	0.15	1.49	30	9.06	15.2	202.4	3.8	2,210
	Dry_Q3	12/10/13	10:33 A.M.	0.44	0.1	0.438	9.27	7.16	19.79	172.5	152	407
	Dry_Q4	1/16/14	11:01 A.M.	0.43	0.1	0.69	20.92	8.23	8.55	96	0	624
Year 2 Wet Weather Monitoring Events	Wet_1	12/19/13	11:51 A.M.	1.6	0.25	14.1	16.39	6.71	10.25	104.7	61.7	102
	Wet_2	2/2/14	10:10 P.M.	1.05	0.37	13.7	15.3	7.82	6.6	68.4	102	292
	Wet_3	2/27/14	2:34 A.M.	4	1.5	211.5	10.72	7.05	12.8	115.3	66.7	80
	Wet_4	2/28/14	1:46 A.M.	2.4	0.5	42.3	11.08	6.62	15.25	143.2	52.7	102

(1) % Saturated dissolved Oxygen values are calculated using USGS DOTABLES (<http://water.usgs.gov/software/DOTABLES/>)

Table 13
3I_ASHB Field Parameter Measurements

Parameter/ Constituent		Event Date	Time of Sample	Velocity	Depth at Center	Flow	Temperature	pH	Dissolved Oxygen	Dissolved Oxygen ¹	Turbidity	Conductivity
Units		-	-	ft/sec	Ft	cfs	°C	S.U.	mg/L DO	% Saturated	NTU	µmhos/cm
Year 2 Dry Weather Monitoring Events	Dry_Q1	6/19/13	12:25 P.M.	0.39	0.063	0.007	27	8.32	8.57	58.62	0.44	855
	Dry_Q2	9/19/13	12:10 P.M.	0.142	0.021	0.051	28	8.25	7.09	90.9	12.5	1,093
	Dry_Q3	12/10/13	11:19 A.M.	0.38	0.04	0.011	13.08	7.57	10.02	95.5	0	866
	Dry_Q4	1/16/14	10:21 A.M.	0.86	0.08	0.07	17.88	8.4	6.05	63.9	0	633
Year 2 Wet Weather Monitoring Events	Wet_1	12/19/13	12:10 P.M.	3.5	0.08	0.285	16.25	6.61	6.92	70.5	164	142
	Wet_2	2/2/14	9:45 P.M.	3	0.16	0.69	15.03	7.94	6.64	68.1	61.2	248
	Wet_3	2/27/14	2:15 A.M.	6	1	19.4	10.63	6.95	13.97	125.6	41	75
	Wet_4	2/28/14	1:55 A.M.	3.34	0.41	2.99	10.89	6.83	15.38	143.8	35.8	78

(1) % Saturated dissolved Oxygen values are calculated using USGS DOTABLES (<http://water.usgs.gov/software/DOTABLES/>)

Table 14
30_VAND Field Parameter Measurements

Parameter/ Constituent		Event Date	Time of Sample	Velocity	Depth at Center	Flow	Temperature	pH	Dissolved Oxygen	Dissolved Oxygen ¹	Turbidity	Conductivity
Units		-	-	ft/sec	Ft	cfs	°C	S.U.	mg/L DO	% Saturated	NTU	µmhos/cm
Year 2 Dry Weather Monitoring Events	Dry_Q1	6/19/13	11:15 A.M.	0.835	0.03125	0.039	35	9.81	9.74	66.62	8.79	2,310
	Dry_Q2	9/19/13	10:50 A.M.	1	0.025	0.030	29	8.28	7.84	102.2	20.1	891
	Dry_Q3	12/10/13	12:30 P.M.	0.55	0.02	0.017	16.49	9.84	10.19	104.6	1.6	846
	Dry_Q4	1/16/14	7:57 A.M.	0.368	0.02	0.012	13.73	7.97	7.85	76	0	1,080
Year 2 Wet Weather Monitoring Events	Wet_1	12/19/13	12:45 P.M.	0.35	0.33	0.492	15.61	6.7	10.35	104	49.9	118
	Wet_2	2/2/14	9:20 P.M.	2	0.66	6.23	14.67	8.21	7.89	80.9	124	262
	Wet_3	2/27/14	2:00 A.M.	3.02	1.16	18.37	10.46	6.92	12.73	114	123	88
	Wet_4	2/28/14	3:00 A.M.	1.83	2.16	24.75	9.67	6.92	17.15	155.7	78.2	53

(1) % Saturated dissolved Oxygen values are calculated using USGS DOTABLES (<http://water.usgs.gov/software/DOTABLES/>)

Table 15
30_VERSEP Field Parameter Measurements

Parameter/ Constituent		Event Date	Time of Sample	Velocity	Depth at Center	Flow	Temperature	pH	Dissolved Oxygen	Dissolved Oxygen ¹	Turbidity	Conductivity
Units		-	-	ft/sec	Ft	cfs	°C	S.U.	mg/L DO	% Saturated	NTU	µmhos/cm
Year 2 Dry Weather Monitoring Events	Dry_Q1	6/19/13	1:00 P.M.	0.85	0.073	1.26	32	9.86	10.57	72.3	4.46	2,120
	Dry_Q2	9/19/13	12:15 P.M.	0.86	0.146	4.2	31	9.01	8.42	114.1	3.79	2,110
	Dry_Q3	12/10/13	1:20 P.M.	0.39	0.093	0.3	12.61	9.66	10.53	99.6	1.4	1,650
	Dry_Q4	1/16/14	9:16 A.M.	0.31	0.083	0.21	15.85	9.15	11.25	114.3	0	1,890
Year 2 Wet Weather Monitoring Events	Wet_1	12/19/13	12:20 P.M.	1.3	0.25	11.4	15.9	6.72	10.34	104.5	77.1	131
	Wet_2	2/2/14	8:38 P.M.	1.32	0.19	8.8	14.86	8.81	6	67.7	46	826
	Wet_3	2/27/14	2:46 A.M.	3.12	1	109.2	10.7	7.12	12.2	109.9	75.9	78
	Wet_4	2/28/14	3:30 A.M.	3.28	1.1	126.3	9.78	6.95	50	457.9	87.3	51

(1) % Saturated dissolved Oxygen values are calculated using USGS DOTABLES (<http://water.usgs.gov/software/DOTABLES/>)

6.0 FLOW ESTIMATION AND LOAD CALCULATION

6.1 Precipitation

Precipitation values for 2013-2014 were obtained from surrounding County gauges near the watershed and are shown in **Table 16**. The approved MRP does not prescribe the precipitation triggers for Wet Weather sampling events. NOAA forecasts, as well as Weather Underground stations, were used extensively when determining whether or not to mobilize for storms. The four stations that were used are the County stations at AL373-Manhattan Beach, AL372-Redondo Yard, AL315-Dominguez Water Company, and RD 432-Lomita.

Following the precipitation triggers utilized in the prior year, coupled with the historic precipitation triggers used by the County of Los Angeles for its on-going monitoring activities, a 48-hour forecast of a cumulative precipitation of 0.25 inches in 24 hours was used as a trigger for mobilization. Thus, a viable storm is defined as having precipitation values above 0.25 inches. However, two of the Wet Weather Monitoring Events were under 0.25 inches.

The precipitations for the eight storms in Year 2 are shown in **Table 16**. Smaller storms (precipitation under 0.25 inches) are not included in **Table 16**, unless the storm was one of the four Wet Weather Monitoring Events. There is no one gauge associated with the Machado Watershed.

The precipitation amount for each storm is determined by taking the median value of the four gauges located near the site location. The median value of the four gauges allows a more accurate precipitation value and the elimination of outlier gauges which can experience extreme rainfall intensities due to micro-climates conditions. The total precipitation at each rain-gauge station is shown at the bottom of the **Table 16**.

The total annual precipitation for the 2013-2014 year, ranged from 3.71 to 5.63 inches, which is less than the reported average rainfall within the watershed as reported by the County. The average rainfall is approximately 12 inches in County Island 3 and 14 inches in County Islands 1 and 2 (County, 2013). Most of the precipitation events were short events that lasted for only an hour or two.

**Table 16
Precipitation Summary**

Storm and Date	Storm Days	County Water Resource Department Weather Station Gauges (inches)				
		AL373- Manhattan Beach	AL372- Redondo Yard	AL315- Dominguez Water	RD 432- Lomita	Median of the four gauges
11/20/13-11/21/13	2	0.4	0.3	0.25	0.31	0.305
11/29/13	1	0.45	0.54	0.49	0.39	0.47
12/7/13	1	0.47	0.47	0.33	0.19	0.40
12/19/13 ¹	1	0.08	0.06	0.28	0.2	0.14
2/2/14 ²	1	0.15	0.11	0.1	0.08	0.105
2/27/14 ³	1	0.8	0.57	0.77	0.44	0.67
2/28/14 ⁴	1	1.39	1.32	1.2	1.17	1.26
3/1/2014	1	0.08	0.3	1.15	0.51	0.405
2013-2014 Total⁵	9	4.53	4.15	5.63	3.71	

(1) Wet Weather Monitoring Event No. 1

(2) Wet Weather Monitoring Event No. 2

(3) Wet Weather Monitoring Event No. 3

(4) Wet Weather Monitoring Event No. 4

(5) Total Precipitation is the precipitation recorded by each gauge from March 25, 2013 to March 25, 2014, which includes smaller storms (precipitation <0.25 inches)

6.2 Flow Estimation

The average flows during Dry and Wet weather conditions were obtained by utilizing the HOBO data and Manning's equation:

$$Q \text{ (cfs)} = (1.49/n) * A * R^{2/3} * S^{1/2}$$

Where,

n = manning's constant, which is typically equal to 0.0013 for concrete.

A = Area of the flow. This is determined by the height of the water and the geometry of the channel.

R = Area/wetted perimeter. The wetted perimeter is the perimeter of the channel which is touching water. The wetted perimeter is dependent on the height of the water and the geometry of the channel.

S = slope of the channel. Slope is found in the As-built Plans provided by the County.

For 1O_ACAD, 1O_EAST, and 3I_ASHB, which are manholes, the wetted perimeter and area are calculated assuming these shapes are circular. For 3O_VAND the wetted perimeter and area of flow are calculated assuming the channel to be trapezoidal. For Wet Weather flows, 3I_NORMP and 3O_VERSEP are assumed to be rectangular. The two sites are in the same channel; upstream and downstream; respectively.

For Dry Weather flows, depending on the amount of flow, 3I_NORMP and 3O_VERSEP are assumed to be triangular in shape because:

- the depth of water is deepest at the middle of the channel

- the depth of water decreases as the water approaches the side of the channel, and
- the water does not reach the sides of the channel at these two locations.

Under these conditions, if 3I_NORMP and 3O_VERSEP are considered as rectangular channels during Dry Weather flow, the flow calculated using Manning's equation over predicts the flow because Manning's calculates the flow as if the depth of water across the whole channel is the same as the depth of water at the HOBO meter.

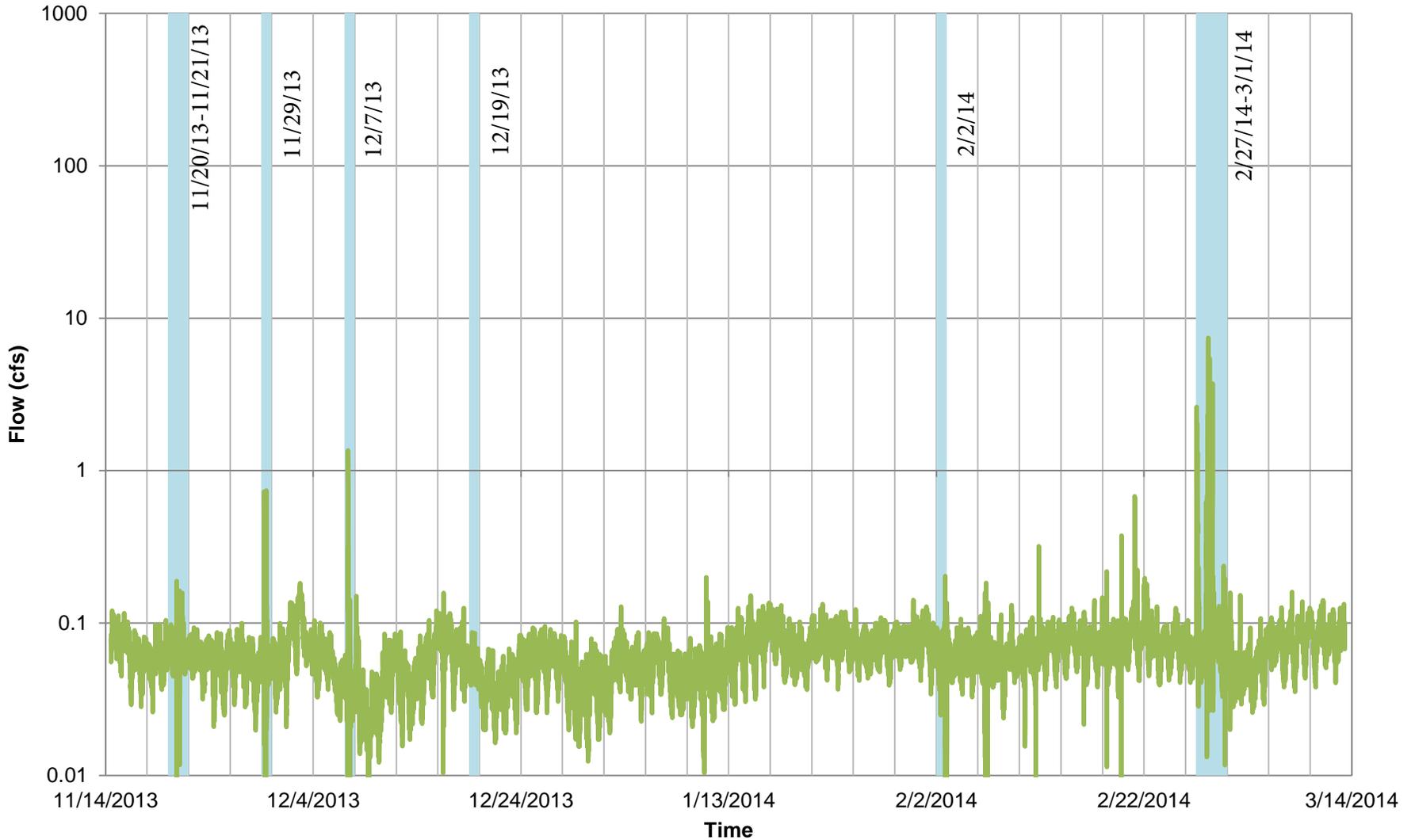
6.2.1. Wet Weather Flow Hydrographs:

Storm hydrographs were created for each site for the entirety of the period that the HOBO meters were installed (**Figure 8** through **Figure 12**). The storm water graphs shown in blue-color are for storm events. Hydrographs for Wet Weather and Dry Weather Monitoring Events can be found in **Attachment 4** which show smaller time scales than seen in **Figures 8** through **Figure 12**.

During the Wet Weather Monitoring Events, there was no flow data recorded for 2O_SCBG or 1O_EAST. For the storm event on February 28, 2014, the height of water was recorded over the 4 inch-stainless steel box housing the HOBO meter at 2O_SCBG. Field visits verified that rainfall occurred and pooled in the location where the HOBO meter is located, although no flow occurred past this location. Field visits confirmed there was no flow from the pond at the Botanical Gardens.

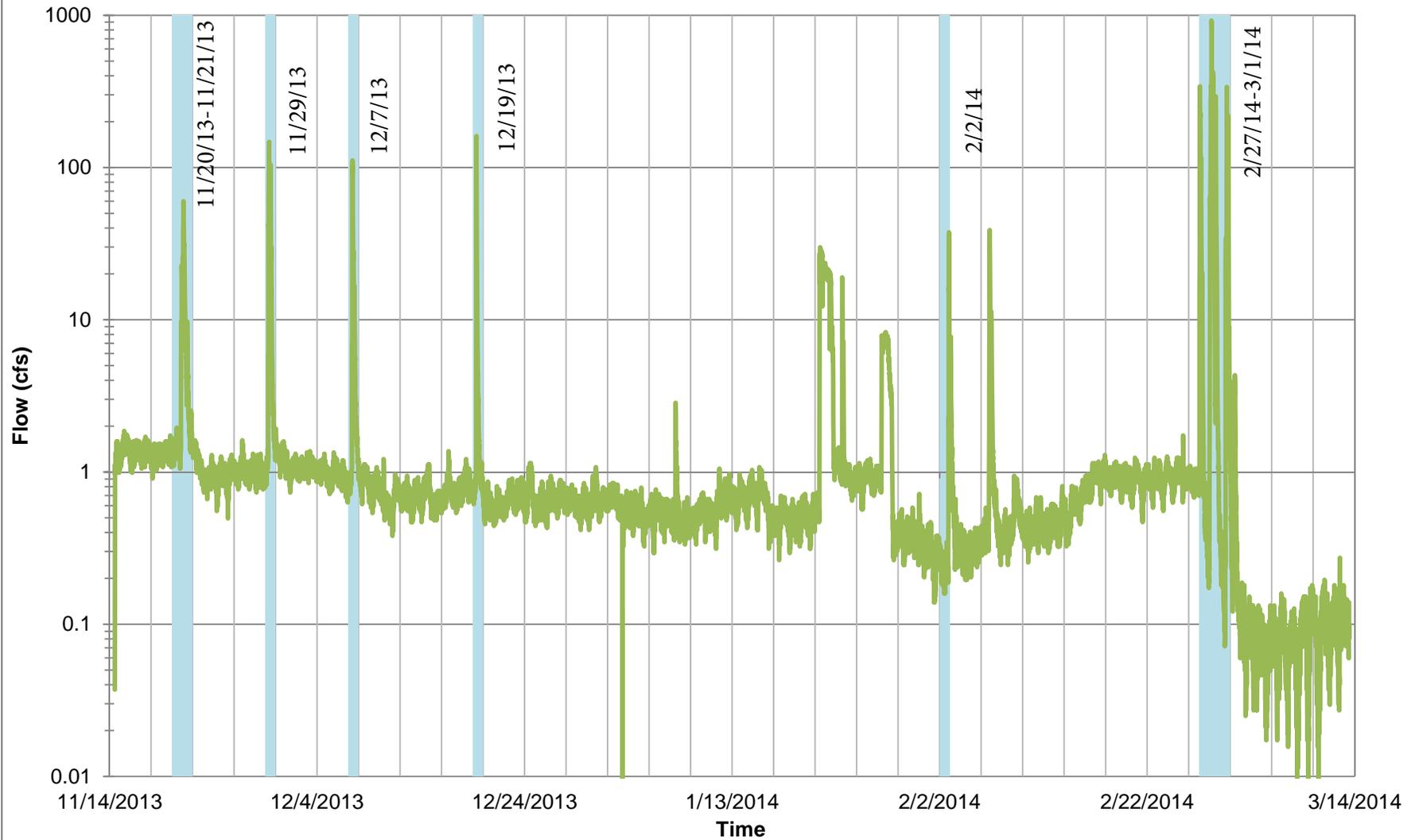
During Dry Weather Monitoring Events, no flow was observed at 1O_EAST. However, during the second, third, and fourth Wet Weather Monitoring Event, there was flow at 1O_EAST. The flow was always shallow and had a high velocity. Field visits verified that flow was deflected off of the HOBO meter housing. Due to the deflection, the pressure (and resulting depth) measurement was compromised. However, the field measurements were successfully collected.

Figure 8
Estimated Flow from HOBO Data at 10_ACAD



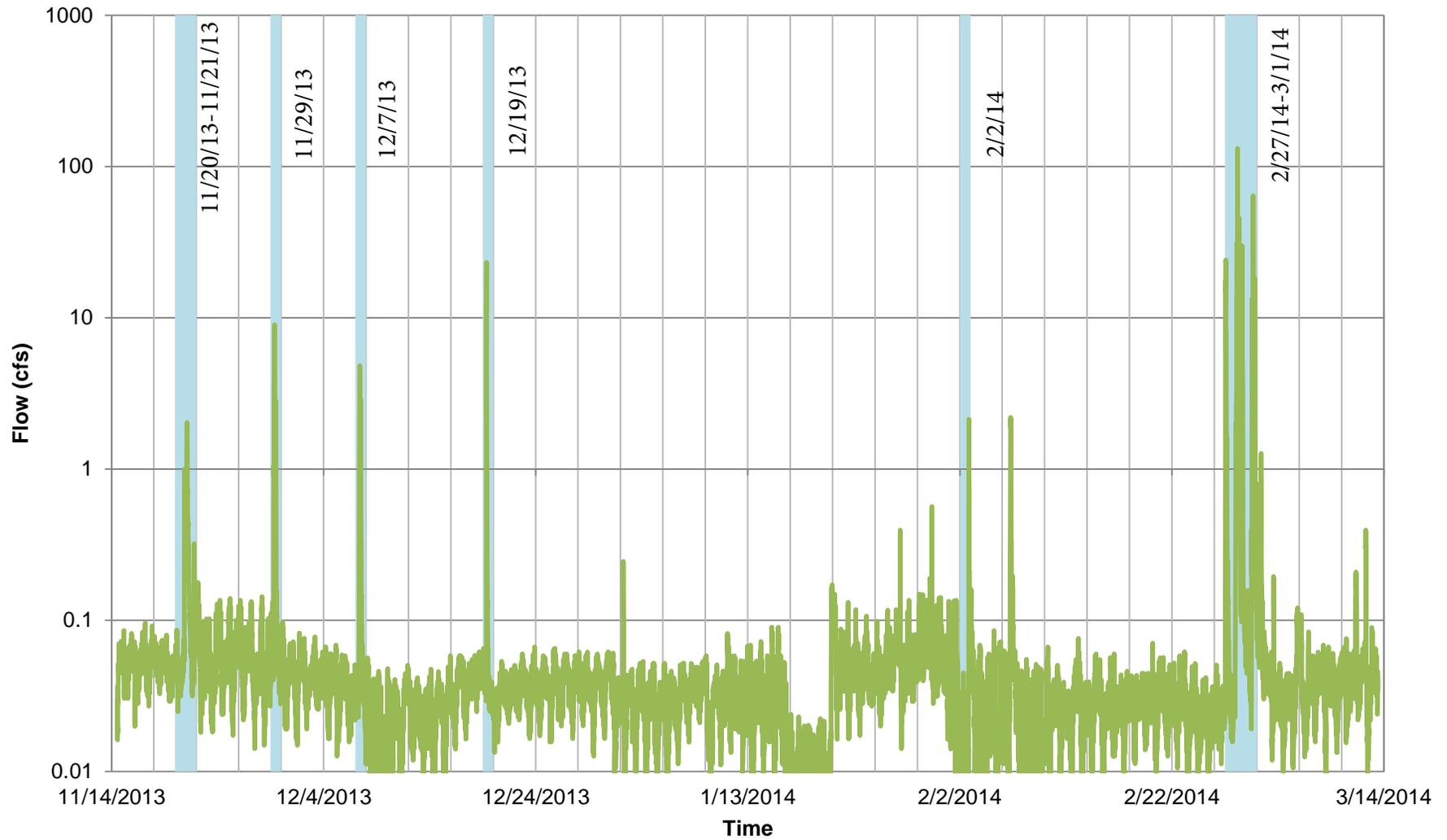
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents storm days.
3. Flow is determined using Manning's equation.

Figure 9
Estimated Flow from HOBO Data at 3I_NORMP



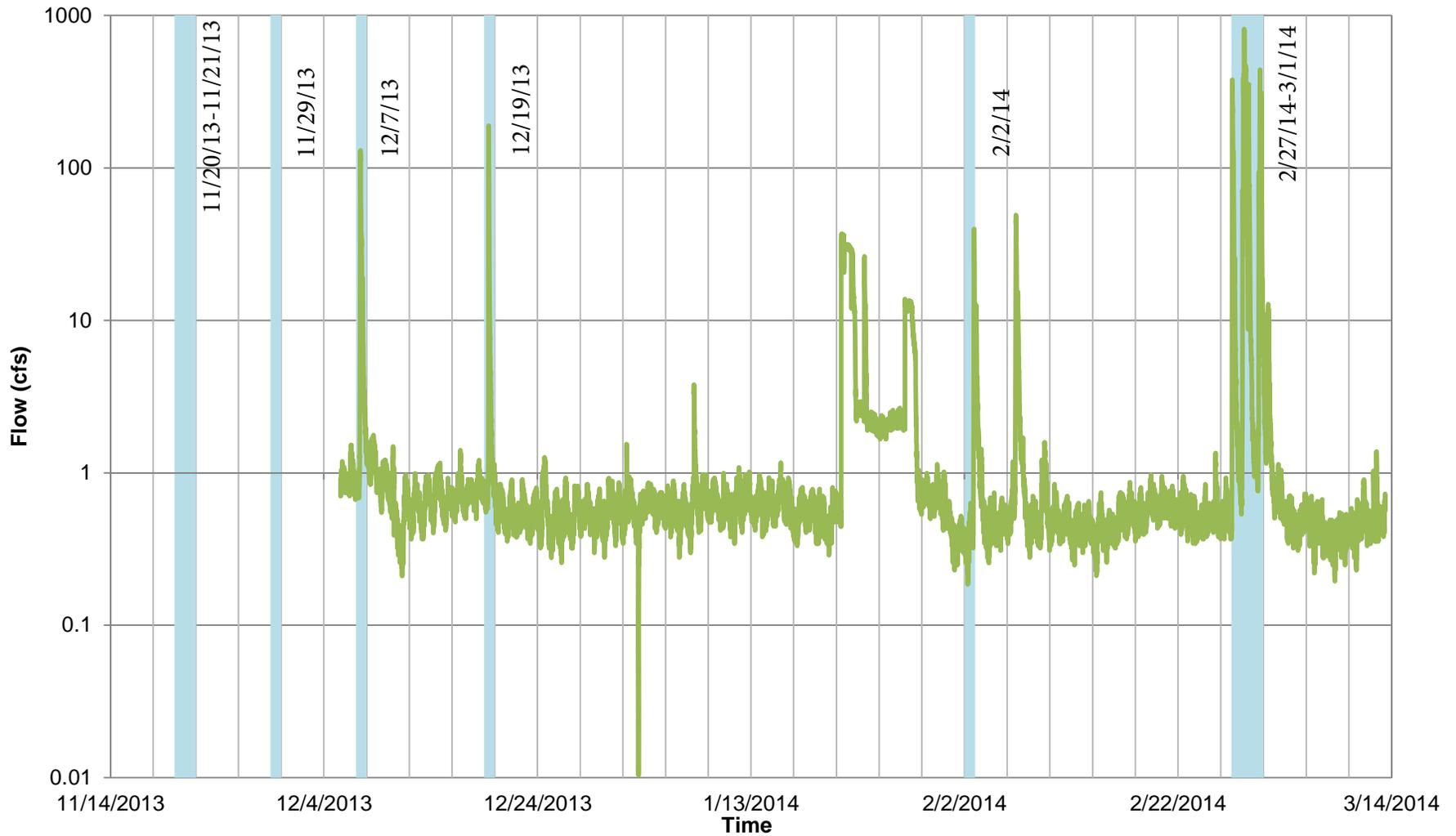
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents storm days.
3. Flow is determined using Manning's equation.

Figure 10
Estimated Flow from HOBO Data at 3I_ASHB



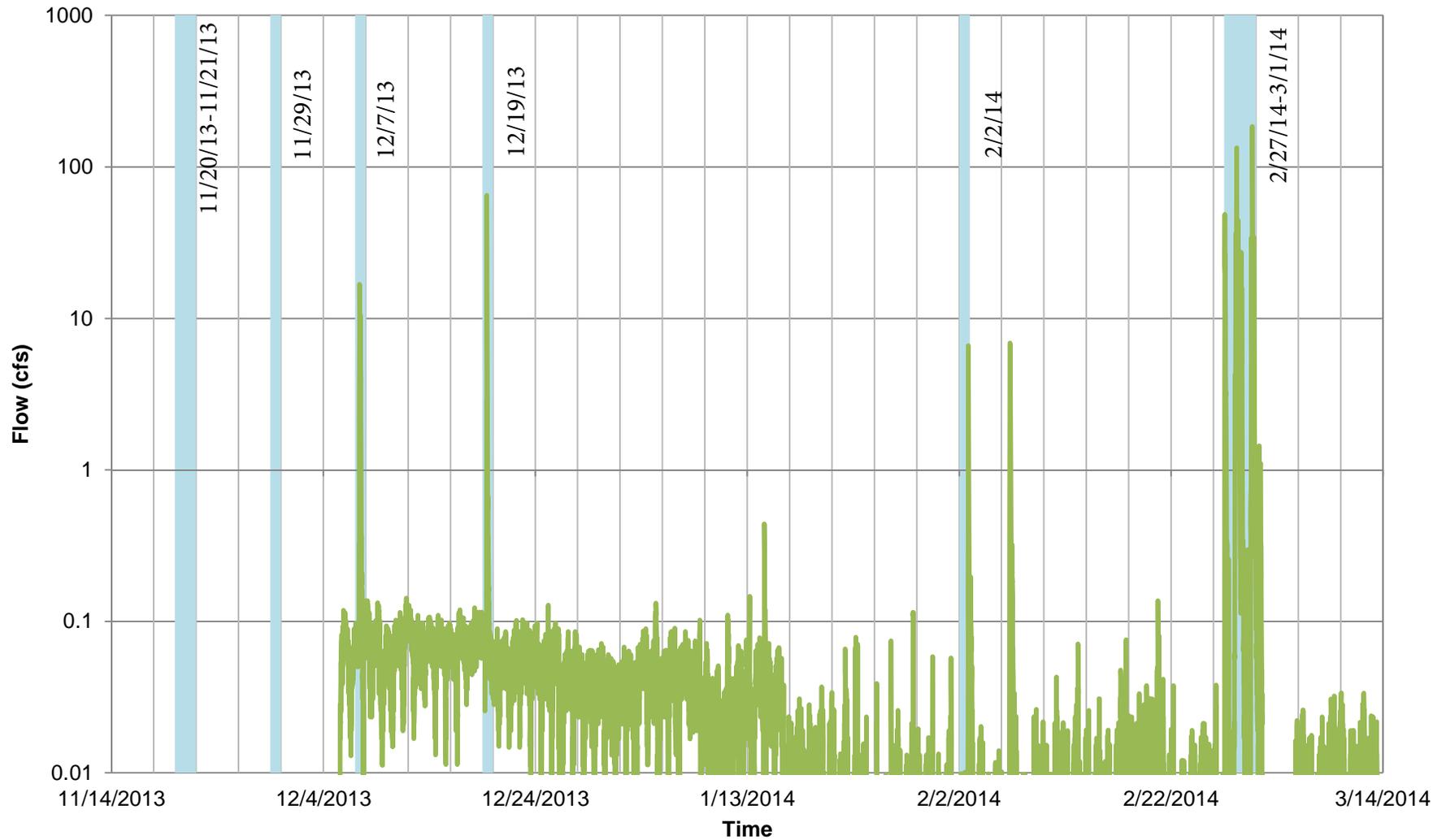
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents storm days.
3. Flow is determined using Manning's equation.

Figure 11
Estimated Flow from HOBO Data at 30_VERSEP



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. HOBO meter was installed on December 5th.
3. Light blue line represents storm days
4. Flow is determined using Manning's equation.

Figure 12
Estimated Flow from HOBO Data at 30_VAND



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. HOBO meter was installed on December 5th.
3. Light blue line represents storm days
4. Flow is determined using Manning's equation.

6.3 Mass Load Estimation

The pollutant load is the mass or weight of pollutant which passes a cross-section of the river in a specific amount of time (EPA, 2003). Calculating the pollutant load is a fundamental part of the process of development and implementation of TMDLs pursuant to the requirements of Section 303(d) of the Clean Water Act (EPA, 1999). For the Machado Lake Nutrients TMDLs, mass is an annual load calculation based on the discharge volume. The discharge is the volume of water which passes a cross-section of the storm channel in a specific amount of time. The loading rate, or flux, is the rate at which the load is passing the point of reference in a channel, and has units of mass per unit time.

Mathematically, the load is the integral over time of the flux (Richards, 1997):

$$Load = \int_t flux(t)dt$$

As this is not practical, the integral is estimated by summing the products of a sequence of measurements of concentration and flow available:

$$Load = \sum_{i=1}^n c_i q_i t_i$$

Where c_i is the i^{th} observation of concentration, q_i is the corresponding observation of flow, t_i is the time interval represented by the i^{th} sample. Concentration is a direct measurement from lab analysis. Therefore, it is most common that concentration observations are less frequently available than flow observations.

A review of load estimation methods included the Ratio method, the Regression method, the Numerical Integration method, and various variations of each. The Numerical Integration method appeared to be more reflective of site and flow conditions at the Watershed and was therefore selected to estimate the load and is further discussed below.

6.3.1 Numerical Integration

This method is also referred to as an Averaging Method and uses results that summarize differing types of flow periods, e.g., wet weather flow and dry weather flow. It assumes samples taken during different conditions are representative of that period.

To complete the calculation, each time period for a field concentration measurement is converted to a decimal day of the year. For example, noon on January 2 would be day 1.5. For wet weather events, a time period is assumed to be the time of the wet weather event. The time of the wet weather event is determined using a straight line method. This method draws a horizontal line from the start of the rising flow (which is assumed to be the base-flow). The time period of the storm is the time it takes for the flow to decline and reach the base-flow, which is determined by the straight line. Wet weather events are then broken up by dry weather time periods. Multiply the flow during the time period by the concentration at the time of the sample results in a unit

load. The sum of all the unit loads for the years totals the annual load. This method is the most applicable to the Machado Lake TMDL dataset.

As with most methods, there are positives and negatives to the Numerical Integration method. This method is very flexible, although it is generally biased. However, the bias associated with each calculation is usually a function of the period of time the average is applied. Generally speaking, the annual load consisting of four quarterly loads will be more biased than the annual load which is the sum of the 12 monthly loads (Richards, 1997) if samples were collected and analyzed monthly for a year. The bias can be reduced by sampling frequency.

The Numerical Integration (Average) Method is one of the most applicable methods to calculate the annual load for the Machado Lake Nutrients TDMLs. In order to determine the loading into Machado Lake from the Watershed, the loading from each County Island will be calculated. Since there was no Dry weather or Wet weather flow for County Island 2; there is no loading calculated for County Island 2. This report is focusing on the total Nitrogen and total Phosphorus loading in accordance with the TMDL.

The load is calculated using the water quality samples and the volume of water passing through each site.

6.3.2 Water Quality and Runoff Extrapolations Methods to Estimate Annual Loads

Water quality samples were collected in each County Island: 1O_ACAD for County Island 1, 2O_SCBG for County Island 2 (although there was no flow), and 3O_VAND for the County portion of County Island 3. The water quality sample results are shown in **Table 8** and **Table 9** in **Section 5**. Since only one water quality sample location was approved and collected for each County Island (outlet), the water quality collected at each site is assumed to be the same as the water quality samples for the other sites in a particular County Island. Thus, the median water quality value for each constituent analyzed at 1O_ACAD is used for all County Island 1 outlets (1O_ACAD and 1O_EAST). Similarly, the median water quality value for each constituent analyzed at 3O_VAND is used for County Island 3 outlets (3O_VAND and 3O_VERSEP). Since the water quality entering through the inlets in County Island 3 (3I_NORMP and 3I_ASHB) is unknown, and since the outlet water quality through 3O_VERSEP is unknown, it is assumed that the water quality which originated in County Island 3 and is flowing out 3O_VERSEP has the same water quality as that at 3O_VAND. This assumption is not entirely accurate, but is the best that can be done with the information provided. Even though the loadings at the inlets sites, (3I_NORMP and 3I_ASHB) will be determined, they will not count as part of the loading at 3O_VERSEP, derived from the County jurisdictional area.

Four Dry Weather and Four Wet Weather water quality samples were collected at 1O_ACAD and 3O_VAND and analyzed in laboratories. Therefore extrapolated water quality data may be derived from these two sites and applied to the remaining outlet sites in those two Islands for both dry weather and wet weather conditions; respectively.

For the inlet and outlet sites where there are no collected water quality data, the median values of the four Dry Weather water quality samples for each County Island was used for the sites

without such data for Dry weather analytical results. The median values are used to eliminate outliers. The median Dry weather water quality values for both County Island 1 and 3 are shown in **Table 17**.

Wet weather water quality methodology is slightly more complicated than the Dry Weather methodology. According to **Table 16**, there were eight storms this season. Four of the storms have water quality measurements, and four of the storms do not have water quality measurements. When calculating the loading, the storms that have water quality measurements (Wet Weather Monitoring Events 1 through 4) will use the water quality measurements taken during the storm. For storms that do not have water quality measurements, the median value of the constituents' concentrations from the monitored storm events (Events 1-4) will be applied to the corresponding sites in each County Island. The median Wet weather water quality values for both County Island 1 and 3 are shown in **Table 17**.

Table 17
Year 2 Median Concentrations For Dry and Wet Weather Events

Concentrations	Nutrients	County Island 1 (10_ACAD)	County Island 3 (30_VAND)
Dry Weather Median Concentrations	Total Nitrogen (mg/L)	1.37	1.48
	Total Phosphorous (mg/L)	0.37	0.25
Wet Weather Median Concentrations	Total Nitrogen (mg/L)	2.14	4.68
	Total Phosphorous (mg/L)	0.53	0.58

6.3.3 Flow Calculations

Flow has been calculated by two methods as mentioned in the **Section 4**: instantaneous flow using field measurements and flow calculated by Manning's equation using the HOBO data. Since the HOBO meters record data every ten minutes, the data is more accurate in determining flow than one instantaneous measurement. Therefore, the flow used for the loading will be determined using the HOBO meter data.

The HOBO data records pressure (converted to depth) of water in increments of ten minutes. Therefore, the flow rate (cfs) can be calculated every 10 minutes by using Manning's equation. To convert the flow rate (cfs) to a total flow volume in cubic feet (cf), the flow rate is multiplied by 10 minutes and the appropriate conversion factors (as shown below). Therefore, the flow volume for every 10 minutes can be determined.

$$X \text{ Flow Rate } \left(\frac{ft^3}{sec} \right) * \frac{60sec}{1min} * 10min = Z \text{ Total Flow Volume } (ft^3) \text{ for ten - minute period}$$

[For example, if the flow rate calculated using Manning's equation from one of the HOBO measurement points was 1 ft³/sec, then the flow volume for a ten minute period would be 1*60*10 = 600 ft³]

The total 10-minute flow volume can then be summed up for each time period (as described in **Section 6.3.1**) to get a total flow volume for that time period.

$$\sum_{\text{Time Period Start}}^{\text{Time Period End}} \text{Total Flow Volume (ft}^3\text{)} = \text{Flow Volume per time period (ft}^3\text{)}$$

[For example, if the time period lasted 30 minutes, and the first ten minutes (0 to 10 minutes) had a flow volume of 600 ft³, the second ten minutes (10 to 20 minutes) had a flow volume of 700 ft³, and the third ten minutes (20 to 30 minutes) had a flow volume of 400 ft³, then the flow volume for that 30 minute time period would be 1,700 ft³.]

The total flow volume per time period is converted to an average flow rate per time period by dividing by the time period.

$$\frac{\text{Flow Volume per time period (ft}^3\text{)}}{\text{Time period (seconds)}} = \text{Average flow rate per time period (cfs)}$$

[For example, if the time period was 30 minutes (1,800 seconds) and the flow volume for that 30 minutes was 1,700 ft³, then the average flow rate for that time period would be (1,700/1,800 = 0.94 cfs)]

To determine what time period would be used for the Wet Weather time period, the straight line method was used. To use the straight line method, a horizontal line is drawn across the hydrograph from the start of the storm flow. This horizontal line represents the base-flow prior to the storm event. The time period begins right before the storm flow begins. The time period is over when the flow equals or touches the horizontal line that was drawn, which is equivalent to returning to the base-flow (when the storm flow is over). In this case the duration of each storm, determined by when runoff returns to the base-flow, can be obtained after the actual rain has physically ceased. Thus, the runoff may continue for days after the rain event.

6.6 Load Calculation

The load is calculated by multiplying the total flow volume by the constituent concentration.

$$\text{Loading per time period (kg)} = \text{Flow Volume per time period (ft}^3\text{)} * \frac{28.317L}{1ft^3} * \text{Concentration} \left(\frac{mg}{L} \right) * \frac{1 kg}{1,000,000 mg}$$

[For example, if the flow volume for a 30 minute time period was 1,700 ft³, and the concentration of Total Nitrogen was 2.0 mg/L for that time period, then the loading for that 30 minute time period would be equal to 0.096 kg of Total Nitrogen (0.096 = 1,700 * 28.317*2/1,000,000)]

When summed, these loads represent the estimated total annual load. To complete the load calculation, several assumptions were made, which are summarized below.

Assumption 1: Dry Weather Loads

For the Dry weather time periods when there is no flow data (before 11/14/2013), the average dry weather flow rate data for the entire monitoring period (11/14/2013 – 3/14/2014) will be used. The average Dry weather flow rate data for the entire monitoring period is shown in **Table 18** below.

Average Flow Rate = $\frac{\text{Total Volume of Flow during Dry Weather (ft}^3\text{)}}{\text{Total Time during Dry Weather (seconds)}}$ for all dry weather time periods with HOBO data.

[For example, if the total volume during all dry weather periods at a site was 1,000,000 ft³, and total time of all dry weather periods was 500,000 seconds, then the average dry weather flow rate would be 2 cfs (1 = 1,000,000/500,000)]

Table 18
Average Dry Weather Flow Rate Data for Each Site

	1O_ACAD	3I_ASHB	3I_NORMP	3O_VAND	3O_VERSEP
Flow Rate (cfs)	0.062	0.039	1.09	0.030	1.25

The dry weather flow rate for 3I_NORMP does not include the reduced dry weather flow rate observed after the February 28th storm. It is assumed that the storm either removed or deposited sediment or trash which redirected the flow of water around the HOBO meter entering in at 3I_NORMP, providing an incorrect reading from the HOBO meter. The observed decrease in flow at 3I_NORMP was not observed at the downstream HOBO meter (3O_VERSEP). Therefore, the baseflow for 3I_NORMP is calculated from November 14th, 2013 to February 27th, 2014.

Assumption 2: Wet Weather Loads

For the Wet weather time periods when there is no flow data (11/20/2013 and 11/29/2013 for 3O_VERSEP and 3O_VAND), a regression runoff relationship will be used to estimate the flow. The regression is developed for 3O_VERSEP and 3O_VAND by developing a correlation between precipitation from the storm gauges and the total flow for the storms where HOBO data was available. This regression was applied to 3O_VAND, but a stronger correlated regression (a higher R²) was developed for 3O_VERSEP by developing a correlation between flow volume at 3I_NORMP and flow volume at 3O_VERSEP, since 3O_VERSEP is the outlet of 3I_NORMP. The HOBO meter at 3I_NORMP was installed for both of the storms where HOBO data is unavailable at 3O_VERSEP. **Figure 13** shows the trendline of the correlation developed for 3O_VERSEP and **Figure 14** shows the trendline of the correlation developed for 3O_VAND. Using the trendline equation (in the top right corner of each graph) and the known precipitation value or known flow at 3I_NORMP, predicted flow for storms without HOBO data can be

determined at 3O_VAND and 3O_VERSEP, respectively. Time periods for these storms are assumed to be the same as that of 3I_NORMP.

Assumption 3: For the wet weather time periods when there is no field concentration data (11/20-11/21/2013, 11/29/2013, 12/7/2013, and 3/1/2014), the Mean Concentration of the four wet weather monitoring events' water quality data will be used for each constituent whose loading is being calculated

Assumption 4: The only flow coming out of County Island 1 is from 1O_ACAD since there is no flow data for 1O_EAST and no flow for 1O_EAST during dry weather.

Assumption 5: The entirety of the flow leaving County Island 3 flows through 3O_VERSEP and 3O_VAND and the entirety of the flow leaving County Island 1 flows through 1O_ACAD and 1O_EAST.

Table 19 through **Table 23** show unit loads for the Dry weather and Wet weather time periods and how the unit loads are calculated. **Table 24** shows a summary of the total loads from each County Island. Since 3I_NORMP and 3I_ASHB are influent channels from outside County Island 3 and flowing into County Island 3, the loading values are subtracted from the County Island 3 total load.

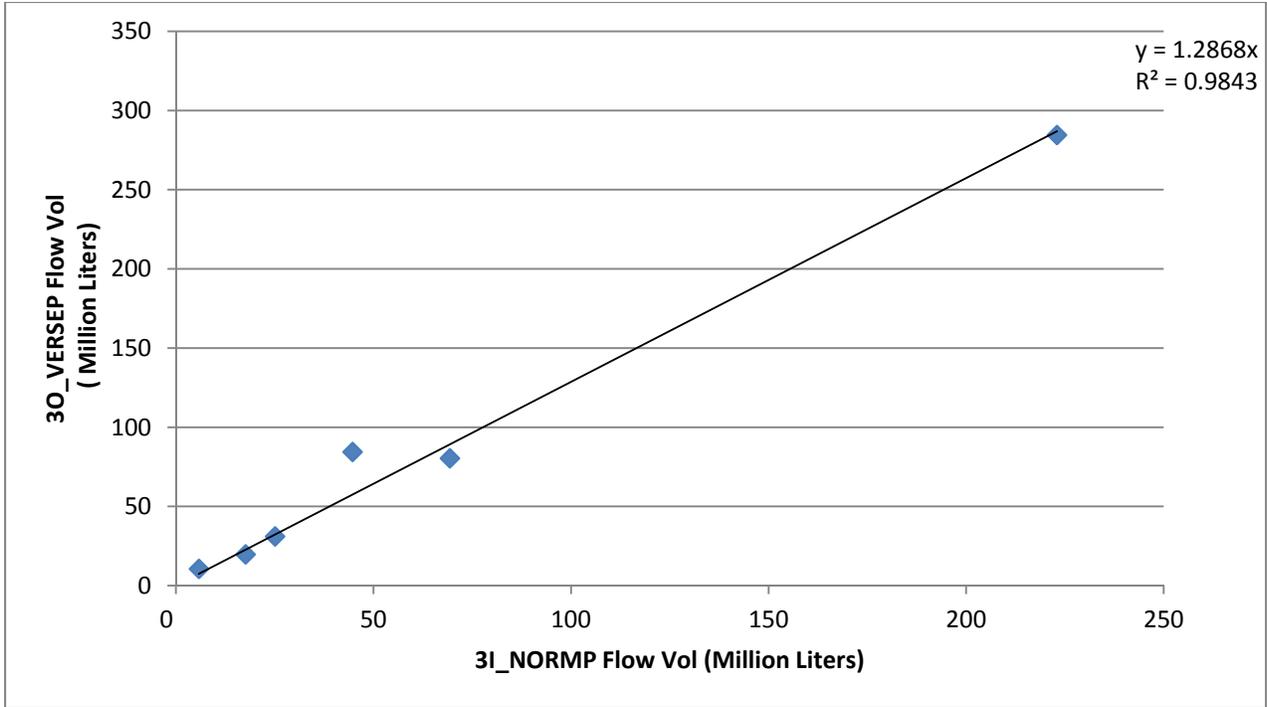


Figure 13
Regression of Total Flow for Varying Total Flow at 3I_NORMP for Storms with HOBO Data

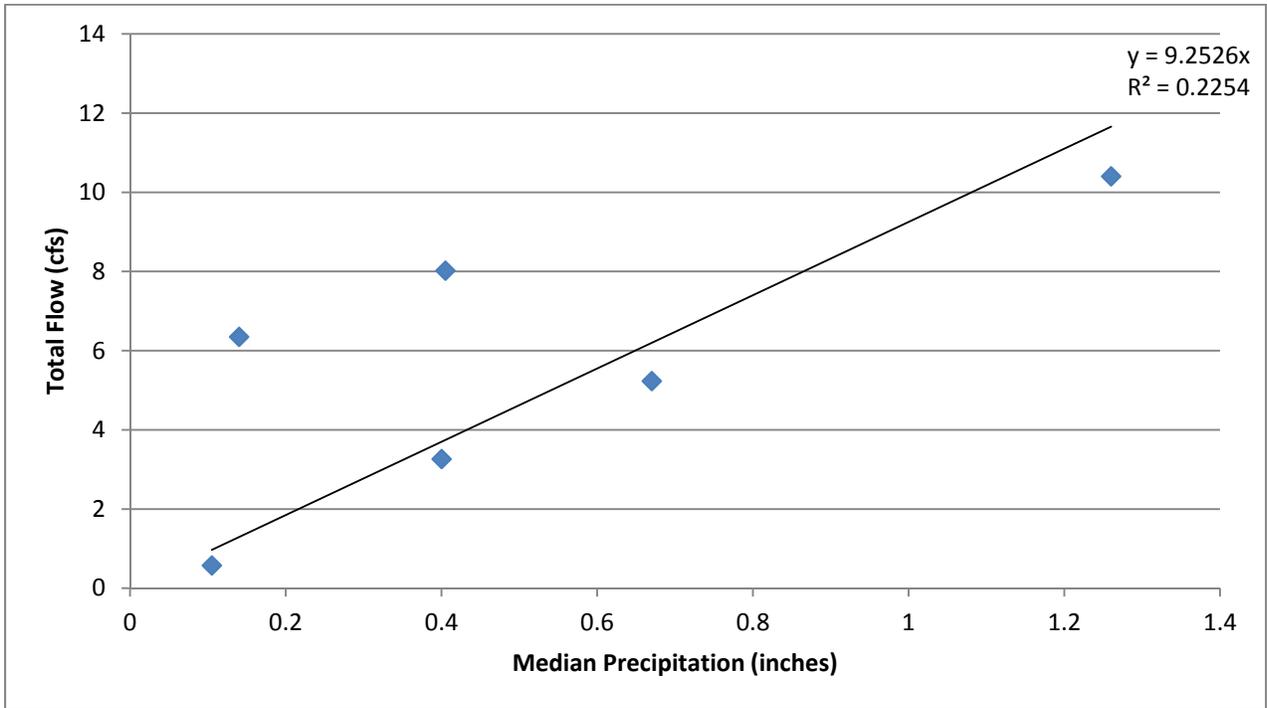


Figure 14
Regression of Total Flow for Varying Precipitation for Storms with HOBO Data

Table 19
10_ACAD Total Nitrogen and Total Phosphorous Loading for Year 2 (2013-2014)

Dry Or Wet	Time Period of Event (days)	Time Period Start Date and Time	Time Period End Date and Time	Total Flow (CFS)	Applied Total Nitrogen Concentration (mg/L)	Applied Total Phosphorous Concentration (mg/L)	Total Nitrogen Loading ² (kg)	Total Phosphorous Loading ³ (kg)
Dry	234.52	3/26/13 12:00	11/14/13 12:30	0.062 ¹	1.365	0.374	48.70	13.34
Dry	6.31	11/14/2013 12:40	11/20/13 20:10	0.066	1.365	0.374	1.39	0.38
Dry	7.78	11/21/2013 11:00	11/29/13 5:40	0.057	1.365	0.374	1.49	0.41
Dry	7.72	11/29/2013 14:20	12/7/13 7:30	0.065	1.365	0.374	1.69	0.46
Dry	11.96	12/7/2013 11:40	12/19/13 10:40	0.049	1.365	0.374	1.97	0.54
Dry	45.16	12/19/2013 15:10	2/2/14 19:00	0.059	1.365	0.374	8.94	2.45
Dry	24.13	2/2/2014 21:30	2/27/14 0:30	0.070	1.365	0.374	5.65	1.55
Dry	0.58	2/27/2014 8:40	2/27/14 22:40	0.062	1.365	0.374	0.12	0.03
Dry	0.74	2/28/2014 21:30	3/1/14 15:10	0.064	1.365	0.374	0.16	0.04
Dry	11.42	3/1/2014 21:50	3/13/14 8:00	0.069	1.365	0.374	2.63	0.72
Dry	11.65	3/13/2014 8:10	3/24/14 23:50	0.062 ¹	1.365	0.374	2.42	0.66
Dry Weather Total							75.16	20.58
Wet	0.60	11/20/2013 20:20	11/21/13 10:50	0.101	2.14	0.5285	0.32	0.08
Wet	0.35	11/29/2013 5:50	11/29/13 14:10	0.121	2.14	0.5285	0.22	0.05
Wet	0.16	12/7/2013 7:40	12/7/13 11:30	0.147	2.14	0.5285	0.12	0.03
Wet	0.17	12/19/2013 10:50	12/19/13 15:00	0.060	1.36	0.25	0.03	0.01
Wet	0.09	2/2/2014 19:10	2/2/14 21:20	0.079	4.83	0.911	0.08	0.02
Wet	0.33	2/27/2014 0:40	2/27/14 8:30	0.379	2.17	0.643	0.66	0.19
Wet	0.94	2/27/2014 22:50	2/28/14 21:20	0.368	2.11	0.414	1.78	0.35
Wet	0.26	3/1/2014 15:20	3/1/14 21:40	0.089	2.14	0.5285	0.12	0.03
Wet Weather Total							3.34	0.77
TOTAL							78.50	21.35

- (1) Values are calculated using the average base flow for when HOBO data is available.
- (2) Total Nitrogen Loading = "Applied Total Nitrogen Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf / 1,000,000 mg/kg.
 [For example, looking at the first row of the table, Total Nitrogen Loading = 1.365*0.062*234.52*86,400*28.317/1,000,000= 48.55 kg of total Nitrogen. Value is different from the table due to rounding associated in this example but not included in the calculation of the total Nitrogen from the raw data.
- (3) Total Phosphorous Loading = "Applied Total Phosphorus Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf.

Table 20
3I ASHB Total Nitrogen and Total Phosphorous Loading for Year 2 (2013-2014)

Dry Or Wet	Time Period of Event (days)	Time Period Start Date and Time	Time Period End Date and Time	Total Flow (CFS)	Applied Total Nitrogen Concentration (mg/L)	Applied Total Phosphorous Concentration (mg/L)	Total Nitrogen Loading ² (kg)	Total Phosphorous Loading ³ (kg)
Dry	234.56	3/26/13 0:00	11/14/13 13:30	0.039 ¹	1.475	0.2555	33.06	5.73
Dry	6.30	11/14/2013 13:40	11/20/13 20:50	0.052	1.475	0.2555	1.19	0.21
Dry	7.71	11/21/2013 13:20	11/29/13 6:20	0.063	1.475	0.2555	1.75	0.30
Dry	7.67	11/29/2013 15:50	12/7/13 8:00	0.041	1.475	0.2555	1.14	0.20
Dry	11.62	12/7/2013 17:20	12/19/13 8:10	0.028	1.475	0.2555	1.19	0.21
Dry	45.28	12/19/2013 13:00	2/2/14 19:50	0.037	1.475	0.2555	6.06	1.05
Dry	23.81	2/3/2014 5:10	2/27/14 0:40	0.032	1.475	0.2555	2.77	0.48
Dry	0.47	2/27/2014 11:20	2/27/14 22:40	0.027	1.475	0.2555	0.05	0.01
Dry	0.03	3/1/2014 11:20	3/1/14 12:00	0.035	1.475	0.2555	0.00	0.00
Dry	11.24	3/2/2014 4:20	3/13/14 10:10	0.048	1.475	0.2555	1.95	0.34
Dry	11.56	3/13/2014 10:20	3/24/14 23:50	0.039 ¹	1.475	0.2555	1.63	0.28
Dry Weather Total							50.79	8.81
Wet	0.67	11/20/2013 21:00	11/21/13 13:10	0.494	4.675	0.5795	3.80	0.47
Wet	0.38	11/29/2013 6:30	11/29/13 15:40	1.777	4.675	0.5795	7.76	0.96
Wet	0.37	12/7/2013 8:10	12/7/13 17:10	0.846	4.675	0.5795	3.63	0.45
Wet	0.19	12/19/2013 8:20	12/19/13 12:50	2.298	4.5	0.541	4.74	0.57
Wet	0.38	2/2/2014 20:00	2/3/14 5:00	0.242	10.1	0.94	2.24	0.21
Wet	0.43	2/27/2014 0:50	2/27/14 11:10	2.812	4.85	0.618	14.37	1.83
Wet	1.51	2/27/2014 22:50	3/1/14 11:10	4.700	2	0.355	34.82	6.18
Wet	0.67	3/1/2014 12:10	3/2/14 4:10	3.348	4.675	0.5795	25.53	3.16
Wet Weather Total							96.88	13.82
TOTAL							147.67	22.63

- (1) Values are calculated using the average base flow for when HOBO data is available.
- (2) Total Nitrogen Loading = "Applied Total Nitrogen Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf / 1,000,000 mg/kg.
 [For example, looking at the first row of the table, Total Nitrogen Loading = 1.475*0.039*234.56*86,400*28.317/1,000,000= 33.01 kg of total Nitrogen. Value is different from the table due to rounding associated in this example but not included in the calculation of the total Nitrogen from the raw data.
- (3) Total Phosphorous Loading = "Applied Total Phosphorus Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf.

Table 21
3I_NORMP Total Nitrogen and Total Phosphorous Loading for Year 2 (2013-2014)

Dry Or Wet	Time Period of Event (days)	Time Period Start Date and Time	Time Period End Date and Time	Total Flow (CFS)	Applied Total Nitrogen Concentration (mg/L)	Applied Total Phosphorous Concentration (mg/L)	Total Nitrogen Loading ² (kg)	Total Phosphorous Loading ³ (kg)
Dry	234.53	3/26/13 0:00	11/14/13 12:40	1.09 ¹	1.475	0.2555	923.37	159.95
Dry	6.36	11/14/13 12:50	11/20/13 21:30	1.34	1.475	0.2555	30.77	5.33
Dry	7.31	11/21/13 23:40	11/29/13 7:00	1.01	1.475	0.2555	26.52	4.59
Dry	7.38	11/29/13 23:30	12/7/13 8:30	1.04	1.475	0.2555	27.70	4.80
Dry	11.30	12/8/13 0:40	12/19/13 7:50	0.74	1.475	0.2555	30.25	5.24
Dry	45.13	12/19/13 16:30	2/2/14 19:40	1.31	1.475	0.2555	213.56	36.99
Dry	23.53	2/3/14 11:50	2/27/14 0:40	0.82	1.475	0.2555	70.03	12.13
Dry	0.48	2/27/14 11:40	2/27/14 23:10	0.43	1.475	0.2555	0.74	0.13
Dry	0.43	3/1/14 2:40	3/1/14 13:00	1.09 ¹	1.475	0.2555	1.70	0.29
Dry	10.79	3/2/14 15:50	3/13/14 10:50	1.09 ¹	1.475	0.2555	42.49	7.36
Dry	11.53	3/13/14 11:00	3/24/14 23:50	1.09 ¹	1.475	0.2555	45.41	7.87
Dry Weather Total							1,412.54	244.68
Wet	1.08	11/20/13 21:40	11/21/13 23:30	11.48	4.675	0.5795	141.37	17.52
Wet	0.67	11/29/13 7:10	11/29/13 23:20	29.66	4.675	0.5795	228.54	28.33
Wet	0.66	12/7/13 8:40	12/8/13 0:30	15.53	4.675	0.5795	117.22	14.53
Wet	0.35	12/19/13 8:00	12/19/13 16:20	20.74	4.5	0.541	79.28	9.53
Wet	0.66	2/2/14 19:50	2/3/14 11:40	3.60	10.1	0.94	58.66	5.46
Wet	0.44	2/27/14 0:50	2/27/14 11:30	63.75	4.85	0.618	336.19	42.84
Wet	1.13	2/27/14 23:20	3/1/14 2:30	80.52	2.00	0.355	445.98	79.16
Wet	1.10	3/1/14 13:10	3/2/14 15:40	16.55	4.675	0.5795	209.03	25.91
Wet Weather Total							1,616.27	223.28
TOTAL							3,028.81	467.96

- (1) Values are calculated using the average base flow for when HOBO data is available.
- (2) Total Nitrogen Loading = "Applied Total Nitrogen Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf / 1,000,000 mg/kg.
 [For example, looking at the first row of the table, Total Nitrogen Loading = 1.475*1.09*234.53*86,400*28.317/1,000,000= 922.5 kg of total Nitrogen. Value is different from the table due to rounding associated in this example but not included in the calculation of the total Nitrogen from the raw data.
- (3) Total Phosphorous Loading = "Applied Total Phosphorus Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf.

Table 22
30_VERSEP Total Nitrogen and Total Phosphorous Loading for Year 2 (2013-2014)

Dry Or Wet	Time Period of Event (days)	Time Period Start Date and Time	Time Period End Date and Time	Total Flow (CFS)	Applied Total Nitrogen Concentration (mg/L)	Applied Total Phosphorous Concentration (mg/L)	Total Nitrogen Loading ³ (kg)	Total Phosphorous Loading ⁴ (kg)
Dry	240.90	3/26/13 0:00	11/20/13 21:30	1.25 ¹	1.475	0.2555	1,089.74	188.77
Dry	7.31	11/21/13 23:40	11/29/13 7:00	1.25 ¹	1.475	0.2555	33.05	5.72
Dry	5.58	11/29/13 23:30	12/5/13 13:20	1.25 ¹	1.475	0.2555	25.23	4.37
Dry	1.77	12/5/2013 13:30	12/7/13 8:00	0.95	1.475	0.2555	6.05	1.05
Dry	11.15	12/8/2013 5:50	12/19/13 9:20	0.73	1.475	0.2555	29.51	5.11
Dry	44.97	12/19/2013 20:20	2/2/14 19:40	1.82	1.475	0.2555	296.00	51.27
Dry	23.26	2/3/2014 17:30	2/26/14 23:50	0.77	1.475	0.2555	64.92	11.25
Dry	10.63	3/2/2014 18:40	3/13/14 9:50	0.49	1.475	0.2555	18.74	3.25
Dry	11.58	3/13/2014 10:00	3/24/14 23:50	1.25 ¹	1.475	0.2555	52.37	9.07
Dry Weather Total							1,615.61	279.86
Wet	1.08	11/20/13 21:40	11/21/13 23:30	14.78 ²	4.675	0.5795	181.91	22.55
Wet	0.67	11/29/13 7:10	11/29/13 23:20	38.17 ²	4.675	0.5795	294.08	36.45
Wet	0.90	12/7/2013 8:10	12/8/13 5:40	14.17	4.675	0.5795	145.18	18.00
Wet	0.44	12/19/2013 9:30	12/19/13 20:10	18.13	4.5	0.541	88.70	10.66
Wet	0.90	2/2/2014 19:50	2/3/14 17:20	4.83	10.1	0.94	106.98	9.96
Wet	0.93	2/27/2014 0:00	2/27/14 22:20	35.32	4.85	0.618	389.96	49.69
Wet	1.57	2/27/2014 22:30	3/1/14 12:10	74.11	2.00	0.36	569.14	101.02
Wet	1.26	3/1/2014 12:20	3/2/14 18:30	27.45	4.675	0.5795	394.69	48.92
Wet Weather Total							2,170.64	297.25
TOTAL							3,786.25	577.11

(1) Values are calculated using the average base flow for when HOBO data is available.

(2) Values are calculated using the regression analysis developed in **Figure 13**.

(3) Total Nitrogen Loading = "Applied Total Nitrogen Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf / 1,000,000 mg/kg.
 [For example, looking at the first row of the table, Total Nitrogen Loading = 1.475*1.25*240.90*86,400*28.317/1,000,000= 1,086.6 kg of total Nitrogen. Value is different from the table due to rounding associated in this example but not included in the calculation of the total Nitrogen from the raw data.

(4) Total Phosphorous Loading = "Applied Total Phosphorus Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf.

Table 23
30_VAND Total Nitrogen and Total Phosphorous Loading for Year 2 (2013-2014)

Dry Or Wet	Time Period of Event (days)	Time Period Start Date and Time	Time Period End Date and Time	Total Flow (CFS)	Applied Total Nitrogen Concentration (mg/L)	Applied Total Phosphorous Concentration (mg/L)	Total Nitrogen Loading ³ (kg)	Total Phosphorous Loading ⁴ (kg)
Dry	240.90	3/26/13 0:00	11/20/13 21:30	0.030 ¹	1.475	0.2555	26.11	4.52
Dry	7.31	11/21/13 23:40	11/29/13 7:00	0.030 ¹	1.475	0.2555	0.79	0.14
Dry	5.59	11/29/13 23:30	12/5/13 13:40	0.030 ¹	1.475	0.2555	0.61	0.10
Dry	1.78	12/5/2013 13:50	12/7/13 8:30	0.061	1.475	0.2555	0.39	0.07
Dry	11.71	12/7/2013 16:30	12/19/13 9:30	0.068	1.475	0.2555	2.86	0.50
Dry	45.15	12/19/2013 16:10	2/2/14 19:50	0.026	1.475	0.2555	4.18	0.72
Dry	23.77	2/3/2014 5:50	2/27/14 0:20	0.025	1.475	0.2555	2.13	0.37
Dry	0.49	2/27/2014 11:10	2/27/14 22:50	0.002	1.475	0.2555	0.00	0.00
Dry	0.45	2/28/2014 22:30	3/1/14 9:20	0.027	1.475	0.2555	0.04	0.01
Dry	11.19	3/2/2014 5:20	3/13/14 10:00	0.016	1.475	0.2555	0.65	0.11
Dry	11.57	3/13/2014 10:10	3/24/14 23:50	0.030 ¹	1.475	0.2555	1.25	0.22
Dry Weather Total							39.01	6.76
Wet	1.08	11/20/13 21:40	11/21/13 23:30	2.088 ²	4.675	0.5795	25.71	3.19
Wet	0.67	11/29/13 7:10	11/29/13 23:20	5.142 ²	4.675	0.5795	39.61	4.91
Wet	0.32	12/7/2013 8:40	12/7/13 16:20	3.267	4.675	0.5795	11.94	1.48
Wet	0.26	12/19/2013 9:40	12/19/13 16:00	6.351	4.5	0.541	18.45	2.22
Wet	0.40	2/2/2014 20:00	2/3/14 5:40	0.579	10.1	0.94	5.77	0.54
Wet	0.44	2/27/2014 0:30	2/27/14 11:00	5.234	4.85	0.618	27.17	3.46
Wet	0.97	2/27/2014 23:00	2/28/14 22:20	10.405	2.00	0.36	49.50	8.79
Wet	0.82	3/1/2014 9:30	3/2/14 5:10	8.026	4.675	0.5795	75.22	9.32
Wet Weather Total							253.37	33.90
TOTAL							292.38	40.66

(1) Values are calculated using the average base flow for when HOBO data is available.

(2) Values are calculated using the regression analysis for precipitation.

(3) Total Nitrogen Loading = "Applied Total Nitrogen Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/ cf / 1,000,000 mg/kg.
 [For example, looking at the first row of the table, Total Nitrogen Loading = 1.475*0.030*240.90*86,400*28.317/1,000,000= 26.08 kg of total Nitrogen. Value is different from the table due to rounding associated in this example but not included in the calculation of the total Nitrogen from the raw data.

(4) Total Phosphorous Loading = "Applied Total Phosphorus Concentration" * "Total Flow" * "Time Period of Event"*86,400 seconds/day * 28.317 L/cf.

Table 24
Annual Loading Summary for March 26, 2013 to March 25, 2014

County Island Number	Site Location	Drains to Site ² (acres)	County Land Drainage Acreage ³	Wet or Dry Weather Event	Total Nitrogen Loading (kg/yr)	Total Phosphorous Loading (kg/yr)	Total Nitrogen Loading Per Acre ¹ (kg/yr/acre)	Total Phosphorous Loading Per Acre ¹ (kg/yr/acre)
1	1O_ACAD	61	61	Dry	75.2	20.6	1.23	0.34
				Wet	3.3	0.8	0.05	0.01
	1O_EAST ⁴	54	54	Dry	0	0	0	0
				Wet	0	0	0	0
Sub-total		115	115		78.5	21.4	0.68	0.19
2	2O_SCBG ⁴	87	87		0	0	0	0
	Sub-total	87	87		0	0	0	0
3	County Portion of C: [C] - [B] - [A] ⁸	292	292	Dry	152.3	26.27	0.52	0.09
				Wet	457.5	60.15	1.57	0.21
	County Portion of 3O_VAND	665	339	Dry	19.9 ⁵	3.4 ⁵	0.06	0.01
				Wet	129.2 ⁵	17.3 ⁵	0.38	0.05
	Sub-total⁶		957	631		758.8	107.15	1.20
GRAND TOTAL⁽⁷⁾		1,159	833	Dry	247.4	50.3	0.30	0.06
				Wet	590.0	78.2	0.71	0.09
				Total	837.3	128.5	1.01	0.15

(1) Calculated by dividing the "Total Nitrogen Loading" and the "Total Phosphorous Loading" value by the "County Land Drainage Acreage".

(2) "Drains to Site" is the total acreage that is drained into a particular site.

(3) County Land Drainage Acreage is the total County Land that is drained into a particular site.

(4) There was either no flow data or accurate flow data was unable to be recorded for this site, so no loading could be calculated.

(5) Calculated by dividing the "County Land Drainage Acreage" by the "Drains to Site" and multiplying by the 3O_VAND_Total values.

(6) Total is the sum of [C]-[B]-[A] + 3O_VAND_County.

(7) Grand Total is the sum of the three TOTALS.

(8) A is 3I_NORMP, B is 3I_ASHB, and C is 3O_VERSEP

6.7 Comparisons with Nutrient TMDL Waste Load Allocations

Interim and final WLAs based for the County area are listed in **Table 25**. Note that the interim WLAs are effective March 2014. The WLAs for 2013-2014 from the County Islands are 837.3 kg/yr and 128.5 kg/yr for total nitrogen and total phosphorous, respectively. Both total nitrogen and total phosphorus loading meet the 5 year interim limits (1,739 kg/year for total nitrogen and 887 kg/yr for total phosphorus) as specified in **Table 25**.

Table 25
Los Angeles County Nutrient TMDL Mass-based Waste Load Allocations

Constituent	County WLAs		2014 Calculated Loads (kg/yr)
	March, 2014 (Interim Limits) (kg/yr)	September, 2018 (Final Limits) (kg/yr)	
Total Nitrogen	1,739	710	837.3
Total Phosphorous	887	71	128.5

7.0 SUMMARY

The County performed four (4) Dry Weather Monitoring Events and four (4) Wet Weather Monitoring Events during year 2 of the Machado Lake Nutrient TMDL monitoring. There are three County Islands with a total of seven monitoring sites; two outlet sites in County Island 1, one outlet site in County Island 2, and two inlet and two outlet sites in County Island 3. All seven sites consists of water parameter measurements being conducted (pH, temperature, conductivity, turbidity, and dissolved oxygen) using a Horiba-U52 multi-meter. Velocity was also conducted at each site using either a Marsh-McBirney flowmate to determine velocity during rain events and using a float method during Dry Weather Monitoring Events. Using the velocity data and the cross sectional area, the instantaneous flow could also be calculated for each site. The flowrates were also calculated using the HOBO meter data and Manning's Equation.

Monitoring at three of the outlet sites (one from each County Island) also consisted of water quality measurements being conducted to determine the loading from each County Island. No flow was observed from County Island 2 for the entire Storm Year (2013-2014); therefore, no measurements were conducted at this site. 1O_EAST has similar no-flow characteristics during the dry weather conditions and three occasional flows during the latter part of the wet season.

QA/QC procedures were applied during all of the events. QA/QC consisted of Field Blanks, Equipment Blanks, Field Duplicates, Matrix Spikes and Matrix Spike Duplicates, cleaning of all equipment prior to and after every field events, and equipment calibrations.

The storm year did not produce adequate precipitation. Three (3) of out the four (4) sampled storms had very short sampling durations, ranging from 20 minutes to 2 hours. It was only the last storm event (Event no. 4), when samples were collected for over 6 hours. Every attempt was made to capture every storm event; even those for such short duration as mentioned.

Continuous monitoring devices (HOBO meters) were installed to monitor the flows year-round (after the installations) to provide data for the flows in the channels and the Botanical Gardens, (a soft-bottom spillway). The data from the HOBO was always verified in the field by taking field flow-measurements on sampling event days. The HOBOs are pressure transducers that are able to measure the height of water by measuring the pressure above the HOBO meter. One HOBO meter has been installed on the channel wall at the confluence of 3I_ASHB and 3I_NORMP to measure the barometric pressure. The hydrographs for the storm events were derived from the HOBO meters and using Manning's Equation. However, at 1O_EAST the HOBOs could not accurately record water depth values due to the steep slope of the pipe and high turbulence of water.

The load calculations were completed using the flow data calculated using the HOBO meter data and the water quality obtained during the Dry Weather and Wet Weather Monitoring Events. The flow is calculated for each site and for each County Island. The results show that the majority of the total nitrogen and total phosphorous come from the County Island 3, and more specifically; at the lower half of County Island 3 (3O_VERSEP).

The total load for Year 2 (837.3 kg/yr for total nitrogen and 128.5 kg/yr for total phosphorous) was under the 5 year interim limits of the TMDL (1,739 kg/yr for total nitrogen and 887 kg/yr for total phosphorous).

8.0 REFERENCES

1. Los Angeles County Department of Public Works (County), 2013. Year 1 Nutrient Monitoring for the County of Los Angeles Unincorporated Area of the Machado Lake Watershed, April, 2013.
2. Los Angeles County Department of Public Works (County), 2011a. Machado Lake Nutrient TMDL Special Study: Characterization of Water Quality Conditions in the Unincorporated Areas of Los Angeles County within the Machado Lake Watershed, September 12, 2011.
3. Los Angeles County Department of Public Works (County), 2011b. Machado Lake Multipollutant TMDL Monitoring and Reporting Program (MRP) for the Unincorporated Areas of Los Angeles County within the Machado Lake Watershed, LACDPW, September 12, 2011.
4. Los Angeles County Department of Public Works (County), 2011c. Quality Assurance and Project Plan (QAPP) for the Unincorporated Areas of Los Angeles County within the Machado Lake Watershed, LACDPW, September 12, 2011.
5. Onset Computer Corporation, 2014. HOBO U20 Water Level Logger (U20-001-0x and U20-001-0x-Ti) Manual.
6. EPA (environmental protection Agency), 2003, National Management Measures to Control Nonpoint Source Pollution from Agriculture, EPA 841-B-03-004, Office of Water (4503-F), U.S. Environmental Protection Agency, Washington, D.C.
7. EPA, 1999. Protocol for Developing Nutrient TMDLs: First Edition. EPA 841-B-99-007. Office of Water (4503-F), U.S. Environmental Protection Agency, Washington, D.C.
8. Richards, R.P. 1997. Estimation of Pollutant Loads in Rivers and Stream A Guidance Document for NPS Programs. DRAFT. Water Quality Laboratory, Heidelberg College, Tiffin, OH.

Machado Lake Nutrient TMDL Year 2

Attachment 1:
Machado Lake Nutrient TMDL
Field Logs

Q1 Dry Weather Monitoring Event
June 19, 2013

Sampling Data Log Sheet

Site: **Island Outlet - Eastvale Rd/ Palos Verdes Dr**

GPS Reference

GPS Readings

Latitude: **33.7809**

Longitude: **-118.3506**

Site Id: **10 EAST**

Sample Region:

Personnel: **Ofori, Hisham, Tim Marino** Date: **6/19/2013**

Time: **9:40am**

Pictures: **2**

Field Measured Data

(Note: At Tox sites, If EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)

Field Observations

(See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
				Clear
% Bank Vegetation Left Bank	Right Bank	% Shading	Water Color	No flow - DRY
			Instream Activity	
			Odor	
			Foreign Matter	

Flow Data

Flow Start Time End Time

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)								
Depth at 50% at TOP (ft in)								
Depth at 75% at TOP (ft in)								
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured:

Site is very dry; no flow (in a manhole)

Additional Notes or Comments

Wildlife present? Non-contact recreation? (If present, describe below)

There was no flow at the site. Manhole is DRY.

1ST QTR- DRY WEATHER EVENT

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

GPS Reference

GPS Readings

Site: **Island Outlet - Academy Dr/ Palos Verdes Dr**

Latitude: **33.7831**

Site Id: **10 ACAD**

Sample Region: _____

Longitude: **-118.3537**

Personnel: **Marino, Hisham, Ofori**

Date: **6/19/2013**

Time: **10:00am**

Pictures: **2**

Samples Collected

Intermediate container used to transfer water to sample bottles?

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
TMDL 004515	10:00am	0.3ins	TSS, TDS Diss Phosphorus, OrthoP, Nitrate, Nitrite Total Kjeldahl Nitrogen Ammonia-N, Total Phosphorus		Actual Samples

Field Measured Data

(Note: At Tox sites, If EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)
10:15am	24.4	7.78	9.63	65.87	2510	0.29

Field Observations

(See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	Algae % Periphyton	Dominant Substrate	Weather
N/A	0	0		Very Clear
				Water Color
				Yellowish
				Instream Activity
				None
				Odor
				None
				Foreign Matter
				None

Flow Data

Flow Start Time _____ End Time _____

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)	8ins							
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)	0.2"							
Depth at 50% at TOP (ft in)	0.3"							
Depth at 75% at TOP (ft in)	0.2"							
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)	2							
Flow time #1 (sec)	0.85							
Flow time #2 (sec)	0.80							
Flow time #3 (sec)	0.99							

Reason if flow not measured: _____

Additional Notes or Comments

Wildlife present? Non-contact recreation? (If present, describe below)

Flow width = 8ins
 Depth = 0.3ins (0.025ft)
 Velocity = 0.20 ft/sec — 0.27 ft/sec. (Avg 0.235 ft/sec) Q = 0.023 ft³/sec.
 Measurements were taken in the manhole
 Velocity measurements by Float method (Distance measured = 2 feet)
 Samples were collected and directly to sample bottles.

Sampling Data Log Sheet

GPS Reference

GPS Readings

Site: **Field Duplicates**

Latitude: 33.7831°

Site Id: 10-ACAD

Sample Region:

Longitude: -118.3537

Personnel: **Marino, Hisham, Ofori**

Date: 6/19/2013

Time: 10:00am

Pictures:

Samples Collected

Intermediate container used to transfer water to sample bottles?

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
10-ACAD	10:00am	0.3ms	TSS, TDS		Field Duplicate
			Diss Phosphorus, OrthoP, Nitrate, Nitrite		Field Duplicate
			Total Kjeldahl Nitrogen		Field Duplicate
			Ammonia-N, Total Phosphorus		Field Duplicate

Field Measured Data

(Note: At Tox sites, if EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)

Field Observations

(See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
				Very Clear
				Water Color: yellowish
				Instream Activity: None
				Odor: None
				Foreign Matter: None

Flow Data

Flow Start Time: End Time:

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)								
Depth at 50% at TOP (ft in)								
Depth at 75% at TOP (ft in)								
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured:

Additional Notes or Comments

Wildlife present?

Non-contact recreation? (If present, describe below)

Samples were collected and directly to the sample bottles.

Sampling Data Log Sheet

GPS Reference

GPS Readings

Site: Island Outlet - Academy Dr @ Palas Verdes Dr.

Latitude: 33.7831

Longitude: -118.3537

Site Id: IO-ACAD

Sample Region: _____

Personnel: Ofori, Hisham, Tim Marino

Date: 6/19/2013

Time: 10:15am

Pictures: 2

Samples Collected Intermediate container used to transfer water to sample bottles?

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
<u>TMDL 004520</u>	<u>10:15am</u>	<u>N/A</u>	Diss Phosphorus, OrthoP, Nitrate, Nitrite		Blank (Equipment)
			Total Kjeldahl Nitrogen		Blank
			Ammonia-N, Total Phosphorus		Blank

Field Measured Data (Note: At Tox sites, If EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)

Field Observations (See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
% Bank Vegetation Left Bank Right Bank				Water Color
				Instream Activity
% Shading				Odor
				Foreign Matter

Flow Data Flow Start Time _____ End Time _____

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)								
Depth at 50% at TOP (ft in)								
Depth at 75% at TOP (ft in)								
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured:

Additional Notes or Comments _____ Wildlife present? Non-contact recreation? (If present, describe below)

Machado Lake Nutrient TMDL Sampling

1ST QTR. DRY WEATHER EVENT

Sampling Data Log Sheet

Site: Island Outlet Van Deene Ave @ 228th St.

GPS Reference _____
 GPS Readings
 Latitude: _____
 Longitude: _____

Site Id: 30-VAND

Sample Region: _____

Time: 11:10am

Pictures: _____

Personnel: Ofori, Hisham, Tim Marino Date: 6/19/2013

Samples Collected Intermediate container used to transfer water to sample bottles?

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
30-VAND	11:10am	N/A	Diss Phosphorus, OrthoP, Nitrate, Nitrite	↓	Field Blank
			Total Kjeldahl Nitrogen		Field Blank
			Ammonia-N, Total Phosphorus		Field Blank

Field Measured Data

(Note: At Tox sites; If EC > 3000 uS/cm, collect an additional container)

Time: 11:10am Temp(°C): _____ pH: _____ D.O.(mg/L): _____ D.O.(%Sat): _____ Sp.Cond(uS/cm): _____ Turbidity(NTU): _____

Field Observations

(See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
_____	_____	_____	_____	Water Color
% Bank Vegetation Left Bank	Right Bank	% Shading		Instream Activity
_____	_____	_____		Odor
				Foreign Matter

Flow Data

Flow Start Time: _____ End Time: _____

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)								
Depth at 50% at TOP (ft in)								
Depth at 75% at TOP (ft in)								
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured: _____

Additional Notes or Comments

Wildlife present? Non-contact recreation? (If present, describe below)

1ST QTR. DRY WEATHER EVENT

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

GPS Reference

GPS Readings

Site: Island Inlet - Normandie Ave/ Pasatiempo Ln

Latitude: 33.8058

Site Id: 31 NORMP

Sample Region:

Longitude: -118.2989

Personnel: Oferi, Hisham, Tim Marine

Date: 6/19/2013

Time: 12:00 noon Pictures: 2

Field Measured Data

(Note: At Tox sites, if EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)
<u>12:10pm</u>	<u>32</u>	<u>9.23</u>	<u>9.28</u>	<u>63.47</u>	<u>2190</u>	<u>8.26</u>

Field Observations

(See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
<u>N/A</u>	<u>10%</u>	<u>90%</u>	<u>K</u>	<u>Very Clear</u>
% Bank Vegetation				Water Color
Left Bank	Right Bank	% Shading		<u>yellowish</u>
<u>0</u>	<u>0</u>	<u>0</u>		Instream Activity
				<u>None</u>
				Odor
				<u>Musty</u>
				Foreign Matter
				<u>None</u>

Flow Data

Flow Start Time 12:15pm End Time 12:30pm

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)	<u>15</u>							
Width at MIDDLE (ft)	<u>14.5</u>							
Width at BOTTOM (ft)	<u>13.8</u>							
Depth at 25% at TOP (ft in)	<u>0.5</u>							
Depth at 50% at TOP (ft in)	<u>0.75</u>							
Depth at 75% at TOP (ft in)	<u>0.50</u>							
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)	<u>25</u>							
Flow time #1 (sec)	<u>33</u>							
Flow time #2 (sec)	<u>33.6</u>							
Flow time #3 (sec)	<u>32.2</u>							
#4	<u>34.2</u>							

Reason if flow not measured:
 Non-contact recreation? (If present, describe below)

Additional Notes or Comments

Flow velocity meter failed to work.
 Flow velocity by float method.
 Lots of Algae on water surface - some greenish and brownish color.
 Algae present at the mouth of 31- ASTHB storm drain lateral.
 $Vel = 0.73 - 0.77 \text{ ft/sec. (by calcs.)} = 0.75 \text{ ft/sec.}$ $Q = 1.21 \text{ cfs}$
 D.O. (% Sat) obtained from USGS database computations; using the values of measured D.O., and Specific Conductance. Atmospheric/barometric pressure is 760mmHg.

FIRST QTR. DRY WEATHER

Copy

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 20-SCBG (South Coast Botanical Garden)

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow

Observer/ Sampler:

Date: 6/19/2013

Time: 9:20 am

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): N/A

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). No Sampling Required.

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum. Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: No flow observed. Pictures taken. Only site visit and observation required.

FIRST QTR. DRY WEATHER EVENT

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 10 - EAST

Eastrake #1
Academy Drive

Palos Verdes
Drive

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.
Fill out all applicable information.

Data for:

Dry Weather Flow

Wet Weather Flow

Observer/ Sampler:

Tim Marino, Hisham Eldin, Jori Amoah

Date:

6/19/2013

Time:

9:40am

Weather condition:

Clear

Drizzle

Fog

Haze

Overcast

Partly Cloudy

Rain

Thunder Storm

Flow condition:

Dry

Ponded

Trickling

Steady Flow

High/ Flooded

Temperature of water body (°C):

N/A

Sample(s) taken?

Yes

No

If yes, Lab/Sample ID No(s).

Not Required to be Sampled

Sampling type: Dry Weather Flow

Mixed Dry Weather/Ocean

Stormwater

Mixed Storm/Ocean

Is surface flow reaching the ocean?

Yes

No

Don't Know (See notes)

Odor (of outfall)

None

Sewage

Fish/Decay

Petroleum

Rotten Egg

Musty

Chlorine

Ammonia

Chemical

Color (of flowing water)

Colorless

Brownish

Reddish

Greenish

Bluish

Yellowish

Turbidity:

Clear

Cloudy

Murky

Algae near drain?:

Yes

No

Soap or foam in discharge?:

Yes

No

Trash coming from drain?:

Yes

No

If Yes, type of trash:

Vegetation

Plastics(cups, bottles, bags, wrappers)

Styrofoam

Wood

Other _____

e.g. dead animals, etc.

Wildlife within 50 yards?:

Yes

No

If yes, type and number _____

e.g. 100 ducks, etc.

Redtide (ocean)?:

Yes

No

Notes:

Flow and field measurements were not taken.

No flow, completely dry.

FIRST STR. DRY WEATHER EVENT

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 10 ACAD (Academy Drive @

Palos Verdes Drive)

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for:

Dry Weather Flow

Wet Weather Flow

1st Dry Weather Event

Observer/ Sampler:

Tim Marino, Hisham Eldin, Jovi Amoah

Date:

6/19/2013

Time:

10:00am

Weather condition:

Clear

Drizzle

Fog

Haze

Overcast

Partly Cloudy

Rain

Thunder Storm

Flow condition:

Dry

Ponded

Trickling

Steady Flow

High/ Flooded

Temperature of water body (°C):

24.4

Sample(s) taken?

Yes

No

If yes, Lab/Sample ID No(s).

TMDL 004515

Sampling type:

Dry Weather Flow

Mixed Dry Weather/Ocean

Stormwater

Mixed Storm/Ocean

Is surface flow reaching the ocean?

Yes

No

Don't Know (See notes)

Odor (of outfall)

None

Sewage

Fish/Decay

Petroleum

Rotten Egg

Musty

Chlorine

Ammonia

Chemical

Color (of flowing water)

Colorless

Brownish

Reddish

Greenish

Bluish

Yellowish

Turbidity:

Clear

Cloudy

Murky

Algae near drain?:

Yes

No

Soap or foam in discharge?:

Yes

No

Trash coming from drain?:

Yes

No

If Yes, type of trash:

Vegetation

Plastics (cups, bottles, bags, wrappers)

Styrofoam

Wood

Other _____

e.g. dead animals, etc.

Wildlife within 50 yards?:

Yes

No

If yes, type and number _____

e.g. 100 ducks, etc.

Redtide (ocean)?:

Yes

No

Notes:

Water was collected from a manhole.

FIRST QTR. DRY WEATHER EVENT

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 10 ACAD (Duplicate)

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow

Observer/ Sampler:

Date: 6/19/2013

Time: 10:00am

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): 24.4

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). TMDL 004518

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: Sample duplicate of TMDL 004515.

FIRST QTR. DRY WEATHER EVENT

FIELD OBSERVATION PLAN DATASHEET

Van Deene @
228th Street

Monitoring Station No. / Drain Location No. 30_VAND

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow

Observer/ Sampler: _____
Date: 6/19/2013 Time: 11:15am

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): 35

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). TMDL 004516

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No (minor)

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: Pictures taken also

FIRST QTR. DRY WEATHER EVENT

FIELD OBSERVATION PLAN DATASHEET

(Normandie Blvd @ Pasatiempo Lane)

Monitoring Station No. / Drain Location No. 3I-NORMP

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow

Observer/ Sampler: Tim Marino, Hisham Eldin, Ofori Amoah

Date: 6/19/2013 Time: 12:10 pm

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): 32

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). N/A

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: Pictures taken. Lots of algae in the water with very strong musty odor. Samples not required at the site - Only flow measurements and field parameters measurements taken.

FIRST QTR. DRY WEATHER EVENT

FIELD OBSERVATION PLAN DATASHEET

Ashbridge Drive @ Pasatiempo Lane

Monitoring Station No. / Drain Location No. 3I-ASTB

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: [x] Dry Weather Flow [] Wet Weather Flow

Observer/ Sampler:

Date: 6/19/2013

Time: 12:25pm

Weather condition: [x] Clear [] Drizzle [] Fog [] Haze [] Overcast [] Partly Cloudy [] Rain [] Thunder Storm

Flow condition: [] Dry [] Ponded [] Trickling [x] Steady Flow [] High/ Flooded

Temperature of water body (°C): 27

Sample(s) taken? [] Yes [x] No If yes, Lab/Sample ID No(s). N/A

Sampling type: [x] Dry Weather Flow [] Mixed Dry Weather/Ocean [] Stormwater [] Mixed Storm/Ocean

Is surface flow reaching the ocean? [] Yes [x] No [] Don't Know (See notes)

Odor (of outfall) [x] None [] Sewage [] Fish/Decay [] Petroleum [] Rotten Egg [] Musty [] Chlorine [] Ammonia [] Chemical

Color (of flowing water) [] Colorless [x] Brownish [] Reddish [] Greenish [] Bluish [x] Yellowish

Turbidity: [x] Clear [] Cloudy [] Murky

Algae near drain?: [x] Yes [] No

Soap or foam in discharge?: [] Yes [x] No

Trash coming from drain?: [] Yes [x] No

If Yes, type of trash: [] Vegetation [] Plastics(cups, bottles, bags, wrappers) [] Styrofoam [] Wood [] Other e.g. dead animals, etc.

Wildlife within 50 yards?: [] Yes [x] No If yes, type and number e.g. 100 ducks, etc.

Redtide (ocean)?: [] Yes [x] No

Notes: Samples not required - only flow and field parameters measurements required. Site is a storm-drain lateral. Pictures taken. Algae observed at the outfall of the lateral into site 3I-NORMP channel.

FIRST QTR. DRY WEATHER EVENT

FIELD OBSERVATION PLAN DATASHEET

Vermont Avenue @ Sepulveda Blvd.

Monitoring Station No. / Drain Location No. 30 VERSEP

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow
Observer/ Sampler: Irm Marins, Hisham Eldin, Jori Amoah

Date: 6/19/2013 Time: 1:05 pm

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): _____

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). N/A

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: No sampling required; only flow and field parameters measurements required. Pictures taken. Algae was observed in water/channel. Strong odor. VERSEP is the downstream section of 3I-NORMP, ~~and~~ 3I-ASHB, and other laterals.

Q2 Dry Weather Monitoring Event
September 19, 2013

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

Site: Island Outlet - Eastvale Rd/ Palos Verdes Dr

GPS Reference

GPS Readings

Site Id: 10 EAST

Sample Region:

Latitude: 33.7809

Longitude: -118.3506

Personnel: Hisham & Ofori

Date: 9/19/2013

Time: 8:45am

Pictures: 2

Field Measured Data

(Note: At Tox sites, If EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)

Field Observations

(See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
				Water Color
% Bank Vegetation Left Bank	Right Bank	% Shading		Instream Activity
				Odor
				Foreign Matter

Flow Data

Flow Start Time End Time

	Path# <u> </u>	Path# <u> </u>	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)								
Depth at 50% at TOP (ft in)								
Depth at 75% at TOP (ft in)								
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured:

Additional Notes or Comments

Wildlife present? Non-contact recreation? (If present, describe below)

Dry, no flow.

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

Site: **Island Outlet - Academy Dr/ Palos Verdes Dr**

GPS Reference

GPS Readings

Latitude: **33.7831**

Longitude: **-118.3537**

Site Id: **10 ACAD**

Sample Region:

Personnel: **Hisham Ekin, Ofori Amadi**

Date: **9/19/2013**

Time: **9:15am**

Pictures: **2**

Samples Collected Intermediate container used to transfer water to sample bottles? **No**

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
TMDL 00454S	9:15am	0.53 in	TSS, TDS Diss Phosphorus, OrthoP, Nitrate, Nitrite Total Kjeldahl Nitrogen Ammonia-N, Total Phosphorus	↓	Actual/Environmental Sample

Field Measured Data (Note: At Tox sites, If EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)
9:35am	23	8.10	7.55	88.62	2140	4.37

Field Observations (See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
				clear
				clear
				None/hydrocarbon sheen
				Hydrocarbon
				flashing oil sheen

Flow Data Flow Start Time **9:25** End Time **9:30am** **Q = 6.65 gpm**

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)								
Depth at 50% at TOP (ft in)								
Depth at 75% at TOP (ft in)								
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured:

Additional Notes or Comments

Wildlife present? Non-contact recreation? (If present, describe below)

Flowrate, Q, cfs, was determined directly with an ISCO Auto-sampler. Depth = 0.53 inches. Hydrocarbon oil sheen and odor were observed on and from runoff. No algae.
Q = 6.65 gpm = 0.015 cfs

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

Site: Island Outlet - Academy Dr. & Greenham GPS Reference Latitude: 33.8083 GPS Readings
 Site Id: 10 ACAD Sample Region: Palos Verdes Dr. Longitude: -118.2883
 Personnel: Hisham & Ofori Date: 9/19/2013 Time: 9:15am Pictures: 2

Samples Collected Intermediate container used to transfer water to sample bottles?

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
<u>TMDL-0045.49</u>			TSS, TDS		<u>Equipment Blank</u>
			Diss Phosphorus, OrthoP, Nitrate, Nitrite		
			Total Kjeldahl Nitrogen		
			Ammonia-N, Total Phosphorus		

Field Measured Data (Note: At Tox sites, If EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)

Field Observations (See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
% Bank Vegetation Left Bank Right Bank % Shading				Water Color
				Instream Activity
				Odor
				Foreign Matter

Flow Data Flow Start Time End Time

	Path# <u> </u>	Path# <u> </u>	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft)								
Depth at 50% at TOP (ft)								
Depth at 75% at TOP (ft)								
Depth at 25% at MIDDLE (ft)								
Depth at 50% at MIDDLE (ft)								
Depth at 75% at MIDDLE (ft)								
Depth at 25% at BOTTOM (ft)								
Depth at 50% at BOTTOM (ft)								
Depth at 75% at BOTTOM (ft)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured:

Additional Notes or Comments Wildlife present? Non-contact recreation? (If present, describe below)

Equipment blank using de-ionized water.

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

Site: Island Outlet - Van Deene @ 228th St. GPS Reference Latitude: 33.8083 GPS Readings
 Site Id: 30_YAND Sample Region: Longitude: -118.2883
 Personnel: Hisham & Ofori Date: 9/19/2013 Time: 9:45am Pictures: 3

Samples Collected Intermediate container used to transfer water to sample bottles?

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
<u>TMDL 004546</u>	<u>9:45am</u>	<u>0.25</u>	TSS, TDS Diss Phosphorus, OrthoP, Nitrate, Nitrite Total Kjeldahl Nitrogen Ammonia-N, Total Phosphorus		<u>Actual Sample</u>

Field Measured Data (Note: At Tox sites, if EC > 3000 uS/cm, collect an additional container)

Time	Temp (°C)	pH	D.O. (mg/L)	D.O. (%Sat)	Sp. Cond (uS/cm)	Turbidity (NTU)
<u>10:50am</u>	<u>29</u>	<u>8.28</u>	<u>7.84</u>	<u>102.22</u>	<u>891</u>	<u>20.1</u>

Field Observations (See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	Algae % Periphyton	Dominant Substrate	Weather
				<u>clear</u>
				<u>Water Color: Dark/Murky</u>
				<u>Instream Activity: illegal discharge/unknown</u>
				<u>Odor: None</u>
				<u>Foreign Matter: Floating debris</u>

Flow Data Flow Start Time: 10:00am End Time: 10:20am

Width at TOP (ft)	Width at MIDDLE (ft)	Width at BOTTOM (ft)	Depth at 25% at TOP (ft)	Depth at 50% at TOP (ft)	Depth at 75% at TOP (ft)	Depth at 25% at MIDDLE (ft)	Depth at 50% at MIDDLE (ft)	Depth at 75% at MIDDLE (ft)	Depth at 25% at BOTTOM (ft)	Depth at 50% at BOTTOM (ft)	Depth at 75% at BOTTOM (ft)	Distance marked-off (ft)	Flow time #1 (sec)	Flow time #2 (sec)	Flow time #3 (sec)
<u>4/2 =</u>			<u>0.9 ft/sec</u>	<u>1.1 ft/sec</u>	<u>1.1 ft/sec</u>							<u>None</u>			

R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
<u>12"</u>	<u>2"</u>	<u>0.9</u>	<u>12"</u>	<u>3"</u>	<u>0.9</u>
<u>12"</u>	<u>3"</u>	<u>1.1</u>	<u>12"</u>	<u>3"</u>	<u>1.1</u>
<u>12"</u>	<u>3"</u>	<u>1.1</u>	<u>12"</u>	<u>3"</u>	<u>1.1</u>
<u>22"</u>	<u>2.75</u>	<u>0.9</u>	<u>22"</u>	<u>2.75</u>	<u>0.9</u>
<u>22"</u>	<u>3"</u>	<u>1.1</u>	<u>22"</u>	<u>3"</u>	<u>1.1</u>
<u>22"</u>	<u>3"</u>	<u>1.1</u>	<u>22"</u>	<u>3"</u>	<u>1.1</u>

Reason if flow not measured:

Additional Notes or Comments Wildlife present? Non-contact recreation? (If present, describe below)

illegal discharge water from unknown source, south of the sampling location (south of the freeway bridge and east embankment) was another illegal discharge from top of embankment ditch/drain

Using velocity meter: Avg vel = (0.9 + 1.1 + 1.1 + 0.9) / 4 = 1.0 ft/sec.

25% initial depth = 0.3 ins.

Q = 0.302 cfs

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

GPS Reference

GPS Readings

Site: **Field Duplicates**

Latitude:

Site Id: **30 VAND**

Sample Region: **Van Deene 228th**

Longitude:

Personnel: **Hisham & ofori**

Date: **9/19/2013**

Time: **9:45am**

Pictures: **3**

Samples Collected

Intermediate container used to transfer water to sample bottles?

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
TMDL 00:45:48	9:45am	0.25	TSS, TDS	↓	Field Duplicate
			Diss Phosphorus, OrthoP, Nitrate, Nitrite	↓	Field Duplicate
			Total Kjeldahl Nitrogen	↓	Field Duplicate
			Ammonia-N, Total Phosphorus	↓	Field Duplicate

Field Measured Data

(Note: At Tox sites, If EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)
10:55am	30	8.31	7.6	100.8	895	19.9

Field Observations

(See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	Algae % Periphyton	Dominant Substrate	Weather
				clear
				Dark
				illegal discharge/unknown
				None
				floating debris

Flow Data

Flow Start Time **10am** End Time **10:20am**

Path# <u>1</u>	Path# <u> </u>	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)							
Width at MIDDLE (ft)							
Width at BOTTOM (ft)							
Depth at 25% at TOP (ft/in)	2"	12"	2"	0.9	12"	2"	0.9
Depth at 50% at TOP (ft/in)	3 ins	12"	3"	1.1	12"	3"	1.1
Depth at 75% at TOP (ft/in)	3 ins	12"	3"	1.1	12"	3"	1.1
Depth at 25% at MIDDLE (ft/in)							
Depth at 50% at MIDDLE (ft/in)		22"	2.75"	0.9	22"	2.75"	0.9
Depth at 75% at MIDDLE (ft/in)		22"	3"	1.1	22"	3"	1.1
Depth at 25% at BOTTOM (ft/in)		22"	3"	1.1	22"	3"	1.1
Depth at 50% at BOTTOM (ft/in)							
Depth at 75% at BOTTOM (ft/in)							
Distance marked-off (ft)	—						
Flow time #1 (sec)							
Flow time #2 (sec)							
Flow time #3 (sec)							

Reason if flow not measured:

Additional Notes or Comments

Wildlife present? Non-contact recreation? (If present, describe below)

This runoff is from the discharge, which we don't know or could determine the source.

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

GPS Reference

GPS Readings

Site: 30-VAND

Latitude:

Site Id: 30-VAND

Sample Region: Van Deenweg 228th St

Longitude:

Personnel: Hisham & Ofori

Date: 9/19/2013

Time: 9:50am

Pictures:

Samples Collected Intermediate container used to transfer water to sample bottles?

Sample ID	Time	Sample Depth (ft)	Analytes	Bottle Count	Notes
TMDL <u>604547</u>	<u>9:50am</u>		Diss Phosphorus, OrthoP, Nitrate, Nitrite	↓	Field Blank
			Total Kjeldahl Nitrogen	↓	Field Blank
			Ammonia-N, Total Phosphorus	↓	Field Blank

Field Measured Data (Note: At Tox sites, If EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)
<u>9:50am</u>						

Field Observations (See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
% Bank Vegetation Left Bank Right Bank % Shading				Water Color
				Instream Activity
				Odor
				Foreign Matter

Flow Data Flow Start Time End Time

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)								
Depth at 50% at TOP (ft in)								
Depth at 75% at TOP (ft in)								
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured:

Additional Notes or Comments

Wildlife present? Non-contact recreation? (If present, describe below)

Machado Lake Nutrient TMDL Sampling

Sampling Data Log Sheet

Site: **Island Outlet - Crenshaw Blvd/ Palos Verdes Dr**

GPS Reference

GPS Readings

Latitude: **33.7844**

Longitude: **-118.3441**

Site Id: **20 SCBG**

Sample Region: _____

Personnel: **Hisham & ofori**

Date: _____

Time: **1:55pm**

Pictures: **3**

Field Measured Data

(Note: At Tox sites, if EC > 3000 uS/cm, collect an additional container)

Time	Temp(°C)	pH	D.O.(mg/L)	D.O.(%Sat)	Sp.Cond(uS/cm)	Turbidity(NTU)

Field Observations

(See attached "Field Observations" sheet for standard comments and further guidance)

Air Temp (°C)	Algae % Filamentous	% Periphyton	Dominant Substrate	Weather
% Bank Vegetation Left Bank	Right Bank	% Shading	Water Color	Instream Activity
			Odor	Foreign Matter

Flow Data

Flow Start Time _____ End Time _____

	Path#	Path#	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)	R. Bank Dist (ft)	Depth (ft)	Velocity (ft/sec)
Width at TOP (ft)								
Width at MIDDLE (ft)								
Width at BOTTOM (ft)								
Depth at 25% at TOP (ft in)								
Depth at 50% at TOP (ft in)								
Depth at 75% at TOP (ft in)								
Depth at 25% at MIDDLE (ft in)								
Depth at 50% at MIDDLE (ft in)								
Depth at 75% at MIDDLE (ft in)								
Depth at 25% at BOTTOM (ft in)								
Depth at 50% at BOTTOM (ft in)								
Depth at 75% at BOTTOM (ft in)								
Distance marked-off (ft)								
Flow time #1 (sec)								
Flow time #2 (sec)								
Flow time #3 (sec)								

Reason if flow not measured:

Additional Notes or Comments

Wildlife present? Non-contact recreation? (If present, describe below)

Dry, no flow.

COUNTY OF LOS ANGELES
 AGRICULTURE COMMISSIONER/WEIGHTS AND MEASURES

ENVIRONMENTAL TOXICOLOGY LABORATORY
 11012B GARFIELD AVENUE, SOUTH GATE CA 90208
 PHONE NO. (562) 622-0437 FAX (562) 622-0440

PROJECT NAME <u>Machado Lake Multipollutant TMDL</u>				CHAIN-OF-CUSTODY RECORD				Date:	
COMPANY NAME <u>LACDPW</u>									
REFERENCE <u>Watershed Mgmt.</u>									
ADDRESS <u>900 S. Fremont Avenue</u> <u>Alhambra, CA 91803-1331</u>									
FSID	DATE	TIME	SITE NO.	SITE NAME	GROUP	#BOTTLES	COMMENTS	TEMP	
TMDL004545			10_ACAD	Academy Dr. at Palos Verdes Dr.	CUST				
TMDL004546			30_VAND	Van Deene Ave. at 228th St.	CUST				
TMDL004547			BLNK_TM DL	Blank Sample TMDL 30_VAND	CUST				
TMDL004548			DUP_TM DL	Duplicate Sample TMDL 30_VAND	CUST				
TMDL004549			EQ_BLNK _TMDL	Equipment Blank for TMDLs 10_ACAD	CUST				
TMDL004550			30_VAND _MS1	Matrix Spike for 30_VAND 30_VAND	CUST				

HOLD ANALYSIS - additional composite samples are possible for these FSID numbers.

FINAL SAMPLES - begin analysis.

1 RELINQUISHED BY SIGNATURE	DATE	3 RELINQUISHED BY SIGNATURE	DATE	TOTAL NUMBER OF CONTAINERS
	TIME		TIME	
PRINTED NAME	TIME	PRINTED NAME	TIME	
COMPANY NAME LACDPW, Watershed Mgmt.	TIME	COMPANY NAME	TIME	
2 RECEIVED BY SIGNATURE	DATE	4 RECEIVED BY SIGNATURE	DATE	SPECIAL SHIPPING/HANDLING OR STORAGE REQUIREMENTS:
	TIME		TIME	
PRINTED NAME	TIME	PRINTED NAME	TIME	
COMPANY NAME	TIME	COMPANY NAME	TIME	

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 10-EAST

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow

Observer/ Sampler: _____
Date: 9/19/2013 Time: 8:45am

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): 10

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). _____

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum. Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish N/A

Turbidity: Clear Cloudy Murky No Flow

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)

Styrofoam Wood Other None

e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____

e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: No flow, no sample taken

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 10-ACAD.

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow

Observer/ Sampler: _____
Date: 9/19/2013 Time: 9:15am

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): _____

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). TMDL 004545

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish Oil sheen

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: Oil sheen on water, ~~Red~~ hydrocarbon odor

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 30-VAND

Monitoring Site Coordinates*: N _____ W _____

***Note:** Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow
 Observer/ Sampler: Hisham Eldin & Ofiri Amoah
 Date: 9/19/2013 Time: ~~10:55am~~ 9:45am - 10:55am

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): 29°C

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). TMDL 004546

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg

Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish

Bluish Yellowish
 Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No (minor)

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No (minor ~~trash~~ debris in channel)

If Yes, type of trash: Vegetation Plastics (cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: Observed unknown discharge into channel when work started. Depth of illicit discharge about 1 foot depth. Staff had to wait for discharge to subside before re-entering channel. Water Quality will be affected by discharge. Flow Measurement was repeated.

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 3I-ASHB

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow
 Observer/ Sampler: Hisham Eldin & Ofori Amuah
 Date: 9/11/2013 Time: 11:50 am

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): 28°C

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). _____

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics (cups, bottles, bags, wrappers)

Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: Algae is present at the confluence of 3I-ASHB and 3I-NORMP. 3I-NORMP-ASHB is a lateral that drains into 3I-NORMP.

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 3I-NORMP

Monitoring Site Coordinates*: N _____ W _____

***Note:** Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow

Observer/ Sampler: Hisham Eldin & Ofun Ameh
 Date: 9/19/2013 Time: 12:50 pm

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded *Water Quality*

Temperature of water body (°C): 30

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). Flow measurements & Field Parameters

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No *(large amount of algae)*

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics (cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: _____

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 30-VERSEP

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow
 Observer/ Sample: Hisham Ebdin & Ofori Amoah
 Date: 9/19/2013 Time: 12:15pm

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): 31

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). _____

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg

Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish

Bluish Yellowish

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)

Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: VERSEP is downstream location of 3I-NORMP and 3I-ASHB. Observed floatables and odor in at 3I-NORMP are also similarly observed at 30-VERSEP.
One lateral @ 11+11 station was observed ^{channel} ~~flowing~~ discharging to

FIELD OBSERVATION PLAN DATASHEET

Monitoring Station No. / Drain Location No. 20 SCBG

Monitoring Site Coordinates*: N _____ W _____

*Note: Coordinates accuracy is within 3 meters per GPSMAP 76GARMIN. See coordinates list on reverse page.

Fill out all applicable information.

Data for: Dry Weather Flow Wet Weather Flow

Observer/ Sampler: Hisham Eldin & Ofori Amuah

Date: 9/19/2013 Time: 1:55pm

Weather condition: Clear Drizzle Fog Haze Overcast
 Partly Cloudy Rain Thunder Storm

Flow condition: Dry Ponded Trickling Steady Flow High/ Flooded

Temperature of water body (°C): 10

Sample(s) taken? Yes No If yes, Lab/Sample ID No(s). _____

Sampling type: Dry Weather Flow Mixed Dry Weather/Ocean Stormwater Mixed Storm/Ocean

Is surface flow reaching the ocean? Yes No Don't Know (See notes)

Odor (of outfall) None Sewage Fish/Decay Petroleum Rotten Egg
 Musty Chlorine Ammonia Chemical

Color (of flowing water) Colorless Brownish Reddish Greenish
 Bluish Yellowish No flow

Turbidity: Clear Cloudy Murky

Algae near drain?: Yes No

Soap or foam in discharge?: Yes No

Trash coming from drain?: Yes No

If Yes, type of trash: Vegetation Plastics(cups, bottles, bags, wrappers)
 Styrofoam Wood Other _____
e.g. dead animals, etc.

Wildlife within 50 yards?: Yes No If yes, type and number _____
e.g. 100 ducks, etc.

Redtide (ocean)?: Yes No

Notes: No flow, very dry condition

Q3 Dry Weather Monitoring Event
December 10, 2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/10/2013 8:00 a.m. Report Date: 12/10/2013

Site Information

Site Name and ID: 10-ACAD
 Location: Academy and Pallas Woods

Weather and Observations

Estimate Storm Beginning: <u>dry weather</u> (date and time)	Estimate Storm Duration: — (hours)	Predicted % Chance of Rain: <u>0</u>	Rain Gauge Reading: — (inches)
--	--	---	--------------------------------------

Observations: [If yes identify location]

Color	<u>No color</u>	<input checked="" type="checkbox"/>
Odors	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Sample Information

Sampling depth: 1/2 inch
 Sample ID: MLMRP-001-10-ACAD-001 through 012
 QC Sample Type: all nutrients
 Requested analyses: Nutrients
 Sample Type: Nutrients

Velocity: 1.29 ft/sec
 Temperature: 9.23 C
 Dissolved Oxygen 5.75 mg/L
 pH: 6.49
 Conductivity: 1750 umhos/cm
 Turbidity: 0 NTU

Field Parameters

Velocity/Flow: leaf method = 1.29 ft/sec 0.45 ft/sec meter
 Temperature: 9.23°C
 Dissolved Oxygen: 5.75 mg/L
 pH: 6.49
 Conductivity: 1.75 ms/cm
 Turbidity: 0 NTU

Site Findings

Location:	Water Conditions/Observations
	<u>took samples during morning commute.</u>

Photos Taken: Yes No Photo Reference IDs: IMAG 1823 IMAG 1824

Observer Information

Observer Name: Nathan Griffin Observer Title: Associate Engineer
 Signature: [Signature] Date: 12/10/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 9:08 12/10/2013 Report Date: 12/10/2013

Site Information

Site Name and ID: 10-EAST
 Location: Eastvale, Westvale

Weather and Observations

Estimate Storm Beginning: <u>dw</u> (date and time)	Estimate Storm Duration: <u>—</u> (hours)	Predicted % Chance of Rain: <u>0</u>	Rain Gauge Reading: <u>—</u> (inches)
---	--	---	--

Observations: [If yes identify location]

Color N/A - no flow

Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Sample Information

Sampling depth: N/A - no sample taken, no flow

Sample ID: _____

QC Sample Type: _____

Requested analyses: _____

Sample Type: _____

Field Parameters

Velocity/Flow: 0 - no flow

Temperature: N/A

Dissolved Oxygen: N/A

pH: N/A

Conductivity: N/A

Turbidity: N/A

Site Findings

Location:	Water Conditions/Observations

Photos Taken: Yes No Photo Reference IDs: IMAG 1427 IMAG 1428

Observer Information

Observer Name: Nathan Griffin Observer Title: Assoc. Eng. EIT

Signature: [Signature] Date: 12/10/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 9:50 12/10/2013 Report Date: 12/10/2013

Site Information

Site Name and ID: 20-SCB6

Location: botanical gardens

Weather and Observations

Estimate Storm Beginning: <u>—</u> (date and time)	Estimate Storm Duration: <u>—</u> (hours)	Predicted % Chance of Rain: <u>0</u>	Rain Gauge Reading: <u>—</u> (inches)
--	--	---	--

Observations: [If yes identify location] NO FLOW

Color

Odors Yes No

Floating Material Yes No

Foreign Matter Yes No

Discolorations Yes No

Turbidity Yes No

Sample Information

Sampling depth: NA

Sample ID: NA

QC Sample Type: NA

Requested analyses: NA

Sample Type: NA

Field Parameters

Velocity/Flow: 0. flow

Temperature: NA

Dissolved Oxygen: NA

pH: NA

Conductivity: NA

Turbidity: NA

Site Findings

Location:	Water Conditions/Observations

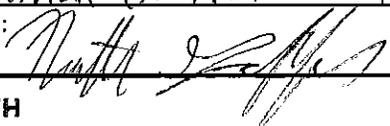
Photos Taken: Yes No Photo Reference IDs: IMAGE 1924 IMAGE 1930

Observer Information

Observer Name: Nathan Griffin Observer Title: Associate Engr.

Signature: [Signature] Date: 12/10/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/10/2013 10:33		Report Date: 12/10/2013	
Site Information			
Site Name and ID: 3E - NORMP			
Location: Normandie bridge			
Weather and Observations			
Estimate Storm Beginning: _____ (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain: 0	Rain Gauge Reading: _____ (inches)
Observations: [If yes identify location]			
Color	None		
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Trash
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: 1'4"			
Sample ID: NA			
QC Sample Type: NA			
Requested analyses NA			
Sample Type NA			
Field Parameters			
Velocity/Flow: 0.59 ft/sec = leaf method		1.3 ft/sec flow meter	
Temperature: 9.27°C			
Dissolved Oxygen: 19.79 mg/L DO			
pH 7.16			
Conductivity: 0.407 ms/cm			
Turbidity: 152 NTU			
Site Findings			
Location:		Water Conditions/Observations	
		Algae on slight amounts of algae on floor of channel.	
		• Multimeter read extremely high values of DO, sometimes it needed to be analyzed twice on a sample to get a more accurate value of DO	
Photos Taken:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs: IMAG 1833 IMAG 1834
Observer Information			
Observer Name: Nathan Griffin		Observer Title: Associate Engr	
Signature: 		Date: 12/10/2013	

Velocity: 0.59 ft/sec
 Temperature: 9.27 C
 Dissolved Oxygen 19.79 mg/L
 pH: 7.16
 Conductivity: 407 umhos/cm
 Turbidity: 152 NTU

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/10/2013 11:19 Report Date: 12/10/2013

Site Information

Site Name and ID: An 3I-AshB Location: In lateral north of Ashbridge ln

Weather and Observations

Estimate Storm Beginning: — (date and time)	Estimate Storm Duration: — (hours)	Predicted % Chance of Rain: 0	Rain Gauge Reading: — (inches)
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Observations: [If yes identify location]

Color	No <input checked="" type="checkbox"/> / Yes <input type="checkbox"/>
Odors	Yes <input type="checkbox"/> / No <input checked="" type="checkbox"/>
Floating Material	Yes <input type="checkbox"/> / No <input checked="" type="checkbox"/>
Foreign Matter	Yes <input type="checkbox"/> / No <input checked="" type="checkbox"/>
Discolorations	Yes <input type="checkbox"/> / No <input checked="" type="checkbox"/>
Turbidity	Yes <input type="checkbox"/> / No <input checked="" type="checkbox"/>

Sample Information

Sampling depth: 1/2"
 Sample ID: NA
 QC Sample Type: NA
 Requested analyses: NA
 Sample Type: NA

Field Parameters

Velocity/Flow: 0.508 ft/sec
 Temperature: 13.08°C
 Dissolved Oxygen: 10.02 mg/L DO
 pH: 7.57
 Conductivity: 0.866 mS/cm
 Turbidity: 0.0 NTU

Velocity: 0.58 ft/sec
 Temperature: 13.08 C
 Dissolved Oxygen 10.02 mg/L
 pH: 7.57
 Conductivity: 866 umhos/cm
 Turbidity: 0.0 NTU

Site Findings

Location:	Water Conditions/Observations

Photos Taken: Yes No Photo Reference IDs: IMAG 1539 IMAG 1540

Observer Information

Observer Name: Nathan Griffin Observer Title: associate Engr.
 Signature: *Nathan Griffin* Date: 12/10/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/10/2013 12:30 Report Date: 12/10/2013

Site Information

Site Name and ID: 30-VAND
 Location: next to freeway

Weather and Observations

Estimate Storm Beginning: — (date and time)	Estimate Storm Duration: — (hours)	Predicted % Chance of Rain: 0	Rain Gauge Reading: — (inches)
---	---------------------------------------	----------------------------------	--------------------------------------

Observations: [If yes identify location]

Color: light color (slight yellow with turbidity)
 Odors: Yes No
 Floating Material: Yes No
 Foreign Matter: Yes No
 Discolorations: Yes No
 Turbidity: Yes No

Sample Information

Sampling depth: 1/8" 1/4"
 Sample ID: MLEMRP-001-30-VAND-001 through 004
 QC Sample Type: NA
 Requested analyses: Nutrients
 Sample Type: Nutrients

Field Parameters

Velocity/Flow: 0.731 ft/sec leaf method, too low for flow meter
 Temperature: 16.49°C
 Dissolved Oxygen: 10.19 mg/L DO
 pH: 9.84 pH
 Conductivity: 0.846 mS/cm
 Turbidity: 1.6 NTU

Velocity: 0.731 ft/sec
 Temperature: 16.49 C
 Dissolved Oxygen 10.19 mg/L
 pH: 9.84
 Conductivity: 846 umhos/cm
 Turbidity: 1.6 NTU

Site Findings

Location:	Water Conditions/Observations
	lots of algae

Photos Taken: Yes No Photo Reference IDs: IMAG 1542 IMAG 1543

Observer Information

Observer Name: Nathan Griffin Observer Title: Associate Eng
 Signature: *Nathan Griffin* Date: 12/10/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/10/2013 1:20 Report Date: 12/10/2013

Site Information

Site Name and ID: 30-VERSEP
 Location: Vermont and Sepulveda

Weather and Observations

Estimate Storm Beginning: <u>—</u> (date and time)	Estimate Storm Duration: <u>—</u> (hours)	Predicted % Chance of Rain: <u>0</u>	Rain Gauge Reading: <u>—</u> (inches)
--	--	---	--

Observations: [If yes identify location]

Color _____

Odors Yes No

Floating Material Yes No

Foreign Matter Yes No

Discolorations Yes No

Turbidity Yes No

Sample Information

Sampling depth: 1.078^m 1 1/8"

Sample ID: NA

QC Sample Type: NA

Requested analyses: NA

Sample Type: NA

Velocity: 0.523 ft/sec
 Temperature: 12.61 C
 Dissolved Oxygen 10.53 mg/L
 pH: 9.66
 Conductivity: 1650 umhos/cm
 Turbidity: 1.4 NTU

Field Parameters

Velocity/Flow: 0.523 ft/sec leaf method 0.65 flow meter

Temperature: 12.61°C

Dissolved Oxygen: 10.53 mg/L DO

pH: 9.66

Conductivity: 1.65 mscm

Turbidity: 1.4 NTU

Site Findings

Location:	Water Conditions/Observations
	<u>Some algae on surface of culvert</u>

Photos Taken: Yes No Photo Reference IDs: IMAG 1546 IMAG 1547

Observer Information

Observer Name: Nathan Griffin Observer Title: Associate Engr

Signature: *Nathan Griffin* Date: 12/10/2013

Wet Weather Monitoring Event No.1
December 19, 2013

Date was incorrectly written.
Should be 12/19/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/18/2013 time: 10:36		Report Date: 12/18/2013	
Site Information			
Site Name and ID: 10-ACAD			
Location: Academy rd and Dallas Verdez			
Weather and Observations			
Estimate Storm Beginning: 12/18/2013 12 PM-4 AM (date and time)	Estimate Storm Duration: 12 hrs (hours)	Predicted % Chance of Rain: 60%	Rain Gauge Reading: (inches)
Observations: [If yes identify location]			
Color: CLR			
Odors	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Gas
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: 1/2 inch			
Sample ID: MWRP-002-10-ACAD-1 through 13			
QC Sample Type: Yes QA/QC field duplicates and field blanks			
Requested analyses: Nutrients			
Sample Type: Nutrients			
Field Parameters			
Velocity/Flow: Vis 1/2 inch @ 0.5 f/s			
Temperature: 18.86 °C			
Dissolved Oxygen: 11.38 mg/L 124.3% DO			
pH: 6.17			
Conductivity: 0.849 mS/cm			
Turbidity: 8.9 NTU			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name: TH Nathan Griffin		Observer Title: Associate Egr	
Signature: <i>Nathan Griffin</i>		Date: 12/18/2013	

Velocity: 0.5 ft/sec
Temperature: 18.56 C
DO: 11.38 mg/L
pH: 6.72
Conductivity: 849 umhos/cm
Turbidity: 8.9 NTU

Date was incorrectly written.
Should be 12/19/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/18/2013 11:51 AM		Report Date: 12/18/2013	
Site Information			
Site Name and ID: 3E-NORMP			
Location: Normandia Road and Pasatero			
Weather and Observations			
Estimate Storm Beginning: 12/18/2013 10 PM-4 AM (date and time)	Estimate Storm Duration: 12 (hours)	Predicted % Chance of Rain: 60%	Predicted Rain Gauge Reading: .19 (inches) actual
Observations: [If yes identify location]			
Color <u>dark</u>			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	leaves
Foreign Matter	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	trash
Discolorations	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	dark
Turbidity	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	murky
Sample Information			
Sampling depth: 3' in			
Sample ID: NA			
QC Sample Type: NA			
Requested analyses: NA			
Sample Type: NA			
Field Parameters			
Velocity/Flow: 1.6 FPS		D = 4-5 inches	
Temperature: 16.39 °C			
Dissolved Oxygen: 10.25 mg/L DO		107.5% DO	
pH: 6.71			
Conductivity: 0.102 mS/cm			
Turbidity: 61.7 NTU			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken:		Photo Reference IDs:	
Yes <input type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name: Tony Hancock		Observer Title:	
Signature: 		Date: 12/18/2013	

Velocity: 1.6 ft/sec
Temperature: 16.39 C
DO: 10.25 mg/L
pH: 6.71
Conductivity: 102 umhos/cm
Turbidity: 61.7 NTU

Date was incorrectly written.
Should be 12/19/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/18/2013		Report Date: 12/19/2013	
Site Information			
Site Name and ID: 30-VERSEP 31-ASHB			
Location: Vermont ml sepulveda			
Weather and Observations			
Estimate Storm Beginning: 12/17/2013 10 AM - 4 PM (date and time) 12:10 pm	Estimate Storm Duration: 12 (hours)	Predicted % Chance of Rain: 60%	Predicted Rain Gauge Reading: .19 (inches)
Observations: [If yes identify location]			
Color: Clear (Drainage)			
Odors	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	SEMIAR
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample Information			
Sampling depth: 1.0"			
Sample ID: FIELD			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: 3.5 ft/s			
Temperature: 3.5 7.0 ft/s 16.25 °C			
Dissolved Oxygen: 83.0% 6.92 mg/L			
pH: 6.61			
Conductivity: 0.142 mS/cm			
Turbidity: 164 NTU			
Site Findings			
Location:		Water Conditions/Observations	
31-ASHB		Flow Approx 1.5' Wide	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>	
Observer Information			
Observer Name: Tony Hancock		Observer Title:	
Signature: 		Date: 12/18/2013	

Velocity: 3.5 ft/sec
Temperature: 16.25 C
DO: 6.92 mg/L
pH: 6.61
Conductivity: 142 umhos/cm
Turbidity: 164 NTU

Date was incorrectly written.
Should be 12/19/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/18/13 12:20		Report Date: 12/18/13	
Site Information			
Site Name and ID: 3D-VERSEP			
Location: OFF SEPULVEDA			
Weather and Observations			
Estimate Storm Beginning: (date and time)	Estimate Storm Duration: (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: (inches)
Observations: [If yes identify location]			
Color LT BRN			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample Information			
Sampling depth: 3 IN			
Sample ID NA			
QC Sample Type:			
Requested analyses:			
Sample Type			
Field Parameters			
Velocity/Flow: 1.3 FT/S			
Temperature: 15.9 °C 10.34 mg/L			
Dissolved Oxygen: 110.1 %			
pH 6.72			
Conductivity: 0.131 mS/cm			
Turbidity: 77.1 NTU			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name:		Observer Title:	
Tony Hancock			
Signature:		Date:	

Velocity: 1.3 ft/sec
Temperature: 15.90 C
DO: 10.34 mg/L
pH: 6.72
Conductivity: 131 umhos/cm
Turbidity: 77.1 NTU

Date was incorrectly written.
Should be 12/19/2013

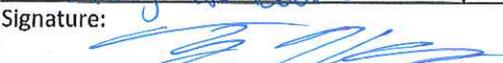
Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/18/2013 12:45 pm		Report Date: 12/18/2013	
Site Information			
Site Name and ID: 30-VAND			
Location: VAN DEERE and 229th Street near freeway			
Weather and Observations			
Estimate Storm Beginning: 12/17/2013 10 PM yAm (date and time)	Estimate Storm Duration: 12 hrs (hours)	Predicted % Chance of Rain: 60 %	Predicted Rain Gauge Reading: .14 (Inches)
Observations: [If yes identify location]			
Color BRN			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample Information			
Sampling depth: 4 inch			
Sample ID: NA			
QC Sample Type: NA			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: 0.35 ft/s (Approx 4 ft wide)			
Temperature: 15.61 °C			
Dissolved Oxygen: 10.35 mg/L 97.1%			
pH 6.7			
Conductivity: 0.118 mS/cm			
Turbidity: 49.9 NTU			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>		
Observer Information			
Observer Name: Tony Hancock		Observer Title:	
Signature: 		Date: 12/18/2013	

Velocity: 0.35 ft/sec
Temperature: 15.61 C
DO: 10.35 mg/L
pH: 6.7
Conductivity: 118 umhos/cm
Turbidity: 49.9 NTU

Date was incorrectly written.
Should be 12/19/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/18/2013 1:35 PM		Report Date: 12/18/2013	
Site Information			
Site Name and ID: 10-East			
Location: Eastway and Pulas Verdes			
Weather and Observations			
Estimate Storm Beginning: 12/17/2013 10 PM-4 AM (date and time)	Estimate Storm Duration: 12 (hours)	Predicted % Chance of Rain: 60 %	Med:efed Rain Gauge Reading: .14 (inches)
Observations: [If yes identify location] NEVER HAS FLOW - VERY DRY			
Color			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth:			
Sample ID NA			
QC Sample Type: NA			
Requested analyses NA			
Sample Type NA			
Field Parameters			
Velocity/Flow:			
Temperature:			
Dissolved Oxygen:			
pH			
Conductivity:			
Turbidity:			
Site Findings			
Location:		Water Conditions/Observations	
		NO FLOW / VERY DRY	
Photos Taken:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs:
Observer Information			
Observer Name: Terry Hancock		Observer Title:	
Signature: 		Date: 12/18/2013	

Date was incorrectly written.
Should be 12/19/2013

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 12/18/2013 Time: 11:20		Report Date: 12/18/2013	
Site Information			
Site Name and ID: ZU-SC130			
Location: South Coast Botanical Gardens			
Weather and Observations			
Estimate Storm Beginning: 12/18/2013 12pm-4pm (date and time)	Estimate Storm Duration: 1.5 hrs (hours)	Predicted % Chance of Rain: 60%	Rain Gauge Reading: .19 (inches)
Observations: [If yes identify location] NO FLOW			
Color			
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Sample Information			
Sampling depth:			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow:	NO FLOW		
Temperature:			
Dissolved Oxygen:			
pH			
Conductivity:			
Turbidity:			
Site Findings			
Location:		Water Conditions/Observations	
		NO FLOW	
Photos Taken:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs:
Observer Information			
Observer Name: Tony Hancock		Observer Title:	
Signature: 		Date:	

Q4 Dry Weather Monitoring Event
January 16, 2014



MWH

FIELD REPORT

DATE	1/16/2014	JOB NO.	
PROJECT	LADPW Machado Lake Nutrient TMDL Warm Weather Monitoring		
LOCATION	County Islands 1, 2, & 3 - LA County, CA		
WEATHER	Sunny - some clouds w/ minor smoke		
PRESENT AT SITE	MWH - Adam Norris, Nathan Griffin		
	BL Hall - Mike Hoehn, Paul Iler Barnett Hoehn		

0700: AWN met Nathan Griffin and BL Hall @ 30-VAND site.

0716: SAFETY MEETING.

0721-0837: Conducted dry weather monitoring and sampling @ 30-VAND location. Nathan Griffin calibrated water quality meter prior to measurements.

Horiba U-52 Water Quality meter SN: 023886

	Stds	Rdgs
pH	4	4.03
Conductivity	4.49 mS/cm	4.49 mS/cm
Turbidity	0.0 NTU	0.0 NTU
DO	0.0 mg/L	0.0 mg/L

- SEE OBSERVATION FIELD LOG SHEET FOR MONITORING DATA @ EACH RESPECTIVE LOCATION -

Collected Field Blank Samples @ 30 VAND:

MLMRP-003-30-VAND-9 (0816 hrs)	MLMRP-003-30-VAND-2 (0818 hrs)
MLMRP-003-30-VAND-10 (0816 hrs)	
MLMRP-003-30-VAND-11 (0817 hrs)	

Collected Primary Water Samples @ 30-VAND:

MLMRP-003-30-VAND-1 (0807 hrs)	MLMRP-003-30-VAND-4 (0814 hrs)
MLMRP-003-30-VAND-2 (0811 hrs)	
MLMRP-003-30-VAND-3 (0813 hrs)	

Collected Duplicate Samples @ 30-VAND

MLMRP-003-30-VAND-5 (0810 hrs)
MLMRP-003-30-VAND-6 (0812 hrs)
MLMRP-003-30-VAND-7 (0813 hrs)
MLMRP-003-30-VAND-8 (0814 hrs)

- ALL SAMPLES PROMPTLY LABELED, PLACED IN CHILLED COOLER, AND LOGGED ON CHAIN-OF-CUSTODY FORM. Adam W. Norris

PAGE 1 OF 2

PREPARED BY: Adam W. Norris

618 Michillinda Avenue, Suite 200
Arcadia, California
91107

Tel: 626.568.6600
Fax: 626.568.6515

Serving the World's Environmental Needs



0838-0849: Proceeded to location 30-VERSEP.
 0901-0942: Conducted Dry weather monitoring @ 30-VERSEP location.
 0944-0951: Proceeded to location 3I-ASHB. Note: Smoke increasing in clouds w/ some ash falling.
 0954-1032: Conducted Dry weather monitoring @ 3I-ASHB location.
 1034-1039: Proceeded to location 3I-NORMP.
 1041-1124: Conducted Dry weather monitoring @ 3I-NORMP location.
 → Proceeded to location 20-SCB. Note: Dry → no flow @ 20-SCB.
 1127-1149: ^{AWN} Conducted Dry weather monitoring @ 20-SCB location.
 1151-1206: ^{AWN} Conducted Dry weather monitoring @ 20-SCB location.
 1210-1217: Proceeded to back gate @ 20-SCB botanical gardens and tested lock Key (AWN and NG) OK ✓
 1218-1222: Proceeded to 10-EAST location.
 1224-1245: Conducted Dry weather monitoring @ 10-EAST location.
 Note: Dry → No Flow @ 10-EAST.
 1247-1252: Proceed to 10-ACAD location.
 1257-1342: Conducted Dry weather monitoring @ 10-East.

1325: Collected Primary Water Samples @ 10-ACAD:

- MLMRP-003-10-ACAD-1
- MLMRP-003-10-ACAD-2
- MLMRP-003-10-ACAD-3
- MLMRP-003-10-ACAD-4

1343: Left Site, BL Hall enroute to PAS-1 w/ Nathan Griffin.

AWN

1/16/2014	Adam W. Norris Adam W. Norris
LA DPW Machado Lake Nutrient TMDL - Dry Weather Monitoring	

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 1/16/2014 0757 hrs		Report Date: 1/16/2014	
Site Information			
Site Name and ID: 30-VAND			
Location:			
Weather and Observations			
Estimate Storm Beginning: Dry weather (date and time)	Estimate Storm Duration: 0 (hours)	Predicted % Chance of Rain: 0%	Rain Gauge Reading: 0 (inches)
Observations: [If yes identify location]			
Color Clear			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: 1/8"			
Sample ID MWMRP-003-30-VAND-1 Through 12			
QC Sample Type: Duplicate			
Requested analyses Nutrients			
Sample Type			
Field Parameters			
Velocity/Flow: 0.49 fts Float Method			
Temperature: 13.73 °C			
Dissolved Oxygen: 7.85 mg/L			
pH 7.97			
Conductivity: 1.08 mS/cm			
Turbidity: 0.0 NTU			
Site Findings			
Location:		Water Conditions/Observations	
30-VAND		Some leaves in channel; minor debris in channel Water depth = 1/8" @ sample location; Algae on channel bottom; sample collected on top of Ziplor bag covering algae.	
Photos Taken:		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		Photo Reference IDs:	
Observer Information			
Observer Name: Adam Norris Nathan Griffin		Observer Title: Senior Hydrogeologist (MWH) Associate Engineer (MWH)	
Signature: Adam W. Norris		Date: 1/16/2014	

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: 1/16/2014 0916 hrs		Report Date: 1/16/2014	
Site Information			
Site Name and ID: 30-VERSEP			
Location:			
Weather and Observations			
Estimate Storm Beginning: Dry weather (date and time)	Estimate Storm Duration: 0 (hours)	Predicted % Chance of Rain: 0	Rain Gauge Reading: 0 (inches)
Observations: [If yes identify location]			
Color Slight yellowish color / very clear though			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>	awn
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: 1"			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow:	0.41 ft/sec	float	0.13 ft/sec flow-meter
Temperature:	15.85 °C		
Dissolved Oxygen:	11.25 mg/L		
pH	9.15		
Conductivity:	1.89 mS/cm		
Turbidity:	0.0 NTU		
Site Findings			
Location:		Water Conditions/Observations	
30-VERSEP		1" water depth measured @ HOB0; moderate algae accumulation on channel bottom; minor local algae suspended fragments in water flow.	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name: Adam Norris Nathan Griffin		Observer Title: Senior Hydrogeologist (MWH) Associate Engineer (MWH)	
Signature: Adam W. Norris		Date: 1/16/2014	

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: 1/16/2014 1021 hrs		Report Date: 1/16/2014	
Site Information			
Site Name and ID: 3I-ASHB			
Location:			
Weather and Observations			
Estimate Storm Beginning: Dry weather (date and time)	Estimate Storm Duration: 0 (hours)	Predicted % Chance of Rain: 0	Rain Gauge Reading: 0 (inches)
Observations: [If yes identify location]			
Color Clear			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: 1"			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow:	1.15 ft/sec	Float	0.40 ft ³ /meter
Temperature:	17.88°C		
Dissolved Oxygen:	6.05 mg/L		
pH	8.4		
Conductivity:	0.633 mS/cm		
Turbidity:	0.0 NTU		
Site Findings			
Location:		Water Conditions/Observations	
		Water depth = 1" @ HOB0 location; Paper plate debris observed; Floating ash observed in water flow; Algae on channel bottom.	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name: Adam Norris Nathan Griffin		Observer Title: Adam W. Norris Senior Hydrogeologist (MWH) Associate Engineer (MWH)	
Signature: Adam W. Norris		Date: 1/16/2014	

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: 1/16/2014 1101 hrs		Report Date: 1/16/2014	
Site Information			
Site Name and ID: 3I - NORMP			
Location:			
Weather and Observations			
Estimate Storm Beginning: Dry Weather (date and time)	Estimate Storm Duration: 0 (hours)	Predicted % Chance of Rain: 0	Rain Gauge Reading: 0 (inches)
Observations: [If yes identify location]			
Color Clear			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: 1.25"			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: 0.57 ft/sec float 0.28 ft/sec meter			
Temperature: 20.92°C			
Dissolved Oxygen: 8.55 mg/L			
pH 8.23			
Conductivity: 0.624 mS/cm			
Turbidity: 0.0 NTU			
Site Findings			
Location:		Water Conditions/Observations	
		Water Depth = 1'4" @ HOB0 Location;	
		Heavy algae on channel bottom;	
		Ash floating on water flow.	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name: Adam Norris Nathan Griffin		Observer Title: Adam W. Norris Senior Hydrogeologist (MWH) Associate Engineer (MWH)	
Signature: Adam W. Norris		Date: 1/16/2014	

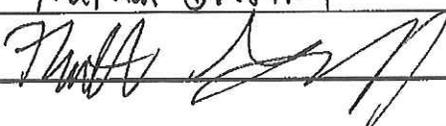
Visual Observation Field Log Sheet				
Date and Time of Visual Observation: 1/16/2014 1156 hrs		Report Date: 1/16/2014		
Site Information				
Site Name and ID: 20-SCBG				
Location:				
Weather and Observations				
Estimate Storm Beginning: Dry Weather (date and time)	Estimate Storm Duration: 0 (hours)	Predicted % Chance of Rain: 0	Rain Gauge Reading: 0 (inches)	
Observations: [If yes identify location]				
Color				
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	NO FLOW	
Floating Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Foreign Matter	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Sample Information				
Sampling depth:				
Sample ID				
QC Sample Type: NO FLOW				
Requested analyses				
Sample Type				
Field Parameters				
Velocity/Flow:				
Temperature:				
Dissolved Oxygen:				
pH				
Conductivity:				
Turbidity:				
Site Findings				
Location:		Water Conditions/Observations		
Photos Taken:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs:	
Observer Information				
Observer Name: Adam Norris Nathan Griffin		Observer Title: Senior Hydrogeologist (MWH) Associate Engineer (MWH)		
Signature: Adam W. Norris		Date: 1/16/2014		

Visual Observation Field Log Sheet				
Date and Time of Visual Observation: <u>1/16/2014</u> <u>12:31 hrs</u>		Report Date: <u>1/16/2014</u>		
Site Information				
Site Name and ID: <u>10 - EAST</u>				
Location:				
Weather and Observations				
Estimate Storm Beginning: <u>Dry Weather</u> (date and time)	Estimate Storm Duration: <u>0</u> (hours)	Predicted % Chance of Rain: <u>0</u>	Rain Gauge Reading: <u>0</u> (inches)	
Observations: [If yes identify location]				
Color				
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>	NO FLOW	
Floating Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Foreign Matter	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Sample Information				
Sampling depth:				
Sample ID:				
QC Sample Type: <u>NO FLOW</u>				
Requested analyses:				
Sample Type:				
Field Parameters				
Velocity/Flow:				
Temperature:				
Dissolved Oxygen:				
pH:				
Conductivity:				
Turbidity:				
Site Findings				
Location:		Water Conditions/Observations		
Photos Taken:		Photo Reference IDs:		
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Observer Information				
Observer Name: <u>Adam Norris</u> <u>Nathan Griffin</u>		Observer Title: <u>Senior Hydrogeologist (MWH)</u> <u>Associate Engineer (MWH)</u>		
Signature: <u>Adam W. Norris</u>		Date: <u>1/16/2014</u>		

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: 1/16/2014 1319 hrs		Report Date: 1/16/2014	
Site Information			
Site Name and ID: 10-ACAD			
Location:			
Weather and Observations			
Estimate Storm Beginning: Dry Weather (date and time)	Estimate Storm Duration: 0 (hours)	Predicted % Chance of Rain: 0	Rain Gauge Reading: 0 (inches)
Observations: [If yes identify location]			
Color Clear			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: 1.5"			
Sample ID MLMRP-003-10-ACAD-1 through 4			
QC Sample Type:			
Requested analyses Nutrients			
Sample Type			
Field Parameters			
Velocity/Flow: 0.30 ft/sec float		0.15 ft/sec meter	
Temperature: 19.26 °C			
Dissolved Oxygen: 5.48 mg/L			
pH 8.52			
Conductivity: 0.929 mS/cm			
Turbidity: 0.0 NTU			
Site Findings			
Location:		Water Conditions/Observations	
		Water Depth = 1.5" @ HOB location;	
		Some floating grass in flow.	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name: Adam Norris Nathan Griffin		Observer Title: Senior Hydrogeologist (MWH) Associate Engineer (MWH)	
Signature: Adam W. Norris		Date: 1/16/2014	

Wet Weather Monitoring Event No.2
February 2, 2014

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/2/14 7:48		Report Date:	
Site Information			
Site Name and ID: ARAP 10-ACAD			
Location:			
Weather and Observations			
Estimate Storm Beginning: 7:00 PM 2/2/14 7:30 (date and time)	Estimate Storm Duration: 1:20 (hours)	Predicted % Chance of Rain: 90%	Rain Gauge Reading: 0.18 (inches)
Observations: [If yes identify location]			
Color dark brown			
Odors	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	slight smell of petroleum
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: 2 in ?			
Sample ID M6MRP-004-10-ACAD			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: 5.7 ft/sec		Velocity: 5.7 ft/sec	
Temperature: 17.33		Temperature: 17.33 C	
Dissolved Oxygen: 7.82		DO: 7.82 mg/L	
pH: 6.72		Ph: 6.72	
Conductivity: 0.347 ms/sec		Conductivity: 347 umhos/cm	
Turbidity: 62 NTU		Turbidity: 62 NTU	
Site Findings			
Location:		Water Conditions/Observations	
		Flowing very fast, water would flow in waves. water peaked quickly after storm at started.	
Photos Taken:		Photo Reference IDs:	
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name: Nathan Griffin		Observer Title:	
Signature: 		Date:	

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: <u>2/2/14 8:00 AM</u>		Report Date:	
Site Information			
Site Name and ID: <u>10 - EAST</u>			
Location:			
Weather and Observations			
Estimate Storm Beginning: <u>4:30 pm 2/2/14</u> 7:30 (date and time)	Estimate Storm Duration: <u>1:20</u> (hours)	Predicted % Chance of Rain: <u>90 %</u>	Rain Gauge Reading: <u>0.18</u> (inches)
Observations: [If yes identify location]			
Color <u>very dark brown. picture to verify color</u>			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample Information			
Sampling depth: <u>1/4"</u>	<u>width of about 5 inches</u>		
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: <u>4.62</u>			
Temperature: <u>15.91</u>			
Dissolved Oxygen: <u>6.68</u>	<u>69.9 % DO</u>		
pH: <u>7.34</u>			
Conductivity: <u>0.729</u>			
Turbidity: <u>192</u>			
Site Findings			
Location:	Water Conditions/Observations		
	<u>water very shallow and flowing fast. looks like water flows around 10.5m meter or so over it very quickly. could be forming pressure deficit</u>		
Photos Taken:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs:
Observer Information			
Observer Name: <u>Nathan Griffin</u>	Observer Title:		
Signature: <u>Nathan Griffin</u>	Date:		

Velocity: 4.62 ft/sec
 Temperature: 15.91 C
 DO: 6.68 mg/L
 Ph: 7.34
 Conductivity: 729 umhos/cm
 Turbidity: 192 NTU

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/2/14 8:38 Report Date:

Site Information

Site Name and ID: 30-NAND 30-VE/SEP
 Location:

Weather and Observations

Estimate Storm Beginning: <u>4:00 pm 2/2/14</u> 7:30 (date and time)	Estimate Storm Duration: <u>1:20</u> (hours)	Predicted % Chance of Rain: <u>90</u>	Rain Gauge Reading: <u>0.18</u> (inches)
--	---	--	---

Observations: [If yes identify location]

Color	
Odors	Yes <input type="checkbox"/> No <input type="checkbox"/>
Floating Material	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> <u>lots of little leaves</u>
Foreign Matter	Yes <input type="checkbox"/> No <input type="checkbox"/>
Discolorations	Yes <input type="checkbox"/> No <input type="checkbox"/>
Turbidity	Yes <input type="checkbox"/> No <input type="checkbox"/>

Sample Information

Sampling depth: 1/4" depth at wall edge.
 Sample ID:
 QC Sample Type:
 Requested analyses:
 Sample Type:

Field Parameters

Velocity/Flow: 1.77 ft/sec 1.32 ft/sec when multiply by 0.75
 Temperature: 14.86
 Dissolved Oxygen: 6.00 67.7 % DO
 pH: 8.81
 Conductivity: 0.826 mS/cm
 Turbidity: 46

Velocity: 1.32 ft/sec
 Temperature: 14.86 C
 DO: 6.00 mg/L
 Ph: 8.81
 Conductivity: 826 umhos/cm
 Turbidity: 46 NTU

Site Findings

Location:	Water Conditions/Observations
	<u>lots of little leaves, dark murky</u>

Photos Taken: Yes No Photo Reference IDs: too dark for photos

Observer Information

Observer Name: Nathan Griffin Observer Title:
 Signature: Nathan Griffin Date:

10 ft
 6.0 sec
 5.5 sec
 5.4 sec
 could not get flow with meter, too shallow

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: <u>2/2/14 9:20 PM</u>		Report Date:	
Site Information			
Site Name and ID: <u>30-VAND</u>			
Location:			
Weather and Observations			
Estimate Storm Beginning: <u>4:00 PM 2/2/14</u> 7:30 (date and time)	Estimate Storm Duration: <u>1:20</u> (hours)	Predicted % Chance of Rain: <u>90</u>	Rain Gauge Reading: <u>0.18</u> (Inches)
Observations: [If yes identify location]			
Color <u>brown color</u>			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: <u>8"</u>			
Sample ID <u>MLMRP-004-30-VAND</u>			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: <u>2 ft/sec</u>	Velocity: 2 ft/sec		
Temperature: <u>14.67</u>	Temperature: 14.67 C		
Dissolved Oxygen: <u>7.89</u>	DO: 7.89 mg/L		
pH: <u>8.21</u>	Ph: 8.21		
Conductivity: <u>0.262</u>	Conductivity: 262 umhos/cm		
Turbidity: <u>124</u>	Turbidity: 124 NTU		
Site Findings			
Location:		Water Conditions/Observations	
		<u>The storm had stopped about a half hour before we took samples while taking samples the water had decreased about 2-3 inches</u>	
Photos Taken:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Photo Reference IDs: <u>too dark for photos</u>
Observer Information			
Observer Name: <u>Nathan Griffin</u>		Observer Title:	
Signature: <u>Nathan Griffin</u>		Date:	

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: 2/2/14 9:45 PM		Report Date:	
Site Information			
Site Name and ID: 3I-AS4B			
Location:			
Weather and Observations			
Estimate Storm Beginning: 2/2/14 4:00 PM (date and time) 7:30	Estimate Storm Duration: 1:20 (hours)	Predicted % Chance of Rain: 90	Rain Gauge Reading: 0.18 (inches)
Observations: [If yes identify location]			
Color light brown color			
Odors	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: ~ 2"		Velocity: 3.0 ft/sec	
Sample ID		Temperature: 15.03 C	
QC Sample Type:		DO: 6.64 mg/L	
Requested analyses:		Ph: 7.94	
Sample Type		Conductivity: 248 umhos/cm	
Field Parameters			
Velocity/Flow: 3.0 ft/sec		Turbidity: 61.2	
Temperature: 15.03		Dissolved Oxygen: 6.64	
pH: 7.94		68.1 % DO	
Conductivity: 0.248 MS/cm			
Turbidity: 61.2			
Site Findings			
Location:		Water Conditions/Observations	
		We woke up a neighbor and had a conversation with him about what we were doing	
Photos Taken:		Photo Reference IDs:	
Yes <input type="checkbox"/>		No <input type="checkbox"/>	
Observer Information			
Observer Name: Nathan Griffin		Observer Title:	
Signature: <i>Nathan Griffin</i>		Date:	

Velocity: 3.0 ft/sec
 Temperature: 15.03 C
 DO: 6.64 mg/L
 Ph: 7.94
 Conductivity: 248 umhos/cm
 Turbidity: 61.2 NTU

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/2/14 10:10 PM Report Date:

Site Information

Site Name and ID: 3I-NORMP

Location:

Weather and Observations

Estimate Storm Beginning: <u>2/2/14 4:00 pm</u> (date and time) 7:30	Estimate Storm Duration: <u>1:20</u> (hours)	Predicted % Chance of Rain: <u>90</u>	Rain Gauge Reading: <u>0.18</u> (inches)
--	---	--	---

Observations: [If yes identify location]

Color light brown color

Odors Yes No

Floating Material Yes No lots of leaves and trash

Foreign Matter Yes No

Discolorations Yes No

Turbidity Yes No

Sample Information

Sampling depth: 3.5" at wall edge

Sample ID

QC Sample Type:

Requested analyses

Sample Type

Field Parameters

Velocity/Flow: 1.05 flow meter near wall with some turbulence

Temperature: 15.30°C

Dissolved Oxygen: 6.60 68.4% DO

pH 7.82

Conductivity: 0.292

Turbidity: 102

Site Findings

Location:

Water Conditions/Observations

at this point, the storm has been finished for about an hour or so.

Photos Taken:

Yes

No

Photo Reference IDs:

Observer Information

Observer Name:

Nathan Griffin

Observer Title:

Signature:

Nathan Griffin

Date:

Velocity: 1.05 ft/sec
 Temperature: 15.30 C
 DO: 6.60 mg/L
 Ph: 7.82
 Conductivity: 292 umhos/cm
 Turbidity: 102 NTU

float test
10 ft

6.2

4.5

5.5

1.38 ft/sec
(already multiplied by 0.75)

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: 2/2/14 10:45 PM		Report Date:	
Site Information			
Site Name and ID: 20-SCRG			
Location:			
Weather and Observations			
Estimate Storm Beginning: 4:30 PM 2/2/14 7:30 (date and time)	Estimate Storm Duration: 1:20 (hours)	Predicted % Chance of Rain: 90	Rain Gauge Reading: .18 (inches)
Observations: [If yes identify location]			
Color			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth:			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow:			
Temperature:			
Dissolved Oxygen:			
pH			
Conductivity:			
Turbidity:			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken:		Photo Reference IDs:	
Yes <input type="checkbox"/>		No <input checked="" type="checkbox"/>	
Observer Information			
Observer Name: Nathan Griffin		Observer Title:	
Signature: <i>Nathan Griffin</i>		Date:	

NO FLOW



1:03 am
 went to 30-NAMP → flow looked like it was almost at
 base flow, so samples were not taken 250 ml at 30 min

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: 2/3/14 12:05 AM		Report Date:	
Site Information			
Site Name and ID: 10-ACAD			
Location:			
Weather and Observations			
Estimate Storm Beginning: 11:30 PM 2/2/2014 (date and time)	Estimate Storm Duration: 0:25 (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: (inches)
Observations: [If yes identify location]			
Color: slight brown			
Odors	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	slight petroleum smell	
Floating Material	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Foreign Matter	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Discolorations	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Turbidity	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Sample Information			
Sampling depth: 3'			
Sample ID:			
QC Sample Type:			
Requested analyses:			
Sample Type:			
Field Parameters			
Velocity/Flow: 5.8			
Temperature: 15.01			
Dissolved Oxygen: 7.59			
pH: 7.93			
Conductivity: 0.168 MS/cm			
Turbidity: 31.3			
Site Findings			
Location:		Water Conditions/Observations	
		abundant at 7' in sample bottle	
		250 ml every 30 mins	
Photos Taken:		Photo Reference IDs:	
Yes <input type="checkbox"/> No <input type="checkbox"/>			
Observer Information			
Observer Name: Nathan Ceriffin		Observer Title: associate engr	
Signature: <i>Nathan Ceriffin</i>		Date: 2/3/2014	

Velocity: 5.8 ft/sec
 Temperature: 15.01 C
 DO: 7.59 mg/L
 Ph: 7.93
 Conductivity: 162 umhos/cm
 Turbidity: 31.3 NTU

Visual Observation Field Log Sheet			
Date and Time of Visual Observation: 12:25		Report Date:	
Site Information			
Site Name and ID: 10 - EAST			
Location:			
Weather and Observations			
Estimate Storm Beginning: 11:30 PM 2/2/2014 (date and time)	Estimate Storm Duration: 0:25 (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: (inches)
Observations: [If yes identify location]			
Color: brown color			
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: ~ 1"	width at about 8"		
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: 4.48 ft/sec	Velocity: 4.48 ft/sec		
Temperature: 13.51 °C	Temperature: 13.51 C		
Dissolved Oxygen: 7.49	DO: 7.49 mg/L		
pH: 7.78	Ph: 7.78		
Conductivity: 0.197	Conductivity: 197 umhos/cm		
Turbidity: 106	Turbidity: 106 NTU		
Site Findings			
Location:		Water Conditions/Observations	
		+ Water flows off front part of Hobo meters	
		- flow was more than first time at this site. Rain stopped while at this site.	
Photos Taken:		Photo Reference IDs:	
Yes <input type="checkbox"/>		No <input type="checkbox"/>	
Observer Information			
Observer Name: Nathan Griffin		Observer Title:	
Signature: 		Date: 2/3/2013	

Wet Weather Monitoring Event No.3
February 27, 2014

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/27/14 1:27 Report Date: 2/27/14

Site Information

Site Name and ID: East Vale 10-EAST
 Location:

Weather and Observations

Estimate Storm Beginning: <u>~12:40 am 2/27/14</u> (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
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Observations: [If yes identify location]

Color no

Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Sample Information

Sampling depth: 4"
 Sample ID
 QC Sample Type:
 Requested analyses
 Sample Type

Field Parameters

Velocity/Flow: 10.92 m/s
 Temperature: 9.83 °C
 Dissolved Oxygen: 12.47 m (12.47) mg/L
 pH: 6.69
 Conductivity: 0.160 mS/cm
 Turbidity: 241 NTU

Site Findings

Location:	Water Conditions/Observations

Photos Taken: Yes No Photo Reference IDs:

Observer Information

Observer Name: Ryan Kristensen Observer Title:
 Signature: [Signature] Date: 2/27/14

Visual Observation Field Log Sheet

Date and Time of Visual Observation: <i>2/27/14 ~2:00 am</i>		Report Date:	
Site Information			
Site Name and ID: <i>30 Vand 27:00 am</i>			
Location:			
Weather and Observations			
Estimate Storm Beginning: <i>12:40 am 2/27/14</i> (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
Observations: [If yes identify location]			
Color <i>greyish</i>			
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Sample Information			
Sampling depth: <i>14"</i>			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: <i>0.92 m/s = 3.02 ft/sec</i>			
Temperature: <i>10.46</i>			
Dissolved Oxygen: <i>12.73</i>			
pH <i>6.94</i>			
Conductivity: <i>0.088 mS/cm</i>			
Turbidity: <i>12.3 NTU</i>			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken: <i>check photos for hair on</i>		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> Photo Reference IDs:
Observer Information			
Observer Name: <i>Ryan Kristensen</i>		Observer Title:	
Signature: <i>[Signature]</i>		Date: <i>2/27/14</i>	

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 31 ASHB 2:15 am 2/27/14 Report Date: _____

Site Information

Site Name and ID: 31-ASHB
 Location: _____

Weather and Observations

Estimate Storm Beginning: _____ (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain: _____	Rain Gauge Reading: _____ (inches)
---	---	-----------------------------------	---------------------------------------

Observations: [If yes identify location] _____

Color clear

Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Sample Information

Sampling depth: 1'
 Sample ID _____
 QC Sample Type: _____
 Requested analyses _____
 Sample Type _____

Field Parameters

Velocity/Flow: 1.85 m/s = 6.0 f/s
 Temperature: 10.63 °C
 Dissolved Oxygen: 13.97, 17.32 mg/L ... orig. 16.2
 pH: 6.95
 Conductivity: 0.075 mS/cm
 Turbidity: 41.0 NTU

Site Findings

Location:	Water Conditions/Observations

Photos Taken: 2 days for photo Yes No Photo Reference IDs: _____

Observer Information

Observer Name: Ryan Kristensen Observer Title: _____
 Signature: [Signature] Date: 2/27/14

Visual Observation Field Log Sheet

Date and Time of Visual Observation: <i>2:34</i> <i>2/27/14</i>		Report Date:	
Site Information			
Site Name and ID: <i>3I Normandy</i> <i>3I-NORMP</i>			
Location:			
Weather and Observations			
Estimate Storm Beginning: _____ (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
Observations: [If yes identify location]			
Color <i>clear</i>			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	<i>3m</i>
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: <i>19" at wall (not center line) seventeen"</i>			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: <i>1.23 m/s</i> <i>4.0 f3/sec</i>			
Temperature: <i>10.72°C</i>			
Dissolved Oxygen: <i>12.8 mg/L</i>			
pH <i>7.05</i>			
Conductivity: <i>0.08 mS/cm</i>			
Turbidity: <i>66.7 NTU</i>			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken:		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
		Photo Reference IDs:	
Observer Information			
Observer Name: <i>Ryan Cristensen</i>		Observer Title:	
Signature: <i>[Signature]</i>		Date: <i>2/27/14</i>	

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2:46 am Report Date: 2/27/14

Site Information

Site Name and ID: 30 Versep 30-Versep
 Location:

Weather and Observations

Estimate Storm Beginning: _____ (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
---	---	-----------------------------	---------------------------------------

Observations: [If yes identify location]

Color clear

Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Sample Information

Sampling depth: 10" @ wall
 Sample ID
 QC Sample Type:
 Requested analyses
 Sample Type

Field Parameters

Velocity/Flow: 0.95 m/s (0.95 m/s) = 3.12
 Temperature: 10.70°C
 Dissolved Oxygen: 12.20 mg/L
 pH: 7.12
 Conductivity: 0.078 mS/cm
 Turbidity: 75.9 NTU

Site Findings

Location:	Water Conditions/Observations

Photos Taken: Yes No Photo Reference IDs:

Observer Information

Observer Name: Ryan Kristensen Observer Title:

Signature: [Signature] Date: 2-27-14

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/27/14 3:20 AM Report Date: _____

Site Information

Site Name and ID: 20-SCB6

Location: _____

Weather and Observations

Estimate Storm Beginning: _____ (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain: _____	Rain Gauge Reading: _____ (inches)
---	---	-----------------------------------	---------------------------------------

Observations: [If yes identify location] _____

Color _____

Odors Yes No

Floating Material Yes No

Foreign Matter Yes No

Discolorations Yes No

Turbidity Yes No

Sample Information

Sampling depth: _____

Sample ID _____

QC Sample Type: _____

Requested analyses _____

Sample Type _____

Field Parameters

Velocity/Flow: _____

Temperature: _____

Dissolved Oxygen: _____

pH _____

Conductivity: _____

Turbidity: _____

Site Findings

Location:	Water Conditions/Observations

Photos Taken:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs: _____
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Observer Information

Observer Name: Ryan Knstensen Observer Title: _____

Signature: [Signature] Date: 2/27/14

NO FLOW

Wet Weather Monitoring Event No.4
February 28, 2014

Visual Observation Field Log Sheet

Date and Time of Visual Observation: <i>1:04 am 2/28/14</i>		Report Date:	
Site Information			
Site Name and ID: <i>Eastvale 10-EAST</i>			
Location:			
Weather and Observations			
Estimate Storm Beginning: <i>10:30/11:30 pm 2/27/14</i> (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
Observations: [If yes identify location]			
Color <i>clear</i>			
Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Sample Information			
Sampling depth: <i>2"</i>			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: <i>1.8 m/s = 5.9 ft/sec</i>			
Temperature: <i>10.36 °C</i>			
Dissolved Oxygen: <i>14.92 mg/L</i>			
pH <i>6.38</i>			
Conductivity: <i>0.158 ms/cm</i>			
Turbidity: <i>52.0 NTU</i>			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Photo Reference IDs:
Observer Information			
Observer Name: <i>Ryan Knitensae</i>		Observer Title:	
Signature: <i>[Signature]</i>		Date: <i>2/28/14</i>	

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/28/14 1:46 Report Date:

Site Information

Site Name and ID: 3I-NORMP
Location:

Weather and Observations

Estimate Storm Beginning: <u>220:00 2/27/14</u> (date and time)	Estimate Storm Duration: <u>24</u> (hours)	Predicted % Chance of Rain: <u>100</u>	Rain Gauge Reading: <u>~ 2</u> (inches)
---	---	---	--

Observations: [If yes identify location]

Color slight brown

Odors	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Floating Material	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Foreign Matter	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Discolorations	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Turbidity	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

Sample Information

Sampling depth: 5" at wall
Sample ID
QC Sample Type:
Requested analyses
Sample Type

Field Parameters

Velocity/Flow: 0.73 m/s 2.4 ft/sec
Temperature: 11.08
Dissolved Oxygen: 15.25 mg/L DO
pH: 6.62
Conductivity: 0.102 ms/cm
Turbidity: 52.7 NTU

Site Findings

Location:	Water Conditions/Observations

Photos Taken: Yes No Photo Reference IDs: picture is too dark to see

Observer Information

Observer Name: Nathan Griffin Observer Title: assessment eng.
Signature: [Signature] Date: 2/28/14

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/28/14 1:55 Report Date: _____

Site Information

Site Name and ID: 3E-AsTB
 Location: _____

Weather and Observations

Estimate Storm Beginning: <u>22:00 2/27/14</u> (date and time)	Estimate Storm Duration: <u>24</u> (hours)	Predicted % Chance of Rain: <u>100</u>	Rain Gauge Reading: <u>~2</u> (inches)
--	---	---	---

Observations: [If yes identify location]

Color light yellow

Odors Yes No

Floating Material Yes No

Foreign Matter Yes No

Discolorations Yes No

Turbidity Yes No

Sample Information

Sampling depth: 5'

Sample ID _____

QC Sample Type: _____

Requested analyses _____

Sample Type _____

Field Parameters

Velocity/Flow: 1.02 m/s, however, it looked a little faster.

Temperature: 10.84

Dissolved Oxygen: 15.39

pH 6.63

Conductivity: 0.076 mS/cm

Turbidity: 35.6 NTU

Site Findings

Location:	Water Conditions/Observations

Photos Taken: Yes No Photo Reference IDs: _____

Observer Information

Observer Name: Nathan Griffin Observer Title: associate eng.

Signature: [Signature] Date: 2/28/14

Visual Observation Field Log Sheet

Date and Time of Visual Observation: <u>2/28/14 2:31</u>		Report Date:	
Site Information			
Site Name and ID: <u>10-ACAD</u>			
Location:			
Weather and Observations			
Estimate Storm Beginning: _____ (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
Observations: [If yes identify location]			
Color <u>slight yellow</u>			
Odors Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Floating Material Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Foreign Matter Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Discolorations Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Turbidity Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Sample Information			
Sampling depth: <u>4" pipe was sucking water - could be up to 6"</u>			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: <u>2.85 m/s = 9.34 ft/sec</u>			
Temperature: <u>9.83 °C</u>			
Dissolved Oxygen: <u>13.63</u>			
pH <u>6.95</u>			
Conductivity: <u>0.058 mS/cm</u>			
Turbidity: <u>39.8 NTU</u>			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken: Yes <input type="checkbox"/> No <input type="checkbox"/>		Photo Reference IDs:	
Observer Information			
Observer Name: <u>Nathan Griffin</u>		Observer Title:	
Signature: <u>[Signature]</u>		Date: <u>2/28/14</u>	

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/28/14 3:00 am Report Date: 2/28

Site Information

Site Name and ID: 30-VAND
 Location:

Weather and Observations

Estimate Storm Beginning: <hr/> (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
---	---	-----------------------------	---------------------------------------

Observations: [If yes identify location]

Color _____
 Odors Yes No
 Floating Material Yes No
 Foreign Matter Yes No
 Discolorations Yes No
 Turbidity Yes No

Sample Information

Sampling depth: Dist to water = 0.7m 115"
 Sample ID _____
 QC Sample Type: _____
 Requested analyses _____
 Sample Type _____

Field Parameters

Velocity/Flow: 0.56 m/s = 1.83 ft/s
 Temperature: 9.6 °C
 Dissolved Oxygen: 17.15 mg/L, 135.7%
 pH: 6.92
 Conductivity: 0.053 mS/cm
 Turbidity: 78.2 NTU

Site Findings

Location:	Water Conditions/Observations

Photos Taken: Yes No Photo Reference IDs: 102-2539

Observer Information

Observer Name: Tony Hancock Observer Title: _____
 Signature: _____ Date: 2/28/14

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 3/28/14 3:30 am		Report Date:	
Site Information			
Site Name and ID: VERSEP 30-VERSEP			
Location:			
Weather and Observations			
Estimate Storm Beginning: _____ (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
Observations: [If yes identify location]			
Color			
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Sample Information			
Sampling depth: 13 ft to water from top of concrete to water			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow: 1 m/s			
Temperature: 9.78°C			
Dissolved Oxygen: 5.0 mg/L 145.9%			
pH: 6.85			
Conductivity: 0.051 mS/cm			
Turbidity: 87.3 NTU			
Site Findings			
Location:		Water Conditions/Observations	
Photos Taken: Yes <input type="checkbox"/> No <input type="checkbox"/>		Photo Reference IDs:	
Observer Information			
Observer Name: Tony Hancock		Observer Title:	
Signature: 		Date: 2-28-14	

Visual Observation Field Log Sheet

Date and Time of Visual Observation: 2/28/14 4:30 AM		Report Date:	
Site Information			
Site Name and ID: 20-SCRG			
Location:			
Weather and Observations			
Estimate Storm Beginning: _____ (date and time)	Estimate Storm Duration: _____ (hours)	Predicted % Chance of Rain:	Rain Gauge Reading: _____ (inches)
Observations: [If yes identify location]			
Color			
Odors	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Floating Material	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Foreign Matter	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Discolorations	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Turbidity	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Sample Information			
Sampling depth:			
Sample ID			
QC Sample Type:			
Requested analyses			
Sample Type			
Field Parameters			
Velocity/Flow:			
Temperature:			
Dissolved Oxygen:			
pH			
Conductivity:			
Turbidity:			
Site Findings			
Location:		Water Conditions/Observations	
		Flow ponded at location of Hobo meter, but that was a result of heavy rainfall and not flow from the lake. NO samples were taken	
Photos Taken:		Yes <input type="checkbox"/>	No <input type="checkbox"/>
		Photo Reference IDs:	
Observer Information			
Observer Name: Tony Hancock		Observer Title:	
Signature: 		Date: 2-28-14	

Machado Lake Nutrient TMDL Year 2

Attachment 2:
Machado Lake Nutrient TMDL
Site Photo's

Q1 Dry Weather Monitoring Event
June 19, 2013

FIELD PHOTOS



10_ACAD (taking samples with auto sampler)



Flow at 10_ACAD (Looking upstream & downstream in manhole)



No flow at 10_EAST (looking upstream)



No flow at 10_EAST (looking downstream)



No flow at 2O_SCBG (looking upstream)



No flow at 2O_SCBG (looking downstream)



Flow at 3I_ASHB (Looking upstream)



Flow at 3I_ASHB (on the left) to 3I_NORMP (main channel)



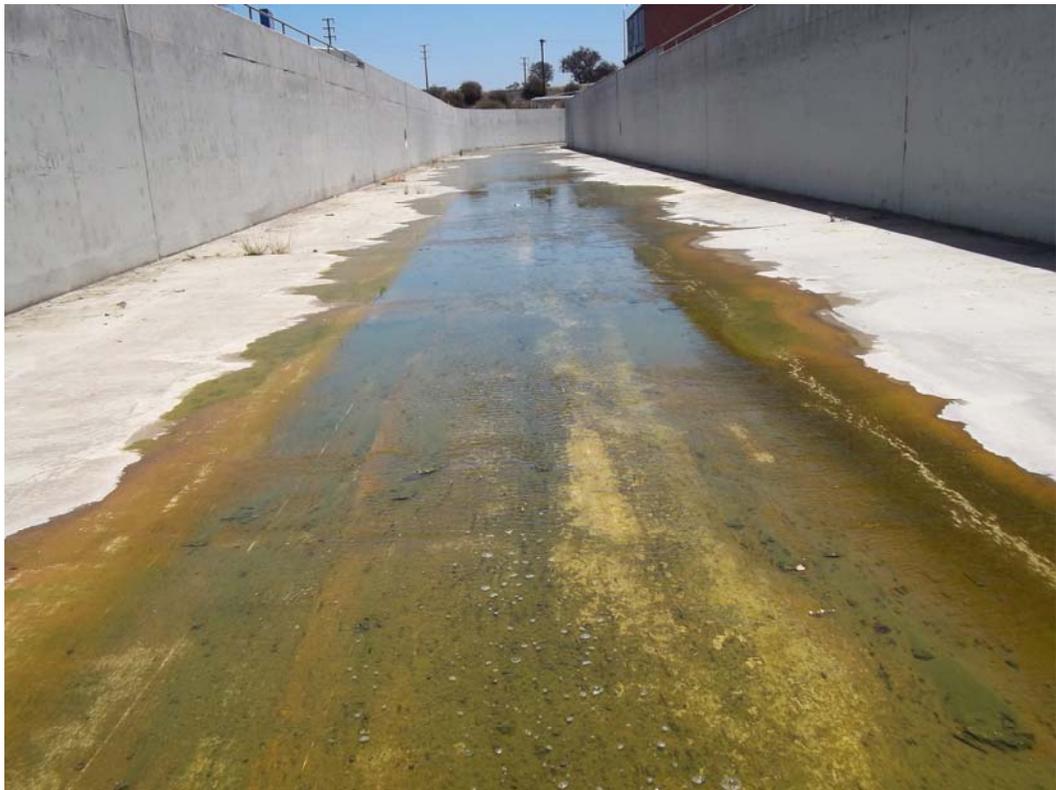
Flow at 3I_NORMP (Looking upstream)



Flow at 3I_NORMP (Taking depth measurement)



Flow at 30_VERSEP (Looking upstream & Taking flow measurement)



Flow at 30_VERSEP (Looking downstream)



Flow at 30_VAND (Looking upstream)

- Attachments: Field Photos
Field Logs (Field Parameters)
Site Observation Sheets
Chain-of-Custody Records

Q2 Dry Weather Monitoring Event
September 19, 2013

Attachments:

Field Photos [Dry Weather Yr.2, 2nd Qtr Tech. Memo.doc](#)

Field Logs (Field Parameters)

FIELD PHOTOS



10_ACAD

Collecting Equipment Blanks with Sigma 900 MAX



10_ACAD
Collecting flow data with a Sigma 900 MAX auto-sampler
(looking upstream & downstream)



10_EAST
No- flow condition at (looking upstream)



10_EAST
No-flow condition at (looking downstream)



20_SCGB
No-flow condition at sampling location (looking upstream)



20_SCGB

No-flow condition at sampling location (looking downstream)



31_ASHB

Taking Flow measurements (looking upstream)



3I_ASHB
Taking Flow measurements (looking downstream)



3I_NORMP
Looking upstream of sampling location



3I_NORMP

Looking downstream from sampling location. The lateral on the left hand-side is the confluence of 3I_ASHB & 3I_NORMP



3O_VERSEP

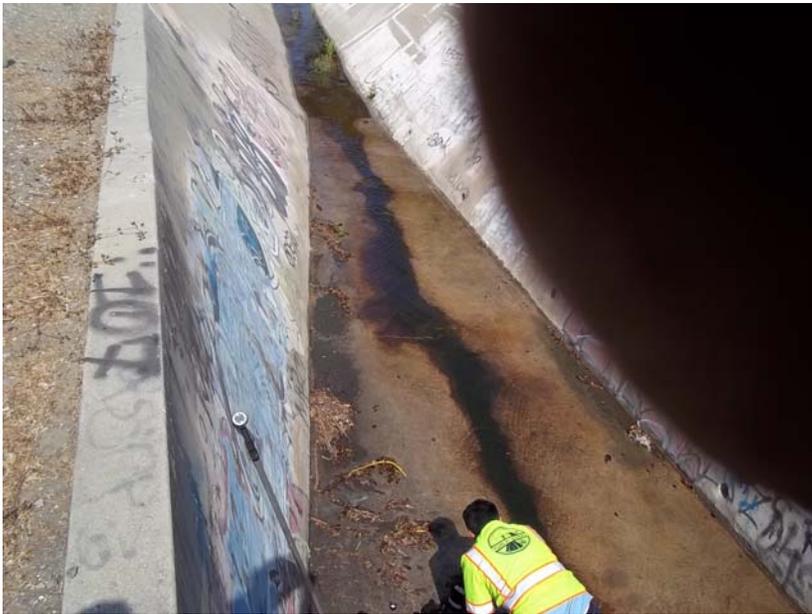
Looking upstream sampling location



30_VERSEP
Downstream of sampling location



30_VAND
Collecting samples (looking upstream)



30_VAND
Collecting samples (looking downstream)

“Unexpected Discharge No. 1” that flowed to 30_VAND
Sampling location



“Unexpected Discharge No.1” gushing into channel (30_VAND)



**Taking flow measurement of "Unexpected Discharge No.1"
at 30_VAND sampling location (after a minor subsidence)**



**Taking water depth of the "Unexpected Discharge No. 1"
(after a minor subsidence)**



**Immediately downstream (south) of 3O_VAND sampling location
("Unexpected discharge No.1" flowing under Freeway Bridge)**

**Further Downstream of 3O_VAND (after Freeway Bridge)
("Unexpected Discharge" No.2)**



**“Unexpected Discharge No.2” further downstream of
30_VAND sampling location (near Freeway abutment)**



**Source of “Unexpected Discharge No.2” above
(from Freeway abutment)**

Q3 Dry Weather Monitoring Event
December 10, 2013

Site ID: 10_ACAD
Date: 12/10/2013
Time: 8:00 AM

Figure 1: Upstream view at 10_ACAD. The pipe on the left is used for the Autosampler suction pipe during wet weather events. Height of water was at 0.5 inches deep



Figure 2: Site view of 10_ACAD



Site ID: 10_EAST
Date: 12/10/2013
Time: 9:08 AM

Figure 3: Downstream view at 10_EAST. There is no flow. HOBO meter case can be seen in the middle of the pipe



Figure 4: Upstream view at 10_EAST. There is no flow.



Site ID: 20_SCBG
Date: 12/10/2013
Time: 9:50 AM

Figure 5: Downstream view at 20_SCBG. There is no flow.



Figure 6: Close up view of HOB0 meter at 20_SCBG. HOB0 meter is located in the middle of the stream bed. This box is covered with a lid and disguised with rocks



Site ID: 3I_NORMP

Date: 12/10/2013

Time: 10:33 AM

Figure 7: Upstream view at 3I_NORMP. Height of water was at 1.25 inches at the deepest part of the channel. Channel had some small pieces of trash.



Figure 8: Downstream view at 3I_NORMP.



Site ID: 3I_ASHB
Date: 12/10/2013
Time: 11:19 AM

Figure 9: Upstream view at 3I_ASHB when the lateral enters into the channel



Figure 10: Close up view of where the lateral enters into the channel. Height of water was at 0.5 inches at the deepest part in the lateral.



Site ID: 30_VAND
Date: 12/10/2013
Time: 12:30 PM

Figure 11: Upstream view at 30_VAND. Height of water was measured at 0.25 inches at the deepest spot in the channel.



Figure 12: Downstream view at 30_VAND. There was quite a bit of algae in the channel



Site ID: 30_VERSEP

Date: 12/10/2013

Time: 1:20 PM

Figure 13: Upstream view at 30_VERSEP. Height of water was measured at 1.125 inches at the deepest spot in the channel.



Figure 14: Downstream view at 30_VERSEP.



Wet Weather Monitoring Event No.1
December 19, 2013

Site ID: 10_ACAD
Date: 12/19/2013
Time: 10:36 AM

Figure 1: 10_ACAD
Manhole



Figure 2: Autosampler in
10_ACAD



Site ID: 10_EAST
Date: 12/19/2013
Time: 1:35 PM

Figure 3: Although difficult to see on this photo, the storm drain pipe was dry and the pipe appeared as if there had been no flow.



Site ID: 20_SCBG
Date: 12/19/2013
Time: 11:21 AM

Figure 4: Downstream view at 20_SCBG with the Autosampler in view. There is no flow.



Figure 5: Upstream view at 20_SCBG



Site ID: 3I_NORMP
Date: 12/19/2013
Time: 11:51 AM

Figure 6: Upstream view at 3I_NORMP. Height of water was about 4-5 inches in the middle of the channel



Figure 7: Downstream view at 3I_NORMP.



Site ID: 3I_ASHB
Date: 12/19/2013
Time: 12:10 PM

Figure 8: Manhole view at 3I_ASHB. Although difficult to see in the photo, there is flow approximately 1 inch deep



Figure 9: A closer up view of the manhole at 3I_ASHB at



Site ID: 30_VAND
Date: 12/19/2013
Time: 12:45 PM

Figure 10: Upstream view at 30_VAND. Height of water was approximately 4 inches at the deepest spot in the channel.



Figure 11: Downstream view at 30_VAND.



Site ID: 30_VERSEP

Date: 12/19/2013

Time: 12:20 PM

Figure 12: Upstream view at 30_VERSEP. Height of water was measured at approximately 3 inches at the side of the channel



Figure 13: Downstream view at 30_VERSEP.



Q4 Dry Weather Monitoring Event
January 16, 2014

Site ID: 10_ACAD
Date: 1/16/2014
Time: 1:19 PM

Figure 1: Upstream view at 10_ACAD. The pipe on the left is used for the Autosampler suction pipe during wet weather events.



Figure 2: Downstream view of 10_ACAD



Site ID: 10_EAST
Date: 1/16/2014
Time: 12:31 PM

Figure 3: Downstream view at 10_EAST. There is no flow. HOBO meter case can be seen in the middle of the pipe



Figure 4: Upstream view at 10_EAST. There is no flow.



Site ID: 20_SCBG

Date: 1/16/2014

Time: 11:56 AM

Figure 5: Upstream view at 20_SCBG. There is no flow.



Figure 6: Close up view of HOBO meter at 20_SCBG. HOBO meter is located in the middle of the stream bed. This box is covered with a lid and disguised with rocks



Site ID: 3I_NORMP

Date: 1/16/2014

Time: 11:01 AM

Figure 7: Upstream view at 3I_NORMP. Heavy moss growing within the channel



Figure 8: Downstream view at 3I_NORMP.



Site ID: 3I_ASHB
Date: 1/16/2014
Time: 10:21 AM

Figure 9: Upstream view at 3I_ASHB when the lateral enters into the channel



Figure 10: Close up view of where the lateral enters into the channel. Height of water was at 0.5 inches at the deepest part in the lateral.



Site ID: 30_VAND

Date: 1/16/2014

Time: 7:57 AM

Figure 11: Upstream view at 30_VAND.

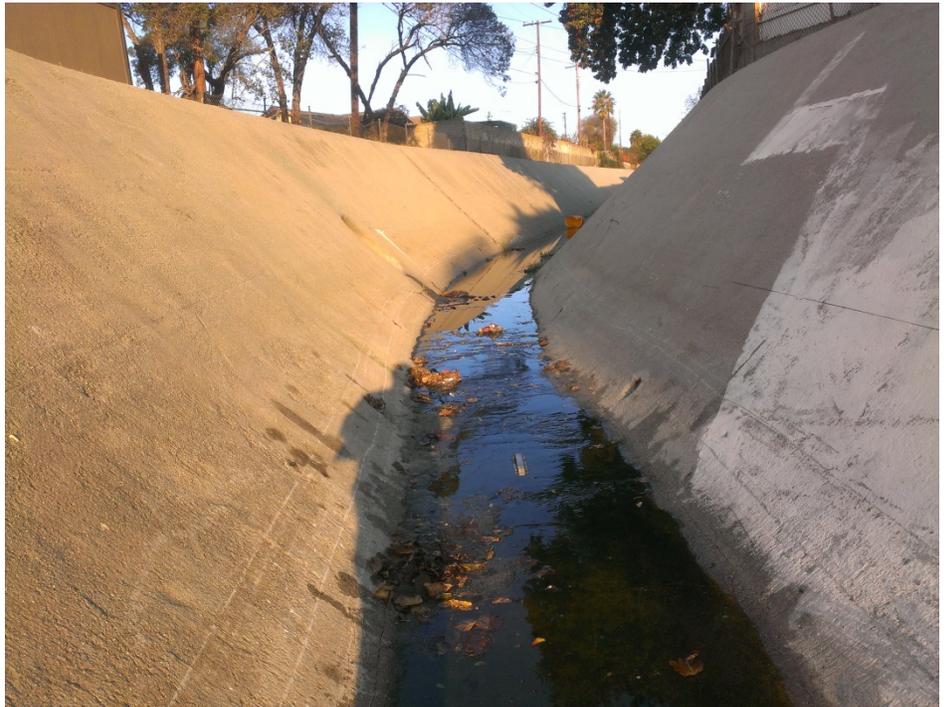


Figure 12: Downstream view at 30_VAND. There was quite a bit of leaves in the channel



Site ID: 30_VERSEP
Date: 1/16/2014
Time: 9:16 AM

Figure 13: Downstream view
at 30_VERSEP



Figure 14: Upstream view at
30_VERSEP.



Wet Weather Monitoring Event No.2
February 2, 2014

Site ID: 10_ACAD
Date: 2/02/2014
Time: 7:48 PM

Figure 1: 10_ACAD flow
looking downstream



Figure 2: Flow in 10_ACAD



Site ID: 10_EAST
Date: 2/02/2014
Time: 8:00 PM

Figure 3: Upstream view of 10_EAST. This is the first time seeing storm flow in this manhole for Year 2



Figure 4: Although difficult to see on this photo, the water was rushing past the HOBO meter and was not deep enough to have the HOBO meter submerged under water



Site ID: 20_SCBG

Date: 2/02/2014

Time: 10:45 PM

Figure 5: Downstream view at 20_SCBG with the Autosampler in view. There was no flow.



Figure 6: Although difficult to see in the photo, the picture shows how the lake still needed to increase by about 6 inches in order to overflow to create flow for 20_SCBG



Site ID: 3I_NORMP
Date: 2/02/2014
Time: 10:10 PM

Figure 7: Upstream view at 3I_NORMP. The scooper is seen at the right hand side of the photo

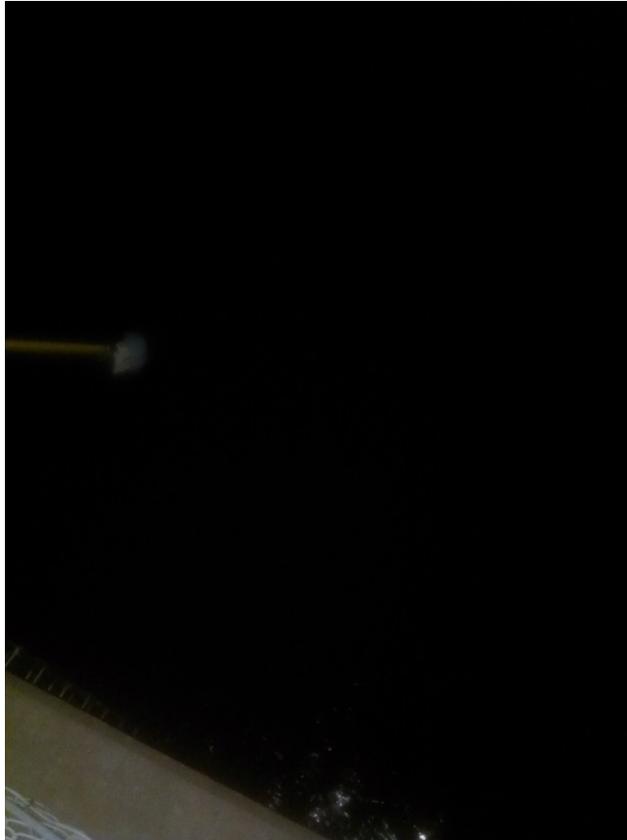


Figure 8: Picture of the water quality at 3I_NORMP



Site ID: 3I_ASHB
Date: 2/02/2014
Time: 9:45 PM

Figure 9: Manhole view at 3I_ASHB. Although difficult to see in the photo, there is flow approximately 2 inch deep



Figure 10: Water quality at 3I_ASHB



Site ID: 30_VAND

Date: 2/02/2014

Time: 9:26 PM

Photo quality was too poor
to display due to poor
lighting

Site ID: 30_VERSEP

Date: 2/02/2014

Time: 8:38 PM

Photo quality was too poor
to display due to poor
lighting

Wet Weather Monitoring Event No.3
February 27, 2014

Site ID: 10_ACAD
Date: 2/27/2014
Time: 12:40 AM

Figure 1: 10_ACAD flow
looking downstream



Figure 2: Flow in 10_ACAD



Site ID: 10_EAST
Date: 2/27/2014
Time: 1:27 AM

Figure 3: Upstream view of
10_EAST.



Site ID: 2O_SCBG

Date: 2/27/2014

Time: 3:20 AM

Figure 4: Downstream view at 2O_SCBG with the Autosampler in view. This picture was taken on a previous event but the sampler was placed in the same spot during this event.



Figure 5: Although difficult to see in the photo, the picture shows the autosampler on the bridge while it is raining.



Site ID: 3I_NORMP

Date: 2/27/2014

Time: 2:34 AM

Figure 6: Upstream view at 3I_NORMP. Too dark to take pictures. The other picture taken at this spot was too dark to see anything



Site ID: 3I_ASHB
Date: 2/27/2014
Time: 2:15 AM

Figure 7: Manhole view at 3I_ASHB. This picture was taken as samples were being drawn out of the manhole for field parameter measurements.



Site ID: 30_VAND
Date: 2/27/2014
Time: 2:00 AM

Figure 8: Downstream view
at 30_VAND. Picture quality
too dark to see anything



Site ID: 30_VERSEP

Date: 2/27/2014

Time: 2:46 AM

Photo quality was too poor
to display due to poor
lighting. Pictures were
completely black

Wet Weather Monitoring Event No.4
February 28, 2014

Site ID: 10_ACAD
Date: 2/28/2014
Time: 2:31 AM

Figure 1: 10_ACAD flow



Figure 2: Flow in 10_ACAD
with a picture of the auto-
sampler



Site ID: 10_EAST
Date: 2/28/2014
Time: 1:04 AM

Figure 3: Maintenance hole
view of 10_EAST.



Site ID: 20_SCBG

Date: 2/28/2014

Time: 4:30 AM

Figure 4: Downstream view at 20_SCBG with the Autosampler in view. This picture was taken on a previous event but the sampler was placed in the same spot during this event.



Figure 5: Although difficult to see in the photo, the picture shows pooling of rainwater near the HOBO meter.



Site ID: 3I_NORMP

Date: 2/28/2014

Time: 1:46 AM

Figure 6: Upstream view at 3I_NORMP. Too dark to take pictures. The other picture taken at this spot was too dark to see anything



Site ID: 3I_ASHB
Date: 2/28/2014
Time: 1:55 AM

Figure 7: Manhole view at 3I_ASHB. This picture was taken as samples were being drawn out of the manhole for field parameter measurements.



Site ID: 30_VAND
Date: 2/28/2014
Time: 3:00 AM

Figure 8: Downstream view
at 30_VAND. Picture quality
too dark to see anything



Site ID: 30_VERSEP

Date: 2/28/2014

Time: 3:30 AM

Figure 9: Photo quality was too poor to display due to poor lighting. Pictures were completely black



Machado Lake Nutrient TMDL Year 2

Attachment 3:
Machado Lake Nutrient TMDL
Lab Reports

Q1 Dry Weather Monitoring Event
June 19, 2013



Kurt E. Floren
Agricultural Commissioner
Director of Weights and Measures

COUNTY OF LOS ANGELES

Department of Agricultural Commissioner/ Weights and Measures

Environmental Toxicology Laboratory
11012 S. Garfield Ave.
South Gate, California 90280
<http://acwm.lacounty.gov>



Richard K. Iizuka
Chief Deputy

CA State DPH Certificate #1430
County Sanitation ID #10240

August 2, 2013

Geoffrey Owu
LA County Dept of Public Works-Watershed
900 South Fremont Avenue
Alhambra, CA 91803-1331

RE: Workorder: E1301575 MachadoLake MultipollutantTMDL

Dear Geoffrey Owu:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, June 19, 2013. Results reported herein conform to the most current ELAP standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me at (562)622-0437.

Sincerely,

Thant Zin Win

Chief

Enclosures



Kurt E. Floren
 Agricultural Commissioner
 Director of Weights and Measures

COUNTY OF LOS ANGELES

**Department of
 Agricultural Commissioner/
 Weights and Measures**

Environmental Toxicology Laboratory
 11012 S. Garfield Ave.
 South Gate, California 90280
<http://acwm.lacounty.gov>



Richard K. Iizuka
 Chief Deputy

SAMPLE SUMMARY

Workorder: E1301575 MachadoLake MultipollutantTMDL

Lab ID	Sample ID	Location	Matrix	Date Collected	Date Received
E1301575001	TMDL004515	1O_ACAD - Academy Dr. at Palos Verdes Dr. (Manhole)	Water	6/19/2013 10:00	6/19/2013 15:40
				Collector: Hisham Eldin	
E1301575002	TMDL004516	3O_VAND - Van Deene Ave. at 228th St. (Open Channel)	Water	6/19/2013 11:15	6/19/2013 15:40
				Collector: Hisham Eldin	
E1301575003	TMDL004517	BLNK_TMDL - Blank Sample TMDL	Water	6/19/2013 11:10	6/19/2013 15:40
				Collector: Hisham Eldin	
E1301575004	TMDL004518	DUP_TMDL - Duplicate Sample TMDL	Water	6/19/2013 10:00	6/19/2013 15:40
				Collector: Hisham Eldin	
E1301575005	TMDL004520	EQ_BLNK_TMDL - Equipment Blank for TMDLs	Water	6/19/2013 10:15	6/19/2013 15:40
				Collector: Hisham Eldin	



Kurt E. Floren
Agricultural Commissioner
Director of Weights and Measures

COUNTY OF LOS ANGELES

Department of Agricultural Commissioner/ Weights and Measures

Environmental Toxicology Laboratory
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South Gate, California 90280
<http://acwm.lacounty.gov>



Richard K. Iizuka
Chief Deputy

ANALYTICAL RESULTS

Workorder: E1301575 MachadoLake MultipollutantTMDL

Lab ID: **E1301575001** **10-ACAD** Date Received: 6/19/2013 Matrix: Water
Sample ID: **TMDL004515** Date Collected: 6/19/2013
System Number: Purpose:
System Name: Sample Type:

Parameters	Results Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY								
Analysis Desc: EPA 300.0		Analytical Method: EPA 300.0						
Nitrate	7.41 mg/L	1.00	0.100	1	6/20/2013 15:30	RZ		
Nitrate-N	1.67 mg/L	0.500	0.0300	1	6/20/2013 15:30	RZ		
Nitrite	ND mg/L	0.100	0.100	1	6/20/2013 15:30	RZ		
Nitrite-N	ND mg/L	0.0300	0.0100	1	6/20/2013 15:30	RZ		
Analysis Desc: SM 2540C		Analytical Method: SM 2540C						
Total Dissolved Solids	1650 mg/L	1.00	1.00	1	6/25/2013 11:55	LS		
Analysis Desc: SM 2540D		Analytical Method: SM 2540D						
Total Suspended Solids	ND mg/L	2.00	1.00	1	6/21/2013 14:56	LS		
Analysis Desc: SM 4500-NH3 C		Preparation Method: SM 4500-NH3 B						
		Analytical Method: SM 4500-NH3 C						
Ammonia	ND mg/L	0.121	0.121	1	7/11/2013 08:30	JK		
Ammonia-N	ND mg/L	0.100	0.100	1	7/11/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C		Preparation Method: SM 4500-NH3 B						
		Analytical Method: SM 4500-NHorg C						
Total Kjeldahl Nitrogen	ND mg/L	0.100	0.100	2	7/11/2013 08:30	JK		
Analysis Desc: SM 4500-P E		Analytical Method: SM 4500-P E						
Orthophosphate	0.137 mg/L	0.03	0.03	1	6/20/2013 15:04	JK		
Total Phosphate	0.176 mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		
WETCHEMISTRY, DISSOLVED								
Analysis Desc: SM 4500-P E, Dissolved		Preparation Method: SM 4500-P B						
		Analytical Method: SM 4500-P E, Dissolved						
Total Dissolved Phosphate	0.144 mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		



Kurt E. Floren
Agricultural Commissioner
Director of Weights and Measures

COUNTY OF LOS ANGELES

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Richard K. Iizuka
Chief Deputy

ANALYTICAL RESULTS

Workorder: E1301575 MachadoLake MultipollutantTMDL

Lab ID: **E1301575002** **30_VAND** Date Received: 6/19/2013 Matrix: Water
Sample ID: **TMDL004516** Date Collected: 6/19/2013 11:15
System Number: Purpose:
System Name: Sample Type:

Parameters	Results	Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY									
Analysis Desc: EPA 300.0 Analytical Method: EPA 300.0									
Nitrate	ND	mg/L	1.00	0.100	1	6/20/2013 16:18	RZ		
Nitrate-N	ND	mg/L	0.500	0.0300	1	6/20/2013 16:18	RZ		
Nitrite	ND	mg/L	0.100	0.100	1	6/20/2013 16:18	RZ		
Nitrite-N	ND	mg/L	0.0300	0.0100	1	6/20/2013 16:18	RZ		
Analysis Desc: SM 2540C Analytical Method: SM 2540C									
Total Dissolved Solids	1320	mg/L	1.00	1.00	1	6/25/2013 11:55	LS		
Analysis Desc: SM 2540D Analytical Method: SM 2540D									
Total Suspended Solids	ND	mg/L	2.00	1.00	1	6/21/2013 14:56	LS		
Analysis Desc: SM 4500-NH3 C Preparation Method: SM 4500-NH3 B									
Analytical Method: SM 4500-NH3 C									
Ammonia	ND	mg/L	0.121	0.121	1	7/11/2013 08:30	JK		
Ammonia-N	ND	mg/L	0.100	0.100	1	7/11/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C Preparation Method: SM 4500-NH3 B									
Analytical Method: SM 4500-NHorg C									
Total Kjeldahl Nitrogen	1.56	mg/L	0.100	0.100	2	7/11/2013 08:30	JK		
Analysis Desc: SM 4500-P E Analytical Method: SM 4500-P E									
Orthophosphate	0.151	mg/L	0.03	0.03	1	6/20/2013 15:04	JK		
Total Phosphate	0.291	mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		
WETCHEMISTRY, DISSOLVED									
Analysis Desc: SM 4500-P E, Dissolved Preparation Method: SM 4500-P B									
Analytical Method: SM 4500-P E, Dissolved									
Total Dissolved Phosphate	0.205	mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		



Kurt E. Floren
Agricultural Commissioner
Director of Weights and Measures

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Richard K. Iizuka
Chief Deputy

ANALYTICAL RESULTS

Workorder: E1301575 MachadoLake MultipollutantTMDL

Lab ID: E1301575003
Sample ID: TMDL004517
System Number:
System Name:

*30-VAND
field
Blank*

Date Received: 6/19/2013
Date Collected: 6/19/2013 11:10
Matrix: Water
Purpose:
Sample Type:

Parameters	Results Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY								
Analysis Desc: EPA 300.0	Analytical Method: EPA 300.0							
Nitrate	ND mg/L	1.00	0.100	1	6/20/2013 13:32	RZ		
Nitrate-N	ND mg/L	0.500	0.0300	1	6/20/2013 13:32	RZ		
Nitrite	ND mg/L	0.100	0.100	1	6/20/2013 13:32	RZ		
Nitrite-N	ND mg/L	0.0300	0.0100	1	6/20/2013 13:32	RZ		
Analysis Desc: SM 2540C	Analytical Method: SM 2540C							
Total Dissolved Solids	ND mg/L	1.00	1.00	1	6/25/2013 11:55	LS		
Analysis Desc: SM 2540D	Analytical Method: SM 2540D							
Total Suspended Solids	ND mg/L	2.00	1.00	1	6/21/2013 14:56	LS		
Analysis Desc: SM 4500-NH3 C	Preparation Method: SM 4500-NH3 B							
	Analytical Method: SM 4500-NH3 C							
Ammonia	ND mg/L	0.121	0.121	1	7/25/2013 08:30	JK		
Ammonia-N	ND mg/L	0.100	0.100	1	7/25/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C	Preparation Method: SM 4500-NH3 B							
	Analytical Method: SM 4500-NHorg C							
Total Kjeldahl Nitrogen	0.240 mg/L	0.100	0.100	2	7/11/2013 08:30	JK		
Analysis Desc: SM 4500-P E	Analytical Method: SM 4500-P E							
Orthophosphate	ND mg/L	0.03	0.03	1	6/20/2013 15:04	JK		
Total Phosphate	ND mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		
WETCHEMISTRY, DISSOLVED								
Analysis Desc: SM 4500-P E, Dissolved	Preparation Method: SM 4500-P B							
	Analytical Method: SM 4500-P E, Dissolved							
Total Dissolved Phosphate	ND mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		



Kurt E. Floren
Agricultural Commissioner
Director of Weights and Measures

COUNTY OF LOS ANGELES

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Richard K. Iizuka
Chief Deputy

ANALYTICAL RESULTS

Workorder: E1301575 MachadoLake MultipollutantTMDL

Lab ID: E1301575004	<i>Duplicate Sample</i> 10-ACAD	Date Received: 6/19/2013	Matrix: Water
Sample ID: TMDL004518		Date Collected: 6/19/2013	
System Number:		Purpose:	
System Name:		Sample Type:	

Parameters	Results	Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY									
Analysis Desc: EPA 300.0		Analytical Method: EPA 300.0							
Nitrate	7.45	mg/L	1.00	0.100	1	6/20/2013 15:54	RZ		
Nitrate-N	1.68	mg/L	0.500	0.0300	1	6/20/2013 15:54	RZ		
Nitrite	ND	mg/L	0.100	0.100	1	6/20/2013 15:54	RZ		
Nitrite-N	ND	mg/L	0.0300	0.0100	1	6/20/2013 15:54	RZ		
Analysis Desc: SM 2540C		Analytical Method: SM 2540C							
Total Dissolved Solids	1660	mg/L	1.00	1.00	1	6/25/2013 11:55	LS		
Analysis Desc: SM 2540D		Analytical Method: SM 2540D							
Total Suspended Solids	ND	mg/L	2.00	1.00	1	6/21/2013 14:56	LS		
Analysis Desc: SM 4500-NH3 C		Preparation Method: SM 4500-NH3 B							
		Analytical Method: SM 4500-NH3 C							
Ammonia	0.121	mg/L	0.121	0.121	1	7/25/2013 08:30	JK		
Ammonia-N	0.100	mg/L	0.100	0.100	1	7/25/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C		Preparation Method: SM 4500-NH3 B							
		Analytical Method: SM 4500-NHorg C							
Total Kjeldahl Nitrogen	0.160	mg/L	0.100	0.100	2	7/11/2013 08:30	JK		
Analysis Desc: SM 4500-P E		Analytical Method: SM 4500-P E							
Orthophosphate	0.133	mg/L	0.03	0.03	1	6/20/2013 15:04	JK		
Total Phosphate	0.152	mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		
WETCHEMISTRY, DISSOLVED									
Analysis Desc: SM 4500-P E, Dissolved		Preparation Method: SM 4500-P B							
		Analytical Method: SM 4500-P E, Dissolved							
Total Dissolved Phosphate	0.150	mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		



Kurt E. Floren
Agricultural Commissioner
Director of Weights and Measures

COUNTY OF LOS ANGELES

Department of Agricultural Commissioner/ Weights and Measures

Environmental Toxicology Laboratory
11012 S. Garfield Ave.
South Gate, California 90280
<http://acwm.lacounty.gov>



Richard K. Iizuka
Chief Deputy

ANALYTICAL RESULTS

Workorder: E1301575 MachadoLake MultipollutantTMDL

Lab ID: E1301575005	<i>Equipment Blank</i>	Date Received: 6/19/2013	Matrix: Water
Sample ID: TMDL004520	<i>10-ACAD</i>	Date Collected: 6/19/2013	
System Number:		Purpose:	
System Name:		Sample Type:	

Parameters	Results Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY								
Analysis Desc: EPA 300.0	Analytical Method: EPA 300.0							
Nitrate	ND mg/L	1.00	0.100	1	6/20/2013 13:55	RZ		
Nitrate-N	ND mg/L	0.500	0.0300	1	6/20/2013 13:55	RZ		
Nitrite	ND mg/L	0.100	0.100	1	6/20/2013 13:55	RZ		
Nitrite-N	ND mg/L	0.0300	0.0100	1	6/20/2013 13:55	RZ		
Analysis Desc: SM 2540C	Analytical Method: SM 2540C							
Total Dissolved Solids	ND mg/L	1.00	1.00	1	6/25/2013 11:55	LS		
Analysis Desc: SM 2540D	Analytical Method: SM 2540D							
Total Suspended Solids	ND mg/L	2.00	1.00	1	6/21/2013 14:56	LS		
Analysis Desc: SM 4500-NH3 C	Preparation Method: SM 4500-NH3 B							
	Analytical Method: SM 4500-NH3 C							
Ammonia	ND mg/L	0.121	0.121	1	7/25/2013 08:30	JK		
Ammonia-N	ND mg/L	0.100	0.100	1	7/25/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C	Preparation Method: SM 4500-NH3 B							
	Analytical Method: SM 4500-NHorg C							
Total Kjeldahl Nitrogen	0.280 mg/L	0.100	0.100	1	7/25/2013 08:30	JK		
Analysis Desc: SM 4500-P E	Analytical Method: SM 4500-P E							
Orthophosphate	ND mg/L	0.03	0.03	1	6/20/2013 15:04	JK		
Total Phosphate	ND mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		
WETCHEMISTRY, DISSOLVED								
Analysis Desc: SM 4500-P E, Dissolved	Preparation Method: SM 4500-P B							
	Analytical Method: SM 4500-P E, Dissolved							
Total Dissolved Phosphate	ND mg/L	0.0500	0.0500	1	6/20/2013 10:30	JK		

COUNTY OF LOS ANGELES
 AGRICULTURE COMMISSIONER/WEIGHTS AND MEASURES

ENVIRONMENTAL TOXICOLOGY LABORATORY
 11012B GARFIELD AVENUE, SOUTH GATE CA 90208
 PHONE NO. (562) 622-0437 FAX (562) 622-0440

PROJECT NAME		Machado Lake Multipollutant TMDL		CHAIN-OF-CUSTODY RECORD		Page 1 of 3		
COMPANY NAME		LACDPW				Machado Lake TMDL Dry Weather Date: 6/19/2013		
REFERENCE ADDRESS		Watershed Mgmt. 900 S. Fremont Avenue Alhambra, CA 91803-1331						
FSID	DATE	TIME	SITE NO.					SITE NAME
TMDL004515	6/19/13	10:00	10_ACAD	Academy Dr. at Palos Verdes Dr. E1301575 001	CUST	2	in date - temp, DO, Cond, Turb, pH,	7
TMDL004516	6/19/13	11:15	30_VAND	Van Deene Ave. at 228th St. 002	CUST	2	" "	7
TMDL004517	6/19/13	11:10	BLNK_TM DL	Blank Sample TMDL 003	CUST	2	" "	7
TMDL004518	6/19/13	10:00	DUP_TM DL	Duplicate Sample TMDL 004	CUST	2	" "	7

RECEIVED
 JUN 19 2013
 ENV TOX LAB

[] HOLD ANALYSIS - additional composite samples are possible for these FSID numbers.
 [x] FINAL SAMPLES - begin analysis.

1 RELINQUISHED BY		DATE	3 RELINQUISHED BY		DATE	(8) TOTAL NUMBER OF CONTAINERS
SIGNATURE		6/19	SIGNATURE		6-19-13	
PRINTED NAME		TIME	PRINTED NAME		TIME	SAMPLE CONDITIONS RECEIVED ON ICE YES/NO SEALED YES/NO
HISHAM LOFORI		13:00	KAMRUZ		15:20	
COMPANY NAME		DATE	COMPANY NAME		DATE	SPECIAL SHIPPING/HANDLING OR STORAGE REQUIREMENTS:
LACDPW, Watershed Mgmt.		6-19-13	Env. Tox. Lab		6/19/13	
2 RECEIVED BY		DATE	4 RECEIVED BY		DATE	
SIGNATURE		6-19-13	SIGNATURE		6/19/13	
PRINTED NAME		TIME	PRINTED NAME		TIME	
KAMRUZ		13:05	William Chen		15:46	
COMPANY NAME			COMPANY NAME			
Env. Tox. Lab			ETL			

COMMENTS:

**COUNTY OF LOS ANGELES
AGRICULTURE COMMISSIONER/WEIGHTS AND MEASURES**

ENVIRONMENTAL TOXICOLOGY LABORATORY
11012B GARFIELD AVENUE, SOUTH GATE CA 90208
PHONE NO. (562) 940-6778 FAX (562) 940-6785

ATTACHMENT

Custom Analysis Groups	
FSID	Constituent
TMDL004515	Dissolved Phosphorus
	Nitrate-N
	Nitrite-N
	Nitrogen- Ammonia (as N)
	Nitrogen- Kjeldahl- Total
	Total Dissolved Solids
	Total Phosphate
	Total Suspended Solids
	ortho-phosphate
TMDL004516	Dissolved Phosphorus
	Nitrate-N
	Nitrite-N
	Nitrogen- Ammonia (as N)
	Nitrogen- Kjeldahl- Total
	Total Dissolved Solids
	Total Phosphate
	Total Suspended Solids
	ortho-phosphate
TMDL004517	Dissolved Phosphorus
	Nitrate-N
	Nitrite-N
	Nitrogen- Ammonia (as N)
	Nitrogen- Kjeldahl- Total
	Total Dissolved Solids
	Total Phosphate
	Total Suspended Solids
	ortho-phosphate
TMDL004518	Dissolved Phosphorus
	Nitrate-N
	Nitrite-N
	Nitrogen- Ammonia (as N)
	Nitrogen- Kjeldahl- Total
	Total Dissolved Solids
	Total Phosphate

COUNTY OF LOS ANGELES
 AGRICULTURE COMMISSIONER/WEIGHTS AND MEASURES

ENVIRONMENTAL TOXICOLOGY LABORATORY
 11012B GARFIELD AVENUE, SOUTH GATE CA 90208
 PHONE NO. (562) 622-0437 FAX (562) 622-0440

PROJECT NAME		Machado Lake Multipollutant TMDL		CHAIN-OF-CUSTODY RECORD		Page 1 of 2 <i>Machado Lake</i> <i>TMDL Dry Weather</i> Date: <i>6/19/2013</i>		
COMPANY NAME		LACDPW						
REFERENCE ADDRESS		Watershed Mgmt. 900 S. Fremont Avenue Alhambra, CA 91803-1331						
FSID	DATE	TIME	SITE NO.	SITE NAME	GROUP	#BOTTLES	COMMENTS	TEMP
TMDL004520	<i>6/19/13</i>	<i>10:15</i>	EQ_BLNK _TMDL	Equipment Blank for TMDLs <i>E 1301575 005</i>	CUST	<i>2</i>		<i>9</i>

RECEIVED
JUN 19 2013
ENV TOX LAB

[] HOLD ANALYSIS - additional composite samples are possible for these FSID numbers.
 FINAL SAMPLES - begin analysis.

1 RELINQUISHED BY		DATE	3 RELINQUISHED BY		DATE	2 TOTAL NUMBER OF CONTAINERS
SIGNATURE <i>[Signature]</i>		<i>6/19</i>	SIGNATURE <i>K2</i>		<i>6-19-13</i>	
PRINTED NAME <i>HISHAM /ofori</i>		TIME <i>13:00</i>	PRINTED NAME <i>KAMRUZ</i>		TIME <i>15:20</i>	SAMPLE CONDITIONS RECEIVED ON ICE <input checked="" type="checkbox"/> YES / NO SEALED <input checked="" type="checkbox"/> YES / NO
COMPANY NAME LACDPW, Watershed Mgmt.			COMPANY NAME <i>Env. Tox Lab</i>			
2 RECEIVED BY		DATE	4 RECEIVED BY		DATE	SPECIAL SHIPPING/HANDLING OR STORAGE REQUIREMENTS:
SIGNATURE <i>K2</i>		<i>6-19-13</i>	SIGNATURE <i>[Signature]</i>		<i>6/19/13</i>	
PRINTED NAME <i>KAMRUZ</i>		TIME <i>13:05</i>	PRINTED NAME <i>William Uon</i>		TIME <i>15:00</i>	
COMPANY NAME <i>Env. Tox Lab</i>			COMPANY NAME <i>ETL</i>			

COMMENTS:

**COUNTY OF LOS ANGELES
AGRICULTURE COMMISSIONER/WEIGHTS AND MEASURES**

ENVIRONMENTAL TOXICOLOGY LABORATORY
11012B GARFIELD AVENUE, SOUTH GATE CA 90208
PHONE NO. (562) 940-6778 FAX (562) 940-6785

ATTACHMENT

Page 2 of 2

Custom Analysis Groups	
FSID	Constituent
TMDL004520	Dissolved Phosphorus
	Nitrate-N
	Nitrite-N
	Nitrogen- Ammonia (as N)
	Nitrogen- Kjeldahl- Total
	Total Dissolved Solids
	Total Phosphate
	Total Suspended Solids
	ortho-phosphate

Q2 Dry Weather Monitoring Event
September 19, 2013



Kurt E. Floren
Agricultural Commissioner
Director of Weights and Measures

COUNTY OF LOS ANGELES

Department of Agricultural Commissioner/ Weights and Measures

Environmental Toxicology Laboratory
11012 S. Garfield Ave.
South Gate, California 90280
<http://acwm.lacounty.gov>



Richard K. Iizuka
Chief Deputy

CA State DPH Certificate #1430
County Sanitation ID #10240

October 18, 2013

Geoffrey Owu
LA County Dept of Public Works-Watershed
900 S Fremont Ave. 6th Floor
Alhambra, CA 91803-1331

RE: Workorder: E1302500 MachadoLake MultipollutantTMDL

Dear Geoffrey Owu:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, September 19, 2013. Results reported herein conform to the most current ELAP standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me at (562)622-0437.

Sincerely,

Thant Zin Win

Chief

Enclosures

Note: All results have no blank correction unless otherwise specified

Report ID: 18069 - 546655

Page 1 of 10

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To Enrich Lives Through Effective and Caring Service**

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Kurt E. Floren
Agricultural Commissioner
Director of Weights and Measures

COUNTY OF LOS ANGELES

Department of Agricultural Commissioner/ Weights and Measures

Environmental Toxicology Laboratory
11012 S. Garfield Ave.
South Gate, California 90280
<http://acwm.lacounty.gov>



Richard K. Iizuka
Chief Deputy

SAMPLE SUMMARY

Workorder: E1302500 MachadoLake MultipollutantTMDL

Lab ID	Sample ID	Location	Matrix	Date Collected	Date Received
E130250001	TMDL004545	1O_ACAD - Academy Dr. at Palos Verdes Dr. (Manhole)	Water	9/19/2013 09:35	9/19/2013 15:05
				Collector: Hisham Eldin	
E130250002	TMDL004546	3O_VAND - Van Deene Ave. at 228th St. (Open Channel)	Water	9/19/2013 10:55	9/19/2013 15:05
				Collector: Hisham Eldin	
E130250003	TMDL004547 ^{3O_VAND}	BLNK_TMDL - Blank Sample TMDL	Water	9/19/2013 10:55	9/19/2013 15:05
				Collector: Hisham Eldin	
E130250004	TMDL004548 ^{3O_VAND}	DUP_TMDL - Duplicate Sample TMDL	Water	9/19/2013 10:55	9/19/2013 15:05
				Collector: Hisham Eldin	
E130250005	TMDL004549 ^{1O_ACAD}	EQ_BLNK_TMDL - Equipment Blank for TMDLs	Water	9/19/2013 09:35	9/19/2013 15:05
				Collector: Hisham Eldin	
E130250006	TMDL004550	3O_VAND_MS1 - Matrix Spike for 3O_VAND	Water	9/19/2013 10:55	9/19/2013 15:05
				Collector: Hisham Eldin	



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Chief Deputy

ANALYTICAL RESULTS

Workorder: E1302500 MachadoLake MultipollutantTMDL

Lab ID: **E1302500001** Date Received: 9/19/2013 15:05 Matrix: Water
Sample ID: **TMDL004545** **10-ACAD** Date Collected: 9/19/2013 09:35
System Number: Purpose:
System Name: Sample Type:

Parameters	Results Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY								
Analysis Desc: EPA 300.0	Analytical Method: EPA 300.0							
Nitrate	6.66 mg/L	1.00	0.0443	1	9/20/2013 15:28	RZ		
Nitrate-N	1.50 mg/L	0.500	0.0100	1	9/20/2013 15:28	RZ		
Nitrite	ND mg/L	0.165	0.0329	1	9/20/2013 15:28	RZ		
Nitrite-N	ND mg/L	0.0500	0.0100	1	9/20/2013 15:28	RZ		
Analysis Desc: SM 2540C	Analytical Method: SM 2540C							
Total Dissolved Solids	1430 mg/L	10.0	1.00	1	9/25/2013 15:50	LS		
Analysis Desc: SM 2540D	Analytical Method: SM 2540D							
Total Suspended Solids	7.00 mg/L	2.00	0.500	1	9/26/2013 10:26	LS		
Analysis Desc: SM 4500-NH3 C	Preparation Method: SM 4500-NH3 B							
	Analytical Method: SM 4500-NH3 C							
Ammonia	0.387 mg/L	0.121	0.121	1	10/3/2013 08:30	JK		
Ammonia-N	0.320 mg/L	0.100	0.100	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C	Preparation Method: SM 4500-NH3 B							
	Analytical Method: SM 4500-NHorg C							
Total Kjeldahl Nitrogen	1.12 mg/L	0.500	0.455	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-P E	Analytical Method: SM 4500-P E							
Orthophosphate	0.3 mg/L	0.01	0.001	1	10/9/2013 10:00	JK		
Total Phosphate	0.450 mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		
WETCHEMISTRY, DISSOLVED								
Analysis Desc: SM 4500-P E, Dissolved	Preparation Method: SM 4500-P B							
	Analytical Method: SM 4500-P E, Dissolved							
Total Dissolved Phosphate	0.400 mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		



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Chief Deputy

ANALYTICAL RESULTS

Workorder: E1302500 MachadoLake MultipollutantTMDL

Lab ID: **E1302500002**
Sample ID: **TMDL004546**
System Number:
System Name:

30-VAND

Date Received: 9/19/2013 15:05 Matrix: Water
Date Collected: 9/19/2013 10:55
Purpose:
Sample Type:

Parameters	Results Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY								
Analysis Desc: EPA 300.0	Analytical Method: EPA 300.0							
Nitrate	1.47 mg/L	1.00	0.0443	1	9/20/2013 15:52	RZ		
Nitrate-N	0.331J mg/L	0.500	0.0100	1	9/20/2013 15:52	RZ		
Nitrite	ND mg/L	0.165	0.0329	1	9/20/2013 15:52	RZ		
Nitrite-N	ND mg/L	0.0500	0.0100	1	9/20/2013 15:52	RZ		
Analysis Desc: SM 2540C	Analytical Method: SM 2540C							
Total Dissolved Solids	634 mg/L	10.0	1.00	1	9/25/2013 15:50	LS		
Analysis Desc: SM 2540D	Analytical Method: SM 2540D							
Total Suspended Solids	53.0 mg/L	2.00	0.500	1	9/26/2013 10:26	LS		
Analysis Desc: SM 4500-NH3 C	Preparation Method: SM 4500-NH3 B Analytical Method: SM 4500-NH3 C							
Ammonia	0.460 mg/L	0.121	0.121	1	10/3/2013 08:30	JK		
Ammonia-N	0.380 mg/L	0.100	0.100	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C	Preparation Method: SM 4500-NH3 B Analytical Method: SM 4500-NHorg C							
Total Kjeldahl Nitrogen	1.64 mg/L	0.500	0.455	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-P E	Analytical Method: SM 4500-P E							
Orthophosphate	0.07 mg/L	0.01	0.001	1	10/9/2013 10:00	JK		
Total Phosphate	0.220 mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		
WETCHEMISTRY, DISSOLVED								
Analysis Desc: SM 4500-P E, Dissolved	Preparation Method: SM 4500-P B Analytical Method: SM 4500-P E, Dissolved							
Total Dissolved Phosphate	0.0800 mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		



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ANALYTICAL RESULTS

Workorder: E1302500 MachadoLake MultipollutantTMDL

Lab ID: E1302500003	Date Received: 9/19/2013 15:05	Matrix: Water
Sample ID: TMDL004547	Date Collected: 9/19/2013 10:55	
System Number:	Purpose:	
System Name: <i>Field Sample Blank</i>	Sample Type:	

Parameters	Results	Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY									
Analysis Desc: EPA 300.0 Analytical Method: EPA 300.0									
Nitrate	ND	mg/L	1.00	0.0443	1	9/21/2013 10:31	RZ		
Nitrate-N	ND	mg/L	0.500	0.0100	1	9/21/2013 10:31	RZ		
Nitrite	ND	mg/L	0.165	0.0329	1	9/21/2013 10:31	RZ		
Nitrite-N	ND	mg/L	0.0500	0.0100	1	9/21/2013 10:31	RZ		
Analysis Desc: SM 2540C Analytical Method: SM 2540C									
Total Dissolved Solids	ND	mg/L	10.0	1.00	1	9/25/2013 15:50	LS		
Analysis Desc: SM 2540D Analytical Method: SM 2540D									
Total Suspended Solids	ND	mg/L	2.00	0.500	1	9/26/2013 10:26	LS		
Analysis Desc: SM 4500-NH3 C Preparation Method: SM 4500-NH3 B Analytical Method: SM 4500-NH3 C									
Ammonia	ND	mg/L	0.121	0.121	1	10/3/2013 08:30	JK		
Ammonia-N	ND	mg/L	0.100	0.100	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C Preparation Method: SM 4500-NH3 B Analytical Method: SM 4500-NHorg C									
Total Kjeldahl Nitrogen	ND	mg/L	0.500	0.455	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-P E Analytical Method: SM 4500-P E									
Orthophosphate	ND	mg/L	0.01	0.001	1	10/9/2013 10:00	JK		
Total Phosphate	ND	mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		
WETCHEMISTRY, DISSOLVED									
Analysis Desc: SM 4500-P E, Dissolved Preparation Method: SM 4500-P B Analytical Method: SM 4500-P E, Dissolved									
Total Dissolved Phosphate	ND	mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		

Report ID: 18069 - 546655

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Richard K. Iizuka
Chief Deputy

ANALYTICAL RESULTS

Workorder: E1302500 MachadoLake MultipollutantTMDL

Lab ID: **E1302500004** Date Received: 9/19/2013 15:05 Matrix: Water
 Sample ID: **TMDL004548** Date Collected: 9/19/2013 10:55
 System Number: Purpose:
 System Name: Sample Type:

Sample Duplicate 30-VAND

Parameters	Results	Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY									
Analysis Desc: EPA 300.0 Analytical Method: EPA 300.0									
Nitrate	1.42	mg/L	1.00	0.0443	1	9/21/2013 10:07	RZ		
Nitrate-N	0.320J	mg/L	0.500	0.0100	1	9/21/2013 10:07	RZ		
Nitrite	ND	mg/L	0.165	0.0329	1	9/21/2013 10:07	RZ		
Nitrite-N	ND	mg/L	0.0500	0.0100	1	9/21/2013 10:07	RZ		
Analysis Desc: SM 2540C Analytical Method: SM 2540C									
Total Dissolved Solids	640	mg/L	10.0	1.00	1	9/25/2013 15:50	LS		
Analysis Desc: SM 2540D Analytical Method: SM 2540D									
Total Suspended Solids	18.0	mg/L	2.00	0.500	1	9/26/2013 10:26	LS		
Analysis Desc: SM 4500-NH3 C Preparation Method: SM 4500-NH3 B Analytical Method: SM 4500-NH3 C									
Ammonia	0.508	mg/L	0.121	0.121	1	10/3/2013 08:30	JK		
Ammonia-N	0.420	mg/L	0.100	0.100	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C Preparation Method: SM 4500-NH3 B Analytical Method: SM 4500-NHorg C									
Total Kjeldahl Nitrogen	1.32	mg/L	0.500	0.455	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-P E Analytical Method: SM 4500-P E									
Orthophosphate	0.07	mg/L	0.01	0.001	1	10/9/2013 10:00	JK		
Total Phosphate	0.160	mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		
WETCHEMISTRY, DISSOLVED									
Analysis Desc: SM 4500-P E, Dissolved Preparation Method: SM 4500-P B Analytical Method: SM 4500-P E, Dissolved									
Total Dissolved Phosphate	0.100	mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		

Report ID: 18069 - 546655

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Richard K. Iizuka
Chief Deputy

ANALYTICAL RESULTS

Workorder: E1302500 MachadoLake MultipollutantTMDL

Lab ID: **E1302500005** Date Received: 9/19/2013 15:05 Matrix: Water
 Sample ID: **TMDL004549** Date Collected: 9/19/2013 09:35
 System Number: Purpose:
 System Name: Sample Type:

EQ Blank
10 ACAD

Parameters	Results Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY								
Analysis Desc: EPA 300.0		Analytical Method: EPA 300.0						
Nitrate	ND mg/L	1.00	0.0443	1	9/20/2013 17:03	RZ		
Nitrate-N	ND mg/L	0.500	0.0100	1	9/20/2013 17:03	RZ		
Nitrite	ND mg/L	0.165	0.0329	1	9/20/2013 17:03	RZ		
Nitrite-N	ND mg/L	0.0500	0.0100	1	9/20/2013 17:03	RZ		
Analysis Desc: SM 2540C		Analytical Method: SM 2540C						
Total Dissolved Solids	20.0 mg/L	10.0	1.00	1	9/25/2013 15:50	LS		
Analysis Desc: SM 2540D		Analytical Method: SM 2540D						
Total Suspended Solids	ND mg/L	2.00	0.500	1	9/26/2013 10:26	LS		
Analysis Desc: SM 4500-NH3 C		Preparation Method: SM 4500-NH3 B						
		Analytical Method: SM 4500-NH3 C						
Ammonia	ND mg/L	0.121	0.121	1	10/3/2013 08:30	JK		
Ammonia-N	ND mg/L	0.100	0.100	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C		Preparation Method: SM 4500-NH3 B						
		Analytical Method: SM 4500-NHorg C						
Total Kjeldahl Nitrogen	0.800 mg/L	0.500	0.455	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-P E		Analytical Method: SM 4500-P E						
Orthophosphate	ND mg/L	0.01	0.001	1	10/9/2013 10:00	JK		
Total Phosphate	ND mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		
Analysis Desc: SM 4500-P E, Dissolved		Preparation Method: SM 4500-P B						
		Analytical Method: SM 4500-P E, Dissolved						
Total Dissolved Phosphate	ND mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		



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Chief Deputy

ANALYTICAL RESULTS

Workorder: E1302500 MachadoLake MultipollutantTMDL

Lab ID: **E1302500006** *30 VAND* Date Received: 9/19/2013 15:05 Matrix: Water
 Sample ID: **TMDL004550** Date Collected: 9/19/2013 10:55
 System Number: *Matrix spike* Purpose:
 System Name: Sample Type:

Parameters	Results Units	Report Limit	MDL	DF	Analyzed	By	Qual	MCL
WETCHEMISTRY								
Analysis Desc: EPA 300.0	Analytical Method: EPA 300.0							
Nitrate	1.30 mg/L	1.00	0.0443	1	9/20/2013 18:14	RZ		
Nitrate-N	0.293J mg/L	0.500	0.0100	1	9/20/2013 18:14	RZ		
Nitrite	0.0360J mg/L	0.165	0.0329	1	9/20/2013 18:14	RZ		
Nitrite-N	0.0109J mg/L	0.0500	0.0100	1	9/20/2013 18:14	RZ		
Analysis Desc: SM 2540C	Analytical Method: SM 2540C							
Total Dissolved Solids	630 mg/L	10.0	1.00	1	9/25/2013 15:50	LS		
Analysis Desc: SM 2540D	Analytical Method: SM 2540D							
Total Suspended Solids	20.0 mg/L	2.00	0.500	1	9/26/2013 10:26	LS		
Analysis Desc: SM 4500-NH3 C	Preparation Method: SM 4500-NH3 B							
	Analytical Method: SM 4500-NH3 C							
Ammonia	0.908 mg/L	0.121	0.121	1	10/3/2013 08:30	JK		
Ammonia-N	0.750 mg/L	0.100	0.100	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-NHorg C	Preparation Method: SM 4500-NH3 B							
	Analytical Method: SM 4500-NHorg C							
Total Kjeldahl Nitrogen	2.40 mg/L	0.500	0.455	1	10/3/2013 08:30	JK		
Analysis Desc: SM 4500-P E	Analytical Method: SM 4500-P E							
Orthophosphate	0.07 mg/L	0.01	0.001	1	10/9/2013 10:00	JK		
Total Phosphate	0.140 mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		
WETCHEMISTRY, DISSOLVED								
Analysis Desc: SM 4500-P E, Dissolved	Preparation Method: SM 4500-P B							
	Analytical Method: SM 4500-P E, Dissolved							
Total Dissolved Phosphate	0.0900 mg/L	0.100	0.0200	1	10/1/2013 09:30	JK		

COUNTY OF LOS ANGELES
 AGRICULTURE COMMISSIONER/WEIGHTS AND MEASURES

ENVIRONMENTAL TOXICOLOGY LABORATORY
 11012B GARFIELD AVENUE, SOUTH GATE CA 90208
 PHONE NO. (562) 622-0437 FAX (562) 622-0440

PROJECT NAME		Machado Lake Multipollutant TMDL		CHAIN-OF-CUSTODY RECORD		Date: <u>9/19/2013</u>		
COMPANY NAME		LACDPW						
REFERENCE ADDRESS		Watershed Mgmt. 900 S. Fremont Avenue Alhambra, CA 91803-1331						
ADDRESS								
FSID	DATE	TIME	SITE NO.	SITE NAME	GROUP	#BOTTLES	COMMENTS	TEMP
TMDL004545	9/19/13	9:35am	10_ACAD	Academy Dr. at Palos Verdes Dr.	CUST	2	E1302500 001	3.55
TMDL004546	✓	10:55am	30_VAND	Van Deene Ave. at 228th St.	CUST	2	002	
TMDL004547	✓	10:55am	BLNK_TM DL	Blank Sample TMDL	CUST	2	003	
TMDL004548	✓	10:55am	DUP_TM DL	Duplicate Sample TMDL	CUST	2	004	
TMDL004549	✓	9:35am	EQ_BLNK _TMDL	Equipment Blank for TMDLs	CUST	2	005	
TMDL004550	✓	10:55am	30_VAND _MS1	Matrix Spike for 30_VAND	CUST	2	006	↓

RECEIVED

SEP 19 2013

ENV TOX LAB

[] HOLD ANALYSIS - additional composite samples are possible for these FSID numbers.

[x] FINAL SAMPLES - begin analysis.

1 RELINQUISHED BY		DATE	3 RELINQUISHED BY		DATE	12 TOTAL NUMBER OF CONTAINERS
SIGNATURE		9/19/13	SIGNATURE		9/19/13	
PRINTED NAME		TIME	PRINTED NAME		TIME	SAMPLE CONDITIONS RECEIVED ON ICE <input checked="" type="radio"/> YES <input type="radio"/> NO SEALED <input checked="" type="radio"/> YES <input type="radio"/> NO
COMPANY NAME		1:00pm	COMPANY NAME		15:00	
LACDPW, Watershed Mgmt.			F.T.L			SPECIAL SHIPPING/HANDLING OR STORAGE REQUIREMENTS:
2 RECEIVED BY		DATE	4 RECEIVED BY		DATE	
SIGNATURE		9/19/13	SIGNATURE		9/19/13	
PRINTED NAME		TIME	PRINTED NAME		TIME	
KAMPUZ		13:10	Kamiliya Selva		15:05	
COMPANY NAME			COMPANY NAME			
Env. Tox. Lab			ETL			

COMMENTS:

COUNTY OF LOS ANGELES
AGRICULTURE COMMISSIONER/WEIGHTS AND MEASURES

ENVIRONMENTAL TOXICOLOGY LABORATORY
11012B GARFIELD AVENUE, SOUTH GATE CA 90208
PHONE NO. (562) 940-6778 FAX (562) 940-6785

ATTACHMENT

Page 2 of 2

Custom Analysis Groups	
FSID	Constituent
1	Dissolved Phosphorus
	NH3-N
	Nitrate-N
	Nitrite-N
	Nitrogen- Kjeldahl- Total
	Phosphorus- Total (as P)
	Phosphorus- Total
	Total Dissolved Solids
	Total Suspended Solids

Q3 Dry Weather Monitoring Event
December 10, 2013



January 06, 2014

Bronwyn K Kelly
MWH Americas, Inc.
618 Michillinda Avenue
Suite 200
Arcadia, CA 91107-

Project Name: Machado Lake TMDL
Physis Project ID: 1311002-001

Dear Bronwyn,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 12/10/2013. A total of 12 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Total Suspended Solids by SM 2540 D
Total Phosphorus by SM 4500-P E
Total Orthophosphate as P by SM 4500-P E
Total Dissolved Solids by SM 2540 C
Total Dissolved Phosphorus by SM 4500-P E
Nitrite as N by IC by EPA 300.0
Nitrate as N by IC by EPA 300.0
Ammonia as N by SM 4500-NH3 D
Subcontract
Total Kjeldahl Nitrogen by EPA 351.2

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
Extension 202
714-335-5918 cell
mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

MATRIX SPIKES: MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

BLANK SPIKES: BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

CERTIFIED REFERENCE MATERIALS: CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

SURROGATES: Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored

under specific conditions after collection and prior to analysis without significantly affecting the analyte's concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

PHYSICS

PANALYTICAL

REPORT

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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 23906-R1						
MLMRP-001-10_ACAD-1 Dry Weather Q4		Matrix: Liquid	Sampled: 10-Dec-13 8:06		Received: 10-Dec-13	
Method: SM 2540 D		Batch ID: C-14140	Prepared: 16-Dec-13		Analyzed: 16-Dec-13	
Total Suspended Solids	NA	2.8	0.5	0.5	mg/L	
Total Suspended Solids	NA	2.8	0.5	0.5	mg/L	
Method: SM 2540 C		Batch ID: C-15010	Prepared: 16-Dec-13		Analyzed: 16-Dec-13	
Total Dissolved Solids	NA	925	0.1	5	mg/L	
Total Dissolved Solids	NA	925	0.1	5	mg/L	
Sample ID: 23908-R1						
MLMRP-001-10_ACAD-3 Dry Weather Q		Matrix: Liquid	Sampled: 10-Dec-13 8:06		Received: 10-Dec-13	
Method: EPA 300.0		Batch ID: C-14134	Prepared: 11-Dec-13		Analyzed: 11-Dec-13	
Nitrate as N by IC	NA	1.06	0.01	0.05	mg/L	
Nitrate as N by IC	NA	1.06	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
Method: SM 4500-P E		Batch ID: C-14136	Prepared: 11-Dec-13		Analyzed: 11-Dec-13	
Total Orthophosphate as P	NA	0.05	0.01	0.02	mg/L	
Total Orthophosphate as P	NA	0.05	0.01	0.02	mg/L	
Method: SM 4500-P E		Batch ID: C-15008	Prepared: 12-Dec-13		Analyzed: 03-Jan-14	
Total Dissolved Phosphorus	NA	0.111	0.016	0.05	mg/L	
Total Dissolved Phosphorus	NA	0.111	0.016	0.05	mg/L	
Sample ID: 23909-R1						
MLMRP-001-10_ACAD-4 Dry Weather Q		Matrix: Liquid	Sampled: 10-Dec-13 8:06		Received: 10-Dec-13	
Method: SM 4500-P E		Batch ID: C-15008	Prepared: 02-Jan-14		Analyzed: 03-Jan-14	
Total Phosphorus	NA	1.348	0.016	0.05	mg/L	
Total Phosphorus	NA	1.348	0.016	0.05	mg/L	
Method: SM 4500-NH3 D		Batch ID: C-15009	Prepared: 06-Jan-14		Analyzed: 06-Jan-14	
Ammonia as N	NA	0.07	0.02	0.05	mg/L	
Ammonia as N	NA	0.07	0.02	0.05	mg/L	
Sample ID: 23910-R1						
MLMRP-001-10_ACAD-5 Dry Weather Q		Matrix: Liquid	Sampled: 10-Dec-13 8:00		Received: 10-Dec-13	
Method: SM 2540 D		Batch ID: C-14140	Prepared: 16-Dec-13		Analyzed: 16-Dec-13	
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	



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Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Method: SM 2540 C		Batch ID: C-15010		Prepared: 16-Dec-13		Analyzed: 16-Dec-13
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
Sample ID: 23912-R1	MLMRP-001-10_ACAD-7 Dry Weather Q	Matrix: Liquid	Sampled: 10-Dec-13 8:00		Received: 10-Dec-13	
Method: EPA 300.0		Batch ID: C-14134		Prepared: 11-Dec-13		Analyzed: 11-Dec-13
Nitrate as N by IC	NA	ND	0.01	0.05	mg/L	
Nitrate as N by IC	NA	ND	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
Method: SM 4500-P E		Batch ID: C-14136		Prepared: 11-Dec-13		Analyzed: 11-Dec-13
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	
Method: SM 4500-P E		Batch ID: C-15008		Prepared: 12-Dec-13		Analyzed: 03-Jan-14
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 23913-R1	MLMRP-001-10_ACAD-8 Dry Weather Q	Matrix: Liquid	Sampled: 10-Dec-13 8:00		Received: 10-Dec-13	
Method: SM 4500-P E		Batch ID: C-15008		Prepared: 02-Jan-14		Analyzed: 03-Jan-14
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
Method: SM 4500-NH3 D		Batch ID: C-15009		Prepared: 06-Jan-14		Analyzed: 06-Jan-14
Ammonia as N	NA	ND	0.02	0.05	mg/L	
Ammonia as N	NA	ND	0.02	0.05	mg/L	
Sample ID: 23914-R1	MLMRP-001-10_ACAD-9 Dry Weather Q	Matrix: Liquid	Sampled: 10-Dec-13 8:18		Received: 10-Dec-13	
Method: SM 2540 D		Batch ID: C-14140		Prepared: 16-Dec-13		Analyzed: 16-Dec-13
Total Suspended Solids	NA	0.7	0.5	0.5	mg/L	
Total Suspended Solids	NA	0.7	0.5	0.5	mg/L	
Method: SM 2540 C		Batch ID: C-15010		Prepared: 16-Dec-13		Analyzed: 16-Dec-13
Total Dissolved Solids	NA	928	0.1	5	mg/L	
Total Dissolved Solids	NA	928	0.1	5	mg/L	
Sample ID: 23916-R1	MLMRP-001-10_ACAD-11 Dry Weather Q	Matrix: Liquid	Sampled: 10-Dec-13 8:18		Received: 10-Dec-13	



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Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Method: EPA 300.0 Batch ID: C-14134 Prepared: 11-Dec-13 Analyzed: 11-Dec-13						
Nitrate as N by IC	NA	1.12	0.01	0.05	mg/L	
Nitrate as N by IC	NA	1.12	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
Method: SM 4500-P E Batch ID: C-14136 Prepared: 11-Dec-13 Analyzed: 11-Dec-13						
Total Orthophosphate as P	NA	0.05	0.01	0.02	mg/L	
Total Orthophosphate as P	NA	0.05	0.01	0.02	mg/L	
Method: SM 4500-P E Batch ID: C-15008 Prepared: 12-Dec-13 Analyzed: 03-Jan-14						
Total Dissolved Phosphorus	NA	0.097	0.016	0.05	mg/L	
Total Dissolved Phosphorus	NA	0.097	0.016	0.05	mg/L	
Sample ID: 23917-R1	MLMRP-001-10_ACAD-12 Dry Weather Q	Matrix: Liquid	Sampled: 10-Dec-13 8:18	Received: 10-Dec-13		
Method: SM 4500-P E Batch ID: C-15008 Prepared: 02-Jan-14 Analyzed: 03-Jan-14						
Total Phosphorus	NA	0.1	0.016	0.05	mg/L	
Total Phosphorus	NA	0.1	0.016	0.05	mg/L	
Method: SM 4500-NH3 D Batch ID: C-15009 Prepared: 06-Jan-14 Analyzed: 06-Jan-14						
Ammonia as N	NA	ND	0.02	0.05	mg/L	
Ammonia as N	NA	ND	0.02	0.05	mg/L	

QUALITY CONTROL

REPORT

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Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY % LIMITS	PRECISION % LIMITS	QA CODE
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Ammonia as N

Method: SM 4500-NH₃ D

Fraction: NA

Prepared: 06-Jan-14

Analyzed: 06-Jan-14

23905-B1	QAQC Procedural Blank	C-15009	ND	0.02	0.05	mg/L				
23905-B1	QAQC Procedural Blank	C-15009	ND	0.02	0.05	mg/L				
23905-BS1	QAQC Procedural Blank	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130% PASS
23905-BS1	QAQC Procedural Blank	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130% PASS
23905-BS2	QAQC Procedural Blank	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130% PASS
23905-BS2	QAQC Procedural Blank	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130% PASS
23917-MS1	MLMRP-001-10_ACAD-1	C-15009	0.26	0.02	0.05	mg/L	0.25	0	104	70 - 130% PASS
23917-MS1	MLMRP-001-10_ACAD-1	C-15009	0.26	0.02	0.05	mg/L	0.25	0	104	70 - 130% PASS
23917-MS2	MLMRP-001-10_ACAD-1	C-15009	0.26	0.02	0.05	mg/L	0.25	0	104	70 - 130% PASS
23917-MS2	MLMRP-001-10_ACAD-1	C-15009	0.26	0.02	0.05	mg/L	0.25	0	104	70 - 130% PASS
23917-R2	MLMRP-001-10_ACAD-1	C-15009	ND	0.02	0.05	mg/L				0 30 PASS
23917-R2	MLMRP-001-10_ACAD-1	C-15009	ND	0.02	0.05	mg/L				0 30 PASS

Nitrate as N by IC

Method: EPA 300.0

Fraction: NA

Prepared: 11-Dec-13

Analyzed: 11-Dec-13

23905-B1	QAQC Procedural Blank	C-14134	ND	0.01	0.05	mg/L				
23905-B1	QAQC Procedural Blank	C-14134	ND	0.01	0.05	mg/L				
23905-BS1	QAQC Procedural Blank	C-14134	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130% PASS
23905-BS1	QAQC Procedural Blank	C-14134	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130% PASS
23905-BS2	QAQC Procedural Blank	C-14134	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130% PASS
23905-BS2	QAQC Procedural Blank	C-14134	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130% PASS
23908-MS1	MLMRP-001-10_ACAD-3	C-14134	1.16	0.01	0.05	mg/L	0.11	1.07	82	70 - 130% PASS
23908-MS1	MLMRP-001-10_ACAD-3	C-14134	1.16	0.01	0.05	mg/L	0.11	1.07	82	70 - 130% PASS
23908-MS2	MLMRP-001-10_ACAD-3	C-14134	1.19	0.01	0.05	mg/L	0.11	1.07	109	70 - 130% PASS
23908-MS2	MLMRP-001-10_ACAD-3	C-14134	1.19	0.01	0.05	mg/L	0.11	1.07	109	70 - 130% PASS
23908-R2	MLMRP-001-10_ACAD-3	C-14134	1.07	0.01	0.05	mg/L				1 30 PASS
23908-R2	MLMRP-001-10_ACAD-3	C-14134	1.07	0.01	0.05	mg/L				1 30 PASS

Nitrite as N by IC

Method: EPA 300.0

Fraction: NA

Prepared: 11-Dec-13

Analyzed: 11-Dec-13

23905-B1	QAQC Procedural Blank	C-14134	ND	0.01	0.05	mg/L				
23905-B1	QAQC Procedural Blank	C-14134	ND	0.01	0.05	mg/L				



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Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
23905-BS1	QAQC Procedural Blank	C-14134	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	
23905-BS1	QAQC Procedural Blank	C-14134	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	
23905-BS2	QAQC Procedural Blank	C-14134	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	0 30 PASS
23905-BS2	QAQC Procedural Blank	C-14134	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	0 30 PASS
23908-MS1	MLMRP-001-10_ACAD-3	C-14134	ND 0	0.01	0.05	mg/L	0.15	0	0	70 - 130%	FAIL	M
23908-MS1	MLMRP-001-10_ACAD-3	C-14134	ND 0	0.01	0.05	mg/L	0.15	0	0	70 - 130%	FAIL	M
23908-MS2	MLMRP-001-10_ACAD-3	C-14134	ND 0	0.01	0.05	mg/L	0.15	0	0	70 - 130%	FAIL	0 30 PASS M
23908-MS2	MLMRP-001-10_ACAD-3	C-14134	ND 0	0.01	0.05	mg/L	0.15	0	0	70 - 130%	FAIL	0 30 PASS M
23908-R2	MLMRP-001-10_ACAD-3	C-14134	ND	0.01	0.05	mg/L						0 30 PASS
23908-R2	MLMRP-001-10_ACAD-3	C-14134	ND	0.01	0.05	mg/L						0 30 PASS

Total Dissolved Phosphorus

Method: SM 4500-P E

Fraction: NA

Prepared: 12-Dec-13

Analyzed: 03-Jan-14

23905-B1	QAQC Procedural Blank	C-15008	ND	0.016	0.05	mg/L						
23905-B1	QAQC Procedural Blank	C-15008	ND	0.016	0.05	mg/L						
23905-BS1	QAQC Procedural Blank	C-15008	0.298	0.016	0.05	mg/L	0.3	0	99	70 - 130%	PASS	
23905-BS1	QAQC Procedural Blank	C-15008	0.298	0.016	0.05	mg/L	0.3	0	99	70 - 130%	PASS	
23905-BS2	QAQC Procedural Blank	C-15008	0.313	0.016	0.05	mg/L	0.3	0	104	70 - 130%	PASS	5 30 PASS
23905-BS2	QAQC Procedural Blank	C-15008	0.313	0.016	0.05	mg/L	0.3	0	104	70 - 130%	PASS	5 30 PASS
23908-MS1	MLMRP-001-10_ACAD-3	C-15008	0.395	0.016	0.05	mg/L	0.3	0.105	97	70 - 130%	PASS	
23908-MS1	MLMRP-001-10_ACAD-3	C-15008	0.395	0.016	0.05	mg/L	0.3	0.105	97	70 - 130%	PASS	
23908-MS2	MLMRP-001-10_ACAD-3	C-15008	0.395	0.016	0.05	mg/L	0.3	0.105	97	70 - 130%	PASS	0 30 PASS
23908-MS2	MLMRP-001-10_ACAD-3	C-15008	0.395	0.016	0.05	mg/L	0.3	0.105	97	70 - 130%	PASS	0 30 PASS
23908-R2	MLMRP-001-10_ACAD-3	C-15008	0.1	0.016	0.05	mg/L						10 30 PASS
23908-R2	MLMRP-001-10_ACAD-3	C-15008	0.1	0.016	0.05	mg/L						10 30 PASS

Total Dissolved Solids

Method: SM 2540 C

Fraction: NA

Prepared: 16-Dec-13

Analyzed: 16-Dec-13

23905-B1	QAQC Procedural Blank	C-15010	ND	0.1	5	mg/L						
23905-B1	QAQC Procedural Blank	C-15010	ND	0.1	5	mg/L						
23905-BS1	QAQC Procedural Blank	C-15010	24840	0.1	5	mg/L	24959	0	100	70 - 130%	PASS	
23905-BS1	QAQC Procedural Blank	C-15010	24840	0.1	5	mg/L	24959	0	100	70 - 130%	PASS	
23905-BS2	QAQC Procedural Blank	C-15010	70280	0.1	5	mg/L	69684	0	101	70 - 130%	PASS	1 30 PASS
23905-BS2	QAQC Procedural Blank	C-15010	70280	0.1	5	mg/L	69684	0	101	70 - 130%	PASS	1 30 PASS



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Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY % LIMITS	PRECISION % LIMITS	QA CODE
23906-R2	MLMRP-001-10_ACAD-1	C-15010	955	0.1	5	mg/L			3 30	PASS
23906-R2	MLMRP-001-10_ACAD-1	C-15010	955	0.1	5	mg/L			3 30	PASS

Total Orthophosphate as P			Method: SM 4500-P E			Fraction: NA			Prepared: 11-Dec-13			Analyzed: 11-Dec-13		
23905-B1	QAQC Procedural Blank	C-14136	ND	0.01	0.02	mg/L								
23905-B1	QAQC Procedural Blank	C-14136	ND	0.01	0.02	mg/L								
23905-BS1	QAQC Procedural Blank	C-14136	0.18	0.01	0.02	mg/L	0.2	0	90	70 - 130%	PASS			
23905-BS1	QAQC Procedural Blank	C-14136	0.18	0.01	0.02	mg/L	0.2	0	90	70 - 130%	PASS			
23905-BS2	QAQC Procedural Blank	C-14136	0.19	0.01	0.02	mg/L	0.2	0	95	70 - 130%	PASS	5	30	PASS
23905-BS2	QAQC Procedural Blank	C-14136	0.19	0.01	0.02	mg/L	0.2	0	95	70 - 130%	PASS	5	30	PASS
23908-MS1	MLMRP-001-10_ACAD-3	C-14136	0.24	0.01	0.02	mg/L	0.2	0.05	95	70 - 130%	PASS			
23908-MS1	MLMRP-001-10_ACAD-3	C-14136	0.24	0.01	0.02	mg/L	0.2	0.05	95	70 - 130%	PASS			
23908-MS2	MLMRP-001-10_ACAD-3	C-14136	0.24	0.01	0.02	mg/L	0.2	0.05	95	70 - 130%	PASS	0	30	PASS
23908-MS2	MLMRP-001-10_ACAD-3	C-14136	0.24	0.01	0.02	mg/L	0.2	0.05	95	70 - 130%	PASS	0	30	PASS
23908-R2	MLMRP-001-10_ACAD-3	C-14136	0.05	0.01	0.02	mg/L						0	30	PASS
23908-R2	MLMRP-001-10_ACAD-3	C-14136	0.05	0.01	0.02	mg/L						0	30	PASS

Total Phosphorus			Method: SM 4500-P E			Fraction: NA			Prepared: 02-Jan-14			Analyzed: 03-Jan-14		
23905-B1	QAQC Procedural Blank	C-15008	ND	0.016	0.05	mg/L								
23905-B1	QAQC Procedural Blank	C-15008	ND	0.016	0.05	mg/L								
23905-BS1	QAQC Procedural Blank	C-15008	0.298	0.016	0.05	mg/L	0.3	0	99	70 - 130%	PASS			
23905-BS1	QAQC Procedural Blank	C-15008	0.298	0.016	0.05	mg/L	0.3	0	99	70 - 130%	PASS			
23905-BS2	QAQC Procedural Blank	C-15008	0.313	0.016	0.05	mg/L	0.3	0	104	70 - 130%	PASS	5	30	PASS
23905-BS2	QAQC Procedural Blank	C-15008	0.313	0.016	0.05	mg/L	0.3	0	104	70 - 130%	PASS	5	30	PASS
23909-MS1	MLMRP-001-10_ACAD-4	C-15008	1.61	0.016	0.05	mg/L	0.3	1.356	85	70 - 130%	PASS			
23909-MS1	MLMRP-001-10_ACAD-4	C-15008	1.61	0.016	0.05	mg/L	0.3	1.356	85	70 - 130%	PASS			
23909-MS2	MLMRP-001-10_ACAD-4	C-15008	1.622	0.016	0.05	mg/L	0.3	1.356	89	70 - 130%	PASS	5	30	PASS
23909-MS2	MLMRP-001-10_ACAD-4	C-15008	1.622	0.016	0.05	mg/L	0.3	1.356	89	70 - 130%	PASS	5	30	PASS
23909-R2	MLMRP-001-10_ACAD-4	C-15008	1.365	0.016	0.05	mg/L						1	30	PASS
23909-R2	MLMRP-001-10_ACAD-4	C-15008	1.365	0.016	0.05	mg/L						1	30	PASS

Total Suspended Solids			Method: SM 2540 D			Fraction: NA			Prepared: 16-Dec-13			Analyzed: 16-Dec-13		
------------------------	--	--	-------------------	--	--	--------------	--	--	---------------------	--	--	---------------------	--	--



1904 E. Wright Circle, Anaheim CA 92806

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fax: (714) 602-5321

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CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY % LIMITS	PRECISION % LIMITS	QA CODE
23905-B1	QAQC Procedural Blank	C-14140	ND	0.5	0.5	mg/L				
23905-B1	QAQC Procedural Blank	C-14140	ND	0.5	0.5	mg/L				

SUBCONTRACT

REPORT

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



Associated Laboratories

806 N. Batavia - Orange, CA 92868
Tel (714)771-6900 Fax (714)538-1209
www.associatedlabs.com
Info@associatedlabs.com



Client: PHYSIS Environmental Laboratories, Inc.
Address: 1904 E. Wright Circle
Anaheim, CA 92806

Lab Request: 333865
Report Date: 01/06/2014
Date Received: 12/19/2013
Client ID: 13622

Attn: Misty Mercier

Comments: #1311002

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

<u>Sample #</u>	<u>Client Sample ID</u>
333865-001	MLMRP-001-10_ACAD-2
333865-002	MLMRP-001-10_ACAD-6
333865-003	MLMRP-001-10_ACAD-10

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

Nina Prasad
President

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 45 days from date reported.

The reports of the Associated Laboratories are confidential property of our clients and may not be reproduced or used for publication in part or in full without our written permission. This is for the mutual protection of the public, our clients, and ourselves.

TESTING & CONSULTING
Chemical
Microbiological
Environmental

QCBatchID: QC1142625	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 12/21/2013	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1142625MB1				
Total Kjeldahl Nitrogen	ND	mg/L	0.4	

Lab Control Spike/Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1142625LCS1											
Total Kjeldahl Nitrogen	2.5		2.63		mg/L	105			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

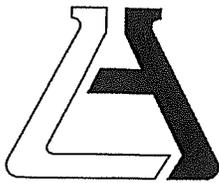
Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1142625MS1, QC1142625MSD1												
Total Kjeldahl Nitrogen	ND	12.5	12.5	12.1	10.7	mg/L	97	86	12.3	80-120	20	Source: 333865-001



Notes and Definitions

B	Analyte was present in an associated method blank. Associated sample data was reported with qualifier.
C	Laboratory Contamination.
D	The sample duplicate RPD was not within control limits, the sample data was reported without further clarification.
DF	Dilution Factor
DW	Sample result is calculated on a dry weigh basis
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
MDL	Method Detection Limit
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
ND	Analyte was not detected or was less than the detection limit.
P	Sample was received without proper preservation according to EPA guidelines.
Q1	Analyte Calibration Verification exceeds criteria and the result was reported with qualifier.
RDL	Reporting Detection Limit
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
T	Sample was extracted/analyzed past the holding time.
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.





ASSOCIATED LABORATORIES

806 North Batavia – Orange, California 92868 – 714-771-6900

FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1
 Client: PHYSIS ENVIRO. Project: 1311002
 Date Received: 12/19/13 Sampler's Name: Yes No
 Sample temperature: _____
 Sample(s) received in cooler: Yes No (Skip Section 2)
 Shipping Information: _____

Section 2
 Was the cooler packed with: ___ Ice Ice Packs ___ Bubble Wrap ___ Styrofoam
 ___ Paper ___ None ___ Other _____
 Cooler Temperature: 5°C

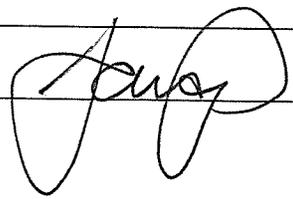
(Acceptance range is 0 to 6 Deg. C. or arrival on ice; For Microbiology sample <= 10 Deg. C or arrival on ice)

Section 3	YES	NO	N/A
Was a COC received?	<input checked="" type="checkbox"/>		
Is it properly completed? (IDs, sampling date and time, signature, test)	<input checked="" type="checkbox"/>		
Were custody seals present?		<input checked="" type="checkbox"/>	
If Yes – were they intact?			<input checked="" type="checkbox"/>
Were all samples sealed in plastic bags?	<input checked="" type="checkbox"/>		
Did all samples arrive intact? If no, indicate below.	<input checked="" type="checkbox"/>		
Did all bottle labels agree with COC? (ID, dates and times)	<input checked="" type="checkbox"/>		
Were correct containers used for the tests required?	<input checked="" type="checkbox"/>		
Was a sufficient amount of sample sent for tests indicated?	<input checked="" type="checkbox"/>		
Was there headspace in VOA vials?			<input checked="" type="checkbox"/>
Were the containers labeled with correct preservatives?	<input checked="" type="checkbox"/>		
Was total residual chlorine measured (Fish Bioassay samples only)? *			<input checked="" type="checkbox"/>

*: If the answer is no, please inform Fish Bioassay Dept. immediately.

Section 4
 Explanations/Comments

Section 5
 Was Project Manager notified of discrepancies: Y / N N/A
 Project Manager's response: _____

Completed By:  Date: 12/19/13.



CHAIN of CUSTODY

333865

SEND TO: Associated

COMPANY NAME: **Physis Environmental Laboratories, Inc.** EMAIL: **sc@physislabs.com** PROJECT NAME / NUMBER: **1311002** COC PAGE **1** of **1**

PROJECT MANAGER: **Misty Mercier** FAX: **714 602-5321** PO #: **1311002-001** PHYSIS SOS #: **1311002-001** TYPE OF ICE USED: WET BLUE DRY

COMPANY ADDRESS: **1904 E. Wright Circle, Anaheim, CA 92806** PHONE: **714 602-5320** OFFICE: **714 335-5918** CELL: **714 335-5918** SHIPPED VIA: FEDEX UPS USPS

TURNAROUND TIME: STANDARD RUSH BUSINESS DAYS

REPORT FORMAT: PDF/EDD SWAMP EDD OTHER

SPECIAL INSTRUCTIONS: **please report down the MDL**

PHYSIS MATRIX CODES: **TKN**

SW = seawater FW = freshwater RW = rainwater
 WW = wastewater DW = drinking water
 S = sediment T = tissue E = extract O = other (specify)

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	# of bottles	REQUESTED ANALYSES
1	MLMRP-001-10_ACAD-3	12/10/13	8:06		1	X
2	MLMRP-001-10_ACAD-6	12/10/13	8:00		1	X
3	MLMRP-001-10_ACAD-10	12/10/13	8:18		1	X
4						
5						
6						
7						
8						
9						
10						

RELINQUISHED BY: **Adam Idell** (signature) company: **PHYSIS Labs** date & time: **12/19/13 0957**

RECEIVED BY: **Nathan Griffin** (signature) company: **Associated Labs** date & time: **12/19/13 958**

PHYSICS
CHAIN OF
CUSTODY

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



CHAIN of CUSTODY

COMPANY NAME MWH	EMAIL Nathan.Griffin@mwhglobal.com	PROJECT NAME / NUMBER Machado Lake Monitoring + Reporting Program (MLMRP)	COC PAGE 1 of 2
PROJECT MANAGER Bronwyn Kelly	FAX	PO #	PHYSIS SOS #
COMPANY ADDRESS 518 Michillinda Ave Suite 200 Arcadia CA 91007	PHONE 949-322-1331	TYPE OF ICE USED <input checked="" type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY	
	office	SHIPPED VIA <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Physis <input type="checkbox"/> other	
	cell	SAMPLED BY Nathan Griffin	

TURNAROUND TIME
 STANDARD (15-20 business days) RUSH business days

REPORT FORMAT
 PHYSIS PDF/EDD SWAMP EDD other

SPECIAL INSTRUCTIONS

REQUESTED ANALYSES

PLEASE SEE PHYSIS SOS

PHYSIS MATRIX CODES
SW = seawater FW = freshwater RW = rainwater
WW = wastewater DW = drinking water
S = sediment T = tissue E = extract O = other (specify)

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	# of bottles														
1	MLMRP-001-10-ACAD-1 Dry Weather Q4	12/10	09:06		1	X													
2	MLMRP-001-10-ACAD-2 Dry Weather Q4	12/10	09:06		1		X												
3	MLMRP-001-10-ACAD-3 Dry Weather Q4	12/10	09:06		1			X											
4	MLMRP-001-10-ACAD-4 Dry Weather Q4	12/10	09:06		1				X										
5	MLMRP-001-10-ACAD-5	12/10	09:00		1	X													
6	MLMRP-001-10-ACAD-6	12/10	09:00		1		X												
7	MLMRP-001-10-ACAD-7	12/10	09:00		1			X											
8	MLMRP-001-10-ACAD-8	12/10	09:00		1				X										
9	MLMRP-001-10-ACAD-9	12/10	09:19		1	X													
10	MLMRP-001-10-ACAD-10	12/10	09:19		1		X												

RELINQUISHED BY				RECEIVED BY			
print	signature	company	date & time	print	signature	company	date & time
Nathan Griffin	<i>Nathan Griffin</i>	MWH	12/10/13 2:40	MIKE HOSAN	<i>Mike Hosan</i>	B.C. Hall	12/10/13 2:40 PM
MIKE HOSAN	<i>Mike Hosan</i>	B.C. Hall	12-10-13 5:00 PM	Adam Dell	<i>Adam Dell</i>	Physis	12/10/13 17:00

CHAIN of CUSTODY

COMPANY NAME MWH		EMAIL nathan.griffin@mwhglobal.com		PROJECT NAME / NUMBER Macheta Lake Monitoring & Reporting Program			COG PAGE 12 of 2								
PROJECT MANAGER Bronwyn Kelly		FAX		PO #	PHYSIS SOS #	TYPE OF ICE USED <input checked="" type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY									
COMPANY ADDRESS 618 Michillinda Ave Suite 200 Arcadia CA 91007		PHONE 949-322-1331		SAMPLED BY Nathan Griffin		SHIPPED VIA <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Physis <input type="checkbox"/> other									
TURNAROUND TIME <input checked="" type="checkbox"/> STANDARD (15-20 business days) <input type="checkbox"/> RUSH business days		REQUESTED ANALYSES PLEASE SEE PHYSIS SOS						Nitrate, Nitrite, Dissolved Phosphorus Ammonia & Total Phosphorus							
REPORT FORMAT <input type="checkbox"/> PHYSIS PDF/EDD <input type="checkbox"/> SWAMP EDD <input type="checkbox"/> other															
SPECIAL INSTRUCTIONS		PHYSIS MATRIX CODES SW = seawater FW = freshwater RW = rainwater WW = wastewater DW = drinking water S = sediment T = tissue E = extract O = other (specify)		SAMPLE ID		SAMPLE DESCRIPTION				SAMPLE date time		physis matrix code	# of bottles		
1	MLMRP-001-102-ACAD-11	Dry Weather Q4	12/10	08:18		1	X								
2	MLMRP-001-102-ACAD-12	↓	12/10	08:18		1	X								
3															
4															
5															
6															
7															
8															
9															
10															
RELINQUISHED BY				RECEIVED BY											
print		signature		company		date & time		print		signature		company		date & time	
Nathan Griffin				MWH		12/10/13 2:40		MIKE HEARN				B.L. HALL		12/10/13 2:40 PM	
MIKE HEARN				B.L. HALL		12-10-13 5:00 PM		Adam Elan				PHYSIS		12/10/13 17:00	



January 06, 2014

Bronwyn K Kelly
MWH Americas, Inc.
618 Michillinda Avenue
Suite 200
Arcadia, CA 91107-

Project Name: Machado Lake TMDL
Physis Project ID: 1311002-002

Dear Bronwyn,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 12/10/2013. A total of 4 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Total Suspended Solids by SM 2540 D
Total Phosphorus by SM 4500-P E
Total Orthophosphate as P by SM 4500-P E
Total Dissolved Solids by SM 2540 C
Total Dissolved Phosphorus by SM 4500-P E
Nitrite as N by IC by EPA 300.0
Nitrate as N by IC by EPA 300.0
Ammonia as N by SM 4500-NH3 D
Subcontract
Total Kjeldahl Nitrogen by EPA 351.2

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
Extension 202
714-335-5918 cell
mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

MATRIX SPIKES: MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

BLANK SPIKES: BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

CERTIFIED REFERENCE MATERIALS: CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

SURROGATES: Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored

under specific conditions after collection and prior to analysis without significantly affecting the analyte's concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

PHYSICS

PANALYTICAL

REPORT

TERRA AURA
ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 23919-R1	MLMRP-001-30_VAND-1 Dry Weather Q	Matrix: Liquid				
	Method: SM 2540 D	Batch ID: C-14140				
Total Suspended Solids	NA	14.8	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15010				
Total Dissolved Solids	NA	513	0.1	5	mg/L	
Sample ID: 23921-R1	MLMRP-001-30_VAND-3 Dry Weather Q	Matrix: Liquid				
	Method: EPA 300.0	Batch ID: C-14134				
Nitrate as N by IC	NA	1	0.01	0.05	mg/L	
Nitrite as N by IC	NA	0.03	0.01	0.05	mg/L	J
	Method: SM 4500-P E	Batch ID: C-14136				
Total Orthophosphate as P	NA	0.77	0.01	0.02	mg/L	
	Method: SM 4500-P E	Batch ID: C-15008				
Total Dissolved Phosphorus	NA	0.761	0.016	0.05	mg/L	
Sample ID: 23922-R1	MLMRP-001-30_VAND-4 Dry Weather Q	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-15008				
Total Phosphorus	NA	0.104	0.016	0.05	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15009				
Ammonia as N	NA	ND	0.02	0.05	mg/L	

QUALITY CONTROL

REPORT

TERRA FIDELITY AQUA AURA
ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



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CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
Ammonia as N			Method: SM 4500-NH₃ D			Fraction: NA		Prepared: 06-Jan-14		Analyzed: 06-Jan-14		
23918-B1	QAQC Procedural Blank	C-15009	ND	0.02	0.05	mg/L						
23918-BS1	QAQC Procedural Blank	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130%	PASS	
23918-BS2	QAQC Procedural Blank	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130%	PASS	0 30 PASS
23922-MS1	MLMRP-001-30_VAND-4	C-15009	0.27	0.02	0.05	mg/L	0.25	0	108	70 - 130%	PASS	
23922-MS2	MLMRP-001-30_VAND-4	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130%	PASS	4 30 PASS
23922-R2	MLMRP-001-30_VAND-4	C-15009	ND	0.02	0.05	mg/L						0 30 PASS
Nitrate as N by IC			Method: EPA 300.0			Fraction: NA		Prepared: 11-Dec-13		Analyzed: 11-Dec-13		
23918-B1	QAQC Procedural Blank	C-14134	ND	0.01	0.05	mg/L						
23918-BS1	QAQC Procedural Blank	C-14134	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130%	PASS	
23918-BS2	QAQC Procedural Blank	C-14134	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130%	PASS	0 30 PASS
Nitrite as N by IC			Method: EPA 300.0			Fraction: NA		Prepared: 11-Dec-13		Analyzed: 11-Dec-13		
23918-B1	QAQC Procedural Blank	C-14134	ND	0.01	0.05	mg/L						
23918-BS1	QAQC Procedural Blank	C-14134	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	
23918-BS2	QAQC Procedural Blank	C-14134	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	0 30 PASS
Total Dissolved Phosphorus			Method: SM 4500-P E			Fraction: NA		Prepared: 12-Dec-13		Analyzed: 03-Jan-14		
23918-B1	QAQC Procedural Blank	C-15008	ND	0.016	0.05	mg/L						
23918-BS1	QAQC Procedural Blank	C-15008	0.298	0.016	0.05	mg/L	0.3	0	99	70 - 130%	PASS	
23918-BS2	QAQC Procedural Blank	C-15008	0.313	0.016	0.05	mg/L	0.3	0	104	70 - 130%	PASS	5 30 PASS
Total Dissolved Solids			Method: SM 2540 C			Fraction: NA		Prepared: 16-Dec-13		Analyzed: 16-Dec-13		
23918-B1	QAQC Procedural Blank	C-15010	ND	0.1	5	mg/L						
23918-BS1	QAQC Procedural Blank	C-15010	24840	0.1	5	mg/L	24959	0	100	70 - 130%	PASS	
23918-BS2	QAQC Procedural Blank	C-15010	70280	0.1	5	mg/L	69684	0	101	70 - 130%	PASS	1 30 PASS
Total Orthophosphate as P			Method: SM 4500-P E			Fraction: NA		Prepared: 11-Dec-13		Analyzed: 11-Dec-13		
23918-B1	QAQC Procedural Blank	C-14136	ND	0.01	0.02	mg/L						
23918-BS1	QAQC Procedural Blank	C-14136	0.18	0.01	0.02	mg/L	0.2	0	90	70 - 130%	PASS	
23918-BS2	QAQC Procedural Blank	C-14136	0.19	0.01	0.02	mg/L	0.2	0	95	70 - 130%	PASS	5 30 PASS



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CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE
Total Phosphorus		Method: SM 4500-P E		Fraction: NA		Prepared: 02-Jan-14		Analyzed: 03-Jan-14		
23918-B1	QAQC Procedural Blank	C-15008	ND	0.016	0.05	mg/L				
23918-BS1	QAQC Procedural Blank	C-15008	0.298	0.016	0.05	mg/L	0.3	0	99	70 - 130% PASS
23918-BS2	QAQC Procedural Blank	C-15008	0.313	0.016	0.05	mg/L	0.3	0	104	70 - 130% PASS
Total Suspended Solids		Method: SM 2540 D		Fraction: NA		Prepared: 16-Dec-13		Analyzed: 16-Dec-13		
23918-B1	QAQC Procedural Blank	C-14140	ND	0.5	0.5	mg/L				

SUBCONTRACT

REPORT

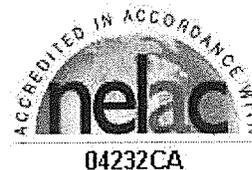
TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



Associated Laboratories

806 N. Batavia - Orange, CA 92868
Tel (714)771-6900 Fax (714)538-1209
www.associatedlabs.com
Info@associatedlabs.com



Client: PHYSIS Environmental Laboratories, Inc.
Address: 1904 E. Wright Circle
Anaheim, CA 92806

Lab Request: 333864
Report Date: 01/06/2014
Date Received: 12/19/2013
Client ID: 13622

Attn: Misty Mercier

Comments: #1311002

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

<u>Sample #</u>	<u>Client Sample ID</u>
333864-001	MLMRP-001- 30_VAND-2

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

Nina Prasad
President

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 45 days from date reported.

The reports of the Associated Laboratories are confidential property of our clients and may not be reproduced or used for publication in part or in full without our written permission. This is for the mutual protection of the public, our clients, and ourselves.

TESTING & CONSULTING
Chemical
Microbiological
Environmental

Matrix: Water
Sampled: 12/10/2013 12:25
Sample #: 333864-001

Client: PHYSIS Environmental Laboratories, Inc. Collector: Client
Site:
Client Sample #: MLMRP-001-30_VAND-2 Sample Type:

Analyte	Result	DF	MDL	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2								QCBatchID: QC1142624
Prep Method: Method								
Total Kjeldahl Nitrogen	0.6	1	0.06	0.4	mg/L	12/21/13	trinh	



QCBatchID: QC1142624	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 12/21/2013	Instrument: CHEM (group)

Blank Summary					
Analyte	Blank Result	Units	RDL	Notes	
QC1142624MB1					
Total Kjeldahl Nitrogen	ND	mg/L	0.4		

Lab Control Spike/ Lab Control Spike Duplicate Summary										
Analyte	Spike Amount		Spike Result		Units	Recoveries		Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	
QC1142624LCS1										
Total Kjeldahl Nitrogen	2.5		2.63		mg/L	105		80-120		

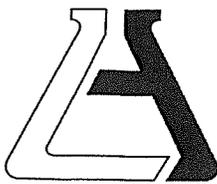
Matrix Spike/Matrix Spike Duplicate Summary												
Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1142624MS1, QC1142624MSD1												
Total Kjeldahl Nitrogen	ND	12.5	12.5	12.3	12.3	mg/L	98	98	0.0	80-120	20	Source: 333822-005



Notes and Definitions

B	Analyte was present in an associated method blank. Associated sample data was reported with qualifier.
C	Laboratory Contamination.
D	The sample duplicate RPD was not within control limits, the sample data was reported without further clarification.
DF	Dilution Factor
DW	Sample result is calculated on a dry weigh basis
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
MDL	Method Detection Limit
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
ND	Analyte was not detected or was less than the detection limit.
P	Sample was received without proper preservation according to EPA guidelines.
Q1	Analyte Calibration Verification exceeds criteria and the result was reported with qualifier.
RDL	Reporting Detection Limit
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
T	Sample was extracted/analyzed past the holding time.
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.





ASSOCIATED LABORATORIES

806 North Batavia - Orange, California 92868 - 714-771-6900

FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1
 Client: PHYSIS ENVIRO - Project: 1311002
 Date Received: 12/19/13 Sampler's Name: Yes No
 Sample temperature: _____
 Sample(s) received in cooler: Yes No (Skip Section 2)
 Shipping Information: _____

Section 2
 Was the cooler packed with: ___ Ice Ice Packs ___ Bubble Wrap ___ Styrofoam
 ___ Paper ___ None ___ Other _____
 Cooler Temperature: 5°C

(Acceptance range is 0 to 6 Deg. C. or arrival on ice; For Microbiology sample ≤ 10 Deg. C or arrival on ice)

Section 3	YES	NO	N/A
Was a COC received?	<input checked="" type="checkbox"/>		
Is it properly completed? (IDs, sampling date and time, signature, test)	<input checked="" type="checkbox"/>		
Were custody seals present?		<input checked="" type="checkbox"/>	
If Yes - were they intact?			<input checked="" type="checkbox"/>
Were all samples sealed in plastic bags?	<input checked="" type="checkbox"/>		
Did all samples arrive intact? If no, indicate below.	<input checked="" type="checkbox"/>		
Did all bottle labels agree with COC? (ID, dates and times)	<input checked="" type="checkbox"/>		
Were correct containers used for the tests required?	<input checked="" type="checkbox"/>		
Was a sufficient amount of sample sent for tests indicated?	<input checked="" type="checkbox"/>		
Was there headspace in VOA vials?			<input checked="" type="checkbox"/>
Were the containers labeled with correct preservatives?	<input checked="" type="checkbox"/>		
Was total residual chlorine measured (Fish Bioassay samples only)? *			<input checked="" type="checkbox"/>

*: If the answer is no, please inform Fish Bioassay Dept. immediately.

Section 4
 Explanations/Comments

Section 5
 Was Project Manager notified of discrepancies: Y / N N/A
 Project Manager's response: _____

Completed By: [Signature] Date: 12/19/13

CHAIN OF CUSTODY

SEND TO: Associated
333864

COMPANY NAME: Physis Environmental Laboratories, Inc. PROJECT NAME / NUMBER: 1311002
 PROJECT MANAGER: Misty Mercier FAX: sc@physislabs.com
 COMPANY ADDRESS: 1904 E. Wright Circle PHONE: 714 602-5320
 Anaheim, CA 92806 714 335-5918
 TURNAROUND TIME: STANDARD RUSH
 PDF/EDD SWAMP EDD other
 SPECIAL INSTRUCTIONS: please report down the MDL

PHYSIS MATRIX CODES: SW = seawater, FW = freshwater, RW = rainwater, WW = wastewater, DW = drinking water, S = sediment, T = tissue, E = extract, O = other (specify)

PO # 1311002
 PHYSIS SOS # 1311002-002
 SHIPPED VIA: WET, BLUE, DRY, FEDEX, UPS, USPS, Client, Physis, other

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	# of bottles	REQUESTED ANALYSES
1	MLMRP-001-30_VAND	12/10/13	12:25		1	X
2						
3						
4						
5						
6						
7						
8						
9						
10						

RELINQUISHED BY: Adam Idell (signature), PHYSIS Labs, date & time: 12/19/13 09:57

RECEIVED BY: ZARA PADILIA (signature), Associated Labs, date & time: 12/19/13 9:58

PHYSICS
CHAIN OF
CUSTODY

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature

Wet Weather Monitoring Event No.1
December 19, 2013



January 13, 2014

Bronwyn K Kelly
MWH Americas, Inc.
618 Michillinda Avenue
Suite 200
Arcadia, CA 91107-

Project Name: Machado Lake TMDL
Physis Project ID: 1311002-003

Dear Bronwyn,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 12/20/2013. A total of 17 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Total Suspended Solids by SM 2540 D
Total Phosphorus by SM 4500-P E
Total Orthophosphate as P by SM 4500-P E
Total Dissolved Solids by SM 2540 C
Total Dissolved Phosphorus by SM 4500-P E
Nitrite as N by IC by EPA 300.0
Nitrate as N by IC by EPA 300.0
Ammonia as N by SM 4500-NH3 D
Subcontract
Total Kjeldahl Nitrogen by EPA 351.2

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
Extension 202
714-335-5918 cell
mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

MATRIX SPIKES: MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

BLANK SPIKES: BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

CERTIFIED REFERENCE MATERIALS: CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

SURROGATES: Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored

under specific conditions after collection and prior to analysis without significantly affecting the analyte's concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

PHYSICS

PANALYTICAL

REPORT

TERRA AURA
ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 24115-R1	MLMRP-002-10_ACAD-1 Wet Weather-1	Matrix: Liquid				
	Method: SM 2540 D	Batch ID: C-15001				
				Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
				Prepared: 23-Dec-13		Analyzed: 23-Dec-13
Total Suspended Solids	NA	2.5	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15017				
				Prepared: 23-Dec-13		Analyzed: 23-Dec-13
Total Dissolved Solids	NA	839	0.1	5	mg/L	
Sample ID: 24117-R1	MLMRP-002-10_ACAD-3 Wet Weather-1	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-14155				
				Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
				Prepared: 20-Dec-13		Analyzed: 20-Dec-13
Total Orthophosphate as P	NA	0.21	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-14156				
				Prepared: 20-Dec-13		Analyzed: 20-Dec-13
Nitrate as N by IC	NA	0.96	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15008				
				Prepared: 21-Dec-13		Analyzed: 03-Jan-14
Total Dissolved Phosphorus	NA	0.213	0.016	0.05	mg/L	
Sample ID: 24118-R1	MLMRP-002-10_ACAD-4 Wet Weather-1	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-15008				
				Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
				Prepared: 02-Jan-14		Analyzed: 03-Jan-14
Total Phosphorus	NA	0.25	0.016	0.05	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15009				
				Prepared: 06-Jan-14		Analyzed: 06-Jan-14
Ammonia as N		0.12	0.02	0.05	mg/L	
Sample ID: 24119-R1	MLMRP-002-30_VAND-1 Wet Weather-1	Matrix: Liquid				
	Method: SM 2540 D	Batch ID: C-15001				
				Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
				Prepared: 23-Dec-13		Analyzed: 23-Dec-13
Total Suspended Solids	NA	19.6	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15017				
				Prepared: 23-Dec-13		Analyzed: 23-Dec-13
Total Dissolved Solids	NA	145	0.1	5	mg/L	
Sample ID: 24121-R1	MLMRP-002-30_VAND-3 Wet Weather-1	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-14155				
				Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
				Prepared: 20-Dec-13		Analyzed: 20-Dec-13
Total Orthophosphate as P	NA	0.47	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-14156				
				Prepared: 20-Dec-13		Analyzed: 20-Dec-13
Nitrate as N by IC	NA	1.72	0.01	0.05	mg/L	
Nitrite as N by IC	NA	0.09	0.01	0.05	mg/L	



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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
	Method: SM 4500-P E	Batch ID: C-15008		Prepared: 21-Dec-13		Analyzed: 03-Jan-14
Total Dissolved Phosphorus	NA	0.403	0.016	0.05	mg/L	
Sample ID: 24122-R1	MLMRP-002-30_VAND-4 Wet Weather-1	Matrix: Liquid		Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
	Method: SM 4500-P E	Batch ID: C-15008		Prepared: 02-Jan-14		Analyzed: 03-Jan-14
Total Phosphorus	NA	0.541	0.016	0.05	mg/L	
	Method: SM 4500-NH3 D	Batch ID: C-15009		Prepared: 06-Jan-14		Analyzed: 06-Jan-14
Ammonia as N		0.9	0.02	0.05	mg/L	
Sample ID: 24123-R1	MLMRP-002-30_VAND-5 Wet Weather-1	Matrix: Liquid		Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
	Method: SM 2540 D	Batch ID: C-15001		Prepared: 23-Dec-13		Analyzed: 23-Dec-13
Total Suspended Solids	NA	19.1	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15017		Prepared: 23-Dec-13		Analyzed: 23-Dec-13
Total Dissolved Solids	NA	131	0.1	5	mg/L	
Sample ID: 24125-R1	MLMRP-002-30_VAND-7 Wet Weather-1	Matrix: Liquid		Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
	Method: SM 4500-P E	Batch ID: C-14155		Prepared: 20-Dec-13		Analyzed: 20-Dec-13
Total Orthophosphate as P	NA	0.48	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-14156		Prepared: 20-Dec-13		Analyzed: 20-Dec-13
Nitrate as N by IC	NA	1.73	0.01	0.05	mg/L	
Nitrite as N by IC	NA	0.09	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15008		Prepared: 21-Dec-13		Analyzed: 03-Jan-14
Total Dissolved Phosphorus	NA	0.432	0.016	0.05	mg/L	
Sample ID: 24126-R1	MLMRP-002-30_VAND-8 Wet Weather-1	Matrix: Liquid		Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
	Method: SM 4500-P E	Batch ID: C-15008		Prepared: 02-Jan-14		Analyzed: 03-Jan-14
Total Phosphorus	NA	0.544	0.016	0.05	mg/L	
	Method: SM 4500-NH3 D	Batch ID: C-15009		Prepared: 06-Jan-14		Analyzed: 06-Jan-14
Ammonia as N		0.88	0.02	0.05	mg/L	
Sample ID: 24127-R1	MLMRP-002-30_VAND-9 Wet Weather-1	Matrix: Liquid		Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
	Method: SM 2540 D	Batch ID: C-15001		Prepared: 23-Dec-13		Analyzed: 23-Dec-13
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15017		Prepared: 23-Dec-13		Analyzed: 23-Dec-13



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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Total Dissolved Solids	NA	3	0.1	5	mg/L	J
Sample ID: 24129-R1	MLMRP-002-30_VAND-11 Wet Weather-1	Matrix: Liquid		Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
	Method: SM 4500-P E	Batch ID: C-14155		Prepared: 20-Dec-13		Analyzed: 20-Dec-13
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-14156		Prepared: 20-Dec-13		Analyzed: 20-Dec-13
Nitrate as N by IC	NA	ND	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15008		Prepared: 21-Dec-13		Analyzed: 03-Jan-14
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 24130-R1	MLMRP-002-30_VAND-12 Wet Weather-	Matrix: Liquid		Sampled: 19-Dec-13 14:00		Received: 20-Dec-13
	Method: SM 4500-P E	Batch ID: C-15008		Prepared: 02-Jan-14		Analyzed: 03-Jan-14
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15009		Prepared: 06-Jan-14		Analyzed: 06-Jan-14
Ammonia as N		0.05	0.02	0.05	mg/L	

QUALITY CONTROL

REPORT

TERRA FIDELITY AQUA AURA
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CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
-----------	----------	--------	-----	----	-------	-------------	---------------	------------	--------	-------------	--------	---------

Ammonia as N		Method: SM 4500-NH ₃ D			Fraction:		Prepared: 06-Jan-14			Analyzed: 06-Jan-14		
24114-B1	QAQC Procedural Blank	C-15009	ND	0.02	0.05	mg/L						
24114-BS1	QAQC Procedural Blank	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130%	PASS	
24114-BS2	QAQC Procedural Blank	C-15009	0.28	0.02	0.05	mg/L	0.25	0	112	70 - 130%	PASS	0 30 PASS
24118-MS1	MLMRP-002-10_ACAD-4	C-15009	0.39	0.02	0.05	mg/L	0.25	0.12	108	70 - 130%	PASS	
24118-MS2	MLMRP-002-10_ACAD-4	C-15009	0.42	0.02	0.05	mg/L	0.25	0.12	120	70 - 130%	PASS	11 30 PASS
24118-R2	MLMRP-002-10_ACAD-4	C-15009	0.12	0.02	0.05	mg/L						0 30 PASS

Nitrate as N by IC		Method: EPA 300.0			Fraction: NA		Prepared: 20-Dec-13			Analyzed: 20-Dec-13		
24114-B1	QAQC Procedural Blank	C-14156	ND	0.01	0.05	mg/L						
24114-BS1	QAQC Procedural Blank	C-14156	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130%	PASS	
24114-BS2	QAQC Procedural Blank	C-14156	0.12	0.01	0.05	mg/L	0.11	0	109	70 - 130%	PASS	9 30 PASS
24117-MS1	MLMRP-002-10_ACAD-3	C-14156	1.06	0.01	0.05	mg/L	0.11	0.96	91	70 - 130%	PASS	
24117-MS2	MLMRP-002-10_ACAD-3	C-14156	1.06	0.01	0.05	mg/L	0.11	0.96	91	70 - 130%	PASS	0 30 PASS
24117-R2	MLMRP-002-10_ACAD-3	C-14156	0.96	0.01	0.05	mg/L						0 30 PASS

Nitrite as N by IC		Method: EPA 300.0			Fraction: NA		Prepared: 20-Dec-13			Analyzed: 20-Dec-13		
24114-B1	QAQC Procedural Blank	C-14156	ND	0.01	0.05	mg/L						
24114-BS1	QAQC Procedural Blank	C-14156	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130%	PASS	
24114-BS2	QAQC Procedural Blank	C-14156	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	7 30 PASS
24117-MS1	MLMRP-002-10_ACAD-3	C-14156	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130%	PASS	
24117-MS2	MLMRP-002-10_ACAD-3	C-14156	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130%	PASS	0 30 PASS
24117-R2	MLMRP-002-10_ACAD-3	C-14156	ND	0.01	0.05	mg/L						0 30 PASS

Total Dissolved Phosphorus		Method: SM 4500-P E			Fraction: NA		Prepared: 21-Dec-13			Analyzed: 03-Jan-14		
24114-B1	QAQC Procedural Blank	C-15008	ND	0.016	0.05	mg/L						
24114-BS1	QAQC Procedural Blank	C-15008	0.298	0.016	0.05	mg/L	0.3	0	99	70 - 130%	PASS	
24114-BS2	QAQC Procedural Blank	C-15008	0.313	0.016	0.05	mg/L	0.3	0	104	70 - 130%	PASS	5 30 PASS

Total Dissolved Solids		Method: SM 2540 C			Fraction: NA		Prepared: 23-Dec-13			Analyzed: 23-Dec-13		
24114-B1	QAQC Procedural Blank	C-15017	ND	0.1	5	mg/L						
24114-BS1	QAQC Procedural Blank	C-15017	25660	0.1	5	mg/L	24959	0	103	70 - 130%	PASS	



1904 E. Wright Circle, Anaheim CA 92806

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fax: (714) 602-5321

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info@physislabs.com

CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

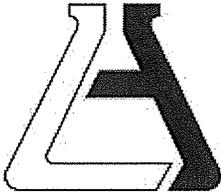
SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE			
								LIMITS	LIMITS				
24114-BS2	QAQC Procedural Blank	C-15017	71300	0.1	5	mg/L	69684	0	102	70 - 130% PASS	1	30	PASS
24115-R2	MLMRP-002-10_ACAD-1	C-15017	848	0.1	5	mg/L					1	30	PASS
Total Orthophosphate as P		Method: SM 4500-P E		Fraction: NA		Prepared: 20-Dec-13			Analyzed: 20-Dec-13				
24114-B1	QAQC Procedural Blank	C-14155	ND	0.01	0.02	mg/L							
24114-BS1	QAQC Procedural Blank	C-14155	0.19	0.01	0.02	mg/L	0.2	0	95	70 - 130% PASS			
24114-BS2	QAQC Procedural Blank	C-14155	0.2	0.01	0.02	mg/L	0.2	0	100	70 - 130% PASS	5	30	PASS
24117-MS1	MLMRP-002-10_ACAD-3	C-14155	0.41	0.01	0.02	mg/L	0.2	0.21	100	70 - 130% PASS			
24117-MS2	MLMRP-002-10_ACAD-3	C-14155	0.42	0.01	0.02	mg/L	0.2	0.21	105	70 - 130% PASS	5	30	PASS
24117-R2	MLMRP-002-10_ACAD-3	C-14155	0.21	0.01	0.02	mg/L					0	30	PASS
Total Phosphorus		Method: SM 4500-P E		Fraction: NA		Prepared: 02-Jan-14			Analyzed: 03-Jan-14				
24114-B1	QAQC Procedural Blank	C-15008	ND	0.016	0.05	mg/L							
24114-BS1	QAQC Procedural Blank	C-15008	0.298	0.016	0.05	mg/L	0.3	0	99	70 - 130% PASS			
24114-BS2	QAQC Procedural Blank	C-15008	0.313	0.016	0.05	mg/L	0.3	0	104	70 - 130% PASS	5	30	PASS
Total Suspended Solids		Method: SM 2540 D		Fraction: NA		Prepared: 23-Dec-13			Analyzed: 23-Dec-13				
24114-B1	QAQC Procedural Blank	C-15001	ND	0.5	0.5	mg/L							
24119-R2	MLMRP-002-30_VAND-1	C-15001	18.2	0.5	0.5	mg/L					7	30	PASS

SUBCONTRACT

REPORT

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



Associated Laboratories

806 N. Batavia - Orange, CA 92868
Tel (714)771-6900 Fax (714)538-1209
www.associatedlabs.com
Info@associatedlabs.com



Client: PHYSIS Environmental Laboratories, Inc.
Address: 1904 E. Wright Circle
Anaheim, CA 92806

Lab Request: 334107
Report Date: 01/08/2014
Date Received: 12/23/2013
Client ID: 13622

Attn: Misty Mercier

Comments: Project #1311002-003

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

<u>Sample #</u>	<u>Client Sample ID</u>
334107-001	MLMRP-002-10_ACAD-2
334107-002	MLMRP-002-30_VAND-2
334107-003	MLMRP-002-30_VAND-6
334107-004	MLMRP-002-30_VAND-10

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

Nina Prasad
President

NOTE: Unless notified in writing , all samples will be discarded by appropriate disposal protocol 45 days from date reported.

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TESTING & CONSULTING
Chemical
Microbiological
Environmental

Matrix: Water **Client:** PHYSIS Environmental Laboratories, Inc. **Collector:** Client
Sampled: 12/19/2013 14:00 **Site:**
Sample #: 334107-001 **Client Sample #:** MLMRP-002-10_ACAD-2 **Sample Type:**

Analyte	Result	DF	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1142913				
Total Kjeldahl Nitrogen	0.4	1	0.4	mg/L	01/06/14	trinh	

Matrix: Water **Client:** PHYSIS Environmental Laboratories, Inc. **Collector:** Client
Sampled: 12/19/2013 14:00 **Site:**
Sample #: 334107-002 **Client Sample #:** MLMRP-002-30_VAND-2 **Sample Type:**

Analyte	Result	DF	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1142913				
Total Kjeldahl Nitrogen	2.69	1	0.4	mg/L	01/06/14	trinh	

Matrix: Water **Client:** PHYSIS Environmental Laboratories, Inc. **Collector:** Client
Sampled: 12/19/2013 14:00 **Site:**
Sample #: 334107-003 **Client Sample #:** MLMRP-002-30_VAND-6 **Sample Type:**

Analyte	Result	DF	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1142913				
Total Kjeldahl Nitrogen	2.67	1	0.4	mg/L	01/06/14	trinh	

Matrix: Water **Client:** PHYSIS Environmental Laboratories, Inc. **Collector:** Client
Sampled: 12/19/2013 14:00 **Site:**
Sample #: 334107-004 **Client Sample #:** MLMRP-002-30_VAND-10 **Sample Type:**

Analyte	Result	DF	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1142913				
Total Kjeldahl Nitrogen	ND	1	0.4	mg/L	01/06/14	trinh	



QCBatchID: QC1142913	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 01/06/2014	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1142913MB1				
Total Kjeldahl Nitrogen	ND	mg/L	0.4	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	
QC1142913LCS1										
Total Kjeldahl Nitrogen	2.5		2.51		mg/L	100		80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	
QC1142913MS1, QC1142913MSD1											
Total Kjeldahl Nitrogen	1.34	12.5	12.5	14.4	13.6	mg/L	104	98	5.7	80-120	20

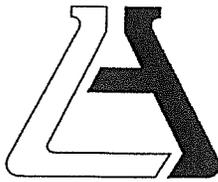
Source: 334217-001



Notes and Definitions

B	Analyte was present in an associated method blank. Associated sample data was reported with qualifier.
C	Laboratory Contamination.
D	The sample duplicate RPD was not within control limits, the sample data was reported without further clarification.
DF	Dilution Factor
DW	Sample result is calculated on a dry weigh basis
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
MDL	Method Detection Limit
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
ND	Analyte was not detected or was less than the detection limit.
P	Sample was received without proper preservation according to EPA guidelines.
Q1	Analyte Calibration Verification exceeds criteria and the result was reported with qualifier.
RDL	Reporting Detection Limit
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
T	Sample was extracted/analyzed past the holding time.
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.





ASSOCIATED LABORATORIES

806 North Batavia – Orange, California 92868 – 714-771-6900

FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1 Physis
 Client: _____ Project: _____
 Date Received: 12-23-13 Sampler's Name: Yes No
 Sample temperature: _____
 Sample(s) received in cooler: Yes No (Skip Section 2)
 Shipping Information: _____

Section 2
 Was the cooler packed with: ___ Ice Ice Packs ___ Bubble Wrap ___ Styrofoam
 ___ Paper ___ None ___ Other _____
 Cooler Temperature: 2.0c

(Acceptance range is 0 to 6 Deg. C. or arrival on ice; For Microbiology sample ≤10 Deg. C or arrival on ice)

Section 3	YES	NO	N/A
Was a COC received?	<input checked="" type="checkbox"/>		
Is it properly completed? (IDs, sampling date and time, signature, test)	<input checked="" type="checkbox"/>		
Were custody seals present?		<input checked="" type="checkbox"/>	
If Yes – were they intact?			<input checked="" type="checkbox"/>
Were all samples sealed in plastic bags?	<input checked="" type="checkbox"/>		
Did all samples arrive intact? If no, indicate below.	<input checked="" type="checkbox"/>		
Did all bottle labels agree with COC? (ID, dates and times)	<input checked="" type="checkbox"/>		
Were correct containers used for the tests required?	<input checked="" type="checkbox"/>		
Was a sufficient amount of sample sent for tests indicated?	<input checked="" type="checkbox"/>		
Was there headspace in VOA vials?			<input checked="" type="checkbox"/>
Were the containers labeled with correct preservatives?	<input checked="" type="checkbox"/>		
Was total residual chlorine measured (Fish Bioassay samples only)? *			<input checked="" type="checkbox"/>

*: If the answer is no, please inform Fish Bioassay Dept. immediately.

Section 4
 Explanations/Comments

Section 5
 Was Project Manager notified of discrepancies: Y / N N/A
 Project Manager's response: _____

Completed By: M. E. [Signature] Date: 12/23/13

CHAIN of CUSTODY

SEND TO: Associated
334107

COMPANY NAME: Physis Environmental Laboratories, Inc. PROJECT NAME / NUMBER: 131 1002-003

PROJECT MANAGER: Misty Mercier EMAIL: sc@physislabs.com

COMPANY ADDRESS: 1904 E. Wright Circle, Anaheim, CA 92806 PHONE: 714 602-5320

TURNAROUND TIME: STANDARD RUSH SWAMP EDD other

REPORT FORMAT: PDF/EDD SWAMP EDD other

SPECIAL INSTRUCTIONS: please report results in dry weight

PHYSIS MATRIX CODES: SW = seawater, FW = freshwater, RW = rainwater, MW = wastewater, DW = drinking water, S = sediment, T = tissue, E = extract, Q = other (specify)

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	# of bottles	PROJECT NAME / NUMBER	PHYSIS SOS #	TYPE OF ICE USED	SHIPED VIA	COC PAGE
1	MLMRP-002-10_ACAD-2	12/19/13	14:00		1	131 1002-003	1311002	<input type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY	<input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS	1 of 1
2	MLMRP-002-30_VAND-2	12/19/13	14:00		1					
3	MLMRP-002-30_VAND-6	12/19/13	14:00		1					
4	MLMRP-002-30_VAND-10	12/19/13	14:00		1					
5										
6										
7										
8										
9										
10										

RELINQUISHED BY: Adam Idell (signature) RECEIVED BY: M. Eckert (signature)

Physis Environmental Laboratories, Inc. 1904 E. Wright Circle, Anaheim, CA 92806. Date: 12/23/13, Time: 14:26.

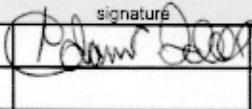
PHYSICS
CHAIN OF
CUSTODY

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CHAIN of CUSTODY

1311002-003

COMPANY NAME MWH		EMAIL nathan.griffin@mwhglobal.com		PROJECT NAME / NUMBER Machado Lake Monitoring & Reporting Program			COC PAGE 1 of 2 3												
PROJECT MANAGER Bronwyn Kelly		FAX 626-568-6101		PO #	PHYSIS SOS #	TYPE OF ICE USED <input checked="" type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY													
COMPANY ADDRESS 618 Michillinda Ave Arcadia, CA, 91007		PHONE 626-568-6187 office 949-322-1331 cell		SAMPLED BY		SHIPPED VIA <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Physis <input type="checkbox"/> other													
TURNAROUND TIME <input type="checkbox"/> STANDARD (15-20 business days) <input type="checkbox"/> RUSH business days				REQUESTED ANALYSES <small>PLEASE SEE PHYSIS SOS</small>															
REPORT FORMAT <input type="checkbox"/> PHYSIS PDF/EDD <input type="checkbox"/> SWAMP EDD <input type="checkbox"/> other																			
SPECIAL INSTRUCTIONS																			
PHYSIS MATRIX CODES <u>SW</u> = seawater <u>FW</u> = freshwater <u>RW</u> = rainwater <u>WW</u> = wastewater <u>DW</u> = drinking water <u>S</u> = sediment <u>T</u> = tissue <u>E</u> = extract <u>O</u> = other (specify)																			
SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	# of bottles	TSS and TDS	TKN	Nitrite, Nitrate, Dissolved P, Total Orthophosphate	Ammonia & Total Phosphorus										
1	MLMRP-002-10_ACAD-1	Wet Weather -1	12/19	2:00 P			X												
2	MLMRP-002-10_ACAD-2	Wet Weather -1	12/19	2:00 P				X											
3	MLMRP-002-10_ACAD-3	Wet Weather -1	12/19	2:00 P					X										
4	MLMRP-002-10_ACAD-4	Wet Weather -1	12/19	2:00 P						X									
5	MLMRP-002-10_ACAD-5	Wet Weather -1					X												
6	MLMRP-002-10_ACAD-6	Wet Weather -1					X												
7	MLMRP-002-10_ACAD-7	Wet Weather -1					X												
8	MLMRP-002-10_ACAD-8	Wet Weather -1					X												
9	MLMRP-002-10_ACAD-9	Wet Weather -1					X												
10	MLMRP-002-10_ACAD-10	Wet Weather -1					X												
RELINQUISHED BY print: ADNAN ANABTAWI signature:  company: MWH date & time: 12/20 10:40				RECEIVED BY print: Adam J. Kelly signature:  company: Physis date & time: 12/20/13 10:40															

Q4 Dry Weather Monitoring Event
January 16, 2014

February 06, 2014

Bronwyn K Kelly
MWH Americas, Inc.
618 Michillinda Avenue
Suite 200
Arcadia, CA 91107-

Project Name: Machado Lake TMDL
Physis Project ID: 1311002-004

Dear Bronwyn,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 1/16/2014. A total of 12 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Total Suspended Solids by SM 2540 D
Total Phosphorus by SM 4500-P E
Total Orthophosphate as P by SM 4500-P E
Total Dissolved Solids by SM 2540 C
Total Dissolved Phosphorus by SM 4500-P E
Nitrite as N by IC by EPA 300.0
Nitrate as N by IC by EPA 300.0
Ammonia as N by SM 4500-NH ₃ D
Subcontract
Total Kjeldahl Nitrogen by EPA 351.2

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
Extension 202
714-335-5918 cell
mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

MATRIX SPIKES: MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

BLANK SPIKES: BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

CERTIFIED REFERENCE MATERIALS: CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

SURROGATES: Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's

concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

PHYSICS

PANALYTICAL

TERRA AURA
REPORT

ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



1904 E. Wright Circle, Anaheim CA 92806

main: (714) 602-5320

fax: (714) 602-5321

www.physislabs.com

info@physislabs.com

CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 24190-R1	MLMRP-003-3O_VAND-1 Q4 DRY Weath	Matrix: Liquid		Sampled: 16-Jan-14	8:07	Received: 16-Jan-14
	Method: SM 2540 D	Batch ID: C-15034		Prepared: 21-Jan-14		Analyzed: 21-Jan-14
Total Suspended Solids	NA	14.6	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15037		Prepared: 22-Jan-14		Analyzed: 22-Jan-14
Total Dissolved Solids	NA	1048	0.1	5	mg/L	
Sample ID: 24192-R1	MLMRP-003-3O_VAND-3 Q4 DRY Weath	Matrix: Liquid		Sampled: 16-Jan-14	8:13	Received: 16-Jan-14
	Method: SM 4500-P E	Batch ID: C-15028		Prepared: 17-Jan-14		Analyzed: 17-Jan-14
Total Orthophosphate as P	NA	0.22	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-15031		Prepared: 17-Jan-14		Analyzed: 17-Jan-14
Nitrate as N by IC		0.49	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15056		Prepared: 18-Jan-14		Analyzed: 05-Feb-14
Total Dissolved Phosphorus	NA	0.285	0.016	0.05	mg/L	
Sample ID: 24193-R1	MLMRP-003-3O_VAND-4 Q4 DRY Weath	Matrix: Liquid		Sampled: 16-Jan-14	8:14	Received: 16-Jan-14
	Method: SM 4500-NH ₃ D	Batch ID: C-15036		Prepared: 22-Jan-14		Analyzed: 22-Jan-14
Ammonia as N		0.03	0.02	0.05	mg/L	J
	Method: SM 4500-P E	Batch ID: C-15056		Prepared: 05-Feb-14		Analyzed: 05-Feb-14
Total Phosphorus	NA	0.346	0.016	0.05	mg/L	
Sample ID: 24194-R1	MLMRP-003-3O_VAND-5 Q4 DRY Weath	Matrix: Liquid		Sampled: 16-Jan-14	8:10	Received: 16-Jan-14
	Method: SM 2540 D	Batch ID: C-15034		Prepared: 21-Jan-14		Analyzed: 21-Jan-14
Total Suspended Solids	NA	9.6	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15037		Prepared: 22-Jan-14		Analyzed: 22-Jan-14
Total Dissolved Solids	NA	1032	0.1	5	mg/L	
Sample ID: 24196-R1	MLMRP-003-3O_VAND-7 Q4 DRY Weath	Matrix: Liquid		Sampled: 16-Jan-14	8:13	Received: 16-Jan-14
	Method: SM 4500-P E	Batch ID: C-15028		Prepared: 17-Jan-14		Analyzed: 17-Jan-14
Total Orthophosphate as P	NA	0.22	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-15031		Prepared: 17-Jan-14		Analyzed: 17-Jan-14
Nitrate as N by IC		0.48	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	



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ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
	Method: SM 4500-P E	Batch ID: C-15056		Prepared: 18-Jan-14		Analyzed: 05-Feb-14
Total Dissolved Phosphorus	NA	0.315	0.016	0.05	mg/L	
Sample ID: 24197-R1	MLMRP-003-3O_VAND-8 Q4 DRY Weath	Matrix: Liquid		Sampled: 16-Jan-14	8:14	Received: 16-Jan-14
	Method: SM 4500-NH3 D	Batch ID: C-15036		Prepared: 22-Jan-14		Analyzed: 22-Jan-14
Ammonia as N		0.03	0.02	0.05	mg/L	J
	Method: SM 4500-P E	Batch ID: C-15056		Prepared: 05-Feb-14		Analyzed: 05-Feb-14
Total Phosphorus	NA	0.339	0.016	0.05	mg/L	
Sample ID: 24198-R1	MLMRP-003-3O_VAND-9 Q4 DRY Weath	Matrix: Liquid		Sampled: 16-Jan-14	8:16	Received: 16-Jan-14
	Method: SM 2540 D	Batch ID: C-15034		Prepared: 21-Jan-14		Analyzed: 21-Jan-14
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15037		Prepared: 22-Jan-14		Analyzed: 22-Jan-14
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
Sample ID: 24200-R1	MLMRP-003-3O_VAND-11 Q4 DRY Weat	Matrix: Liquid		Sampled: 16-Jan-14	8:17	Received: 16-Jan-14
	Method: SM 4500-P E	Batch ID: C-15028		Prepared: 17-Jan-14		Analyzed: 17-Jan-14
Total Orthophosphate as P	NA	0.01	0.01	0.02	mg/L	J
	Method: EPA 300.0	Batch ID: C-15031		Prepared: 17-Jan-14		Analyzed: 17-Jan-14
Nitrate as N by IC		ND	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15057		Prepared: 18-Jan-14		Analyzed: 06-Feb-14
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 24201-R1	MLMRP-003-3O_VAND-12 Q4 DRY Weat	Matrix: Liquid		Sampled: 16-Jan-14	8:18	Received: 16-Jan-14
	Method: SM 4500-NH3 D	Batch ID: C-15036		Prepared: 22-Jan-14		Analyzed: 22-Jan-14
Ammonia as N		ND	0.02	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15056		Prepared: 05-Feb-14		Analyzed: 05-Feb-14
Total Phosphorus	NA	ND	0.016	0.05	mg/L	

PHYSICS

QUALITY CONTROL

REPORT

TERRA F... AQUA AURA
ENVIRONMENTAL LABORATORIES, INC.

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CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
Ammonia as N		Method: SM 4500-NH₃ D			Fraction:		Prepared: 22-Jan-14		Analyzed: 22-Jan-14			
24189-B1	QAQC Procedural Blank	C-15036	ND	0.02	0.05	mg/L						
24189-BS1	QAQC Procedural Blank	C-15036	0.25	0.02	0.05	mg/L	0.25	0	100	70 - 130%	PASS	
24189-BS2	QAQC Procedural Blank	C-15036	0.25	0.02	0.05	mg/L	0.25	0	100	70 - 130%	PASS	0 30 PASS
24193-MS1	MLMRP-003-3O_VAND-	C-15036	0.22	0.02	0.05	mg/L	0.25	0.03	76	70 - 130%	PASS	
24193-MS2	MLMRP-003-3O_VAND-	C-15036	0.25	0.02	0.05	mg/L	0.25	0.03	88	70 - 130%	PASS	15 30 PASS
24193-R2	MLMRP-003-3O_VAND-	C-15036	0.03	0.02	0.05	mg/L						0 30 PASS J
Nitrate as N by IC		Method: EPA 300.0			Fraction:		Prepared: 17-Jan-14		Analyzed: 17-Jan-14			
24189-B1	QAQC Procedural Blank	C-15031	ND	0.01	0.05	mg/L						
24189-BS1	QAQC Procedural Blank	C-15031	0.12	0.01	0.05	mg/L	0.11	0	109	70 - 130%	PASS	
24189-BS2	QAQC Procedural Blank	C-15031	0.12	0.01	0.05	mg/L	0.11	0	109	70 - 130%	PASS	0 30 PASS
24192-MS1	MLMRP-003-3O_VAND-	C-15031	0.61	0.01	0.05	mg/L	0.11	0.49	109	70 - 130%	PASS	
24192-MS2	MLMRP-003-3O_VAND-	C-15031	0.62	0.01	0.05	mg/L	0.11	0.49	118	70 - 130%	PASS	8 30 PASS
24192-R2	MLMRP-003-3O_VAND-	C-15031	0.49	0.01	0.05	mg/L						0 30 PASS
Nitrite as N by IC		Method: EPA 300.0			Fraction: NA		Prepared: 17-Jan-14		Analyzed: 17-Jan-14			
24189-B1	QAQC Procedural Blank	C-15031	ND	0.01	0.05	mg/L						
24189-BS1	QAQC Procedural Blank	C-15031	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	
24189-BS2	QAQC Procedural Blank	C-15031	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	0 30 PASS
24192-MS1	MLMRP-003-3O_VAND-	C-15031	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130%	PASS	
24192-MS2	MLMRP-003-3O_VAND-	C-15031	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130%	PASS	0 30 PASS
24192-R2	MLMRP-003-3O_VAND-	C-15031	ND	0.01	0.05	mg/L						0 30 PASS
Total Dissolved Phosphorus		Method: SM 4500-P E			Fraction: NA		Prepared: 18-Jan-14		Analyzed: 05-Feb-14			
24189-B1	QAQC Procedural Blank	C-15056	ND	0.016	0.05	mg/L						
24189-BS1	QAQC Procedural Blank	C-15056	0.345	0.016	0.05	mg/L	0.3	0	115	70 - 130%	PASS	
24189-BS2	QAQC Procedural Blank	C-15056	0.351	0.016	0.05	mg/L	0.3	0	117	70 - 130%	PASS	2 30 PASS
24196-MS1	MLMRP-003-3O_VAND-	C-15056	0.616	0.016	0.05	mg/L	0.3	0.302	105	70 - 130%	PASS	
24196-MS2	MLMRP-003-3O_VAND-	C-15056	0.622	0.016	0.05	mg/L	0.3	0.302	107	70 - 130%	PASS	2 30 PASS
24196-R2	MLMRP-003-3O_VAND-	C-15056	0.289	0.016	0.05	mg/L						9 30 PASS



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Conventionals

QUALITY CONTROL REPORT

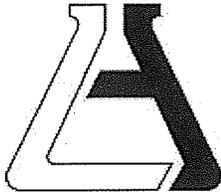
SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
Total Dissolved Solids		Method: SM 2540 C			Fraction: NA		Prepared: 22-Jan-14		Analyzed: 22-Jan-14			
24189-B1	QAQC Procedural Blank	C-15037	ND	0.1	5	mg/L						
24189-BS1	QAQC Procedural Blank	C-15037	25691	0.1	5	mg/L	25320	0	101	70 - 130%	PASS	
24189-BS2	QAQC Procedural Blank	C-15037	70741	0.1	5	mg/L	70453	0	100	70 - 130%	PASS	1 30 PASS
24190-R2	MLMRP-003-3O_VAND-	C-15037	1038	0.1	5	mg/L						1 30 PASS
Total Orthophosphate as P		Method: SM 4500-P E			Fraction: NA		Prepared: 17-Jan-14		Analyzed: 17-Jan-14			
24189-B1	QAQC Procedural Blank	C-15028	ND	0.01	0.02	mg/L						
24189-BS1	QAQC Procedural Blank	C-15028	0.19	0.01	0.02	mg/L	0.2	0	95	70 - 130%	PASS	
24189-BS2	QAQC Procedural Blank	C-15028	0.18	0.01	0.02	mg/L	0.2	0	90	70 - 130%	PASS	5 30 PASS
24192-MS1	MLMRP-003-3O_VAND-	C-15028	0.41	0.01	0.02	mg/L	0.2	0.22	95	70 - 130%	PASS	
24192-MS2	MLMRP-003-3O_VAND-	C-15028	0.41	0.01	0.02	mg/L	0.2	0.22	95	70 - 130%	PASS	0 30 PASS
24192-R2	MLMRP-003-3O_VAND-	C-15028	0.22	0.01	0.02	mg/L						0 30 PASS
Total Phosphorus		Method: SM 4500-P E			Fraction: NA		Prepared: 05-Feb-14		Analyzed: 05-Feb-14			
24189-B1	QAQC Procedural Blank	C-15056	ND	0.016	0.05	mg/L						
24189-BS1	QAQC Procedural Blank	C-15056	0.345	0.016	0.05	mg/L	0.3	0	115	70 - 130%	PASS	
24189-BS2	QAQC Procedural Blank	C-15056	0.351	0.016	0.05	mg/L	0.3	0	117	70 - 130%	PASS	2 30 PASS
24197-MS1	MLMRP-003-3O_VAND-	C-15056	0.669	0.016	0.05	mg/L	0.3	0.339	110	70 - 130%	PASS	
24197-MS2	MLMRP-003-3O_VAND-	C-15056	0.674	0.016	0.05	mg/L	0.3	0.339	112	70 - 130%	PASS	2 30 PASS
24197-R2	MLMRP-003-3O_VAND-	C-15056	0.339	0.016	0.05	mg/L						0 30 PASS
Total Suspended Solids		Method: SM 2540 D			Fraction: NA		Prepared: 21-Jan-14		Analyzed: 21-Jan-14			
24189-B1	QAQC Procedural Blank	C-15034	ND	0.5	0.5	mg/L						
24190-R2	MLMRP-003-3O_VAND-	C-15034	7.1	0.5	0.5	mg/L						69 30 FAIL NH

SUBCONTRACT

REPORT

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



Associated Laboratories

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Client: PHYSIS Environmental Laboratories, Inc.
Address: 1904 E. Wright Circle
Anaheim, CA 92806

Lab Request: 335346
Report Date: 02/03/2014
Date Received: 01/24/2014
Client ID: 13622

Attn: Misty Mercier

Comments: Project #1311002-004

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

<u>Sample #</u>	<u>Client Sample ID</u>
335346-001	MLMRP-003-3O_VAND-2
335346-002	MLMRP-003-3O_VAND-6
335346-003	MLMRP-003-3O_VAND-10

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

Nina Prasad
President

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 45 days from date reported.

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TESTING & CONSULTING
Chemical
Microbiological
Environmental

QCBatchID: QC1143386	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 01/27/2014	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1143386MB1				
Total Kjeldahl Nitrogen	ND	mg/L	0.4	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries		Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	
QC1143386LCS1										
Total Kjeldahl Nitrogen	2.5		2.37		mg/L	95		80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries		Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	
QC1143386MS1, QC1143386MSD1											
Total Kjeldahl Nitrogen	0.4	12.5	12.5	12.7	12.6	mg/L	98	98	0.8	80-120	20

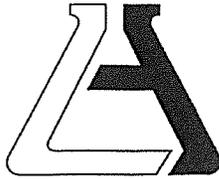
Source: 335345-001



Notes and Definitions

B	Analyte was present in an associated method blank. Associated sample data was reported with qualifier.
C	Laboratory Contamination.
D	The sample duplicate RPD was not within control limits, the sample data was reported without further clarification.
DF	Dilution Factor
DW	Sample result is calculated on a dry weigh basis
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
MDL	Method Detection Limit
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
ND	Analyte was not detected or was less than the detection limit.
P	Sample was received without proper preservation according to EPA guidelines.
Q1	Analyte Calibration Verification exceeds criteria and the result was reported with qualifier.
Q2	Analyte calibration was not verified and the result was estimated and reported with qualifier.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated and reported with qualifier.
RDL	Reporting Detection Limit
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
T	Sample was extracted/analyzed past the holding time.
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
TIC	Tentatively Identified Compounds





ASSOCIATED LABORATORIES

806 North Batavia – Orange, California 92868 – 714-771-6900

FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1
 Client: PHYSIS ENVIRO- Project: 1311002-004
 Date Received: 1/24/14 Sampler's Name: Yes No
 Sample temperature: _____
 Sample(s) received in cooler: Yes No (Skip Section 2)
 Shipping Information: _____

Section 2
 Was the cooler packed with: Ice Ice Packs Bubble Wrap Styrofoam
 Paper None Other _____
 Cooler Temperature: 5°C

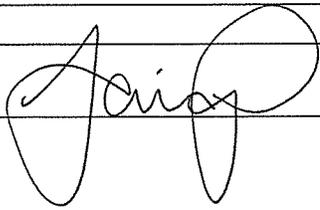
(Acceptance range is 0 to 6 Deg. C. or arrival on ice; For Microbiology sample ≤ 10 Deg. C or arrival on ice)

Section 3	YES	NO	N/A
Was a COC received?	<input checked="" type="checkbox"/>		
Is it properly completed? (IDs, sampling date and time, signature, test)	<input checked="" type="checkbox"/>		
Were custody seals present?		<input checked="" type="checkbox"/>	
If Yes – were they intact?			<input checked="" type="checkbox"/>
Were all samples sealed in plastic bags?	<input checked="" type="checkbox"/>		
Did all samples arrive intact? If no, indicate below.	<input checked="" type="checkbox"/>		
Did all bottle labels agree with COC? (ID, dates and times)	<input checked="" type="checkbox"/>		
Were correct containers used for the tests required?	<input checked="" type="checkbox"/>		
Was a sufficient amount of sample sent for tests indicated?	<input checked="" type="checkbox"/>		
Was there headspace in VOA vials?			<input checked="" type="checkbox"/>
Were the containers labeled with correct preservatives?	<input checked="" type="checkbox"/>		
Was total residual chlorine measured (Fish Bioassay samples only)? *			<input checked="" type="checkbox"/>

*: If the answer is no, please inform Fish Bioassay Dept. immediately.

Section 4
 Explanations/Comments

Section 5
 Was Project Manager notified of discrepancies: Y / N N/A
 Project Manager's response: _____

Completed By:  Date: 1/24/14

PHYSICS
CHAIN OF
CUSTODY

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature

CHAIN of CUSTODY

COMPANY NAME MWH	EMAIL nathan.griffin@mwhglobal.com	PROJECT NAME / NUMBER Machado Lake Monitoring & Reporting Program	COC PAGE 1 of 2
PROJECT MANAGER Bronwyn Kelly	FAX 626-568-6101	PO #	PHYSIS SOS #
COMPANY ADDRESS 618 Michillinda Ave Arcadia, CA, 91007	PHONE 626-568-6187 office 949-322-1331 cell	TYPE OF ICE USED <input checked="" type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY	
TURNAROUND TIME <input type="checkbox"/> STANDARD (15-20 business days) <input type="checkbox"/> RUSH business days		SHIPPED VIA <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Physis <input type="checkbox"/> other	

REQUESTED ANALYSES

PLEASE SEE PHYSIS SOS

REPORT FORMAT
 PHYSIS PDF/EDD SWAMP EDD other

SPECIAL INSTRUCTIONS

PHYSIS MATRIX CODES
SW = seawater FW = freshwater RW = rainwater
WW = wastewater DW = drinking water
S = sediment T = tissue E = extract O = other (specify)

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE		physis matrix code	# of bottles	TSS and TDS	TKN	Nitrate, Nitrate, Dissolved P., Total Orthophosphate	Ammonia & Total Phosphorus													
		date	time																			
1	MLMRP-003-30_VAND-1	Q4 Dry Weather	1/16/14	0807	2	X																
2	MLMRP-003-30_VAND-2	Q4 Dry Weather	1/16/14	0811	1		X															
3	MLMRP-003-30_VAND-3	Q4 Dry Weather	1/16/14	0813	1			X														
4	MLMRP-003-30_VAND-4	Q4 Dry Weather	1/16/14	0814	1				X													
5	MLMRP-003-30_VAND-5	Q4 Dry Weather	1/16/14	0810	1	X																
6	MLMRP-003-30_VAND-6	Q4 Dry Weather	1/16/14	0812	1		X															
7	MLMRP-003-30_VAND-7	Q4 Dry Weather	1/16/14	0813	1			X														
8	MLMRP-003-30_VAND-8	Q4 Dry Weather	1/16/14	0814	1				X													
9	MLMRP-003-30_VAND-9	Q4 Dry Weather	1/16/14	0816	1	X																
10	MLMRP-003-30_VAND-10	Q4 Dry Weather	1/16/14	0816	1		X															

RELINQUISHED BY				RECEIVED BY			
print	signature	company	date & time	print	signature	company	date & time
Nathan Griffin	<i>[Signature]</i>	MWH	1/16/14 3:06	MIKE HOEHN	<i>[Signature]</i>	B.L. Hall	1/16/14 3:26 pm
MIKE HOEHN	<i>[Signature]</i>	B.L. Hall	1/16/14 3:01	Adam Tol	<i>[Signature]</i>	Physis	1/16/14 17:01

CHAIN of CUSTODY

COMPANY NAME MWH		EMAIL nathan.griffin@mwhglobal.com		PROJECT NAME / NUMBER Machado Lake Monitoring & Reporting Program			COC PAGE 2 of 2								
PROJECT MANAGER Bronwyn Kelly		FAX 626-568-6101		PO #	PHYSIS SOS #	TYPE OF ICE USED <input checked="" type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY									
COMPANY ADDRESS 618 Michillinda Ave Arcadia, CA, 91007		PHONE 626-568-6187 office 949-322-1331 cell		SAMPLED BY			SHIPPED VIA <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Physis <input type="checkbox"/> other								
TURNAROUND TIME <input type="checkbox"/> STANDARD (15-20 business days) <input type="checkbox"/> RUSH business days				REQUESTED ANALYSES <small>PLEASE SEE PHYSIS SOS</small>											
REPORT FORMAT <input type="checkbox"/> PHYSIS PDF/EDD <input type="checkbox"/> SWAMP EDD <input type="checkbox"/> other															
SPECIAL INSTRUCTIONS															
PHYSIS MATRIX CODES SW = seawater FW = freshwater RW = rainwater WW = wastewater DW = drinking water S = sediment T = tissue E = extract O = other (specify)															
SAMPLE ID		SAMPLE DESCRIPTION		SAMPLE date time		physis matrix code	# of bottles								
1	MLMRP-003-30_VAND-11	Q4 Dry Weather	1/16/14	0817			1	X							
2	MLMRP-003-30_VAND-12	Q4 Dry Weather	1/16/14	0818			1	X							
3															
4															
5															
6															
7															
8															
9															
10															
RELINQUISHED BY				RECEIVED BY											
print		signature		company		date & time		print		signature		company		date & time	
Nathan Griffin		<i>[Signature]</i>		MWH		1/16/14 3:00		Mike Hoehn		<i>[Signature]</i>		B.L. Hall Inc.		1/16/14 3:00 pm	
Mike Hoehn		<i>[Signature]</i>		B.L. Hall		1/16/14 5:00		Adam Eden		<i>[Signature]</i>		Physis		1/16/14 17:00	

February 0 , 2014

Bronwyn K Kelly
 MWH Americas, Inc.
 618 Michillinda Avenue
 Suite 200
 Arcadia, CA 91107-

Project Name: Machado Lake Monitoring & Reporting Program
 Physis Project ID: 1311002-005

Dear Bronwyn,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 1/16/2014. A total of 4 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Total Suspended Solids by SM 2540 D
Total Phosphorus by SM 4500-P E
Total Orthophosphate as P by SM 4500-P E
Total Dissolved Solids by SM 2540 C
Total Dissolved Phosphorus by SM 4500-P E
Nitrite as N by IC by EPA 300.0
Nitrate as N by IC by EPA 300.0
Ammonia as N by SM 4500-NH ₃ D
Subcontract
Total Kjeldahl Nitrogen by EPA 351.2

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
 Extension 202
 714-335-5918 cell
 mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

MATRIX SPIKES: MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

BLANK SPIKES: BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

CERTIFIED REFERENCE MATERIALS: CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

SURROGATES: Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's

concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

PHYSICS

PANALYTICAL

REPORT

TERRA AURA
ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



1904 E. Wright Circle, Anaheim CA 92806

main: (714) 602-5320

fax: (714) 602-5321

www.physislabs.com

info@physislabs.com

CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 24203-R1						
MLMRP-003-10_ACAD-1 Q4 Dry Weathe		Matrix: Liquid		Sampled: 16-Jan-14 13:25		Received: 16-Jan-14
Method: SM 2540 D		Batch ID: C-15034		Prepared: 21-Jan-14		Analyzed: 21-Jan-14
Total Suspended Solids	NA	13.1	0.5	0.5	mg/L	
Sample ID: 24205-R1						
MLMRP-003-10_ACAD-3 Q4 Dry Weathe		Matrix: Liquid		Sampled: 16-Jan-14 13:25		Received: 16-Jan-14
Method: SM 2540 C		Batch ID: C-15037		Prepared: 22-Jan-14		Analyzed: 22-Jan-14
Total Dissolved Solids	NA	835	0.1	5	mg/L	
Sample ID: 24205-R1						
MLMRP-003-10_ACAD-3 Q4 Dry Weathe		Matrix: Liquid		Sampled: 16-Jan-14 13:25		Received: 16-Jan-14
Method: SM 4500-P E		Batch ID: C-15028		Prepared: 17-Jan-14		Analyzed: 17-Jan-14
Total Orthophosphate as P	NA	0.22	0.01	0.02	mg/L	
Method: EPA 300.0		Batch ID: C-15031		Prepared: 17-Jan-14		Analyzed: 17-Jan-14
Nitrate as N by IC		ND	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
Method: SM 4500-P E		Batch ID: C-15056		Prepared: 17-Jan-14		Analyzed: 05-Feb-14
Total Dissolved Phosphorus	NA	0.264	0.016	0.05	mg/L	
Sample ID: 24206-R1						
MLMRP-003-10_ACAD-4 Q4 Dry Weathe		Matrix: Liquid		Sampled: 16-Jan-14 13:25		Received: 16-Jan-14
Method: SM 4500-NH ₃ D		Batch ID: C-15036		Prepared: 22-Jan-14		Analyzed: 22-Jan-14
Ammonia as N		0.13	0.02	0.05	mg/L	
Method: SM 4500-P E		Batch ID: C-15056		Prepared: 05-Feb-14		Analyzed: 05-Feb-14
Total Phosphorus	NA	0.298	0.016	0.05	mg/L	

QUALITY CONTROL

REPORT

TERRA FIDELITY AQUA AURA
ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



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CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
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Ammonia as N

Method: SM 4500-NH₃ D

Fraction:

Prepared: 22-Jan-14

Analyzed: 22-Jan-14

24202-B1	QAQC Procedural Blank	C-15036	ND	0.02	0.05	mg/L						
24202-BS1	QAQC Procedural Blank	C-15036	0.25	0.02	0.05	mg/L	0.25	0	100	70 - 130%	PASS	
24202-BS2	QAQC Procedural Blank	C-15036	0.25	0.02	0.05	mg/L	0.25	0	100	70 - 130%	PASS	0 30 PASS

Nitrate as N by IC

Method: EPA 300.0

Fraction:

Prepared: 17-Jan-14

Analyzed: 17-Jan-14

24202-B1	QAQC Procedural Blank	C-15031	ND	0.01	0.05	mg/L						
24202-BS1	QAQC Procedural Blank	C-15031	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	
24202-BS2	QAQC Procedural Blank	C-15031	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	0 30 PASS

Nitrite as N by IC

Method: EPA 300.0

Fraction: NA

Prepared: 17-Jan-14

Analyzed: 17-Jan-14

24202-B1	QAQC Procedural Blank	C-15031	ND	0.01	0.05	mg/L						
24202-BS1	QAQC Procedural Blank	C-15031	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	
24202-BS2	QAQC Procedural Blank	C-15031	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	0 30 PASS

Total Dissolved Phosphorus

Method: SM 4500-P E

Fraction: NA

Prepared: 17-Jan-14

Analyzed: 05-Feb-14

24202-B1	QAQC Procedural Blank	C-15056	ND	0.016	0.05	mg/L						
24202-BS1	QAQC Procedural Blank	C-15056	0.345	0.016	0.05	mg/L	0.3	0	115	70 - 130%	PASS	
24202-BS2	QAQC Procedural Blank	C-15056	0.351	0.016	0.05	mg/L	0.3	0	117	70 - 130%	PASS	2 30 PASS

Total Dissolved Solids

Method: SM 2540 C

Fraction: NA

Prepared: 22-Jan-14

Analyzed: 22-Jan-14

24202-B1	QAQC Procedural Blank	C-15037	ND	0.1	5	mg/L						
24202-BS1	QAQC Procedural Blank	C-15037	25691	0.1	5	mg/L	25320	0	101	70 - 130%	PASS	
24202-BS2	QAQC Procedural Blank	C-15037	70731	0.1	5	mg/L	70453	0	100	70 - 130%	PASS	1 30 PASS

Total Orthophosphate as P

Method: SM 4500-P E

Fraction: NA

Prepared: 17-Jan-14

Analyzed: 17-Jan-14

24202-B1	QAQC Procedural Blank	C-15028	ND	0.01	0.02	mg/L						
24202-BS1	QAQC Procedural Blank	C-15028	0.19	0.01	0.02	mg/L	0.2	0	95	70 - 130%	PASS	
24202-BS2	QAQC Procedural Blank	C-15028	0.18	0.01	0.02	mg/L	0.2	0	90	70 - 130%	PASS	5 30 PASS

Total Phosphorus

Method: SM 4500-P E

Fraction: NA

Prepared: 05-Feb-14

Analyzed: 05-Feb-14

24202-B1	QAQC Procedural Blank	C-15056	ND	0.016	0.05	mg/L						
24202-BS1	QAQC Procedural Blank	C-15056	0.345	0.016	0.05	mg/L	0.3	0	115	70 - 130%	PASS	



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www.physislabs.com

info@physislabs.com

CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE			
								LIMITS	LIMITS				
24202-BS2	QAQC Procedural Blank	C-15056	0.351	0.016	0.05	mg/L	0.3	0	117	70 - 130% PASS	2	30	PASS
Total Suspended Solids		Method: SM 2540 D		Fraction: NA		Prepared: 21-Jan-14		Analyzed: 21-Jan-14					
24202-B1	QAQC Procedural Blank	C-15034	ND	0.5	0.5	mg/L							

SUBCONTRACT

REPORT

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



Associated Laboratories

806 N. Batavia - Orange, CA 92868
Tel (714)771-6900 Fax (714)538-1209
www.associatedlabs.com
Info@associatedlabs.com



Client: PHYSIS Environmental Laboratories, Inc.
Address: 1904 E. Wright Circle
Anaheim, CA 92806

Lab Request: 335345
Report Date: 02/03/2014
Date Received: 01/24/2014
Client ID: 13622

Attn: Misty Mercier

Comments: Project #1311002-005

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

<u>Sample #</u>	<u>Client Sample ID</u>
335345-001	MLMRP-003- 10_ACAD-2

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

Nina Prasad
President

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 45 days from date reported.

The reports of the Associated Laboratories are confidential property of our clients and may not be reproduced or used for publication in part or in full without our written permission. This is for the mutual protection of the public, our clients, and ourselves.

TESTING & CONSULTING
Chemical
Microbiological
Environmental

Matrix: Water	Client: PHYSIS Environmental Laboratories, Inc.	Collector: Client
Sampled: 01/16/2014 13:25	Site:	
Sample #: <u>335345-001</u>	Client Sample #: MLMRP-003-10_ACAD-2	Sample Type:

Analyte	Result	DF	MDL	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method							
Total Kjeldahl Nitrogen	0.4	1	0.06	0.4	mg/L	01/27/14	trinh	QCBatchID: QC1143386



QCBatchID: QC1143386	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 01/27/2014	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1143386MB1				
Total Kjeldahl Nitrogen	ND	mg/L	0.4	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1143386LCS1											
Total Kjeldahl Nitrogen	2.5		2.37		mg/L	95			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
											Source: 335345-001	
QC1143386MS1, QC1143386MSD1												
Total Kjeldahl Nitrogen	0.4	12.5	12.5	12.7	12.6	mg/L	98	98	0.8	80-120	20	



Notes and Definitions

B	Analyte was present in an associated method blank. Associated sample data was reported with qualifier.
C	Laboratory Contamination.
D	The sample duplicate RPD was not within control limits, the sample data was reported without further clarification.
DF	Dilution Factor
DW	Sample result is calculated on a dry weigh basis
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
MDL	Method Detection Limit
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
ND	Analyte was not detected or was less than the detection limit.
P	Sample was received without proper preservation according to EPA guidelines.
Q1	Analyte Calibration Verification exceeds criteria and the result was reported with qualifier.
Q2	Analyte calibration was not verified and the result was estimated and reported with qualifier.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated and reported with qualifier.
RDL	Reporting Detection Limit
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
T	Sample was extracted/analyzed past the holding time.
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
TIC	Tentatively Identified Compounds





ASSOCIATED LABORATORIES

806 North Batavia – Orange, California 92868 – 714-771-6900

FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1
 Client: PHYSIS ENVIRO. Project: 1311002-005
 Date Received: 1/24/14 Sampler's Name: Yes No
 Sample temperature: _____
 Sample(s) received in cooler: Yes No (Skip Section 2)
 Shipping Information: _____

Section 2
 Was the cooler packed with: _____ Ice Ice Packs _____ Bubble Wrap _____ Styrofoam
 _____ Paper _____ None _____ Other _____
 Cooler Temperature: 5°C

(Acceptance range is 0 to 6 Deg. C. or arrival on ice; For Microbiology sample ≤10 Deg. C or arrival on ice)

Section 3	YES	NO	N/A
Was a COC received?	<input checked="" type="checkbox"/>		
Is it properly completed? (IDs, sampling date and time, signature, test)	<input checked="" type="checkbox"/>		
Were custody seals present?		<input checked="" type="checkbox"/>	
If Yes – were they intact?			<input checked="" type="checkbox"/>
Were all samples sealed in plastic bags?	<input checked="" type="checkbox"/>		
Did all samples arrive intact? If no, indicate below.	<input checked="" type="checkbox"/>		
Did all bottle labels agree with COC? (ID, dates and times)	<input checked="" type="checkbox"/>		
Were correct containers used for the tests required?	<input checked="" type="checkbox"/>		
Was a sufficient amount of sample sent for tests indicated?	<input checked="" type="checkbox"/>		
Was there headspace in VOA vials?			<input checked="" type="checkbox"/>
Were the containers labeled with correct preservatives?	<input checked="" type="checkbox"/>		
Was total residual chlorine measured (Fish Bioassay samples only)? *			<input checked="" type="checkbox"/>

*: If the answer is no, please inform Fish Bioassay Dept. immediately.

Section 4
 Explanations/Comments

Section 5
 Was Project Manager notified of discrepancies: Y / N N/A
 Project Manager's response: _____

Completed By:  Date: 1/24/14

PHYSICS
CHAIN OF
CUSTODY

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature

Wet Weather Monitoring Event No.2
February 2, 2014

February 21, 2014

Bronwyn K Kelly
 MWH Americas, Inc.
 618 Michillinda Avenue
 Suite 200
 Arcadia, CA 91107-

Project Name: Machado Lake TMDL
 Physis Project ID: 1311002-006

Dear Bronwyn,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 2/3/2014. A total of 16 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Total Suspended Solids by SM 2540 D
Total Phosphorus by SM 4500-P E
Total Orthophosphate as P by SM 4500-P E
Total Dissolved Solids by SM 2540 C
Total Dissolved Phosphorus by SM 4500-P E
Nitrite as N by IC by EPA 300.0
Nitrate as N by IC by EPA 300.0
Ammonia as N by SM 4500-NH ₃ D
Subcontract
Total Kjeldahl Nitrogen by EPA 351.2

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
 Extension 202
 714-335-5918 cell
 mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

MATRIX SPIKES: MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

BLANK SPIKES: BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

CERTIFIED REFERENCE MATERIALS: CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

SURROGATES: Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's

concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

PHYSICS

PANALYTICAL

REPORT

TERRA AURA
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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 24817-R1	MLMRP-004-10_ACAD-1	Matrix: Liquid				
	Method: SM 2540 D	Batch ID: C-15066				
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15067				
Total Dissolved Solids	NA	0.7	0.1	5	mg/L	J
Sample ID: 24819-R1	MLMRP-004-10_ACAD-3	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-15053				
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-15054				
Nitrate as N by IC	NA	ND	0.01	0.05	mg/L	
Nitrite as N by IC	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15072				
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 24820-R1	MLMRP-004-10_ACAD-4	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-15072				
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15079				
Ammonia as N	NA	ND	0.02	0.05	mg/L	
Sample ID: 24821-R1	MLMRP-004-10_ACAD-5	Matrix: Liquid				
	Method: SM 2540 D	Batch ID: C-15066				
Total Suspended Solids	NA	38.8	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15067				
Total Dissolved Solids	NA	179	0.1	5	mg/L	
Sample ID: 24823-R1	MLMRP-004-10_ACAD-7	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-15053				
Total Orthophosphate as P	NA	0.52	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-15054				
Nitrate as N by IC	NA	1.99	0.01	0.05	mg/L	
Nitrite as N by IC	NA	0.04	0.01	0.05	mg/L	J



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Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
	Method: SM 4500-P E	Batch ID: C-15072		Prepared: 05-Feb-14		Analyzed: 12-Feb-14
Total Dissolved Phosphorus	NA	0.532	0.016	0.05	mg/L	
Sample ID: 24824-R1	MLMRP-004-10_ACAD-8	Matrix: Liquid		Sampled: 03-Feb-14 4:00		Received: 03-Feb-14
	Method: SM 4500-P E	Batch ID: C-15072		Prepared: 11-Feb-14		Analyzed: 12-Feb-14
Total Phosphorus	NA	0.911	0.016	0.05	mg/L	
	Method: SM 4500-NH3 D	Batch ID: C-15079		Prepared: 14-Feb-14		Analyzed: 14-Feb-14
Ammonia as N	NA	0.54	0.02	0.05	mg/L	
Sample ID: 24825-R1	MLMRP-004-10_ACAD-9	Matrix: Liquid		Sampled: 03-Feb-14 4:00		Received: 03-Feb-14
	Method: SM 2540 D	Batch ID: C-15066		Prepared: 10-Feb-14		Analyzed: 10-Feb-14
Total Suspended Solids	NA	39.6	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15067		Prepared: 10-Feb-14		Analyzed: 10-Feb-14
Total Dissolved Solids	NA	183	0.1	5	mg/L	
Sample ID: 24827-R1	MLMRP-004-10_ACAD-11	Matrix: Liquid		Sampled: 03-Feb-14 4:00		Received: 03-Feb-14
	Method: SM 4500-P E	Batch ID: C-15053		Prepared: 04-Feb-14		Analyzed: 04-Feb-14
Total Orthophosphate as P	NA	0.59	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-15054		Prepared: 04-Feb-14		Analyzed: 04-Feb-14
Nitrate as N by IC	NA	1.99	0.01	0.05	mg/L	
Nitrite as N by IC	NA	0.04	0.01	0.05	mg/L	J
	Method: SM 4500-P E	Batch ID: C-15072		Prepared: 05-Feb-14		Analyzed: 12-Feb-14
Total Dissolved Phosphorus	NA	0.592	0.016	0.05	mg/L	
Sample ID: 24828-R1	MLMRP-004-10_ACAD-12	Matrix: Liquid		Sampled: 03-Feb-14 4:00		Received: 03-Feb-14
	Method: SM 4500-P E	Batch ID: C-15072		Prepared: 11-Feb-14		Analyzed: 12-Feb-14
Total Phosphorus	NA	0.803	0.016	0.05	mg/L	
	Method: SM 4500-NH3 D	Batch ID: C-15079		Prepared: 14-Feb-14		Analyzed: 14-Feb-14
Ammonia as N	NA	0.52	0.02	0.05	mg/L	
Sample ID: 24829-R1	MLMRP-004-30_VAND-1	Matrix: Liquid		Sampled: 03-Feb-14 3:20		Received: 03-Feb-14
	Method: SM 4500-P E	Batch ID: C-15053		Prepared: 04-Feb-14		Analyzed: 04-Feb-14
Total Orthophosphate as P	NA	0.54	0.01	0.02	mg/L	
	Method: EPA 300.0	Batch ID: C-15054		Prepared: 04-Feb-14		Analyzed: 04-Feb-14



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Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Nitrate as N by IC	NA	4.08	0.01	0.05	mg/L	
Nitrite as N by IC	NA	0.07	0.01	0.05	mg/L	
	Method: SM 2540 D	Batch ID: C-15066		Prepared: 10-Feb-14		Analyzed: 10-Feb-14
Total Suspended Solids	NA	82.7	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-15067		Prepared: 10-Feb-14		Analyzed: 10-Feb-14
Total Dissolved Solids	NA	213	0.1	5	mg/L	
	Method: SM 4500-P E	Batch ID: C-15072		Prepared: 05-Feb-14		Analyzed: 12-Feb-14
Total Dissolved Phosphorus	NA	0.617	0.016	0.05	mg/L	
Total Phosphorus	NA	0.94	0.016	0.05	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15079		Prepared: 14-Feb-14		Analyzed: 14-Feb-14
Ammonia as N	NA	1.33	0.02	0.05	mg/L	

QUALITY CONTROL

REPORT

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Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	PRECISION %	QA CODE	
Ammonia as N		Method: SM 4500-NH₃ D			Fraction: NA		Prepared: 14-Feb-14		Analyzed: 14-Feb-14		
24816-B1	QAQC Procedural Blank	C-15079	ND	0.02	0.05	mg/L					
24816-BS1	QAQC Procedural Blank	C-15079	0.25	0.02	0.05	mg/L	0.25	0	100	70 - 130% PASS	
24816-BS2	QAQC Procedural Blank	C-15079	0.25	0.02	0.05	mg/L	0.25	0	100	70 - 130% PASS	
24828-MS1	MLMRP-004-10_ACAD-1	C-15079	0.79	0.02	0.05	mg/L	0.25	0.53	104	70 - 130% PASS	
24828-MS2	MLMRP-004-10_ACAD-1	C-15079	0.81	0.02	0.05	mg/L	0.25	0.53	112	70 - 130% PASS	
24828-R2	MLMRP-004-10_ACAD-1	C-15079	0.53	0.02	0.05	mg/L				7 30 PASS	
										2 30 PASS	
Nitrate as N by IC		Method: EPA 300.0			Fraction: NA		Prepared: 04-Feb-14		Analyzed: 04-Feb-14		
24816-B1	QAQC Procedural Blank	C-15054	ND	0.01	0.05	mg/L					
24816-BS1	QAQC Procedural Blank	C-15054	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130% PASS	
24816-BS2	QAQC Procedural Blank	C-15054	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130% PASS	
24823-MS1	MLMRP-004-10_ACAD-7	C-15054	2.09	0.01	0.05	mg/L	0.11	1.99	91	70 - 130% PASS	
24823-MS2	MLMRP-004-10_ACAD-7	C-15054	2.08	0.01	0.05	mg/L	0.11	1.99	82	70 - 130% PASS	
24823-R2	MLMRP-004-10_ACAD-7	C-15054	1.99	0.01	0.05	mg/L				10 30 PASS	
										0 30 PASS	
Nitrite as N by IC		Method: EPA 300.0			Fraction: NA		Prepared: 04-Feb-14		Analyzed: 04-Feb-14		
24816-B1	QAQC Procedural Blank	C-15054	ND	0.01	0.05	mg/L					
24816-BS1	QAQC Procedural Blank	C-15054	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130% PASS	
24816-BS2	QAQC Procedural Blank	C-15054	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130% PASS	
24823-MS1	MLMRP-004-10_ACAD-7	C-15054	0.18	0.01	0.05	mg/L	0.15	0.04	93	70 - 130% PASS	
24823-MS2	MLMRP-004-10_ACAD-7	C-15054	0.18	0.01	0.05	mg/L	0.15	0.04	93	70 - 130% PASS	
24823-R2	MLMRP-004-10_ACAD-7	C-15054	0.04	0.01	0.05	mg/L				0 30 PASS	
										J	
Total Dissolved Phosphorus		Method: SM 4500-P E			Fraction: NA		Prepared: 05-Feb-14		Analyzed: 12-Feb-14		
24816-B1	QAQC Procedural Blank	C-15072	ND	0.016	0.05	mg/L					
24816-BS1	QAQC Procedural Blank	C-15072	0.291	0.016	0.05	mg/L	0.3	0	97	70 - 130% PASS	
24816-BS2	QAQC Procedural Blank	C-15072	0.296	0.016	0.05	mg/L	0.3	0	99	70 - 130% PASS	
24823-MS1	MLMRP-004-10_ACAD-7	C-15072	0.747	0.016	0.05	mg/L	0.3	0.528	73	70 - 130% PASS	
24823-MS2	MLMRP-004-10_ACAD-7	C-15072	0.739	0.016	0.05	mg/L	0.3	0.528	70	70 - 130% PASS	
24823-R2	MLMRP-004-10_ACAD-7	C-15072	0.523	0.016	0.05	mg/L				4 30 PASS	
										2 30 PASS	



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Conventionals

QUALITY CONTROL REPORT

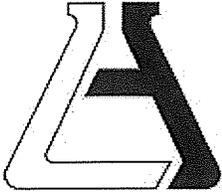
SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
Total Dissolved Solids			Method: SM 2540 C			Fraction: NA			Prepared: 10-Feb-14		Analyzed: 10-Feb-14	
24816-B1	QAQC Procedural Blank	C-15067	ND	0.1	5	mg/L						
24816-BS1	QAQC Procedural Blank	C-15067	25296	0.1	5	mg/L	25320	0	100	70 - 130%	PASS	
24816-BS2	QAQC Procedural Blank	C-15067	69996	0.1	5	mg/L	70453	0	99	70 - 130%	PASS	1 30 PASS
24825-R2	MLMRP-004-10_ACAD-9	C-15067	175	0.1	5	mg/L				4	30	PASS
Total Orthophosphate as P			Method: SM 4500-P E			Fraction: NA			Prepared: 04-Feb-14		Analyzed: 04-Feb-14	
24816-B1	QAQC Procedural Blank	C-15053	ND	0.01	0.02	mg/L						
24816-BS1	QAQC Procedural Blank	C-15053	0.19	0.01	0.02	mg/L	0.2	0	95	70 - 130%	PASS	
24816-BS2	QAQC Procedural Blank	C-15053	0.2	0.01	0.02	mg/L	0.2	0	100	70 - 130%	PASS	5 30 PASS
24823-MS1	MLMRP-004-10_ACAD-7	C-15053	0.71	0.01	0.02	mg/L	0.2	0.53	90	70 - 130%	PASS	
24823-MS2	MLMRP-004-10_ACAD-7	C-15053	0.71	0.01	0.02	mg/L	0.2	0.53	90	70 - 130%	PASS	0 30 PASS
24823-R2	MLMRP-004-10_ACAD-7	C-15053	0.53	0.01	0.02	mg/L				2	30	PASS
Total Phosphorus			Method: SM 4500-P E			Fraction: NA			Prepared: 11-Feb-14		Analyzed: 12-Feb-14	
24816-B1	QAQC Procedural Blank	C-15072	ND	0.016	0.05	mg/L						
24816-BS1	QAQC Procedural Blank	C-15072	0.291	0.016	0.05	mg/L	0.3	0	97	70 - 130%	PASS	
24816-BS2	QAQC Procedural Blank	C-15072	0.296	0.016	0.05	mg/L	0.3	0	99	70 - 130%	PASS	2 30 PASS
24824-MS1	MLMRP-004-10_ACAD-8	C-15072	1.148	0.016	0.05	mg/L	0.3	0.913	78	70 - 130%	PASS	
24824-MS2	MLMRP-004-10_ACAD-8	C-15072	1.16	0.016	0.05	mg/L	0.3	0.913	82	70 - 130%	PASS	5 30 PASS
24824-R2	MLMRP-004-10_ACAD-8	C-15072	0.915	0.016	0.05	mg/L				0	30	PASS
Total Suspended Solids			Method: SM 2540 D			Fraction: NA			Prepared: 10-Feb-14		Analyzed: 10-Feb-14	
24816-B1	QAQC Procedural Blank	C-15066	ND	0.5	0.5	mg/L						
24825-R2	MLMRP-004-10_ACAD-9	C-15066	41.2	0.5	0.5	mg/L				4	30	PASS

SUBCONTRACT

REPORT

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



Associated Laboratories

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Client: PHYSIS Environmental Laboratories, Inc.
Address: 1904 E. Wright Circle
Anaheim, CA 92806

Lab Request: 335808
Report Date: 02/17/2014
Date Received: 02/05/2014
Client ID: 13622

Attn: Misty Mercier

Comments: #1311002-006

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

<u>Sample #</u>	<u>Client Sample ID</u>
335808-001	MLMRP-004-10_ACAD-2
335808-002	MLMRP-004-10_ACAD-6
335808-003	MLMRP-004-10_ACAD-10
335808-004	MLMRP-004-30_VAND-1

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

Nina Prasad
President

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 45 days from date reported.

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TESTING & CONSULTING
Chemical
Microbiological
Environmental

QCBatchID: QC1143620	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 02/05/2014	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1143620MB1				
Total Kjeldahl Nitrogen	ND	mg/L	0.4	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1143620LCS1											
Total Kjeldahl Nitrogen	2.5		2.43		mg/L	97			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1143620MS1, QC1143620MSD1												
Total Kjeldahl Nitrogen	0.5	12.5	12.5	12.5	12.7	mg/L	96	98	1.6	80-120	20	Source: 335770-008



Notes and Definitions

B	Analyte was present in an associated method blank. Associated sample data was reported with qualifier.
C	Laboratory Contamination.
D	The sample duplicate RPD was not within control limits, the sample data was reported without further clarification.
DF	Dilution Factor
DW	Sample result is calculated on a dry weigh basis
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
MDL	Method Detection Limit
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
ND	Analyte was not detected or was less than the detection limit.
P	Sample was received without proper preservation according to EPA guidelines.
Q1	Analyte Calibration Verification exceeds criteria and the result was reported with qualifier.
Q2	Analyte calibration was not verified and the result was estimated and reported with qualifier.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated and reported with qualifier.
RDL	Reporting Detection Limit
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
T	Sample was extracted/analyzed past the holding time.
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
TIC	Tentatively Identified Compounds





ASSOCIATED LABORATORIES

806 North Batavia – Orange, California 92868 – 714-771-6900

FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1
 Client: Physis E.L. Project: 1311002-006
 Date Received: 2-5-14 ~~401005-001me~~
 Sample temperature: _____
 Sampler's Name: Yes No
 Sample(s) received in cooler: Yes No (Skip Section 2)
 Shipping Information: _____

Section 2
 Was the cooler packed with: _____ Ice _____ Ice Packs _____ Bubble Wrap _____ Styrofoam
 _____ Paper _____ None _____ Other _____
 Cooler Temperature: 4.5c

(Acceptance range is 0 to 6 Deg. C. or arrival on ice; For Microbiology sample <= 10 Deg. C or arrival on ice)

Section 3	YES	NO	N/A
Was a COC received?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is it properly completed? (IDs, sampling date and time, signature, test)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were custody seals present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
If Yes – were they intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were all samples sealed in plastic bags?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did all samples arrive intact? If no, indicate below.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did all bottle labels agree with COC? (ID, dates and times)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Were correct containers used for the tests required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was a sufficient amount of sample sent for tests indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was there headspace in VOA vials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Were the containers labeled with correct preservatives?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Was total residual chlorine measured (Fish Bioassay samples only)? *	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

*: If the answer is no, please inform Fish Bioassay Dept. immediately.

Section 4
 Explanations/Comments

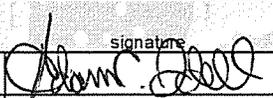
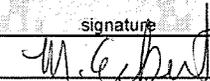
Section 5
 Was Project Manager notified of discrepancies: Y / N N/A
 Project Manager's response: _____

Completed By: M. Eckert Date: 2/5/14

CHAIN of CUSTODY

SEND TO: Associated Labs

335808

COMPANY NAME Physis Environmental Laboratories, Inc.		EMAIL sc@physislabs.com		PROJECT NAME / NUMBER 1311002-006			COC PAGE 1 of 1							
PROJECT MANAGER Misty Mercier		FAX 714 602-5321		PO #	PHYSIS SOS # 1311002	TYPE OF ICE USED <input type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY								
COMPANY ADDRESS 1904 E. Wright Circle Anaheim, CA 92806		PHONE 714 602-5320 office 714 335-5918 cell		SAMPLED BY		SHIPPED VIA <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Physis <input type="checkbox"/> other								
TURNAROUND TIME <input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> RUSH business days				REQUESTED ANALYSES										
REPORT FORMAT <input checked="" type="checkbox"/> PDF/EDD <input type="checkbox"/> SWAMP EDD <input type="checkbox"/> other														
SPECIAL INSTRUCTIONS Please report down to the MDL														
PHYSIS MATRIX CODES SW = seawater FW = freshwater RW = rainwater WW = wastewater DW = drinking water S = sediment I = tissue E = extract O = other (specify)				TKN										
SAMPLE ID		SAMPLE DESCRIPTION							SAMPLE date time		physis matrix code	# of bottles		
1	MLMRP-004-10_ACAD-2								2/3/14	4:00	W	1	X	
2	MLMRP-004-10_ACAD-6								2/3/14	4:00	W	1	X	
3	MLMRP-004-10_ACAD-10								2/3/14	4:00	W	1	X	
4	MLMRP-004-30_VAND-1								2/3/14	3:20	W	1	X	
5														
6														
7														
8														
9														
10														
RELINQUISHED BY print: Adam Idell signature:  company: Physis date & time: 2/5/14 09:18				RECEIVED BY print: M. Eckert signature:  company: ASL date & time: 2/5/14 09:18										

PHYSICS
CHAIN OF
CUSTODY

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature

Wet Weather Monitoring Event No.3
February 27, 2014



April 24, 2014

Bronwyn K Kelly
MWH Global
618 Michillinda Avenue
Suite 200
Arcadia, CA 91107-

Project Name: Machado Lake TMDL
Physis Project ID: 1311002-007

Dear Bronwyn,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 2/27/2014. A total of 15 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Total Suspended Solids by SM 2540 D
Total Phosphorus by SM 4500-P E
Total Orthophosphate as P by SM 4500-P E
Total Dissolved Solids by SM 2540 C
Total Dissolved Phosphorus by SM 4500-P E
Nitrite as N by EPA 300.0
Nitrate as N by EPA 300.0
Ammonia as N by SM 4500-NH3 D
Subcontract
Total Kjeldahl Nitrogen by EPA 351.2

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier
Extension 202
714-335-5918 cell
mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

MATRIX SPIKES: MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

BLANK SPIKES: BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

CERTIFIED REFERENCE MATERIALS: CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

SURROGATES: Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored

under specific conditions after collection and prior to analysis without significantly affecting the analyte's concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

PHYSICS

PANALYTICAL

TERRA AURA
REPORT

ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 25270-R1						
MLMRP-005-30-VAND-1 EQUIP. BLANK		Matrix: Lab Water		Sampled: 27-Feb-14 1:00		Received: 27-Feb-14
Method: SM 2540 C		Batch ID: C-15145		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
Method: SM 2540 D		Batch ID: C-16004		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
Sample ID: 25272-R1						
MLMRP-005-30-VAND-3 EQUIP. BLANK		Matrix: Lab Water		Sampled: 27-Feb-14 1:00		Received: 27-Feb-14
Method: EPA 300.0		Batch ID: C-15108		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Nitrate as N	NA	ND	0.01	0.05	mg/L	
Nitrite as N	NA	ND	0.01	0.05	mg/L	
Method: SM 4500-P E		Batch ID: C-15109		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	
Method: SM 4500-P E		Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25273-R1						
MLMRP-005-30-VAND-4 EQUIP. BLANK		Matrix: Lab Water		Sampled: 27-Feb-14 1:00		Received: 27-Feb-14
Method: SM 4500-NH3 D		Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	ND	0.02	0.05	mg/L	
Method: SM 4500-P E		Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25274-R1						
MLMRP-005-30-VAND-5 FIELD SAMPLE		Matrix: Rainwater		Sampled: 27-Feb-14 5:30		Received: 27-Feb-14
Method: EPA 300.0		Batch ID: C-15108		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Nitrate as N	NA	1.35	0.01	0.05	mg/L	
Nitrite as N	NA	0.05	0.01	0.05	mg/L	
Method: SM 4500-P E		Batch ID: C-15109		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Total Orthophosphate as P	NA	0.32	0.01	0.02	mg/L	
Method: SM 2540 C		Batch ID: C-15145		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Dissolved Solids	NA	80	0.1	5	mg/L	
Method: SM 4500-NH3 D		Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	0.79	0.02	0.05	mg/L	
Method: SM 2540 D		Batch ID: C-16004		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Suspended Solids	NA	81.3	0.5	0.5	mg/L	



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Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	0.618	0.016	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	0.226	0.016	0.05	mg/L	
Sample ID: 25275-R1	MLMRP-005-30-VAND-6 FIELD BLANK	Matrix: Lab Water		Sampled: 27-Feb-14 5:30		Received: 27-Feb-14
	Method: SM 2540 C	Batch ID: C-15145		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
	Method: SM 2540 D	Batch ID: C-16004		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
Sample ID: 25277-R1	MLMRP-005-30-VAND-8 FIELD BLANK	Matrix: Lab Water		Sampled: 27-Feb-14 5:30		Received: 27-Feb-14
	Method: EPA 300.0	Batch ID: C-15108		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Nitrate as N	NA	ND	0.01	0.05	mg/L	
Nitrite as N	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15109		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25278-R1	MLMRP-005-30-VAND-9 FIELD BLANK	Matrix: Lab Water		Sampled: 27-Feb-14 5:30		Received: 27-Feb-14
	Method: SM 4500-NH ₃ D	Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	ND	0.02	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25279-R1	MLMRP-005-10-ACAD-1 EQUIP. BLANK	Matrix: Lab Water		Sampled: 27-Feb-14 12:00		Received: 27-Feb-14
	Method: SM 2540 C	Batch ID: C-15145		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
	Method: SM 2540 D	Batch ID: C-16004		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
Sample ID: 25281-R1	MLMRP-005-10-ACAD-3 EQUIP. BLANK	Matrix: Lab Water		Sampled: 27-Feb-14 12:00		Received: 27-Feb-14
	Method: EPA 300.0	Batch ID: C-15108		Prepared: 28-Feb-14		Analyzed: 28-Feb-14



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Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Nitrate as N	NA	ND	0.01	0.05	mg/L	
Nitrite as N	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15109		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25282-R1	MLMRP-005-10-ACAD-4 EQUIP. BLANK	Matrix: Lab Water		Sampled: 27-Feb-14 12:00		Received: 27-Feb-14
	Method: SM 4500-NH3 D	Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	ND	0.02	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25283-R1	MLMRP-005-10-ACAD-5 FIELD SAMPLE	Matrix: Rainwater		Sampled: 27-Feb-14 4:00		Received: 27-Feb-14
	Method: EPA 300.0	Batch ID: C-15108		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Nitrate as N	NA	0.59	0.01	0.05	mg/L	
Nitrite as N	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15109		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Total Orthophosphate as P	NA	0.35	0.01	0.02	mg/L	
	Method: SM 2540 C	Batch ID: C-15145		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Dissolved Solids	NA	60	0.1	5	mg/L	
	Method: SM 4500-NH3 D	Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	0.35	0.02	0.05	mg/L	
	Method: SM 2540 D	Batch ID: C-16004		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Suspended Solids	NA	71	0.5	0.5	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	0.643	0.016	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	0.273	0.016	0.05	mg/L	
Sample ID: 25284-R1	MLMRP-005-30-VAND-10 FIELD DUP	Matrix: Rainwater		Sampled: 27-Feb-14 5:30		Received: 27-Feb-14
	Method: EPA 300.0	Batch ID: C-15108		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Nitrate as N	NA	1.34	0.01	0.05	mg/L	



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Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Nitrite as N	NA	0.05	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-15109		Prepared: 28-Feb-14		Analyzed: 28-Feb-14
Total Orthophosphate as P	NA	0.32	0.01	0.02	mg/L	
	Method: SM 2540 C	Batch ID: C-15145		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Dissolved Solids	NA	120	0.1	5	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	0.63	0.02	0.05	mg/L	
	Method: SM 2540 D	Batch ID: C-16004		Prepared: 06-Mar-14		Analyzed: 06-Mar-14
Total Suspended Solids	NA	92	0.5	0.5	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	0.635	0.016	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	0.21	0.016	0.05	mg/L	

QUALITY CONTROL

REPORT

TERRA FIDELITY AQUA AURA
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Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
Ammonia as N			Method: SM 4500-NH₃ D			Fraction: NA		Prepared: 13-Mar-14		Analyzed: 13-Mar-14		
25269-B1	QAQC Procedural Blank	C-15146	ND	0.02	0.05	mg/L						
25269-BS1	QAQC Procedural Blank	C-15146	0.21	0.02	0.05	mg/L	0.25	0	84	70 - 130%	PASS	
25269-BS2	QAQC Procedural Blank	C-15146	0.21	0.02	0.05	mg/L	0.25	0	84	70 - 130%	PASS	0 30 PASS
25283-MS1	MLMRP-005-10-ACAD-5	C-15146	0.57	0.02	0.05	mg/L	0.25	0.34	92	70 - 130%	PASS	
25283-MS2	MLMRP-005-10-ACAD-5	C-15146	0.56	0.02	0.05	mg/L	0.25	0.34	88	70 - 130%	PASS	4 30 PASS
25283-R2	MLMRP-005-10-ACAD-5	C-15146	0.33	0.02	0.05	mg/L						6 30 PASS
Nitrate as N			Method: EPA 300.0			Fraction: NA		Prepared: 28-Feb-14		Analyzed: 28-Feb-14		
25269-B1	QAQC Procedural Blank	C-15108	ND	0.01	0.05	mg/L						
25269-BS1	QAQC Procedural Blank	C-15108	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130%	PASS	
25269-BS2	QAQC Procedural Blank	C-15108	0.1	0.01	0.05	mg/L	0.11	0	91	70 - 130%	PASS	9 30 PASS
25284-MS1	MLMRP-005-30-VAND-1	C-15108	1.45	0.01	0.05	mg/L	0.11	1.34	100	70 - 130%	PASS	
25284-MS2	MLMRP-005-30-VAND-1	C-15108	1.45	0.01	0.05	mg/L	0.11	1.34	100	70 - 130%	PASS	0 30 PASS
25284-R2	MLMRP-005-30-VAND-1	C-15108	1.34	0.01	0.05	mg/L						0 30 PASS
Nitrite as N			Method: EPA 300.0			Fraction: NA		Prepared: 28-Feb-14		Analyzed: 28-Feb-14		
25269-B1	QAQC Procedural Blank	C-15108	ND	0.01	0.05	mg/L						
25269-BS1	QAQC Procedural Blank	C-15108	0.15	0.01	0.05	mg/L	0.15	0	100	70 - 130%	PASS	
25269-BS2	QAQC Procedural Blank	C-15108	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130%	PASS	7 30 PASS
25284-MS1	MLMRP-005-30-VAND-1	C-15108	0.18	0.01	0.05	mg/L	0.15	0.05	87	70 - 130%	PASS	
25284-MS2	MLMRP-005-30-VAND-1	C-15108	0.18	0.01	0.05	mg/L	0.15	0.05	87	70 - 130%	PASS	0 30 PASS
25284-R2	MLMRP-005-30-VAND-1	C-15108	0.05	0.01	0.05	mg/L						0 30 PASS
Total Dissolved Phosphorus			Method: SM 4500-P E			Fraction: NA		Prepared: 01-Mar-14		Analyzed: 26-Mar-14		
25269-B1	QAQC Procedural Blank	C-16022	ND	0.016	0.05	mg/L						
25269-BS1	QAQC Procedural Blank	C-16022	0.257	0.016	0.05	mg/L	0.3	0	86	70 - 130%	PASS	
25269-BS2	QAQC Procedural Blank	C-16022	0.255	0.016	0.05	mg/L	0.3	0	85	70 - 130%	PASS	1 30 PASS
25283-MS1	MLMRP-005-10-ACAD-5	C-16022	0.552	0.016	0.05	mg/L	0.3	0.276	92	70 - 130%	PASS	
25283-MS2	MLMRP-005-10-ACAD-5	C-16022	0.554	0.016	0.05	mg/L	0.3	0.276	93	70 - 130%	PASS	1 30 PASS
25283-R2	MLMRP-005-10-ACAD-5	C-16022	0.278	0.016	0.05	mg/L						2 30 PASS



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CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE	
Total Dissolved Solids			Method: SM 2540 C			Fraction: NA			Prepared: 06-Mar-14			Analyzed: 06-Mar-14	
25269-B1	QAQC Procedural Blank	C-15145	ND	0.1	5	mg/L							
25269-BS1	QAQC Procedural Blank	C-15145	25260	0.1	5	mg/L	25320	0	100	70 - 130%	PASS		
25269-BS2	QAQC Procedural Blank	C-15145	68540	0.1	5	mg/L	70453	0	97	70 - 130%	PASS	3 30 PASS	
25274-R2	MLMRP-005-30-VAND-5	C-15145	100	0.1	5	mg/L						22 30 PASS	
Total Orthophosphate as P			Method: SM 4500-P E			Fraction: NA			Prepared: 28-Feb-14			Analyzed: 28-Feb-14	
25269-B1	QAQC Procedural Blank	C-15109	ND	0.01	0.02	mg/L							
25269-BS1	QAQC Procedural Blank	C-15109	0.2	0.01	0.02	mg/L	0.2	0	100	70 - 130%	PASS		
25269-BS2	QAQC Procedural Blank	C-15109	0.21	0.01	0.02	mg/L	0.2	0	105	70 - 130%	PASS	5 30 PASS	
25284-MS1	MLMRP-005-30-VAND-1	C-15109	0.52	0.01	0.02	mg/L	0.2	0.32	100	70 - 130%	PASS		
25284-MS2	MLMRP-005-30-VAND-1	C-15109	0.53	0.01	0.02	mg/L	0.2	0.32	105	70 - 130%	PASS	5 30 PASS	
25284-R2	MLMRP-005-30-VAND-1	C-15109	0.32	0.01	0.02	mg/L						0 30 PASS	
Total Phosphorus			Method: SM 4500-P E			Fraction: NA			Prepared: 24-Mar-14			Analyzed: 24-Mar-14	
25269-B1	QAQC Procedural Blank	C-16018	ND	0.016	0.05	mg/L							
25269-BS1	QAQC Procedural Blank	C-16018	0.25	0.016	0.05	mg/L	0.3	0	83	70 - 130%	PASS		
25269-BS2	QAQC Procedural Blank	C-16018	0.254	0.016	0.05	mg/L	0.3	0	85	70 - 130%	PASS	2 30 PASS	
25274-MS1	MLMRP-005-30-VAND-5	C-16018	0.904	0.016	0.05	mg/L	0.3	0.622	94	70 - 130%	PASS		
25274-MS2	MLMRP-005-30-VAND-5	C-16018	0.898	0.016	0.05	mg/L	0.3	0.622	92	70 - 130%	PASS	2 30 PASS	
25274-R2	MLMRP-005-30-VAND-5	C-16018	0.626	0.016	0.05	mg/L						1 30 PASS	
Total Suspended Solids			Method: SM 2540 D			Fraction: NA			Prepared: 06-Mar-14			Analyzed: 06-Mar-14	
25269-B1	QAQC Procedural Blank	C-16004	ND	0.5	0.5	mg/L							
25284-R2	MLMRP-005-30-VAND-1	C-16004	96	0.5	0.5	mg/L						4 30 PASS	

SUBCONTRACT

REPORT

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



Associated Laboratories

806 N. Batavia - Orange, CA 92868
Tel (714)771-6900 Fax (714)538-1209
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Client: PHYSIS Environmental Laboratories, Inc.
Address: 1904 E. Wright Circle
Anaheim, CA 92806

Lab Request: 337676
Report Date: 03/25/2014
Date Received: 03/07/2014
Client ID: 13622

Attn: Misty Mercier

Comments: #1311002-007

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

<u>Sample #</u>	<u>Client Sample ID</u>
337676-001	MLMRP-005-30-VAND-2
337676-002	MLMRP-005-30-VAND-5
337676-003	MLMRP-005-30-VAND-7
337676-004	MLMRP-005-10_ACAD-2
337676-005	MLMRP-005-10_ACAD-5
337676-006	MLMRP-005-30-VAND-10

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

Nina Prasad
President

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 45 days from date reported.

The reports of the Associated Laboratories are confidential property of our clients and may not be reproduced or used for publication in part or in full without our written permission. This is for the mutual protection of the public, our clients, and ourselves.

TESTING & CONSULTING
Chemical
Microbiological
Environmental

QCBatchID: QC1144868	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 03/11/2014	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1144868MB1				
Total Kjeldahl Nitrogen	ND	mg/L	0.4	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1144868LCS1											
Total Kjeldahl Nitrogen	2.5		2.44		mg/L	98			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

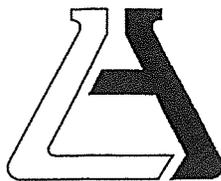
Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1144868MS1, QC1144868MSD1												Source: 337676-002
Total Kjeldahl Nitrogen	3.45	12.5	12.5	15.6	16.2	mg/L	97	102	3.8	80-120	20	



Notes and Definitions

B	Analyte was present in an associated method blank. Associated sample data was reported with qualifier.
BQ1	No valid test replicates. Result may be greater. Best result was reported with qualifier. Sample toxicity possible.
BQ2	No valid test replicates.
BQ3	Minimum DO is less than 1.0 mg/L. Result may be greater and reported with qualifier.
C	Laboratory Contamination.
D	The sample duplicate RPD was not within control limits, the sample data was reported without further clarification.
DF	Dilution Factor
DW	Sample result is calculated on a dry weigh basis
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
MDL	Method Detection Limit
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
ND	Analyte was not detected or was less than the detection limit.
P	Sample was received without proper preservation according to EPA guidelines.
Q1	Analyte Calibration Verification exceeds criteria and the result was reported with qualifier.
Q2	Analyte calibration was not verified and the result was estimated and reported with qualifier.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated and reported with qualifier.
RDL	Reporting Detection Limit
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
T	Sample was extracted/analyzed past the holding time.
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
TIC	Tentatively Identified Compounds





ASSOCIATED LABORATORIES

806 North Batavia – Orange, California 92868 – 714-771-6900

FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1
 Client: Physis Environmental Laboratories Project: 1311002-007
 Date Received: 3/7/14 Sampler's Name: Yes No
 Sample temperature: 11°C
 Sample(s) received in cooler: Yes No (Skip Section 2)
 Shipping Information: _____

Section 2
 Was the cooler packed with: Ice Ice Packs Bubble Wrap Styrofoam
 Paper None Other _____
 Cooler Temperature: _____

(Acceptance range is 0 to 6 Deg. C. or arrival on ice; For Microbiology sample ≤10 Deg. C or arrival on ice)

Section 3	YES	NO	N/A
Was a COC received?	✓		
Is it properly completed? (IDs, sampling date and time, signature, test)	✓		
Were custody seals present?			✓
If Yes – were they intact?			✓
Were all samples sealed in plastic bags?	✓		
Did all samples arrive intact? If no, indicate below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were correct containers used for the tests required?	✓		
Was a sufficient amount of sample sent for tests indicated?	✓		
Was there headspace in VOA vials?			✓
Were the containers labeled with correct preservatives?	✓		
Was total residual chlorine measured (Fish Bioassay samples only)? *			✓

*: If the answer is no, please inform Fish Bioassay Dept. immediately.

Section 4
 Explanations/Comments

Section 5
 Was Project Manager notified of discrepancies: Y / N N/A
 Project Manager's response: _____

Completed By: Chris Ota Date: 3/7/14



CHAIN OF CUSTODY

337676

SEND TO: Associated

COMPANY NAME: **Physis Environmental Laboratories, Inc.** EMAIL: **sec@physislabs.com** PROJECT NAME / NUMBER: **1311002-007** COC PAGE: **1** of **1**

PROJECT MANAGER: **Misty Mercier** FAX: **714 602-5321** PO #: **1311002** PHYSIS SOS #: **1311002** TYPE OF ICE USED: WET BLUE DRY

COMPANY ADDRESS: **1904 E. Wright Circle, Anaheim, CA 92806** PHONE: **714 602-5320** OFFICE: **714 335-5918** CELL: **714 335-5918** SHIPPED VIA: FEDEX UPS USPS Client Physis other

TURNAROUND TIME: STANDARD RUSH BUSINESS DAYS: RUSH other

REPORT FORMAT: PDF/EDD SWAMP EDD other

PLEASE REPORT DOWN TO THE MDL

PHYSIS MATRIX CODES: **SW** = seawater **FW** = freshwater **RW** = rainwater **WW** = wastewater **DW** = drinking water **S** = sediment **I** = tissue **E** = extract **O** = other (specify)

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE		physis matrix code	# of bottles	TKN	REQUESTED ANALYSES
		date	time				
1	MLMRP-005-30-VAND-2	2/27/14	1:00		1	X	
2	MLMRP-005-30-VAND-5	2/27/14	5:30		1	X	
3	MLMRP-005-30-VAND-7	2/27/14	5:30		1	X	
4	MLMRP-005-10_ACAD-2	2/27/14	0:00		1	X	
5	MLMRP-005-10_ACAD-5	2/27/14	4:00		1	X	
6	MLMRP-005-30-VAND-10	2/27/14			1	X	
7							
8							
9							
10							

RELINQUISHED BY: Jackie Moreno (signature) company: Physis date & time: 03/07/14 16:02 RECEIVED BY: [signature] company: Associated date & time: 3/7/14 1609

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Innovative Solutions for Nature

Wet Weather Monitoring Event No.4
February 28, 2014

April 25, 2014

Bronwyn K Kelly
 MWH Global
 618 Michillinda Avenue
 Suite 200
 Arcadia, CA 91107-

Project Name: Machado Lake TMDL
 Physis Project ID: 1311002-008

Dear Bronwyn,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 3/1/2014. A total of 17 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Conventionals
Total Suspended Solids by SM 2540 D
Total Phosphorus by SM 4500-P E
Total Orthophosphate as P by SM 4500-P E
Total Dissolved Solids by SM 2540 C
Total Dissolved Phosphorus by SM 4500-P E
Nitrite as N by EPA 300.0
Nitrate as N by EPA 300.0
Ammonia as N by SM 4500-NH ₃ D
Organics
Organochlorine Pesticides & PCB Congeners/Aroclors by EPA 8270C
Subcontract
Total Organic Carbon by SM 5310 B
Total Kjeldahl Nitrogen by EPA 351.2

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Misty Mercier



Extension 202
714-335-5918 cell
mistymercier@physislabs.com

ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and are used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use was assessed through the analysis of procedural blanks at a minimum frequency of one per batch. Physis' QM requires that all procedural blanks be below 10 times the MDL and all detectable constituents in the procedural blanks be flagged in the project sample results with a B qualifier.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

MATRIX SPIKES: MS samples were employed to assess the effect a particular project sample matrix has on the accuracy of a measurement. It is prepared by adding a known amount of the target analyte(s) to an aliquot of the project sample. Matrix spikes indicate the bias of analytical measurements due to chemical interferences inherent in the sample matrix. If the matrix spike recovery does not fall within the specified acceptance limits, it may be an indication of sample matrix interference in the specific project sample used for the MS. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

BLANK SPIKES: BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

CERTIFIED REFERENCE MATERIALS: CRMs are pre-homogenized materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of a preparation and analytical method. CRMs are analyzed to provide evidence that the laboratory method produces results that are comparable to those obtained by an independent organization.

SURROGATES: Where CRMs are unavailable, target analyte recovery can be assessed by monitoring added surrogate compounds/elements. A surrogate is a pure analyte unlikely to be found in any project sample and most often used with organic analytical procedures. Percent recovery is calculated for each surrogate and is used to monitor method performance within each discrete sample and is indicative of the procedure's ability to recover the actual analytes of interest.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's

concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes. Physis' QM requires that all samples analyzed beyond the method recommended holding time be flagged in the sample results with an H qualifier.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
*	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified recovery and/or RPD acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore MS recovery and/or RPD acceptance limits do not apply
SL	analyte results for R1 and/or R2 were lower than 10 times the MDL, therefore RPD acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore MS recovery and/or RPD were outside the specified acceptance limits
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

PHYSICS

PANALYTICAL

TERRA AURA

REPORT

ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Sample ID: 25896-R1	MLMRP-006-3O_VAND-1 EB	Matrix: Liquid				
	Method: SM 2540 D	Batch ID: C-15131				
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-16017				
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
Sample ID: 25898-R1	MLMRP-006-3O_VAND-3 EB	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-15103				
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	J
	Method: EPA 300.0	Batch ID: C-15151				
Nitrate as N	NA	ND	0.01	0.05	mg/L	
Nitrite as N	NA	ND	0.01	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022				
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25899-R1	MLMRP-006-3O_VAND-4 EB	Matrix: Liquid				
	Method: SM 4500-NH ₃ D	Batch ID: C-15146				
Ammonia as N	NA	ND	0.02	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018				
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25900-R1	MLMRP-006-3O_VAND-5 Field Samples	Matrix: Liquid				
	Method: SM 4500-P E	Batch ID: C-15110				
Total Orthophosphate as P	NA	0.23	0.01	0.02	mg/L	
	Method: SM 2540 D	Batch ID: C-15131				
Total Suspended Solids	NA	50.8	0.5	0.5	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15146				
Ammonia as N	NA	0.11	0.02	0.05	mg/L	
	Method: EPA 300.0	Batch ID: C-15151				
Nitrate as N	NA	0.52	0.01	0.05	mg/L	
Nitrite as N	NA	0.05	0.01	0.05	mg/L	
	Method: SM 2540 C	Batch ID: C-16017				
Total Dissolved Solids	NA	100	0.1	5	mg/L	



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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	0.355	0.016	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	0.169	0.016	0.05	mg/L	
Sample ID: 25902-R1	MLMRP-006-1O_ACAD-1 EB	Matrix: Liquid		Sampled: 26-Feb-14 22:20		Received: 28-Feb-14
	Method: SM 2540 D	Batch ID: C-15131		Prepared: 05-Mar-14		Analyzed: 05-Mar-14
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-16017		Prepared: 05-Mar-14		Analyzed: 05-Mar-14
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
Sample ID: 25904-R1	MLMRP-006-1O_ACAD-3 EB	Matrix: Liquid		Sampled: 26-Feb-14 22:20		Received: 28-Feb-14
	Method: SM 4500-P E	Batch ID: C-15103		Prepared: 01-Mar-14		Analyzed: 01-Mar-14
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	H
	Method: EPA 300.0	Batch ID: C-15151		Prepared: 01-Mar-14		Analyzed: 01-Mar-14
Nitrate as N	NA	ND	0.01	0.05	mg/L	H
Nitrite as N	NA	ND	0.01	0.05	mg/L	H
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	H,J
Sample ID: 25905-R1	MLMRP-006-1O_ACAD-4 EB	Matrix: Liquid		Sampled: 26-Feb-14 22:20		Received: 28-Feb-14
	Method: SM 4500-NH3 D	Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	ND	0.02	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25906-R1	MLMRP-006-1O_ACAD-5 FB	Matrix: Liquid		Sampled: 26-Feb-14 22:30		Received: 28-Feb-14
	Method: SM 2540 D	Batch ID: C-15131		Prepared: 05-Mar-14		Analyzed: 05-Mar-14
Total Suspended Solids	NA	ND	0.5	0.5	mg/L	
	Method: SM 2540 C	Batch ID: C-16017		Prepared: 05-Mar-14		Analyzed: 05-Mar-14
Total Dissolved Solids	NA	ND	0.1	5	mg/L	
Sample ID: 25908-R1	MLMRP-006-1O_ACAD-7 FB	Matrix: Liquid		Sampled: 26-Feb-14 22:30		Received: 28-Feb-14
	Method: SM 4500-P E	Batch ID: C-15103		Prepared: 01-Mar-14		Analyzed: 01-Mar-14



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CA ELAP #2769

Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
Total Orthophosphate as P	NA	ND	0.01	0.02	mg/L	H
	Method: EPA 300.0	Batch ID: C-15151		Prepared: 01-Mar-14		Analyzed: 01-Mar-14
Nitrate as N	NA	ND	0.01	0.05	mg/L	H
Nitrite as N	NA	ND	0.01	0.05	mg/L	H
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	ND	0.016	0.05	mg/L	H,J
Sample ID: 25909-R1	MLMRP-006-10_ACAD-8 FB	Matrix: Liquid		Sampled: 26-Feb-14 22:30		Received: 28-Feb-14
	Method: SM 4500-NH ₃ D	Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	ND	0.02	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	ND	0.016	0.05	mg/L	
Sample ID: 25910-R1	MLMRP-006-10_ACAD-9 Field Samples	Matrix: Liquid		Sampled: 28-Feb-14 23:00		Received: 28-Feb-14
	Method: SM 4500-P E	Batch ID: C-15110		Prepared: 01-Mar-14		Analyzed: 01-Mar-14
Total Orthophosphate as P	NA	0.13	0.01	0.02	mg/L	
	Method: SM 2540 D	Batch ID: C-15131		Prepared: 05-Mar-14		Analyzed: 05-Mar-14
Total Suspended Solids	NA	28.8	0.5	0.5	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	0.1	0.02	0.05	mg/L	
	Method: EPA 300.0	Batch ID: C-15151		Prepared: 01-Mar-14		Analyzed: 01-Mar-14
Nitrate as N	NA	0.5	0.01	0.05	mg/L	
Nitrite as N	NA	0.03	0.01	0.05	mg/L	J
	Method: SM 2540 C	Batch ID: C-16017		Prepared: 05-Mar-14		Analyzed: 05-Mar-14
Total Dissolved Solids	NA	180	0.1	5	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	0.414	0.016	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	0.26	0.016	0.05	mg/L	
Sample ID: 25911-R1	MLMRP-006-10_ACAD-10 Field Duplicat	Matrix: Liquid		Sampled: 28-Feb-14 23:00		Received: 28-Feb-14
	Method: SM 4500-P E	Batch ID: C-15110		Prepared: 01-Mar-14		Analyzed: 01-Mar-14
Total Orthophosphate as P	NA	0.13	0.01	0.02	mg/L	



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Conventionals

ANALYTICAL REPORT

ANALYTE	FRACTION	RESULT	MDL	RL	UNITS	QA CODE
	Method: SM 2540 D	Batch ID: C-15131		Prepared: 05-Mar-14		Analyzed: 05-Mar-14
Total Suspended Solids	NA	29	0.5	0.5	mg/L	
	Method: SM 4500-NH ₃ D	Batch ID: C-15146		Prepared: 13-Mar-14		Analyzed: 13-Mar-14
Ammonia as N	NA	0.12	0.02	0.05	mg/L	
	Method: EPA 300.0	Batch ID: C-15151		Prepared: 01-Mar-14		Analyzed: 01-Mar-14
Nitrate as N	NA	0.49	0.01	0.05	mg/L	
Nitrite as N	NA	0.03	0.01	0.05	mg/L	J
	Method: SM 2540 C	Batch ID: C-16017		Prepared: 05-Mar-14		Analyzed: 05-Mar-14
Total Dissolved Solids	NA	220	0.1	5	mg/L	
	Method: SM 4500-P E	Batch ID: C-16018		Prepared: 24-Mar-14		Analyzed: 24-Mar-14
Total Phosphorus	NA	0.409	0.016	0.05	mg/L	
	Method: SM 4500-P E	Batch ID: C-16022		Prepared: 01-Mar-14		Analyzed: 26-Mar-14
Total Dissolved Phosphorus	NA	0.26	0.016	0.05	mg/L	

QUALITY CONTROL

REPORT

TERRA F... AQUA AURA
ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature



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CA ELAP #2769

Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE
Ammonia as N			Method: SM 4500-NH₃ D			Fraction: NA			Prepared: 13-Mar-14		Analyzed: 13-Mar-14	
25895-B1	QAQC Procedural Blank	C-15146	ND	0.02	0.05	mg/L						
25895-BS1	QAQC Procedural Blank	C-15146	0.21	0.02	0.05	mg/L	0.25	0	84	70 - 130%	PASS	
25895-BS2	QAQC Procedural Blank	C-15146	0.21	0.02	0.05	mg/L	0.25	0	84	70 - 130%	PASS	0 30 PASS
25910-MS1	MLMRP-006-1O_ACAD-	C-15146	0.3	0.02	0.05	mg/L	0.25	0.11	76	70 - 130%	PASS	
25910-MS2	MLMRP-006-1O_ACAD-	C-15146	0.29	0.02	0.05	mg/L	0.25	0.11	72	70 - 130%	PASS	5 30 PASS
25910-R2	MLMRP-006-1O_ACAD-	C-15146	0.13	0.02	0.05	mg/L						26 30 PASS
Nitrate as N			Method: EPA 300.0			Fraction: NA			Prepared: 01-Mar-14		Analyzed: 01-Mar-14	
25895-B1	QAQC Procedural Blank	C-15151	ND	0.01	0.05	mg/L						
25895-BS1	QAQC Procedural Blank	C-15151	0.1	0.01	0.05	mg/L	0.11	0	91	70 - 130%	PASS	
25895-BS2	QAQC Procedural Blank	C-15151	0.1	0.01	0.05	mg/L	0.11	0	91	70 - 130%	PASS	0 30 PASS
25898-MS1	MLMRP-006-3O_VAND-	C-15151	0.1	0.01	0.05	mg/L	0.11	0	91	70 - 130%	PASS	
25898-MS2	MLMRP-006-3O_VAND-	C-15151	0.11	0.01	0.05	mg/L	0.11	0	100	70 - 130%	PASS	9 30 PASS
25898-R2	MLMRP-006-3O_VAND-	C-15151	ND	0.01	0.05	mg/L						0 30 PASS
25900-MS1	MLMRP-006-3O_VAND-	C-15151	0.63	0.01	0.05	mg/L	0.11	0.52	100	70 - 130%	PASS	
25900-MS2	MLMRP-006-3O_VAND-	C-15151	0.63	0.01	0.05	mg/L	0.11	0.52	100	70 - 130%	PASS	0 30 PASS
25900-R2	MLMRP-006-3O_VAND-	C-15151	0.52	0.01	0.05	mg/L						0 30 PASS
Nitrite as N			Method: EPA 300.0			Fraction: NA			Prepared: 01-Mar-14		Analyzed: 01-Mar-14	
25895-B1	QAQC Procedural Blank	C-15151	ND	0.01	0.05	mg/L						
25895-BS1	QAQC Procedural Blank	C-15151	0.13	0.01	0.05	mg/L	0.15	0	87	70 - 130%	PASS	
25895-BS2	QAQC Procedural Blank	C-15151	0.13	0.01	0.05	mg/L	0.15	0	87	70 - 130%	PASS	0 30 PASS
25898-MS1	MLMRP-006-3O_VAND-	C-15151	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130%	PASS	
25898-MS2	MLMRP-006-3O_VAND-	C-15151	0.14	0.01	0.05	mg/L	0.15	0	93	70 - 130%	PASS	0 30 PASS
25898-R2	MLMRP-006-3O_VAND-	C-15151	ND	0.01	0.05	mg/L						0 30 PASS
25900-MS1	MLMRP-006-3O_VAND-	C-15151	0.18	0.01	0.05	mg/L	0.15	0.05	87	70 - 130%	PASS	
25900-MS2	MLMRP-006-3O_VAND-	C-15151	0.19	0.01	0.05	mg/L	0.15	0.05	93	70 - 130%	PASS	7 30 PASS
25900-R2	MLMRP-006-3O_VAND-	C-15151	0.05	0.01	0.05	mg/L						0 30 PASS
Total Dissolved Phosphorus			Method: SM 4500-P E			Fraction: NA			Prepared: 01-Mar-14		Analyzed: 26-Mar-14	
25895-B1	QAQC Procedural Blank	C-16022	ND	0.016	0.05	mg/L						



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Conventionals

QUALITY CONTROL REPORT

SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY %	LIMITS	PRECISION %	LIMITS	QA CODE	
25895-BS1	QAQC Procedural Blank	C-16022	0.257	0.016	0.05	mg/L	0.3	0	86	70 - 130%	PASS		
25895-BS2	QAQC Procedural Blank	C-16022	0.255	0.016	0.05	mg/L	0.3	0	85	70 - 130%	PASS	1 30	
25900-MS1	MLMRP-006-3O_VAND-	C-16022	0.435	0.016	0.05	mg/L	0.3	0.17	88	70 - 130%	PASS		
25900-MS2	MLMRP-006-3O_VAND-	C-16022	0.432	0.016	0.05	mg/L	0.3	0.17	87	70 - 130%	PASS	1 30	
25900-R2	MLMRP-006-3O_VAND-	C-16022	0.171	0.016	0.05	mg/L						1 30	
Total Dissolved Solids			Method: SM 2540 C			Fraction: NA			Prepared: 05-Mar-14		Analyzed: 05-Mar-14		
25895-B1	QAQC Procedural Blank	C-16017	ND	0.1	5	mg/L							
25895-BS1	QAQC Procedural Blank	C-16017	25180	0.1	5	mg/L	25320	0	99	70 - 130%	PASS		
25895-BS2	QAQC Procedural Blank	C-16017	70220	0.1	5	mg/L	70453	0	100	70 - 130%	PASS	1 30	
25900-R2	MLMRP-006-3O_VAND-	C-16017	80	0.1	5	mg/L						22 30	
Total Orthophosphate as P			Method: SM 4500-P E			Fraction: NA			Prepared: 01-Mar-14		Analyzed: 01-Mar-14		
25895-B1	QAQC Procedural Blank	C-15103	ND	0.01	0.02	mg/L							
25895-BS1	QAQC Procedural Blank	C-15103	0.22	0.01	0.02	mg/L	0.2	0	110	70 - 130%	PASS		
25895-BS2	QAQC Procedural Blank	C-15103	0.21	0.01	0.02	mg/L	0.2	0	105	70 - 130%	PASS	5 30	
25898-MS1	MLMRP-006-3O_VAND-	C-15103	0.23	0.01	0.02	mg/L	0.2	0	115	70 - 130%	PASS		
25898-MS2	MLMRP-006-3O_VAND-	C-15103	0.23	0.01	0.02	mg/L	0.2	0	115	70 - 130%	PASS	0 30	
25898-R2	MLMRP-006-3O_VAND-	C-15103	ND	0.01	0.02	mg/L						0 30	
25900-MS1	MLMRP-006-3O_VAND-	C-15110	0.46	0.01	0.02	mg/L	0.2	0.23	115	70 - 130%	PASS		
25900-MS2	MLMRP-006-3O_VAND-	C-15110	0.45	0.01	0.02	mg/L	0.2	0.23	110	70 - 130%	PASS	4 30	
25900-R2	MLMRP-006-3O_VAND-	C-15110	0.23	0.01	0.02	mg/L						0 30	
Total Phosphorus			Method: SM 4500-P E			Fraction: NA			Prepared: 24-Mar-14		Analyzed: 24-Mar-14		
25895-B1	QAQC Procedural Blank	C-16018	ND	0.016	0.05	mg/L							
25895-BS1	QAQC Procedural Blank	C-16018	0.25	0.016	0.05	mg/L	0.3	0	83	70 - 130%	PASS		
25895-BS2	QAQC Procedural Blank	C-16018	0.254	0.016	0.05	mg/L	0.3	0	85	70 - 130%	PASS	2 30	
25900-MS1	MLMRP-006-3O_VAND-	C-16018	0.632	0.016	0.05	mg/L	0.3	0.356	92	70 - 130%	PASS		
25900-MS2	MLMRP-006-3O_VAND-	C-16018	0.632	0.016	0.05	mg/L	0.3	0.356	92	70 - 130%	PASS	0 30	
25900-R2	MLMRP-006-3O_VAND-	C-16018	0.358	0.016	0.05	mg/L						1 30	
Total Suspended Solids			Method: SM 2540 D			Fraction: NA			Prepared: 05-Mar-14		Analyzed: 05-Mar-14		
25895-B1	QAQC Procedural Blank	C-15131	ND	0.5	0.5	mg/L							



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Conventional

QUALITY CONTROL REPORT

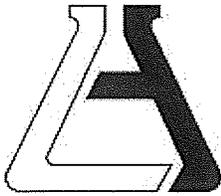
SAMPLE ID	BATCH ID	RESULT	MDL	RL	UNITS	SPIKE LEVEL	SOURCE RESULT	ACCURACY		PRECISION		QA CODE
								%	LIMITS	%	LIMITS	
25900-R2	MLMRP-006-30_VAND-	C-15131	58.5	0.5	0.5	mg/L				14	30	PASS

SUBCONTRACT

REPORT

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature



Associated Laboratories

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www.associatedlabs.com
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Client: PHYSIS Environmental Laboratories, Inc.
Address: 1904 E. Wright Circle
Anaheim, CA 92806

Lab Request: 337673
Report Date: 03/25/2014
Date Received: 03/07/2014
Client ID: 13622

Attn: Misty Mercier

Comments: #1311002-008

This laboratory request covers the following listed samples which were analyzed for the parameters indicated on the attached Analytical Result Report. All analyses were conducted using the appropriate methods. Methods accredited by NELAC are indicated on the report. This cover letter is an integral part of the final report.

<u>Sample #</u>	<u>Client Sample ID</u>
337673-001	MLMRP-006-10_ACAD-9
337673-002	MLMRP-006-10_ACAD-10
337673-003	MLMRP-006-30-VAND-2
337673-004	MLMRP-006-30-VAND-5
337673-005	MLMRP-006-10_ACAD-2
337673-006	MLMRP-006-10_ACAD-6

Thank you for the opportunity to be of service to your company. Please feel free to call if there are any questions regarding this report or if we can be of further service.

ASSOCIATED LABORATORIES by,

Nina Prasad
President

NOTE: Unless notified in writing, all samples will be discarded by appropriate disposal protocol 45 days from date reported.

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TESTING & CONSULTING
Chemical
Microbiological
Environmental

Matrix: Water Client: PHYSIS Environmental Laboratories, Inc. Collector: Client
 Sampled: 02/26/2014 23:00 Site:
 Sample #: 337673-001 Client Sample #: MLMRP-006-10_ACAD-9 Sample Type:

Analyte	Result	DF	MDL	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1144867					
Total Kjeldahl Nitrogen	1.58	1	0.06	0.4	mg/L	03/11/14	trinh	

Matrix: Water Client: PHYSIS Environmental Laboratories, Inc. Collector: Client
 Sampled: 02/26/2014 23:00 Site:
 Sample #: 337673-002 Client Sample #: MLMRP-006-10_ACAD-10 Sample Type:

Analyte	Result	DF	MDL	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1144867					
Total Kjeldahl Nitrogen	1.52	1	0.06	0.4	mg/L	03/11/14	trinh	

Matrix: Water Client: PHYSIS Environmental Laboratories, Inc. Collector: Client
 Sampled: 02/27/2014 20:30 Site:
 Sample #: 337673-003 Client Sample #: MLMRP-006-30-VAND-2 Sample Type:

Analyte	Result	DF	MDL	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1144867					
Total Kjeldahl Nitrogen	ND	1	0.06	0.4	mg/L	03/11/14	trinh	

Matrix: Water Client: PHYSIS Environmental Laboratories, Inc. Collector: Client
 Sampled: 02/28/2014 23:00 Site:
 Sample #: 337673-004 Client Sample #: MLMRP-006-30-VAND-5 Sample Type:

Analyte	Result	DF	MDL	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1144867					
Total Kjeldahl Nitrogen	1.43	1	0.06	0.4	mg/L	03/11/14	trinh	

Matrix: Water Client: PHYSIS Environmental Laboratories, Inc. Collector: Client
 Sampled: 02/26/2014 22:20 Site:
 Sample #: 337673-005 Client Sample #: MLMRP-006-10_ACAD-2 Sample Type:

Analyte	Result	DF	MDL	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1144867					
Total Kjeldahl Nitrogen	ND	1	0.06	0.4	mg/L	03/11/14	trinh	

Matrix: Water Client: PHYSIS Environmental Laboratories, Inc. Collector: Client
 Sampled: 02/26/2014 22:30 Site:
 Sample #: 337673-006 Client Sample #: MLMRP-006-10_ACAD-6 Sample Type:

Analyte	Result	DF	MDL	RDL	Units	Analyzed	By	Notes
Method: EPA 351.2	Prep Method: Method		QCBatchID: QC1144867					
Total Kjeldahl Nitrogen	ND	1	0.06	0.4	mg/L	03/11/14	trinh	



QCBatchID: QC1144867	Analyst: trinh	Method: EPA 351.2
Matrix: Water	Analyzed: 03/11/2014	Instrument: CHEM (group)

Blank Summary

Analyte	Blank Result	Units	RDL	Notes
QC1144867MB1				
Total Kjeldahl Nitrogen	ND	mg/L	0.4	

Lab Control Spike/ Lab Control Spike Duplicate Summary

Analyte	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
	LCS	LCSD	LCS	LCSD		LCS	LCSD	RPD	%Rec	RPD	
QC1144867LCS1											
Total Kjeldahl Nitrogen	2.5		2.44		mg/L	98			80-120		

Matrix Spike/Matrix Spike Duplicate Summary

Analyte	Sample Amount	Spike Amount		Spike Result		Units	Recoveries			Limits		Notes
		MS	MSD	MS	MSD		MS	MSD	RPD	%Rec	RPD	
QC1144867MS1, QC1144867MSD1												
Total Kjeldahl Nitrogen	4.19	12.5	12.5	17.9	17.0	mg/L	110	102	5.2	80-120	20	Source: 337416-001



Notes and Definitions

B	Analyte was present in an associated method blank. Associated sample data was reported with qualifier.
BQ1	No valid test replicates. Result may be greater. Best result was reported with qualifier. Sample toxicity possible.
BQ2	No valid test replicates.
BQ3	Minimum DO is less than 1.0 mg/L. Result may be greater and reported with qualifier.
C	Laboratory Contamination.
D	The sample duplicate RPD was not within control limits, the sample data was reported without further clarification.
DF	Dilution Factor
DW	Sample result is calculated on a dry weigh basis
J	Reported value is estimated
L	The laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) was out of control limits. Associated sample data was reported with qualifier.
M	The matrix spike (MS) or matrix spike duplicate (MSD) was not within control limits due to matrix interference. The associated LCS and/or LCSD was within control limits and the sample data was reported without further clarification.
MDL	Method Detection Limit
NC	The analyte concentration in the sample exceeded the spike level by a factor of four or greater, spike recovery and limits do not apply.
ND	Analyte was not detected or was less than the detection limit.
P	Sample was received without proper preservation according to EPA guidelines.
Q1	Analyte Calibration Verification exceeds criteria and the result was reported with qualifier.
Q2	Analyte calibration was not verified and the result was estimated and reported with qualifier.
Q3	Analyte initial calibration was not available or exceeds criteria. The result was estimated and reported with qualifier.
RDL	Reporting Detection Limit
S	The surrogate recovery was out of control limits due to matrix interference. The associated method blank surrogate recovery was within control limits and the sample data was reported without further clarification.
T	Sample was extracted/analyzed past the holding time.
T2	Sample was analyzed ASAP but received and analyzed past the 15 minute holding time.
TIC	Tentatively Identified Compounds





ASSOCIATED LABORATORIES

806 North Batavia – Orange, California 92868 – 714-771-6900

FAX 714-538-1209

SAMPLE ACCEPTANCE CHECKLIST

Section 1
 Client: Physis Environmental Laboratories, Inc. Project: 1311002-008
 Date Received: 3/7/14 Sampler's Name: Yes (No)
 Sample temperature: 11°C
 Sample(s) received in cooler: (Yes) No (Skip Section 2)
 Shipping Information: _____

Section 2
 Was the cooler packed with: ___ Ice ✓ Ice Packs ___ Bubble Wrap ___ Styrofoam
 ___ Paper ___ None ___ Other _____
 Cooler Temperature: _____

(Acceptance range is 0 to 6 Deg. C. or arrival on ice; For Microbiology sample ≤10 Deg. C or arrival on ice)

Section 3	YES	NO	N/A
Was a COC received?	✓		
Is it properly completed? (IDs, sampling date and time, signature, test)	✓		
Were custody seals present?			✓
If Yes – were they intact?			✓
Were all samples sealed in plastic bags?	✓		
Did all samples arrive intact? If no, indicate below.	✓		
Did all bottle labels agree with COC? (ID, dates and times)	✓		
Were correct containers used for the tests required?	✓		
Was a sufficient amount of sample sent for tests indicated?	✓		
Was there headspace in VOA vials?			✓
Were the containers labeled with correct preservatives?	✓		
Was total residual chlorine measured (Fish Bioassay samples only)? *			✓

*: If the answer is no, please inform Fish Bioassay Dept. immediately.

Section 4
 Explanations/Comments

Section 5
 Was Project Manager notified of discrepancies: Y / N N/A
 Project Manager's response: _____

Completed By: Chris Ok Date: 3/7/14



CHAIN OF CUSTODY

337673

SEND TO: Associated

COMPANY NAME: **Physis Environmental Laboratories, Inc.** EMAIL: **sec@physislabs.com** PROJECT NAME / NUMBER: **1311002-008** COC PAGE: **1** of **1**

PROJECT MANAGER: **Misty Mercier** FAX: **714 602-5321** PO #: **1311002** PHYSIS SOS #: **1311002** TYPE OF ICE USED: YET FUE PRY

COMPANY ADDRESS: **1904 E. Wright Circle, Anaheim, CA 92806** PHONE: **714 602-5320** OFFICE: **714 335-5918** CELL: **714 335-5918** SHIPPED VIA: FEDEX UPS USPS

TURNDOWN TIME: STANDARD RUSH BUSINESS DAYS: RUSH OTHER

REPORT FORMAT: PDF/EDD SWAMP EDD OTHER

SPECIAL INSTRUCTIONS: **Please report down to the MDL**

PHYSIS MATRIX CODES: **SW = seawater FW = freshwater RW = rainwater WW = wastewater DW = drinking water S = sediment T = tissue E = extract O = other (specify)**

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE		physis matrix code	# of bottles	TKN											
		date	time														
1	MLMRP-006-10_ACAD-9	2/26/14	23:00	RW	1	X											
2	MLMRP-006-10_ACAD-10	2/26/14	23:00	RW	1	X											
3	MLMRP-006-30-VAND-2	2/27/14	20:30		1	X											
4	MLMRP-006-30-VAND-5	2/28/14	23:00		1	X											
5	MLMRP-006-10_ACAD-2	2/26/14	22:20		1	X											
6	MLMRP-006-10_ACAD-6	2/26/14	22:30		1	X											
7																	
8																	
9																	
10																	

RELINQUISHED BY: Jackie Moreno (signature) company: Physis date & time: 03-07-14 16:02

RECEIVED BY: (signature) company: Associated date & time: 3/11/14 16:04

PHYSICS
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CHAIN of CUSTODY

COMPANY NAME MWH		EMAIL nathan.griffin@mwhglobal.com		PROJECT NAME / NUMBER Machado Lake Monitoring & Reporting Program				COC PAGE 5 of 5		
PROJECT MANAGER Bronwyn Kelly		FAX 626-568-6101		PO #	PHYSIS SOS #		TYPE OF ICE USED <input checked="" type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY			
COMPANY ADDRESS 618 Michillinda Ave Arcadia, CA, 91007		PHONE 626-568-6187 office 949-322-1331 cell		SAMPLED BY		SHIPPED VIA <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Physis <input type="checkbox"/> other				
TURNAROUND TIME <input checked="" type="checkbox"/> STANDARD (15-20 business days) <input type="checkbox"/> RUSH business days				REQUESTED ANALYSES						
REPORT FORMAT <input type="checkbox"/> PHYSIS PDF/EDD <input type="checkbox"/> SWAMP EDD <input type="checkbox"/> other				PLEASE SEE PHYSIS SOS						
SPECIAL INSTRUCTIONS 1) Cleaning of equipment for stormwater analysis, needs to be finished before next storm event 2) Cleaning requirements: "All containers and test chambers will be acid-rinsed" 3) Quantity of equipment needing cleaning will be filled in when dropping off equipment, since the number will vary depending on if flow occurred at all sites				Cleaning (acid Rinsing) of containers and hose						
PHYSIS MATRIX CODES <u>SW</u> = seawater <u>FW</u> = freshwater <u>RW</u> = rainwater <u>WW</u> = wastewater <u>DW</u> = drinking water <u>S</u> = sediment <u>I</u> = tissue <u>E</u> = extract <u>O</u> = other (specify)										
SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	# of bottles					
1	2.5 gallon polyethylene bottles				3	X				
2	Segments of Vinyle suction line				3	X				
3	Polypropylene strainer				2	X				
4										
5										
6										
7										
8										
9										
10										
RELINQUISHED BY print: Nathan Griffin signature: <i>[Signature]</i> company: MWH date & time: 2/28/14				RECEIVED BY print: Misty Mercier signature: <i>[Signature]</i> company: Physis date & time: 2/28/14						MB 2240 2240



CHAIN of CUSTODY

COMPANY NAME MWH	EMAIL nathan.griffin@mwhglobal.com	PROJECT NAME / NUMBER Machado Lake Monitoring & Reporting Program	COC PAGE 3 of 5
PROJECT MANAGER Bronwyn Kelly	FAX 626-568-6101	PO #	PHYSIS SOS #
COMPANY ADDRESS 618 Michillinda Ave Arcadia, CA, 91007	PHONE 626-568-6187 office 949-322-1331 cell	TYPE OF ICE USED <input checked="" type="checkbox"/> WET <input type="checkbox"/> BLUE <input type="checkbox"/> DRY	
TURNAROUND TIME <input checked="" type="checkbox"/> STANDARD (15-20 business days) <input type="checkbox"/> RUSH business days		SHIPPED VIA <input type="checkbox"/> FEDEX <input type="checkbox"/> UPS <input type="checkbox"/> USPS <input type="checkbox"/> Client <input type="checkbox"/> Physis <input type="checkbox"/> other	

REQUESTED ANALYSES

PLEASE SEE PHYSIS SOS

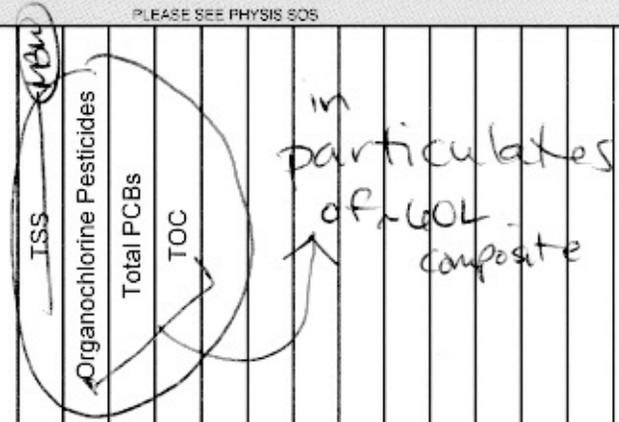
REPORT FORMAT
 PHYSIS PDF/EDD SWAMP EDD other

SPECIAL INSTRUCTIONS
thirteen
1 gallon bottles are delivered. A little bit (~100ml) from each bottle needs to be extracted and composited into one bottle for Field Samples (FS). The FS need to be split by PHYSIS to run nutrient analysis. All the other bottles are used to run toxics analysis. Toxics that are required are written in the QAPP that was sent to Misty

*** sample is a composite from 23:00 on 2/27/2014 to 23:00 on 2/28/2014**

PHYSIS MATRIX CODES
SW = seawater **FW** = freshwater **RW** = rainwater
WW = wastewater **DW** = drinking water
S = sediment **I** = tissue **E** = extract **O** = other (specify)

TSS and TDS	TKN	Nitrate, Nitrite, Dissolved P, Total Orthophosphate	Ammonia & Total Phosphorus	ISS	Organochlorine Pesticides	Total PCBs	TOC											



SAMPLE ID	SAMPLE DESCRIPTION	SAMPLE date	SAMPLE time	physis matrix code	# of bottles														
1	MLMRP-006-30_VAND-1	EB	12/27/14	20:30		1	X												
2	MLMRP-006-30_VAND-2	EB	12/27/14	20:30		1		X											
3	MLMRP-006-30_VAND-3	EB	12/27/14	20:30		1			X										
4	MLMRP-006-30_VAND-4	EB	12/27/14	20:30		1				X									
5	MLMRP-006-30_VAND-5	Field Samples	12/28/14	*23:00	RW	13	X	X	X	X									
6	MLMRP-006-30_VAND-6	FS - Toxics	12/28/14	*23:00	RW						X	X	X	X					
7																			
8																			
9																			
10																			

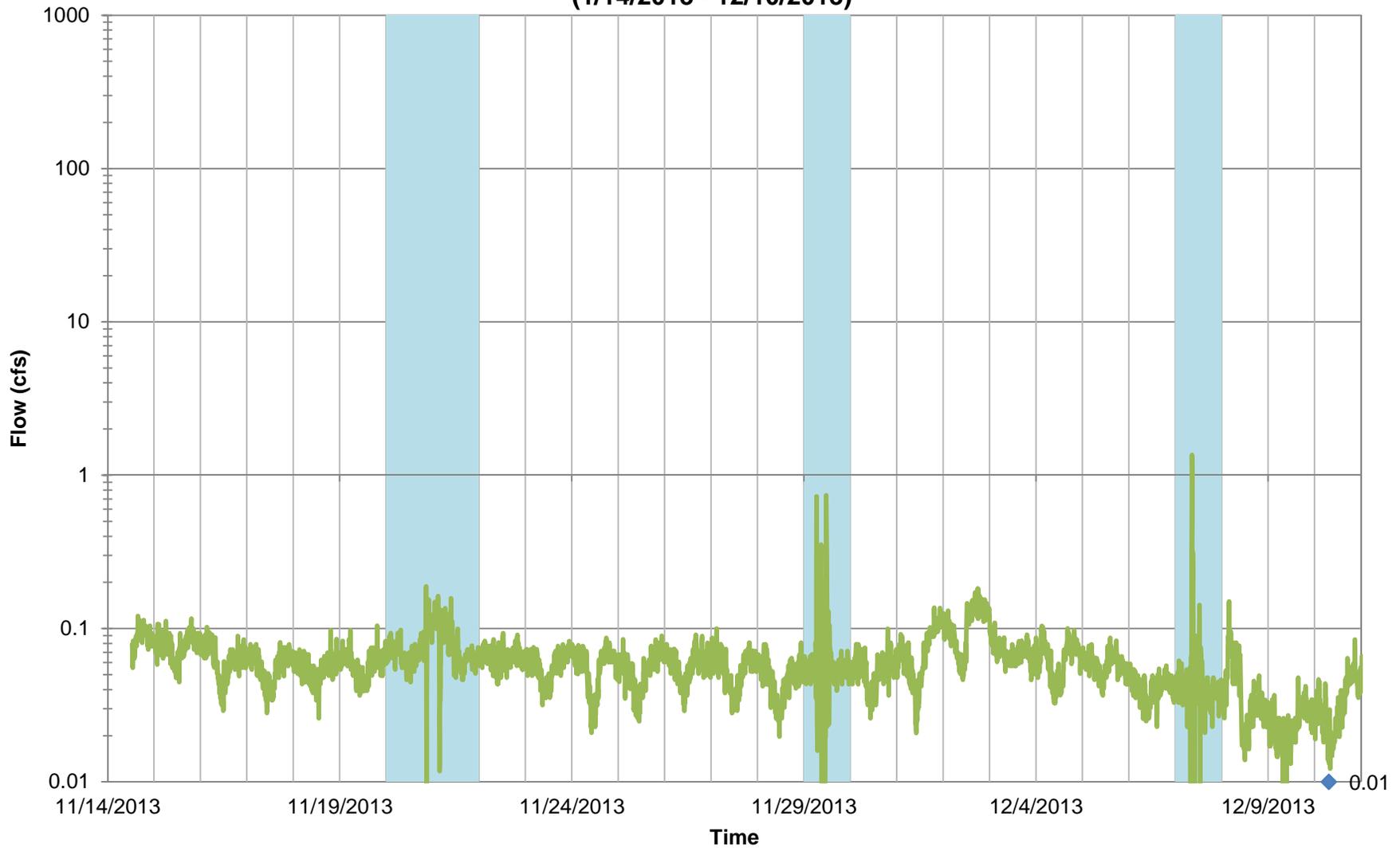
RELINQUISHED BY				RECEIVED BY			
print Nathan Griffin	signature <i>Nathan Griffin</i>	company MWH	date & time 2/28/14 22:40	print Mercier	signature <i>Mercier</i>	company Physis	date & time 2/28/14 22:40

Machado Lake Nutrient TMDL Year 2

Attachment 4:
Machado Lake Nutrient TMDL
HOBO Data Hydrographs

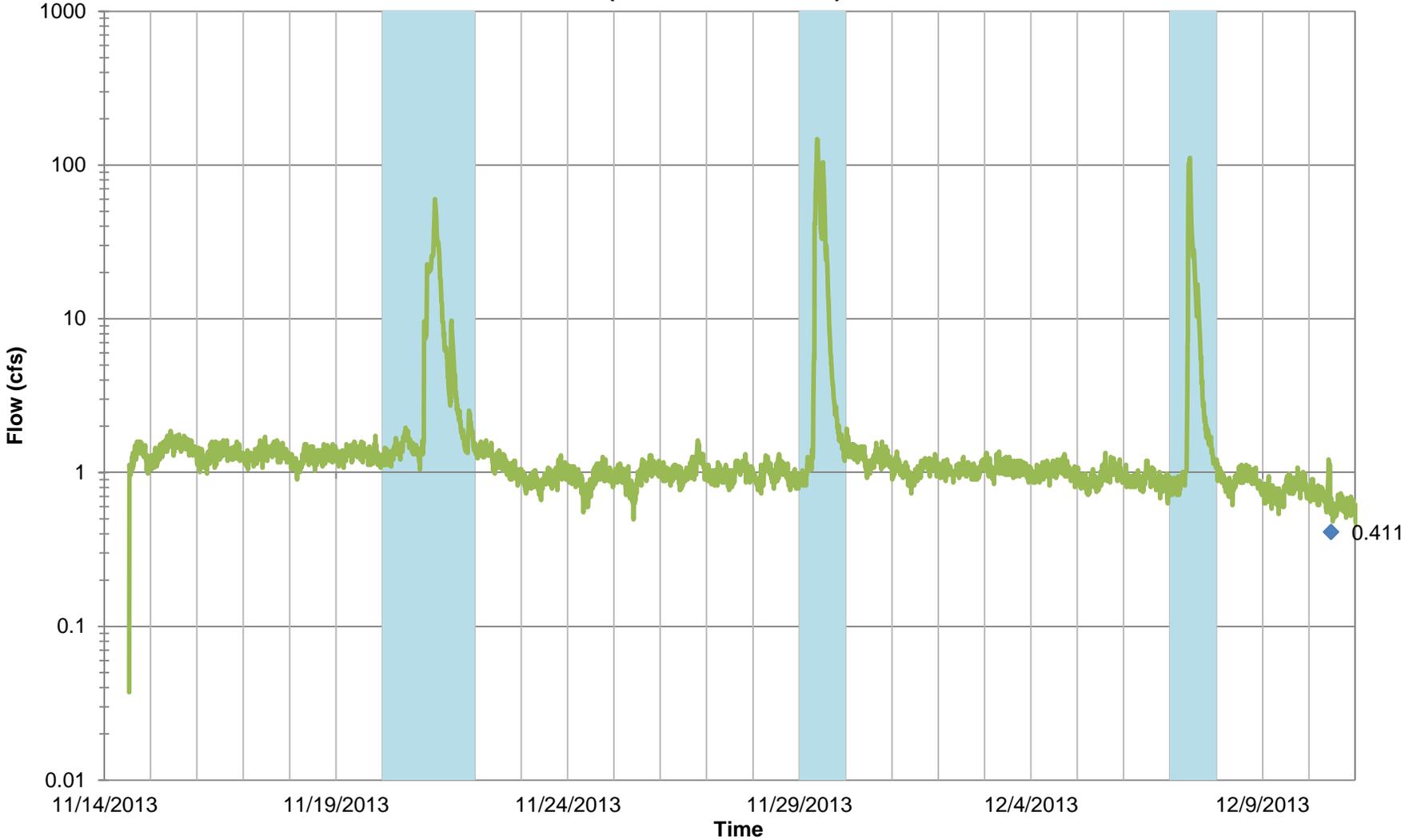
Q3 Dry Weather Monitoring Event
December 10, 2013

Figure A4-1
Estimated Flow from HOBO Data at 1O_ACAD
(1/14/2013 - 12/10/2013)



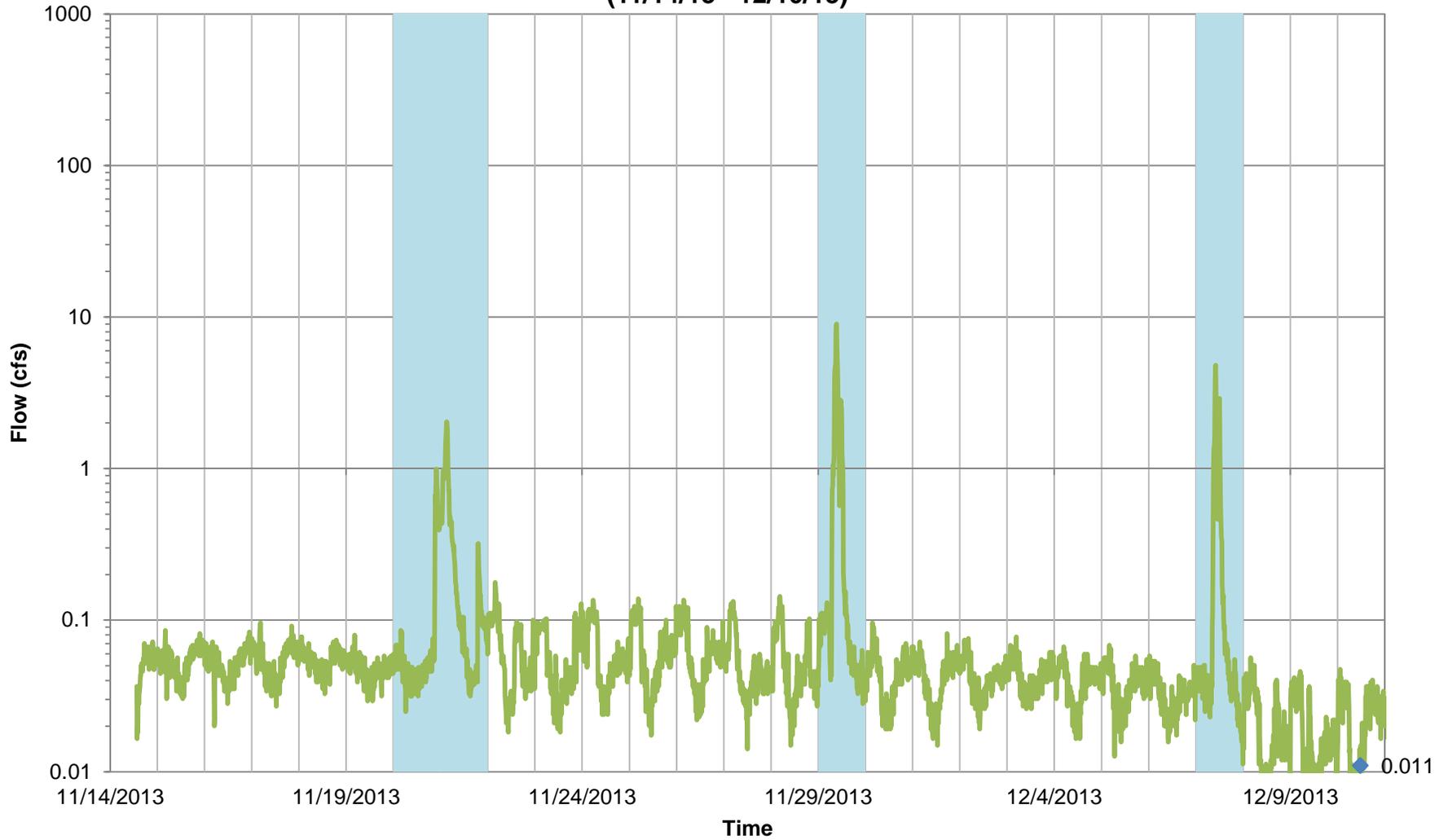
1. HOB0 meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOB0 meter was read.

Figure A4-2
Estimated Flow from HOBO Data at 3I_NORMP
(11/14/13 - 12/10/13)



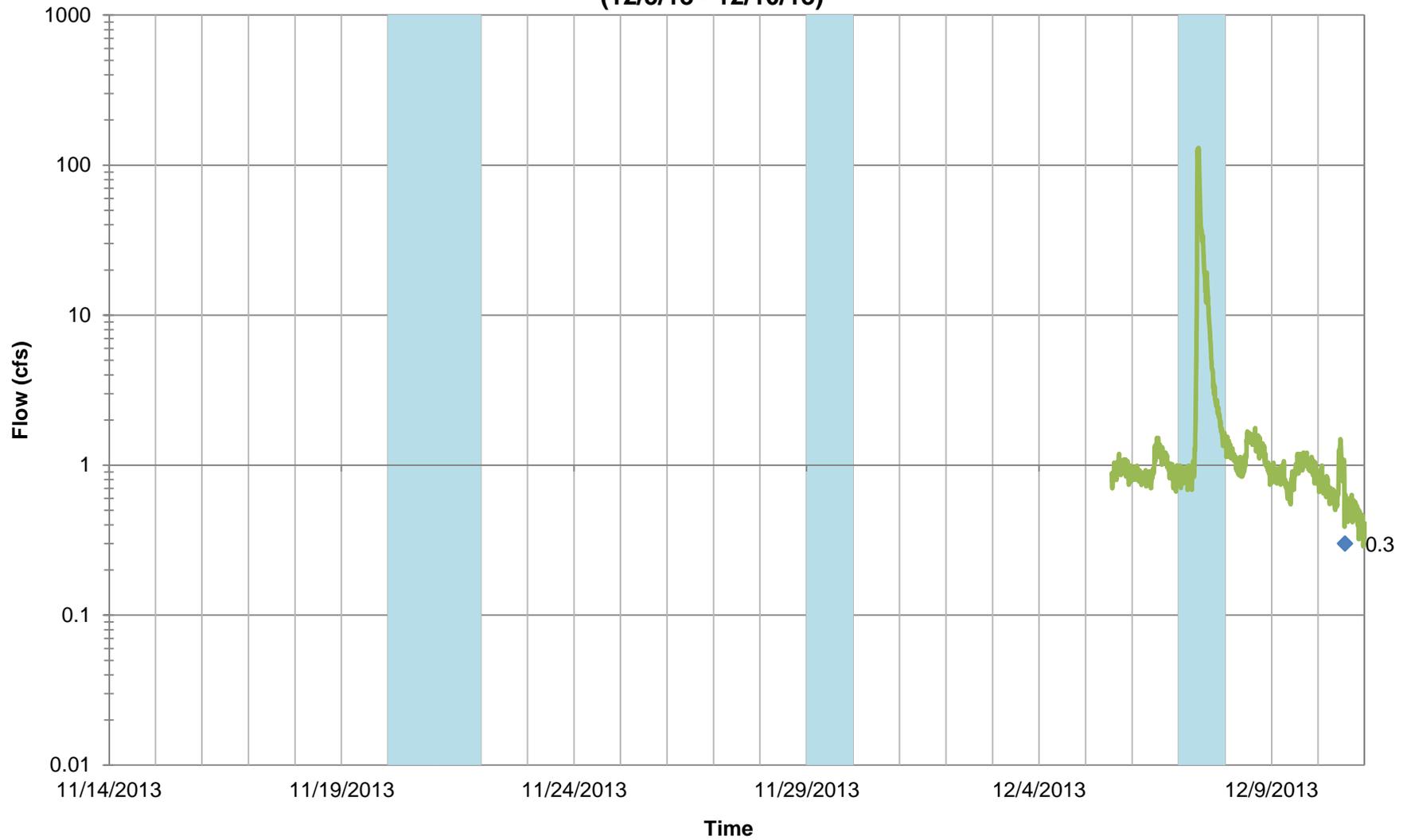
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-3
Estimated Flow from HOBO Data at 3I_ASHB
(11/14/13 - 12/10/13)



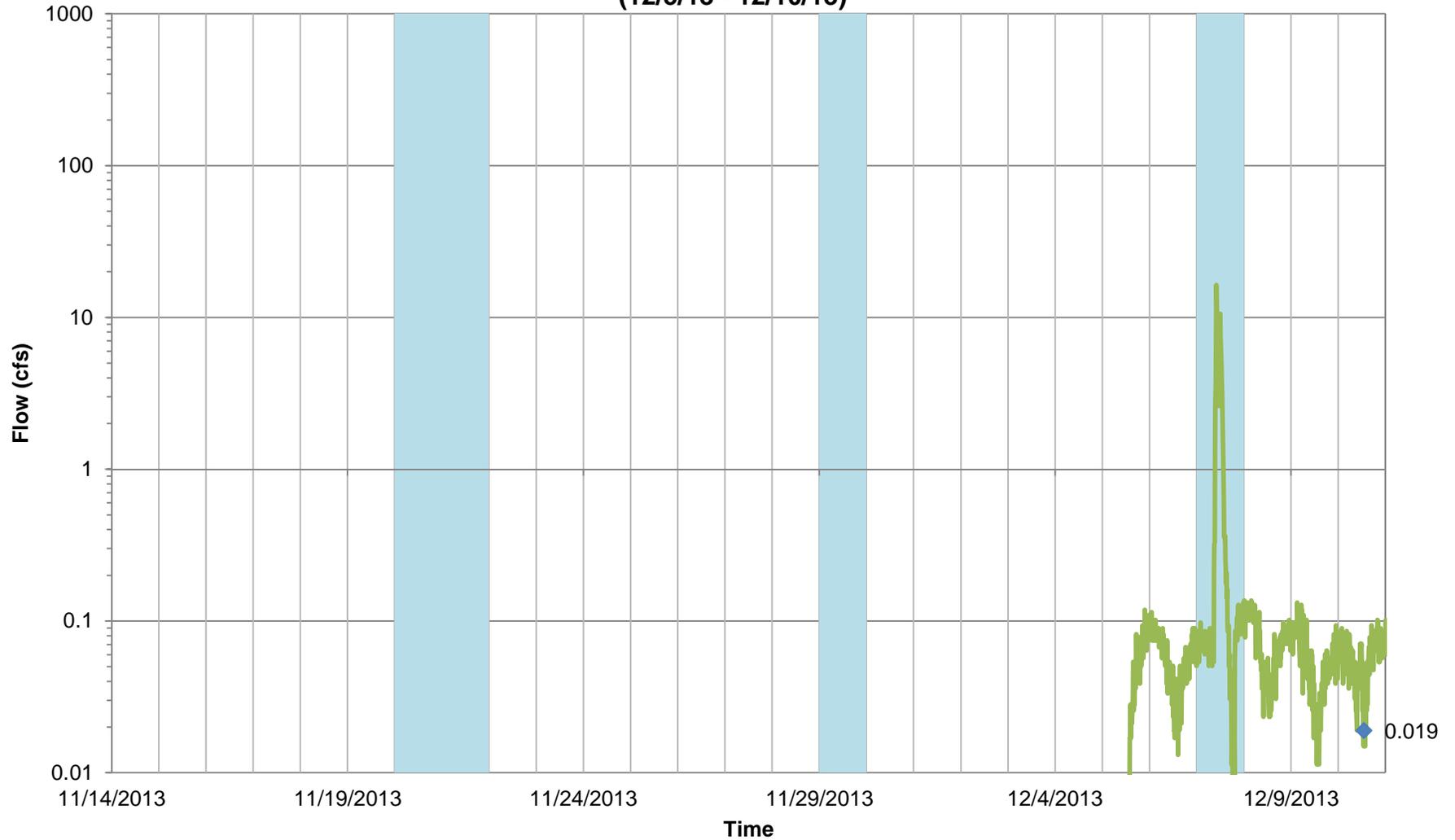
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-4
Estimated Flow from HOBO Data at 30_VERSEP
(12/5/13 - 12/10/13)



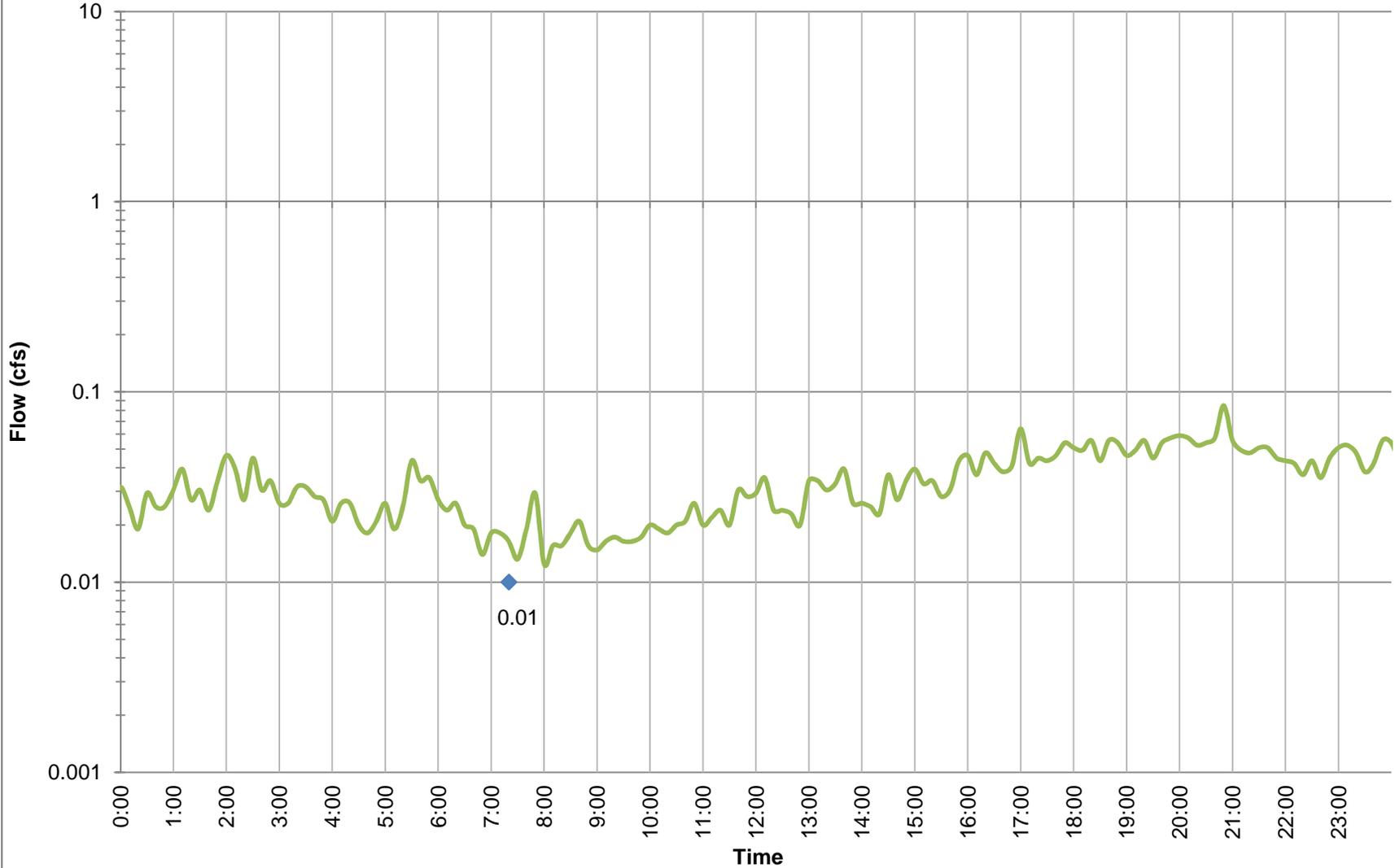
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-5
Estimated Flow from HOBO Data at 30_VAND
(12/5/13 - 12/10/13)



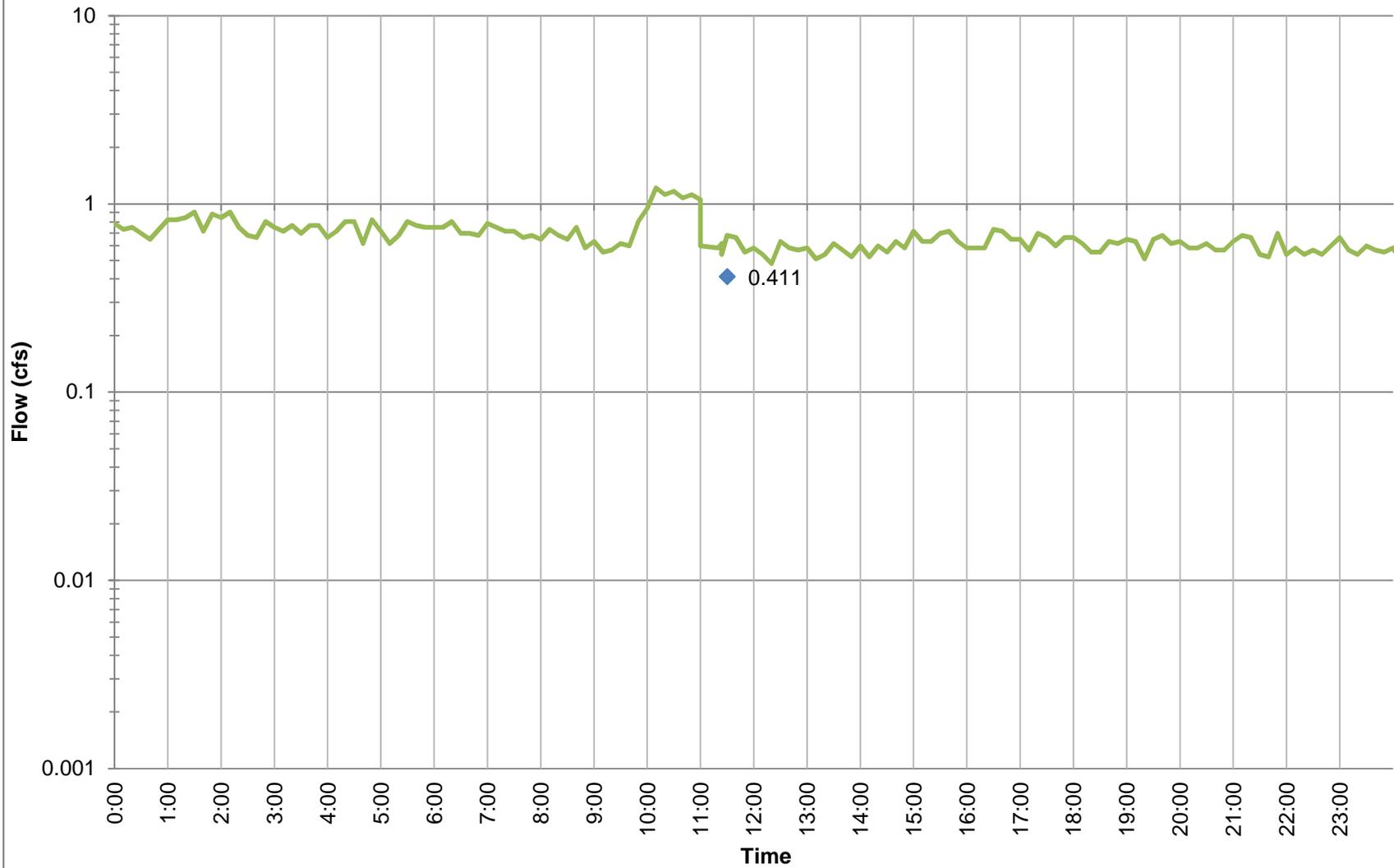
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-6
Estimated Flow from HOBO Data at 1O_ACAD on December 10, 2013



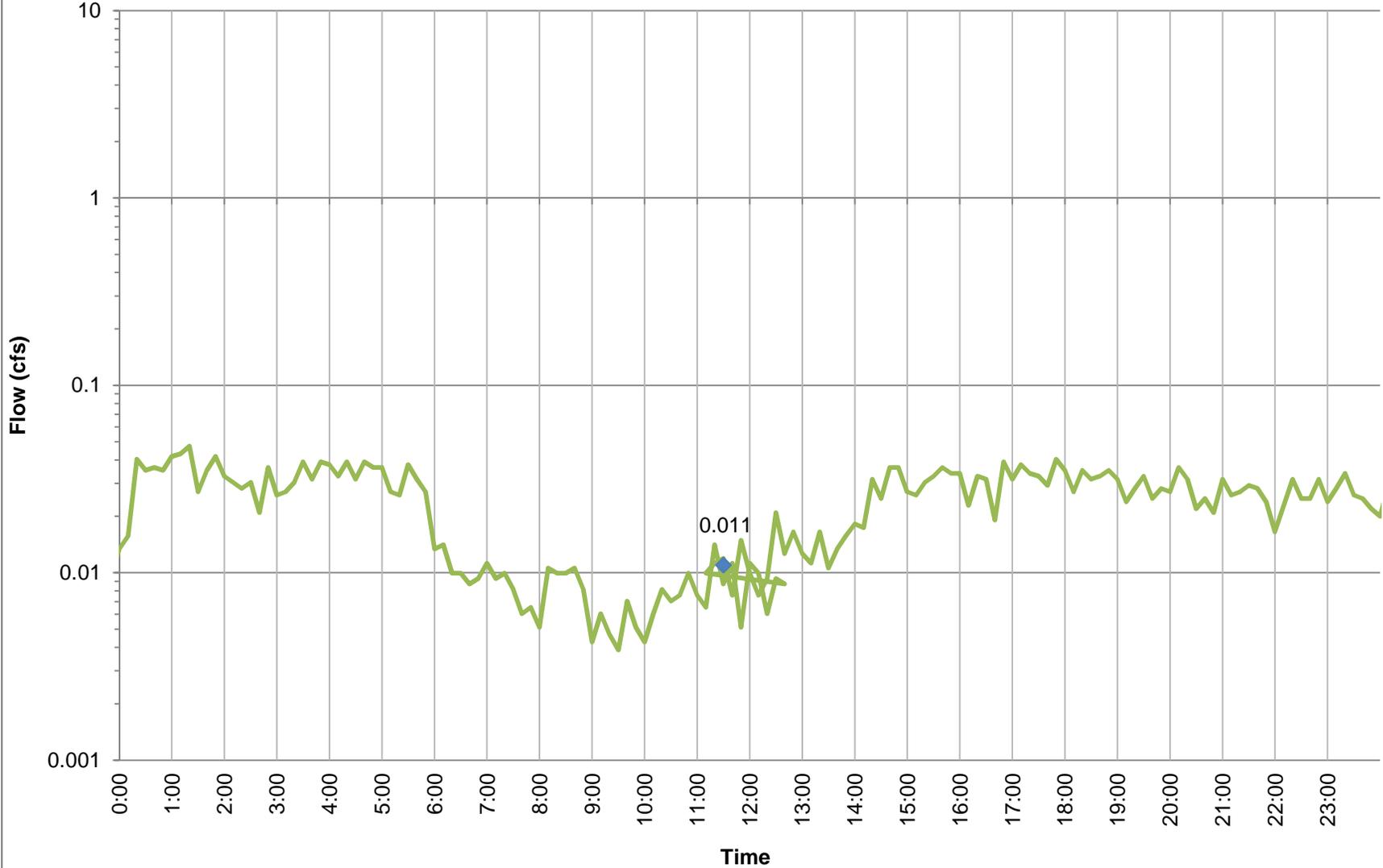
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow within conduit is determined using Manning's equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-7
Estimated Flow from HOBO Data at 3I_NORMP on December 10, 2013



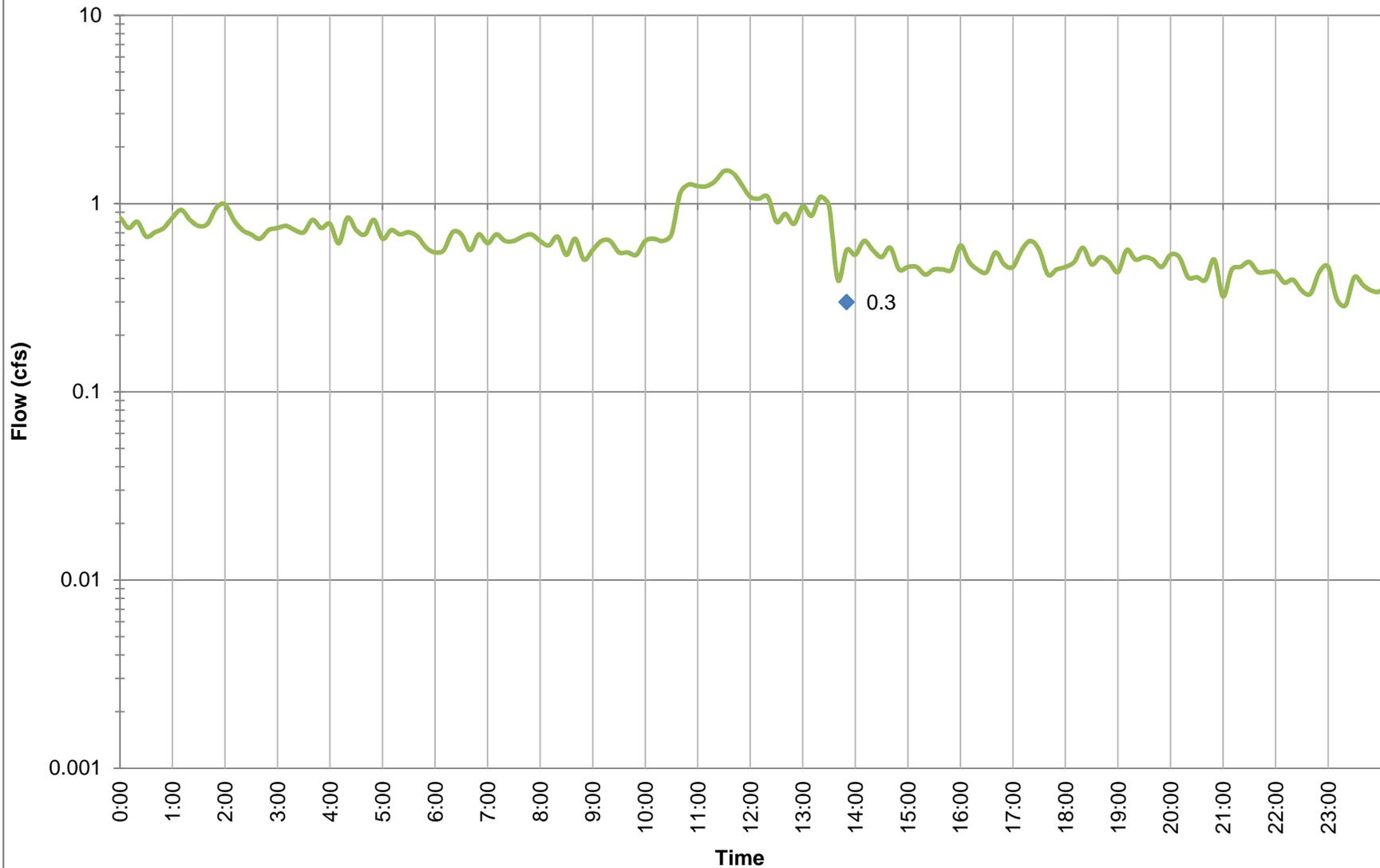
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow within conduit is determined using Manning's equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-8
Estimated Flow from HOBO Data at 3I_ASHB on December 10 2013



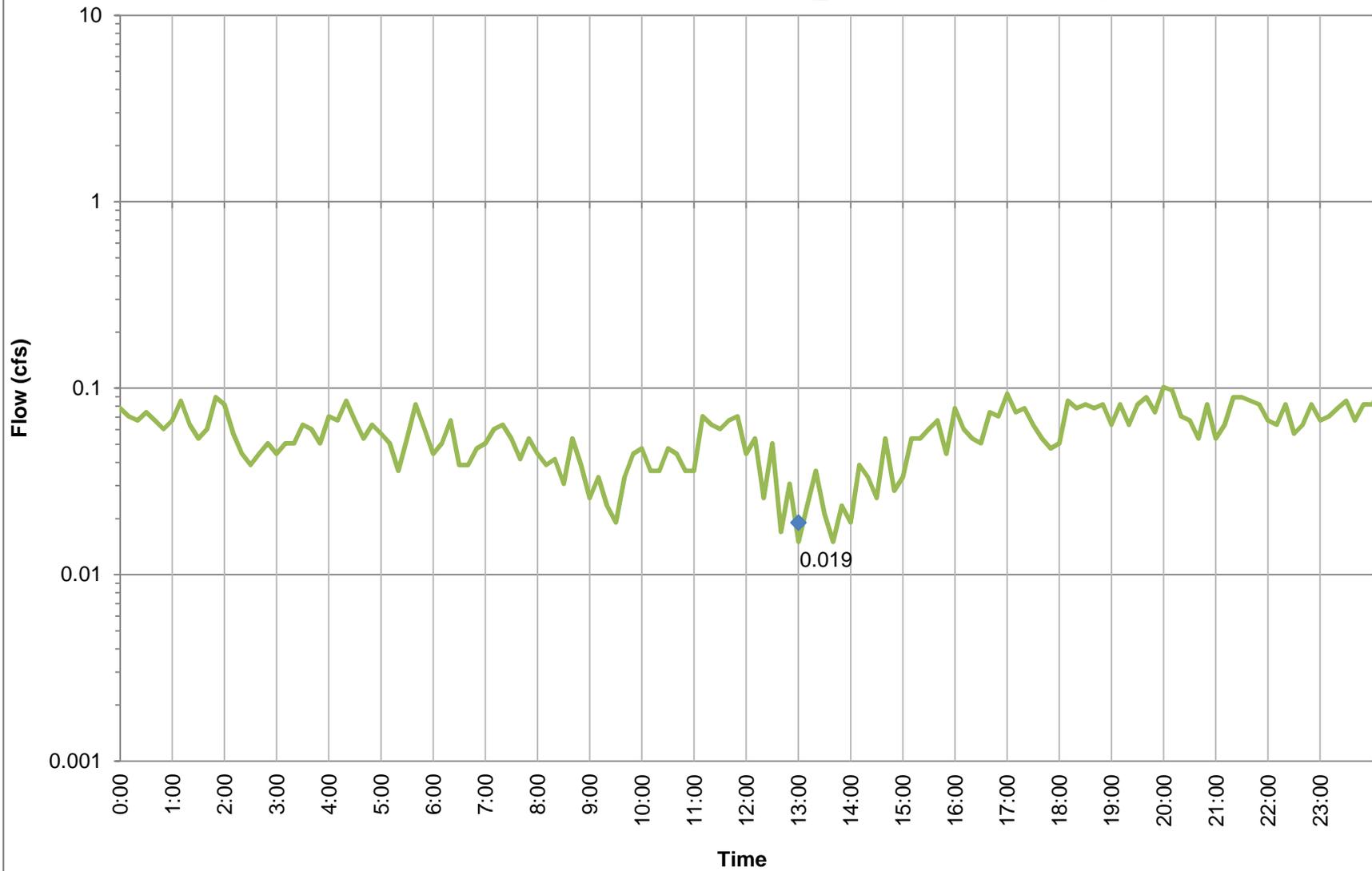
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow within conduit is determined using Manning's equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-9
Estimated Flow from HOBO Data at 30_VERSEP on December 10, 2013



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow within conduit is determined using Manning's equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-10
Estimated Flow from HOBO Data at 30_VAND on December 10, 2013

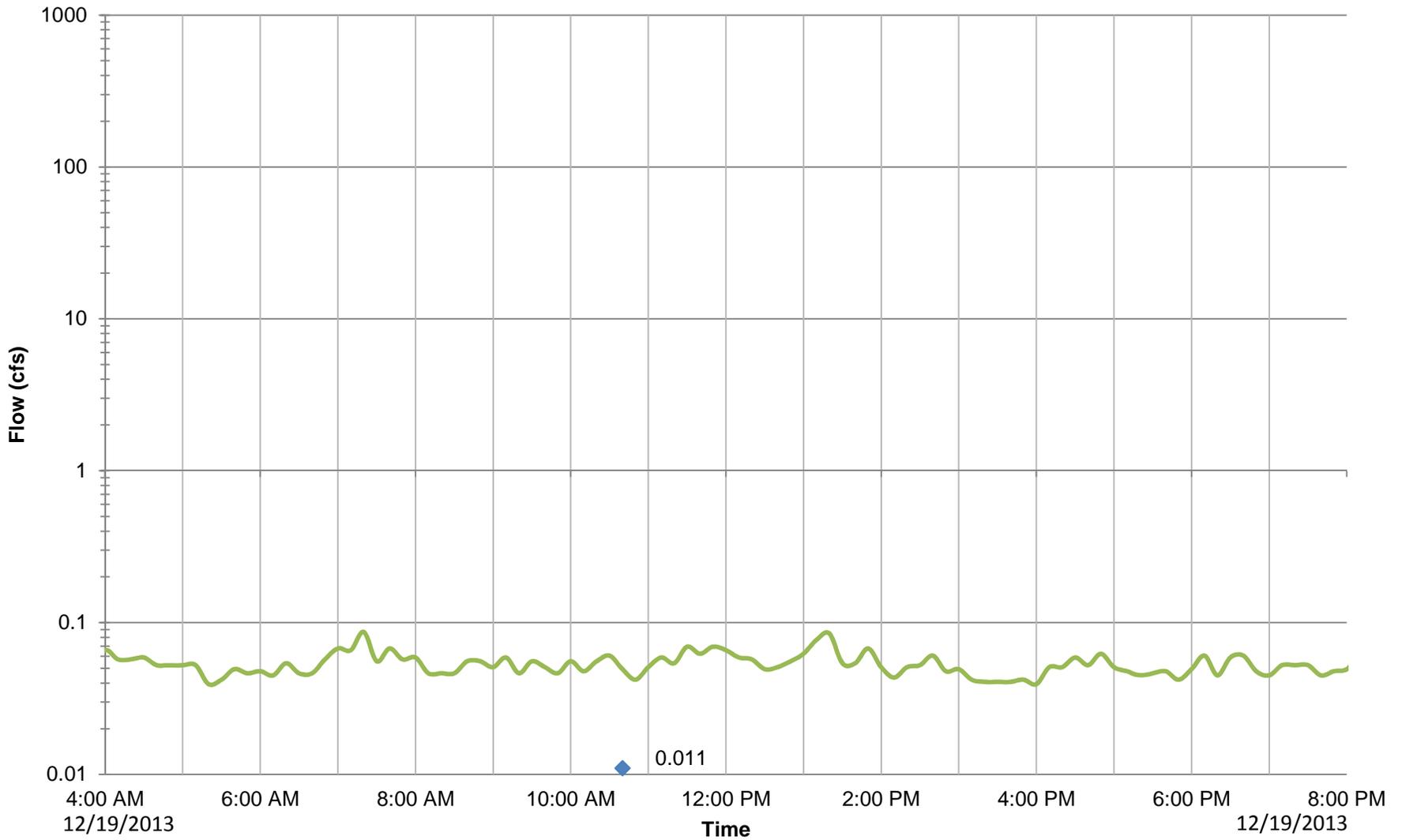


1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow within conduit is determined using Manning's equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Graphs are not displayed for 1O_EAST and for 2O_SCBG. There is no graph for 1O_EAST because during storm events the pressure would decrease in the HOBO meters instead of increase, which would make the appearance of negative pressure. Therefore, the data is inconclusive and no conclusion can be drawn from the graph. There is no graph for 2O_SCBG because the height of water over the HOBO meter was never higher than 4", which is the height of the metallic box the HOBO meter is in. Therefore, we assume that there was never any flow at 2O_SCBG.

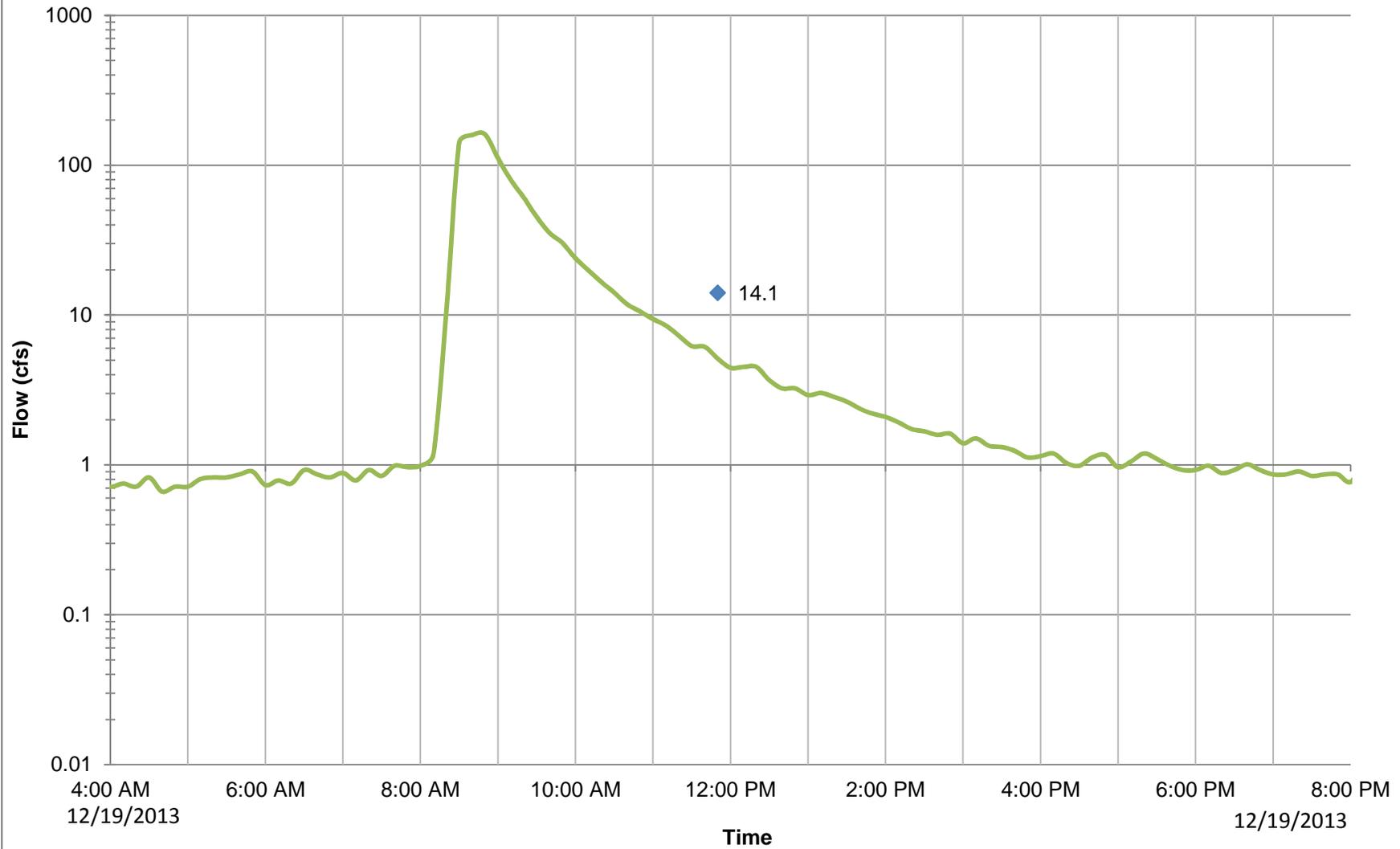
Wet Weather Monitoring Event No.1
December 19, 2013

Figure A4-1
Estimated Flow from HOBO Data at 10_ACAD



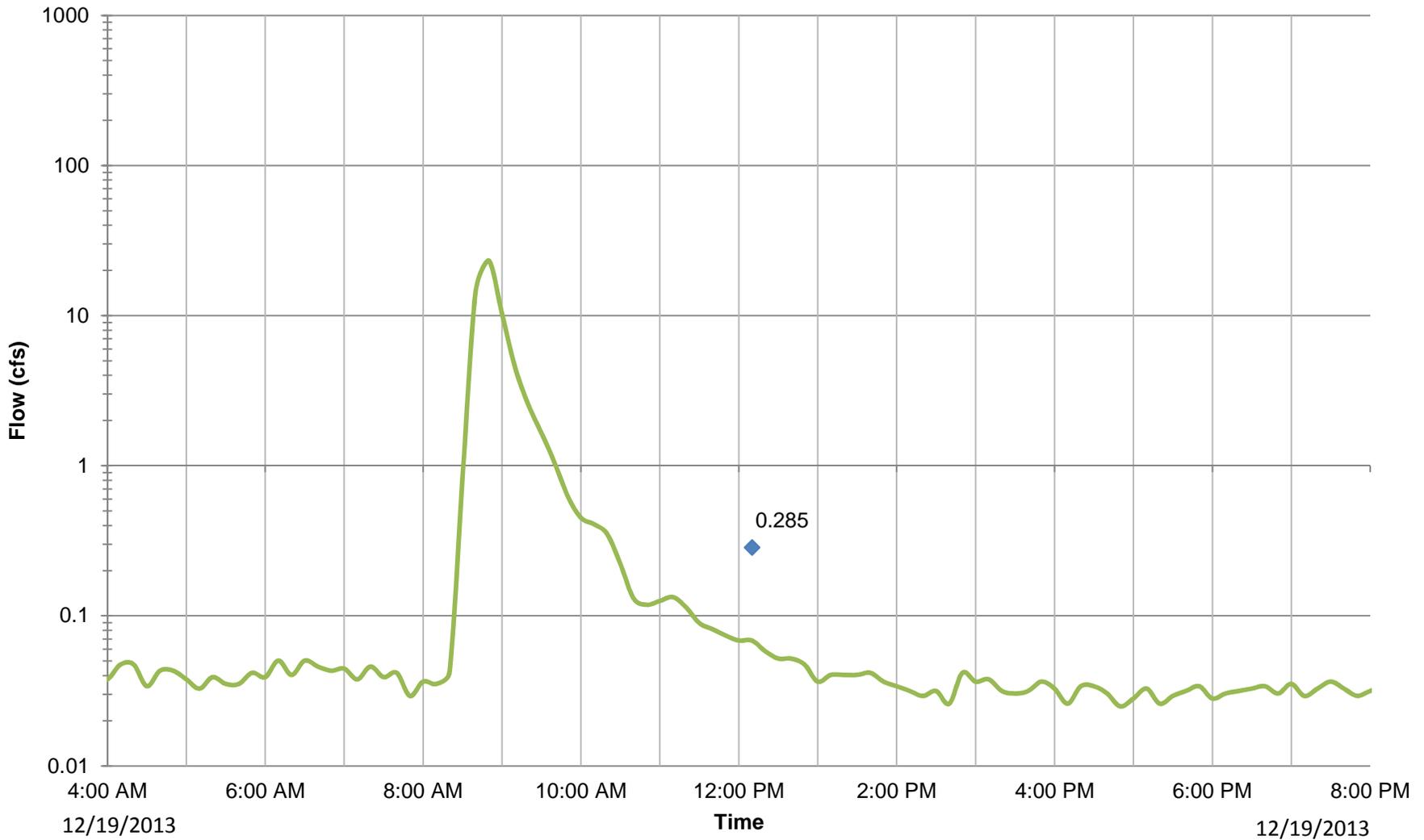
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-2
Estimated Flow from HOBO Data at 3I_NORMP



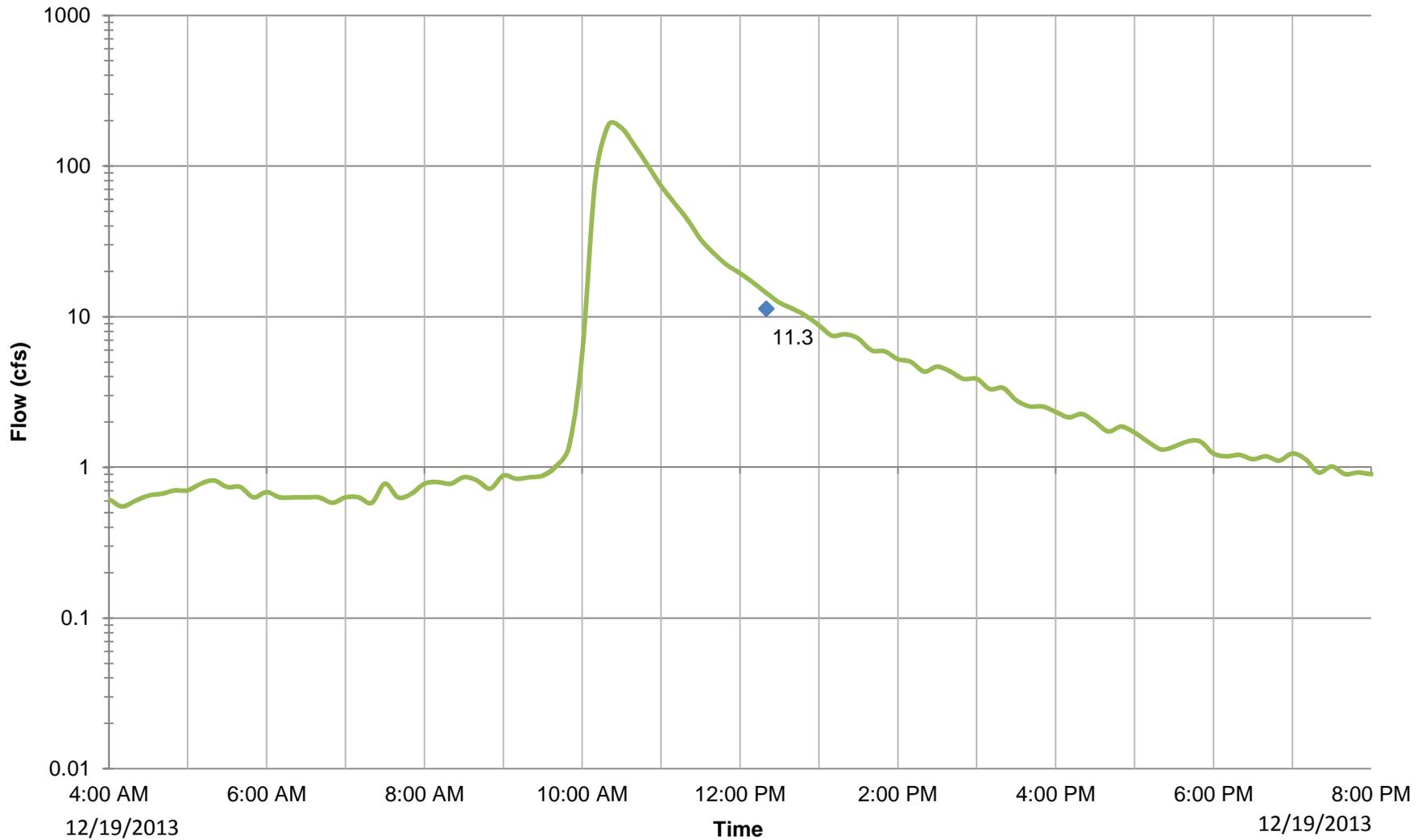
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-3
Estimated Flow from HOBO Data at 3I_ASHB



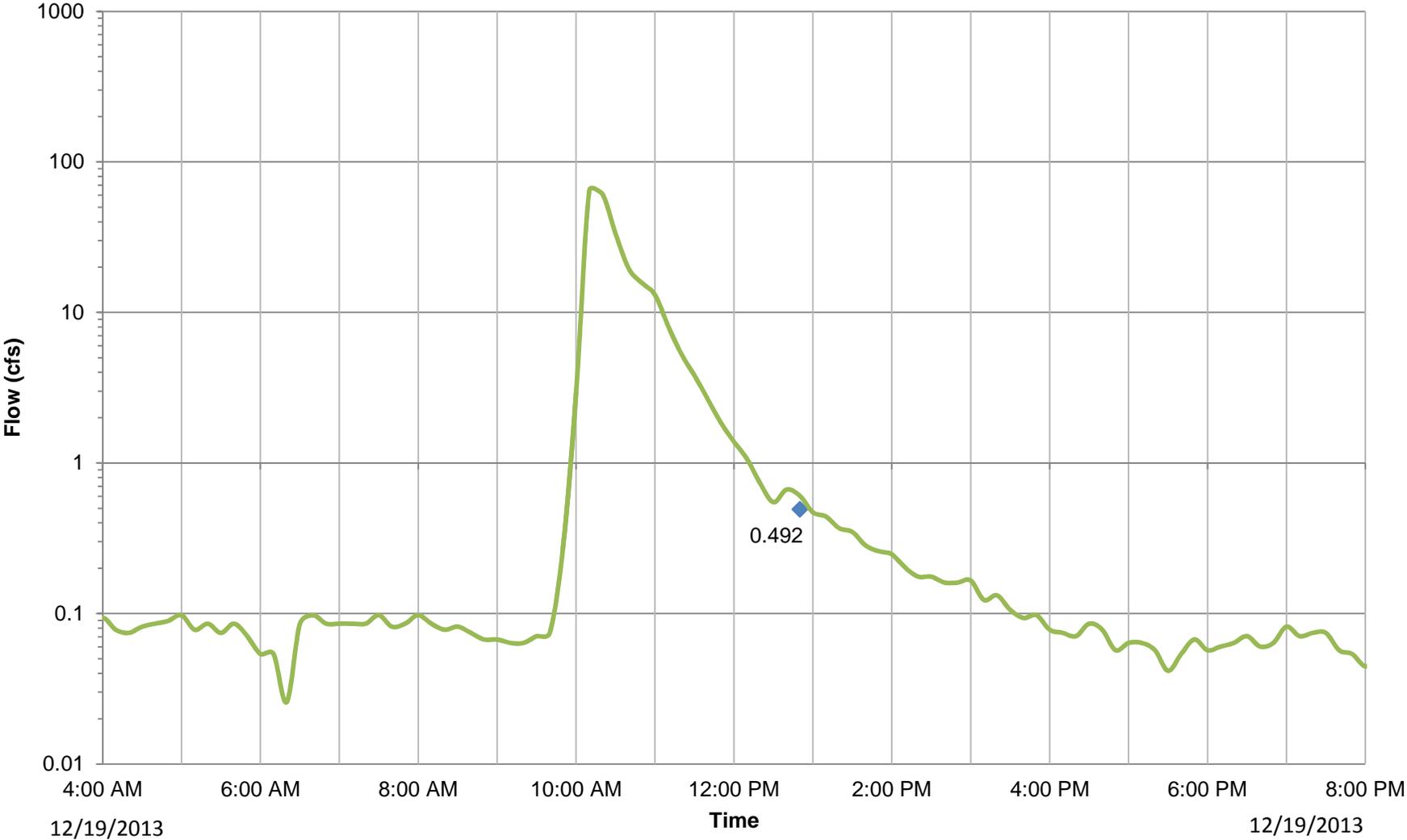
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-4
Estimated Flow from HOBO Data at 30_VERSEP



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

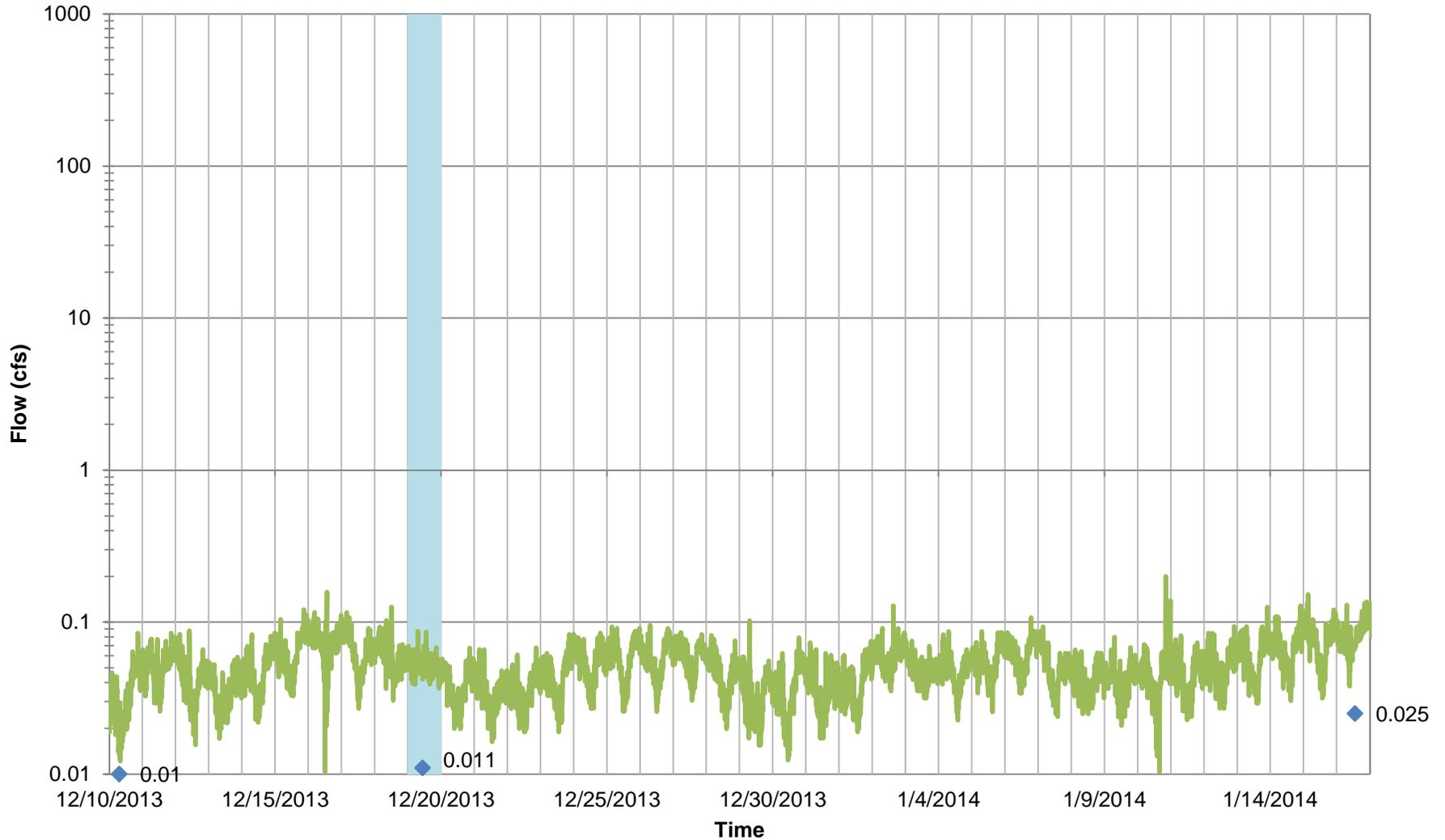
Figure A4-5
Estimated Flow from HOBO Data at 30_VAND



- 1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
- 2. Flow in conduit is determined using Manning's Equation.
- 3. The blue diamonds are field measurements at the time the HOBO meter was read.

Q4 Dry Weather Monitoring Event
January 16, 2014

Figure A4-1
Estimated Flow from HOBO Data at 10_ACAD
(12/10/13 - 01/16/14)



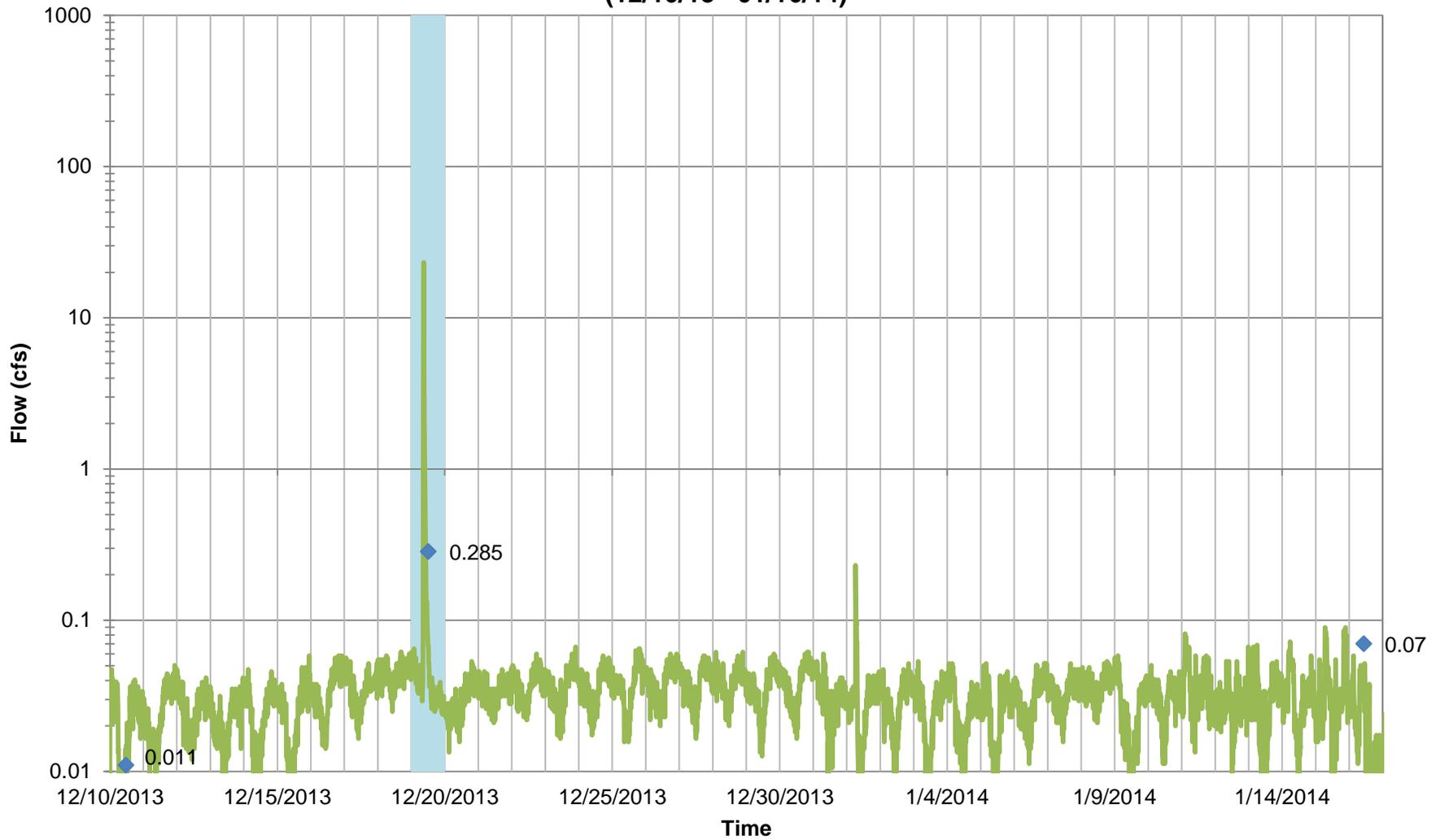
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-2
Estimated Flow from HOBO Data at 3I_NORMP
(12/10/13 - 01/16/14)



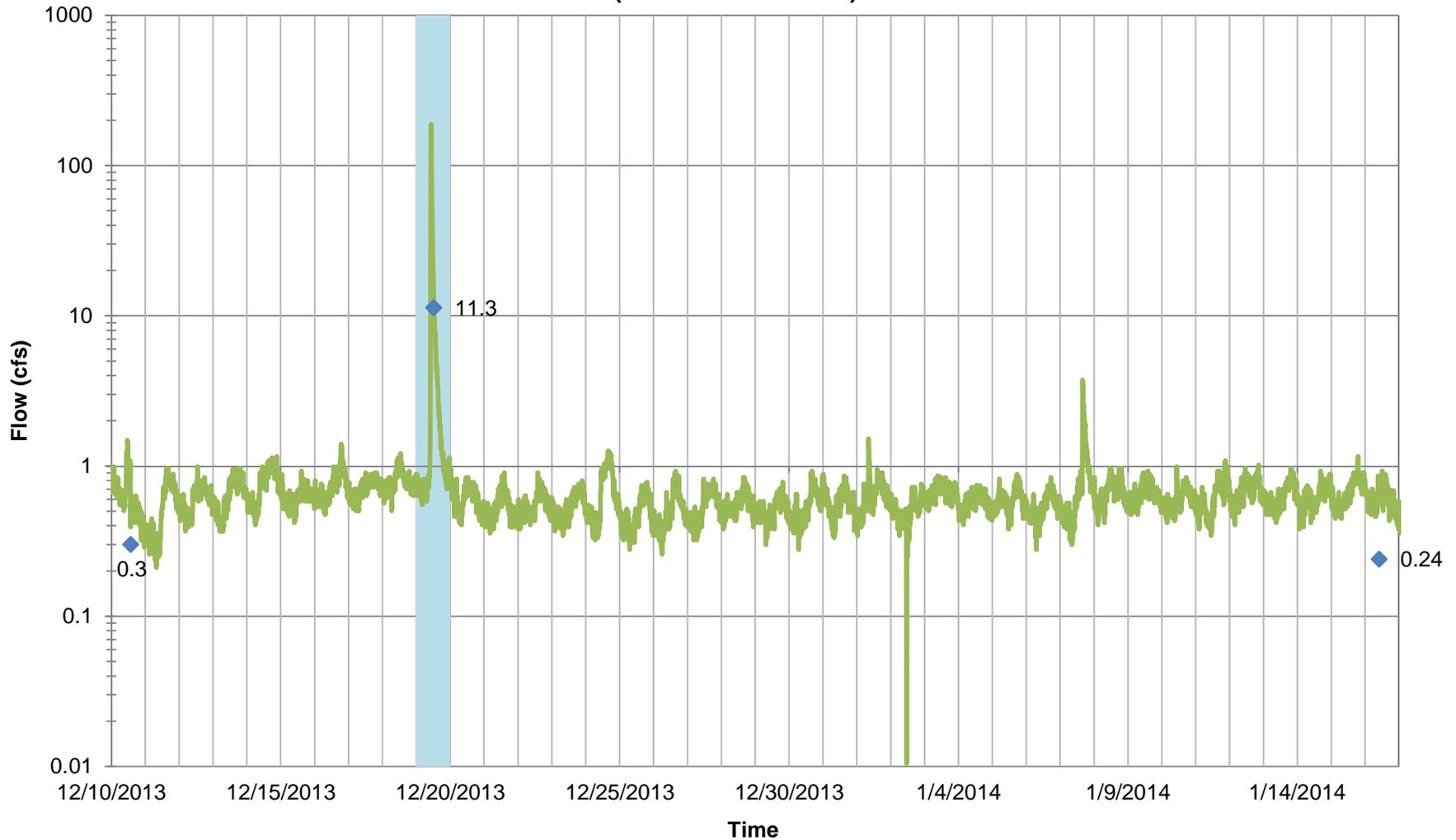
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-3
Estimated Flow from HOBO Data at 3I_ASHB
(12/10/13 - 01/16/14)



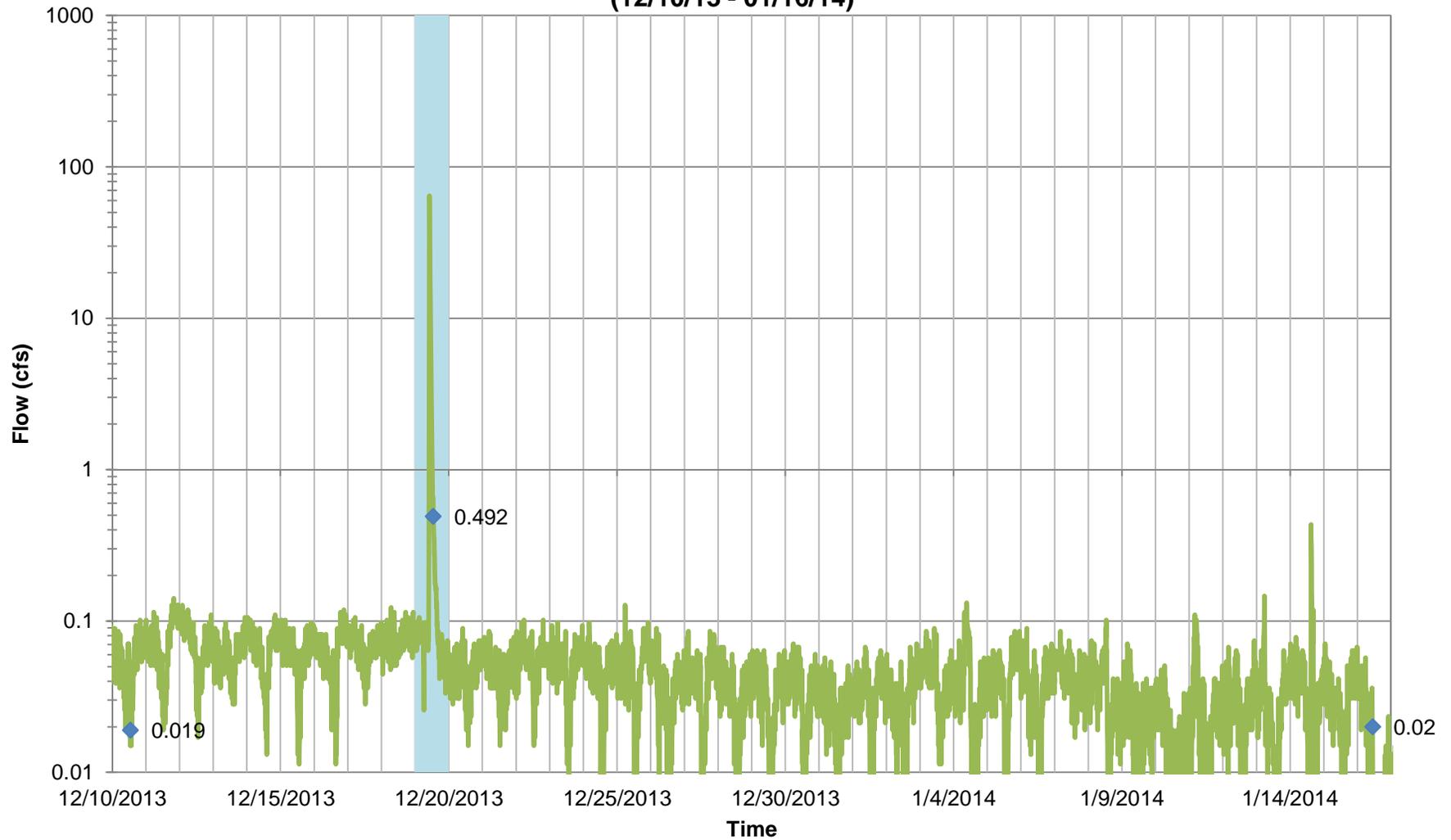
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-4
Estimated Flow from HOBO Data at 30_VERSEP
(12/10/13 - 01/16/14)



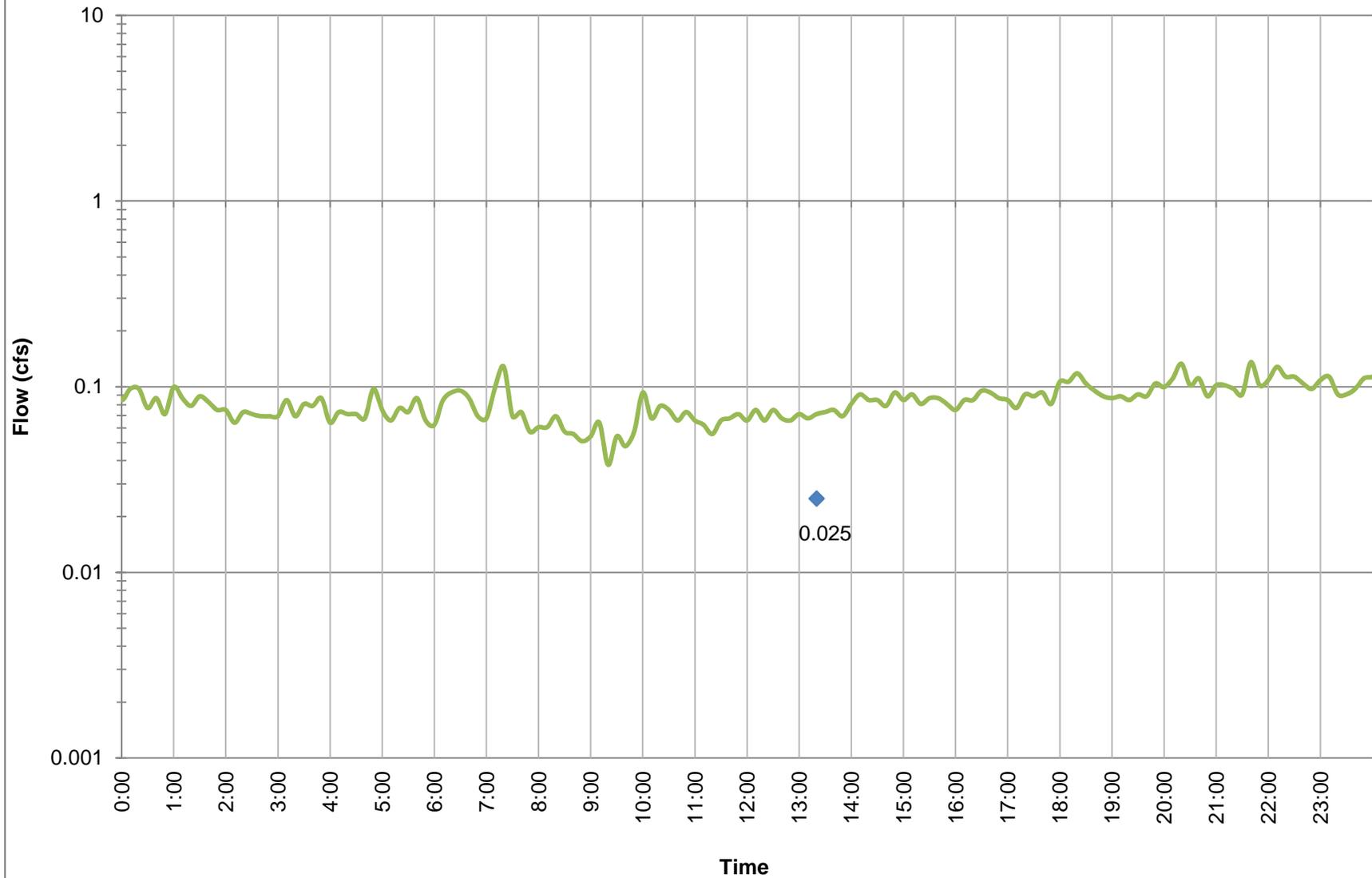
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-5
Estimated Flow from HOBO Data at 3O_VAND
(12/10/13 - 01/16/14)



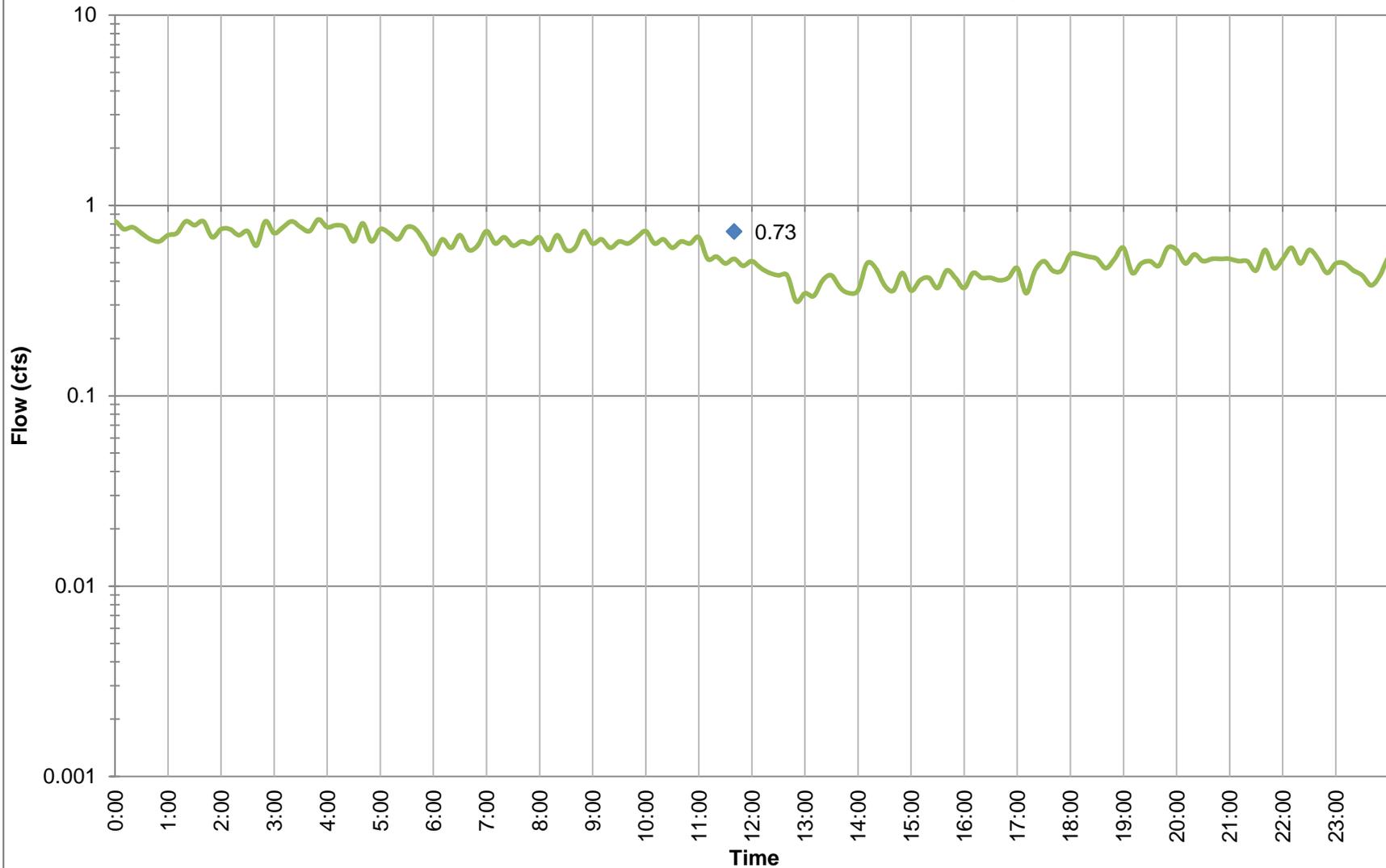
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Light blue line represents Wet Weather periods (24 hours).
3. Flow within conduit is determined using Manning's equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-6
Estimated Flow from HOBO Data at 10_ACAD on January 16th, 2014



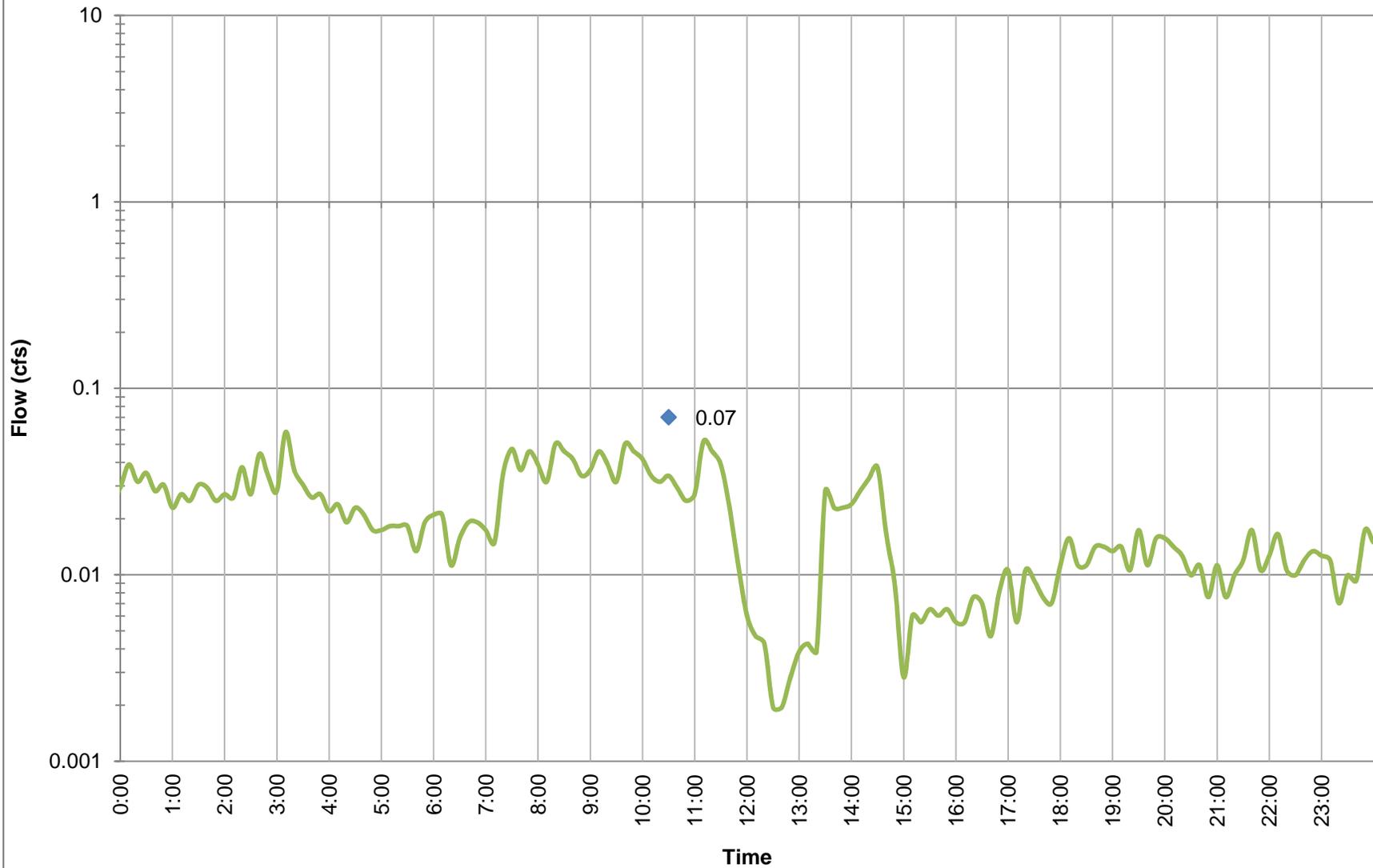
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. The blue diamonds are field measurements at the time the HOBO meter was read.
3. Flow within conduit is determined using Manning's equation.

Figure A4-7
Estimated Flow from HOBO Data at 3I_NORMP on January 16th, 2014



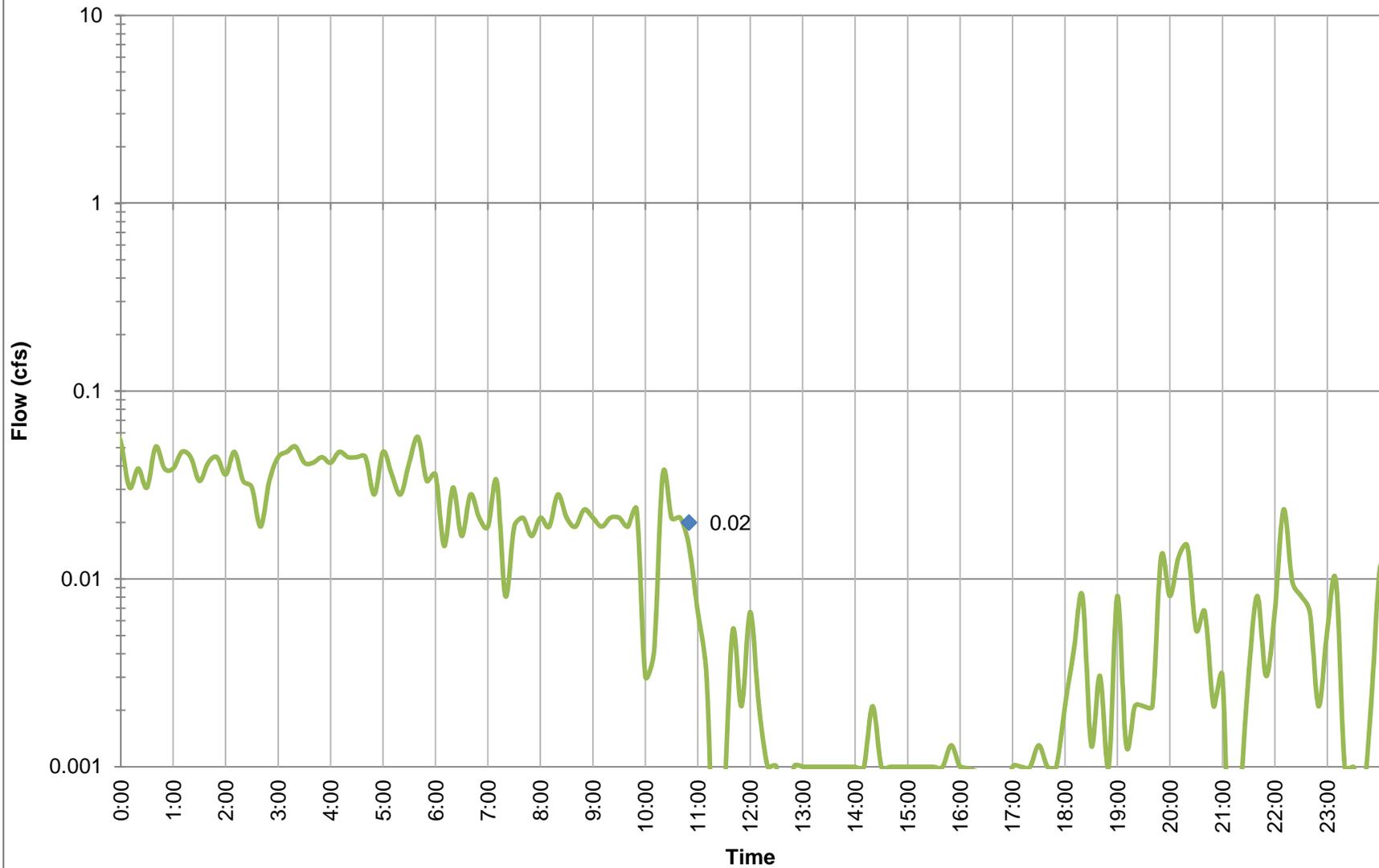
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. The blue diamonds are field measurements at the time the HOBO meter was read.
3. Flow within conduits is determined using Manning's equation.

Figure A4-8
Estimated Flow from HOBO Data at 3I_ASHB on January 16th, 2014



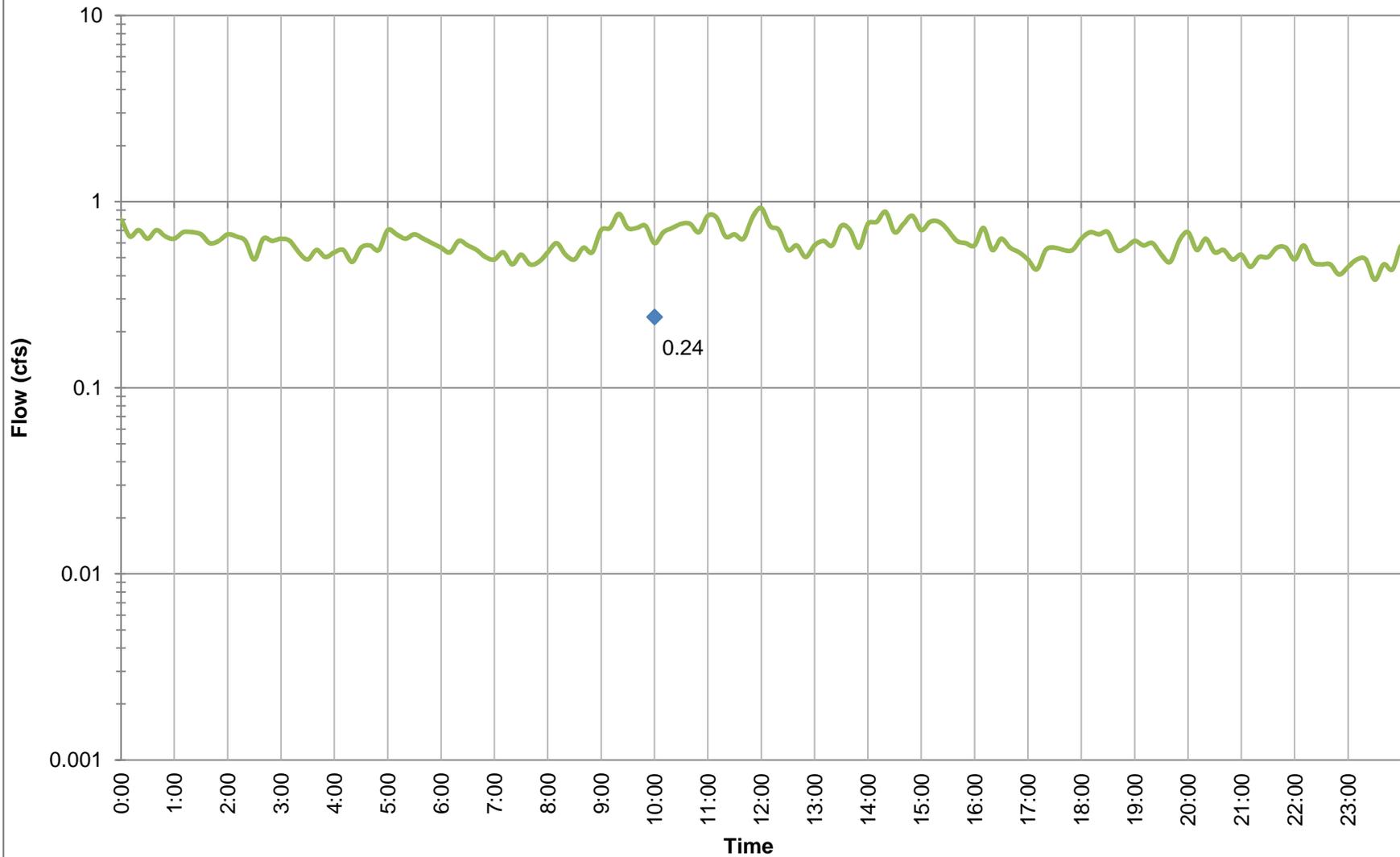
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. The blue diamonds are field measurements at the time the HOBO meter was read.
3. Flow within conduit is determined using Manning's equation.

Figure A4-9
Estimated Flow from HOBO Data at 3O_VAND on January 16th, 2014



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. The blue diamonds are field measurements at the time the HOBO meter was read.
3. Flow within conduit is determined using Manning's equation.

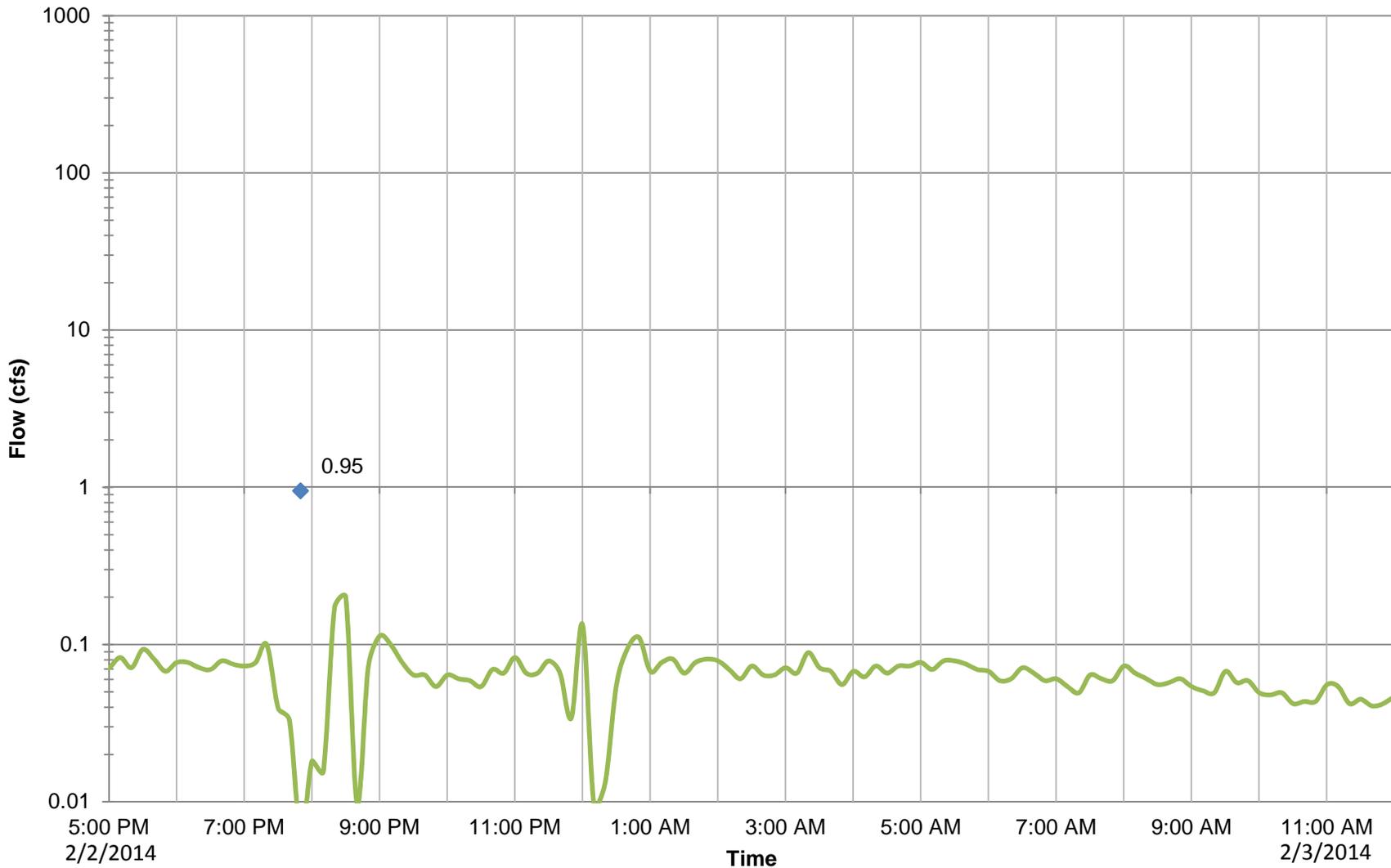
Figure A4-10
Estimated Flow from HOBO Data at 30_VERSEP on January 16th, 2014



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. The blue diamonds are field measurements at the time the HOBO meter was read.
3. Flow within conduit is determined using Manning's equation.

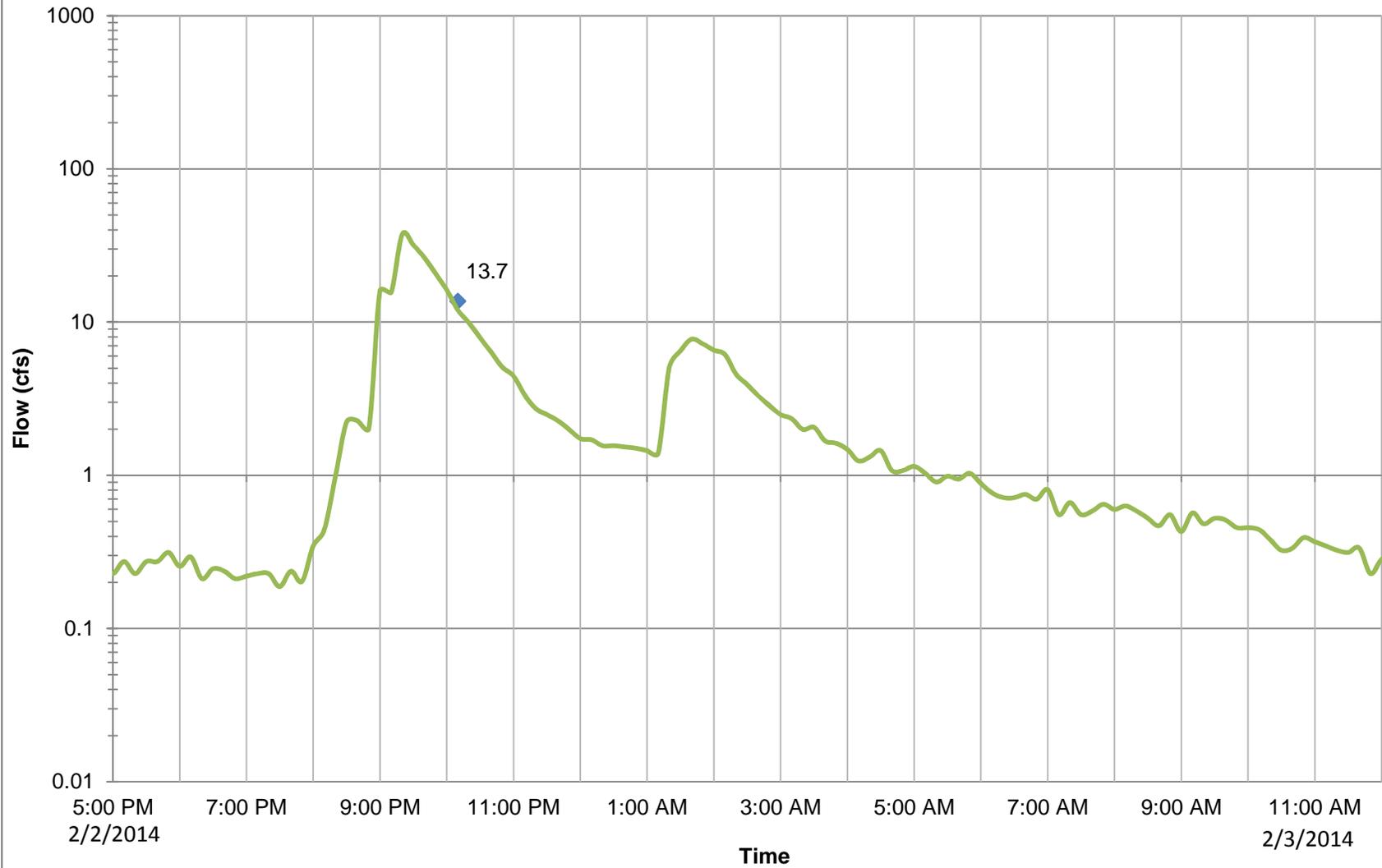
Wet Weather Monitoring Event No.2
February 2, 2014

Figure A4-1
Estimated Flow from HOBO Data at 10_ACAD



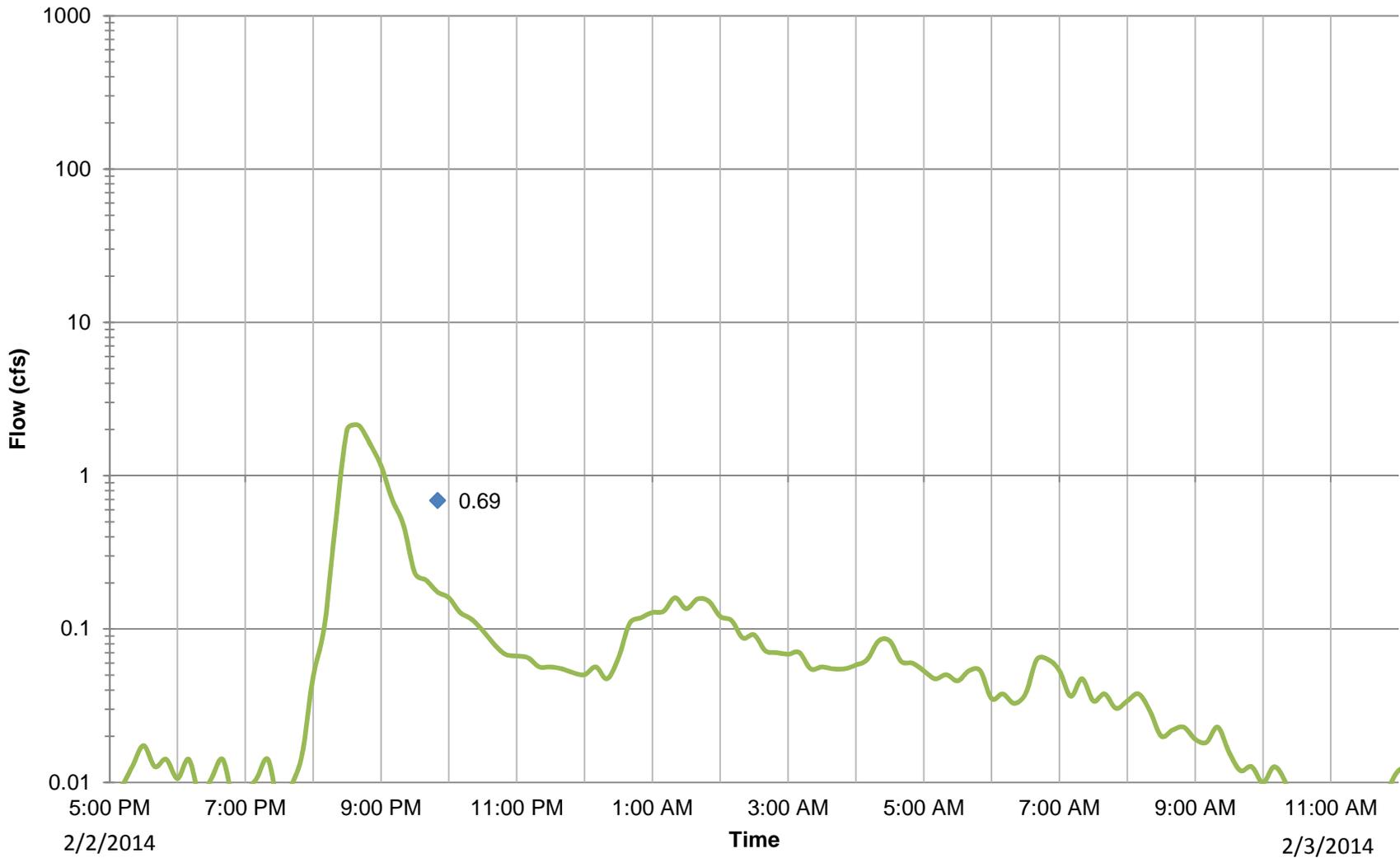
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow decreases due to pressure differential caused by low flow and high velocities over the HOBO meters.
3. Flow in conduit is determined using Manning's Equation.
4. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-2
Estimated Flow from HOBO Data at 3I_NORMP



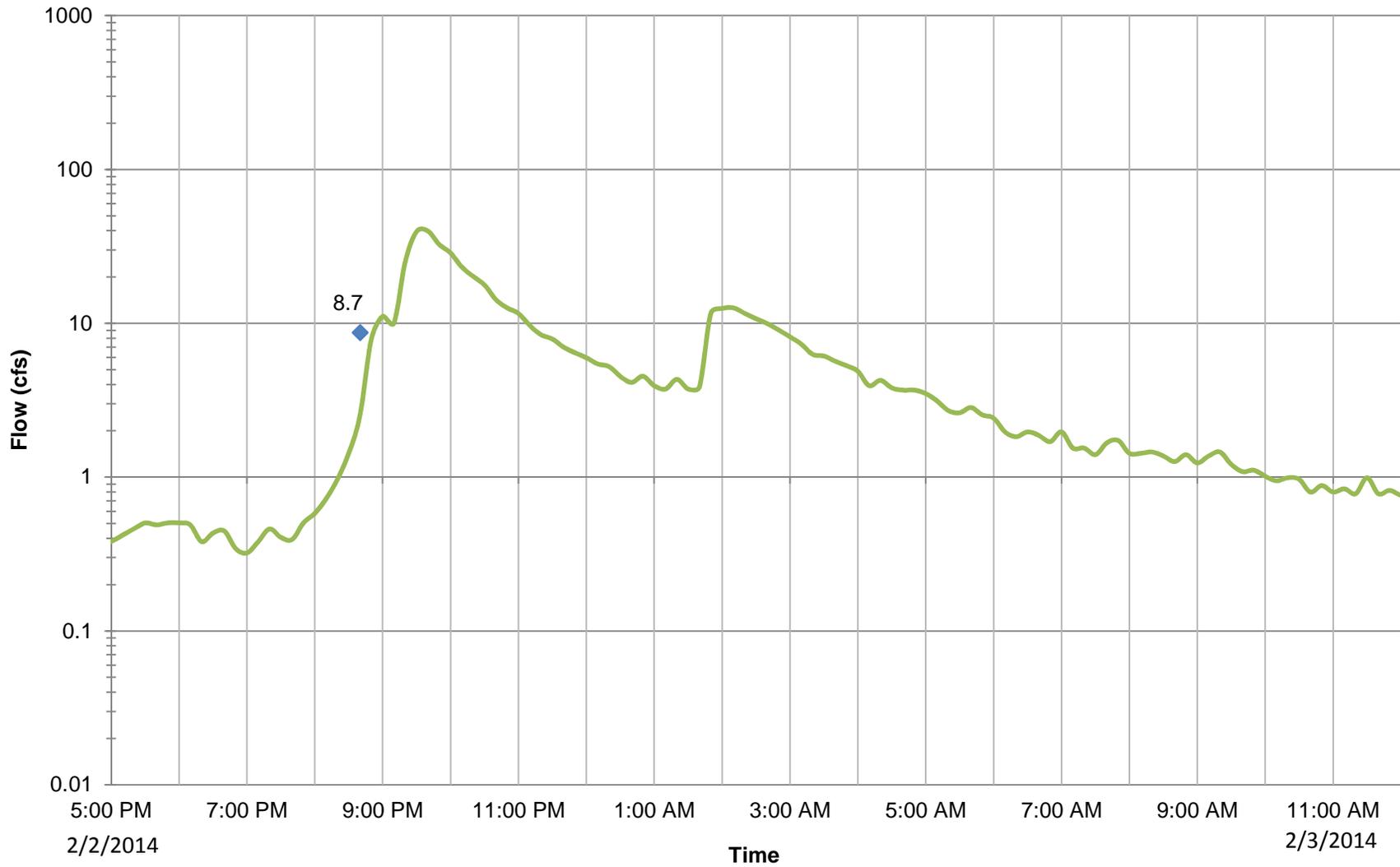
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-3
Estimated Flow from HOBO Data at 3I_ASHB



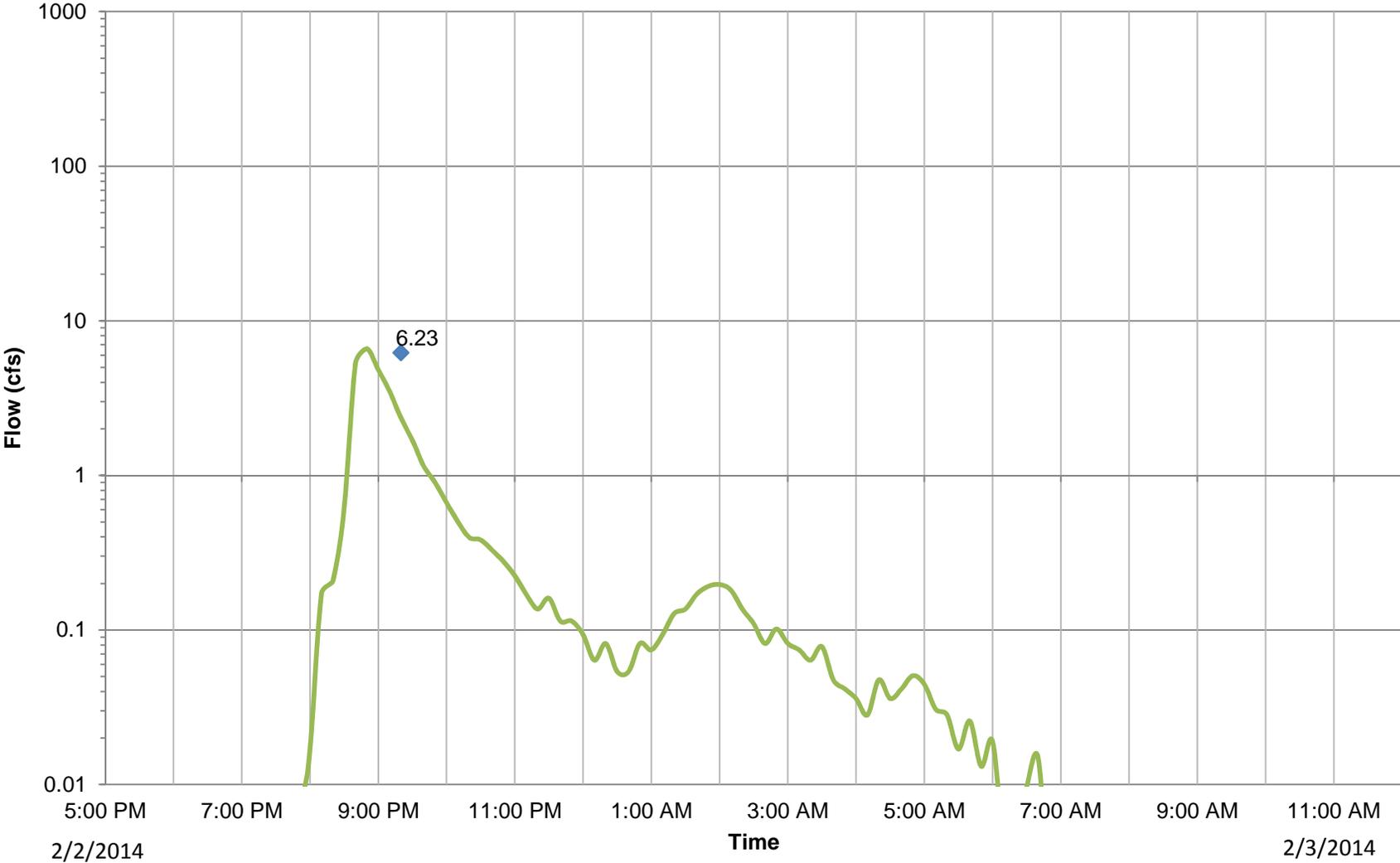
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-4
Estimated Flow from HOBO Data at 30_VERSEP



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

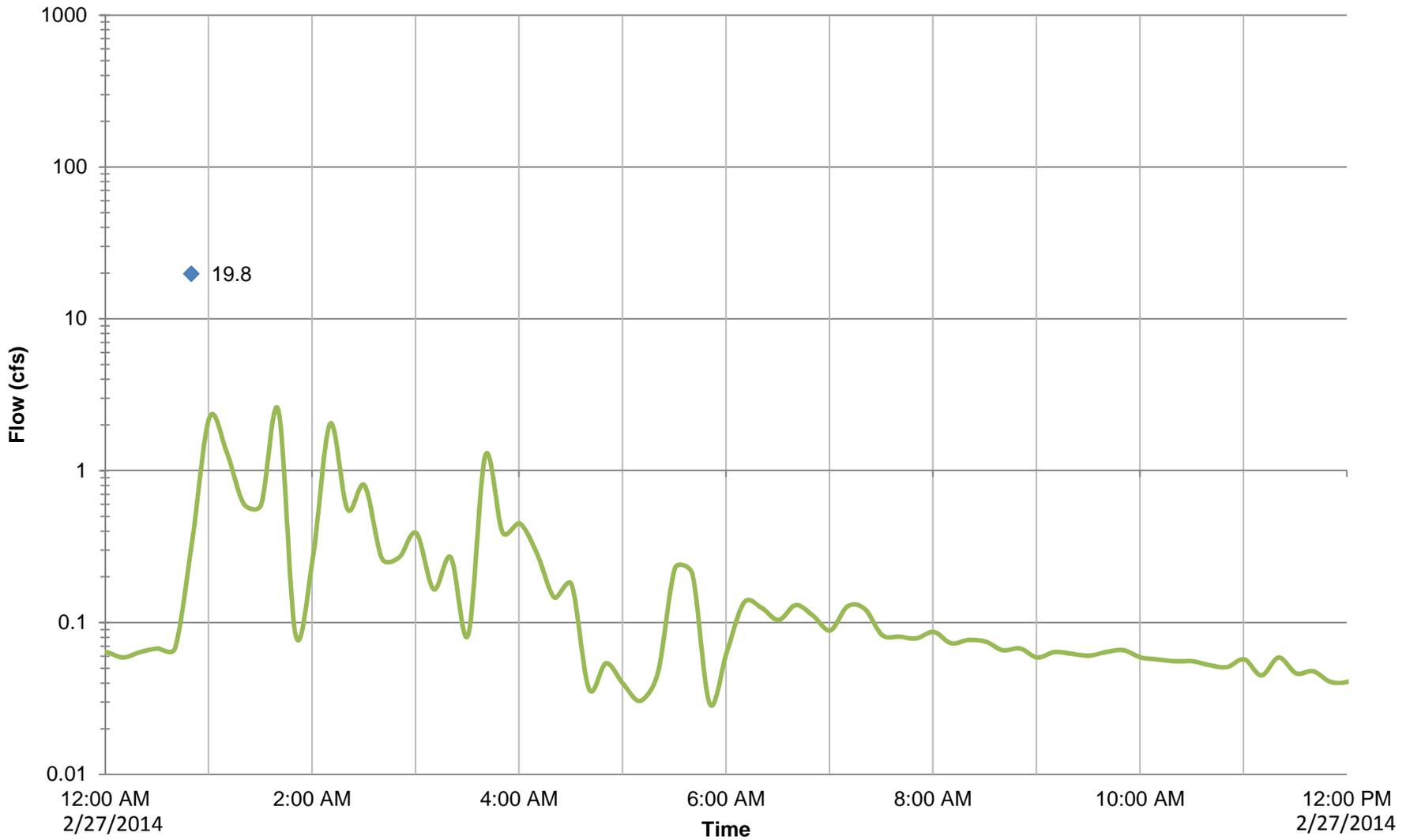
Figure A4-5
Estimated Flow from HOBO Data at 30_VAND



- 1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
- 2. Flow in conduit is determined using Manning's Equation.
- 3. The blue diamonds are field measurements at the time the HOBO meter was read.

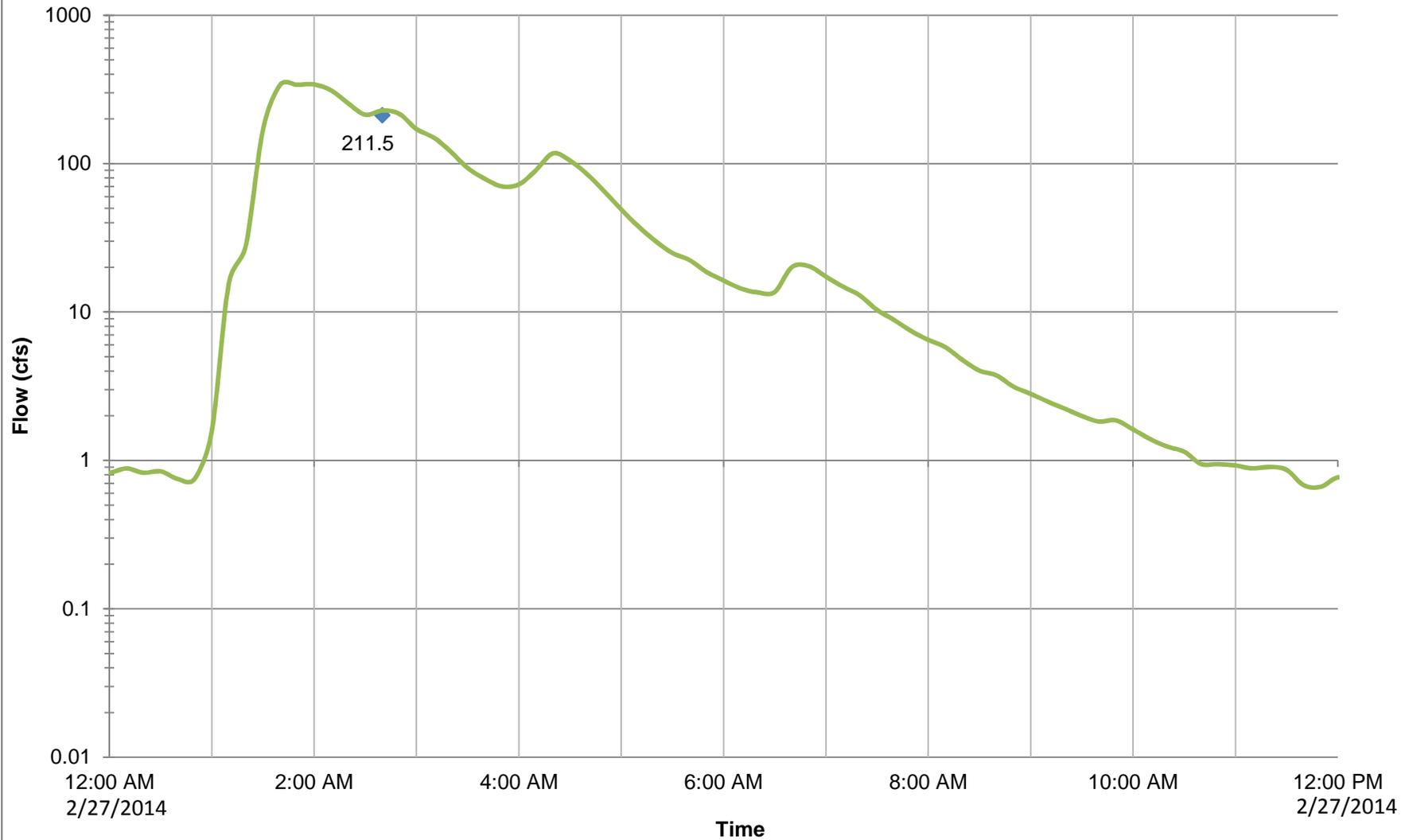
Wet Weather Monitoring Event No.3
February 27, 2014

Figure A4-1
Estimated Flow from HOBO Data at 10_ACAD



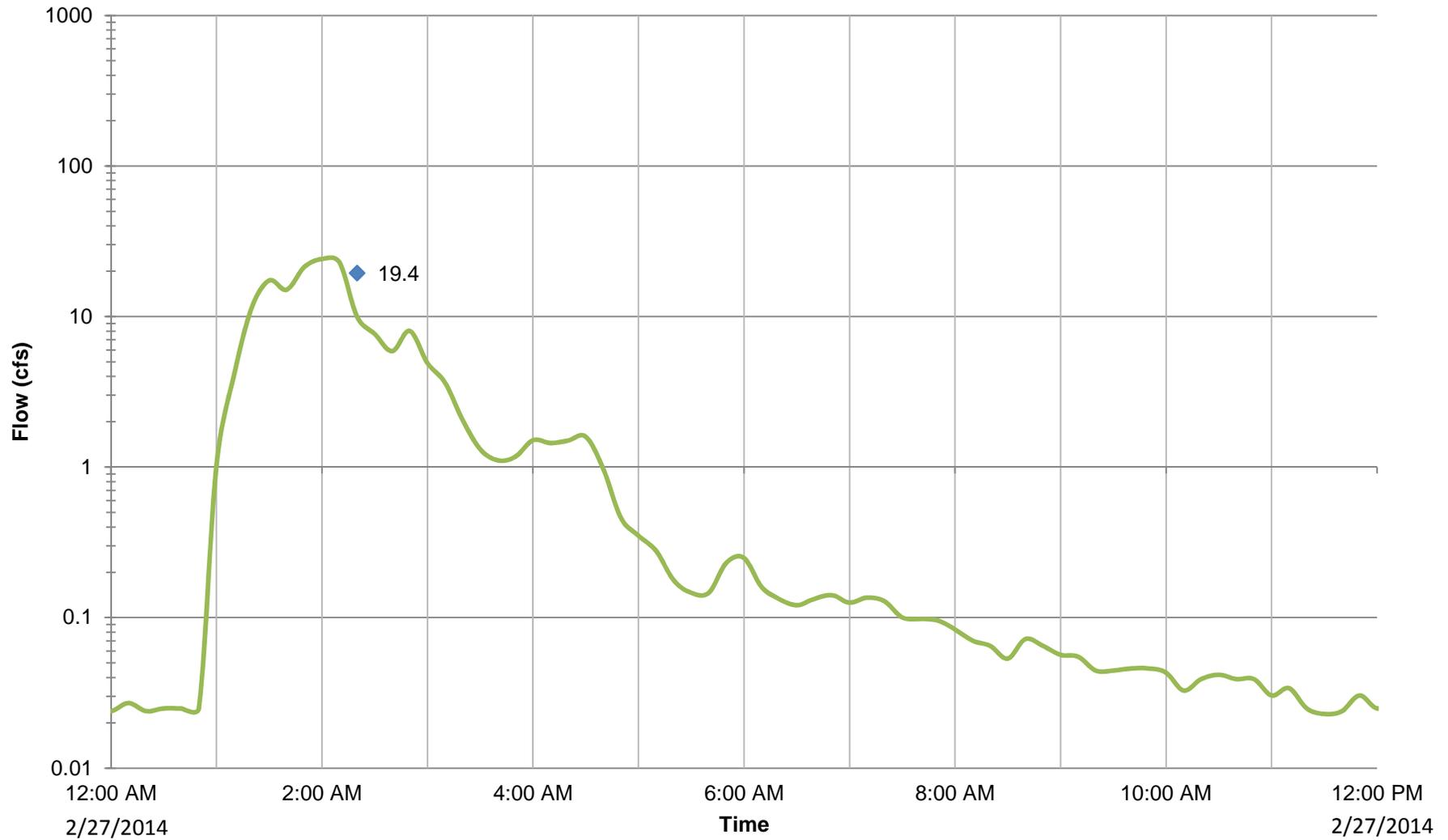
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-2
Estimated Flow from HOBO Data at 3I_NORMP



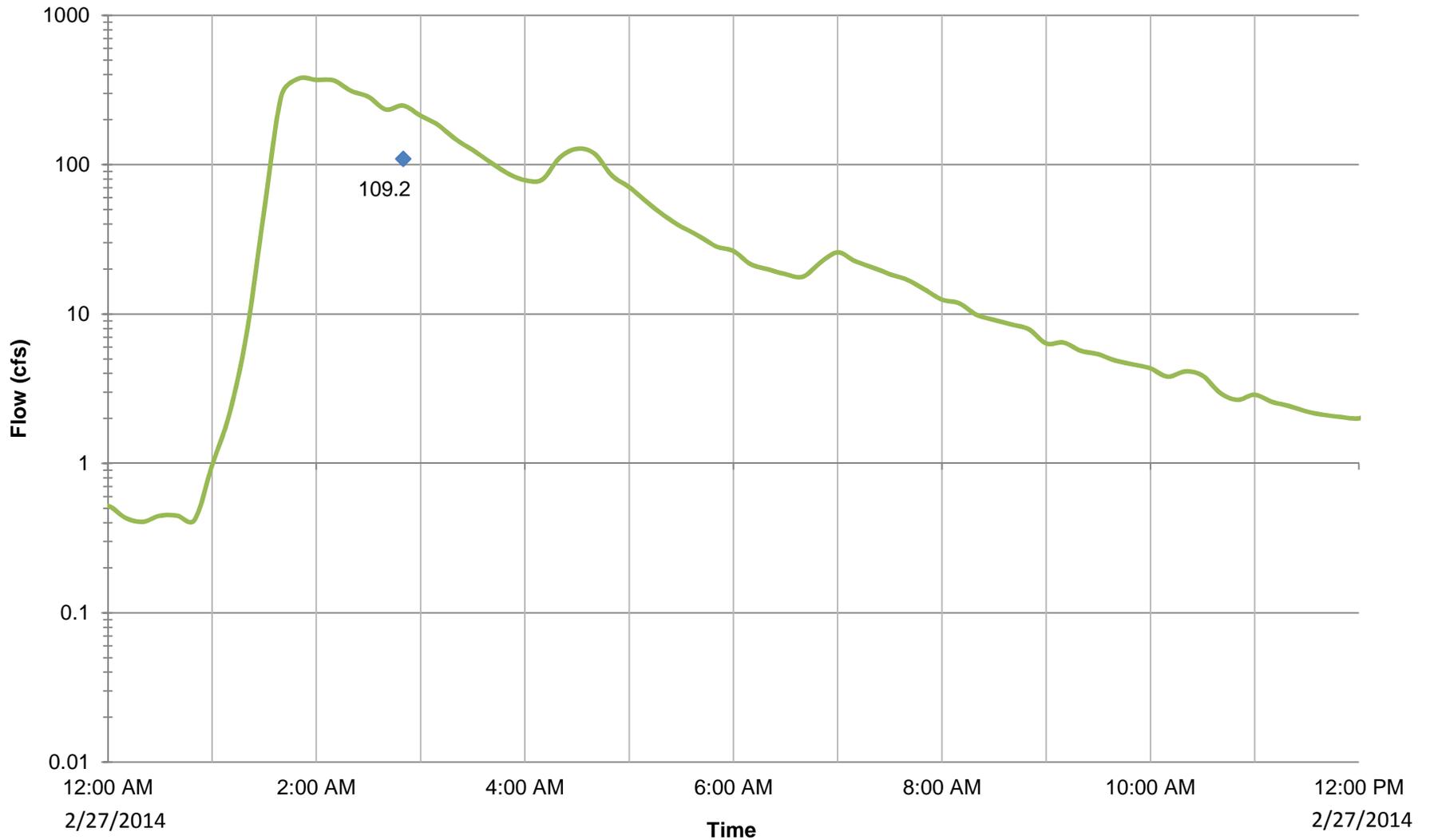
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-3
Estimated Flow from HOBO Data at 3I_ASHB



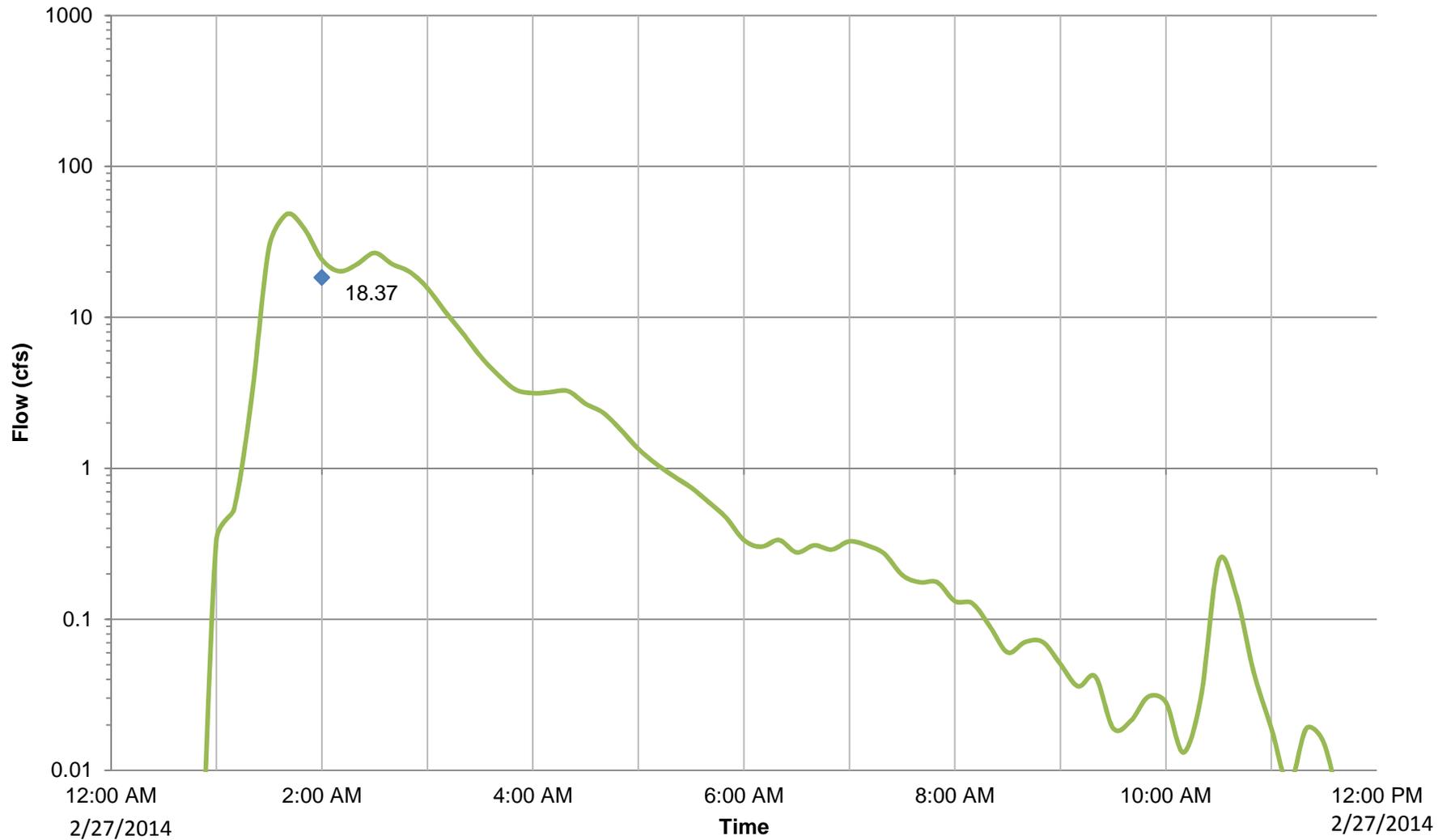
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-4
Estimated Flow from HOBO Data at 3O_VERSEP



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

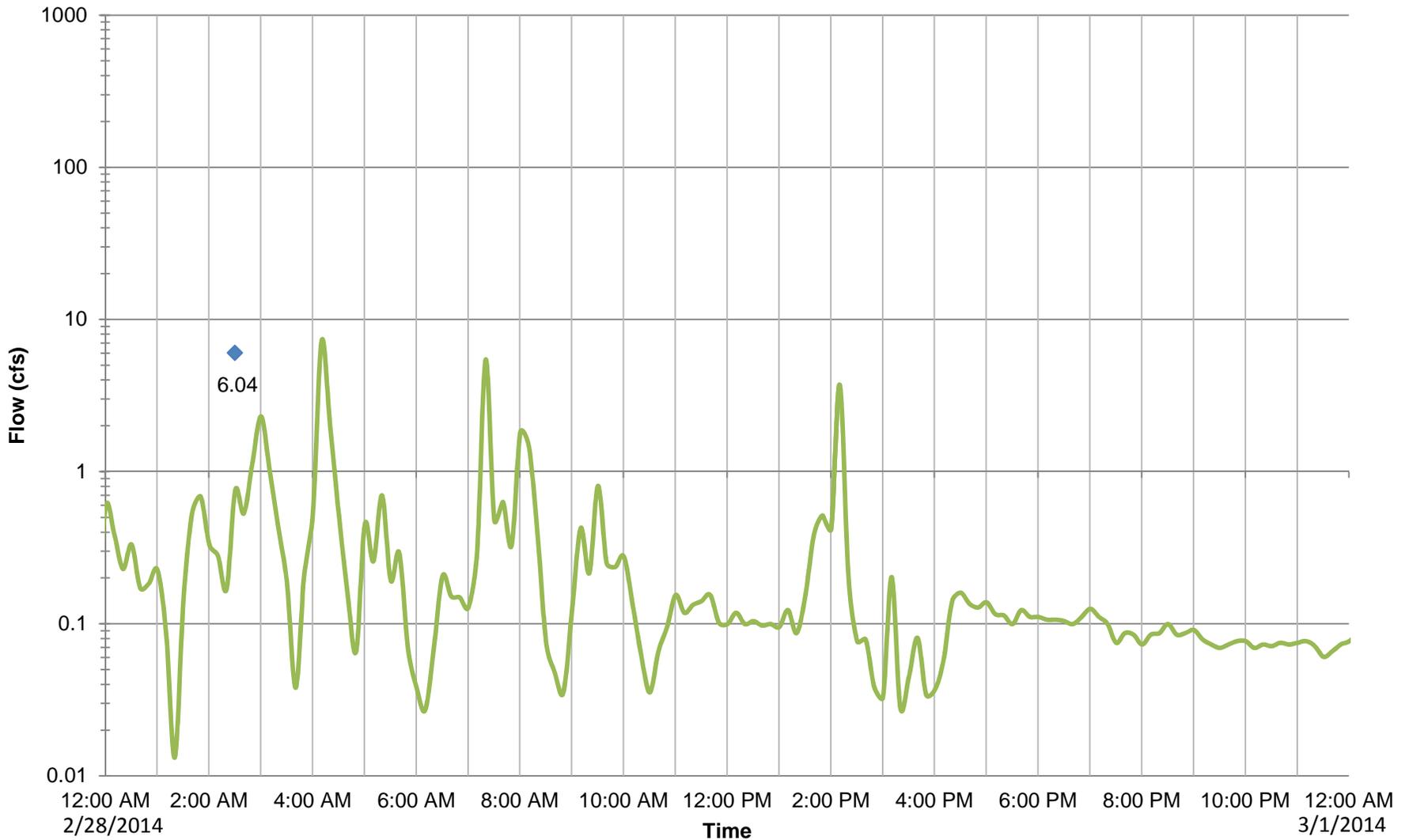
Figure A4-5
Estimated Flow from HOBO Data at 30_VAND



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

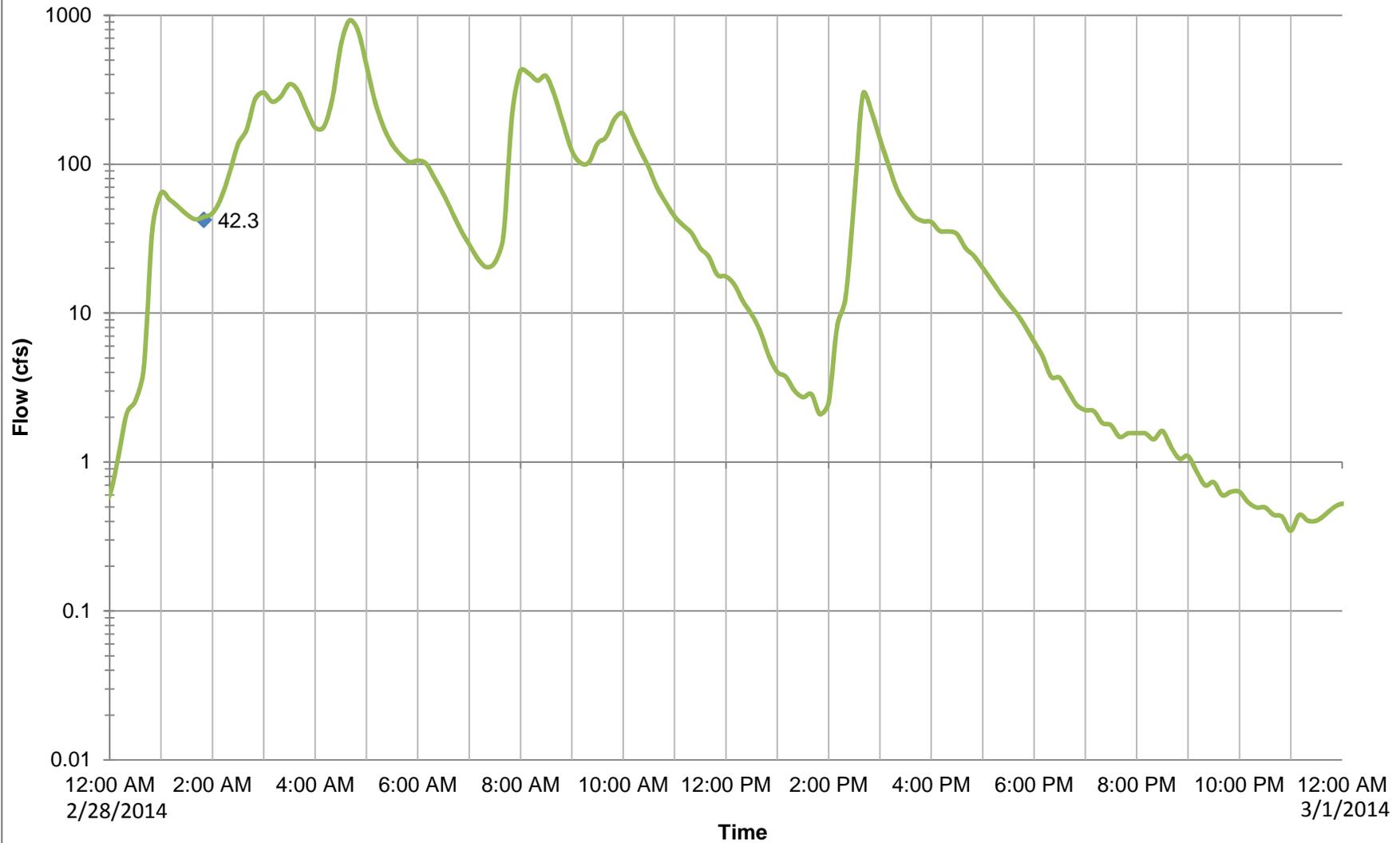
Wet Weather Monitoring Event No.4
February 28, 2014

Figure A4-1
Estimated Flow from HOBO Data at 10_ACAD



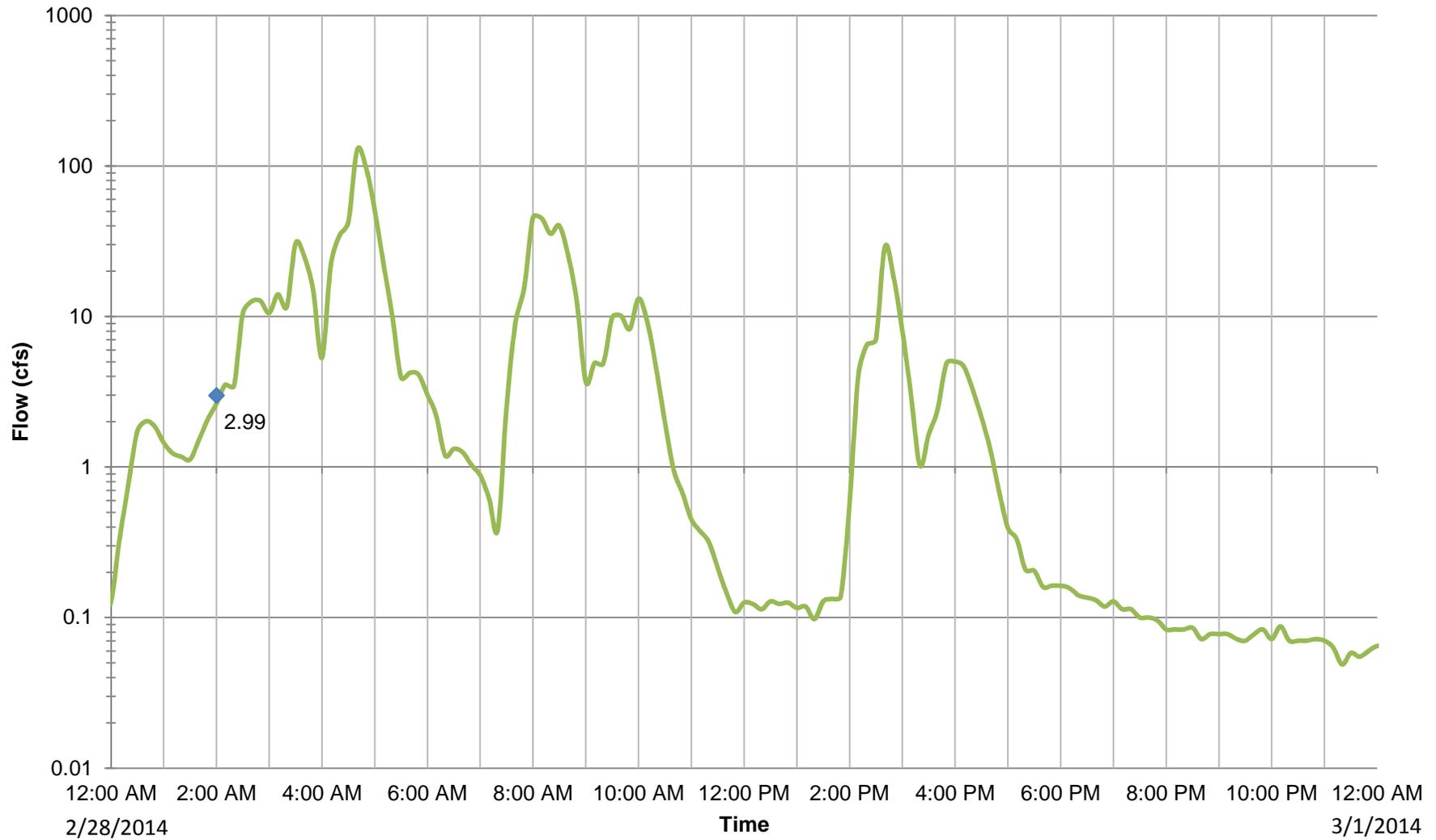
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-2
Estimated Flow from HOBO Data at 3I_NORMP



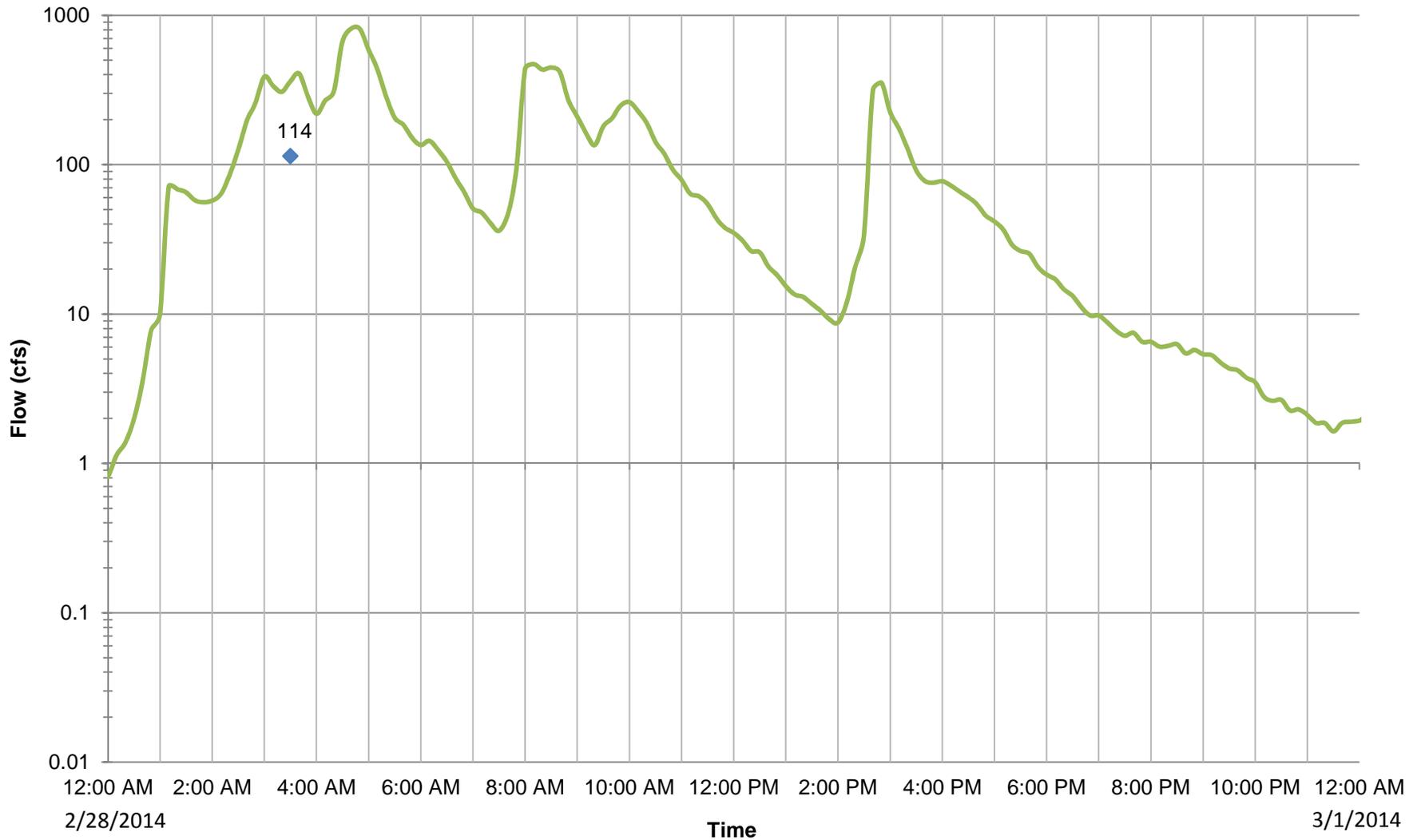
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
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3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-3
Estimated Flow from HOBO Data at 3I_ASHB



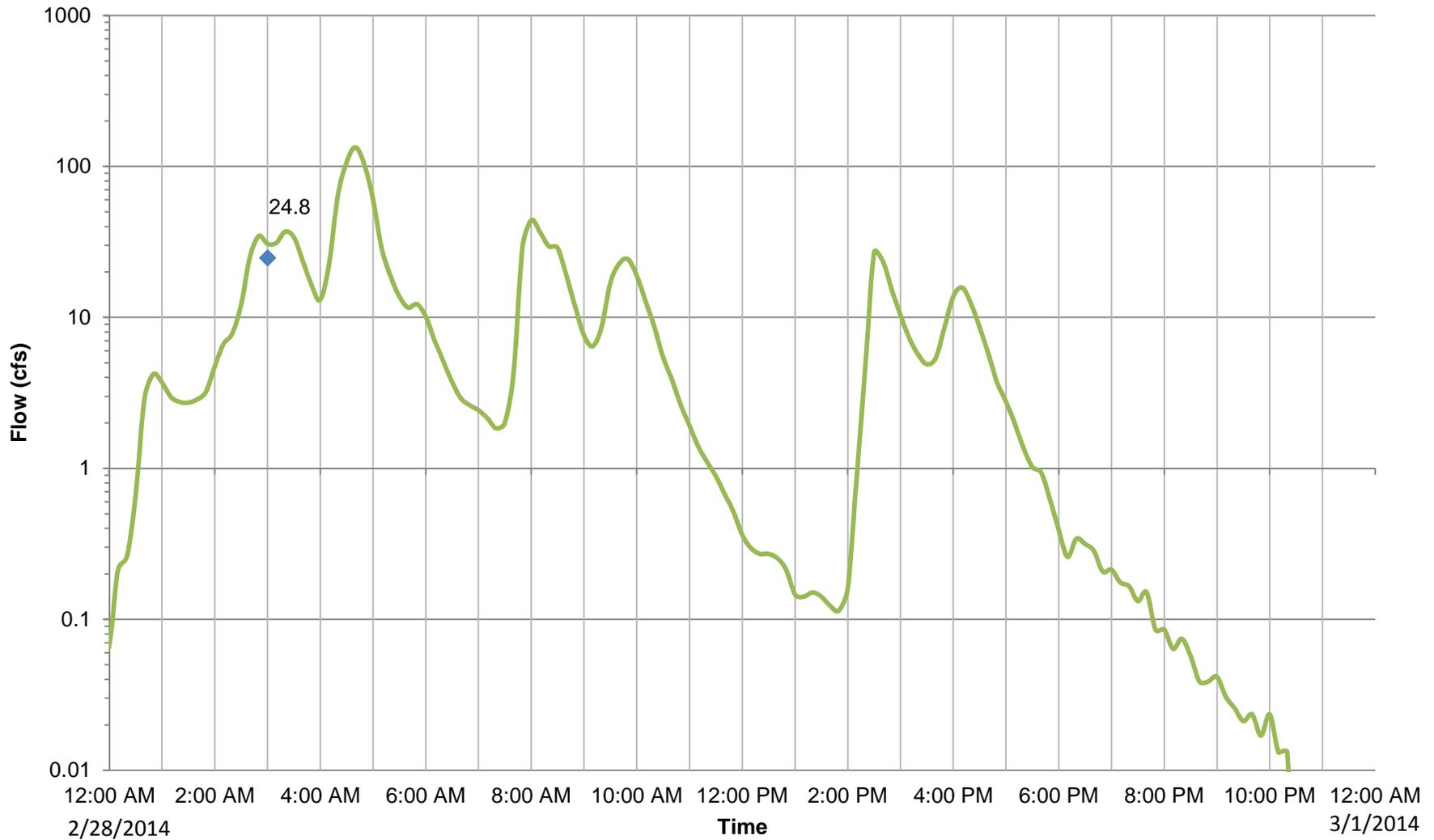
1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-4
Estimated Flow from HOBO Data at 30_VERSEP



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.

Figure A4-5
Estimated Flow from HOBO Data at 30_VAND



1. HOBO meters have a measurement error of approximately 0.03 ft and at low flows during dry periods that could cause uncertainties of up to 40%.
2. Flow in conduit is determined using Manning's Equation.
3. The blue diamonds are field measurements at the time the HOBO meter was read.