Water Quality Monitoring Report - 2018

Sacramento Municipal Utility District

Hydro License Implementation • June 2019 Upper American River Project FERC Project No. 2101





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Acronyms and Abbreviations

Acronym	Definition
BLM	U.S. Bureau of Land Management
CDFW	California Department of Fish and Wildlife
COLD	cold freshwater habitat
℃	degrees Celsius
DO	dissolved oxygen
EPA	United States Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
hr	hour
m	Meter
MQO	Measurement Quality Objective
MDL	Method Detection Limit
uS/cm	microsiemens per centimeter
mg/L	milligram per liter
mL	milliliter
MPN	Most Probable Number
MRL	Method Reporting Limit
NTU	Nephelometric Turbidity Unit
% Sat	percent saturation
QA/QC	quality assurance and quality control
RWQCB	Regional Water Quality Control Board
SFAR	South Fork American River
SMUD	Sacramento Municipal Utility District
SPWN	Spawning, reproduction and/or early development
SWRCB	State Water Resources Control Board
SM	standard methods
S.U.	standard unit of pH
USFS	United States Forest Service
UARP	Upper American River Project
YSI	Yellow Springs Instruments



1.0 INTRODUCTION AND BACKGROUND

This Water Quality Monitoring Report (Report) addresses monitoring requirements set forth in Sacramento Municipal Utility District's (SMUD) Water Quality Monitoring Plan (Plan) (SMUD 2016). The requirements for this Plan are found in State Water Resources Control Board (SWRCB) Condition 8.J, and U.S. Forest Service (USFS) 4(e) Condition 31.10, located in Appendices A and B, respectively, of the Federal Energy Regulatory Commission's (FERC) Order Issuing New License for the Upper American River Project (UARP), dated July 23, 2014. The Plan was developed by SMUD (SMUD 2015) in coordination with the Consultation Group and Resource Agencies stipulated in the license (FERC 2014). The Plan was revised in 2015 (Revision 1) and again in 2016 (Revision 2) to update the referenced analytical methods for various sub-programs within the Plan. At the completion of the first five years of monitoring, SMUD will consult with the SWRCB, Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), USFS, and U.S. Bureau of Land Management (BLM) to determine if the results warrant further modifications to the Water Quality Monitoring Plan (SMUD 2016).

This report describes the results of the fourth year (2018) of water quality monitoring of basic *in situ* parameters and bacteria for the UARP.

SMUD owns and operates the UARP, which is licensed by FERC. The UARP (FERC Project No. 2101) lies within El Dorado and Sacramento counties, primarily within lands of the Eldorado National Forest. The UARP consists of three major storage reservoirs: Loon Lake, Union Valley, and Ice House (with a combined capacity of approximately 379,000 acre-feet), eight smaller regulating or diversion reservoirs, and eight powerhouses. The UARP also includes recreation facilities containing over 700 campsites, five boat ramps, hiking paths, and bicycle trails at the reservoirs.

2.0 MONITORING OBJECTIVE

The objective of the 2018 monitoring program was to perform *in situ* water quality and bacteria monitoring in reservoirs and stream reaches of the UARP, in order to meet the objectives and rationale of SWRCB Water Quality Certification Condition 8.J.

The rationale for water quality monitoring, as described by the SWRCB Water Quality Certification, is as follows:

Water quality monitoring is important for determining compliance with state and federal water quality standards and examining long-term trends in water quality. The frequency of monitoring for any compound can be reduced if shown to be at background or non-detect levels for a statistically significant period of time.



3.0 STUDY AREA

The study area included UARP reservoirs and diverted stream reaches. All UARP reservoirs (Rubicon, Buck Island, Loon Lake, Gerle Creek, Ice House, Union Valley, Junction, Camino, Brush Creek, and Slab Creek) were included in the monitoring program; the relatively small Robbs Peak Forebay (30 acre-feet) was not included. [Note: Rockbound Lake, although hydraulically associated with the UARP, is not a UARP reservoir and is not included within the FERC-defined UARP boundary.] The diverted stream reaches included in the monitoring program represented all streams and rivers downstream of UARP reservoirs (Figure 3-1).



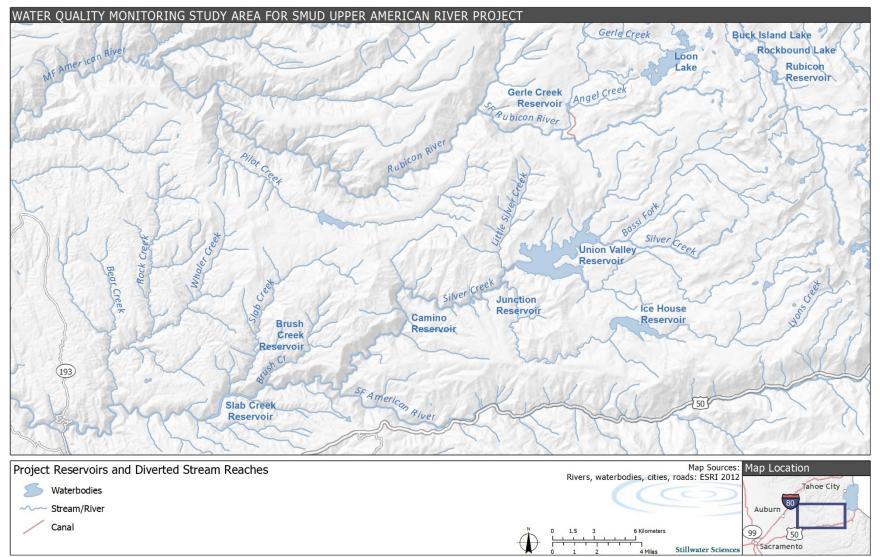


Figure 3-1. Study area for SMUD Upper American River Project in situ and bacteria monitoring.

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4.0 SAMPLING FREQUENCY AND LOCATIONS

Year 4 (2018) sampling frequency for *in situ* water quality was consistent with winter, spring, summer, and fall monitoring periods designated in the Water Quality Monitoring Plan (SMUD 2016) (Table 4-1). Required bacteria monitoring was conducted by sampling the middle elevation UARP reservoir sites (Gerle Creek, Union Valley, Junction, Ice House, Brush Creek, Slab Creek) during the 30-day period surrounding 4th of July and sampling the upper elevation UARP reservoir sites (Loon Lake, Buck Island) during the 30-day period surrounding Labor Day.

Туре	2018 (Year 4) Frequency		
In situ reservoir	Once in spring – April/May		
In situ leselvoli	Once in fall – October/November		
	Once in winter – January/February		
<i>In situ</i> riverine	Once in spring – April/May		
	Once in summer – August		
	Once in fall – November		
Bacteria Five samples within 30 days – around 4 th of July Five samples within 30 days – around Labor Day			

Specific sampling locations within reservoirs and diverted stream reaches varied depending on the general constituent under study. As specified in the Water Quality Monitoring Plan, *in situ* monitoring occurred at 15 representative reservoir locations (Figure 4-1 and Figure 4-2, Table 4-2) and 19 representative stream reaches (Figure 4-1 and Figure 4-2, Table 4-3). Several riverine sites could not be sampled during January 2018 due to snow accumulation (Table 4-4). Bacteria sampling occurred at 15 locations (Figure 4-1 and Figure 4-2, Table 4-5).



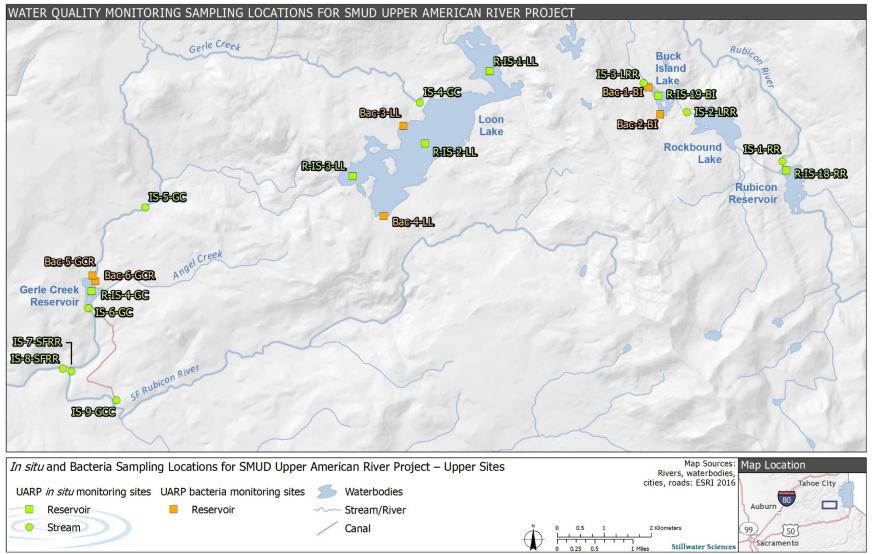


Figure 4-1. In situ water quality and bacteria sampling locations for SMUD Upper American River Project - upper sites.

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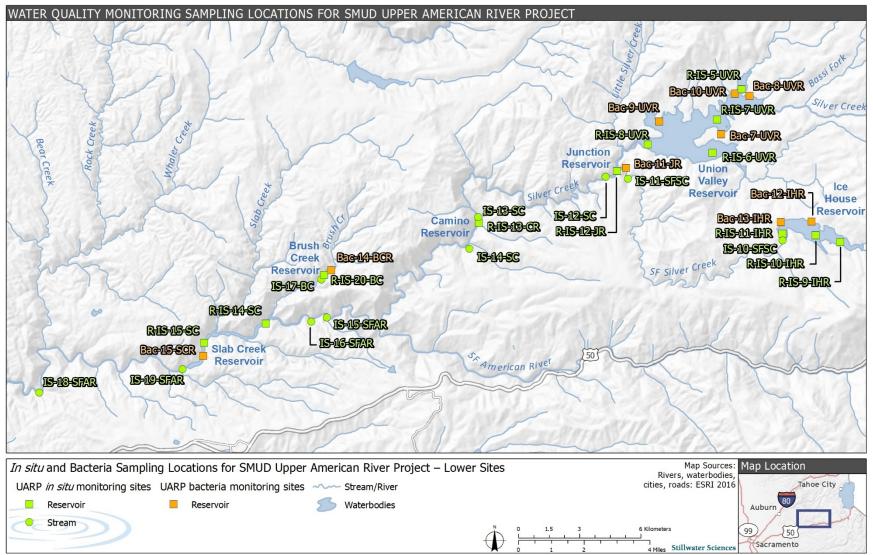


Figure 4-2. In situ water quality and bacteria sampling locations for SMUD Upper American River Project – lower sites.



Table 4-2. In situ Water Quality Sampling Locations and Dates for SMUD Upper American River Project Reservoir Site	Table 4-2. In situ Water Quali	y Sampling Locations and Dates for SMUD	Upper American River Project Reservoir Sites.
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			2018
SMUD Site	Site ID	Location	<i>In situ</i> Survey Sample Date
Name			
R-4C	R-IS-1-LL	Loon Lake, upper reservoir (northeast body)	5/3, 10/23
R-4B	R-IS-2-LL	Loon Lake, mid-reservoir (west body)	5/1, 10/23
R-4A	R-IS-3-LL	Loon Lake, near dam	5/1, 10/23
R-5	R-IS-4-GC	Gerle Creek Reservoir, mid-reservoir	5/3, 10/26
R-6C	R-IS-5-UVR	Union Valley Reservoir, Robbs PH tailrace zone	4/30, 10/24
R-6D	R-IS-6-UVR	Union Valley Reservoir, Jones Fork Silver Creek arm	5/1, 10/24
R-6B	R-IS-7-UVR	Union Valley Reservoir, mid-reservoir	5/1, 10/24
R-6A	R-IS-8-UVR	Union Valley Reservoir, near dam	5/1, 10/24
R-7C	R-IS-9-IHR	Ice House Reservoir, upper lake body	4/30, 10/22
R-7B	R-IS-10-IHR	Ice House Reservoir, mid-reservoir	4/30, 10/22
R-7A	R-IS-11-IHR	lce House Reservoir, near dam	4/30, 10/22
R-8	R-IS-12-JR	Junction Reservoir, mid-reservoir between arms	5/10, 10/26
R-9	R-IS-13-CR	Camino Reservoir, mid-reservoir	5/10, 10/26
R-11B	R-IS-14-SC	Slab Creek Reservoir, upper-reservoir	5/2, 10/25
R-11A	R-IS-15-SC	Slab Creek Reservoir, mid-reservoir	5/2, 10/25



SMUD			2018
Site			<i>In situ</i> Survey
Name	Site ID	Location	Sample Date
2	IS-1-RR	Rubicon River outflow from Rubicon Reservoir	5/18, 8/17, 11/12
5	IS-2-LRR	Little Rubicon River outflow from Rockbound Lake	5/18, 8/17, 11/12
6	IS-3-LRR	Little Rubicon outflow from Buck Island Lake	5/18, 8/17, 11/12
7	IS-4-GC	Gerle Creek outflow from Loon Lake	5/8, 8/13, 11/13
14	IS-5-GC	Gerle Creek inflow to Gerle Creek Reservoir	5/8, 8/13, 11/13
15	IS-6-GC	Gerle Creek outflow from Gerle Creek Reservoir	5/8, 8/13, 11/13
18	IS-7-SFRR	S.F. Rubicon upstream of Gerle Creek confluence	5/8, 8/13, 11/13
19	IS-8-SFRR	S.F. Rubicon downstream of Gerle Creek confluence	5/8, 8/13, 11/13
16	IS-9-GCC	Gerle Creek Canal inflow to Robbs Forebay	1/29, 5/8, 8/13, 11/13
25	IS-10-SFSC	S.F. Silver Creek outflow from Ice House	1/29, 5/8, 8/13, 11/13
27	IS-11-SFSC	S.F. Silver Creek inflow to Junction Reservoir	1/29, 5/10, 8/14, 11/14
29	IS-12-SC	Silver Creek outflow from Junction Reservoir	1/29, 5/10, 8/14, 11/14
32	IS-13-SC	Silver Creek inflow to Camino Reservoir	1/29, 5/10, 8/14, 11/14
34	IS-14-SC	Silver Creek outflow from Camino Reservoir	1/29, 5/10, 8/14, 11/14
38	IS-15-SFAR	South Fork American River (SFAR) upstream of Camino Powerhouse	1/30, 5/9, 8/14, 11/14
41	IS-16-SFAR	SFAR downstream of Camino Powerhouse	1/30, 5/9, 8/14, 11/14
40	IS-17-BC	Brush Creek outflow from Brush Creek Reservoir	1/30, 5/9, 8/14, 11/16
60	IS-18-SFAR	SFAR upstream of White Rock Powerhouse	1/30, 5/9, 8/15, 11/14
43	IS-19-SFAR	SFAR downstream of Slab Creek Reservoir	1/30, 5/9, 8/15, 11/14

Table 4-3. In situ Water Quality Sampling Locations and Dates for SMUD Upper American River Project Riverine Sites.



Table 4-4. In situ Water Quality Sampling Locations Not Sampled for SMUD Upper American River Project Riverine Sites.

SMUD Site			Reason not sampled during January 2018 (Winter)
Name	Site ID	Location	<i>In situ</i> Survey
2	IS-1-RR	Rubicon River outflow from Rubicon Reservoir	Snow accumulation
5	IS-2-LRR	Little Rubicon River outflow from Rockbound Lake	Snow accumulation
6	IS-3-LRR	Little Rubicon outflow from Buck Island Lake	Snow accumulation
7	IS-4-GC	Gerle Creek outflow from Loon Lake	Snow accumulation
14	IS-5-GC	Gerle Creek inflow to Gerle Creek Reservoir	Snow accumulation
15	IS-6-GC	Gerle Creek outflow from Gerle Creek Reservoir	Snow accumulation
18	IS-7-SFRR	S.F. Rubicon upstream of Gerle Creek confluence	Snow accumulation
19	IS-8-SFRR	S.F. Rubicon downstream of Gerle Creek confluence	Snow accumulation



	SMUD Site			
Reservoir	Name	Site ID	Location	2018 Sample Dates
Buck Island Reservoir	R-3B	Bac-1-BI	On Northshore, near dam and Off-Highway Vehicle camping	8/23, 8/30, 9/6, 9/13, 9/20
(beach locations)	77	Bac-2-BI	On south shore, near Rubicon hiking trail	8/23, 8/30, 9/6, 9/13, 9/20
Loon Lake Reservoir	64	Bac-3-LL	West of main dam, near Red Fir Campground	8/23, 8/30, 9/6, 9/13, 9/20
(beach locations)	65	Bac-4-LL	West of Loon Lake Campground, near boat launch	8/23, 8/30, 9/6, 9/13, 9/20
Gerle Creek Reservoir	66	Bac-5-GCR	Near Gerle Creek Campground	6/20, 6/27, 7/3, 7/12, 7/18
(beach locations)	67	Bac-6-GCR	Near Angel Creek picnic area	6/27, 7/3, 7/12, 7/18, 7/25
	R-6H	Bac-7-UVR	At Fashoda Beach	6/20, 6/27, 7/3, 7/12, 7/18
Union Valley	R-6E	Bac-8-UVR	Near Wench Creek Campground	6/20, 6/27, 7/3, 7/12, 7/18
Reservoir (swim areas)	FC-2	Bac-9-UVR	Near Camino Cove Campground	6/20, 6/27, 7/3, 7/12, 7/18
	R-6F	Bac-10-UVR	Near Yellowjacket Campground	6/20, 6/27, 7/3, 7/12, 7/18
Other UARP Locations	R-8B	Bac-11-JR	Junction Reservoir, near boat launch	6/19, 6/26, 7/2, 7/11, 7/17
lce House Reservoir	68	Bac-12-IHR	Northshore near private campground access	6/19, 6/26, 7/2, 7/11, 7/17
(beach locations)	69	Bac-13-IHR	East of boat launch and picnic area	6/19, 6/26, 7/2, 7/11, 7/17
Other UARP	R-10B	Bac-14-BCR	Brush Creek Reservoir, near boat launch	6/19, 6/26, 7/2, 7/11, 7/17
locations	R-11C	Bac-15-SCR	Slab Creek Reservoir, near boat launch	6/19, 6/26, 7/2, 7/11, 7/17



5.0 METHODS

5.1 *IN SITU* PARAMETERS

Reservoir *in situ* water quality monitoring was conducted by watercraft to access midreservoir areas (Figure 5-1). A multi-probe Sonde (Yellow Springs Instruments [YSI] 6920 or EXO) was deployed from the boat for measurement of *in situ* parameters, including water temperature, conductivity, dissolved oxygen, pH, and turbidity (Table 5-1).



Figure 5-1. Example of mid-reservoir *in situ* water quality sampling site (R-IS-11-IHR) at Ice House Reservoir.



At each reservoir site, a vertical water column profile was collected for all *in situ* water quality parameters, at one-meter depth intervals. For bottom water samples, the Sonde was drawn back 0.5 meter (m) from the sediment layer before taking a reading. Prior to taking each reading, the Sonde was allowed to stabilize (typically requiring no more than 90 seconds). Water transparency was measured at reservoir stations with a standard 7.9-inch-diameter Secchi disk.

At riverine sites, Sonde readings were obtained where sufficient stream turbulence provided good lateral and vertical mixing of the water, and as near as possible to the stream thalweg (Figure 5-2). Prior to taking each reading, the Sonde was allowed to stabilize (typically requiring no more than 90 seconds) such that there was little variability in parameter readings at each location.



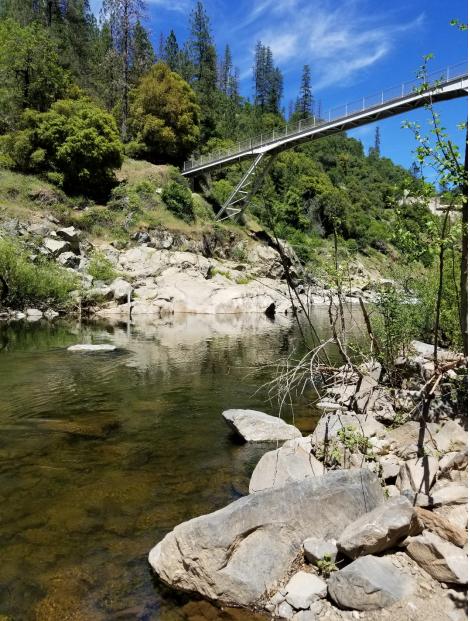


Figure 5-2. Example of an *in situ* water quality sampling site (IS-19-SFAR) at the outflow from Slab Creek Reservoir.

For both reservoir and riverine *in situ* monitoring, Sonde calibration was conducted onsite prior to the start of each sampling day using standard solutions, and recorded on calibration logs (Appendix E). Other data gathered at each monitoring station included date, time, site name, sampling location, collector's name, weather conditions, and any other pertinent observations related to the monitoring station. Following each field event, data was added to a database template provided by SMUD, for eventual transfer into SMUD's master database.



All *in situ* water quality sampling was conducted in compliance with the approved Water Quality Monitoring Plan (SMUD 2016).

Parameter ¹	Method	Units	MDL
Water temperature (YSI 6560 Sensor)	EPA 170.1	degrees Celsius (°C)	0.1
Conductivity (YSI 6560 Sensor)	SM 2510-B	microsiemens per centimeter (uS/cm)	1.0
DO (YSI 6562 Rapid Pulse Sensor)	SM 4500-O(G)	milligrams per liter (mg/L)	0.1
pH (YSI 6565 Sensor)	SM 4500-H	standard unit of pH (s.u.)	0.1
Turbidity (YSI 6136 Sensor)	SM 2130B	Nephelometric Turbidity Unit (NTU)	0.1
Secchi depth (Secchi disk)	USGS	meter (m)	0.1

Table 5-1. In situ Water Quality Methods.

DO = dissolved oxygen

EPA = Environmental Protection Agency

MDL = method detection limit

SM = Standard Methods

¹ A YSI 6920 instrument was used during part of the spring and fall sampling events. All sensor numbers listed apply to the YSI 6920. A YSI EXO instrument was used during the winter, spring, summer, and fall sampling events. YSI does not assign specific numbers or codes to the EXO sensors.

Conductivity data were qualified for 59 of 98 (60%) of *in situ* samples in 2018, which is greater than observed during 2015–2017 monitoring (33% of samples in 2017, 45% of samples in 2016, 0% of samples in 2015). Potential reasons for the relatively high degree of qualified data in 2018 include 1) calibration procedure (i.e., insufficient time for sensor stabilization during the post-sampling calibration check given sample conductivity values that are generally at or near the low end of the sensor range and cold water temperatures); and, 2) the conductivity sensor was malfunctioning. Both of these potential reasons will be explored prior to 2019 monitoring to reduce the occurrence of qualified data.

5.2 BACTERIA

Bacteria grab samples were collected near reservoir and river shorelines in shallow water, and in particular at swim areas/beach locations (Table 4-5, Figure 5-3). Samples were collected in sterilized bottles supplied by the analytical laboratory. Field sampling personnel filled each sample bottle by direct immersion in the reservoir or stream. Immediately after collection, samples were placed on ice for transport to the analytical laboratory within the required field hold time (Table 5-2).





Figure 5-3. Example of a bacteria sampling site at Ice House Reservoir (Bac-12-IHR).



Table 5-2. Bacteria Analytical Methods and Field Hold Times.

Analyte	Method	Units	MDL	Hold time
Escherichia coli	SM9223B (Quantitray)	MPN/100 mL	1.8	8 hr
Fecal coliform	SM9221E (MPN 15 or 25)	MPN/100 mL	1.8	8 hr

hr = hour MDL = method detection limit

mL = milliliter

MPN = mostprobable number

SM = Standard Method

Field-based Quality Assurance/Quality Control (QA/QC) for bacterial samples was assured by accurate and thoroughly completed sample labels, field sheets, chain of custody, and sample log forms. Sample labels included sample identification code, date, time, preservative, client name, collector's name, reservoir/river name, sampling location, and analysis/sample type. All sample labels were cross-checked by a second field technician before delivering samples to the analytical laboratory.

6.0 RESULTS

6.1. IN SITU PARAMETERS

6.1.1. <u>Riverine Sites</u>

In situ water quality data for UARP riverine sites are summarized in Table 6-1, and field data sheets are provided in Appendix D. Several riverine sites were not sampled during the 2018 January (Winter) sampling event due to snow accumulation (Table 4-4).

January (Winter) In situ Water Quality Sampling Event

During the January sampling event, water temperatures ranged from 2.5 to 7.2 degrees Celsius (°C) and were variable by site. Riverine dissolved oxygen ranged from 11.0 to 12.8 milligrams per liter (mg/L) (86 to 102% saturation), with no measurements falling below the Basin Plan instantaneous minimum concentration of 7.0 mg/L for cold freshwater habitat (COLD) and spawning, reproduction, and/or early development (SPWN) designated beneficial uses (Table 6-1). pH at riverine sites ranged from 6.7 to 7.8 standard units (s.u.), with no exceedances of the Basin Plan instantaneous minimum or maximum pH objectives (6.5 s.u. and 8.5 s.u., respectively).

Typical of granitic watersheds, conductivity at the riverine sites was low, ranging from 6 to 35 microsiemens per centimeter (uS/cm).

Turbidity measurements during the January sampling event were low, ranging from 0.3 to 7.5 Nephelometric Turbidity Unit (NTU) (Table 6-1). Turbidity at Site IS-17-BC was 7.5 NTU during this survey (Table 6-1), which was higher than other sites sampled during 2018 and may be due to the increased runoff from the King Fire area that burned over 97,000 acres of land in El Dorado County, California, in mid-September to mid-October



2014. Turbidity at Site IS-17-BC during the 2018 winter sampling event was notably lower than the highest values recorded in 2017 (78.7 NTU at Site IS-14-SC), 2016 (46.0 NTU at Site IS-17-BC), and 2015 (295.4 NTU at Site IS-17-BC).

May (Spring) In situ Water Quality Sampling Event

During the May sampling event, water temperatures exhibited a greater range and were generally higher than winter temperatures (5.3 to 15.3°C). Dissolved oxygen ranged from 9.3 to 11.4 mg/L (81 to 101% saturation) across all riverine sites, which is well above the minimum Basin Plan concentration of 7.0 mg/L for COLD and SPWN. pH ranged from 6.4 to 7.5 s.u., with one measurement falling below the Basin Plan instantaneous minimum pH objective (6.5 s.u.) and no exceedances of the instantaneous maximum (8.5 s.u.). Measured pH below the Basin Plan instantaneous minimum occurred at Site IS-4-GC (6.4 s.u.) (Table 6-1).

Conductivity at the riverine sites was low, ranging from 6 to 34 uS/cm during the May sampling event.

Turbidity measurements were low, ranging from 0.1 to 3.9 NTU (Table 6-1).

August (Summer) In situ Water Quality Sampling Event

During the August sampling event, water temperatures ranged from 6.7 to 22.5°C and were variable by site. Riverine dissolved oxygen during the August sampling event ranged from 6.6 to 10.6 mg/L (74 to 100% saturation), with three measurements falling below the Basin Plan instantaneous minimum concentration of 7.0 mg/L for COLD and SPWN. Measured dissolved oxygen below the Basin Plan instantaneous minimum occurred at sites IS-1-RR (6.9 mg/L), IS-2-LRR (6.6 mg/L), and IS-3-LRR (6.9 mg/L) (Table 6-1), which may be due to low river flows or higher water temperatures at these sites in August. Riverine pH ranged from 6.2 to 7.7 s.u. with one measurement falling below the Basin Plan instantaneous minimum pH objective (6.5 s.u.) and no exceedances of the instantaneous maximum (8.5 s.u.). Measured pH below the Basin Plan instantaneous minimum occurred at Site IS-4-GC (6.2 s.u.) (Table 6-1).

Conductivity at the riverine sites was low, ranging from 6 to 49 uS/cm.

During the August sampling event, turbidity measurements were low, ranging from 0.1 to 1.2 NTU (Table 6-1).

November (Fall) In situ Water Quality Sampling Event

Water temperatures during the November sampling event ranged from -2.5¹ to 9.6°C. Riverine dissolved oxygen ranged from 9.9 to 12.8 mg/L (74 to 99% saturation), with no measurements falling below the Basin Plan instantaneous minimum concentration of 7.0

¹ This value represents an isolated, unusually low water temperature result and is qualified as such.



mg/L for COLD and SPWN. Riverine pH ranged from 6.1 to 7.7 s.u. during the November event with four measurements below the Basin Plan instantaneous minimum pH objective (6.5 s.u.) and no exceedances of the instantaneous maximum (8.5 s.u.). Measured pH below the Basin Plan instantaneous minimum occurred at sites IS-5-GC (6.2 s.u.), IS-6-GC (6.1 s.u.), IS-8-SFRR (6.4 s.u.), and IS-10-SFSC (6.1 s.u.) (Table 6-1).

Conductivity at the riverine sites was low, ranging from 8 to 54 uS/cm during the November sampling event.

Turbidity at riverine sites was low, ranging from 0.1 to 1.3 NTU (Table 6-1).



Table 6-1. In situ Water Quality for UARP Riverine Sites.

	2018				Dissolved		
	Sample	Water	рН	Dissolved	Oxygen	Conductivity	
Site ID	Date	Temperature (°C)	(s.u.)	Oxygen (mg/L)	(% sat)	(uS/cm)	Turbidity (NTU)
			Janı	uary (Winter)			
IS-1-RR	-	-	_	-	-	-	-
IS-2-LRR	-	-	_	-	-	-	-
IS-3-LRR	-	-	-	-	-	-	-
IS-4-GC	-	-	_	-	-	-	-
IS-5-GC	-	_	-	-	_	_	-
IS-6-GC	-	-	-	-	_	-	-
IS-9-GCC	1/29	2.5	6.7	11.8	86	7 ^Q	0.7
IS-7-SFRR	_	_	I	_	_	-	_
IS-8-SFRR	_	_	-	_	_	_	_
IS-10-SFSC	1/29	4.8	7.1	11.0	86	6 ^Q	0.4
IS-11-SFSC	1/29	2.6	7.3	12.1	89	9 ^Q	0.6
IS-12-SC	1/29	5.9	7.1	11.1	89	8 ^Q	0.6
IS-13-SC	1/29	6.6	7.3	11.6	94	8 ^Q	0.3
IS-14-SC	1/29	6.0	7.3	11.6	93	13 ^Q	0.8
IS-15-SFAR	1/30	4.5	7.6	12.8	99	35	0.9
IS-16-SFAR	1/30	4.6	7.5	12.7	98	26	0.7
IS-17-BC	1/30	6.6	7.3	11.4	93	17	7.5
IS-18-SFAR	1/30	7.2	7.8	12.4	102	34	0.8
IS-19-SFAR	1/30	5.5	7.5	12.4	98	22	2.2
			Ма	ay (Spring)			
IS-1-RR	5/18	5.3	7.1	10.3	81	8	1.4
IS-2-LRR	5/18	7.5	7.1	9.7	81	7	1.1
IS-3-LRR	5/18	7.3	8.3	9.9	84	7	1.3
IS-4-GC	5/8	6.2	6.4	10.2	82	6 ^Q	0.4
IS-5-GC	5/8	9.4	7.0	9.7	85	9 ^Q	0.2
IS-6-GC	5/8	8.2	6.7	10.0	85	7 ^Q	0.2
IS-9-GCC	5/8	10.7	6.9	9.9	89	9 ^Q	0.2
IS-7-SFRR	5/8	11.4	7.1	9.3	85	12 ^Q	0.3
IS-8-SFRR	5/8	11.4	6.9	9.5	87	10 ^Q	0.2
IS-10-SFSC	5/8	5.5	7.0	10.7	85	7 ^Q	0.5
IS-11-SFSC	5/10	10.1	7.1	9.9	88	11 ^Q	0.2
IS-12-SC	5/10	6.9	7.0	10.7	88	9 ^Q	0.2

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Site ID	2018 Sample Date	Water Temperature (°C)	рН (s.u.)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	Turbidity (NTU)
IS-13-SC	5/10	10.7	7.0	10.3	93	12 ^Q	0.2
IS-14-SC	5/10	8.0	7.3	11.0	94	10 ^Q	0.2
IS-15-SFAR	5/9	12.2	7.2	10.5	98	25 ^Q	1.1
IS-16-SFAR	5/9	10.2	6.9	11.4	101	18 ^Q	0.3
IS-17-BC	5/9	10.7	6.9	10.2	92	21 ^Q	3.9
IS-18-SFAR	5/9	15.3	7.5	10.2	101	34 ^Q	0.1
IS-19-SFAR	5/9	11.1	7.2	10.9	99	21 ^Q	0.3
			Augu	st (Summer)			
IS-1-RR	8/17	22.5	6.9	6.9	79	15	0.6
IS-2-LRR	8/17	20.5	6.9	6.6	74	13	0.2
IS-3-LRR	8/17	21.5	6.8	6.9	78	10	0.1
IS-4-GC	8/13	10.1	6.2	9.2	82	6 ^Q	0.4
IS-5-GC	8/13	14.4	7.1	8.3	86	9 ^Q	0.1
IS-6-GC	8/13	14.7	6.7	8.6	84	9 ^Q	0.2
IS-9-GCC	8/13	16.4	6.7	8.6	88	9 ^Q	0.1
IS-7-SFRR	8/13	15.8	7.0	8.5	86	9 ^Q	0.1
IS-8-SFRR	8/13	15.5	7.0	8.7	88	9 ^Q	0.1
IS-10-SFSC	8/13	6.7	6.8	10.5	85	7 ^Q	0.4
IS-11-SFSC	8/14	13.6	7.2	9.1	87	11 ^Q	0.2
IS-12-SC	8/14	7.9	6.8	10.2	86	8 ^Q	0.2
IS-13-SC	8/14	16.1	7.0	9.0	92	14 ^Q	0.1
IS-14-SC	8/14	10.4	7.1	10.5	94	11 ^Q	0.2
IS-15-SFAR	8/14	20.6	7.7	8.8	98	49 ^Q	0.3
IS-16-SFAR	8/14	11.3	6.7	10.6	97	16 ^Q	0.2
IS-17-BC	8/14	19.3	7.3	8.4	91	24 ^Q	1.2
IS-18-SFAR	8/15	17.7	7.4	9.5	100	26 ^Q	0.2
IS-19-SFAR	8/15	13.3	7.2	10.1	97	17 ^Q	0.8
				ember (Fall)			-
IS-1-RR	11/12	1.3	6.5	10.4	74	12 ^Q	0.4
IS-2-LRR	11/12	3.7	6.9	9.9	75	11 ^Q	0.1
IS-3-LRR	11/12	3.0	6.6	10.6	79	8 ^Q	0.3
IS-4-GC	11/13	5.2	6.6	10.2	80 ^Q	8 ^Q	0.2
IS-5-GC	11/13	1.2	6.2	11.3	81 ^Q	10 ^Q	0.1
IS-6-GC	11/13	3.0	6.1	10.5	78 ^Q	11 ^Q	0.2

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Site ID	2018 Sample Date	Water Temperature (°C)	рН (s.u.)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	Turbidity (NTU)
IS-9-GCC	11/13	3.1	6.8	10.8	81 ^Q	13 ^Q	0.3
IS-7-SFRR	11/13	1.1	6.5	11.5	81 ^Q	13 ^Q	0.1
IS-8-SFRR	11/13	1.6	6.4	11.5	82 ^Q	12 ^Q	0.3
IS-10-SFSC	11/13	5.6	6.1	9.9	79 ^Q	13 ^Q	0.5
IS-11-SFSC	11/14	-2.5 ^q	6.9 ^q	12.5 ^q	80 ^q	15 ^{Q,q}	0.1 ^q
IS-12-SC	11/14	1.2	6.8	11.9	85	14 ^Q	0.2
IS-13-SC	11/14	1.5	6.9	12.5	89	15 ^Q	0.2
IS-14-SC	11/14	4.0	6.9	11.9	90	16 ^Q	0.1
IS-15-SFAR	11/14	1.9	7.0	12.8	93	54 ^Q	0.1
IS-16-SFAR	11/14	4.9	6.7	12.3	96	27 ^Q	0.4
IS-17-BC	11/16	9.6	7.5	10.4	91	30 ^Q	1.3
IS-18-SFAR	11/16	7.1	7.7	12.0	99	32 ^Q	0.2
IS-19-SFAR	11/16	8.4	7.7	11.3	96	26 ^Q	0.4

°C = degrees Celsius

s.u. = standard unit of pH

mg/L = milligrams per liter

% sat = percent saturation

uS/cm = microsiemens per centimeter

NTU = Nephelometric TurbidityUnit

"-" Indicates that data were not collected due to site inaccessibility. See also Table 4-4.

"Q" Indicates data that are designated as "qualified" because the post-sampling calibration check measurement quality objective (MQO) for acceptability was not met (see Appendix E).

"q" All in situ parameters are qualified at this site due to an isolated, unusually low water temperature result.



6.1.2. <u>Reservoir Sites</u>

In situ water quality data for selected UARP reservoir sites are presented in Figures 6-1 and 6-2 as representative of vertical profiles at other sites. Data for all sites are presented in Appendices A and B. As noted in Section 5, *in situ* water quality parameters were collected as part of Spring and Fall *in situ* sampling events in 2018, consistent with the Monitoring Plan (SMUD 2016).

April/May (Spring) In situ Water Quality Sampling Event

During the April/May (Spring) sampling event, thermal stratification was apparent in Union Valley, Ice House, and Junction reservoirs, with the thermocline located between roughly 5 and 15 m depth (Figure 6-1). Less thermal stratification was apparent in Slab Creek Reservoir and at the deeper site in Loon Lake (Site R-IS-1-LL). Across all reservoir sites, surface water temperatures ranged from 6.0° to 12.5°C and bottom water temperatures were lower, ranging from 4.6° to 7.9°C. In Union Valley and Ice House reservoirs, pH and turbidity were generally consistent with depth, suggesting well-mixed water columns that had only recently begun to stratify due to increasing surface water temperatures. Dissolved oxygen concentrations at most reservoir sites increased slightly with depth, likely due to increasing solubility at lower water temperatures. Dissolved oxygen concentrations were above 8 mg/L at all reservoir sites during the April/May (Spring) sampling event, greater than the Basin Plan instantaneous minimum concentration of 7.0 mg/L for COLD and SPAWN designated beneficial uses. pH values showed little variation among reservoirs and with depth, ranging from 6.5 to 7.0 s.u., with several values below the Basin Plan instantaneous minimum pH objective (6.5 s.u.). There were no exceedances of the instantaneous maximum pH objective (8.5 s.u.). Turbidity levels were very low (less than or equal to 2 NTU) (Figure 6-1).



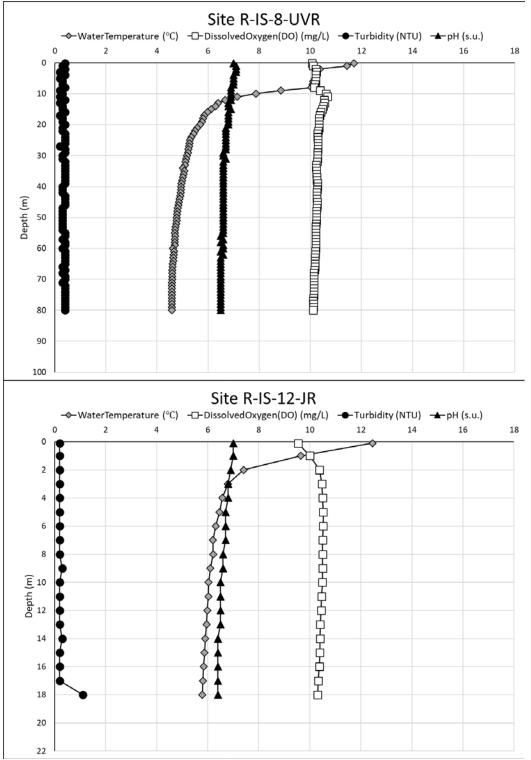


Figure 6-1. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir and Junction Reservoir sites R-IS-8-UVR (top) and R-IS-12-JR (bottom) during May (Spring) 2018.



October (Fall) In situ Sampling Event

During the October sampling event, surface water temperatures across all reservoir sites ranged from 7.6° to 13.1°C and bottom water temperatures ranged from 3.6° to 12.8°C. Most sites exhibited little to no variation in water temperature with depth, indicating that the reservoirs were generally well mixed (Figure 6-2). Exceptions included Union Valley Reservoir (Site R-IS-8-UVR), which exhibited a broad, deep thermocline between 30 and 65 m (Appendix B, Figure B-12), and Slab Creek Reservoir (Site R-IS-14-SC), which exhibited a compact, shallow thermocline between 3 and 4 m (Appendix B, Figure B-15). Dissolved oxygen, pH, and turbidity at reservoir sites were generally consistent throughout depth. Dissolved oxygen concentrations were above the Basin Plan instantaneous minimum concentration of 7.0 mg/L for COLD and SPAWN designated beneficial uses, with the exception of Union Valley Reservoir (Site R-IS-8-UVR) where dissolved oxygen reached 6.7 mg/L at the approximate location of the thermocline (58 m) and continued to decrease towards the bottom of the reservoir (Appendix B, Figure B-12). pH values exhibited little variation with depth, ranging from 5.8 to 7.6 s.u., with Loon Lake (sites R-IS-1-LL, R-IS-2-LL, and R-IS-3-LL), Gerle Creek Reservoir (Site R-IS-4-GC), Union Valley Reservoir (sites R-IS-5-UVR, R-IS-6-UVR, R-IS-7-UVR, and R-IS-8-UVR), Junction Reservoir (Site R-IS-12-JR), and Camino Reservoir (Site R-IS-13-CR) all exhibiting values below the Basin Plan instantaneous minimum pH objective (6.5 s.u.) throughout the water column (Appendix B, Figures B-9, B-10, B-11, B-12, B-14 and B-15 respectively). There were no exceedances of the instantaneous maximum pH objective (8.5 s.u.). Turbidity levels were low (less than or equal to 4 NTU).



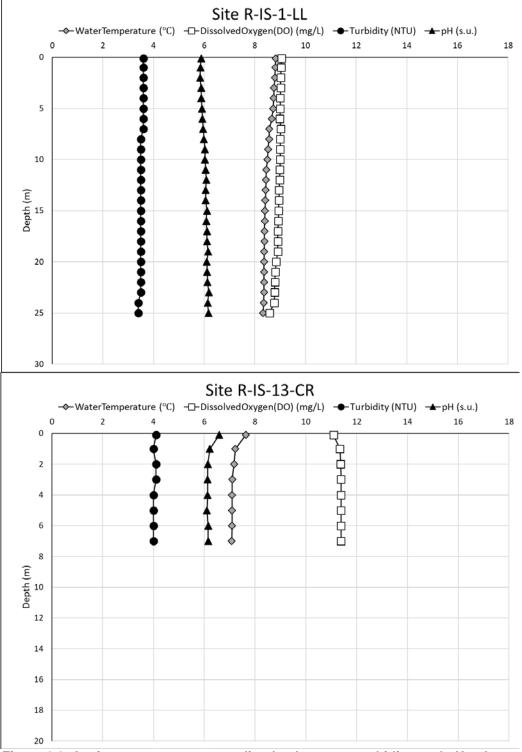


Figure 6-2. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Loon Lake and Camino Reservoir sites R-IS-1-LL (top) and R-IS-13-CR (bottom) during October (Fall) 2018.



6.2. BACTERIA

Instantaneous fecal coliform counts ranged from less than the MDL (1.8 most probable number per 100 milliliters [MPN/100 mL]) to 350 MPN/100 mL during both the 2018 Independence Day and Labor Day sampling events (Appendix C, Tables C-1 and C-2). The lowest geometric mean fecal coliform counts (0.9 MPN/100 mL) were calculated in samples from Brush Creek Reservoir (Site Bac-14-BCR) during the Independence Day sampling event. The highest geometric mean fecal coliform count (9.2 MPN/100 mL) was calculated in samples from Slab Creek Reservoir (Site Bac-15-SCR) during the Independence Day sampling event (Table 6-2). Results less than the MDL were treated as 0.5 x MDL for the calculation. The highest count was well below the Basin Plan objective of 200 MPN/100 mL, as a geometric mean of five samples collected over 30 days, for the recreational water contact (REC-1) designated beneficial use. Fecal coliform geometric mean counts in 2018 were either similar to or less than counts measured during prior years of the monitoring program (SMUD 2016, 2017, 2018). Further, none of the 2018 samples exceeded the instantaneous maximum Basin Plan objective of 400 MPN/100 mL.

Instantaneous *Escherichia coli* (*E. coli*) counts ranged from less than the MDL (1.0 MPN/100 mL) to 344.8 MPN/100 mL during the 2018 Independence Day and Labor Day sampling events (Appendix C, Tables C-1 and C-2). The lowest geometric mean *E. coli* count (0.5 MPN/100 mL) was calculated in samples from Brush Creek Reservoir (Site Bac-14-BCR) during the Independence Day sampling event, while the highest geometric mean *E. coli* count (21.8 MPN/100 mL) was calculated in samples from Junction Reservoir (Site Bac-11-JR) during the Independence Day sampling event (Table 6-2). Results less than the MDL were treated as 0.5 x MDL for the calculation. With the exception of Site Bac-11-JR, *E. coli* geometric mean counts in 2018 were either similar to or less than counts measured during prior years of the monitoring program (SMUD 2016, 2017, 2018). There is no Basin Plan numeric objective for *E. coli*.



Fecal coliform geometric mean ^{1,2} <i>E. coli</i> geometric m						
Site ID	(MPN/100 mL)	(MPN/100 mL)				
	Independence Day	· · · ·				
Bac-5-GCR	2.9	3.2				
Bac-6-GCR	1.5	1.3				
Bac-7-UVR	1.7	1.0				
Bac-8-UVR	1.7	1.3				
Bac-9-UVR	4.3	2.3				
Bac-10-UVR	1.2	0.6				
Bac-11-JR	7.6	21.8				
Bac-12-IHR	1.1	0.7				
Bac-13-IHR	2.0	2.4				
Bac-14-BCR	0.9	0.5				
Bac-15-SCR	9.2	8.4				
	Labor Day					
Bac-1-BI	1.2	0.7				
Bac-2-BI	1.1	0.9				
Bac-3-LL	1.1	0.7				
Bac-4-LL	0.9	0.6				

Table 6-2. Bacteria Counts for UARP Reservoir Sites.

MPN/100 mL = most probable number per 100 milliliters

¹ Method detection limit (MDL for fecal coliform = 1.8 MPN/100 mL.MDL for *E. coli* = 1.0 MPN/100 mL. Individual results less than the MDL were treated as 0.5 x MDL for the geometric mean calculations.

² The Basin Plan REC-1 water quality objective is 200 MPN/100 mL expressed as the geometric mean of five samples collected over 30 days.

7.0 CONCLUSIONS

Based on 2018 *in situ* monitoring results, riverine water quality in the UARP study area consistently met Basin Plan water quality objectives for turbidity. There were three instances of dissolved oxygen measured below the Basin Plan instantaneous minimum objective (7.0 mg/L) for COLD and SPWN, which occurred during the August (Summer) sampling event at Rubicon River and Little Rubicon River sites and may have been due to relatively high water temperatures (greater than 20°C) and low flows. There were six instances of pH measured below the Basin Plan instantaneous minimum objective (6.5 s.u.), which is more than measured during 2015–2017 at riverine sites, but is generally consistent with low pH measured at reservoir sites during the 2015–2018 monitoring period. The occasionally low pH values may be due to low buffering capacity characteristic of headwater reaches in granitic watersheds. There were no instances of pH measured above the Basin Plan instantaneous maximum objective (8.5 s.u.).

Reservoir water quality was also generally good, with occasional values measured below the Basin Plan instantaneous minimum objectives for dissolved oxygen (5 mg/L) in October (Fall) in the bottom waters of the deepest site at Union Valley Reservoir, which was stratified at the time of sampling. The latter result is not uncommon for deep waterbodies that have been thermally stratified for several months. There were several instances of pH measured below the Basin Plan instantaneous minimum objective (6.5 s.u.) in surface and bottom waters, which, similar to the riverine pH results, may be due to low buffering capacity characteristic of headwater reaches in granitic watersheds.



There were no instances of pH measured above the Basin Plan instantaneous maximum objective (8.5 s.u.). There were no instances of elevated turbidity.

Sampling results for 2018 also indicated no exceedances of the fecal coliform Basin Plan objective of 200 MPN/100 mL (geometric mean of five samples collected over 30 days) or the instantaneous maximum Basin Plan objective of 400 MPN/100 mL.

Despite occasional low dissolved oxygen and pH measurements, 2018 monitoring results indicate that overall, surface waters of the UARP study area support designated beneficial uses, including COLD, SPWN, and REC-1.



8.0 LITERATURE CITED

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APPENDIX A In situ Vertical Profile Data for UARP Reservoir Sites



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Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
				Loon Lake	Reservoir				
		0.1	8.2	9.9	84	6	7.3	0.2	
		1	8.2	9.9	84	6	7.3	0.2	
		2	7.7	10.0	84	6	7.3	0.2	
		3	7.6	10.0	83	6	7.3	0.2	
		4	7.5	10.0	83	6	7.3	0.2	
		5	7.0	10.0	83	6	7.2	0.2	
		6	6.6	10.1	83	6	7.2	0.2	
		7	6.5	10.2	83	6	7.2	0.2	
		8	6.3	10.2	82	6	7.1	0.2	
		9	6.1	10.2	82	6	7.1	0.2	
		10	6.1	10.2	82	6	7.0	0.3	
		11	5.9	10.2	82	6	6.9	0.2	
R-IS-1-LL	5/3	12	5.9	10.2	82	6	6.9	0.2	12.2
R-13-1-LL	5/3	13	5.9	10.2	82	6	6.9	0.2	12.2
		14	5.8	10.2	82	6	6.9	0.3	
		15	5.8	10.2	82	6	6.8	0.2	
		16	5.7	10.2	81	6	6.8	0.3	
		17	5.7	10.2	81	6	6.8	0.2	
		18	5.7	10.1	81	6	6.8	0.2	
		19	5.6	10.1	80	6	6.7	0.2	
		20	5.6	10.1	80	6	6.7	0.3	
		21	5.4	10.1	79	6	6.7	0.2	
		22	5.4	10.1	80	6	6.6	0.3	
		23	5.4	10.1	80	6	6.6	0.3	
		24	5.3	10.1	79	6	6.5	0.3	
		25	5.3	10.0	79	6	6.5	0.3 ¹	

Table A-1. Vertical Profile Data for UARP Reservoir Sites – April/May (Spring) In situ Surveys.



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)					
		0.1	6.0	10.5	84	5	7.8	0.5						
		1	6.0	10.5	84	5	7.6	0.4						
		2	6.0	10.5	84	5	7.5	0.5						
		3	6.0	10.5	84	5	7.4	0.5						
		4	6.0	10.5	84	5	7.3	0.5						
		5	6.0	10.4	84	5	7.3	0.4						
		6	6.0	10.5	84	5	7.2	0.5						
		7	6.0	10.4	84	5	7.1	0.4						
		8	6.0	10.4	84	5	6.9	0.4						
		9	6.0	10.4	84	5	6.6	0.4						
		10	5.9	10.4	83	5	6.6	0.4						
		11	6.0	10.4	83	5	6.5	0.5						
		12	5.9	10.4	83	5	6.5	0.5						
		13	6.0	10.4	83	5	6.5	0.5						
R-IS-2-LL	5/1	14	6.0	10.4	83	5	6.4	0.5	13.7					
		15	6.0	10.3	83	5	6.5	0.4						
		16	5.9	10.3	83	5	6.4	0.4						
		17	5.9	10.3	83	5	6.4	0.4						
	-	-	-				18	5.9	10.3	83	5	6.4	0.5	
						19	5.9	10.3	83	5	6.3	0.4		
		20	5.9	10.3	83	5	6.4	0.4						
		21	5.9	10.3	83	5	6.4	0.4						
		22	5.9	10.3	82	5	6.4	0.4						
		23	5.7	10.3	82	5	6.3	0.4						
		24	5.7	10.3	82	5	6.3	0.4						
		25	5.7	10.3	82	5	6.3	0.4						
		26	5.6	10.3	82	5	6.3	0.4						
		27	5.5	10.3	82	5	6.3	0.5						
		28	5.5	10.4	82	5	6.3	0.5						



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		0.1	6.1	10.4	84	5	6.7	0.5	
		1	6.1	10.4	84	5	6.6	0.4	
		2	6.0	10.4	84	5	6.6	0.4	
		3	6.0	10.4	84	5	6.6	0.5	
		4	6.0	10.4	84	5	6.6	0.4	
		5	6.0	10.4	84	5	6.6	0.4	
		6	6.0	10.4	84	5	6.6	0.4	
		7	5.9	10.4	84	5	6.6	0.5	
R-IS-3-LL	5/1	8	5.9	10.4	83	5	6.5	0.4	13.7
		9	5.9	10.4	83	5	6.5	0.4	
		10	5.9	10.4	83	5	6.5	0.4	
		11	5.9	10.4	83	5	6.5	0.4	
		12	5.9	10.4	83	5	6.5	0.4	
		13	5.9	10.4	83	5	6.5	0.4	
		14	5.9	10.4	83	5	6.5	0.4	
		15	5.8	10.3	83	5	6.4	0.4	
		16	5.8	10.3	83	5	6.5	0.4	
				Gerle Re	servoir	•			
		0.1	7.8	10.3	87	7	6.9	0.2	
		1	7.1	10.4	86	7	6.8	0.2	
		2	6.9	10.4	85	7	6.8	0.2	
		3	6.9	10.4	85	7	6.7	0.2	1
R-IS-4-GC	5/3	4	6.9	10.3	85	7	6.7	0.2	8.5
		5	6.9	10.3	85	7	6.7	0.2	-
		6	6.8	10.3	85	7	6.6	0.2]
		7	6.8	10.3	84	7	6.6	0.2	1
		8	6.8	10.3	84	8	6.6	0.2	1



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
				Union Valley					
		0.1	11.9	9.8	90	10	7.5	0.3	
		1	11.9	9.7	90	10	7.4	0.2	
		2	11.4	9.8	89	10	7.3	0.2	
		3	11.1	9.8	88	10	7.3	0.2	
		4	11.0	9.8	88	10	7.3	0.2	
		5	10.2	9.9	88	10	7.3	0.2	
		6	9.5	10.0	88	10	7.2	0.2	
		7	8.7	10.1	87	10	7.2	0.2	
		8	8.1	10.2	87	9	7.1	0.2	
R-IS-5-UVR	4/30	9	7.9	10.2	86	9	7.1	0.2	11.6
R-12-2-0VR	-	10	7.7	10.3	86	9	7.0	0.1	
		11	7.5	10.3	86	9	7.0	0.1	
		12	7.1	10.3	84	9	7.0	0.2	
		13	6.1	10.4	83	9	6.9	0.2	
		14	5.7	10.3	82	8	6.9	0.2	
		15	5.6	10.3	82	9	6.9	0.2	
		16	5.4	10.3	81	8	6.9	0.2	
		17	5.3	10.2	81	8	6.8	0.2	
		18	5.2	10.2	80	8	6.8	0.2	
		19	5.2	10.1	79	8	6.8	0.2	
		0.1	12.2	9.3	92	10	6.9	0.4	
		1	11.2	10.0	91	10	6.9	0.4	
		2	10.8	10.0	91	10	6.9	0.3	
R-IS-6-UVR	5/1	3	10.6	10.1	91	9	6.9	0.3	12.2
R-13-0-UVR	5/1	4	10.5	10.1	91	9	6.9	0.3	12.2
		5	10.5	10.1	90	9	6.9	0.3	
		6	10.2	10.1	90	9	6.9	0.2	
		7	9.9	10.3	91	9	6.9	0.3	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		8	9.1	10.4	90	9	6.9	0.3	
		9	8.4	10.5	90	9	6.9	0.3	
		10	7.9	10.6	89	9	6.8	0.3	
		11	7.8	10.6	89	9	6.9	0.2	
		12	7.4	10.6	88	9	6.9	0.3	
		13	7.1	10.5	87	9	6.8	0.2	
		14	6.9	10.4	86	8	6.8	0.4	
		15	6.8	10.4	85	8	6.8	0.3	
		16	6.5	10.4	85	8	6.8	0.3	
		17	6.4	10.4	84	8	6.7	0.3	
		18	6.3	10.4	83	8	6.8	0.3	
		19	6.1	10.4	83	8	6.8	0.3	
		20	5.8	10.3	83	8	6.7	0.3	
		21	5.8	10.3	82	8	6.7	0.3	
R-IS-6-UVR	5/1	22	5.8	10.3	82	8	6.7	0.3	12.2
		23	5.7	10.3	82	8	6.7	0.3	
		24	5.7	10.3	82	8	6.7	0.3	
		25	5.5	10.3	82	8	6.7	0.3	
	-	26	5.4	10.3	81	8	6.7	0.3	
		27	5.3	10.3	81	8	6.6	0.4	
		28	5.1	10.2	80	8	6.6	0.4	
		29	5.1	10.2	80	8	6.6	0.4	
		30	5.0	10.2	80	8	6.6	0.4	
		31	5.0	10.2	80	8	6.6	0.3	
		32	5.0	10.2	80	8	6.6	0.4	
		33	5.0	10.2	80	8	6.6	0.4	1
		34	5.0	10.2	79	8	6.6	0.4	
		35	5.0	10.2	79	8	6.6	0.4	
		36	4.9	10.1	79	8	6.7	0.4	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		0.1	12.1	9.9	92	10	7.0	0.5	
		1	11.8	9.9	92	10	6.9	0.3	
		2	11.2	10.0	91	10	6.9	0.4	
		3	11.0	10.0	91	10	6.9	0.4	
		4	10.8	10.0	91	9	6.9	0.4	
		5	10.3	10.2	91	9	6.9	0.4	
		6	9.6	10.3	90	9	6.8	0.4	
		7	9.0	10.4	90	9	6.8	0.3	
		8	8.8	10.4	90	9	6.8	0.4	
		9	8.4	10.4	89	8	6.8	0.4	
		10	7.8	10.5	88	8	6.8	0.3	
		11	7.1	10.6	88	8	6.8	0.4	
		12	6.7	10.6	87	8	6.8	0.3	
		13	6.7	10.6	87	8	6.7	0.4	
R-IS-7-UVR	5/1	14	6.5	10.6	86	8	6.7	0.3	10.4
		15	6.4	10.5	85	8	6.7	0.3	
		16	6.2	10.5	85	8	6.7	0.3	
		17	6.1	10.5	84	8	6.7	0.3	
		18	6.0	10.5	84	8	6.7	0.4	
		19	5.8	10.4	83	8	6.7	0.4	
		20	5.8	10.4	83	8	6.6	0.3	
		21	5.6	10.4	83	8	6.6	0.4	
		22	5.6	10.4	82	8	6.6	0.4	
		23	5.5	10.4	82	8	6.6	0.4	
		24	5.3	10.3	82	8	6.6	0.3	
		25	5.2	10.3	81	8	6.6	0.3	
		26	5.2	10.3	81	8	6.6	0.3	
		27	5.2	10.3	81	8	6.6	0.3	
		28	5.2	10.2	81	8	6.6	0.3	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		29	5.1	10.2	80	8	6.6	0.3	
		30	5.1	10.2	80	8	6.6	0.3	
		31	5.1	10.2	80	8	6.6	0.4	
		32	5.0	10.2	80	8	6.6	0.4	
		33	5.0	10.2	80	8	6.6	0.3	
		34	5.0	10.2	80	8	6.6	0.3	
		35	5.0	10.2	80	8	6.6	0.4	
R-IS-7-UVR	5/1	36	4.9	10.2	80	8	6.6	0.4	10.4
R-15-7-0VR	5/1	37	4.9	10.2	79	8	6.6	0.3	10.4
		38	4.9	10.2	79	8	6.6	0.3	
		39	4.9	10.2	79	8	6.6	0.3	
	-	40	4.9	10.2	79	8	6.5	0.4	
		41	4.9	10.2	79	8	6.6	0.4	
		42	4.9	10.2	79	8	6.5	0.3	
		43	4.9	10.2	79	8	6.5	0.4	
		44	4.9	10.1	79	8	6.5	0.4	
		0.1	11.7	10.1	93	10	7.0	0.4	
		1	11.4	10.1	93	10	7.1	0.3	
		2	10.4	10.2	91	9	7.1	0.4	
		3	10.3	10.2	91	9	7.1	0.2	
		4	10.2	10.2	91	9	7.0	0.4	
		5	10.2	10.2	91	9	7.0	0.2	
R-IS-8-UVR	5/1	6	10.1	10.2	91	9	7.0	0.3	11.3
		7	10.1	10.2	91	9	7.0	0.3	
		8	10.0	10.2	90	9	6.9	0.4	
		9	8.9	10.4	90	9	6.9	0.2	
		10	7.9	10.6	89	9	6.9	0.3	
		11	7.1	10.7	88	9	6.9	0.2	
		12	6.7	10.5	86	8	6.9	0.4	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)	
		13	6.4	10.6	86	8	6.8	0.2		
		14	6.3	10.5	85	8	6.8	0.3		
		15	6.1	10.5	84	8	6.8	0.3		
		16	6.0	10.4	84	8	6.8	0.4		
		17	5.9	10.4	83	8	6.8	0.2		
		18	5.8	10.3	83	8	6.8	0.3		
		19	5.8	10.4	83	8	6.8	0.3		
		20	5.7	10.3	82	8	6.8	0.4		
		21	5.6	10.3	82	8	6.7	0.3		
		22	5.5	10.3	82	8	6.7	0.3		
		23	5.4	10.3	82	8	6.7	0.4		
		24	5.3	10.3	81	8	6.7	0.4		
		25	5.3	10.3	81	8	6.7	0.4		
		26	5.3	10.3	81	8	6.7	0.4		
R-IS-8-UVR	5/1	27	5.3	10.3	81	8	6.7	0.2	11.3	
		28	5.2	10.3	81	8	6.7	0.4		
		29	5.2	10.3	81	8	6.6	0.4		
		30	5.2	10.3	81	8	6.6	0.3		
		31	5.2	10.3	81	8	6.7	0.3		
		Ľ	32	5.1	10.3	81	8	6.6	0.4	
		33	5.1	10.2	80	8	6.6	0.4		
		34	5.0	10.2	80	8	6.6	0.4		
		35	5.1	10.2	80	8	6.6	0.4		
		36	5.1	10.3	80	8	6.6	0.4		
		37	5.0	10.3	80	8	6.6	0.4		
		38	5.0	10.3	80	8	6.6	0.4		
		39	5.0	10.3	80	8	6.6	0.4		
		40	5.0	10.3	80	8	6.6	0.3		
		41	4.9	10.3	80	8	6.6	0.3		



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)	
		42	4.9	10.3	80	8	6.6	0.3		
		43	4.9	10.3	80	8	6.6	0.4		
		44	4.9	10.3	80	8	6.6	0.4		
		45	4.9	10.3	80	8	6.6	0.4		
		46	4.9	10.3	80	8	6.6	0.4		
		47	4.8	10.3	80	8	6.6	0.3		
		48	4.8	10.3	80	8	6.6	0.3		
		49	4.8	10.2	80	8	6.6	0.3		
		50	4.8	10.2	80	8	6.6	0.3		
		51	4.8	10.2	80	8	6.6	0.3		
		52	4.8	10.2	80	8	6.6	0.3		
		53	4.7	10.2	80	8	6.6	0.3		
		54	4.7	10.2	79	8	6.6	0.3		
		55	4.7	10.2	79	8	6.6	0.4		
R-IS-8-UVR	5/1	56	4.7	10.2	79	8	6.5	0.4	11.3	
		57	4.7	10.2	79	8	6.6	0.3		
		58	4.7	10.2	79	8	6.5	0.4		
		59	4.7	10.2	79	8	6.6	0.4		
		-	60	4.6	10.2	79	8	6.6	0.3	
		61	4.7	10.2	79	8	6.5	0.4		
		62	4.7	10.2	79	8	6.6	0.4		
		63	4.6	10.2	79	8	6.5	0.4		
		64	4.6	10.2	79	8	6.5	0.4		
		65	4.6	10.2	79	8	6.5	0.4		
		66	4.6	10.2	79	8	6.5	0.3		
		67	4.6	10.2	79	8	6.5	0.4	-	
		68	4.6	10.2	79	8	6.5	0.3	1	
		69	4.6	10.2	79	8	6.5	0.4		
		70	4.6	10.2	79	8	6.5	0.4		



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		71	4.6	10.1	79	8	6.5	0.3	
		72	4.6	10.1	79	8	6.5	0.4	
		73	4.6	10.1	79	8	6.5	0.4	
		74	4.6	10.1	79	8	6.5	0.4	
R-IS-8-UVR	5/1	75	4.6	10.1	79	8	6.5	0.4	11.3
R-13-0-0VR	5/ T	76	4.6	10.1	78	8	6.5	0.4	11.5
		77	4.6	10.1	78	8	6.5	0.4	
		78	4.6	10.1	78	8	6.5	0.4	
		79	4.6	10.1	78	8	6.5	0.4	
		80	4.6	10.1	78	8	6.5	0.4 ¹	
				Ice House	Reservoir				
		0.1	10.3	9.8	88	9	7.7	0.3	
		1	10.2	9.9	88	9	7.4	0.4	
		2	10.2	9.9	88	9	7.3	0.3	
		3	10.1	9.8	87	8	7.2	0.3	
		4	10.0	9.8	87	8	7.1	0.3	
		5	9.5	10.0	87	8	7.1	0.3	
		6	8.0	10.2	86	7	7.1	0.3	
		7	7.3	10.3	86	7	7.0	0.3	
R-IS-9-IHR	4/30	8	6.4	10.5	85	7	6.9	0.4	10.1
K-13-9-10K	4/30	9	5.9	10.5	84	7	6.9	0.3	10.1
		10	5.7	10.6	84	7	6.8	0.3	
		11	5.5	10.5	84	7	6.8	0.3	
		12	5.5	10.6	84	7	6.8	0.4	
		13	5.3	10.6	83	7	6.7	0.3	
		14	5.1	10.5	83	7	6.7	0.3	
		15	5.0	10.5	82	7	6.7	0.4]
		16	5.0	10.5	82	7	6.6	0.4	
		17	5.0	10.4	82	7	6.6	0.4	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		18	5.0	10.4	82	7	6.6	0.3	
		19	4.9	10.4	81	7	6.5	0.4	
	-	20	4.9	10.4	81	7	6.7	0.4	
		21	4.9	10.3	80	7	6.7	0.4	
R-IS-9-IHR	4/30	22	4.9	10.3	80	7	6.7	0.4	10.1
		23	4.9	10.3	80	7	6.6	0.3	
		24	4.9	10.3	80	7	6.7	0.4	
	-	25	4.8	10.3	80	7	6.6	0.3	
	-	26	4.8	10.3	80	7	6.6	0.4	
		0.1	10.3	9.9	88	9	6.9	0.4	
		1	10.1	9.9	88	9	7.0	0.4	
	-	2	10.1	9.9	88	9	7.0	0.3	
		3	10.0	9.9	88	9	6.9	0.3	
		4	9.9	9.9	88	8	6.9	0.3	l
		5	9.6	10.0	88	8	6.9	0.3	
		6	9.1	10.2	89	8	6.9	0.4	
		7	8.6	10.3	88	8	6.9	0.3	
R-IS-10-IHR	4/30	8	7.7	10.4	87	7	6.9	0.3	10.1
		9	7.3	10.4	86	7	6.9	0.3	
		10	7.0	10.4	86	7	6.8	0.4	
	-	11	6.8	10.4	86	7	6.8	0.3	
		12	6.3	10.5	85	7	6.8	0.3	
		13	6.1	10.5	85	7	6.8	0.3	
		14	6.0	10.5	84	7	6.8	0.3	
		15	5.7	10.5	84	7	6.7	0.4	
		16	5.6	10.4	83	7	6.7	0.4 ¹	
		0.1	10.3	10.0	89	9	6.9	0.4	
R-IS-11-IHR	4/30	1	9.9	10.0	88	9	6.9	0.3	10.4
		2	9.7	10.0	88	8	6.9	0.3	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		3	9.7	10.0	88	8	6.9	0.3	
		4	9.7	10.0	88	8	6.9	0.3	
		5	9.7	10.0	88	8	6.9	0.3	
		6	9.5	10.0	88	8	6.9	0.4	
		7	8.7	10.2	88	8	6.9	0.4	
		8	7.6	10.5	88	8	6.8	0.4	
		9	7.1	10.5	87	8	6.8	0.3	
		10	6.4	10.6	86	8	6.8	0.4	
		11	6.4	10.6	85	7	6.8	0.4	
		12	5.9	10.6	85	7	6.7	0.4	
		13	5.5	10.5	84	7	6.8	0.4	
		14	5.4	10.5	83	7	6.7	0.4	
		15	5.4	10.5	83	7	6.7	0.4	
		16	5.1	10.4	82	7	6.7	0.5	
R-IS-11-IHR	4/30	17	5.1	10.4	82	7	6.6	0.3	10.4
		18	5.0	10.4	82	7	6.6	0.5	
		19	4.9	10.4	81	7	6.6	0.4	
		20	4.9	10.3	80	7	6.6	0.4	
		21	4.9	10.3	80	7	6.6	0.5	
		22	4.8	10.3	80	7	6.5	0.5	
		23	4.8	10.3	80	7	6.5	0.5	
		24	4.8	10.3	80	7	6.5	0.4	
		25	4.8	10.3	80	7	6.5	0.5	
		26	4.8	10.3	80	7	6.5	0.5	
		27	4.8	10.3	79	7	6.5	0.3	
		28	4.8	10.3	80	7	6.5	0.4	
		29	4.8	10.3	80	7	6.5	0.5]
		30	4.8	10.3	80	7	6.4	0.5	
		31	4.8	10.3	80	7	6.4	0.4	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disl (m)
		32	4.8	10.3	80	7	6.4	0.4	
R-IS-11-IHR	4/30	33	4.7	10.3	80	7	6.4	0.5	10.4
K-13-11-INK	4/30	34	4.7	10.2	80	7	6.4	0.4	10.4
		35	4.7	10.2	79	7	6.5	0.4 ¹	
				Junction R	Reservoir				
		0.1	12.5	9.5	89	12 ^Q	7.0	0.2	
		1	9.6	10.0	89	11 ^Q	7.0	0.2	
		2	7.4	10.4	86	10 ^Q	6.9	0.2	
		3	6.8	10.5	86	10 ^Q	6.8	0.2	
		4	6.6	10.5	86	9 ^Q	6.8	0.2	
		5	6.5	10.5	86	9 ^Q	6.7	0.2	
	-	6	6.3	10.5	85	9 ^Q	6.7	0.2	6.4
		7	6.2	10.5	85	9 ^Q	6.7	0.2	
		8	6.2	10.5	85	9 ^Q	6.6	0.2	
R-IS-12-JR	5/10	9	6.1	10.5	85	9 ^Q	6.6	0.3	
		10	6.0	10.5	84	9 ^Q	6.5	0.2	
		11	6.0	10.5	84	9 ^Q	6.5	0.2	
		12	6.0	10.4	84	9 ^Q	6.5	0.2	
		13	6.0	10.4	84	9 ^Q	6.5	0.2	
		14	5.9	10.4	83	9 ^Q	6.4	0.3	
	-	15	5.9	10.4	83	9 ^Q	6.4	0.2	
	Ī	16	5.8	10.4	83	9 ^Q	6.4	0.2	
		17	5.8	10.3	83	9 ^Q	6.4	0.2	
		18	5.8	10.3	82	9 ^Q	6.4	0.2 ¹	
	·			Camino R	eservoir			•	1
		0.1	6.8	11.5	95	9 ^Q	7.2	0.2	
	5/40	1	6.7	11.5	94	9 ^Q	7.2	0.2	7.0
R-IS-13-CR	5/10	2	6.7	11.5	94	9 ^Q	6.9	0.2	7.6
	F	3	6.7	11.5	94	9 ^Q	6.9	0.3	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		4	6.7	11.5	94	9 ^Q	6.8	0.2	
R-IS-13-CR	5/10	5	6.7	11.5	94	9 ^Q	6.7	0.2	7.6
K-13-13-CK	5/10	6	6.7	11.5	94	9 ^Q	6.7	0.2	7.0
		7	6.7	11.5	94	9 ^Q	6.7	0.2	
				Slab Creek	Reservoir				
		0.1	8.0	11.8	100	19	6.9	1.8	
		1	7.8	11.8	99	19	6.9	1.7	
		2	7.6	11.8	99	19	6.9	1.8	
		3	7.7	11.8	99	19	6.9	1.7	
R-IS-14-SC	5/2	4	7.6	11.8	99	19	6.9	1.5	7.0
		5	7.6	11.8	99	19	6.9	1.8	
		6	7.5	11.8	98	19	6.9	1.3	
		7	7.4	11.8	98	18	6.9	1.3	
		8	7.4	11.8	98	18	6.9	1.3	
		0.1	9.9	11.2	99	18	6.8	0.7	
		1	9.8	11.2	98	18	6.9	0.7	
		2	9.8	11.2	99	18	6.9	0.7	
		3	9.8	11.2	99	18	6.9	0.9	
		4	9.7	11.2	98	18	7.0	0.8	
		5	9.1	11.2	97	18	7.0	0.7	
		6	8.9	11.3	98	18	7.0	0.8	
R-IS-15-SC	5/2	7	8.8	11.3	97	18	7.0	0.7	8.5
		8	8.8	11.3	97	18	7.0	0.8	
		9	8.7	11.3	97	18	7.0	0.7	
		10	8.4	11.4	97	17	7.0	0.7	
		11	8.3	11.4	98	17	7.0	0.7	
		12	8.3	11.5	98	17	7.0	0.5	
		13	8.2	11.5	98	17	7.0	0.6	
		14	8.2	11.5	98	17	7.0	0.6	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)									
		15	8.2	11.5	98	17	7.0	0.6										
		16	8.2	11.5	98	17	7.0	0.6										
		17	8.1	11.5	97	17	7.0	0.6										
		18	8.0	11.5	97	17	7.0	0.6										
		19	8.0	11.5	97	17	7.0	0.5										
		20	7.9	11.5	97	17	7.0	0.6										
		21	7.9	11.5	97	17	7.0	0.6										
		22	7.9	11.5	97	17	7.0	0.6										
		23	7.9	11.5	97	17	7.0	0.6										
R-IS-15-SC	5/2	24	7.9	11.5	97	17	7.0	0.7	8.5									
R-13-15-3C	5/2	25	7.9	11.5	97	17	7.0	0.7	0.5									
		26	7.9	11.5	97	17	7.0	0.7										
	_					27	7.9	11.5	97	17	7.0	0.6						
		28	7.9	11.5	97	17	7.0	0.7										
	_		-								29	7.9	11.5	97	17	7.0	0.7	
		30	7.9	11.5	97	17	7.0	0.8										
		31	7.9	11.5	97	17	7.0	0.6										
		32	7.9	11.5	97	17	7.0	0.8										
		33	7.9	11.5	97	18	7.0	0.7										
		34	7.9	11.5	97	17	7.0	0.7 ¹										

°C = degrees Celsius

m = meter(s)

mg/L = milligrams per liter

% sat = percent saturation

s.u = standard unit of pH

uS/cm = microsiemens per centimeter

NTU = Nephelometric TurbidityUnit

"Q" indicates data qualified based on post-sampling calibration check (see Appendix E).

¹ Turbidity values are recorded as the values from the previous depth. Higher turbidity values on the data sheet reflect turbidity caused by the probe coming into contact with reservoir bottom sediments.



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
				Loon L	ake				
		0.1	8.8	9.1	78	8	5.9	3.6	
		1.0	8.8	9.0	78	8	5.9	3.6	
		2.0	8.8	9.0	78	8	5.8	3.6	
		3.0	8.8	9.0	78	8	5.9	3.6	
		4.0	8.7	9.0	77	8	5.9	3.6	
		5.0	8.7	9.0	77	8	5.9	3.6	
		6.0	8.7	9.0	77	8	5.9	3.6	
		7.0	8.6	9.0	77	8	6.0	3.6	
		8.0	8.6	9.0	77	8	6.0	3.5	
	-	9.0	8.5	9.0	77	8	6.0	3.5	
		10.0	8.5	9.0	77	8	6.0	3.5	
		11.0	8.5	9.0	77	8	6.1	3.5	
R-IS-1-LL	10/23	12.0	8.4	9.0	77	8	6.1	3.5	7.3
N-IO-I-LL	10/23	13.0	8.4	9.0	76	8	6.1	3.5	1.5
		14.0	8.4	9.0	76	8	6.1	3.5	
		15.0	8.4	8.9	76	8	6.1	3.5	
		16.0	8.4	8.9	76	8	6.1	3.5	
		17.0	8.4	8.9	76	8	6.1	3.5	
		18.0	8.4	8.9	76	8	6.1	3.5	
		19.0	8.4	8.9	76	8	6.2	3.5	
		20.0	8.4	8.8	75	8	6.1	3.5	
		21.0	8.4	8.8	75	8	6.1	3.5	
		22.0	8.4	8.8	75	8	6.1	3.5	
		23.0	8.4	8.8	75	8	6.2	3.5	
		24.0	8.4	8.8	74	8	6.1	3.4	
		25.0	8.3	8.6	71	8	6.2	3.4 ¹	

Table A-2. Vertical Profile Data for UARP Reservoir Sites – October (Fall) In situ Surveys.



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		0.1	8.7	9.5	82	8	7.6	3.4	
		1.0	8.7	9.3	80	8	7.5	3.4	
		2.0	8.7	9.2	79	8	6.5	3.5	
		3.0	8.7	9.1	78	8	6.5	3.4	
	[4.0	8.7	9.1	78	8	6.4	3.5	
		5.0	8.7	9.0	78	8	6.4	3.5	
		6.0	8.6	9.0	77	8	6.4	3.5	
		7.0	8.6	9.0	77	8	6.3	3.5	
		8.0	8.6	9.0	77	8	6.3	3.5	
		9.0	8.6	9.0	77	8	6.3	3.5	
R-IS-2-LL	10/23	10.0	8.6	9.0	77	8	6.3	3.3	7.6
		11.0	8.6	9.0	77	8	6.3	3.5	
		12.0	8.6	9.0	76	8	6.3	3.5	
		13.0	8.6	8.9	77	8	6.2	3.5	
		14.0	8.6	8.9	76	8	6.3	3.6	
		15.0	8.6	8.9	76	8	6.3	3.5	
		16.0	8.6	8.9	76	8	6.2	3.5	
		17.0	8.6	8.9	76	8	6.2	3.5	
		18.0	8.6	8.9	76	8	6.2	3.5	
		19.0	8.6	8.9	76	8	6.2	3.5	
		20.0	8.6	8.9	76	8	6.2	3.5	
		0.1	8.6	9.7	83	8	6.6	3.2	
		1.0	8.6	9.5	81	8	6.6	3.3	
		2.0	8.6	9.4	80	8	6.6	3.3	
	10/22	3.0	8.5	9.3	80	8	6.5	3.3	7.0
R-IS-3-LL	10/23	4.0	8.5	9.3	79	8	6.5	3.4	7.3
		5.0	8.5	9.2	79	8	6.4	3.5	
		6.0	8.5	9.2	78	8	6.5	3.4	1
		7.0	8.5	9.1	78	8	6.4	3.4	1



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		8.0	8.5	9.1	78	8	6.4	3.4	
R-IS-3-LL	10/23	9.0	8.5	9.1	78	8	6.5	3.5	7.0
R-13-3-LL	10/23	10.0	8.4	9.1	78	8	6.4	3.5	7.3
		11.0	8.4	9.0	77	8	6.4	3.5 ¹	
				Gerle Creek	Reservoir				
		0.1	7.7	9.5	80	13	5.8	3.8	
		1.0	7.6	9.5	80	13	5.9	3.8	
		2.0	7.5	9.5	80	12	5.9	3.9	
		3.0	7.5	9.5	79	12	5.9	3.9	5 0
R-IS-4-GC	10/26	4.0	7.4	9.5	79	12	6.0	3.8	5.8
		5.0	7.3	9.6	79	11	6.0	3.8	
		6.0	7.2	9.6	80	11	6.0	3.8	
		7.0	7.1	9.6	79	11	6.0	3.8	
		8.0	8.6	9.7	79	10	6.0	3.8	
				Union Valley	Reservoir				
		0.1	12.8	8.6	81	13	6.0	2.9	
		1	12.7	8.6	81	13	6.2	3.3	
		2	12.6	8.6	81	13	6.3	3.4	
		3	12.6	8.6	80	13	6.2	3.3	
R-IS-5-UVR	10/24	4	12.5	8.6	80	13	6.2	3.3	8.8
		5	12.5	8.5	80	13	6.2	3.2	
		6	12.5	8.5	80	13	6.2	3.2	
		7	12.4	8.5	80	13	6.2	3.2	
		8	12.3	8.5	79	13	6.2	3.2 ¹	
		0.1	13.1	9.9	94	13	6.7	3.2	
		1	13.0	8.9	84	13	6.8	3.2	
R-IS-6-UVR	10/24	2	12.9	8.7	82	13	6.7	3.2	8.2
		3	12.9	8.6	81	13	6.7	3.2	
		4	12.9	8.5	81	13	6.6	3.3	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		5	12.9	8.5	80	13	6.6	3.3	
		6	12.9	8.5	80	13	6.6	3.3	
		7	12.9	8.4	80	13	6.6	3.3	
		8	12.9	8.4	79	13	6.5	3.3	
		9	12.9	8.4	79	13	6.6	3.3	
		10	12.9	8.4	79	13	6.6	3.3	_
		11	12.8	8.4	79	13	6.6	3.3	
		12	12.8	8.3	79	13	6.6	3.3	
		13	12.8	8.3	79	13	6.5	3.3	
		14	12.8	8.3	79	13	6.5	3.3	
R-IS-6-UVR	10/24	15	12.8	8.3	78	13	6.5	3.3	8.2
		16	12.8	8.3	78	13	6.5	3.3	
		17	12.8	8.3	78	13	6.5	3.3	
		18	12.8	8.3	78	13	6.5	3.3	
		19	12.8	8.2	78	13	6.4	3.4	
		20	12.8	8.2	78	13	6.4	3.4	
		21	12.8	8.2	78	13	6.5	3.3	
		22	12.8	8.2	78	13	6.5	3.3	
		23	12.8	8.2	78	12	6.4	3.3	
		24	12.8	8.2	78	12	6.5	3.1	
		25	12.8	8.2	77	12	6.4	3.4	
		0.1	13.0	10.0	95	13	6.7	3.4	
		1	13.0	8.9	84	13	6.7	3.3	
	l l	2	13.0	8.7	82	13	6.6	3.3	
	10/24	3	13.0	8.6	82	13	6.6	3.3	7.6
R-IS-7-UVR	10/24	4	13.0	8.5	81	13	6.6	3.3	7.6
		5	12.9	8.5	80	13	6.6	3.3	-
		6	12.9	8.5	80	13	6.7	3.4	
		7	12.9	8.4	80	13	6.6	3.4	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		8	12.9	8.4	80	13	6.6	3.4	
		9	12.9	8.4	79	13	6.5	3.3	
		10	12.9	8.4	79	13	6.5	3.3	
		11	12.9	8.4	79	13	6.5	3.3	
		12	12.9	8.3	79	13	6.5	3.3	
		13	12.9	8.3	79	13	6.5	3.3	
		14	12.9	8.3	79	13	6.4	3.4	
		15	12.9	8.3	78	13	6.4	3.3	
		16	12.9	8.3	78	13	6.5	3.2	
		17	12.9	8.3	78	13	6.5	3.4	
R-IS-7-UVR	10/24	18	12.9	8.3	78	13	6.4	3.4	7.6
11-13-7-001	10/24	19	12.9	8.2	78	13	6.4	3.2	7.0
		20	12.9	8.2	78	13	6.4	3.3	
		21	12.9	8.2	78	13	6.4	3.3	
		22	12.9	8.2	78	13	6.4	3.3	
		23	12.9	8.2	78	13	6.4	3.4	
		24	12.8	8.2	77	13	6.4	3.3	
		25	12.8	8.1	77	13	6.4	3.3	
		26	12.8	8.1	77	13	6.3	3.3	
		27	12.8	8.1	76	13	6.4	3.2	
		28	12.7	8.1	76	13	6.4	3.3	
		29	12.4	7.8	72	12	6.3	3.2	
		0.1	13.1	9.8	93	12	6.7	3.3	
		1	13.1	9.0	85	12	6.7	3.0	
		2	12.9	8.7	83	12	6.7	3.0	
R-IS-8-UVR	10/24	3	12.9	8.6	82	12	6.7	3.0	9.4
		4	12.9	8.5	81	12	6.6	3.1	
		5	12.9	8.5	80	12	6.6	2.9	
		6	12.9	8.4	80	12	6.6	3.1	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		7	12.8	8.4	79	12	6.5	3.1	
		8	12.8	8.4	79	12	6.5	3.3	
		9	12.8	8.3	79	12	6.5	3.3	
		10	12.8	8.3	79	12	6.5	3.3	
		11	12.8	8.3	78	12	6.5	3.3	
		12	12.8	8.2	78	12	6.5	3.4	
		13	12.8	8.2	78	12	6.5	3.4	
		14	12.8	8.2	78	12	6.5	3.4	
		15	12.8	8.2	78	12	6.4	3.3	
		16	12.8	8.2	78	12	6.4	3.3	
		17	12.8	8.2	78	12	6.4	3.3	
		18	12.8	8.2	77	12	6.4	3.3	
		19	12.8	8.2	77	12	6.4	3.3	
		20	12.8	8.2	77	12	6.4	3.3	
R-IS-8-UVR	10/24	21	12.8	8.2	77	12	6.4	3.3	9.4
		22	12.8	8.1	77	12	6.4	3.4	
		23	12.8	8.1	77	12	6.5	3.3	
		24	12.8	8.1	77	12	6.4	3.3	
		25	12.8	8.1	77	12	6.4	3.4	
		26	12.8	8.1	77	12	6.4	3.4	
		27	12.8	8.1	76	12	6.4	3.3	
		28	12.8	8.1	76	12	6.4	3.3	
		29	12.7	8.0	75	12	6.4	3.3	
		30	12.4	7.9	73	12	6.3	3.4	
		31	12.0	7.7	69	11	6.4	3.4	
		32	10.3	7.4	66	11	6.2	3.5	
		33	10.2	7.4	66	11	6.2	3.5	
		34	9.9	7.3	64	11	6.1	3.5	
		35	9.7	7.1	63	11	6.1	3.5	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		36	9.4	7.2	63	11	6.1	3.5	
		37	9.3	7.2	63	11	6.1	3.5	
		38	9.2	7.2	62	11	6.1	3.5	
		39	8.9	7.2	62	11	6.1	3.5	
		40	8.6	7.2	62	11	6.1	3.5	
		41	8.6	7.2	61	11	6.1	3.5	
		42	8.5	7.2	61	11	6.1	3.5	
		43	8.4	7.2	61	11	6.1	3.4	
		44	8.3	7.2	61	10	6.0	3.4	
		45	8.1	7.2	61	10	6.1	3.5	
		46	8.1	7.3	61	10	6.1	3.4	
		47	8.0	7.3	61	10	6.1	3.5	
		48	7.9	7.2	61	10	6.0	3.4	
		49	7.8	7.1	60	10	6.0	3.4	
R-IS-8-UVR	10/24	50	7.7	7.1	60	10	6.0	3.5	9.4
		51	7.7	7.1	60	10	6.0	3.5	
		52	7.6	7.1	59	10	6.0	3.4	
		53	7.4	7.1	59	10	6.0	3.4	
		54	7.3	7.0	58	10	6.0	3.4	
		55	7.2	6.9	57	10	6.0	3.4	
		56	7.1	6.9	57	10	6.0	3.4	
		57	7.0	6.8	56	10	6.0	3.4	
		58	6.8	6.7	55	10	6.0	3.4	
		59	6.7	6.6	54	10	6.0	3.4	
		60	6.5	6.5	53	10	6.0	3.3	
		61	5.8	6.5	52	10	6.0	3.2	
		62	5.4	6.4	51	10	6.0	3.3	
		63	4.9	6.6	51	10	6.0	3.3	
		64	4.7	6.6	51	10	6.0	3.2	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		65	4.3	6.7	51	10	6.0	3.2	
		66	4.1	6.9	53	10	6.0	3.2	
		67	3.9	7.0	53	10	6.1	3.2	
		68	3.9	7.0	53	10	6.0	3.1	
		69	3.8	7.0	53	10	6.0	3.1	
		70	3.8	7.0	53	10	6.0	3.2	
		71	3.8	7.1	53	10	6.0	3.1	
		72	3.8	7.1	54	10	6.0	3.1	
		73	3.8	7.1	54	10	6.0	3.2	
		74	3.7	7.1	54	10	6.0	3.1	
		75	3.7	7.1	54	10	6.0	3.2	
		76	3.7	7.1	54	10	6.1	3.2	
		77	3.7	7.1	53	10	6.0	3.1	
R-IS-8-UVR	10/24	78	3.7	7.0	53	10	6.0	3.1	9.4
10-0-0 01	10/24	79	3.7	7.0	53	10	6.0	3.1	5.4
		80	3.7	7.0	53	10	6.0	3.1	
		81	3.7	6.9	52	10	6.0	3.0	
		82	3.7	6.9	52	10	6.0	3.1	
		83	3.7	6.8	52	10	6.0	3.0	
		84	3.7	6.8	51	10	6.0	3.0	
		85	3.7	6.6	50	10	6.0	3.0	
		86	3.7	6.6	50	10	6.0	3.0	
		87	3.7	6.4	48	10	6.1	2.9	
		88	3.7	6.4	48	11	6.0	2.9	
		89	3.7	6.4	48	11	6.0	2.7	
		90	3.7	6.2	47	11	6.0	2.7	
		91	3.7	6.1	46	11	6.1	2.6	
		92	3.7	6.1	46	11	6.1	2.7	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
			· · ·	Ice House I	Reservoir				
		0.1	11.1	8.6	78	11	7.1	1.1	
		1	11.0	8.6	78	11	7.1	1.1	
		2	10.8	8.6	77	11	7.1	0.9	
		3	10.8	8.5	77	11	7.0	0.9	
R-IS-9-IHR	10/22	4	10.8	8.5	77	11	7.0	0.9	4.9
		5	10.7	8.5	77	11	6.9	0.9	
		6	10.7	8.5	76	11	6.9	0.7	
		7	10.7	8.4	76	11	6.8	0.9	
		8	10.7	8.4	75	11	6.8	0.8	
		0.1	11.3	8.6	78	11	6.8	1.4	
		1	10.9	8.6	78	11	6.8	1.2	
	10/22 -	2	10.9	8.6	78	11	6.8	1.2	
R-IS-10-IHR		3	10.8	8.6	78	11	6.8	1.2	5.5
K-12-10-10K		4	10.8	8.6	78	11	6.7	1.2	5.5
		5	10.7	8.6	78	11	6.7	1.2	
		6	10.7	8.6	78	11	6.7	1.1	
		7	10.7	8.6	77	11	6.7	1.1 ¹	
		0.1	11.7	8.5	79	11	6.8	1.5	
		1	11.3	8.5	78	11	6.7	1.3	
		2	11.0	8.6	78	11	6.7	1.4	
		3	10.8	8.6	77	11	6.7	1.3	
		4	10.7	8.6	77	11	6.7	1.3	
R-IS-11-IHR	10/22	5	10.7	8.6	77	11	6.6	1.3	5.5
		6	10.7	8.6	77	10	6.6	1.2	1
		7	10.7	8.5	77	10	6.7	1.0	1
		8	10.7	8.5	77	10	6.6	1.1	
		9	10.7	8.5	77	10	6.6	1.3	1
		10	10.7	8.5	77	10	6.6	1.2	1



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disl (m)
R-IS-11-IHR	10/22	11	10.6	8.5	76	10	6.6	1.3	5.5
		12	10.6	8.5	76	10	6.6	0.7	
				Junction R	Reservoir				
		0.1	8.2	10.6	90	11	6.0	4.2	
		1	7.6	10.6	89	10	5.9	4.1	
		2	7.2	10.7	89	10	5.9	4.1	
		3	7.2	10.7	88	10	5.9	4.1	
		4	7.1	10.7	89	10	5.9	4.1	
		5	7.0	10.8	89	10	5.9	4.1	
		6	7.0	10.8	89	10	6.0	4.1	
		7	7.0	10.9	89	10	5.9	4.1	9.8
R-IS-12-JR	10/26	8	7.0	10.9	90	10	5.9	4.1	
		9	7.0	10.9	90	10	5.9	4.1	
		10	7.0	10.8	89	10	5.9	4.1	
		11	6.9	10.9	89	10	6.0	4.1	
		12	6.9	10.9	89	10	5.9	4.1	
		13	6.9	10.9	89	10	5.9	4.1	
		14	6.9	10.9	89	10	5.9	4.1	
		15	6.9	10.9	89	10	5.9	4.1	
		16	6.9	10.9	89	10	5.9	4.1	
		17	6.8	10.9	89	10	5.9	4.1	
		18	6.7	10.8	88	11	6.0	4.1	
		19	6.1	10.8	87	11	6.0	0.9	
				Camino R	leservoir				
	10/26	0.1	7.6	11.1	93	11	6.6	4.1	6.7
		1	7.2	11.3	94	10	6.2	4.0	
R-IS-13-CR		2	7.2	11.4	94	10	6.1	4.1	
	[3	7.1	11.4	94	10	6.1	4.1	
	[4	7.1	11.4	94	10	6.1	4.0	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
R-IS-13-CR	10/26	5	7.1	11.4	94	10	6.1	4.0	6.7
		6	7.1	11.4	94	10	6.2	4.0	
				Slab Creek	Reservoir				
		0.1	9.2	10.5	91	21	6.8	3.6	6.7
		1	9.2	10.5	91	21	6.7	3.6	
		2	9.2	10.5	91	21	6.7	3.6	
		3	9.1	10.5	91	21	6.7	3.6	
R-IS-14-SC	10/25	4	7.8	10.7	90	21	6.8	3.4	
		5	7.5	11.1	94	20	6.8	3.5	
		6	7.4	11.4	95	20	6.7	3.6	
		7	7.4	11.6	97	20	6.7	3.6	
		8	7.3	11.7	97	20	6.7	3.6 ¹	
	10/25	0.1	9.8	10.5	92	22	6.7	3.6	5.5
		1	9.3	10.5	91	21	6.7	3.5	
		2	9.1	10.5	91	21	6.7	3.5	
		3	9.1	10.5	91	21	6.7	3.5	
		4	9.1	10.4	91	21	6.7	3.5	
		5	9.0	10.5	90	21	6.7	3.5	
		6	9.0	10.4	90	21	6.7	3.5	
		7	9.0	10.4	90	21	6.7	3.5	
R-IS-15-SC		8	9.0	10.4	90	21	6.6	3.5	
		9	9.0	10.4	90	21	6.6	3.4	
		10	8.9	10.4	90	21	6.6	3.4	
		11	8.6	10.4	89	20	6.6	3.3	
		12	8.5	10.5	90	20	6.6	3.4	
		13	8.4	10.6	90	20	6.6	3.4	
		14	8.4	10.6	90	20	6.5	3.5	
		15	8.4	10.6	91	20	6.5	3.4	
		16	8.3	10.7	91	19	6.5	3.3	



Site ID	2018 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	рН (s.u.)	Turbidity (NTU)	Secchi disk (m)
		17	8.3	10.7	91	19	6.5	3.4	5.5
		18	8.3	10.7	91	19	6.5	3.4	
		19	8.3	10.7	91	19	6.5	3.3	
		20	8.3	10.7	91	19	6.5	3.3	
		21	8.2	10.7	91	19	6.5	3.3	
		22	8.2	10.8	91	19	6.5	3.3	
		23	8.2	10.8	91	19	6.5	3.3	
		24	8.2	10.8	91	19	6.5	3.3	
		25	8.2	10.8	92	19	6.5	3.2	
S-15-SC	10/25	26	8.2	10.8	92	19	6.5	3.2	
3-15-30	10/25	27	8.2	10.8	92	19	6.5	3.2	
		28	8.2	10.8	92	19	6.5	3.2	
		29	8.2	10.8	92	19	6.5	3.2	
		30	8.1	10.8	92	19	6.5	3.1	
		31	8.1	10.8	92	19	6.5	3.1	
		32	8.0	10.9	92	19	6.4	3.0	
		33	8.0	10.9	92	19	6.5	2.9	
		34	8.0	10.9	92	18	6.4	2.7	
		35	8.0	10.9	92	18	6.5	1.8]
		36	8.0	10.8	92	19	6.5	1.8 ¹	

°C = degrees Celsius

= meter(s) m

mg/L = milligrams per liter

% sat = percent saturation

s.u. = standard unit of pH

uS/cm = microsiemens per centimeter NTU = Nephelometric Turbidity Unit

¹ Turbidity values are recorded as the values from the previous depth. Higher turbidity values on the data sheet reflect turbidity caused by the probe coming into contact with reservoir bottom sediments.



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APPENDIX B In situ Vertical Profiles for UARP Reservoir Sites



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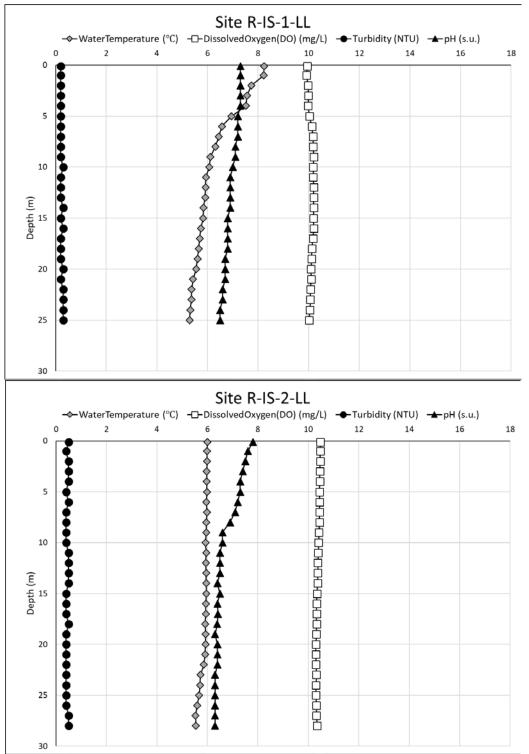


Figure B-1. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Loon Lake sites R-IS-1-LL and R-IS-2-LL during May (Spring) 2018.



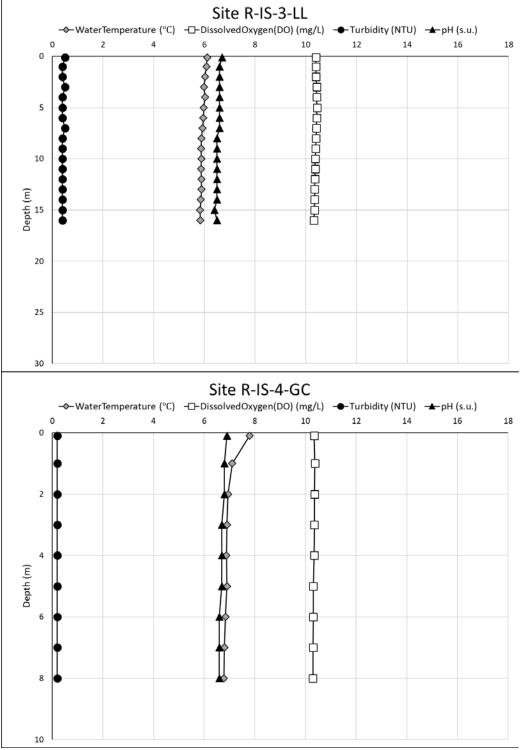


Figure B-2. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Loon Lake and Gerle Creek Reservoir sites R-IS-3-LL and R-IS-4-GC during May (Spring) 2018.



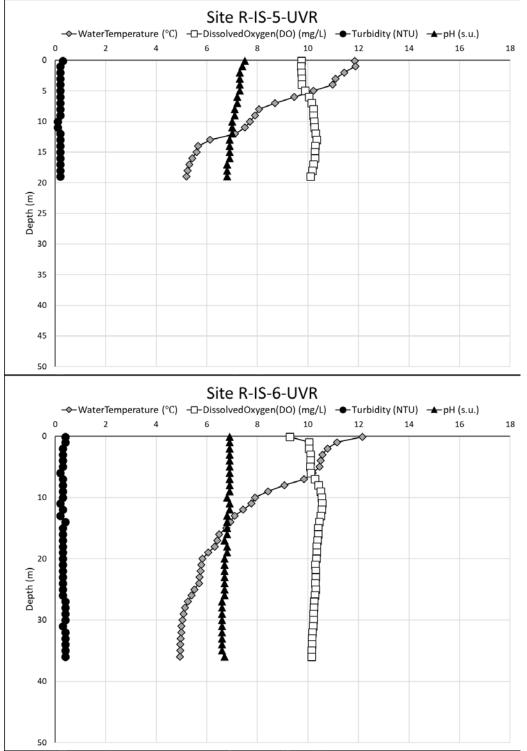


Figure B-3. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir sites R-IS-5-UVR and R-IS-6-UVR during May (Spring) 2018.



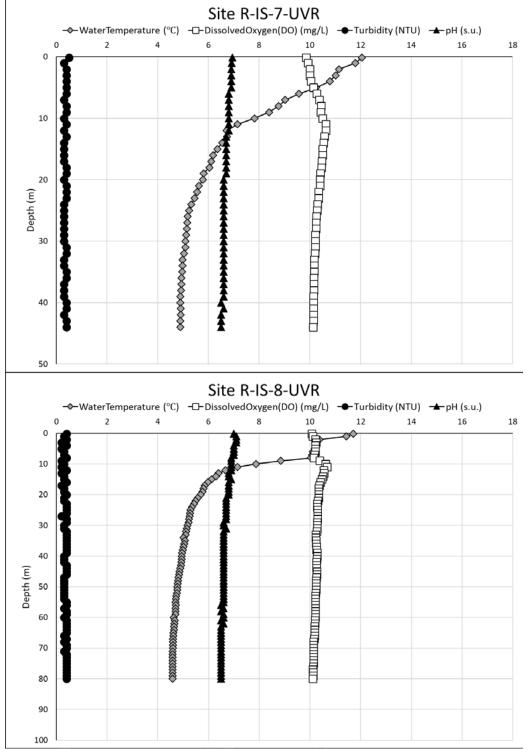


Figure B-4. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir sites R-IS-7-UVR and R-IS-8-UVR during May (Spring) 2018.



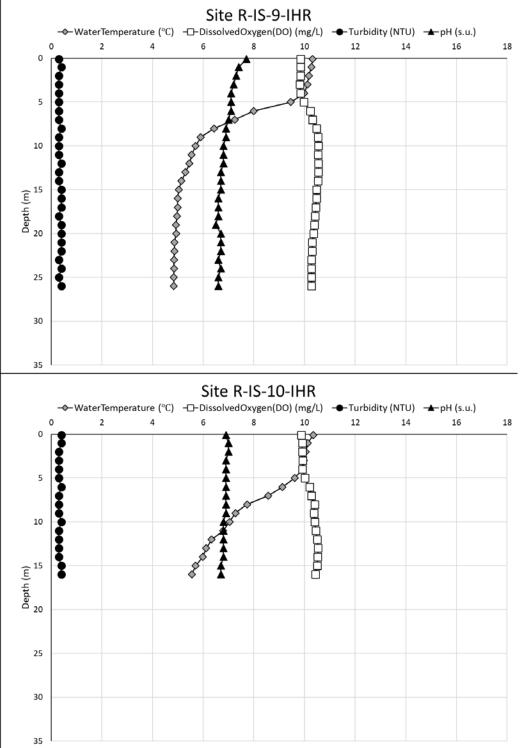


Figure B-5. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Ice House Reservoir sites R-IS-9-IHR and R-IS-10-IHR during April (Spring) 2018.



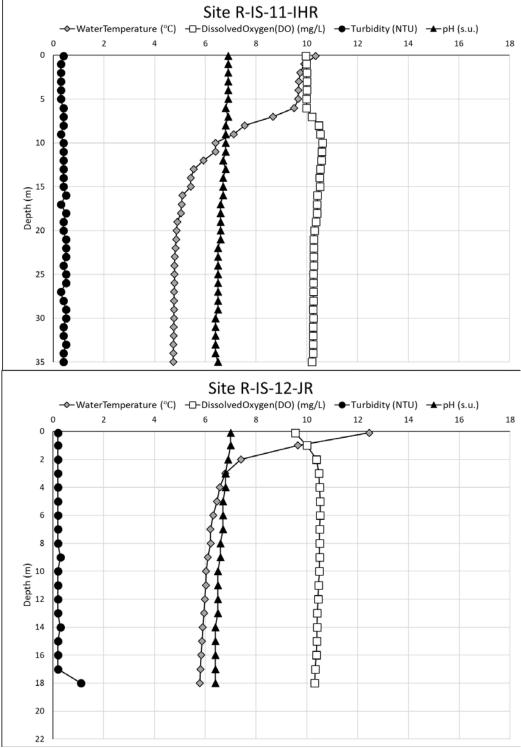


Figure B-6. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Ice House Reservoir Sites R-IS-11-IHR during April (Spring) and Junction Reservoir Site R-IS-12-JR during May (Spring), 2018



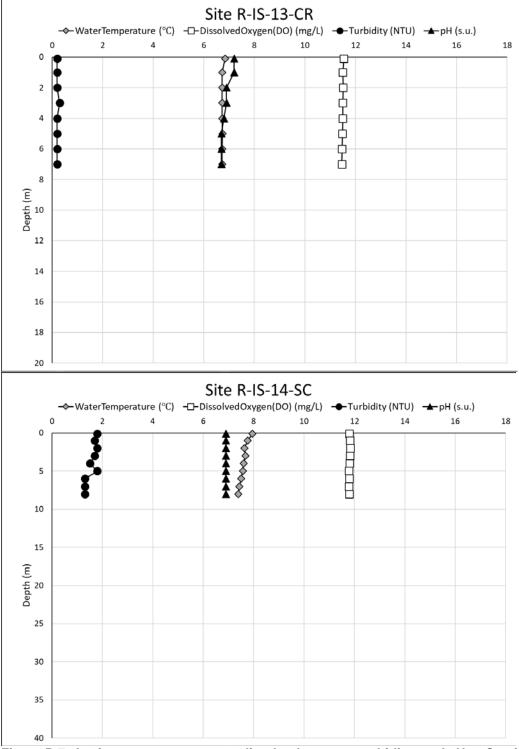


Figure B-7. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Camino Reservoir and Slab Creek Reservoir sites R-IS-13-CR and R-IS-14-SC during May (Spring) 2018.



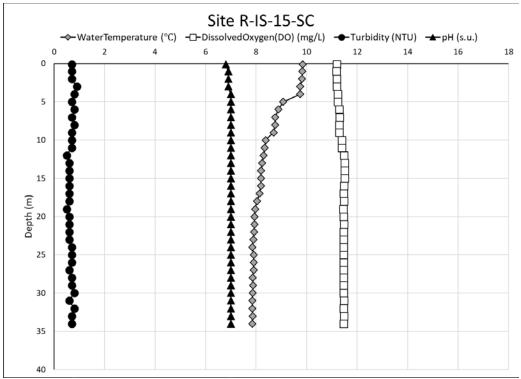


Figure B-8. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Slab Creek Reservoir site R-IS-15-SC during May (Spring) 2018



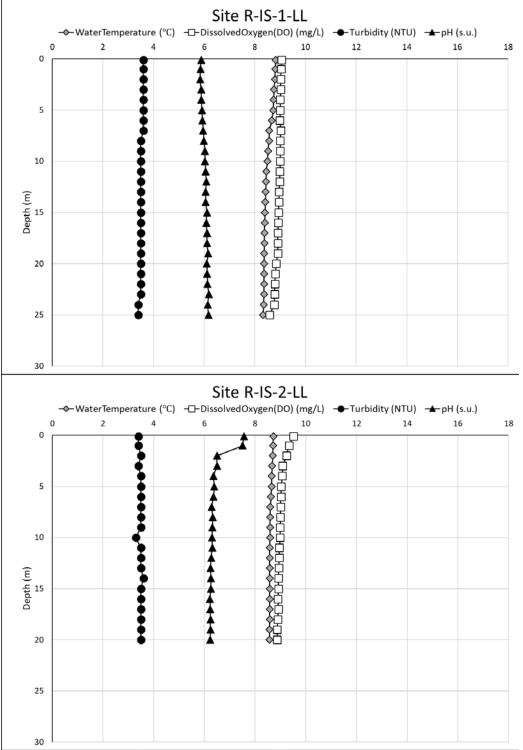


Figure B-9. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Loon Lake sites R-IS-1-LL and R-IS-2-LL during October (Fall) 2018.



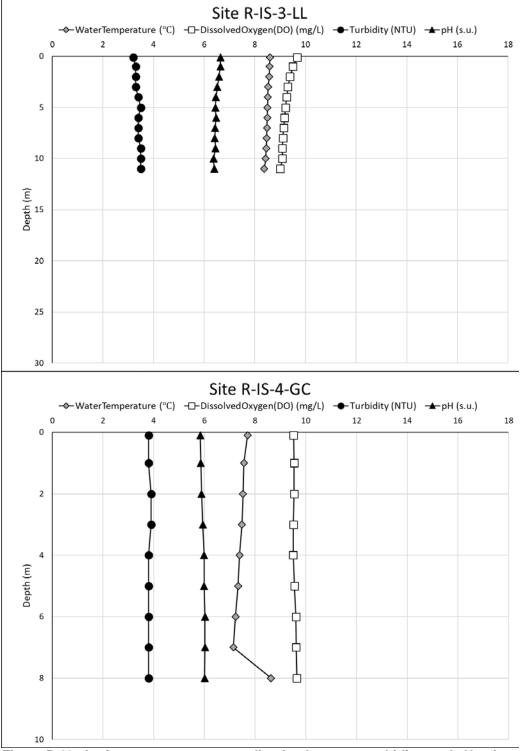


Figure B-10. In situ water temperature, dissolved oxygen, turbidity, and pH at Loon Lake and Gerle Creek Reservoir sites R-IS-3-LL and R-IS-4-GC during October (Fall) 2018.



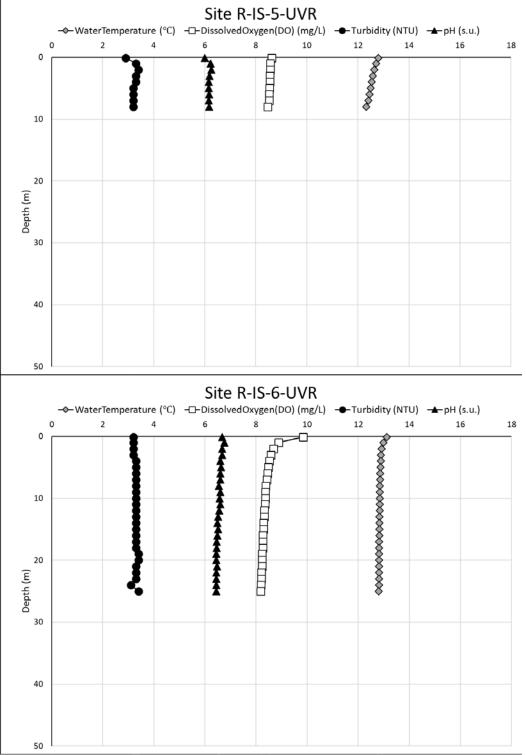


Figure B-11. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir sites R-IS-5-UVR and R-IS-6-UVR during October (Fall) 2018.

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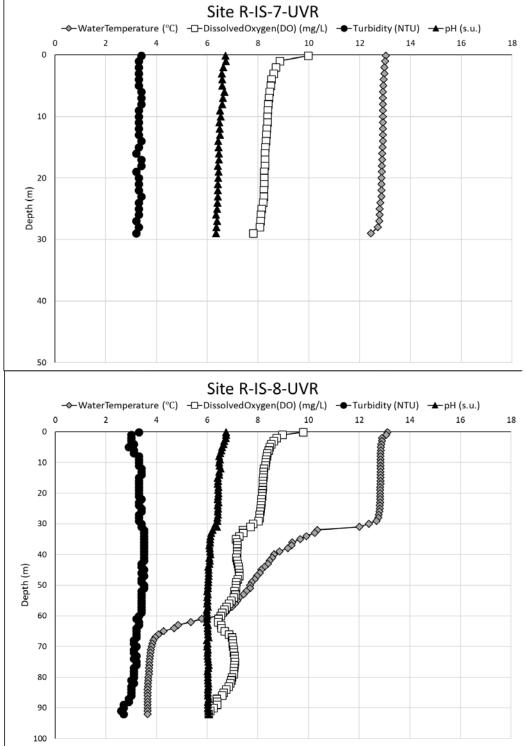


Figure B-12. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir sites R-IS-7-UVR and R-IS-8-UVR during October (Fall) 2018.



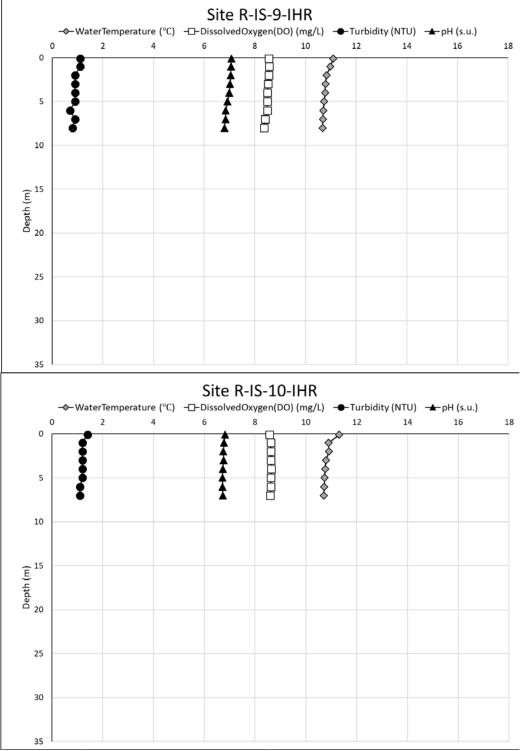


Figure B-13. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Ice House Reservoir sites R-IS-9-IHR and R-IS-10-IHR during October (Fall) 2018.



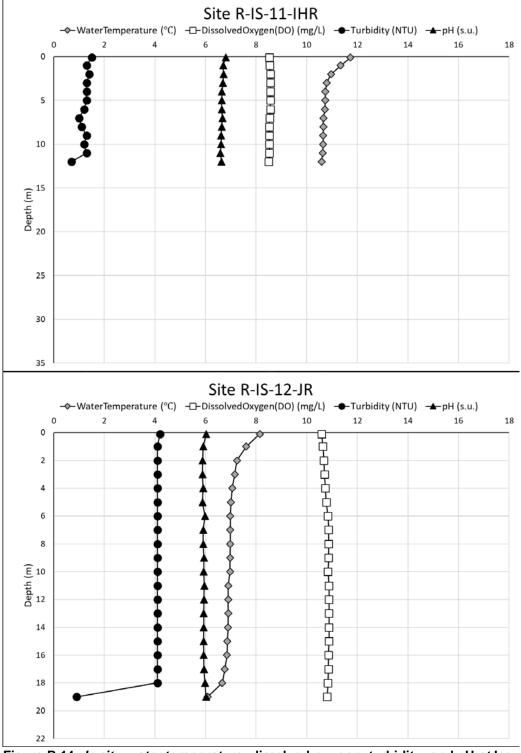


Figure B-14. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Ice House Reservoir and Junction Reservoir sites R-IS-11-IHR and R-IS-12-JR during October (Fall) 2018.



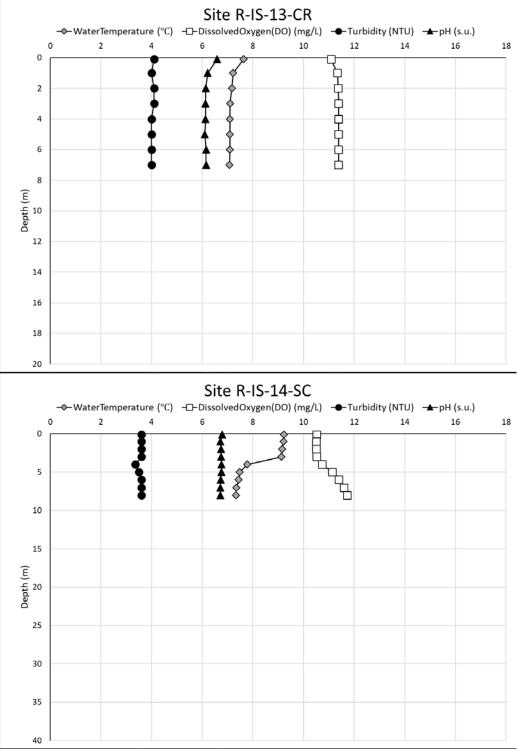


Figure B-15. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Camino Reservoir and Slab Creek Reservoir sites R-IS-13-JR and R-IS-14-SC during October (Fall) 2018.



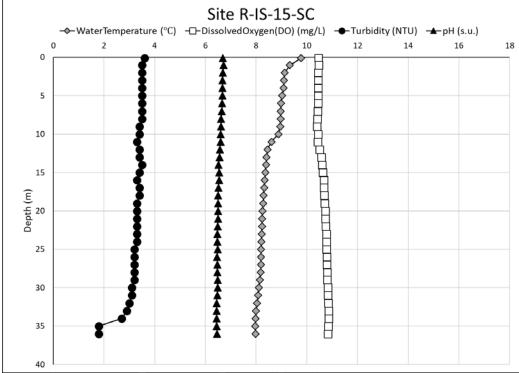


Figure B-16. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Slab Creek Reservoir site R-IS-15-SC during October (Fall) 2018.



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APPENDIX C Bacteria Results for UARP Reservoir and Riverine Sites



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	Samp	le 1	Samp	le 2	Samp	le 3	Samp	le 4	Samp	le 5	Fecal	
Site ID	Fecal coliform	E. coli	coliform geometric mean ¹	<i>E. coli</i> geometric mean ¹								
Bac-5-GCR	4.5	8.6	6.8	7.5	<1.8	5.2	<1.8	1.0	7.8	1.0	2.9	3.2
Bac-6-GCR*	13.0	1.0	<1.8	7.5	<1.8	<1.0	<1.8	2.0	<1.8	<1.0	1.5	1.3
Bac-7-UVR	2.0	1.0	2.0	1.0	2.0	1.0	2.0	2.0	<1.8	<1.0	1.7	1.0
Bac-8-UVR	4.5	1.0	4.0	3.1	<1.8	2.0	<1.8	<1.0	<1.8	1.0	1.7	1.3
Bac-9-UVR	1.8	2.0	23.0	3.1	2.0	6.3	2.0	<1.0	9.3	3.1	4.3	2.3
Bac-10-UVR	2.0	<1.0	<1.8	<1.0	<1.8	1.0	2.0	<1.0	<1.8	<1.0	1.2	0.6
Bac-11-JR	4.5	19.9	2.0	29.2	2.0	5.2	350	261.3	4.0	6.3	7.6	21.8
Bac-12-IHR	<1.8	<1	<1.8	1.0	<1.8	<1.0	2.0	1.0	<1.8	<1	1.1	0.7
Bac-13-IHR	2.0	2.0	<1.8	<1.0	<1.8	<1.0	<1.8	2.0	23.0	73.8	2.0	2.4
Bac-14-BCR	<1.8	<1.0	<1.8	<1.0	<1.8	<1.0	<1.8	<1.0	<1.8	<1.0	0.9	0.5
Bac-15-SCR	<1.8	<1.0	<1.8	<1.0	130.0	344.8	350.0	248.1	1.8	2.0	9.2	8.4
MDL	1.8	1.0	1.8	1.0	1.8	1.0	1.8	1.0	1.8	1.0	-	-
MRL	1.8	1.0	1.8	1.0	1.8	1.0	1.8	1.0	1.8	1.0	-	-

Table C-1. Bacteria (MPN/100mL) for UARP Sites During the 30-day Period Surrounding Independence Day.

¹ Individual results <MDL were treated as 0.5 x MDL for the geometric mean calculations. *Due to construction-related access constraints, sampling was shifted back by one week at Site Bac-6-GCR.

MDL = method detection limit

MRL = method reporting limit



	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5		Fecal	E. coli
Site ID	Fecal coliform	E. coli	Fecal coliform	E. coli	Fecal coliform	E. coli	Fecal coliform	E. coli	Fecal coliform	E. coli	coliform geometric mean ¹	geometric mean ¹
Bac-1-BI	3.7	<1.0	<1.8	<1.0	<1.8	2.0	<1.8	<1.0	<1.8	<1.0	1.2	0.7
Bac-2-BI	<1.8	<1.0	2.0	10.9	<1.8	<1.0	<1.8	<1.0	<1.8	<1.0	1.1	0.9
Bac-3-LL	<1.8	<1.0	<1.8	<1.0	<1.8	2.0	2.0	<1.0	<1.8	<1.0	1.1	0.7
Bac-4-LL	<1.8	1	<1.8	<1.0	<1.8	<1.0	<1.8	<1.0	<1.8	<1.0	0.9	0.6
MDL	1.8	1.0	1.8	1.0	1.8	1.0	1.8	1.0	1.8	1.0	-	-
MRL	1.8	1.0	1.8	1.0	1.8	1.0	1.8	1.0	1.8	1.0	-	-

Table C-2. Bacteria (MPN/100mL) for UARP Sites During the 30-day Period Surrounding Labor Day.

¹ Individual results < MDL were treated as 0.5 x MDL for the geometric mean calculations.

MDL = method detection limit

MRL = method reporting limit



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APPENDIX D In situ Field Data Sheets



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Stillwater Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

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Instrument((s) used:	451	EXO			Crew:	KKC + MND
Site L Date: Photo Notes	os:	5 -4 1 18	1-6CC			GPS: Time: Weathe	IO40 er: Cloudy, Cold
				In situ			
Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
2.52	11.77	86.4	7.3	0.013	6.67	0.69	

Site Loc	ation: IS	- 10 - SFSC			GPS:		
Date:	1/29/18				Time:	1130	
Photos:					Weath	er: Cloudy, cold	
Notes:							
			In situ				
Temp	DO	Conductivity	Specific	pH	Turbidity		

Temp	DO		Conductivity	Conductance	рН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
4.80	11.02	85.9	5.9	0.010	7.11	0.41	

						Date: 1/21/16 Photos: Notes:		
				In situ				
	Notes	Turbidity	рН	Specific Conductance	Conductivity	DO		Temp
1	(NTU)	(s.u.)	(mS/cm)	(µS/cm)	mg/L) (%)		(°C)	
		0.63	7.25	0.016	9.1	89.1	12.11	2.62
								2.62



SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

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Stillwater Sciences	

YSI EXD Instrument(s) used: Crew: KKC + MND Site Location: IS-12-5C GPS: Date: Time: 1252 1/29/18 Weather: Cloudy, Cold Photos: Notes: In situ Specific DO Conductivity Turbidity Temp I I pН

			conducting	Conductance	pin		Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
5.91	11.11	89.0	7.8	0.DIZ	7.08	0.64	

Site Location: IS -14-50	GPS:
Date: 21 18	Time: 1400
Photos:	Weather: Party cloudy, cool
Notes:	7 2.

emp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
6.04	11.62	93.4	13.3	0.021	7.34	0.84	

Site Date Phot Note	os:		- 50		GPS: Time: Weath	1431 er: Cloudy, cool	
				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1
6.61	11.55	94.3	8.4	0.013	7.27	0.32	



Stillwater Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

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Instrument((s) used:	951	Exo			Crew:	KKC + MND
	ocation:		17 - BC			GPS:	
Date:	13	OIB				Time:	1005
Photo Notes						, weath	Br: Clear, Cool
				In situ			
Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
6.63	11.42	93.2	16.7	0.026	7.34	7.54	

Site Location: 15 - 15 - SFAR	GPS:
Date: 1/30 18	Time: 1105
Photos:	Weather: Clear, cool
Notes:	
Notes:	

				In situ				
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1	
4.45	12.77	98.6	35.4	0.058	7.63	0.85		

Date Phote Note	os:/	o 1B				Time: Weath	1130 er: Clear, Cool
				In situ			
Temp	D	D	Conductivity	Specific Conductance	рН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
4.57	12.66	98.1	26.4	0.043	7.52	0.72	



	SMUD In situ Monitoring in the Upper
Stillwater Sciences	American River Project and Chili Bar Project

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Instrument(s) used:	4516	EXD			Crew:	KKC + MND
Site L Date: Photo Notes	os:	 0/18	9-SFAR			GPS: Time: Weathe	1235 ar: Sunny, Cost
				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
5.50	12.36	9B.1	22.0	0.035	7.47	2.21	

Site I Date: Photo Notes	os:	IS-18 0/18	- SFAR				1335 er: Clear, cool
				In situ			
Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7.17	12.35	102.2	33.8	0.051	7.77	0.83	

Site I Date: Photo Note:	os:					GPS: Time: Weath	ər:	_
				In situ				
Temp	D	D	Conductivity	Specific Conductance	рН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1	



strument	(s) used:		YSI EXO			Crew	ESS KKC
Site Date Phot Note	: <u>5</u> os:	<u>IS -</u> 78/20	9- GCL 18				1346 er: Sunny; clear; wo
				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
0.69	9.85	88.8	8.6	0.012	6.9	0.2	
Site Date Phot Note	s:	2018				GPS: Time: Weath	1420 Br: Sonny, clear, calm
Date Phot Note	: _< 8 os: s:	2018		<i>In situ</i> Specific			
Date Phot Note	: _< 8 os: s:	2018		In situ		Time: Weath	1420 Br: Suppy, clear, calm Notes
Date Phot Note	s:	0	Conductivity	<i>In situ</i> Specific Conductance	рН	Time: Weath	
Date Phot Note Temp (°C) 1.36	.ocation:	0 (%) 85.3	Conductivity (µS/cm) (\.6	In situ Specific Conductance (mS/cm)	рН (s.u.)	Turbidity (NTU) 0.3 GPS: Time:	Notes
Date Phot Note		0 (%) 85.3	Conductivity (µS/cm) (\.6	In situ Specific Conductance (mS/cm) 6.0(6	рН (s.u.)	Turbidity (NTU) 0.3 GPS: Time:	Notes
Date Phot Note Temp (°C) (3() Site I Date: Photo		0 (%) 85.3 TS-8	Conductivity (µS/cm) (\.6	In situ Specific Conductance (mS/cm) 6.0 (6	рН (s.u.)	Turbidity (NTU) 0.3 GPS: Time:	Notes 1435 ar: Sony clear
Date Phot Note Temp (°C) (3%	.ocation: 	0 (%) 85.3 TS-8	Conductivity (µS/cm) (1.6 3 - SFER	In situ Specific Conductance (mS/cm) 6.0 (6	рН (s.u.) 7.1	Time: Weath (NTU) o.3 GPS: Time: Weather	Notes



Stillwater							1 110 -
strument	(s) used:		YSI EX	0		Crew	ES KICC
Site Date Phot Note	: <u> </u>	5/8/201	1- <u>6</u> C 8			GPS: Time: Weath	er: Sonny, Clear, withdy
				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
6.19	10.16	82.0	5.5	0.009	6.4	0.4	
Site	Location:					GPS:	
Site Date Phot	5/8	3/2018				Time:	1130 Br: Sunny, clear calm
Date	: <u>5 </u> 6 os:	3/2018		In situ		Time:	1130 BF: Sunny, clear, calin
Date Phote	: _ <u>5/9</u> os: s:	3/2018			рН	Time:	
Date Phot Note	: _ <u>5/9</u> os: s:	3/2018		<i>In situ</i> Specific	рН (s.u.)	Time: Weath	er: Sunny, clear, calon
Date Phote Note	s:	0	Conductivity	<i>In situ</i> Specific Conductance		Time: Weath	er: Sunny, clear, calon
Date Phote Note Temp (°C)	: os: s: (mg/L)	0 (%)	Conductivity (μS/cm)	In situ Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU)	er: Sunny, clear, calon
Date Phot Note Temp (°C) 9.38	: ps: s: (mg/L) 9.67 0.07	0 (%) 84.5	Conductivity (μS/cm)	In situ Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU) 0-2 GPS:	Pr: Sunny, clear, callin
Date Phot Note Temp (°C) 9.38 Site I Date Phote	s: (mg/L) 9.67	0 (%) 84.5	Čonductivity (µS/cm) &. ເວ	In situ Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU) 0-2 GPS: Time:	er: Sunny, clear, calon
Date Phot Note Temp (°C) 9.38 Site I Date	s: (mg/L) 9.67	0 (%) 84.5	Čonductivity (µS/cm) &. ເວ	In situ Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU) 0-2 GPS: Time:	Pr: Sunny, clear, callin Notes
Date Phote Note Temp (°C) 9.38 Site Date Phote Notes	: ps: s: (mg/L) 9.67 Location: s: s: ps:	0 (%) 84.5 3[2018	Conductivity (μS/cm) δ.ω	In situ Specific Conductance (mS/cm) 0.012 0.012 In situ Specific Conductance	(s.u.) 7.0	Time: Weath Turbidity (NTU) 0-2 GPS: Time: Weath Weath	Pr: Sunny, clear, callin Notes
Date Phot Note Temp (°C) 9 .38 Site I Date Phot Notes Temp (°C)	5 5 6 5: 5: 0 (mg/L) 9.67 0 0 0 5: 5: 0 0 0 0 0 0 0 0 0 0 0 0 0	0 (%) 84.5 3[2018 0 (%)	Conductivity (μS/cm) 8.6	In situ Specific Conductance (mS/cm) 0.012 0.012 In situ Specific Conductance (mS/cm)	(s.u.)	Time: Weath (NTU) 0-2 GPS: Time: Weath Weath (NTU)	Notes
Date Phote Note Temp (°C) 9.38 Site Date Phote Notes	: ps: s: (mg/L) 9.67 Location: s: s: ps:	0 (%) 84.5 3[2018	Conductivity (μS/cm) δ.ω	In situ Specific Conductance (mS/cm) 0.012 0.012 In situ Specific Conductance	(s.u.) 7.0	Time: Weath Turbidity (NTU) 0-2 GPS: Time: Weath Weath	Notes



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CCCCC Stillwater Sciences SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

Crew: EES K.KC

Instrument(s) used:

Site Location: TS-10-SESC	GPS:
Date:S	Time: (520
	Weather: Sunny worth, call
Notes:	2,

				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
5.52	10.73	85.Z	6.9	0.011	7.0	0.5	

1e: 1017
ather: Sunny, clear, warm
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

In situ								
Temp DO		Conductivity	Specific Conductance	pН	Turbidity	Notes		
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)		
10.72	10.20	91.9	20.6	0.02.8	6.9	3.9		

ne: 1136
eather: sunny, clear, hot

Temp	D	DO Conductivity Specific pH	pН	pH Turbidity	y Notes			
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)		
2.16	10.49	97.7	25.0	0.033	7.2	1.1		



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Stillwater	Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Page <u>4</u> of <u>7</u>

Instrument(s) used: YSI EXO	Crew: KKL EES
Site Location: IS-16-SFAR Date: S-9-2018 Photos: Notes:	GPS: <u>Kxc</u> Time: <u>1150</u> Weathe <u>r: clear, subny, h</u> ot-

D	0		0			
Temp DO		Conductivity	Specific Conductance	рН	Turbidity	Notes
(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
11.37	101.2	17.5	0.024	6.9	0.3	
				(mg/L) (%) (µS/cm) (mS/cm)	(mg/L) (%) (μS/cm) (mS/cm) (s.u.)	(mg/L) (%) (μS/cm) (mS/cm) (s.u.) (NTU)

Site Location: IS-19-SFAR	GPS:
Date: 5 ~ 9 - 2018	Time: 1400
Photos:	Weather: clear, sunny, hot
Notes:	,,:

In situ									
Temp DO		Conductivity	Specific Conductance	рН	Turbidity	Notes			
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)			
11.13	10.88	99.0	20.9	0.029	7.2	0,3			

Site I Date: Photo Notes	S:	IS-11 - 2018	S-SFAR	GPS: Time: Weather:				
				In situ				
Temp	D	D	Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(μS/cm)	(mS/cm)	(s.u.)	(NTU)		



	Sciences			Monitoring Project and (Page_5 of _7
Instrument	(s) used:	251	Exa			Crew	KKC + EES
Site Date Phote Note	: <u></u> os:	9-2018					1500 er: Sunny, clear, warm
				In situ			
Temp	D	0	Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
15.28	10.17	101.4	34.2	0.042	7.5	0.1	
Site I Date: Photo Notes	os:	0118					1100 1100 ar: Sunny, Clear; warm
				In situ			
Temp	D		Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C) 8.04	(mg/L)	(%) 93.5	(μS/cm)	(mS/cm)	(s.u.) 7.3	(NTU) 0.2	

Site Location: IS-(3-5C	GPS:
Date: 5/10/18	Time: \\30
Photos:	Weather: Supply dear Calm
Notes:	3

Temp	DO		Conductivity	Specific Conductance	рН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1
10.66	10.30	92.6	11.9	0.016	7.0	0.2	



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Stillwater Sciences		A

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SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Page 6 of 7

Crew: BTH, KEC

Instrument(s) used:

Site Loc	ation: IS-11-SESC	GPS:
Date:	5/10/18	Time: \2.3o
Photos:		Weather: Supra, clear, wasm
Notes:		2

In situ								
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1	
10.12	9.86	87.6	10.9	0.015	7.1	0.2		

Site Location:	GPS:
Date: 5 10/18	Time: 1256
Photos:	Weather: Supry, cool, calm
Notes:	0.

In situ								
Temp	D	D	Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1	
6.86	10.66	87.5	8.8	0.013	7.0	0.2		

Site L	ocation:	IS-1.	- RR			GPS:	
Date:	5/1	818			Time:	1300	
Photo	Photos:						" Party cloudy warm
Notes						-	
				In situ			
Temp	DO		Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
5.32	10.30	81,3	8.0	0.012	7.1	1.4	



SMUD In situ Monitoring in the Upper Stillwater Sciences American River Project and Chili Bar Project

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Instrument(s) used:	Crew: KKC + BTH
Site Location: <u>エミー 2 - LRR</u> Date: <u>ニラーはしょう</u> Photos: Notes:	GPS: Time: <u>1430</u> Weathe <u>r: Thurderstands.cool</u>

In situ									
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes		
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1		
7.45	9.71	81.0	7.0	0.011	7.1	1.1			

Site Location: IS-3-UKR	GPS:
Date: 5/18/18	Time: LSI5
Photos:	Weather: Thursdesstorms, 1001
Notes:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

In situ									
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes		
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)			
8.30	9.88	84.1	7.0	0.010	7.3	1.3			

Site I Date: Photo Notes	s:			In situ		GPS: Time: Weath	er:
Temp	DO		DO Conductivity	Specific pH Conductance	H Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1



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SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

Instrument(s) used:

Crew: KKC + DKR

Site Location: TS-4-66	GPS:
Date: 0/3/18	Time: 1045
Photos:	Weather: Sunny, brzezy
Notes:	J 0

				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
10.13	9.20	81.7	6.3	0.009	6.21	0.41	

Site Location: IS-5 - 6C	GPS:
Date: 8/13/18	Time: 1120
Photos:	Weather: Supply, water
Notes:	2

				In situ				
Temp	DO		Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1	
14.37	8.30	Blo.1	9.2	0.01	7.06	0.05		

Site Location: 15-6-6C	GPS:
Date: Ch 1/2/B	Time: 11.445
Photos:	Weather: GIDDA, Was-M
Notes:	

				In situ				
Temp	DO		Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)		
14.07	8.57	84,4	8,7	0,011	6.73	0,15		



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SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Page 2 of 7

Instrument(s) used:

American River Project and Chill Bar Project

 Ysi Exo
 Crew: KEC, DKE

te Location: IS-9-6cc	GPS:
hotos:	Time: 1215
hotos:	Weather: word, Warrow
otes:	

				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
16.39	8.60	87.9	8.7	0.010	6.66	0.07	

GPS:
Time: 1250
Weather: Surray hot
<i>V</i> / · ·

Гетр	np DO		Conductivity	Specific Conductance	рН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1	
15.81	852	85.9	9,4	0.011	7,03	0.08		

Site Location: IS - 8-SER	GPS:
Date: 8/13/18	Time: \3(0
Photos:	Weather: Supply uport
Notes:	3, -

In situ									
Temp	DO		Conductivity	Specific Conductance	pН	Turbidity	Notes		
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)			
15,52	871	87.5	9,3	0,011	7.00	0,05			



SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Stillwater Sciences

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Instrument(s) used:

(CE20)

nstrument(s) used:	Crew:
Site Location: <u>TRSFSC</u> Date: <u>B_113118</u> Photos: Notes:	GPS: Time: 1355 Weather: Sunny hot

			In situ			
DO		DO Conductivity C		pН	Turbidity	Notes
(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
10,46	85,4	6.7	0,010	6,79	0.44	
	(mg/L)	(mg/L) (%)	(mg/L) (%) (μS/cm)	DO Conductivity Specific Conductance (mg/L) (%) (µS/cm) (mS/cm)	DO Conductivity Specific pH (mg/L) (%) (μS/cm) (mS/cm) (s.u.)	DO Conductivity Specific Conductance pH Turbidity (mg/L) (%) (μS/cm) (mS/cm) (s.u.) (NTU)

Site L	ocation:					GPS:					
Date:					Time:						
Photos:							Weather:				
Notes	:										
				In situ							
Temp	DO		Conductivity	Specific Conductance	pН	Turbidity	Notes				
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)					

s:					GPS: Time: Weather:			
			In situ					
D	D	Conductivity	Specific	pН	Turbidity	Notes		
(mg/L) (%)		(µS/cm)	(mS/cm)	(s.u.)	(NTU)			
	s:	s: : DO	s: DO Conductivity	s: DO Conductivity Specific Conductance	s: In situ DO Conductivity Specific pH	s: Time: Weather Weather Time: Weather Time: Weather Weath		



(Stillwater Sciences

Instrument(s) used:

VSI Exo

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

Crew: KKC + DKR

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ite Location: IG-11-5 FSC	GPS:
Date: 9/14/18 Photos:	Time: 0910
Photos:	Weather: Gunny Con
Notes:	0

In situ								
Temp	DO		Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1	
13.57	9.07	\$7.2	11.0	0.014	7.19	0,20		

Site Location: 15-12-50	GPS:
Date: <u>\$ 14 18</u>	Time: 0937
Photos:	Weather: SYDDY CODI
Notes:	0

Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7,95	10,19	85,8	9,1	0,012	6.75	0,16	

Site L	Site Location: <u>TS-13-SC</u> GPS:									
Date: 4/14/18 Time: 1035										
Photos: Weather: Gunny Mr. 1-22										
Notes:										
				In situ						
Temp	D	DO Conductivity Specific pH Turbidity Notes								
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)				
16.05	9,03	91,5	14.0	0,017	7,01	0,11				



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VSI EM

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Instrument(s) used:

Crew: KKC - DKR

Site L Date: Photo Notes	is:/	<u> </u>		GPS: Time: <u>} 20</u> Weathe <u>r: 4J009_Abb*/</u> 0			
				In situ			
Temp	D	0	Conductivity Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
10,42	10152	94,2	10,5	0.015	7,12	0,21	

Site Location: <u>IS-15-SFAR</u>	GPS:
Date:/1///8	Time: 1220
Photos:	Weather: Sonny hot
Notes:	0

In situ								
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1	
20,59	8,77	97.6	49.0	0,053	7,69	0,26		

Site Location: <u>TS-16-5FAR</u> Date: <u>SIHIB</u> Photos: <u>Notes:</u>							GPS: Time: <u>1346</u> Weathe <u>r: Strong</u> hot			
Temp	D	0	Conductivity	In situ Specific	pН	Turbidity				
(°C)	(mg/L)	(%)	(µS/cm)	Conductance (mS/cm)	(s.u.)	(NTU)	Notes			
11.34	10.56	96.7	15,0	0.021	6.72	0,18				



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 American River Project and Chili Bar Project

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Instrument(s) used:	44	Crew:	KKC DKR			
Site L Date: Photo Notes	os: <u>\$4</u>	<u>IS-1</u> 4 18	7-BC-			GPS: Time: Weath	1434 Browny hot
				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(NTU)			
19,33	9.39	91.1	24.1	0,027	7,25	1.22	

		-18-5FA	GPS:				
Date: Photo Notes	s:				Time: Weath	er: grany, hot	ł
			In situ				
Temp	DO	Conductivity	Specific Conductance	pН	Turbidity	Notes	

Temp	D	0	Conductivity	Conductance	рН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)]
17.73	9,54	100,3	25,5	0,030	7,37	0.18	

Site L Date: Photo Notes	s: /	75. 15 18	-19-5F		GPS: Time: Weath	1330 E. Sunny hot			
In situ									
Temp	D	0	Conductivity	Specific Conductance	nH nH	Turbidity	Notes		
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)			
13.25	10.12	965	16,7	0,022	7,24	0.78			
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SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Stillwater Sciences

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Instrument(s) used: Y51 EX0	Crew: EES, BRC
Site Location: IS- 3-LRR	GPS:
Date: 8- גדי ו	Time: 1047
Photos:	Weather: ht, clear
Notes:	

In situ											
DO		Conductivity	Specific Conductance	рН	Turbidity	Notes					
(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)						
6.88	77.8	10.0	0.011	6.84	0.12						
	(mg/L)	(mg/L) (%)	(mg/L) (%) (μS/cm)	DO Conductivity Specific Conductance (mg/L) (%) (μS/cm) (mS/cm)	DO Conductivity Specific Conductance pH (mg/L) (%) (μS/cm) (mS/cm) (s.u.)	DO Conductivity Specific Conductance pH Turbidity (mg/L) (%) (μS/cm) (mS/cm) (s.u.) (NTU)					

Site Location: IS-1-LRK	GPS:
Date: 8-17-18	Time: _1139
Photos:	Weather: het, clew
Notes:	

In situ											
Temp DO		DO Conductivity Specific Conductance	рН	Turbidity	Notes						
(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)						
6.64	73.7	13.4	0.015	6.87	0.23						
	(mg/L)	(mg/L) (%)	(mg/L) (%) (µS/cm)	DO Conductivity Conductance (mg/L) (%) (μS/cm) (mS/cm)	DO Conductivity Conductance pH (mg/L) (%) (μS/cm) (mS/cm) (s.u.)	DO Conductivity Conductance pH Turbidity (mg/L) (%) (μS/cm) (mS/cm) (s.u.) (NTU)					

Date: Photos Notes:	:	<u>Γζ-</u> η- 18	GPS: Time: <u>Iヱゖ</u> Weathe <u>r: ゟヮゖ゚゚゚゚゚゚゚゚゚゚゚ゟゖ</u>				
				In situ			
Гетр	D	0	Conductivity	Specific Conductance pH	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1
.45	6.88	79.1	15.3	0.016	6.88	0.58	60'
							·
,45	6.88	19.1	15.3	0.016	6.88	0.58	60'



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SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

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Instrument(s) used:	YSI	Crew:	Crew: _Eડ → B ∟								
Site Location: <u>IS-1-RR</u> GPS:												
Date: 11/12/2018 Time: 1139												
Photo Notes						Weathe	r: sunny, breezy					
NOICE												
	In situ											
Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Notes					
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)						
1.29	10.41	73.7	12	0.021	6.53	0.4						

Site Loca	tion: IS-2- LRR	GPS:
Date:	11/12/2018	Time: 13:07
Photos:	· · ·	Weather: Swnny, breezy
Notes:		,,,,,
	In situ	
	Concertain and Concer	

Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
3.70	9.91	75.0	11	0.018	6.85	0.1	
							•

Date: 11/12/2018 Photos:						Time: 13:56 Weathe <u>r: Sunny, slight bree</u> ze			
				In situ					
Temp	DO		DO	DO Conductivity Specific pH		Turbidity	Notes		
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1		
2.96	10.63	78.8	8	0.014	6.57	0.3			



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SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Stillwater Sciences

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15I 6920 Instrument(s) used: Crew: ES BL Site Location: IS-4- GC GPS: Date: 11/13/18 Time: 0911 Photos: Weather: Clear, Sunny Notes: In situ Specific Temp DO Conductivity Turbidity pH Conductance Notes (°C) (mg/L) (%) (µS/cm) (NTU) (mS/cm) (s.u.) 5.15 80.0 8 10.18 6.57 0.2 0.013

Site Location: IS-5-66	GPS:
Date: \\/13/18	Time: 0955
Photos:	Weather: clear, sunny
Notes:	, , ,

In situ											
Temp	DO		Conductivity	Specific Conductance	pН	Turbidity	Notes				
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1				
1.55	11.29	80.8	10	0.018	6.16	0.1					

Date: Photo	Site Location: IS-6-6-6 GPS: Date: 11/13/18 Time: 102.7 Photos: Weather: Weather:											
	In situ											
Temp	D	0	Conductivity	uctivity Specific Conductance	pН	Turbidity	Notes					
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)						
3.04	10,47	77.8	11	0.019	6.13	0.2						
							1					



strument	(s) used:	Y 51	5 6920			Crew	ES BL
Site	Location:	IS-	9- GCC			GPS:	
Date	: <u>n/</u>	13/18				Time:	1047
Phot						Weath	er: clear, sunny
Note							
				In situ			
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
3.12	10.82	80.7	13	0.022	6.80	0.3	
014.0	Leastien		0 (00)	2		GPS:	
			-8 - 5FRI	\			
Date	: <u> </u> []	13/18		`		Time:	(137
Date Phot	: <u>[1</u> os:			\		Time:	1137 er: clear, sunny
Date	: <u>[1</u> os:					Time:	
Date Phot	: <u>[1</u> os:					Time:	
Date Phot Note	: os: s:	1 13/18		In situ		Time: Weath	
Date Phot Note	: os: s: D	0	Conductivity	<i>In situ</i> Specific Conductance	рН	Time:	
Date Phot Note	: os: s:	1 13/18		In situ Specific	рН (s.u.)	Time: Weath	er: clear, sunny
Date Phot Note	: os: s: D	0	Conductivity	<i>In situ</i> Specific Conductance		Time: Weath	er: clear, sunny
Date Phot Note Temp (°C)	: [1 os: s: D (mg/L)	0 (%)	Conductivity (µS/cm)	In situ Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU)	er: clear, sunny
Date Phot Note	: [1 os:	0 (%) 82.1	Conductivity (µS/cm) 12	In situ Specific Conductance (mS/cm)	(s.u.)	Turbidity	er: clear, sunny
Date Phot Note (°C) 1,64 Site	с. (1 os:	0 (%) 82.1	Conductivity (µS/cm) 12 7- SFRR	In situ Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU)	Notes
Date Phot Note	: [1 DS: S: [] (mg/L)]] . 4 6 Location:	0 (%) 82.1	Conductivity (µS/cm) 12 7- SFRR	In situ Specific Conductance (mS/cm)	(s.u.)	Turbidity (NTU)	Notes
Date Phot Note (°C) 1,64 Site Date	: DS: s: (mg/L) 11.446 Location: : : : : : : : : : : : : :	0 (%) 82.1	Conductivity (µS/cm) 12 7- SFRR	In situ Specific Conductance (mS/cm)	(s.u.)	Turbidity (NTU)	Notes
Date Phot Note Temp (°C) 1,64 Site Date Phot	: DS: s: (mg/L) 11.446 Location: : : : : : : : : : : : : :	0 (%) 82.1	Conductivity (µS/cm) 12 7- SFRR	In situ Specific Conductance (mS/cm) 0.021	(s.u.)	Turbidity (NTU)	Notes
Date Phot Note	: [1 os: s: (mg/L) 11.46	0 (%) 82.1	Conductivity (µS/cm) 12 7- SFRR	In situ Specific Conductance (mS/cm) 0.02) 0.02) In situ Specific	(s.u.)	Turbidity (NTU)	Notes
Date Phot Note	: [1 os: s: (mg/L) 11.46	(%) 82.1 <u>55</u> 11/13/1	Conductivity (µS/cm) 12 7- SFRR	In situ Specific Conductance (mS/cm) 0.021	(s.u.) 6.43	Turbidity (NTU) (NTU) (NTU) (NTU) (NTU) (NTU) (NTU) (NTU) (NTU) (NTU) (NTU) (NTU) (NTU)	Notes



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SMUD In situ Monitoring in the Upper	
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Stillwater Sciences		Amer	rican River P	roject and C	Project			
strument(s) used:		YSI 692	0	Crew: ES + BL			
Site L Date: Photo Notes	os:	11/13				GPS: Time: <u>1217</u> Weathe <u>r: ()m/, Samy</u>		
				In situ				
Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Notes	
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)		
5.63	9.93	79.0	13	0.021	6.13	0.5		
Site I	_ocation:					GPS:		
Site I Date:								
						Time:	er:	
Date:	DS:					Time:		
Date: Photo	DS:					Time:		
Date: Photo	DS:					Time:		

Site I Date: Photo Note:	os:					GPS: Time: Weath	er:
				In situ			
Temp	D	>	Conductivity	Specific	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	



tillwater		VCI	1000				
trument(s) used:	121	6920			Crew:	ES + BL
	ocation:	15-11-	SESC			GPS:	
Date: Photo		1/18				Time:	08:48
Notes						Weath	er: clear, sunny, cold
				In situ			
Temp	D	D	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
2.49	12.54	80.2	15	0.031	6.86	0.1	
	ocation;	15-13	L-SC			GPS:	
Date:	11/1	15-13 4/18	L-SC			Time:	09:09
	11/1	15-13 4/18	L-SC			Time:	09:09 er: clear, swny, cold
Date:	_11/i	15-13 4/18	r-2C			Time:	
Date: Photo	_11/i	15-13 4/18	L-SC	In eitu		Time:	
Date: Photo Notes	s:	4/18		In situ Specific		Time: Weath	
Date: Photo Notes Temp	s:	9 9	Conductivity	Specific Conductance	рН	Time: Weath Turbidity	
Date: Photo Notes Temp (°C)		o (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU)	er: clear, sunny, cold
Date: Photo Notes Temp (°C)	s:	9 9	Conductivity	Specific Conductance		Time: Weath Turbidity	er: clear, sunny, cold
Date: Photo Notes Temp (°C)	 :: (mg/L)	o (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU)	er: clear, sunny, cold
Date: Photo Notes Temp	 :: (mg/L)	o (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU)	er: clear, sunny, cold
Date: Photo Notes Temp (°C)	 :: (mg/L)	o (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU)	er: clear, sunny, cold
Date: Photo Notes Temp (°C)) 7	 :: (mg/L) .87	9 (%) 85.1	Conductivity (µS/cm)) 4	Specific Conductance (mS/cm)	(s.u.)	Time: Weath Turbidity (NTU)	er: clear, sunny, cold
Date: Photo Notes Temp (°C)) 7		4/18 0 (%) 85.1	Conductivity (µS/cm)) 4	Specific Conductance (mS/cm)	(s.u.)	Turbidity (NTU) (). 2 GPS: Time:	er: clear, swny, cold Notes
Date: Photo Notes Temp (°C) .] 7 Site L Date: Photo	.ocation:	9 (%) 85.1	Conductivity (µS/cm)) 4	Specific Conductance (mS/cm)	(s.u.)	Turbidity (NTU) (). 2 GPS: Time:	er: clear, sunny, cold
Date: Photo Notes Temp (°C) .] 7 Site L Date:	.ocation:	4/18 0 (%) 85.1	Conductivity (µS/cm)) 4	Specific Conductance (mS/cm)	(s.u.)	Turbidity (NTU) (). 2 GPS: Time:	er: clear, swny, cold Notes
Date: Photo Notes Temp (°C) .] 7 Site L Date: Photo	.ocation:	4/18 0 (%) 85.1	Conductivity (µS/cm)) 4	Specific Conductance (mS/cm)	(s.u.)	Turbidity (NTU) (). 2 GPS: Time:	er: clear, swny, cold Notes
Date: Photo Notes Temp (°C)) 7 Site L Date: Photo Notes Temp		9 (%) 85.1 IS-13 /18	Conductivity (µS/cm)) 4	Specific Conductance (mS/cm) 0.024	(s.u.)	Turbidity (NTU) (). 2 GPS: Time:	er: clear, swny, cold Notes
Date: Photo Notes Temp (°C) 		9 (%) 85.1 IS-13 /18	Conductivity (µS/cm)] 4 -SC	Specific Conductance (mS/cm) 0.024	(s.u.) 6.82	Time: Weath Turbidity (NTU) (). 2 GPS: Time: Weath	er: clear, swny, cold Notes 10:05 er: clear, swny
Date: Photo Notes Temp (°C)) 7 Site L Date: Photo Notes Temp		9 (%) 85.1 (S-13 /18	Conductivity (µS/cm)) 4 -SC	Specific Conductance (mS/cm) 0.024	<u>(s.u.)</u> 6.82 рН	Turbidity (NTU) (). 2 GPS: Time: Weath Weath	er: clear, swny, cold Notes 10:05 er: clear, swny



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Date Phot Note	os:	<u>IS-14</u> 14/18	-50			GPS: Time: Weathe	1035 Br: COD, clear, sunny
				In situ			
Temp		0	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
3.97	11.86	90.4	16	0.026	6.87	0.1	

Time: 1312
Weather: CIENG SUNNY
· · · · · · · · · · · · · · · · · · ·

/L) (%)	(µS/cm)	Conductance			Notes
	(10,011)	(mS/cm)	(s.u.)	(NTU)	
30 96.4	27	0.044	6.70	0.4	
	30 96.4	30 96.4 27	30 96.4 27 0.044	30 96.4 27 0.044 6.70	30 96.4 27 0.044 6.70 0.4

Date: <u>\\/\\\</u> Photos: Notes:				Time: <u>1328</u> Weather: کا ر سی دی			
				In situ			
Temp	D	DO	Conductivity	Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
1.85	12.81	92.5	54	0.097	7.01	0.1	



((12))	SMUD In situ Monitoring in the Upper
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Instrument(s) used:	Y 5	I EXO			Crew:	ES + SK
Site L Date: Photo Notes	s:	<u>55-17-</u> /16/18	βC			GPS: Time: Weathe	0900 H: 1)Eur, 1001
				In situ			
Temp	p DO			Specific Conductance	pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1
9.60	10.39	91.2	29.6	0.042	7.46	1,29	
							1

Site Location: 15 - 19 - 5 FAP	GPS:
Date: 11-16-18	Time: 1045
Photos:	Weather: clear, cool
Notes:	

	In situ									
Temp	Temp DO		Conductivity	Specific Conductance	pН	Turbidity	Notes			
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1			
8.42	11.28	96.2	263	0.038	7.73	0.43				

Date: Photo Notes	os:	6-18				Time: Weathe	1200 ar: clear, cool
				In situ			
Temp	D	0	Conductivity Specific Conductance P		pН	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	1
7.13	11.99	99.2	323	0.049	7.65	0.16	



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SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

Reservoir - Water Quality Vertical Profiles

Page_	of	
Date:	5/3/18	
Time:	1142	

Water depth: 9244

Secchi (ft): 40

Site Location: <u>R - I S- I - LL</u> Lat/Long (NAD83):

Personnel: GES BTH

Site Notes: clear, breezy, cool

Dep	əth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(#)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes
surf	ace	8.24	9.94	84.4	6.2	0.009	7,3	0.2		
3.3	1	8.22	9.92	84.2	6.2	0.009	7.3	0.2		
6.6	2	1.73	9.97	83.6	6.1	0.009	1.3	0.2		
9.8	3	7.56	9.99	83.4	6.1	0.009	7.3	0.2		
13.1	4	7.52	9.98	83.3	6.1	0.009	7.3	0.2		
16.4	5	6.95	10.03	82.7	6.0	0.009	7.2	0.2		
19.7	6	6.57	10.13	82.6	5.9	0.009	7.2	0.2		
23.0	7	6.45	10.17	82.7	5.8	0.009	7.2	0,2		
26.2	8	6.31	10,18	82.4	5,8	0.009	7.1	0.2		
29.5	9	6.12	10.20	82.2	5.8	0.009	7.1	0.2		
32.8	10	6.07	10.18	81.9	5,8	0.009	7.0	0.3		
36.1	11	5.94	10.18	81.6	5.8	0.009	6.9	0.2		
39.4	12	5.92	10.20	81.7	5.8	0.009	6.9	0.2		
42.7	13	5.91	10,20	81.8	5.8	0.009	6.9	0.2		
45.9	14	5.84	10.20	81.7	5.8	0.009	6.9	0.3		
49.2	15	5.83	10,19	81.5	5.7	0.009	6.8	0.2		
52.5	16	5.74	10.20	21.3	5.7	0.009	6.8	0.3		
55.8	17	5.69	10.17	81.1	5.7	0.009	6.8	0.2		
59.1	18	5.65	10.13	80:7	5.8	0.009	6.8	0.2		
62.3	19	5,61	10.11	80.4	5.8	0.009	6.7	0.2		
65.6	20	5.55	10.09	80.2	5.7	0.009	6.7	0.3		
68.9	21	5.43	10.10	79.0	5.8	0.009	6.7	0.2		
72.2	22	5.37	10.07	79.6	5.7	0.009	6.6	0.3		
75.5	23	5,36	10.06	79.5	5.8	0.009	6.6	0.3		
78.7	24	5,32	10.05	79.4	5.7	0.009	6.5	0.3		
82.0	25	5.29	10.01	78.6.	5.8	0.009	6.5	171.23		(BOTTOM)
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



Stillv	Perso	te Location g (NAD83) nnel: (3)	SMUD F 	Date: ime: ant used: er depth:	_ of _1 -11/18 -220 EX0 _11474 -14544 -4544					
De	pth	Temp		0	Conductivity	Specific Conductance	pН	Turbidity	Water	
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes
sur	ace	6.00	10.4B	84.2	5.5	0.008	7.8	0.5		
3.3	1	5.99	10.47	84.1	5.3	0.008	7.60	0.4		
6.6	2	5.99	10.47	84,1	513	0.008	7.5	0.5		
9.8	3	5,97	10,46	84.0	5.3	0.008	7.4	0.5		
13.1	4	5.97	10.46	84.0	5.3	0.008	7.3	0.5		
16.4	5	5:98	10.44	83.8	5,3	0.008	7.3	0.4		
19.7	6	5.96	10.45	83.9	5.3	0.008	7.2	0.5		
23.0	7	5.48	10.44	83.9	5.3	0.008	7.1	0.4		
26.2	8	5.96	10.44	83.8	5.3	0.008	6.9	0.4		
29.5	9	5.95	10,412	83.6	5.3	0.008	6.6	0.4		
32.8	10	5.93	10.41	83.4	5.3	0.008	6.6	0.4		
36.1	11	5.95	1039	83.3	5.3	0.008	6.5	0.5		
39.4	12	5.94	10.38	83.3	5.3	0.008	6.5	0.5		
42.7	13	5.95	10.38	83.2	5.3	0.008	6.5	0.5		
45.9	14	5.95	10,37	83.3	5.3	0.008	6.4	0.5		
49.2	15	5,96	10.34	83.0	5.3	0.008	6.5	0.4		
52.5	16	5.94	10.33	32.9	5.3	0.008	6.4	0.4		
55.8	17	5.94	10.33	82.8	5,3	0.008	6.42	0.4		
59.1	18	5.91	10.33	82.8	5.3	0.008	6.39	0.5		
62.3	19	5.93	10.32	82.8	5.3	0.008	6.3	0.4		
65.6	20	5.92	10.30	82.7	5.3	0.008	6.4	0.4		
68.9	21	5.91	10.30	82.5	5.3	0.008	6.4	0.4		
72.2	22	5.86	10.31	82.4	5:3	0.008	6.4	0.4		
75.5	23	5.72	10.32	82.4	5.3	0.00B	6.3	0.4		
78.7	24	5.71	10.31	82.2	5.3	0.008	6.3	0.4		

6.3

6.3

6.3

0.4

0.4

0.5

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BOTTOM

0.008

0.008

0.008

0.008

82.0

85.3

88.6

91.9

95.1

98.4

101.7

105.0

108.3 111.5 25

26

27

28

29 30

31

32

33

34

5.67

5.59

5,53

5.44

10:30

10,32

10.32

10.35

82.1

82.0

81.9

82.0

5.3

5,3

5.3

5.2

D-29



(@33)	SMUD In situ Monitoring in the Upper American River	Page_1_	of _(
Stillwater Sciences	Project and Chili Bar Project	Date:	5/1/18
		Time: 1/	10
	Reservoir - Water Quality Vertical Profiles		
		Instrument used:	EYO
Site Location:	UARP-R-IS-3-LL	Water depth:	

Site Location: Lat/Long (NAD83):

Personnel: BTH + KKC

Secchi (ft): _____45-A-

SUNAU, Cold, Windy Site Notes:

Dep	oth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	NOTES
surf	ace	6.11	10.40	83.8	5.3	0.008	6.7	0.5		
3.3	1	6.08	10.40	83.7	5.3	0.008	6.6	0.4		
6.6	2	6.02	10.41	83.7	5.3	0.008	6.6	0.4		
9.8	3	5.99	10.43	83.7	5.3	0.008	6.6	0.5		
13.1	4	6.02	10.43	\$3.8	5.3	0.008	6.6	0.4		
16.4	5	5.97	10,44	83.8	5.3	0.008	6.6	0.4		
19.7	6	5.96	10.43	83.7	5.3	0.008	6.6	0.4		
23.0	7	5.93	10,42	83.5	5.3	0.008	6.6	0.5		
26.2	8	5.88	10.40	83.3	5.3	0.008	6.5	0.4		
29.5	9	5.87	10.39	83.2	5.3	0.008	6.5	0.4		
32.8	10	5.83	10.37	83.0	5.3	0.008	6.5	0.4		
36.1	11	5.87	10.37	83.0	5.3	0.000	6.5	0.4		
39.4	12	5.88	10,36	82.9	5.3	0.008	6.5	0.4		
42.7	13	5.89	10.35	82.9	5.3	0.008	6.5	0.4		
45.9	14	5.80 .	10.35	82.9	5.3	0-003	6.5	0.4		
49.2	15	5.83	10,34	82.7	5.3	0.003	6.4	0.4		
52.5	16	5.84	10.32	326	5.3	0.008	6.5	0.4		POTTOM
55.8	17									
59.1	18								-	
62.3	19									
65.6	20									
68.9	21				L				<u> </u>	
72.2	22									
75.5	23								<u> </u>	
78.7	24								L	
82.0	25							<u></u>	<u> </u>	
85.3	26									
88.6	27							1		
91.9	28								-	
95.1	29								L	
98.4	30								-	
101.7	31								<u> </u>	
105.0	32								-	
108.3	33									
111.5	34									



tillwater Scier		SMUD <i>In situ</i> Mo Proj	nitoring in th ect and Chili		Date: 513/18			
		Reservoir	Water Qualit	ty Vertical Pr	ofiles		me:	
Site Lat/Long	Location: _ (NAD83):	R-15-4-6	C					131 EXU 29.6
Personn	el: BT	14, 525				Se	cchi (ft):	28
Site Notes	s: cle	ar, calm, cool						
Depth	Temp	DO	Conductivity	Specific	рН	Turbidity	Water	

Dep	oth	Temp		0	Conductivity	Conductance	pH	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	littes
surf	ace	7.79	10.34	86.8	7,3	0.013	6,9	0.2		
3.3	1	7.11	10.37	85.6	7.1	0.011	6.8	0.2		
6.6	2	6.94	10.36	85.3	7.1	0.011	6.8	0.2		
9.8	3	6.90	10,35	85.1	7.1	0.011	6.7	0.2		
13.1	4	6.88	10.34	84.9	7.1	0.011	6.7	0.2		
16.4	5	6.90	10,31	84.8	7.2	0.011	6.7	0.2		
19.7	6	6.84	10.31	84.5	7,3	0.011	6.6	0.2		
23.0	7	6.80	10.30	84.4	7.4	0.011	6.6	0,2		
26.2	8	6.78	10.29	84.3	7.5	0,012	6.6	6.2		
29.5	9									BOTTOM
32.8	10									
36.1	11									
39.4	12									
42.7	13									
45.9	14									
49.2	15									
52.5	16									
55.8	1,7									
59.1	18									
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
9B.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



Stillwater

3	SMUD In situ Monitoring in the Upper American River	Page
Sciences	Project and Chili Bar Project	Date: Time:

Page | of _ 1 Date: 4/30/18 Time: 1300

Reservoir - Water Quality Vertical Profiles

Instrument used: Exc

Site Location: UARP-P-IS-S-OVR Lat/Long (NAD83):

Water depth: <u>68-6+</u> Secchi (ft): <u>38-</u>0+

Personnel: KKC + BTH

Site Notes: _ Cloudy, Cold, Breezy

Dep	oth	Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	10108
surf	асе	11.86	9.75	90.2	10.3	0.014	7.5	0.3		
3.3	1	11.88	9.73	90.1	10,3	0.014	7.4	0.2		
6.6	2	11.44	9.75	89.2	10.1	0.014	7.3	0.2		
9.8	3	11.09	9.76	88.7	10.1	0.014	7.3	0.2		
13.1	4	10.9B	9.76	88.4	10.1	0.014	7.3	0.2		
16.4	5	10.21	9.88	88.1	10.0	0.04	7.3	0.2		
19.7	6	9.45	10.04	87.8	9.8	0.014	7.2	0.2		
23.0	7	8.69	10,14	87.0	9.5	0.014	7.2	0.2		
26.2	8	8.07	10.22	86.5	9.1	0.013	7.1	0.2		
29.5	9	7.91	10.22	86.1	9.0	0.013	7.1	0.2		
32.8	10	7.71	10.25	85.9	9.0	0.013	7.0	0.1		
36.1	11	7.51	10.26	85.7	8.9	0.013	J.D	0.1		
39.4	12	7.12	10.31	84.2	8.8	0.013	7.0	02		
42.7	13	6.13	10.35	83.2	8.6	0,013	69	0.2		
45.9	14	5.66	10.29	82.0	8.4	0.013	6.9	0.2		
49.2	15	5.59	10.28	81.7	8.5	0.013	6.9	0.2		
52.5	16	5.42	10.27	B1.2	8.4	0.013	6.9	0.2		
55.8	17	5.31	10.21	80.6	8.4	0.013	6.8	0.2		
59.1	18	5.24	10.17	80.1	8.4	0.014	6.8	0.2		
62.3	19	5.19	10.10	79.4	8.4	0.014	6.8	0,2		BOTTOM
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34					1				



CCC 300 Stillwater Sciences	SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project	Date: _5/1/18
	Reservoir - Water Quality Vertical Profiles	Time: 1500
Site Location: Lat/Long (NAD83):	UARP-R-IS-6-UVR	Water depth: 127 ft
Personnel: 871	H + KKE	Secchi (ft): <u>4044</u>
Site Notes:	ny, Cool, Calm	

(ft) (surfac 3.3 6.6	(m)			D	Conductivity	Specific Conductance	pH	Turbidity	Water	Notes
3.3	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
	ce .	12.15	9.29	92.4	9.9	0.013	6.9	0.4		
6.6	1	11.15	10.04	91.4	9.6	0.013	6.9	0.4		
	2	10.77	10.08	90.8	9.5	0.013	6.9	0.3		
9.8	3	10.57	10.10	90.7	9.4	0.013	6.9	0.3		
13.1	4	10.50	10.10	90.6	9.4	0.013	6.9	0.3		
16.4	5	10.46	10.09	90.3	9.4	0.013	6.9	0.3		
19.7	6	10.19	10.11	90.0	9.3	0.013	6.9	0.2		Contraction of the second second
23.0	7	9.85	10.27	90.8	9.2	0.013	69	0.3		
26.2	8	9.07	10.42	90.4	9.0	0.013	6.9	0.3		
29.5	9	8.43	10.50	89.8	8,8	0.013	6.9	0.3		
04.0	10	7,90	10.55	88.8	8.7	0.013	6.8	0.3		
00.1	11	7.77	10.50	88.7	8.6	0.013	6.9	0.2		
00.4	12	7.43	10.55	87.9	8.5	0.013	6.9	0.3		
16.1	13	7.10	10.51	86.8	8.5	0.013	6.8	0.2		
40.0	14	6.93	10.44	35,8	8.4	0.03	6.8	0.4		
10.6	15	6.77	10.41	85.2	8.4	0.013	6.8	0.3		
06.0	16	6.49	10.40	84.5	8,3	0.013	6.8	0.3		
00.0	17	6.42	(0.38	84,3	8.4	0.013	6.7	0,3		
	18	6.31	10.35	83.8	8.3	0.03	6.8	0.3		
02.0	19	6.05	10.35	83.2	B.3	0.03	6.8	0.3		
	20	5.82	10,33	82.6	8.3	0.013	6.7	0.3		
00.0	21	5.7B	10,29	82.2	8,3	0.013	6,7	0.3		
12.2	22	5.75	10.30	82.2	8,3	0.013	6.7	0.3		
10.0	23	5.71	6.30	82.2	B.3	0.013	6,7	0,3		
10.1	24	5.69	10.29	82.0	8.3	0.013	6.7	0.3		
02.0	25 26	5.51	10.31	81.7	8.2	0.013	6.7	0,3		
00.0	20	5.39	10.28	81,3	8.2	0.013	6.7	0.3		
00.0	28	5.25	10.25	80.7	8.1	01013	6.6	0.4		
01.0	28	0.111	10,23	80.4	8.1	0.013	6.6	0,4		
80.1	30	5.08	10.21	80.2	8.1	0.013	6.6	0.4		
00.4	31	5.03	10.21	79.8	8.1	6.013	6.6	0.4		
101.7	32	4.99	10,20		8.1	0.013	6.6			
100.0	33	446	10.17	79.6	B.1		6.6	0.4		
100.0	34	4.95	10.16	79.4	8.1	0.013	6.6	0.4		



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Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

Depth		Temp	D	D	Conductivity	Specific Conductance	pН	Turbidity	Water	Nata
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes
	2.22					(CONTINUE)				
114.8	35	4,95	10.15	79.4	B.1	0.013	6.6	0.4		
118.1	36	4.94	10,14	79.3	8.1	0.013	6,7	0.4		BOTTOM
121.4	37									
124.7	38									
128.0	39									
131.2	40									
134.5	41									
137.8	42									
141.1	43									
144.4	44									
147.6	45									
150.9	46									
154.2	47									
157.5	48									
160.8	49									
164.0	50									
167.3	51									
170.6	52									
173.9	.53									
177.2	54									
180.4	55									
183.7	56									
187.0	57									
190.3	58									
193.6	59									
196.8	60									
200.1	61									
203.4	62									
206.7	63									
210.0	64									
213.3	65									
216.5	66									
219.8	67									
223.1	68									
226.4	69									
229.7	70									
232.9	71									
236.2	72									



_	ater Sci			Proje	nitoring in th ect and Chili Water Qualit	Bar Project		Date: _ <u>5/118</u> Time: <u>1580</u>						
La	Sit	e Location: a (NAD83):	1: UARP-R-IS-7-UVR						Water depth:					
F	Personnel: KFC + BTH . Secchi (ft): 34 ft													
Dep	oth	Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Water	Notes				
(fft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes				
surf		12.04	9.86	91.7	9.8	0.017	6.95	0.5						
3.3	1	11.80	9.53	917	9.7	0.013	6.91	0.3						
6.6	2	11.15	10.0	90.9	1.6	0.015	6.9	0.4						
9.8	3	11.02	10.0	90.7	9.5	0.013	4.9	0.4						
13.1	4	10.79	10.04	90.6	9.4	0. 0:3	6.9	0.4						
16.4	5	10.25	10.15	50.5	9.2	0.013	4.9	0.4						
19.7	6	9.57	10.28	90.3	9.0	0.013	6.8	0.4						
23.0	7	9.03	10.38	89.9	8.7	0.013	4.8	0.3						
26.2	8	8.77	10.44	89.5	8.6	0.013	4.8	0.4						
29.5	9	8.39	10.43	88.9	8.4	0.013	6.8	0.4						
32.8	10	7.82	10.5	88.7	8.2	0.013	6.8	0.3						
36.1	11	7 14	10.64	88.0	8.4	0.013	6.8	0,4						
39.4	12	4.72	10.63	86.8	8.2	0.017	6.8	0.3						
42.7	13	6.73	10.57	84.5	8.2	0. 013	6.7	0.4						
45.9	14	6.54	10.55	85.9	8.2	0.013	6.5	0. 3						
49.2	15	6.35	10.51	85.2	8.2	0.013	6.7	0.3						
52.5	16	6.19	10.50	84.8	8.2	0.0:3	6.7	0'2						
55.8	17	6.12	10.48	84.4	8.2	0.019	4.7	0.3						
59.1	18	6.04	10.46	84.2	8.2	0.013	4.7	0.4						
62.3	19	5.81	10.42	83.3	6.1	0.013	6.7	0.4	-					
65.6	20	5.78	10.41	83.1	8.1	0.013	4.6	0.3						
68.9	21	5.63	10.40	82.8	8.1 8.0	0.013	6.6	0.4						
72.2	22	5.55	10.35		8.0	0.013	6.6	0.4						
75.5	23	5.33	10.35	81.5	8.0	0.013	6.6	0.4	-					
78.7	29	5.24	10.29	-	8.0	0.013	6.6	0.3						
82.0	20	5.18	10.26		8.0	~	6.6		<u> </u>					
85.3 88.6	20	5.16	10.25	80.5	8.0	0.013	6.6	0.3						
91.9	28	5.15	10.24	80.5	8.0	0.012	6.6	0.3						
95.1	29	5.13	10.22	80.3	8.0	0.017	40.6	0.3						
98.4	30	5.10	10.21	80.2	8.0	0.013	4.6	0.3						
101.7	31	5.09	10.21	80.2	8.0	0.013	4.6	0.4						
105.0	32	5.03	10.20	79.9	8.0	0.013	6.6	0.4						
108.3	33	4.98	10.18	79.7	8.0	0.012	6.6	0.3						
111.5	34	4.92	10.18	74.7	8.0	0.013	6.6	0.3						



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Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

Dep	oth	Temp	D	o	Conductivity	Specific Concuctance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	10100
						(CONTINUED))			
114.8	35	4.96	10.17	79.6	80	0.013	6.6	0.4		
118.1	36	4.93	10.16	76.5	8.0	0.018	4.6	0.4		
121.4	37	4.93	10.16	79.4	8.0	0.015	6.6	0.3		
124.7	38	4.92	10.16	75.4	8.0	0.013	6.6	0.7		
128.0	39	4.90	10.15	79.4	8.0	0.013	6.6	0.5		
131.2	40	4.90	10.15	74.3	8.0	0. 21 3	6.5	0.4	· .	
134.5	41	4.51	10.15	74.3	0,0	0.013	6.6	0.4		
137.8	42	4.91	10.15	79.3	8.0	0.017	6.5	0.3		
141.1	43	4.90	10.15	79.3	80	0.013	6.5	0.4		
144.4	44	4.90	10.13	79.1	8.1	0.013	4.5	0.4		(6,4m)
147.6	45	4.90				0.017				
150.9	46					0.0.13				
154.2	47									
157.5	48									
160.8	49									
164.0	50									
167.3	51									
170.6	52									
173.9	53							L	<u> </u>	
177.2	54								<u> </u>	
180.4	55								<u> </u>	
183.7	56									
187.0	57						L			
190.3	58		L							
193.6	_		<u> </u>						-	
196.8	60					-				
200.1	61									
203.4								<u> </u>		
206.7								<u> </u>	-	
210.0										
213.3									-	
216.5	_								-	
219.8							<u> </u>			
223.1							-		-	
226.4							<u> </u>			
229.7									+	
232.9	_									
236.2	72									



Stillw	SMUD In situ Monitoring in the Upper American River Page of Stillwater Sciences Project and Chill Bar Project Date: 5/1/18 Time: 1330 Reservoir - Water Quality Vertical Profiles Instrument used: £xo Water depth: Site Location: UARP - R-JIS-8-UVIR Instrument used: £xo Water depth: Personnel: BTH + KkC Secchi (ft): Site Notes: Support Cool, Cal on Secchi (ft):												
Dep	pth	Temp	D	0	Conductivity	Specifi: Conductance	pН	Turbidity	Water	Notes			
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes			
surf	ace	1571	10.07	92.9	9.7	0.03	7.0	0.4					
3.3	1	11.43	10.12	925	9.6	0.013	7.1	0.3					
6.6	2	10.38	10.22	91.4	9.3	0.013	7.1	0.4					
9.8	3	10.25	10.24	91.2	9.3	0.013	7.1	0.2					
13.1	4	10.21	10.22	91.0	9.3	0.013	7.0	0.4					
16.4	5	10.18	10.22	91.0	9.3	0.013	7.0	0.2					
19.7	6	10.11	10.22	90.7	9.3	0.013	7.0	0.3					
23.0	7	10.09	10,19	90.5	9.3	0.013	7.0	0.3					
26.2	8	10.04	10.16	90.0	9.3	0.013	6.9	0.4					
29.5	9	8.85	10.39	89.7	B.9	0.013	6.9	0.2					
32.8	10	7.88	10.62		8.7	0.013	6.9	0.3	<u> </u>				
36.1	12	7.14	10.68	68.3	8.5	0.013	6.9	0.2	<u> </u>				
39.4	13	6.67	10.56	86.1 85.7	8.3 8.2	0.013	6.9	0.4					
45.9	14	6.30	10.5Z	85.Z	8.2	0.013	6.8	0.2	<u> </u>				
49.2	15	6.12	10.48	84.4	8.2	0.013	6.8	0.3	<u> </u>				
52.5	16	5.98	10.42	83.6	8.2	0.013	6.9	0.4					
55.8	17	5.85	10.38	83.0	8.2	0.013	6.8	0.2					
59.1	18	5.81	10.34	82.7	8.1	0.013	6.8	0.3					
62.3	19	5.76	10.35	82.6	8.1	0.013	6.8	0.3					
65.6	20	5.69	10,34	82.4	8.1	0.013	6.8	0.4					
68.9	21	5.57	10.34	82.1	8.1	0.013	67	0.3					
72.2	22	5.49	10.31	81.8	8.1	0.013	6.7	0.3					
75.5	23	5.43	10.29	81.5	8.1	0.013	6.7	0.4					
78.7	24	5.34	10.29	81.3	8.0	0.013	6.7	0.4					
82.0	25	5.29	10.30	B1.3	8.0	0.013	6.7	0.4					
85.3	26	5.28	10.30	31.2	8.0	0.013	6.7	0.4					

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5.18

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5.01

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10.29

10.27

10.23

10.23

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81.1

81.0

81.0

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80.7

BO.3

80.2

8.0

8.0

8.0

6.0

8.0

8.0

8.0

8.0

27

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29

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31

32

33

34

88.6

91.9

95.1

98.4

101.7

105.0

108.3

111.5

D-37



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Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

Dep	pth	Temp		0	Conductivity	Specific Conductance	рН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes
						(CONTINUED	0)			
114.8	35	5.07	10.24	80.3	8.0	0.013	6.6	6,4		
118.1	36	5.05	10.25	80.3	8.0	0.013	6.6	0.4		
121.4	37	5.01	10.26	80.4	2.0	0,013	6.6	0.4		
124.7	38	4.98	10.26	80.3	8,0	0.013	6.6	0.4		
128.0	39	4.96	10.28	80.4	0.8	0.013	6.6	0.4		
131.2	40	4.95	10.28	80.4	8.0	0.013	6.6	0.3		
134.5	41	4.94	10.27	80.3	8.0	0.013	6.6	0.3		
137.8	42	4.93	10.26	80.3	8.0	0.013	6.6	0.3		
141.1	43	4.91	10.26	80.2	8.0	0.013	6.6	0.4		
144.4	44	4.89	10.26	80.1	8.0	0.013	6.6	0.4		
147.6	45	4.86	10.27	80.1	8.0	0.013	6.6	0.4		
150.9	46	4.85	10.27	80.1	8.0	0.013	6.6	0.1		
154.2	47	4.82	10,26	79.9	8.0	0.013	6.6	0.3		
157.5	48	4.80	10.25	79.8	8.0	0.013	6.6	0.3		
160.8	49	4.78	10.24	798	8.0	0.013	6.6	0.3		
164.0	50	4,77	10.24	79.7	8.0	0.013	6.6	0.3		
167.3	51	4,77	10.24	79.7	8.0	0.013	6.6	0.3		
170.6	52	4.75	10.23	79.6	8.0	0.013	6.6	0.3		
173.9	53	4.73	10.22	79.5	8.0	0.013	6.6	0.3		
177.2	54	4.71	10,22	79.4	8.0	0.013	6.6	6.3		
180.4	55	4.70	10.22	79.4	8,0	0.013	6.6	0.4		
183.7	56	4,71	10.22	79,4	8.0	0.013	6.5	0.4		
187.0	57	4.70	10.21	79.4	8.0	0.013	6.6	0.3		
190.3	58	4.70	10.21	79.3	8.0	0.013	6.5	0.4		
193.6	59	4.70	10.21	79.3	8.0	0.013	6.6	0,4		
196.8	60	4.63	10.21	79.3	8.0	0.013	6.6	0.3		
200.1	61	4.67	10.20	79.2	8.0	0.013	6.5	0.4		
203.4	62	4.65	10.20	79.1	8.0	0.013	6.6	0.4		
206.7	63	4.64	10.19	79.0	8.1	0,013	6.5	0.4		
210.0	64	4.64	10.18	79.0	8.0	0.03	6.5	0.4		
213.3	65	4,62	10.18	78.9	8.0	0.013	6.5	0.4		
216.5	66	4.62	10.18	78.9	8.1	0.013	6.5	0.3		
219.8	67	4.60	10,17	78.8	8.0	0,013	6.5	0.4		
223.1	68	4.60	10.15	78.7	0.8	0.013	6.5	0.3		
226.4	69	4.60	10:15	78.6	8.0	0.013	6.5	0.4		
229.7	70	4.60	10.15	78.h	8.0	0.013	6.5	0,4		
232.9	71	4.59	10.14	78.6	8.0	0,013	6.5	0.3		
236.2	72	4.59	10.14	78.6	8.0	0,013	6.5	014		



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Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

Dep	oth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
		1852				(CONTINUED))			
239.5	73	4.59	10.14	78.5	8.0	0.013	6.5	0.4		
242.8	74	4.58	10,14	78.5	B.1	0.013	6.5	0.4		
246.1	75	4.58	10.14	78.5	8.0	0.013	6.5	0.4		
249.3	76	4.58	10.13	78.4	8.0	0.013	6.5	0.4		
252.6	77	4.58	10.12	78.4	8.1	0.013	6.5	0.4		
255.9	78	4.58	10.13	78.4	8.0	0.013	65	0.4		
259.2	79	4.58	10.13	78.4	8.0	0.03	6.5	0.4		
262.5	80	4.58	10.12	78.3	8.0	0.013	65	8.2		воттом
265.7	81									
269.0	82									
272.3	83									
275.6	84									
278.9	85									
282.1	86									
285.4	87									
288.7	88									
292.0	89									
295.3	90									
298.6	91									
301.8	92									
305.1	93									
308.4	94									



SMUD In situ Monitoring in the Upper American River Stillwater Sciences Project and Chili Bar Project		SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project
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Page 1 of 1

Date: 4/30/18 Time: 1000

Reservoir - Water Quality Vertical Profiles

Lat/Long	(NAD83):	

Personnel: BTH + KKC

Secchi (ft): 33 단

Site Notes: Partly cloudy, cold, calm

Dep	pth	Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes
surf	ace	10.32	9.84	87.9	8.57	0.012	7.7	0.3		
3.3	1	10.27	9.85	87.8	8,5	0.012	7.4	0,4		
6.6	2	10.17	9.85	87.5	8.5	0.012	7.3	0.3		
9.8	3	10.11	9.82	87.2	8.4	0.012	7.23	0.3		
13.1	4	9.99	9.84	87.1	8.4	0.012	7.1	0.3		
16.4	5	9.46	9.97	87.4	8.2	0.012	7.1	0.3		
19.7	6	8.00	10.23	863	7.4	0.011	-7.1	0.3		
23.0	7	7.25	10.32	85.5	7.2	0.01	7.0	0.3		
26.2	8	6.43	10.48	85.2	7.1	0.01	6.9	0.4		
29.5	9	5.90	10.53	84.3	7.0	0,01	6.9	0.3		
32.8	10	5.70	lo .55	84.1	7.0	0.01	6.8	0.3		
36.1	11	5.54	10.54	83.7	7.2	0.011	6.8	0.3		
39.4	12	5.46	10.55	83.5	7.2	0.011	6.8	0.4		
42.7	13	5.30	10.55	83.2	7.2	0.012	6.7	0.3		
45.9	14	5.14	10.53	82.7	7.3	0.012	6.7	0.3		
49.2	15	5.03	10.40	82.1	7.2	0.012	6.7	0.4		
52.5	16	4.99	10.47	82.0	7.2	0.012	6.6	0.4		
55.8	17	4,99	10.44	81.7	7.2	0.012	6.6	0.4		
59.1	18	4.97	10.42	61.5	7.3	0.012	6.6	0.3		
62.3	19	4.92	10.39	81.2	7.2	0.012	6.5	0.4		
65.6	20	4.93	10.36	81.0	7.2	0.012	67	0.4		
68.9	21	4.87	10.31	80.4	7.2	0.012	67	0.4		
72.2	22	4.86	10.30	80.3	7.2	0.012	6.7	0.4		
75.5	23	4.85	10.2B	80.2	7.2	0,012	66	0.3		
78.7	24	4.85	10.27	80.0	7.3	0.012	6.7	0.4		
82.0	25	4.84	10.28	80.1	7.2	0.012	6.6	0.3		
85.3	26	4.84	10.27	80.0	7.2	0.012	6.6	0.4		BOTTOM
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



Time: 10:30 Time: 10:30 Reservoir - Water Quality Vertical Profiles Instrument used: EXO Water depth: 6804 Site Location: PARP - R - IS- 10 - IHR Lat/Long (NAD83): Personnel: BTH + KKC Site Notes: Perty choody, cold, calm	Caral Sciential Water Sciential			Monitoring in the roject and Chili		rican Rive	n Di	ate: _4/	of 1
Lat/Long (NAD83): Secchi (ft): Secchi			Reservo	bir - Water Qualit	y Vertical Pr	ofiles			
Personnel: BTH + KKC Secchi (ft): 33 f+				- IS- 10-	IHR	_			
Site Notes: Party chady, cold, calm							Se	cchi (ft):	33 [+
2 2	Site Note	es:Part	ty choody, a	old, calm					
	Depth				Specific				

Dep	th	Temp	DC	0	Conductivity	Conductance	pH	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surfa	808	10.34	9.87	88.2	8.5	0.012	6.9	0.4		
3.3	1	10.13	9.91	88.1	8.5	0.012	7.0	0.4		
6.6	2	10.05	9.91	0.80	8.5	0.012	7.0	0.3		
9.8	3	9.97	9.93	87.9	8.5	0.012	6.9	0.3		
13.1	4	9.92	9.92	87.6	8.4	0.012	6.9	0.3		
16.4	5	9.61	10.01	87.7	8.2	0.012	6.9	0.3		
19.7	6	9.13	10.20	88.5	8.0	0.012	6.9	0.4		
23.0	7	8:57	10.27	87.9	7.7	0.01	6.9	0.3		
26.2	8	7.73	10.40	87.0	7.3	0.011	6.9	0.3		
29.5	9	7.27	10.37	86.0	7.2	0.011	6.9	0.3		
32.8	10	7.04	10.41	85.B	7.3	0.01	6.8	6.4		
36.1	11	6.79	10.44	25.5	7.3	0.011	6.8	0.3		
39.4	12	6.33	10.51	85.0	7.4	0,011	6.8	0.3		
42.7	13	6.12	10.54	85.0	7.4	0.012	6.8	0.3		
45.9	14	5.9B	10.52	84.4	7.4	0.02	6.8	0.3		
49.2	15	5.70	10.50	83.7	7.4	0.012	6.7	0.4		
52.5	16	5.55	10.43	82.8	7.3	0.012	6.7	10.23		BOTTOM
55.8	17									
59.1	18									
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



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SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

Site Location: UARP - R-IS - 11 - IHR Lat/Long (NAD83):

Date: 4/36/18 Time: 1100

Page 1 of 2

Water depth: 110 ft

Secchi (ft): 34 A.

Personnel: BTH + KKC

Site Notes: Partly cloudy, cold, Slight breeze

Dep	pth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	NOTES
surf	ace	10,34	9.96	88.9	8.6	210.0	6.9	0.4		
3.3	1	9.90	9.99	88.3	8.5	0.012	6.9	0.3		
6.6	2	9.74	10.00	88.0	8.4	0.012	6.9	0.3		
9.8	3	9.69	10.00	87.9	8.4	0.02	6.9	0.3		
13.1	4	9.67	10.00	87.9	8.4	0.012	6.9	0,3		
16.4	5	9.66	9.99	87.8	8.4	0.012	6.9	0.3		
19.7	6	9.45	9.99	87.5	8.3	0.012	6.8	0.4		
23.0	7	8.67	10.20	88.0	8.2	0.012	6.9	0.4		
26.2	8	7.55	10.48	87.5	7.9	0.012	6,8	0.4		
29.5	9	7012	10.53	87.1	7.7	0.012	6.8	0.3		
32.8	10	6.40	10.62	86.1	7.5	D.d2	6.8	0.4		
36.1	11	6.40	10,59	85.1	7.4	0.012	6.8	0.4		
39.4	12	5.92	10.58	84.8	7.4	0.012	6.7	0.4		
42.7	13	5.54	10.54	83.6	7.3	0.012	6.8	0.4		
45.9	14	5.42	10.51	83.3	7.3	0.012	6.7	0.4		
49.2	15	5.42	10.52	83.2	7.3	0.012	6.7	0.4		
52.5	16	5.09	10.42	81.7	7.2	0.012	6.7	0.5		
55.8	17	5.06	10.41	81.6	7.2	D.012	6.6	0,3		
59.1	18	5.03	10.41	81.5	7.2	0.012	6.6	0.5		
62.3	19	4.90	10.36	80.9	7.1	0.012	6.6	0.4		
65.6	20	4.86	10.30	80.3	7.1	0.010	6.6	0.4		
68.9	21	4.85	10.28	80.2	7.1	0.012	6.6	0.5		
72.2	22	4.82	10.28	80.1	7.1	0.012	6.5	0.5		
75.5	23	4.79	10.27	80.0	7.1	0.012	6.5	0.5		
78.7	24	4.78	10.27	79.9	7.1	0.012	6.5	0.4		
82.0	25	4.78	10.26	79.9	7.1	0.012	6.5	0.5		
85.3	26	4.78	10.26	79.9	7.1	0.012	6.5	0.5		
88.6	27	4.77	10.26	79.0	7.1	0.012	6.5	0.3		
91.9	28	4.76	10.26	79.8	7.1	0.012	6.5	0.4		
95.1	29	4.76	10.25	79.8	7.1	0.012	6.5	0.5		
98.4	30	4.76	10.26	79.8	7.1	0.012	6.4	0.5		
101.7	31	4.75	10.25	79.7	7.1	0.012	6.4	0.4		
105.0	32	4,75	10.25	79.7	7.1	0.012	6.4	0.4		
108.3	33	4.74	10.25	79.6	7.1	0.012	6.4	0.5		
111.5	34	4.73	10.24	79.7	7.1	0.012	6.4	0.4		



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Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

Dep	oth	Temp	DC)	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	10103
						(CONTINUED))			
114.8	35	4.73	10.20	79.3	7.1	0.012	65	207.4		BOTTOM
118.1	36									
121.4	37									
124.7	38									
128.0	39									
131.2	40									
134.5	41									
137.8	42									
141.1	43									
144.4	44									
147.6	45									
150.9	46									
154.2	47									
157.5	48									
160.B	49									
164.0	50									
167.3	51									
170.6	52									
173.9	53									
177.2	54									
180.4	55									
183.7	56									
187.0	57									
190.3	58									
193.6	59									
196.8	60									
200.1	61									
203.4	62									
206.7	63									
210.0	64									
213.3	65									
216.5	66									
219.8	67									
223.1	68									
226.4	69									
229.7	70									
232.9	71									
236.2	72									



SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project	

Page 1 of 1

Date: 5/10/18 Time: 1400

Reservoir - Water Quality Vertical Profiles

Water depth: 55-64

Secchi (ft): _____

Site Location: <u>UARP-R-IS-12-JR</u> Lat/Long (NAD83): _____

Personnel: KKC, BTH

Site Notes: ______ chat, windy

Dep	pth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	notes
surf	ace	12.45	9.54	B9.4	11.9	0.06	7.0	0.2		
3.3	1	9.64	10.00	89.8	11.0	0.016	7.0	0.2		
6.6	2	7.40	10.38	86.4	0.0	0.015	6.9	0.2		
9.8	3	6.79	10.47	86.0	9.5	0.015	6.8	0.2		
13.1	4	6.57	10,50	85.7	9.4	0.015	6.8	0.2		
16.4	5	6.46	10.52	85.5	9.3	0.04	6.7	0.2		
19.7	6	3١, ما	0.52	85,2	8.8	0.014	6.7	0.2		
23.0	7	6.20	10.50	84.8	8.8	0.014	6.7	0.2		
26.2	8	6.21	(0.50	84.8	B.B	0.014	6.6	0.2		
29.5	9	6.10	10.50	84.5	8.7	0.04	6.6	0.3		
32.8	10	6.03	10.49	84.3	8.7	0.0.4	6.5	0.2		
36.1	11	6.02	10.46	84.0	8.7	0.014	6.5	0.2		
39.4	12	5.98	10,44	83.8	8.7	0.012	6.5	0.2		
42.7	13	5.95	10.41	83.5	8.7	0.014	6.5	0.2		
45.9	14	5.90	10.40	83.4	8.7	0.d4	6.4	0.3		
49.2	15	587	10.39	03.1	8.6	0.014	6.4	0.2		
52.5	16	5.84	10.37	83.0	8.6	0.014	6.4	0.2		
55.8	17	5.81	10,33	82.5	8.10	0.014	6.4	0.2		
59.1	18	5.79	10.31	82.4	8.6	0.014	6.4	1.1		BOTTOM
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



	ter Scie			Proje	hitoring in the oct and Chili Water Quality	Bar Project	D Ti	Page <u>1</u> of <u>1</u> Date: <u>5(10/18</u> Time: <u>0945</u>				
Ц	Site at/Long	e Location: (NAD83):	UAR	P-R-1	5-13-	CR	_	Wate		278		
		anel: <u>87</u> es: <u>5</u>						Se	ecchi (ft):	25 (+		
Dep	pth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes		
(ft)	(m)	80.1							Sample	110100		
	6.07	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample			
surf		6.84	(mg/L)	(%) 94.7	(μS/cm) 9.2	(mS/cn)	(s.u.) 7.2	(NTU)	Sample			
surf 3.3									Sample			
	face	6.84	11.54	94.7	9.2	0.014	7.2	0.2	Sample			
3.3	face 1	6.84	11.55	94.7 94.4 94.2	9.2	0.014	7.2 7.2 6.9	0.2				
3.3 6.6	face 1 2	6.73 6.73 6.73 6.73	11.54	94.7 94,4	9.2 9.(9.1	0.014 0.014 0.014	7.2 7.2 6.9	0.2 0.2 0.2 0.3				
3.3 6.6 9.8	face 1 2 3	6.84 6.73 6.73	11.54 11.55 11.57 11.50	94.7 94.4 94.2 94.2	9.2 9.1 9.1	0.014 0.014 0.014 0.014 0.014	7.2 7.2 6.9 6.9 6.8	0.2 0.2 0.2 0.3 0.2				
3.3 6.6 9.8 13.1	face 1 2 3 4	6.84 6.73 6.73 6.73 6.73	11.55 11.55 11.50 11.50 11.48	94.7 94.4 94.2 94.2 94.2 94.1	9.2 9.(9.1 9.2	0.014 0.014 0.014 0.014	7.2 7.2 6.9	0.2 0.2 0.2 0.3				
3.3 6.6 9.8 13.1 16.4	face 1 2 3 4 5	6.84 6.73 6.73 6.73 6.73 6.73 6.74	11.55	94.7 94.4 94.2 94.2 94.1	9.1 9.1 9.1 9.1 9.1 9.1 9.1	0.014 0.014 0.014 0.014 0.014 0.014	7.2 7.2 6.9 6.9 6.8 6.7	0.2 0.2 0.2 0.3 0.2 0.2		ROTTOM		
3.3 6.6 9.8 13.1 16.4 19.7	face 1 2 3 4 5 6	6.84 6.73 6.73 6.73 6.73 6.74 6.74	11.54 11.55 11.55 11.50 11.50 11.48 11.48 11.47	94.7 94.4 94.2 94.2 94.2 94.0 73.8		0.04 0.04 0.04 0.04 0.04 0.04 0.04 0.04	7.2 7.2 6.9 6.9 6.9 6.7 6.7	0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2		ROTTOM		
3.3 6.6 9.8 13.1 16.4 19.7 23.0	face 1 2 3 4 5 6 7	6.84 6.73 6.73 6.73 6.73 6.74 6.74	11.54 11.55 11.55 11.50 11.50 11.48 11.48 11.47	94.7 94.4 94.2 94.2 94.2 94.0 73.8		0.04 0.04 0.04 0.04 0.04 0.04 0.04 0.04	7.2 7.2 6.9 6.9 6.9 6.7 6.7	0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2		BOTTOM		

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27 88.6 91.9 28 29 95.1

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32 105.0

33 108.3 111.5 34

36.1

39.4

42.7

45.9

49.2

52.5

55.8

59.1

62.3

65.6

68.9

72.2

75.5 78.7 24 25

82.0

85.3

101.7

D-45



(@230)	SMUD In situ Monitoring in the Upper American River	Pag
Stillwater Sciences	Project and Chill Bar Project	Date
	Reservoir - Water Quality Vertical Profiles	Time

ge_l_ of _/_ e: <u>5/2/2018</u> e: <u>1243</u>

Secchi (ft): 23

Instrument used: YSI EXO Water depth: 31 FF

R-15-14-5C Site Location: Lat/Long (NAD83):

Personnel: EES BTH

Site Notes: None; partly cloudy, windy, cool

Dep	oth	Temp		0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	notes
surf	ace	7.95	11.79	99.6	19,4	0.029	6.9	18		
3.3	1	7,76	11.82	99,3	19.1	0.028	6.9	1.7		
6.6	2	7.64	11,84	99.0	18.9	0.028	6.9	1.8		
9.8	3	7.68	11.82	99.0	19.0	0.028	6.9	1.7		
13.1	4	7.60	11.81	98.7	18.9	0.028	6.9	1.5		
16.4	5	7,57	11.78	98.5	18.7	0.028	6.9	1.8		
19.7	6	7,50	11.79	98.3	18.6	0.028	6.9	1.3		
23.0	7	7.44	11.78	98.2	18.4	0.078	6.9	1.3		
26.2	8	7,39	11.80	98.1	18.3	0.028	6.9	1.3		
29.5	9									BOTTOM
32.8	10									
36.1	11									
39.4	12									
42.7	13									
45.9	14									
49.2	15									
52.5	16									
55.8	17									
59.1	18									
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



_	ater Sci		SMUD /	D Ti	Date: 2 m4-1 2018 Time: 1330					
			8		~ ~			Instrume	int used:	751 5x0
1	Sit at/Loo/	e Location: g (NAD83):		2.12.2	55			Wate	er depth:	130 FL
-	ar con	g (IAADOS).						Se	cchi (ff)-	28 AL
F	Persor	nnel: 137	-H - E	55				00	com (ny.	
					0					
Sit	te Not	BS: per 3	1 y elor	× , ~,	-17					
Dep	pth	Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(μS/cm)	(mS/pm)	(s.u.)	(NTU)	Sample	
surf	ace	9.85	11.2	99.0	18.4	0.026	6.8	0.7		
3.3	1	9.83	11.18	98.7	18.4	0.026	6.9	0.7		
6.6	2	9.81	11.19	28.7	18.3	0.026	6.9	0.7		
9.B	3	9.75	11.20	98.6	/8.3	0.026	6.9	ə.q		
13.1	4	9.74	11.23	98.4	18.2	0.026	7.0	0.8		
16.4	5	9.07	11.24	97.4	17.9	0.026	7.0	0.7		
19.7	6	8.88	11.30	57.5	17.7	0.026	7.6	0.8		
23.0	7	8.76	11.3)	97.Z	17.6	0.026	7.0	0.7		
26.2	8	8.76	11.30	97.Z	17.6	0.024	7.0	0.8		
29.5	9	8.69	11.3	97.2	17.6	0.026	7.0	0.7		
32.8	10	3. 39	11.40	97.2	17.2/	0.026	7.0	0.7		
36.1	11	8.34	11.44	97.5	17.2	0.026	7.0	0.7		
39.4	12	8.30	71.48	97.5	17.2	0.026	7.0	0.5		
42.7	13	8.24	11.51	97.8	17.2	0.026	7.0	0.6		
45.9	14	8.20	11.51	97.7	17.2	0.025	7.0	0.6		
49.2	15	8.19	11.51	97.6	17.2	0.025	7.0	0.6		
52.5	16	8.19	11.48	97.5	17.2	0.025	7.0	0.6		
55.8	17	8.14	11.77	97.2	17.2	0.025	7.0	0.6		
59.1	18	8.03	11.48	97.0	1-7. Z	0.025	730	0.6		
62.3	19	7.96	11.45	57.0	17.2	0.025	7.0	0.5		
65.6	20	7.93	11.47	56.8	17.1	0.+25	7.0	0.6		
68.9	21	7.93	11.48	56.7	17.2	0.025	7.0	0.6		
72.2	22	7.92	11.47	56.7	17.1	0.025	7.0	0,6		
75.5	23	7.89	11.47	96.4	17.1	0.025	7.0	2.6		
78.7	24	7.89	11.46	96.5	17.1	2.025	7.0	0.7		
82.0	25	7.90	11.46	96.5	17.1	0.025	7.0	0.7		
85.3	26	7.90	11.46	96.5	17.1	0.025	7.0	0.7		
88.6	27	7.90	11.47	96.7	17.1	0.025 /	7.0	0.6		
91.9	28	7.86	11.47	96.5	17.1	0. 025	7.0	0.7		
95.1	29	7.88	11.46	56.5	17.1	0.025	7.0	0.7		
98.4	30	7.86	11.47	56.5	17.1	0.025	7.0	0.9		
01.7	31	7.85	11.48	96.5	7.1	0.025	7.0	0.6		
105.0	32	7.85	11.47	56.5	17.1	0.025	7.0	0.8		

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Stillwater Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Page | of | Date: 10/23/18 Time: 10:30 Pm

Instrument used: YS1 6920 Water depth: 73 ft.

Secchi (ft): 24

Reservoir - Water Quality Vertical Profiles

Site Location: R-IS-1-LL Lat/Long (NAD83):

Personnel: BTH + BRL

Site Notes:

Dep	th	Temp	D	D	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surfa	ace	8.83	9.05	77.9	8	0.011	5.88	3.6		
3.3	1	8.81	9.04	77.8	8	0.011	5.85	3.6		
6.6	2	8.79	9.02	77.6	8	0.011	5.84	3.6		
9.8	3	8.76	9.02	77.5	8	0.011	5.88	3.6		
13.1	4	8.74	9.00	77.4	8	0.011	5.89	3.6		
16.4	5	8.72	9.00	77.3	8	0.011	5.91	3.6		
19.7	6	8.67	8.99	77.1	8	0.01	5.93	3.6		
23.0	7	8.57	9.02	77.2	8	0.011	5.96	3.6		
26.2	8	8.56	9.00	77.0	8	0.011	5.99	3.5		
29.5	9	8.52	9.00	76.9	8	0.011	6.03	3.5		
32.8	10	8.50	9.00	76.9	8	0.011	6.03	3.5		
36.1	11	8.45	8.99	76.8	8	0.011	6.06	3.5		
39.4	12	8.44	8.98	76.5	8	0.011	6.08	3.5		
42.7	13	8.43	8.96	76.4	8	0.011	6.06	3.5		
45.9	14	8.41	8.95	76.3	8	0.01	6.06	3.5		
49.2	15	8.40	8.94	76.1	8	0.011	6.11	3.5		
52.5	16	8.39	8.93	76.1	8	0.011	6.08	3,5		
55.8	17	8.38	8.91	75,9	8	0.011	6.11	3.5		
59.1	18	8.38	8.91	75.9	8	0.011	6.11	3.5		
62.3	19	8.37	8,91	75.9	8	0.011	6.15	3.5		
65.6	20	8.36	8.84	75.3	8	0.011	6.1	3.5		
68.9	21	8.36	8.81	75.1	8	0.011	6.12	3.5		
72.2	22	8.36	8.79	74.9	8	0.011	6.13	3,5		
75.5	23	8.36	8,78	74.8	8	0.011	6.18	3.5		
78.7	24	8.35	8.77	74.1	8	0.011	6.14	3.4		
82.0	25	8.33	8.58	71.3	8	0.011	6.17	830.0		Bottom
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32			1						
108.3	33									
111.5	34									



control of the second s		SMUD /		nitoring in th act and Chili		erican Riv	er		_ of <u>1</u> <u>/23/18</u> 11:00 AM
				Water Quali	ty Vertical P	rofiles			
Lat/L	Site Location: ong (NAD83):	R-15	- 2-LL			_			YSI 6920 80 Ft.
Per	sonnel: B	TH + B	RL				Se	cchi (ft):	25
Site N	Notes:								
Depth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft) (r	n) (°C)	(mg/L)	(%)	(µS/cm)	(mS/am)	(s.u.)	(NTU)	Sample	

Depai		remp	00		Conductivity	Conductance	pri rurbidity		Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/am)	(s.u.)	(NTU)	Sample	
surface		8.72	9.52	81.6	8	0.011	7.56	3.4		
3.3	1	8.71	9.34	80.1	8	0.011	7.51	3.4		
6.6	2	8.70	9.24	79.2	8	0.011	6.50	3.5		
9.8	. 3	8.67	9.09	78.0	8	0,011	6.50	3.4		
13.1	4	8.66	9.07	77.8	8	0.011	6.35	3.5		
16.4	5	8.65	9.03	77.5	8	0.01	6.39	3.5		
19.7	6	8,63	9.02	77.3	8	0.011	6.36	3.5		
23.0	7	8.60	9.01	77.2	8	0.011	6.28	3.5		
26.2	8	8.59	9,00	77.1	8	0.011	6.33	3,5		
29.5	9	8.59	8.99	77.0	8	0.011	6.31	3.5		
32.8	10	8.59	8.99	77.0	8	0.01)	6.30	3.3		
36.1	11	8.58	8.96	76.7	8	0.011	6.31	3.5		
39.4	12	8.28	8.95	76.1	8	0.011	6.27	3.5		
42.7	13	8.58	8.94	76.5	8	0.011	6.24	3.5		
45.9	14	8.58	8.92	76.4	8	0.01	6.26	3.6		
49.2	15	8.58	8.92	76.4	8	0.011	6.25	3,5		
52.5	16	8.58	8.90	76.3	8	0.011	6.22	3.5		
55.8	17	8.58	8.92	76.3	8	0.011	6.23	3.5		
59.1	18	8.58	8.89	76,1	8	0.011	6.24	3.5		
62.3	19	8.57	8.87	75.9	8	0.011	6.24	3.5		
65.6	20	8.57	8.87	75.9	8	0.011	6.23	3,5		
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



Stillwater Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

Reservoir - Water Quality Vertical Profiles

Page _ of _ Date: 10/23/18 Time: 11:21 Am

Water depth: ______36 ft.

Secchi (ft): ______

Site Location: <u>R - IS - 3 - LL</u> Lat/Long (NAD83):

Personnel: BTH + BRL

Site Notes:

Depth		Temp	DO		Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes
surface		8.60	9,67	82.6	8	0.011	6.64	3.2		
3.3	1	8.58	9.50	81.3	8	0.011	6.64	3.3		
6.6	2	8.57	9.39	80.3	8	0.011	6.58	3.3		
9.8	3	8.52	9:30	79.6	8	0.011	6.52	3.3		
13.1	4	8.51	9.26	79.1	8	0.011	6.46	3.4		
16.4	5	8.50	9.21	78.7	8	0.011	6.44	3.5		
19.7	6	8.49	9.17	78.3	8	0.011	6.47	3.4		
23.0	7	8,48	9,14	78.0	8	0.0/1	6.43	3.4		
26.2	8	8.47	9,11	77.8	8	0.011	6.42	3.4		
29.5	9	8.45	9.09	77.6	8	0.011	6.45	3.5		
32.8	10	8.43	9.09	77.5	8	0.011	6.37	3.5		
36.1	11	8.37	9.00	76.7	8	0.011	6.4	257.3		Bottom
39.4	12									
42.7	13									
45.9	14									
49.2	15									
52.5	16									
55.8	17									
59.1	18									
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	- 30									
101.7	31								~ ~	
105.0	32									
108.3	33									
111.5	34									



Stillwa			R	Proje eservoir -	nitoring in th ct and Chili Water Qualit	Bar Project	D Ti	ate: / 0 me: / 0	or 1 <u>26/18</u> <u>2:15</u> <u>YST 69</u> 20 <u>26 FE</u>	
					vind				19 ft	
			1	//						
Dep	th	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surfa	асе	7.70	9,52	79.9	13	0.019	5.84	3.8		
3.3	1	7.56	9.54	79.7	13	0.019	5,86	3.8		
6.6	2	7.52	9.54	29.6	12	0.018	5.89	3.9		
9.8	3	7,48	9,51	79,2	12	0,018	5.94	3,9		
13.1	4	7.39	9.50	79.1	12	0.017	5.99	3.8		
16.4	5	7.33	9.55	79.4	11	0.017	3.99	3.8		
19.7	6	7.23	9.61	79.6	11	0.017	6.02	3.8		
23.0	7	7.14	9.62	79,2	11	0.017	6.02	3.8		
26.2	8	6.63	9,65	78,7	10	0.016	6.01	3.8		
29.5	9									
32.8	10									
36.1	11								<u> </u>	
39.4	12								-	
42.7	13 14									
45.9	14								<u> </u>	
49.2	15		<u> </u>	<u> </u>	<u> </u>		<u> </u>		<u> </u>	
52.5	17				<u> </u>				<u> </u>	
55.8	18						<u> </u>			
59.1	19									
62.3 65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



Stillwater Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Page _ _ of _

Date: 10-24-18 Time: 1005

Reservoir - Water Quality Vertical Profiles

Instrument used: <u>√5/6920</u> Water depth: <u>23.9 + +</u>

Site Location: <u>パートS- S- u v p</u> Lat/Long (NAD83):

Personnel: BT4 + SP K

Secchi (ft): 29 4+

Site Notes: clear steres, no wind

Dep	oth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/am)	(s.u.)	(NTU)	Sample	
surf	808	12,80	8.60	81.1	13	0.017	4.00	2.9		
3.3	1	1272	8.57	80.8	13	0.017	6.23	3.3		
6.6	2	12.64	8.56	805	13	0.017	6.25	3.4		
9.8	3	12,59	8.55		13	0,017	6.18	3.3		
13.1	4	12.54	8.55-		13	0.017	6.15	3.3		
16.4	5	12.50			13	0.07	6.15	3.2		
19.7	6	12.46	8.53	79.9	13	0.017	6.17	3.2		
23.0	7	12.41	8.52	79.8	13	0.017	6.16	3.2		
26.2	8	12.32	8.47	79.0	13	0.017	6.17	37.8		BOTTOM
29.5	9									
32.8	10									
36.1	11									
39.4	12									
42.7	13									
45.9	14									
49.2	15									
52.5	16									
55.8	17									
59.1	18									
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



Stillwater Sci			<i>n situ</i> Mo Proj eservoir -	erican Riv	Date: <u>10-24-18</u> Time: <u>1100</u>				
Lat/Lon Perso	g (NAD83): nnel: <u>13 T</u>	R-15	- 6 - U PK	ν β.			Wate	er depth:	<u>VSI 6920</u> 85 ft 27
Depth	Temp		0	Conductivity	Specific Conductance	рН	Turbidity	Water	
(ft) (m)	(°C)	(mg/L)	(%)	(μS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes

_						Conductance			Sample	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surf	ace	13.11	9.85	93.7	13	0.014	6.67	3.2		
3.3	1	12.98	8.88	84.0	13	0.016	6.76	3.2		
6.6	2	12.92	8.68	82.1	13	0.016	6.67	3.2		
9.8	3	12.88	8.58	81.2	13	0.016	6.68	3.2		
13.1	4	12 3 8	8.52	80.6	13	0.016	6.60	3.3		
16.4	5	12.87	8.48	80.Z	(3	0.016	6.63	3.3		
19.7	6	12.86	8.45	79.9	13	0.016	6.60	3.3		
23.0	7	1286	8.42	79.6	13	0.016	6.60	3.3		
26.2	8	12.85	8.38	79.2	13	0.016	6.54	3.3		
29.5	9	12,85	8.36	79.0	13	0.016	6.60	3.3		
32.8	10	12.85	836	79.0	13	0.016	6.57	3.3		
36.1	11	12.84	8.35	78.9	/3	0.016	6.60	3.3		
39.4	12	12.84	833	78.7	13	0.016	6.56	3.3		
42.7	13	12.83	8.72	78.6	13	0.016	6.52	3.3		
45.9	14	12.83	8.30	78.5	13	0.016	6.49	3.3		
49.2	15	12.83	8.29	78.4	13	0.016	6.51	3.3		
52.5	16	12.83	8.27	78.2	13	0.016	6.48	3.3		
55.8	17	12,82	8.26	78.1	13	0.016	6.46	3.3		
59.1	18	12.82	8.26	78.0	13	0.016	6.46	33		
62.3	19	12,82	8.24	77.9	13	0.016	6.44	3.4		
65.6	20	12.82	8.24	77.9	13	0.016	6.44	3.4		
68.9	21	12.82	8.23	77.7	13	0.016	6.47	3.3		
72.2	22	12.81	8.21	77.5	13	0.016	6.45	3.3		
75.5	23	12.81	8.21	77.6	12	0.016	6.44	3.3		
78.7	24	12.81	8.20	77.5	12	0.016	6.45	3.		
82.0	25	12.80	8.18	77.3	12	0.016	6.44	3.4		
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



Stillwater Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project Page /___ of /___

Date: <u>10 - 24 - / 8</u> Time: <u>103 0</u>

Reservoir - Water Quality Vertical Profiles

Instrument used: <u>Y5/ 6 92 0</u> Water depth: <u>984 +</u>

Secchi (ft): 25 4+

Lat/Long (NAD83): Personnel: BTH + SPK

Site Location: R-15-7 - UVR

Site Notes: clar skill, NO wind

Dep	oth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	Notes
surf	ace	13.03	9.98	94.8	13	0.017	6.72	3.4		
3.3	1	13.00	8.85	83.7	13	0.017	6.73	3.3		
6.6	2	12.97	8.70	82.4	/3	0.017	6.63	3.3		
9.8	3	12.97	8.61	81.6	13	0.017	6.57	3.3		
13.1	4	12,95	8.53	80.8	13	0.017	6.58	3.3		
16.4	5	12.93	8.49	80.4	13	0.017	6.58	3.3		
19.7	6	12.92	8.45	80.0	13	0.017	6.67	3.4		
23.0	7	12.92	8.42	79.7	13	0.017	6.61	3.4		
26.2	8	12.92	8.40	79.5	13	0.017	6.58	3.4		
29.5	9	12.9z	8.38	79.3	13	0.017	6.50	3.3		
32.8	10	12.91	8.37	79.3	13	0.017	6.53	3.3		
36.1	11	12.91	4,37	79.3	13	0.017	6.47	3.3		
39.4	12	12.91	8.34	79.0	13	0.017	6.48	3.3		
42.7	13	12.91	8.32	78.8	13	0.017	6.50	3.3		
45.9	14	12.91	8.31	78.7	13	0.017	6.43	3.4		
49.2	15	12.90	8.28	78.4	13	0.016	6.44	3.3		
52.5	16	12,89	8.27	78.3	13	0.016	6.46	3.2		
55.8	17	12.89	8.2.6	78.2	13	0.016	6.46	3.4		
59.1	18	12.87	8.26	78.1	13	0.016	6.41	3.4		
62.3	19	12.87	8.24	78.0	13	0.016	6.44	3.2		
65.6	20	12.86	8.24	77.9	13	0.016	6.43	3.3		
68.9	21	12.86	8.23	77.8	13	0.016	6.42	3.3		
72.2	22	12.86	4.22	77.8	13	0.016	6.41	3.3		
75.5	23	12.86	8.22	77.8	13	0.016	6.41	3.4		
78.7	24	12.81	8.19	77.3	13	0.016	6.40	3.3		
82.0	25	12,79	8.13	76.8	13	0.016	6.39	3.3		
85.3	26	1278	811	76.6	13	0.016	6.34	3.3		
88.6	27	12.77	8.09	76.3	13	0.016	6.38	3.2		
91.9	28	12.71	8.07	75.9	13	0.016	6.35	3.3		
95.1	29	12.44	7.80	72.4	12	0.016	6.34	3.2		
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



(Ce 20)	
Stillwater Sciences	

SMUD In situ Monitoring in the Upper American River
Project and Chili Bar Project

Page <u>1</u> of <u>3</u> Date: <u>10-24-1</u>8 Time: <u>1130</u>

Reservoir - Water Quality Vertical Profiles

Site Location: <u>P-15-8 - UV R</u> Lat/Long (NAD83):

Secchi (ft): __3 \

Site Notes: clear skies, no wind

Personnel: BTH + SPL

Dep	oth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surfa	ace	13.12	9.78	13.0	12	0.016	6.74	3.3		
3.3	1	13.07	8.97	85.0	12	0.016	6.74	3.0		
6.6	2	12.90	8.74	827	12	0.016	6.73	3.0		
9.8	3	12.90	8.62	81.5	12	0.016	6.67	3.0		
13.1	4	12.87	8.53	80.6	12	0.016	6.64	3.1		
16.4	5	12.86	8.46	80.0	12	0.016	6.59	2.9		
19.7	6	12.86	8.42	79.6	12	0,016	6.56	31		
23.0	7	12.84	8.37	79.2	12	0.016	6.51	3./		
26.2	8	12.84	8.35	79.0	12	0.016	6.47	3.3		
29.5	9	12.84	8.33	787	12	0.016	6.50	3.3		
32.8	10	12.84	8.31	786	12	0.016	6.47	3.3		
36.1	11	12.84	8.29	78.4	12	0.016	6.49	3.3		
39.4	12	12.54	8.23	77.9	12	0.016	6.53	34		
42.7	13	12.84	8.22	77.7	12	0.016	6.47	3.4		
45.9	14	12.84	8.22	77.8	12	0.06	6.47	3.4		
49.2	15	12.84	8.21	77.6	12	0.016	6.41	3.3		
52.5	16	12.84	8.20	77.6	12	0.016	6.43	3.3		
55.8	17	12.84	8.20	77.5	12	0.016	6.42	3.3		
59.1	18	12.83	8.19	77.4	12	0.016	6.44	3.3		
62.3	19	12.83	8.18	77.3	12	0.016	6.43	3.3		
65.6	20	12.83	816	77.Z	12	0.016	6.44	3.3		
68.9	21	12.83	8.17	77.Z	12	0.016	6.43	3.3		
72.2	22	12.83	8.14	77.0	12	0.016	6.41	3.4		
75.5	23	12.83	8.13	76.9	12	0.016	6.45	3.3		
78.7	24	12.82	8.12	76.8	12	0.016	6.42	3.3		
82.0	25	12.82	8.11	76.6	12	0.016	6.43	3.4		
85.3	26	12.80	8.10	76.5	12	0.016	6.42	3.4		
88.6	27	12.77	807	76.2	12	0.016	6.43	33	<u> </u>	
91.9	28	12.75	8.0b	76.0	12	0.016	6.40	3.3		
95.1	29	12.69	802	75.2	12	0.016	6.40	3,3	<u> </u>	
98.4	30	1238	18.9	73.4	12	0.016	6.33	3.4		
101.7	31	12.01	1.70	69.2	1(0.0 6	6.39	3,4		
105.0	32	10.34	7.40	65.8	1	0.0 5	6.22	3.5		
108.3	33	10,24	7.42	66.0	11	0.016	6.15	3.5		
111.5	34	9.92	1.26	64.1	U	0,0 6	6.13	3.5		



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Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

Dep	th	Temp	D	D	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
						(CONTINUED)			
114.8	35	9.67	7.13	62.5	1/	0.016	6.11	3.5		
118.1	36	9.36	7.17	625	11	0.015	6.11	3.5		
121.4	37	9.33	7.19	62.6	11	0.016	6.08	3.5		
124.7	38	9.18	7.18	62.2	(1	0.016	6.10	3.5		
128.0	39	8.85	7.18	61.8	11	0.016	6.(2	3.5		
131.2	40	8.64	7.18	61.5	1(0.016	6.13	3.5		
134.5	41	8.57	7.15	61.2	11	0.016	6.09	3.5		
137.8	42	8.47	7.18	61.3	11	0.015	6.10	3.5		
141.1	43	8.39	7.21	61.3	ŋ	0.015	6.09	3.4		
144.4	44	8.27	7.23	61.4	10	0.015	604	3.4		
147.6	45	8.14	7.24	61.3	10	0.015	6.06	3.5		
150.9	46	8.08	7.26	61.4	10	0.015	6.06	3.4		
154.2	47	7.96	7.26	61.1	10	0.015	6.06	35		
157.5	48	7.88	7.20	60.6	10	0.015	6.04	3.4		
160.8	49	7.77	7.14	599	10	0.015	6.04	3.4		
164.0	50	7.69	7.13	59.8	10	0.015	6.03	3.5		
167.3	51	7.69	7.13	59.8	10	0.015	6.02	3.5		
170.6	52	7.55	7.07	59.0	10	0.015	6.00	3.4		
173.9	53	7.44	7.10	59.1	10	0.016	6.02	3.4		
177.2	54	7.27	7.04	58.2	10	0.016	6.00	3.4		
180.4	55	7.19	6.94	57.4	10	0.016	6.01	3.4		
183.7	56	7.10	6.86	56.6	10	0.016	6.00	3.4		
187.0	57	6.98	676	\$5.7	10	0.016	6.02	3.4		
190.3	58	6.82	6.67	546	10	0.016	5.98	3.4		
193.6	59	6.73	6.59	53.8	10	0.016	5.99	3.4		
196.8	60	6.51	6.53	53.0	10	0.06	6.00	3.3		
200.1	61	5.78	6.45	51.5	10	0.016	6.00	3.2		
203.4	62	5.35	6.43	50.9	10	0.016	5.98	3,3		
206.7	63	4.85	6.55	513	10	0.016	6.02	5.3		
210.0	64	4.69	656	50.9	10	0.016	6.01	3.2		
213.3	65	4.27	6.69	51.4	10	0.0/6	6.02	3.2		
216.5	66	4.08	6.86	52.5	10	0.016	6.03	3.2		
219.8	67	3.94	6.97	53.1	10	0.016	6.06	3.2		
223.1	68	3.88	7.00	53.2	10	0.016	5.99	3.(
226.4	69	3.83	7.01	53.2	10	0.016	6.01	3.1		
229.7	70	3.81	7.02	53.3	10	0.016	6.00	3.2		
232.9	71	378	7.05	53.4	10	0.016	6.02	3.1		
236.2	72	3.76	7.05	53.5	10	0.016	6.01	3.1		



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Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

Dep	th	Temp	D	D	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
10212	12185		1303(3)(1)			(CONTINUED))			
239.5	73	3.75	7.08	53.7	10	0.016	6.01	3.2		
242.8	74	3.73	7.08	53.7	10	0.016	6.03	3.1		
246.1	75	3.72	7.09	53.7	10	0.016	6.04	32		
249.3	76	3.71	7.07	53.5	10	0.016	6.05	3.2		
252.6	77	3.70	7.06	53.4	10	0.017	6.04	3.1		
255.9	78	3.70	7.04	533	10	0.017	6.01	3.1		
259.2	79	3.70	7.04	53.3	10	0.017	6.02	3.1		
262.5	80	3.68	6.98	52.7	10	0.017	6.03	3.1		
265.7	81	3.67	6.94	52.4	10	0.017	6.03	3.0		
269.0	82	3.66	6.90	52.1	10	0.017	6.04	31		
272.3	83	3.66	6.84	51.7	10	0.017	6.04	3.0		
275.6	84	3.65	6.75	510	10	0.017	6.03	3.0		
278.9	85	3.65	6.64	50.1	10	0.017	6.03	3.0		
282.1	86	3.65	6.59	49.8	10	0.017	6.03	3.0		
285.4	87	3.65	6.37	48.1	10	0.018	6.05	2.9		
288.7	88	3.65	6.38	48.2	11	0.018	6.02	2.9		
292.0	89	3.65	6.38	48.1	11	0.018	6.02	2.7		
295.3	90	3.65	6.24	47.1	11	0.018	6.03	2.7		
298.6	91	3.65	6.11	46.1	11	0.019	6.06	2.6		
301.8	92	3.65	6.06	45.7	1	0.019	6.05	2.7		
305.1	93									
308.4	94									



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(Car)	SMUD In situ Monitoring in the Upper American Rive	r Page / of /
Stillwater Sciences	Project and Chili Bar Project	Date: 10/22/1 Time: 11:21
	Reservoir - Water Quality Vertical Profiles	
Site Location:	R-IS-9-IHR	Water depth: 28 ft.

Lat/Long (NAD83):

Personnel: BTH + BRL

YSI 6920 28 A.

Secchi (ft): 16

Site Notes: Sunny, no breeze

Dep	th	Temp	D	D	Conductivity	Specific Conductance	pН	Turbidity	Water Sample	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surfa	ace	11.09	8.55	77.7	11	0.015	7.07	1.1		
3.3	1	10.98	8.56	77.6	11	0.015	7.04	1.1		
6.6	2	10.83	8.55	77.2	11	0.015	7.05	0.9		
9.8	3	10.79	8.52	76.8	11	0.015	7.02	0.9		
13.1	4	10.77	8.50	76.6	11	0.015	6.99	0.9		
16.4	5	10,74	8.49	76.5	11	0.015	6.92	0.9		
19.7	6	10.70	8.49	76.4	11	0.015	6.85	0.7		
23.0	7	10.69	8.41	75.7	11	0.015	6.84	0.9		
26.2	8	10.67	8.37	75.3	- 11	0.015	6.80	0.8		
29.5	9									
32.8	10									
36.1	11									
39.4	12									
42.7	13									
45.9	14									
49.2	15									
52.5	16									
55.8	17									
59.1	18									
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



itillwa	ater Scie	nces		Proje	ct and Chili	Bar Project		D	ate: 10 ime: 11	/22/18
			R	eservoir -	Water Qualit	ty Vertical P	ofiles			
Ŀ	Sit at/Long	e Location: (NAD83):	R-15	- 10 - 11	HR			Wate	er depth:	YSI 6920
	Baraar	DOL RTI	1 + 00					Se	echi (ft):	_18
Si	te Note	es: <u>Su</u>	nny, ho	breeze	2					
			5,							
	_				1	Specific			1	1
Dep	pth	Temp	D	0	Conductivity	Conductance	pН	Turbidity	Water	Notes
Deg (ft)	pth (m)	Temp (°C)	D (mg/L)	0 (%)	Conductivity (µS/cm)		pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
	(m)			-		Conductance				Notes
(ft) surf	(m)	(°C)	(mg/L)	(%)	(µS/cm)	Conductance (mS/cm)	(s.u.)	(NTU)		Notes
(ft) surf 3.3	(m)	(°C) 1.3	(mg/L) 8.56	(%) 78.2	(µS/cm)	Conductance (mS/cm) 0.015	(s.u.) (j.81	(NTU)		Notes
(ft) surf 3.3 6.6	(m) face	(°C) 11.31 10.89	(mg/L) 8.56 8.62	(%) 78.2 78.1	(µS/cm) 	Conductance (mS/em) 0.015 0.015	(s.u.) 6.81 6.78	(NTU) 1.4 1.2 1.2		Notes
(ft) surf 3.3 6.6 9.8	(m) ace 1 2	(°C) 11.31 10.89 10.91	(mg/L) 8.56 8.62 8.62	(%) 78.2 78.1 77.9	(µS/cm) 	Conductance (mS/em) 0.015 0.015 0.015	(s.u.) 6.81 6.78 6.75	(NTU) 1.4 1.2 1.2 1.2		Notes
(ft) surf 3.3 6.6 9.8 13.1	(m) ace 1 2 3	(°C) 11.31 10.89 10.91 10.79	(mg/L) 8.56 8.62 8.62 8.63 8.63 8.64	(%) 78.2 78.1 77.9 77.9	(µS/cm) 	Conductance (mS/cm) 0.015 0.015 0.015 0.015	(s.u.) 6.81 6.78 6.75 6.75	(NTU) 1.4 1.2 1.2		Notes
(ft) surf 3.3 6.6 9.8 13.1 16.4	(m) [ace 1 2 3 4	(c) 11.31 10.89 10.91 10.79 10.76	(mg/L) 8.56 8.62 8.62 8.62 8.63	(%) 78.2 78.1 77.9 77.9 77.9 77.9	(μS/cm) 	Conductance (mS/cm) 0.015 0.015 0.015 0.015 0.015	(s.u.) 6.81 6.78 6.75 6.76 6.73	(NTU) 1.4 1.2 1.2 1.2 1.2		Notes
(ft) 3.3 6.6 9.8 13.1 16.4 19.7	(m) ace 1 2 3 4 5	(°C) 11.31 10.89 10.91 10.79 10.76 10.74	(mg/L) 8.56 8.62 8.62 8.63 8.63 8.64 8.62	(%) 78.2 78.1 77.9 77.9 77.9 77.9 77.9 77.7	(µS/cm) 	Conductance (mS/em) 0.015 0.015 0.015 0.015 0.015 0.015	(s.u.) 6.81 6.78 6.75 6.75 6.76 6.73 6.72	(NTU) 1.4 1.2 1.2 1.2 1.2 1.2		Notes Bottom
(ft)	(m) ace 1 2 3 4 5 6	(°C) 11.31 10.89 10.91 10.79 10.76 10.74 10.72	(mg/L) 8.56 8.62 8.62 8.63 8.63 8.64 8.62 8.62	(%) 78.2 78.1 77.9 77.9 77.9 77.9 77.9 77.4 77.4	(µS/cm) 	Conductance (mS/em) 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015	(s.u.) 6.81 6.78 6.75 6.76 6.73 6.73 6.72 6.72	(UTN) 1.4 1.2 1.2 1.2 1.2 1.2 1.2 1.2		
(ft) surf 3.3 6.6 9.8 13.1 16.4 19.7 23.0	(m) ace 1 2 3 4 5 6 7	(°C) 11.31 10.89 10.91 10.79 10.76 10.74 10.72	(mg/L) 8.56 8.62 8.62 8.63 8.63 8.64 8.62 8.62	(%) 78.2 78.1 77.9 77.9 77.9 77.9 77.9 77.4 77.4	(µS/cm) 	Conductance (mS/em) 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015 0.015	(s.u.) 6.81 6.78 6.75 6.76 6.73 6.73 6.72 6.72	(UTN) 1.4 1.2 1.2 1.2 1.2 1.2 1.2 1.2		

32.8	10					
36.1	11					
39.4	12					
42.7	13					
45.9	14					
49.2	15					
52.5	16					
55.8	17					
59.1	18					
62.3	19					
65.6	20					
68.9	21					
72.2	22					
75.5	23					
78.7	24					
82.0	25					
85.3	26					
88.6	27					
91.9	28					
95.1	29					
98.4	30					
101.7	31					
105.0	32					
108.3	33					
111.5	34					



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Stillwater	Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

Reservoir - Water Quality Vertical Profiles

Page _ of _ Date: 10/22/18 Time: 12:36

Water depth: 42.8

Secchi (ft): 18

Site Location: ______R - | S - II - 1 HR Lat/Long (NAD83): _____

Personnel: <u>BTH + BRL</u> Site Notes: <u>SUMNY, No brillize</u>

Deg	pth	Temp	D	0	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surt	ace	11.73	8.53	78.6	11	0.015	6.80	1.5		
3.3	1	11.34	8.54	77.8	11	0.015	6.7	1.3		
6.6	2	10.96	8.56	77.6	11	0.015	6.71	1.4		
9.8	3	10.79	8.57	77.3	11	0.015	6.69	1.3		
13.1	4	10.74	8.57	77.3	11	0.014	6.65	1.3		
16.4	5	10.73	8.56	77.1	11	0.014	6.64	1.3		
19.7	6	10.72	8,56	77.1	10	0.014	6.64	1.2		
23.0	7	10.66	8.54	76.8	10	0.014	6.67	1.0		
26.2	8	10.66	8.52	76.7	10	0.014	6.64	1.1		
29.5	9	10.65	8.52	76.6	10	0.014	6.62	1.3		
32.8	10	10.65	8.52	76.6	10	0.014	6.62	1.2		
36.1	11	10.63	8.53	76.2	10	0.014	6.58	1.3		
39.4	12	10.59	8.50	75.6	10	0.014	6.63	0.7		
42.7	13									
45.9	14									
49.2	15									
52.5	16									
55.8	17									
59.1	18									
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32								<u> </u>	
108.3	33									
111.5	34									



Stillwater Sciences

SMUD	In :	situ	Monito	ring in	the	Upper	American	River
		F	Project a	and Ch	ili B	ar Proj	ect	

Page / of / Date: 10/26/18 Time: 1230

Reservoir - Water Quality Vertical Profiles

Instrument used: <u>XSZ 6920</u> Water depth: <u>671</u>

Secchi (ft): 321

Site Location: R-IS - 12 - JR Lat/Long (NAD83): Personnel: BTH, ESB

Site Notes: Partly cloudy, no wind

Dep	th	Temp	D	D	Conductivity	Specific Conductance	рН	Turbidity	Water Sample	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surf	ace	8.15	10.59	89.8	11	0.016	6,03	4.2		
3.3	1	7.61	10,64	38.6	10	0.016	5.91	4.1		
6.6	2	7,24	10,68	38.5	10	0.016	5.89	4.1		
9.8	3	7.16	10.76	38.4	10	0,016	5.88	4.1		
13.1	4	7.06	10.74	88.5	10	0.016	5.91	4.1		
16.4	5	7.01	10,77	88.8	10	0.016	5,88	4.1		
19.7	6	6,98	10.84	89,2	10	0.016	5,98	4.1		
23.0	7	6,98	10,87	89.4	10	0,016	5.91	4.1		
26.2	8	6,98	10.87	89.5	10	0,016	5,91	4.1		
29.5	9	6,97	10.87	89,5	10	0,016	5.94	4.1		
32.8	10	6.97	10,84	89.3	10	0.016	5,93	4.1		
36.1	11	6,90	10.88	89.4	10	0.016	5,95	4.1		
39.4	12	6,90	10.38	89,4	10	0,016	5,94	4.1		
42.7	13	6.90	10.88	89.4	10	0.016	5.93	4.1		
45.9	14	6.89	10.88	29,4	10	0.016	5.93	4.1		
49.2	15	6.86	10.88	89.3	10	0.016	5.92	4.1		
52.5	16	6.85	10.86	89.2	10	0.016	5.93	4.1		
55.8	17	6.76	10.86	88.9	10	0.016	5.94	4.1		
59.1	18	6.66	10.84	87.9	11	0.016	5.98	4.1	<u> </u>	
62.3	19	6.08	10.81	87.0	11	0.017	6.02	0.9		
65.6	20									
68.9	21				L				<u> </u>	
72.2	22									
75.5	23								<u> </u>	
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28								-	
95.1	29	-							-	
98.4	30									
101.7	31									
105.0	32								-	
108.3	33								<u> </u>	
111.5	34									



Stillwater Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

Reservoir - Water Quality Vertical Profiles

Page / of / Date: 10/26/18 Time: 1420

Site Location: R-IS- 13-CR Lat/Long (NAD83):

Personnel:_BTH, ESB

Instrument used: <u>VSI - 6</u>920 Water depth: <u>22</u> Secchi (ft): ______

Site Notes:

Dep	oth	Temp	D	0	Conductivity	Specific Conductance	рН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/em)	(s.u.)	(NTU)	Sample	Notes
surf	ace	7.63	11.09	92.9	11	0.016	6,58	4.1		
3.3	1	7.22	11.34	94.0	10	0.016	6.22	4.0		
6.6	2	7,17	11.37	94.0	10	0.016	6.14	4.1		
9.8	3	7.10	11.38	94.0	10	0.016	6.13	4.1		
13.1	4	7.09	11.38	94.0	10	0.016	6.13	4.0		
16.4	5	7.09	11.38	94.0	10	0.016	6.10	4.0		
19.7	6	7,09	11.38	93.9	10	0.016	6.15	4.0		
23.0	7	7.08	11.38	94.0	10	0.016	6.15	29.8		Bottom
26.2	8									
29.5	9									
32.8	10									
36.1	11									
39.4	12									
42.7	13									
45.9	14									
49.2	15									
52.5	16									
55.8	17									
59.1	18									
62.3	19									
65.6	20									
68.9	21									
72.2	22									
75.5	23									
78.7	24									
82.0	25									
85.3	26									
88.6	27									
91.9	28									
95.1	29									
98.4	30									
101.7	31									
105.0	32									
108.3	33									
111.5	34									



	ter Scie		SMUD In		nitoring in th ect and Chili		erican Riv			of 1 -25-18
			Re	eservoir -	Water Quali	ty Vertical Pr	ofiles			
	0.4	Location	P - 1 5	- 14	- 50			Instrume	nt used:	4516920
La	at/Long	a (NAD83):	K-12	- 11	-se					
								Se	cchi (ft):	22 ++
F	Person	nel: 5 i	445	PL						
Sit	te Noti	ne des	r sleig		wind					
0.				1 100-0						
	_					Generality				
Dep	th	Temp	DC	0	Conductivity	Specific Conductance	рН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surf	ace	9.22	10.52	91.4	21	0.031	6.79	3.6		
3.3	1	9.21	10,5	913	21	0.031	6.72	36		
6.6	2	9.16	10.51	91.3	21	0.031	6.74	3.6		
9.8	3	9.13	10.52	91.2	21	0.030	6.74	3.6		
13.1	4	7.78	10.73	90.1	2/	0.032	6.76	3.36		
16.4	5	7.48	11.14	93.5	20	0031	6.76	3.5		
19.7	6	7.44	11.40	950	20	0.030	6.73	3.6		
23.0	7	7.35	11.60	965	20	0.030	6.72	3.6		
26.2	8	7.33	11.72	97.4	20	0.030	6.72	22.2		BOTTOM
29.5	9									
32.8	10									
36.1	11								<u> </u>	
39.4	12									
42.7	13								<u> </u>	
45.9	14									
49.2	15									
52.5	16								<u> </u>	
55.8	17									
59.1	18								-	
62.3	19									
65.6	20									
68.9	21								<u> </u>	
72.2	22									
75.5	23	1			1	1			1	1

 78.7
 24

 82.0
 25

 85.3
 26

 91.9
 28

 95.1
 29

 96.4
 30

 101.7
 31

 105.0
 32

 108.3
 33

 111.5
 34



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Stillwater	Sciences

SMUD In situ Monitoring in the Upper American River Project and Chili Bar Project

Reservoir - Water Quality Vertical Profiles

Date: 10-25-18 Time: 1220 Instrument used: Water depth: /2/ 4+

Secchi (ft): _18++

Page / of 2

Site Location: <u>*R* - 1 5 - 15 - 5C</u> Lat/Long (NAD83):

Personnel: BTH+ SPK

Site Notes: clear skies, light wind

Dep	th	Temp	DC)	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	Sample	
surf	асе	9.77	10.46	92.2	22	0.031	6.69	3.6		
3.3	1	9.33	10.47	91.2	21	0.080	6.72	3.5		
6.6	2	9.12	10.45	90.6	21	0.030	6.69	3.5		
9.8	3	9.10	10.45	90.6	21	0.020	668	3.5		
13.1	4	9.09	10.44	90.5	21	0.030	6.68	3.5		
16.4	5	9.03	10.45	90.4	21	0.030	6.67	3.5		
19.7	6	8.99	10.44	90.3	21	0.030	6.66	3.5		
23.0	7	8.97	10.43	90.2	21	0.030	6.65	3.5		
26.2	8	8.97	10.42	90.0	21	0.030	6.62	3.5		
29.5	9	8.95	10.41	89.9	21	0.030	6.62	3.4		
32.8	10	8.88	10.44	90.0	21	0.030	6.60	3.4		
36.1	11	8.61	10.43	89.4	20	0.030	660	3.3		
39.4	12	8.45	10.51	89.7	20	0.029	6-57	3.4	<u> </u>	
42.7	13	8.41	1057	902	20	0.029	6.56	3.4		
45.9	14	8.39	10.61	10.4	20	0.029	6.52	3.5		
49.2	15	8.37	10.64	90.6	20	0.029	6.54	3.4		
52.5	16	8.34	10.68	90.8	19	0.029	6.54	3.3		
55.8	17	8.32	10.68	90.9	19	0.028	6.52	5.4	<u> </u>	
59.1	18	8.30	10.69	90.9	19	0.028	6.50	3.4	<u> </u>	
62.3	19	8.28	10.71	11.0	19	0.028	6.50	3.3	<u> </u>	
65.6	20	8.25	10.73	91.2	19	0.028	6.50	3.3	<u> </u>	
68.9	21	824	10.74	91.3	19	0.028	6.50	3.3	<u> </u>	
72.2	22 23	4.23	10.75	91.4			6.49	3,3	-	
75.5		8.22	10,77	91.4	19	0,028	6.47	3.3		
78.7	24 25		10.77	9/.4	19	0.028	6.47	3.3	<u> </u>	
82.0	25	8.20	10.77	91.5	19		6.48	3.2	<u> </u>	
85.3	20	8.19	1079	11.	19	0.028	6.46	3.2		
88.6	28	8,18	1079	91.5	19	2029	6.47	3.2		
91.9	29	8.15	10.80	91.7	19	0.029	6.44	3.2		
95.1 98.4	30	8,11	10,83	91.7	19	0.028	6.48	3.1	-	
101.7	31	8.08	10.84	91.7	19	0.028	6.47	3.1		
101.7	32	8.04	10.85	91.7	19	0.028	6.44	3.0	<u> </u>	
105.0	33	8.00	1 6-	91 56	19	0.02 4	6.45	2.9		
108.3	34	7.98	0.86	41.7	14	0.027	6.44	2.7	<u> </u>	



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Stillwater	Sciences

Reservoir - Water Quality Vertical Profiles

Dep		Temp	D	þ	Conductivity	Specific Conductance	pН	Turbidity	Water	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/em)	(s.u.)	(NTU)	Sample	
						(CONTINUED	D)			
114.8	35	7.97	10.85	91.5	18	0,027	6.45	1. 8		
118.1	36	7.98	10.85	11.5	19	0,028	6.46	130.3		BOTTOM
121.4	37									
124.7	38									
128.0	39									
131.2	40									
134.5	41									
137.8	42									
141.1	43									
144.4	44									
147.6	45									
150.9	46									
154.2	47									
157.5	48									
160.8	49									
164.0	50									
167.3	51									
170.6	52									
173.9	53									
177.2	54									
180.4	55									
183.7	56									
187.0	57									
190.3	58									
193.6	59									
196.8	60									
200.1	61									
203.4	62									
206.7	63									
210.0	64									
213.3	65									
216.5	66									
219.8	67									
223.1	68									
226.4	69									
229.7	70									
232.9	71									
236.2	72									



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APPENDIX E In situ Field Calibration Sheets



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June 2019 Water Quality Monitoring Report



Stillwater Sciences

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Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SHUD VARP WQ WINTER SURJEY 2018

Unit ID: 451 Exo

Sampling Event Date(s): 1/27 -1/31

		PRE-S	SAMPLING CALIBRATION
Date and time	1/28/18	600	Name KELLEIGH CROWE

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	19.41	1020	1000	
Cond (uS/cm @ 25°C)	1,413	19.34	1391	1413	
DO (%)		20.3	94.8	96.4	732.4 mm.Hg.
DO (mg/L)*		20.3	8.68	8.68	Check solubility table*
pH4	pH4	19.9	4.05	4.00	
pH 7	pH 7	19.8	7.01	7.00	
pH 10	pH 10	19.7	10.03	10.00	
Turbidity	D	20.5	0.68	0.00	
Turbidity	12.4	20.3	12.78	12.4	

POST-SAMPLING CALIBRATION CHECK Date and time 129/18 1830 Name KELLEIGH CROWE

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	18.65	1066	NO		Q	
Cond (uS/cm @ 25°C)	1,413	19.04		NO		A	
DO (%)		18.42	93.8	NO		R	713.0 months
DO (mg/L)		18.42	8.81	NO		A	Check solubility table
pH4	pH 4	17.78	3.94	NO		A	
pH 7	pH 7	17.89	7.00	NO		A	
pH 10	pH 10	18.51	10.08	NO		A	
Turbidity	D	19.84	0.94	NO		A	
Turbidity	12.4	17.40	12.32	ND		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



Stillwater Sciences

pg 2 of 3 Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SHUD UARP WQ WINTER SURVEY 2018

Unit ID: 451 EXD

Sampling Event Date(s): _____/29 ~ 1/31

PRE-SAMPLING CALIBRATION								
Date and time 1/30	18	0800	Name	KELLE16H	CROWE.			

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	23.71	1031	1000	
Cond (uS/cm @ 25°C)	1,413	23.94	1374	1413	
DO (%)		22.5	93.4	93.8	712.8 months
DO (mg/L)*		22.5	B.12	8.11	Check solubility table*
pH4	pH4	23.6	4.03	4.00	
pH 7	pH 7	23.4	7.05	7.00	
pH 10	pH 10	23.4	9.97	10.00	
Turbidity	0	23.8	0.00	0.00	
Turbidity	12.4	23.6	12.61	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 1/30/18 1830 Name KELLE16H CROWE

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	20.95	1037	ND		A	
Cond (uS/cm @ 25°C)	1,413	20.83	1412	NO		A	
DO (%)		20.42		NO		A	727.1 monthe
DO (mg/L)		20.42	8.69	NO		A	Check solubility table
pH4	pH 4	20.91	3.97	NO		A	
pH 7	pH 7	21.10	7.02	NO		A	
pH 10	pH 10	21.20	10.04	NO		A	
Turbidity	0	21.19	0.03	NO		A	
Turbidity	12.4	20.98	12.37	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
рН	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



Stillwater Sc	iences					pg_3 of_3
		Water Qua	lity YSI 6920 So	onde Calibratio	on – Daily Use	
Project:	SHUP	UARPWQ	WINTER	SURVEY	2018	
Unit ID:	Y 51	Exo				
		(s): 129 -	1/31			

Date and time 131 18 1000 Name Keyrich CROWE

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	19.51	1,046	1,000	
Cond (uS/cm @ 25°C)	1,413	19,50	1,352	1,413	
DO (%)		19.3	96.4	95.8	728.0 mm. tog.
DO (mg/L)*		19.4	8.83	8.82	Check solubility table*
pH4	pH4	19.6	3.99	4.00	
pH 7	pH 7	19.4	7.05	7.00	
pH 10	pH 10	19.5	10.04	10.00	
Turbidity	0	20.2	0.02	0.00	
Turbidity	12.4	20.3	11.68	12.40	

POST-SAMPLING CALIBRATION CHECK Date and time 13118 1800 Name KELLEIGH CROWE

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	22.08	1,021	NO		A	
Cond (uS/cm @ 25°C)	1,413	22.28	1414	NO		A	
DO (%)		22.29	97.5	NO		A	726.2 mm ttg_
DO (mg/L)		22.29	8.49	NO		A	Check solubility table
pH4	pH4	23.30	4.00	NO		A	
pH 7	pH 7	17.80	7.03	NO		A	
pH 10	pH 10	17.60	10.07	NO		A	
Turbidity	0	22.25	0.03	NO		A	
Turbidity	12.4	22.64	12.27	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



() Stillwater Sciences

pg_l of _8 Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SHUD VARP WO SPEING SURVEY

Unit ID: YSL EXO

Sampling Event Date(s): 4 30/18 - 5 3/18, 5/7/18 - 5/10/18, 5/18/18

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	17.43	859	1000	
Cond (uS/cm @ 25°C)	1,413	17.25	1400	1413	
DO (%)		18.1	97.3	96.5	726.0 mm/40
DO (mg/L)*		18.)	9.2	9.2	Check solubility table*
pH4	pH4	17.0	4.02	4.00	
pH 7	pH 7	17.6	7.06	7.00	
pH 10	pH 10	16.9	10.20	10.00	
Turbidity	0	18.7	0.04	0.00	
Turbidity	12.4	18.6	12.58	12.4	

PRE-SAMPLING CALIBRATION Date and time 29 AREIL 2018 22:30 Name BRUCE HITCH

POST-SAMPLING CALIBRATION CHECK

Date and time 29 April 2018 1800 Name Kellergh Crowe

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQ0 Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	17.00	1049	NO		A	
Cond (uS/cm @ 25°C)	1,413	17.31	1418	NO		A	
DO (%)		18.76	92.9	No		A	
D0 (mg/L)		18.76	8.66	NO		R	Check solubility table
pH4	pH 4	16.07	4.04	NO		A	705.7 mm/Ha-
pH 7	pH 7	16.56	7.00	No		A	
pH 10	pH 10	16.65	10.12	NO		A	
Turbidity	0	19.24	0.10	NO		A	
Turbidity	124	17.90	12.49	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





pg Z of S Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SMUD WARP WQ SPRING SURVEY

Unit ID: 951 Eko

Sampling Event Date(s): 4/30-5/3, 5/7-5/10, 5/18/2018

PRE-SAMPLING CALIBRATION

Date and time IMAY 2018 Name BRUCE HITCH

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	19.92	1102	1000	
Cond (uS/cm @ 25°C)	1,413	20.11	1359	1413	
DO (%)		19.60	91.50	92.60	703.9 mmtty
DO (mg/L)*		19.60	8.47	8.47	Check solubility table*
pH4	pH4	20.90	4.16	4.00	
pH 7	pH 7	21.10	7.02	7.00	
pH 10	pH 10	21.00	10.15	10.00	
Turbidity	0	20.20	0.62	0.00	
Turbidity	12.4	19.90	12.31	12.4	

POST-SAMPLING CALIBRATION CHECK

Date and time INNY ZOIB 1815 Name KELLEIGH CROWE

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	21.68	1086	NO		A	
Cond (uS/cm @ 25°C)	1,413	21.34	1457	NO		A	
DO (%)		21.10	92.8	NO		A	702.8 MM.H.
D0 (mg/L)		21.10	8.25	NO		A	Check solubility table
pH4	pH 4	21.02	4.05	NO		A	
pH 7	pH 7	21.24	6.92	NO		A	
pH 10	pH 10	21.42	9.86	NO		A	
Turbidity	D	21.41	0.23	NO		A	
Turbidity	12.4	21.32	12.43	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	er Units Accept Qualify		Reject	
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





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Project: SMUD UARP WA SPRING SURVEY

Unit ID: 451 EXO

Sampling Event Date(s): <u>430-5/3, ラー・ラル, ラル8/2018</u>

Date and time STU 18 1900 Name Kellighter Create

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	21.78	1089	1000	
Cond (uS/cm @ 25°C)	1,413	21.58	(334	14(3	
DO (%)		21.30	93.1	92.5	
DO (mg/L)*		21.30	8.20	8-20	Check solubility table*
pH4	pH4	21.20	4.04	4.00	703.1 ppm/ the
pH 7	pH 7	21.70	6.93	7.00	
pH 10	pH 10	21.90	9.86	10.00	
Turbidity	0	22.40	0.55	0.00	
Turbidity	12.4	22.20	12.35	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/2/18 1800 Name BRUCE HITCH

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQ0 Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	19.78	1014	No		A	
Cond (uS/cm @ 25°C)	1,413	20.36	1371	No		A	
DO (%)		18.92	94.0	No		4	711. 6 mm/Hg
*D0 (mg/L)		18.92	8.73	No		A	Check solubility table
pH4	pH 4	21.35	4.05	No		A	
pH 7	pH 7	21.81	6.98	No		A	
pH 10	pH 10	21. 04	10.09	N4		A	
Turbidity	0	17.41	0.08	No		A	
Turbidity	12.4	17.70	12.6	No		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





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Project: SMUD UARP WA SPRING SURVEY

Unit ID: 451 EXO

Sampling Event Date(s): 430-53, 57-5/10, 5/18/2018

PRE-SAMPLING CALIBRATION Date and time <u>5/3/18 مركم</u> Name_ BRUCE HITCH

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	20.00	874	1000	
Cond (uS/cm @ 25°C)	1,413	19.49	1460	1413	
DO (%)		18.60	94.7	93.7	
DO (mg/L)*		18.50	8.78	8.78	Check solubility table*
pH4	pH4	17.20	3.93	4.00	712.4 mm Ha
pH 7	pH 7	17.50	8.45	7.00	6
pH 10	pH 10	15.20	13.06	10.00	
Turbidity	0	16.80	0.23	0.00	
Turbidity	12.4	18.20	12.15	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/3/18 2000 Name BRUCE HITCH

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	24.08	987	No		A	
Cond (uS/cm @ 25°C)	1,413	25.73	1444	No		A	
DO (%)		22.22	95.70	NO		A	729.2 MMHg
*DO (mg/L)		22.22	8.33	NO		A	Check solubility table"
pH4	pH 4	23.99	4.07	NO		A	
pH 7	pH 7	23.72	7.04	No		A	
pH 10	pH 10	23.44	9.99	NO		A	
Turbidity	0	22.99	0.09	NO		A	
Turbidity	12.4	23.92	12.52	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



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Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: SMUD LARP WQ SPRING SURVEY

Unit ID: 751 Ex .

Sampling Event Date(s): <u>4/30 - 5/3 , 5/7 - 5/10 , 5/18/2018</u>

PRE-SAMPLING	CALIBRATION
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Date and time 5/7/ 18 ZZas Name BRUCE Hrrchy

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	23.14	1501	1000	
Cond (uS/cm @ 25°C)	1,413	23.56	1182	1413	
DO (%)		21.5	95.8	95.5	726.2 mm/40
DO (mg/L)*		21.5	8.42	8.4z	Check solubility table*
pH4	pH4	23.4	4.07	4.00	
pH 7	pH 7	23.4	6.94	7.00	
pH 10	pH 10	23.6	10.08	10.00	
Turbidity	Ø	24.0	0. Z4	0.0	
Turbidity	12.4	24.0	17.0	12.4	

POST-SAMPLING CALIBRATION CHECK Date and time 5 8 18 2100 Name KEURICH CROWE

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQ0 Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	2.4.51	1109	NO		Q	
Cond (uS/cm @ 25°C)	1,413	22.14	1385	No		A	
DO (%)		23-15	930	NO		A	
D0 (mg/L)		23.15	7.95	NO		A	Check solubility table
pH4	pH 4	22.31	3.98	NO		A	713.2 mm Hy
pH 7	pH 7	22.13	6.91	ND		A	0
pH 10	pH 10	21.91	9.98	NO		A	
Turbidity	0	22.62	0.02	NO		A	
Turbidity	12.4	20.27	12.0	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





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Project: SMUD VARP WASPRING SURVEY

Unit ID: 461 EXD

Sampling Event Date(s): <u>430 - 53, 51 - 5/10, 5/18/2018</u>

PRE-SAMPLING CALIBRATION

Date and time 59 2018 0700 Name KELLEIGH CROWE

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	21.05	1076	1000	
Cond (uS/cm @ 25°C)	1,413	20.43	1242	1413	
DO (%)		20.40	93.2	93.9	713.4 months
DO (mg/L)*		20.40	8.47	8.47	Check solubility table*
pH4	pH4	20.70	4.05	4.00	
pH 7	pH 7	20.80	6.96	7.00	
pH 10	pH 10	20.80	10.01	10.00	
Turbidity	0	21.50	0.37	0.00	
Turbidity	12.4	21.30	10.47	12.4	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/9/2018 2000 Name KELLEIGH CROWE

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	22.93	11 29	NO		Q	
Cond (uS/cm @ 25°C)	1,413	23.71	1513	NO		Q	
DO (%)		23.20	93.8	NO		A	
DO (mg/L)		23.26	8.01	NO		A	Check solubility table
pH4	pH 4	23.68	4.02	NO		A	711.6 mmtte
pH 7	pH 7	23.23	6.92	NO		A	0
pH 10	pH 10	23.75	10.02	NO		A	
Turbidity	0	22.60	0.88	NO		A	
Turbidity	12.4	24.19	12.52	No		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



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Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SHUD VARP WQ SPRING SURVEY

Unit ID: 45 EXO

Sampling Event Date(s): <u>430 - 53, 57 - 510, 5/18/2018</u>

PRE-SAMPLING CALIBRATION Date and time 5/10/18/0600 Name KEUE164 CRowe

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	22.64	1133	1000	
Cond (uS/cm @ 25°C)	1,413	22.90	1315	1413	
DO (%)		22.50	93.3	93.4	
DO (mg/L)*		22.50	8.W	8.11	Check solubility table*
pH4	pH4	22.7	4.02	4.00	709.8 mm/ Ha
pH 7	pH 7	22.5	6.91	7.00	
pH 10	pH 10	22.7	10.00	10.00	
Turbidity	0	23.1	0.39	0.00	
Turbidity	12.4	23.4	25.36	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/10/18 1900 Name KEUEIGH CROWE

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	21.13	1128	NO		Q	
Cond (uS/cm @ 25°C)	1,413	21.60	1456	NO		A	
DO (%)		25.54	95.1	NO		A	
D0 (mg/L)		25.54	7.78	No		0	Check solubility table
pH4	pH 4	28.01	4.05	No		A	721.2 mmHz
pH 7	pH 7	27.93	6.97	No		A	8
pH 10	pH 10	27.83	9.48	NO		A	
Turbidity	0	26.60	0.06	No		A	
Turbidity	12.4	21.96	12.31	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
рН	S.U.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



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Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: SMUD VARP WQ SPRING SURVEY

Unit ID: 451 6920

Sampling Event Date(s): <u>4| 80 - 5|3, 5| つ - 5| 10, 5/18/2018</u>

Date and time 5/18/18 0600 Name_Kelleich Crowe

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	20.77	1049	1000	
Cond (uS/cm @ 25°C)	1,413	20.00	1202	1413	
DO (%)		16.12	80.6	Bo.6	603.7 months
DO (mg/L)*		18.12	7.61	7.61	Check solubility table*
pH4	pH4	20.92	4.07	4.00	
pH 7	pH 7	20.31	6.97	7.00	
pH 10	pH 10	20.18	10.11	10.00	
Turbidity	12.7	20.54	12.6	12.7	
Turbidity					

Date and time 5/18/18 2000 Name Kellein Crowe

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	18.37	1039	NO		A	
Cond (uS/cm @ 25°C)	1,413	18.91	1381	NO		A	
DO (%)		18.63	95.7	NO		A	721.1 mouther
*DO (mg/L)		18.63	B.93	150		A	Check solubility table
pH4	pH 4	18.48	4.08	NO		A	0
pH 7	pH 7	18.51	7.00	No		A	
pH 10	pH 10	18.61	10.08	NO		A	
Turbidity	12.7	18.56		NO		A	
Turbidity							
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



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Stillwater Sciences

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Project: SHOD VARP WQ SUMMER SURVEY

Unit ID: 451 EXO

Sampling Event Date(s): <u>8/13/18 ~ 8/15/18 , 8/17/18</u>

PRE-SAMPLING CALIBRATION

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	29.95	1,011	1,000	
Cond (uS/cm @ 25°C)	1,413	29.78	1382	1413	
DO (%)		27.80	74.3	95.0	722.3 months-
D0 (mg/L)*		27.80	7.52	7.50	Check solubility table*
pH4	pH4	29.4	4.14	4.00	
pH 7	pH 7	29.7	7.05	7.00	
pH 10	pH 10	30.4	10.04	10.00	
Turbidity	0.0	29.2	0.16	0.00	
Turbidity	12.4	29.7	13.42	12.40	

Date and time 8/13/18 1500 Name Kelleige Crosse

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	26.83	1058	ND		Q	
Cond (uS/cm @ 25°C)	1,413	26.56		NO		A	
DO (%)		26.41	93.3	NO		A	709.4 num Has
DO (mg/L)		26.41	7.50	NO		A	Check solubility table
pH4	pH 4	26.63	4.00	No		A	
pH 7	pH 7	27.01	7.02	NO		A	
pH 10	pH 10	27.33		No		A	
Turbidity	0.0	26.62	0.05	NO		A	
Turbidity	12.4	27.21	12.55	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



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Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SMUD VARP WA SUNMER SURVEY

Unit ID: 451 Exp

PRE-SAMPLING CALIBRATION

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
ond (uS/cm @ 25°C)	1,000	25.40	1052	1000	
Cond (uS/cm @ 25°C)	1,413	25.68	1353	1413	
DO (%)		26.1	13.5	93.3	709.4 months
DO (mg/L)*		26.1	7.51	7.57	Check solubility table*
pH4	pH4	25.9	4.06	4.00	
pH 7	pH 7	25.8	7.02	7.00	
pH 10	pH 10	26.3	10.12	10.00	
Turbidity	0.0	26.6	0.24	0.00	
Turbidity	12.4	27.2	13.22	12.40	

POST-SAMPLING CALIBRATION CHECK Date and time <u>8/14/18 1745</u> Name <u>Kelleigh</u> Crowe

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	23.71	1061	NO		Q	
Cond (uS/cm @ 25°C)	1,413	23.67	1410	NO		A	
DO (%)		25.43		NO		A	708.4 mmthe
DO (mg/L)		25.43		NO		A	Check solubility table
pH4	pH 4	26.49	4.00	NO		A	
pH 7	pH 7	25.49	7.00	NO		A	
pH 10	pH 10	26.05	9.81	No		A	
Turbidity	D.0	26.02	0.04	NO		A	
Turbidity	12.4	25.61	12.78	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
рН	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



Stillwater Sciences

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Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SMUD VARP WA SUMMER SURVEY

Unit ID: 451 EXO

Sampling Event Date(s): <u>8/13/18 - 8/15/18 8/17 | 18</u>

PRE-SAMPLING	CALIBRATION
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Date and time _				Kelleigh C	
Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	21.89	1020	1,000	
Cond (uS/cm @ 25°C)	1,413	21.86	1384	1413	
DO (%)		21.60	93.4	93.4	TOP. 7 MMH
DO (mg/L)*		21.60	8.23	8.23	Check solubility table*
pH4	pH4	21.90	4.08	4.00	
pH 7	pH 7	21.80	7.01	7.00	
pH 10	pH 10	21.90	9.85	10.00	
Turbidity	0.0	2240	0.35	0.00	
Turbidity	12.4	23.20	16.27	12.40	

POST-SAMPLING CALIBRATION CHECK Date and time 8/15/18 2000 Name Kelleigh Crowe

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	21.96	931	NO		0	
Cond (uS/cm @ 25°C)	1,413	21.81	1319	NO		a	
DO (%)		22.92	95.2	No		A	725.8 mm Ha
DO (mg/L)		22.92	8.15	No		A	Check solubility table
pH4	pH 4	22.49	3.93	No		A	
pH 7	pH 7	22.87	7.01	NO		A	
pH 10	pH 10	23.02	10.20	NO		A	
Turbidity	0.0	23.01	0.04	NO		A	
Turbidity	12.4	23.10	11.30	NO		Q	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





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Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SMUD VARP WA SUMMER SURVEY

Unit ID: 451 EXO

Sampling Event Date(s): 8/13/18 - 8/15/18 , 8/17/18

PRE-SAMP	LING	CALIBRA	TION
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PRE-SAMPLING CALIBRATION Date and time <u>B/16/18 مح</u> Name <u>Kelleigh Crowse</u>							
Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes		
Cond (uS/cm @ 25°C)	1,000	22.92	967	1,000			
Cond (uS/cm @ 25°C)	1,413	22.10	1372	1413			
DO (%)		22.90	95.2	95.5	726.1 martta		
DO (mg/L)*		22.90	8.22	8.21	Check solubility table*		
pH4	pH4	22.40	3.95	4.00			
pH 7	pH 7	22.60	7.03	7.00			
pH 10	pH 10	22.70	10.28	10.00			
Turbidity	0.00	23.90	0.10	0.00			
Turbidity	12.40	23.90	9.26	12.40			

Date and time 8/17/18 1931 Name Eric Sommeraner

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	29.62	1148	ND		Q	
Cond (uS/cm @ 25°C)	1,413	29.41	1405	NO		A	
DO (%)		28.00	99.6	NO		A	758 5 mm Hz
DO (mg/L)		28.01	7.81	ND		A	Check solubility table
pH4	pH 4	30.46	4.07	NO		A	
pH 7	pH 7	29.58	7.04	NO		A	
pH 10	pH 10	30.45	9.83	NO		A	
Turbidity	0.00	30.44	0.05	NO		A	
Turbidity	12.40	30.56	11-96	NO		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





Water Quality YSI 6920 Sonde Calibration – Daily Use $pg \ \underline{/} \ of \ \underline{5}$

Project: MARP RESERVOIR WQ FALL 2018

Unit ID: _ 451 6920

Sampling Event Date(s): 10/22/18 - 10/20/18

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	20.38	825	1000	
Cond (uS/cm @ 25°C)	1,413	19.63	1926	1413	
DO (%)		21.63	97.8	95.4	
DO (mg/L)*		21.63	8.61	8.38	Check solubility table*
pH4	pH4	21.93	4.12	4.00	724.4 mm / Ha
pH 7	pH 7	18.90	6. 84	7.00	3
pH 10	pH 10	22.30	10.27	10.04	
Turbidity	12.7	22.65	12.7	12.7	
Turbidity					

PRE-SAMPLING CALIBRATION Date and time 10/21/18 1900 Name BRUCE 4, TCH

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	19.43	1012	N/6		A	
Cond (uS/cm @ 25°C)	1,413	19.45	1378	No		A,	
DO (%)		18.40	92.6	tv ⊅		A	707.8 mm/48
DO (mg/L)		18.40	8.7	No		A	Check solubility table
pH4	pH 4	18.90	4.09	NO		A	
pH 7	pH 7	18.75	7.04	NO		A	
pH 10	pH 10	19.16	9.88	No		A	
Turbidity	12.7	18.40	12.9	No		A,	
Turbidity							
¹ See Table 1							-

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



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Water Quality YSI Exo Sonde Calibration - Daily Use

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Project: VARP RESERVOIR WO FALL 2018

Unit ID: 75, 6920

Sampling Event Date(s): 10/21/18 - 10/24 / 18

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	16.79	931	1000	1
Cond (uS/cm @ 25°C)	1,413	16.72	1403	1413	
DO (%)		15.09	92.5	93.1.	707.6 ~~ 142
D0 (mg/L)*		15.09	9.29	9.33	Check solubility table*
pH4	pH4	15.48	4.14	4.00	
pH 7	pH 7	15.47	6.95	7.02	
pH 10	pH 10	12.49	10.00	10.00	
Turbidity	12.7	14.58	14.9	12.7	
Turbidity					

PRE-SAMPLING CALIBRATION

POST-SAMPLING CALIBRATION CHECK

Date and time 10/23/18 1600 Name BRUCE HITCH

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	15.35	976	No		· 4 ·	
Cond (uS/cm @ 25°C)	1,413	15.07	1388	No		A	
DO (%)		14 51	92.9	No		A	708.2 mm / 40
D0 (mg/L)		14.31	9.47	ra		9	Check solubility table 🖒
pH4	pH 4	14.43	3.96	Na		A	
pH 7	pH 7	14.38	6.96	20		A	
pH 10	pH 10	15.35	10.02	20		Ą	
Turbidity	12.7	14.38	12.5	24		A	
Turbidity							
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



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 $$pg\ \underline{3}\ of\ \underline{5}$$ Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: VARP RESERVOIR WY FAIL 2018

Unit ID: 45, 6920

Sampling Event Date(s): 10/22/18 - 10/24/18

	PRE-SAMPLING CALIBRATION				
Date and time 10/24/18	OG Name BRUC	E HITCH			

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	16.17	992	1000	
Cond (uS/cm @ 25°C)	1,413	15.96	1410	1413	
DO (%)		15.19	92.9	93.Z	710.8 no 1 Hg
D0 (mg/L)*		15.19	9.3Z	9.34	Check solubility table*
pH4	pH4	15.47	8.94	4.00	
pH 7	pH 7	14.80	6.97	7.00	
pH 10	pH 10	15. 63	9.95	10.00	
Turbidity	12.7	14.01	12.3	12.7	
Turbidity					

POST-SAMPLING CALIBRATION CHECK

Date and time 10/24/18 1700 Name BRUCE HITCH

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	15.33	989	3-00		A	
Cond (uS/cm @ 25°C)	1,413	15.42	1406	NO		A	
DO (%)		16.15	94.8	~~		A	710.4 malte
D0 (mg/L)		16.15	9.32	No		A,	Check solubility table
pH4	pH4	14.49	3.99	Nro		A	
pH 7	pH 7	14.55	7.01	No		A	
pH 10	pH 10	15.15	10.00	No		A	
Turbidity	12.7	14.55	12.4	No		A	
Turbidity							
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





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Project: LARP RESERVOIR WY FALL ZOIS

Unit ID: 51 6920

Sampling Event Date(s): _____/18 - 10 /26 / 18

Date and time 10/25/18 0700 Name BRUCE ATTCH

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	16.22	1007	1000	
Cond (uS/cm @ 25°C)	1,413	16.17	1412	1413	
DO (%)		14.75	54.0	93.5	710.6 mm)He
DO (mg/L)*		14.75	9.5	9.42	Check solubility table*
pH4	pH4	14.74	3.98	4.00	
pH 7	pH 7	15.00	7.05	7.00	
pH 10	pH 10	15.84	10.03	10.00	
Turbidity	12.7	14.43	13.1	12.6	
Turbidity					

POST-SAMPLING CALIBRATION CHECK Date and time <u>10/こ5/18 1780</u> Name_BRVくビ トロント

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	15.52	977	ND		A	
Cond (uS/cm @ 25°C)	1,413	15.60	1402	No		A	
DO (%)		14.25	93.2	NO		A	710.2 mm/4g
D0 (mg/L)		16.25	9.16	8-2		A	Check solubility table
pH4	pH 4	14.16	4.07	NO		A	
pH 7	pH 7	14.74	6.97	NG		A	
pH 10	pH 10	15.82)0 00	No		A	
Turbidity	12.7	15.12	13.1	200		A	
Turbidity							
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%



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Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: VARP RESERVOIR WY FALL ZOIS

Unit ID: ______ 4920

Sampling Event Date(s): 10/22/18 - 10/24/18

PRE-SAMPLING CALIBRATION Date and time 10/26/18 0630 Name Cruce 4.7-4

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	16.71	1004	1000	
Cond (uS/cm @ 25°C)	1,413	16.58	2419	1413	
DO (%)		15.76	92.6	93.7	711.6 nm/He
DO (mg/L)*		15.76	9.19	9.28	Check solubility table*
pH4	pH4	14.95	3.99	4.00	
pH 7	pH 7	15.62	4.98	7.00	
pH 10	pH 10	15.79	10.00	10.00	
Turbidity	12.7	14.65	13.0	12.7	
Turbidity					

POST-SAMPLING CALIBRATION CHECK

Date and time 10/24/18 1700 Name BRUCE 4.Te4

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	19.58	1083	No		A	
Cond (uS/cm @ 25°C)	1,413	19.57	1412	No		Ą	
DO (%)		19.60	98.2	No		A	727.3 mm/Hg
D0 (mg/L)		19.60	3.58	No		A	Check solubility table
pH4	pH 4	19.65	3.99	No		A	
pH 7	pH 7	19.43	7.01	No		A	
pH 10	pH 10	19.11	9.98	NO		A	
Turbidity	12.7	19.93	12.5	Na			
Turbidity							
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





Pg _1 of ____ Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SMUD VARP WO FALL SURVEY

Unit ID: YSI 6920

Sampling Event Date(s): 11/12/18 - 11/14/18 11/16/18

			MPLING CAL	IBRA'	TION
Date and time	11/11/18.	1745	Name_ &	ERIC	SOMMERAVER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	16.89	1046	1000	,
Cond (uS/cm @ 25°C)	1,413	16.72	1371	1413	
DO (%)		8.28	90.1	87.4	Lal. 11/12 6 0650
DO (mg/L)*		8.28	10.63	10.34	Check solubility table" 664.3 mm Hay
pH4	pH4	17.00	4.01	4.00	-> 10.3 mg/L
pH 7	pH 7	17.06	7.03	7.00	
pH 10	pH 10	17.04	9.92	10.00	
Turbidity	12,7	17.00	13.0	12.7	
Turbidity					

POST-SAMPLING CALIBRATION CHECK

Date and time 11/12/18 1730 Name ERIC SommERAVER

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	16.12	1012	N		Ą	
Cond (uS/cm @ 25°C)	1,413	13.26	1234	N		Ġ.	
DO (%)		10.24	88.1	\sim		A	
DO (mg/L)		10.24	9.83	N		A	Check solubility table
pH4	pH4	15.56	3.95	N		A	
pH 7	pH 7	15.81	7.03	N		A	
pH 10	pH 10	17.29	10.06	N		A	
Turbidity	12.7	14.19	12.9	N		A	
Turbidity							
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: SMUD VARP W& FALL SURVEY

Unit ID: YSI 6920

Sampling Event Date(s): 11/12/2018 - 11/14/18, 11/16/18

		PRE-SA	MPLING CALIBR	ATION
Date and time	11/13/18	6730	Name ERIC	SOMMERAVER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	9.63	8.51	1000	
Cond (uS/cm @ 25°C)	1,413	9.61	1404	1413	
DO (%)		8.57	88.5	87.9	
DO (mg/L)*		8.57	10.30	10.22	Check solubility table" 667.6 mm Hz
pH4	pH4	9.59	3.99	4.00	-> 10.3 mg/L
pH 7	pH 7	7,56	7.01	7.00	
pH 10	pH 10	9.58	9.87	10.00	
Turbidity	12.7	10.41	12.5	12.7	
Turbidity					

Date and time 11/13/18 1900 Name Eric Sommeraner

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQ0 Code1	Notes
Cond (uS/cm @ 25°C)	1,000	14.30	1133	N		(a	
Cond (uS/cm @ 25°C)	1,413	14.73	1595	N		Q	
DO (%)		10.53	95.5	N		a	
D0 (mg/L)		10.53	10.41	N		A	Check solubility table
pH4	pH 4	14.81	3.43	N		A	
pH 7	pH 7	15,26	7.04	N		A	
pH 10	pH 10	15.42	10.14	N		A	
Turbidity	12.7	14.44	12.6	N		A	
Turbidity							
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity uS/cm		≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤ 5%	> 5% and ≤ 10%	> 10%





Water Quality YSI 6920 Sonde Calibration - Daily Use

Project: SMUD VARP W& FALL SURVEY

Unit ID: YSI 6920

Sampling Event Date(s): 11/12/18 - 11/14/18, 11/16/18

			PRE-SAMPLING CALIBRATION						
Date and time	11/14/	18	0730	Name BRIC SOMMERAVER					

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	6.33	935	(000	
Cond (uS/cm @ 25°C)	1,413	6.81	1333	1412	
DO (%)		9.52	88.6	87.6	
DO (mg/L)*		9.52	10.05	9.95	Check solubility table" 667.0 mm Hay
pH4	pH4	7.39	3.94	4.00	-> 10.0 mg/L
pH 7	pH 7	6.70	7.07	7.00	
pH 10	pH 10	6.65	9.96	10.00	
Turbidity	12.7	4.51	13.1	12.7	
Turbidity					

POST-SAMPLING CALIBRATION CHECK Date and time 11/14/18 1645 Name Eric Som merander

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQ0 Code1	Notes
Cond (uS/cm @ 25°C)	1,000	11.67	1142	N		a	
Cond (uS/cm @ 25°C)	1,413	1201	1436	N		A	
DO (%)		11.17	87.0	N		A	
D0 (mg/L)		11.17	9.51	N		A	Check solubility table
pH4	pH 4	13.93	4.00	N		A	
pH 7	pH 7	13.87	7.06	N		A	
pH 10	pH 10	13.32	10.14	N		A	
Turbidity	12.7	12.87	12.8	N		A	
Turbidity							
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen	% saturation	≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	uS/cm	≤ 5%	> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity	NTU	≤5%	> 5% and ≤ 10%	> 10%



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Stillwater Sciences

pg <u>4</u> of <u>4</u> Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: SMUD UARP W& FALL SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 11/12/18 - 11/14/18, 11/16/18

	PRE-S/	AMPLING CA	LIBRATI	ON
Date and time 11/16/18	0700	Name	Eric	Sommeraner

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	9.25	866	1000	
Cond (uS/cm @ 25°C)	1,413	2.83	1340	1413	
DO (%)		16.5	86.0	86.9	
DO (mg/L)*		16.5	8.91	8.40	Check solubility table 660.6 mm Ha
pH4	pH4	12.2	4.05	4.00	38.4 ma /L
pH 7	pH 7	9.1	6.63	7.00	
pH 10	pH 10	7.1	9.95	10.00	
Turbidity	0.0	11.4	0.14	0.00	
Turbidity	12.4	11.1	12.12	12.4	

POST-SAMPLING CALIBRATION CHECK Date and time 11/16/18 1900 Name Eric Sommeraner

Parameter	Std. Value	Std. Temp (°C)	Post- Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQ0 Code ¹	Notes
Cond (uS/cm @ 25°C)	1,000	15.97	1145	N		a	
Cond (uS/cm @ 25°C)	1,413	16.45	1601	N		Q	
DO (%)		12.50	87.4	N		A	
D0 (mg/L)		12.50	9.30	N		A	Check solubility table
pH4	pH 4	13.60	4.08	N		A	
pH 7	pH 7	15.10	6.95	N		A	
pH 10	pH 10	14.66	9.84	N		A	
Turbidity	0.0	17.52	0.04	N		A	
Turbidity	12.9	17.35	12.52	N		A	
¹ See Table 1							

Table 1: Measurement Quality Objectives - comparisons are between Post-sampling Value and Post-calibration Value

Parameter	Units	Accept	Qualify	Reject
Dissolved oxygen % saturati		≤ 5%	> 5% and ≤ 10%	> 10%
Conductivity	Conductivity uS/cm ≤ 5%		> 5% and ≤ 15%	> 15%
pH	s.u.	≤ 0.2	> 0.2 and ≤ 0.5	> 0.5
Turbidity NTU		≤ 5%	> 5% and ≤ 10%	> 10%



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APPENDIX F Analytical Laboratory Bacteria Reports



Sacramento Municipal Utility District Upper American River Project FERC Project No. 2101

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Insert Appendix F Here





CLS Work Order #: 18F0955 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 06/19/18 14:30. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

Page 1 of 4



		Report To:			Job Nur Task 02			ANA	LYSIS	REQU	ESTED	GP	TRA	CKE	R	
	ter Scien elegraph	ces Ave, Suite 400		Destination Laboratory Rancho Cordova				Fee		E 50		ED	EREP	ORT		YES X NO
Berkele	y, CA 9	4705		x CLS (916) 638-7301				810		0 Q		GB	BAG	RE		
Project Ma Maia S	inger ma	aia@stillwatersci.com		3249	ho Core	ald Read lova, CA	PR	Fecal coliform-15 Tube		coli Quanti-tray						
Project Name SMUD In situ, Bac-T, & Chemistry Monitoring				www.cali		lab.com	PRESERVATIVES	0-15		80		-Fii	DEC	DND	(T)ONS	
Sampled By				🗌 отні	ER		VAT	Tub	Z							
Job Description Monifor seasonal bacteria levels in UARP roaches.							IVES	ā.		34						
Site Locati	on UARP						5						URN/ IME I			SPECIAL INSTRUCTIONS
DATE	TIME	SAMPLE	FIELD		CC NO.	INTAINER	v					1	2	3	5	
Jala	1200		10.	MATRIX Serface water	NO.	TYPE	6	x		×		-		-	x	
L/M/18		BAC-11-JP BAC-12-IHR	-	Surface water	_	-	6	X		×		-			x	
MAB		BAC-13-THP		Surface water			6	×	-	×		\square			x	
119/18		BAC-14-BCR		Sorface water			6	X	-	×					x	
	1315	BAC-15 -SCR		Surface water			6	X		×					x	
				Surface water			6								x	
				Surface water			6								-8	INVOLETO:
				Surface water			6								x	Stillwater Sciences
				Surface water			6								X	Same as above
	11			Surface water			6								х	
				Surface water			6								x	Project No. 750.16 Tas 0200.01
				Surface water			6								x	OUCTER
	ED CONST)						SAMP	ee reti	NIION	тіме	PR	SER	VAT	VES (1) HCL (3) = COLD 2) HSO ₂ (4) = H2SO4
RELINQU	SHED BY	Signature)	PRINT NAM	E/COMPANY		DATE/UME			RECEIV	ED BY (Signature)		_	_	PRI	NT SAMECOMPANY
Ju	met for		eigh Cro	Salances		6/19/18	-							_	-	
RECEIV	ED AT LA		mouter	DATE/TIME:	619	1420	CO	NDITIC	NS/CO	MMENT	8: /	Ced	D		-	
-	ED BY:				Contraction of the	1.8	-				1	1.3	1			

Page 2 of 4



Page 2 of 3			06/26/18 14:30
Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Chemistry Mon	itoring
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0200.01	CLS Work Order #: 18F0955
Berkeley, CA 94705	Project Manager:	Maia Singer	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte		orting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-11-JR (18F0955-01) Surface Water	Sampled: 06/19/18 12:00	Receiv	ed: 06/19/	18 14:30					
E. Coli	19.9	1.0	MPN/100 mL) 1	1805061	06/19/18	06/20/18	SM9223	
Fecal Coliforms	4.5	1.8			1805063	06/19/18	06/22/18	SM 9221	
BAC-12-IHR (18F0955-02) Surface Water	Sampled: 06/19/18 11:20	Recei	ived: 06/19	/18 14:30					
E. Coli	<1	1.0	MPN/100 mL	1	1805061	06/19/18	06/20/18	SM9223	
Fecal Coliforms	<1.8	1.8	- mL		1805063	06/19/18	06/22/18	SM 9221	
BAC-13-IHR (18F0955-03) Surface Water	Sampled: 06/19/18 11:00	Recei	ived: 06/19	0/18 14:30					
E. Coli	2.0	1.0	MPN/100 mL) 1	1805061	06/19/18	06/20/18	SM9223	
Fecal Coliforms	2.0	1.8			1805063	06/19/18	06/22/18	SM 9221	
BAC-14-BCR (18F0955-04) Surface Water	Sampled: 06/19/18 09:45	Rece	sived: 06/1	9/18 14:30					
E. Coli	<1	1.0	MPN/100 mL	1	1805061	06/19/18	06/20/18	SM9223	
Fecal Coliforms	<1.8	1.8	- mL		1805063	06/19/18	06/22/18	SM 9221	
BAC-15-SCR (18F0955-05) Surface Water	Sampled: 06/19/18 13:15	Rece	ived: 06/1	9/18 14:30					
E. Coli	<1	1.0	MPN/100 mL	1	1805061	06/19/18	06/20/18	SM9223	
Fecal Coliforms	<1.8	1.8	- mL		1805063	06/19/18	06/22/18	SM 9221	

3249 Fitzgerald Road, Rancho Cordova, CA 95742 | 800.638.7301 | Tel: 916.638.7301 x102 | Fai: 916.638.4510 | www.californialab.com
Page 3 of 4 Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233





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2855 Te	er Sciences elegraph Ave., Suite 400	Project: Project Number:	SMUD In situ, Bac-T, & Chem 750.10 Task 0200.01	CLS Work Order #: 18F0955
Berkele	y, CA 94705	Project Manager:	Maia Singer	COC #:
		Notes and I	Definitions	
T-4a	<1.8			
T-4	<1			
ΕT	Analyte DETECTED			
D	Analyte NOT DETECTED at or above th	e reporting limit (or method detection	t limit when specified)	
R	Not Reported			
y	Sample results reported on a dry weight	hasiis		
D	Relative Percent Difference			

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Page 4 of 4



June 27, 2018

CLS Work Order #: 18F1075 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 06/20/18 14:40. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233



		Report To:				I Job Nu Task 03			AN/	ALY	SIS REQ	UESTED	GEO	TR.	CKE	R	
	ter Scien clegraph	ces Ave. Suite 400			Destina Ran	tion Lab zho Cere			Fec		E.co		EDF	REI	ORT		YES X NO
Berkele	y, CA 9	4705					638-7301		alco		0.5		GLO	BAI	.4D.		
	inger ma	iia@stillwatersci.c	om			ho Cor	rald Road dova, CA	PR	liforn		coli Quanti-tray						
mjest Nar SMUD ampled B	In situ,	Bac-T, & Chemist	ry Monit	oring	www.cal	lifornia	lab.com	PRESERVATIVES	Fecal coliform-15 Tube		W		FBG	DC	OND	ITIONS	k:
oh Descrip donifer se		ia levels in UARP reaches.			отн	ER		TIVES	abe			- 53					
irie Locatio	- UARP	1													AROI		SPECIAL
DATE	TIME	SAMPLE		FIELD			ONTAINER						T	2	3	5	INSTRUCTIONS
		IDENTIFICAT		ID.	MATRIX	NO	TYPE	-		-			227.1	-	100	-	
29/18	1000	BAC-5-60		-	Surface water		-	6	X	-	×	-		_	_	х	
	1123	BAC-7-1			Surface water			6	X	-	×			_	_	X	
	1100	BAC-B-U			Surface water	-		6	×	-	×			_	_	X	
	1220	BAC - 9 - U			Surface water	-		6	X	-	×			_	-	X	
20/18	1038	BAC-10-4	JUR		Surface water			6	X	+	×		\rightarrow	_	_	x	
-	-							6		-				_	_	X	INVOICE TO:
					Surface water			6		-				_	_	X	Stillwater Sciences
					Surface water			6		+	_	+	\vdash	_	_	Х	Same as above
- 1					Surface water		-	6		+		++-		_		X	Sank as asine.
					Surface water			6								x	Project No. 750.10 Tasl 0200.01
					Surface water			6								х	OUCTER
USPECT	ED CONST	ITUENTS							SAM	PEE)	REFENTION	TIME	PRES	SER	VAT	VES (() HC1. (3) = COLD 2) HS(5, (4) = H2SO4
	SHED BY (E/COMPANY		DATE/TIME			REG	EIVED BY	Signature)				PRI	NT NAMECOMPANY
DAN	in ly	noren	DA ST	LLWA	FER SCIEN	NES	6/20/18										
	EDATIA	B BY:			DATE/TIME: (20	2 jAMC	CO	NDITI	ONS	COMMENT	3:	2.	*J.			
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Page 1 of 2	<u> </u>		06/27/18 14:06
Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705		: SMUD In situ, Bac-T, & Chen : 750.10 Task 0200.01 : Maia Singer	nistry Monitoring CLS Work Order #: 18F1075 COC #:

Microbiological Parameters by APHA Standard Methods

Analyte		orting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-5-GCR (18F1075-01) Surface Water	Sampled: 06/20/18 10:00	Recei	ived: 06/20	/18 14:40					
Fecal Coliforms	4.5	1.8	MPN/100	1	1805140	06/20/18 16:00	06/23/18	SM 9221	
E. Coli	8.6	1.0	nl. *		1805108	06/20/18 17:00	06/21/18	SM9223	
BAC-7-UVR (18F1075-02) Surface Water	Sampled: 06/20/18 11:23	Recei	ved: 06/20	/18 14:40					
Fecal Coliforms	2.0	1.8	MPN/100 mL	1	1805140	06/20/18 16:00	06/23/18	SM 9221	
E. Coli	1.0	1.0	mL.		1805108	06/20/18 17:00	06/21/18	SM9223	
BAC-8-UVR (18F1075-03) Surface Water	Sampled: 06/20/18 11:00	Recei	ved: 06/20	/18 14:40					
Fecal Coliforms	4.5	1.8	MPN/100 mL	1	1805140	06/20/18 16:00	06/23/18	SM 9221	
E. Coli	1.0	1.0	· ·		1805108	06/20/18 17:00	06/21/18	SM9223	
BAC-9-UVR (18F1075-04) Surface Water	Sampled: 06/20/18 12:20	Recei	ved: 06/20	/18 14:40					
Fecal Coliforms	1.8	1.8	MPN/100	1	1805140	06/20/18 16:00	06/23/18	SM 9221	
E. Coli	2.0	1.0	nL •		1805108	06/20/18 17:00	06/21/18	SM9223	
BAC-10-UVR (18F1075-05) Surface Water	Sampled: 06/20/18 10:38	Rec	eived: 06/2	0/18 14:4	0				
Fecal Coliforms	2.0	1.8	MPN/100	1	1805140	06/20/18 16:00	06/23/18	SM 9221	
E. Coli	<1	1.0	nl. *		1805108	06/20/18 17:00	06/21/18	SM9223	

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CALIFORNIA LABORATORY SERVICES

Page 2 of	2			06/27/18 14:0	26
	Sciences graph Ave., Suite 400 CA 94705	Project: Project Number: Project Manager:	750.10 Task 0200.01	try Monitoring CLS Work Order #: 18F1075 COC #:	
		Notes and Defini	itions		
BT-4	<1				
DET	Analyte DETECTED				
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection limit	when specified)		
NR	Not Reported				
dry	Sample results reported on a dry weight basis				
RPD	Relative Percent Difference				

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July 03, 2018

CLS Work Order #: 18F1392 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 06/26/18 15:28. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233



CALI	FORNI	A LABORAT	ORY S	ERVIC	CES CHAIN	OFC	CUSTODY		CL	SIL). N(0	ISF	139	12			(l_of1
		Report To:				t Job Nu Task 0			AN	ALY	SIS	RE	QUEST	ED	SEOT	RACK	ER	
Stillwat 2855 Te		ces Ave. Suite 400			Destinat Ranc	tion Lab			Fee					Π,	EDF R	EPOR	Т	YES X NO
Berkele	y, CA 9	4705					638-7301	1	alo		1				GLOBAL ID.			
	inger m	aia@stillwatersci.c	com			ho Cor	rald Road dova, CA	PRESERVATIVES	oliforn		you quantinay	anti-feo						
	In situ,	Bac-T, & Chemist	try Monito	oring	www.cal		lab.com	ESER	1-15		ľ	-		1	TELD	CON	DITION	S:
Sampled By	·				OTH OTH	ER		VAT	Tub									
Job Descrip Monitor sea		ia levels in UARP reaches.						VES										
Site Locatio	LIADD																	
Site Locatio	n UARP															IE IN I		SPECIAL INSTRUCTIONS
DATE	TIME	SAMPLE IDENTIFICAT	ION	FIELD ID.	MATRIX	NO	ONTAINER TYPE	v							1	2 3	5	
6-26-18		BAC - 15 - 5C	R		Surface water			6	×		3	7			+	+	x	
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6-26-18	1337	BAC-12-JN	5		Surface water			6	X		3	×					X	
26-18	12.55	BAC-13-IT	IR		Surface water			6	×)	×					x	
					Surface water			6			-						X	
					Surface water			6								-	x	INVOICE TO:
					Surface water			6									x	Stillwater Sciences
					Surface water			6									x	Same as above
					Surface water			6								-	x	
					Surface water			6									x	Project No. 750.10 Task 0200.01
					Surface water			6									x	QUOTE#
JUSPECTI	D CONST	ITUENTS							SAN	IPLE F	RETEN	TIO	N TIME	F	RESE	RVAT	IVES (1) HCL (3) = COLD 2) HNO ₃ (4)= H2SO4
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us	2~	~	Eric S	ommer a	NUEr		6/26/18											
		A /	Stillw	nter Sc	itness		1528						1	~				
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 Page 2 of 3
 07/03/18 14:49

 Stillwater Sciences
 Project:
 SMUD In situ, Bac-T, & Chemistry Monitoring

 2855 Telegraph Ave., Suite 400
 Project Number:
 750.10 Task 0200.01
 CLS Work Order #: 18F1392

 Berkeley, CA 94705
 Project Manager:
 Maia Singer
 COC #:

Microbiological Parameters by APHA Standard Methods

		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sampled: 06/26/18 09:15	Rece	ived: 06/2	6/18 15:28					
<1	1.0		1	1805304	06/26/18	06/27/18	SM9223	
<1.8	1.8	mL.		1805322	06/26/18	06/29/18	SM 9221	
Sampled: 06/26/18 10:58	Rece	sived: 06/2	6/18 15:28					
<1	1.0		1	1805304	06/26/18	06/27/18	SM9223	
<1.8	1.8	- mL		1805322	06/26/18	06/29/18	SM 9221	
Sampled: 06/26/18 12:18	Receiv	ed: 06/26/1	8 15:28					
29.2	1.0		1	1805304	06/26/18	06/27/18	SM9223	
2.0	1.8	mL.		1805322	06/26/18	06/29/18	SM 9221	
Sampled: 06/26/18 13:32	Recei	ived: 06/26	18 15:28					
1.0	1.0		1	1805304	06/26/18	06/27/18	SM9223	
<1.8	1.8	mL -		1805322	06/26/18	06/29/18	SM 9221	
		landa diciba	18 15-28					
Sampled: 06/26/18 12:55	Recei	rved: 06/20	10 1.5.20					
Sampled: 06/26/18 12:55 <1	1.0	MPN/100 mL		1805304	06/26/18	06/27/18	SM9223	
	Result Sampled: 06/26/18 09:15 <1 <1.8 Sampled: 06/26/18 10:58 <1 <1.8 Sampled: 06/26/18 12:18 1 29.2 2.0 Sampled: 06/26/18 13:32 1.0 <1.8	Sampled: 06/26/18 09:15 Receive <1	Result Limit Units Sampled: 06/26/18 09:15 Received: 06/26 <1	Result Limik Units Dilution Sampled: 06/26/18 09:15 Received: 06/26/18 15:28 <1	Result Limit Units Dilution Batch Sampled: 06/26/18 09:15 Received: 06/26/18 15:28 <1	Result Limit Units Dilution Batch Prepared Sampled: 06/26/18 09:26/18 15:28 06/26/18 06/26/18 <1	Result Limit Units Dilution Batch Prepared Analyzed Sampled: 06/26/18 09:15 Received: 06/26/18 15:28 <1	Result Limit Units Dilution Batch Prepared Analyzed Method Sampled: 06/26/18 09:15 Received: 06/26/18 15:28

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CALIFORNIA LABORATORY SERVICES

Stillwat	of 3 🗳	Project:	SMUD In situ, Bac-T, & Chem	07/03/18 14:49 istry Monitorine
2855 Te	elegraph Ave., Suite 400 y, CA 94705	Project Number: Project Manager:	750.10 Task 0200.01 Maia Singer	CLS Work Order #: 18F1392 COC #:
		Notes and I	Definitions	
3T-4a	<1.8			
3T-4	<1			
ΕT	Analyte DETECTED			
D	Analyte NOT DETECTED at or above 1	he reporting limit (or method detection	a limit when specified)	
R	Not Reported			
y	Sample results reported on a dry weight	basis		
PD	Relative Percent Difference			

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July 05, 2018

CLS Work Order #: 18F1436 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 06/27/18 14:56. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233



		Report To:				Job Nu Task 02			A	NAL	YSIS	RE	QUESTE	D GI	OTR	LAC KI	R	
	ter Scien elegraph	ces Ave. Suite 400			Destinati Ranci	ion Lab ho Coro			Fec			E en		ED	e Ri	PORT	5	YES X IN NO
	y, CA 9						638-7301		alo	1		0		GL	08/	M. 10.		
	Singer m	aia@stillwatersci.	com		3249	to Con	rald Road dova, CA	뭤	Fecal coliform-15 Tube			coli Ouanti-trav						
) In situ,	Bac-T, & Chemis	try Monitorin	g	www.cali		lab.com	ESER	n-15 7			~		ारप	LD.	CONE	THOS	87
Sampled B	y.				🗌 отні	ER		AT	E.									
Fob Dysciij Monitor se		ria levels in UARP reaches	10					VES										
Site Locati	ot UARF															NARO E IN D		SPECIAL INSTRUCTIONS
		SAMPLE	F	ELD		et	INTAINER	1								3		
DATE	TIME	IDENTIFICAT	TION	ID.	MATRIX	NO.	TYPE	Y						1	2	3	5	
127/18	0948	BAC-7-UVE			Sufface water			6	×			X					x	
0/27/1	1010	BAC- 8-UVR			Surface water			6	X			X		_			X	
0/27/8	1035	BAC-10-UVK			Surface, witter			6	×			X					X	
127(1	1105	BAC - 9-UVA	2		Surface water			6	×	1		X					х	
6/27/18	1159	BAC-5-GCR			Surface water			6	×			×					x	
0/27/13	1245	BAL-6-GILI	k l		Surface water			6	×			×					x	
					Surface water			6	Γ								x	INVOICE TO:
	1				Surface water			6									x	Stillwater Sciences
					Surface water			6								T	x	Same as above
	1				Surface water			6									x	
					Surface water			6									x	Project No. 750.10 Tax 0200.01
					Surface water			6									x	OUDTE#
SUSPECT	ED CONST	TTUENTS							SA	MPU	RETE	NTR	IN TIME	PR	ESF	RVAT	IVES (1) HCL (3) = COLD 2) HNO; (4)= H2SO4
RELINGU	ISHED BY	Signature)			ECOMPANY		DATE/TIME			R	ECEIVI	D B	Y (Signatur	c)				NT NAMECOMPANY
2:	20-0-	~	Eric Sommer	mak	stillwater	-	6-27-11 19	560										
RECEIV	ED AT LA	B BY4 W	2		DATE/TIME: 6	1271	18 1456	ce	ONDI	TION	8/004	IME	NTE G	5)		1		
SHIP	PED BY:	FED EX	UPS		OTHER							AIR	BILL#	100				



Page 2 of 3	8			07/05/18 12:28
Stillwater Sciences		Project:	SMUD In situ, Bac-T, & Chemistry Moni	toring
2855 Telegraph Ave., Suite 400		Project Number:	750.10 Task 0200.01	CLS Work Order #: 18F1436
Berkeley, CA 94705		Project Manager:	Maia Singer	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte		orting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-7-UVR (18F1436-01) Surface Water	Sampled: 06/27/18 09:48	Recei	ved: 06/27	/18 14:56					
E. Coli	1.0	1.0	MPN/100 mL	1	1805355	06/27/18	06/28/18	SM9223	
Fecal Coliforms	2.0	1.8	- mL		1805357	06/27/18	06/30/18	SM 9221	
BAC-8-UVR (18F1436-02) Surface Water	Sampled: 06/27/18 10:10	Recei	ved: 06/27	/18 14:56					
E. Coli	3.1	1.0	MPN/100	1	1805355	06/27/18	06/28/18	SM9223	
Fecal Coliforms	4.0	1.8	mL •		1805357	06/27/18	06/30/18	SM 9221	
BAC-10-UVR (18F1436-03) Surface Water	Sampled: 06/27/18 10:35	Reco	ived: 06/2	7/18 14:56					
E. Coli	<1	1.0	MPN/100 mL	1	1805355	06/27/18	06/28/18	SM9223	
Fecal Coliforms	<1.8	1.8			1805357	06/27/18	06/30/18	SM 9221	
BAC-9-UVR (18F1436-04) Surface Water	Sampled: 06/27/18 11:05	Recei	ved: 06/27/	18 14:56					
E. Coli	3.1	1.0	MPN/100 mL	1	1805355	06/27/18	06/28/18	SM9223	
Fecal Coliforms	23	1.8			1805357	06/27/18	06/30/18	SM 9221	
BAC-5-GCR (18F1436-05) Surface Water	Sampled: 06/27/18 11:59	Recei	ved: 06/27	/18 14:56					
E. Coli	7.5	1.0	MPN/100	1	1805355	06/27/18	06/28/18	SM9223	
Fecal Coliforms	6.8	1.8	mL •		1805357	06/27/18	06/30/18	SM 9221	
BAC-6-GCR (18F1436-06) Surface Water	Sampled: 06/27/18 12:45	Recei	ved: 06/27	/18 14:56					
E. Coli	1.0	1.0	MPN/100	1	1805355	06/27/18	06/28/18	SM9223	
Fecal Coliforms	13	1.8	mL •		1805357	06/27/18	06/30/18	SM 9221	

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CALIFORNIA LABORATORY SERVICES

Stillwat	ter Sciences	Project:	SMUD In situ, Bac-T, & Chem	istry Monitorine		
2855 Te	elegraph Ave., Suite 400 y, CA 94705	Project Number: Project Manager:	Project Number: 750.10 Task 0200.01			
		Notes and I	Definitions			
3T-4a	<1.8					
T-4	<1					
ΕT	Analyte DETECTED					
D	Analyte NOT DETECTED at or above f	he reporting limit (or method detection	limit when specified)			
R	Not Reported					
ry	Sample results reported on a dry weight	basis				
PD	Relative Percent Difference					

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July 10, 2018

CLS Work Order #: 18G0085 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 07/02/18 15:15. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.

Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233





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Stillwater Sciences	Project:	SMUD In situ, Bac-	F, & Chemistry Monitoring
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0200.01	CLS Work Order #: 18G0085
Berkeley, CA 94705	Project Manager:	Maia Singer	COC #:
	Ministration of the second sec	A DITA CA	INF-the-la

Microbiological Parameters by	APHA Standard Methods
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Analyte	Result	Re MDL	eporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-11-JR (18G0085-01) Surface Water	Sampled:	07/02/18 12:15	Receiv	ed: 07/02/	18 15:15					
E. Coli	5.2	1.0	1.0	MPN/100	1	1805478	07/02/18	07/03/18	SM9223	
Fecal Coliforms	2.0	1.8	1.8	mL. *		1805496		07/05/18	SM 9221	
BAC-12-IHR (18G0085-02) Surface Water	Sample	d: 07/02/18 11:3	0 Rece	ived: 07/0	2/18 15:15					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1805478	07/02/18	07/03/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8	- mL.		1805496		07/05/18	SM 9221	
BAC-13-IHR (18G0085-03) Surface Water	Sample	d: 07/02/18 11:2	0 Rece	ived: 07/0	2/18 15:15					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1805478	07/02/18	07/03/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8			1805496		07/05/18	SM 9221	
BAC-14-BCR (18G0085-04) Surface Water	Sample	ed: 07/02/18 10:0	00 Rec	rived: 07/0	2/18 15:15					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1805478	07/02/18	07/03/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8	mL.		1805496		07/05/18	SM 9221	
BAC-15-SCR (18G0085-05) Surface Water	Sample	d: 07/02/18 13:2	0 Rece	ived: 07/0	2/18 15:15					
E. Coli	344.8	1.0	1.0	MPN/100 mL	1	1805478	07/02/18	07/03/18	SM9223	
Feeal Coliforms	130	1.8	1.8	*		1805496		07/05/18	SM 9221	

3249 Fitzgerald Road, Rancha Cardova, CA 95742 | 800.638.7301 | Tel: 916.638.7301 x102 | Fax: 916.638.4510 | www.californialab.com Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233





07/10/18 13:24

2855 Te	er Sciences legraph Ave., Suite 400 y, CA 94705	Project: Project Number: Project Manager:	750.10 Task 0200.01	Chemistry Monitoring CLS Work Order #: 18G0085 COC #:	
		Notes and Defin	itions		
BT-4a	<1.8				
BT-4	<1				
DET	Analyte DETECTED				
ND	Analyte NOT DETECTED at or above the r	eporting limit (or method detection limit v	shen specified)		

Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

NR Not Reported

- dry Sample results reported on a dry weight basis
- Relative Percent Difference RPD

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

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		Report To:			t Job Num Task 020			A	NAL	YSIS	S RE	QUESTE	CD GE	OTR	ACK	R	
	ter Scier	ces Ave. Suite 400			tion Labo cho Cordo		1	Fe			E.o		ED	FRE	EPOR	-	YES X NO
	y, CA 9			× CLS	(916)	638-7301	1	cal			oli O			082	AL ID.		
Project Ma Maia S	Singer m	aia@stillwatersci.com		3249	Fitzgera ho Corde	ld Road	PR	Fecal coliform-15 Tube			coli Quanti-tray		01		AL. 117.		
	In situ,	Bac-T, & Chemistry Moni	toring	www.cal		ab.com	PRESERVATIVES	n-15			y		FI	LD	CONE	TIONS	5:
Sampled B	У			🗆 отн	ER		AT	Teb									
Job Descrip Monitor se		ia levels in UARP reaches.					IVES)¢									
Site Locatio	on UARF	,													NARO E IN D		SPECIAL INSTRUCTIONS
DATE	TIME	SAMPLE	FIELD		CON	VTAINER	1_						1	2	3	5	
		IDENTIFICATION	ID.	MATRIX	NO.	TYPE	۷						<u> </u>	Ľ	-	<u> </u>	
7/2/18		BAC-11-5R		Surface water			6	×	_		X		_	1	-	X	
7/2/18		BAC-12-IHR		Surface water		_	6	X		_	X		_	1	1	X	
7/2/18		BAC-13-IHK		Surface water			6	X			X		_	1		X	
7/2/18		BAC-14-BCR		Surface water			6	X	-		X					X	
7/2/18	1320	BAC-15-SCR		Surface water			6	X			X					X	
1.				Surface water			6									X	
				Surface water			6									x	INVOICE TO:
				Surface water			6									X	Stillwater Sciences
				Surface water			6									x	Same as above
				Surface water			6									x	
				Surface water			6									x	Project No. 750.10 Ta 0200.01
				Surface water			6									x	QUOTE#
SUSPECT	ED CONST	TUENTS						SA	MPLE	RET	ENTIC	ON TIME	PR	ESEI	RVAT	VES (1	1) HCL (3) = COLD 2) HNO ₃ (4) = H2SO4
RELINQUI	SHÈD BY (E/COMPANY		DATE/TIME			RE	CEIV	ED B	Y (Signatur	e)			PRD	NT NAME/COMPANY
ling	6	and Kel	leigh Co	Sciences		7/2/0	-										
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NAMES AND ADDRESS OF	or at the			TALL N/ LINES:	1 ~ 1	0.1012-	100	-upt	TROUGS	nco:	MAR	1413:		1.0			





CLS Work Order #: 18G0187 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 07/03/18 14:52. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233



		Report To:				Job Nu Task 02			AN	ALYSIS	REQ	UESTED	GE	TRA	KE	R	
	ter Sciene elegraph	es Ave. Suite 400			Destinati Ranci	ion Lab no Cend			Fec		E co		EDI	REP)RT		YES X NO
Berkela	y, CA 94	705					638-7301	1	E C		0		GL	DBAL	ID.		
	inger ma	ia@stillwatersci.c	om		3249	to Core	ald Road lova, CA	PRESERVATIVES	oliforn		coli Quanti-tray		į.				
Project Na SMILIT		Bac-T, & Chemis	ny Monito	rina	www.cali		lab.com	ESE	E		2		FIE	LD CC	ND	TIONS	¢:
Sampled B		ac-1, a chemis	ay monto	ing	🗆 отні	210		RVA	Tu								
Job Descri Monitor se		a levels in UARP reaches.				28		TIVES	be			. 68					
Site Locati	on UARP													URNA IME I			SPECIAL INSTRUCTIONS
		SAMPLE		FIELD		ce	NTAINER	1									
DATE	TIME	IDENTIFICAT	ION	1D.	MATRIX	NO.	TYPE	V					1	2	3	5	
1/3/18	1115	BAC-5-60	E		Surface water			6	X		X					x	
3/18	1130	BAC- 6-GC	P		Surface water			6	36		×			_		х	
13/18	1015	BAC-7-UV	R		Surface water			6	X		X					X	
1/3/18	1035	BAC- 8- UN			Surface water			6	X		X					X	
1318	1225	BAC - 9- UN	IR		Surface water			6	X		×					х	
13/18	1200	BAC- 10- U	VR		Surface water			6	×		X					х	
11					Surface water			6								X	INVOICE TO:
					Surface water			6								x	Stillwater Sciences
					Surface water			6								x	Same as above
					Surface water			6								x	
					Surface water			6								x	Project No. 750.10 Tas 0200.01
					Surface water			6								x	QUOTE#
SUSPECT	EB CONSTI	TUENTS							SAM	PLERET	NTION	TIME	PRI	SERV	ATI	VES () C	1) HC1. (3) = COLD 2) HNO ₃ (4) = 1(25C)4
RELANQU	ISHED AV (S	istafre)	P	RINTNAM	ECOMPANY	1	DATE/TIME	1		RECEIV	ED BY	(Signature)					NT NAME: COMPANY
Sa	Md Y	hosen		d Rose			7/3/18	-						_			
RECEIV	ED AT LAI	BY: AND	Hillu	unter	DATESTIME 7	13/10	1452	co	NOTTI	ONSCO	MMEN	rs: 1.5		_			
	ED BY:	D FED'EX	UPS	-	OTHER	1.0	11.6	1			AIRE				-		



Page 2 of 3 🍋			07/11/18 15:10
Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Cher	nistry Monitoring
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0200.01	CLS Work Order #: 18G0187
Berkeley, CA 94705	Project Manager:	Maia Singer	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte		orting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-5-GCR (18G0187-01) Surface Water	Sampled: 07/03/18 11:15	Recei	ived: 07/03	/18 14:52					
E. Coli	5.2	1.0	MPN/100 mL	1	1805535	07/03/18	07/04/18	SM9223	
Fecal Coliforms	<1.8	1.8			1805540		07/06/18	SM 9221	
BAC-6-GCR (18G0187-02) Surface Water	Sampled: 07/03/18 11:30	Recei	ived: 07/03	/18 14:52					
E. Coli	7.5	1.0	MPN/100	1	1805535	07/03/18	07/04/18	SM9223	
Fecal Coliforms	<1.8	1.8	mL "		1805540		07/06/18	SM 9221	
BAC-7-UVR (18G0187-03) Surface Water	Sampled: 07/03/18 10:15	Recei	ived: 07/03	/18 14:52					
E. Coli	2.0	1.0	MPN/100 mL	1	1805535	07/03/18	07/04/18	SM9223	
Fecal Coliforms	2.0	1.8			1805540		07/06/18	SM 9221	
BAC-8-UVR (18G0187-04) Surface Water	Sampled: 07/03/18 10:35	Recei	ived: 07/03	/18 14:52					
E. Coli	2.0	1.0	MPN/100 mL	1	1805535	07/03/18	07/04/18	SM9223	
Fecal Coliforms	<1.8	1.8			1805540		07/06/18	SM 9221	
BAC-9-UVR (18G0187-05) Surface Water	Sampled: 07/03/18 12:25	Recei	ived: 07/03	/18 14:52					
E. Coli	6.3	1.0	MPN/100 mL	1	1805535	07/03/18	07/04/18	SM9223	
Fecal Coliforms	2.0	1.8			1805540		07/06/18	SM 9221	
BAC-10-UVR (18G0187-06) Surface Water	Sampled: 07/03/18 12:00	Rec	eived: 07/0	3/18 14:52					
E. Coli	1.0	1.0	MPN/100	1	1805535	07/03/18	07/04/18	SM9223	
Fecal Coliforms	<1.8	1.8	mL "		1805540		07/06/18	SM 9221	

3249 Fitzgerald Road, Rancho Cordova, CA 95742 | 800.638.7301 | Tel: 916.638.7301 ×102 | Fax: 916.638.4510 | www.californialab.com Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233





Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Chem	istry Monitoring
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0200.01	CLS Work Order #: 18G0187
Berkeley, CA 94705	Project Manager:	Maia Singer	COC #:
	Notes and 1	Definitions	

DET Analyte DETECTED

- ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

3249 Fitzgerald Raad, Rancho Cordova, CA 95742 | 800.638.7301 | Tel: 916.638.7301 ×102 | Fax: 916.638.4510 | www.californialab.com Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233



July 18, 2018

CLS Work Order #: 18G0642 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 07/11/18 14:56. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233



Report To: Stillwater Sciences 2855 Telegraph Ave, Suite 400				Client Joli Number 750.10 Task 0200.01 Destination Laboratory Rancho Cordova			ANALYSIS REQUESTED					ED	GEOTRACKER			
							FEGALS	Fecal o		10 000		1	THEREPOR		Г	NES X INO
Berkeley, CA 94705				X CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com					céli Quanti-Iray	2			EOF	IAL-ID		
Project Manages Maia Singer <u>maia@stillwatersci.com</u> Project Name SMUD In situ, Bac-T, & Chemistry Monitoring Sampted By Juli Description Muniter seasonal bacteria levels in UARP reaches. Site Location UARP							PRES	Fecal coliform-15 Tube		santi-leav			FIELD CONDITIONS:			
							PRESERVATIVES	5 Tube								
							IVES					-340				
													TURNAROUND SPECIAL TIME IN DAYS INSTRUCTION			
-	TIME	SAMPLE IDENTIFICATION	FIELD ID.		CON	TAINER	v							1	5	
DATE				MATRIX	NO.	TYPE							1	2 3	2	
/11/18		BAC-14- BCR		Surface water			6	3	3	X					X	
1/1/18	· · · · ·	BAC-IL-JR		Surface water			6	×		X					X	
7/11/18		BAC-12-IHR		Surface water			6	×		×					8	
11/18		BAC- 13- IHR BAC- 15-5CR	1	Surface water			6	X		X					X	
7/11/18	1315	BAC- 15-5CR.		Surface water			6	3.	1	X					X	
				Surface water			6								X	
			-	Surface water			6								X	INVOLT TO:
			_	Surface water			6								X	Stillwater Sciences
				Surface water			6								X	Same as above
				Surface water		-	6								х	
				Surface water			6								x	Project No. 750.10 Tas 0200.01
				Surface water			6								X	OF0.1E%
SUSPACT	ED CONST	ITUENIS						SAMPI.	ERETE	N THOS	S TIME	12	RES	ERVA	IVES (1) HCL (3) = COLD 2) HNO ₃ (4) = H2SO4
						ATE/TIME	RECEIVED BY (Signature)					ne)	PRINT NAMECOMPANY			
n Sa	moon	ere Eric Son	merames /	3k71water	7/	14 1450	2									
a property.	ED AT LA	BBY: AA -		DATE/TIME: 7	Intre	1456	100	NDITIO	NETTIN	MIN	1 7.00	• U)	_		





Page	1	of	2
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Page 1 of 2	<u> </u>		07/18/18 15:04
Stillwater Sciences	Project	: SMUD In situ, Bac-T, & Chemi	istry Monitoring
2855 Telegraph Ave., Suite 400	Project Number	: 750.10 Task 0200.01	CLS Work Order #: 18G0642
Berkeley, CA 94705	Project Manager	: Main Singer	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte		orting Limit Unit	Dilution	Batch	Prepared	Analyzed	Method	Notes		
BAC-14-BCR (18G0642-01) Surface Water	Sampled: 07/11/18 09:35	Received: (7/11/18 14:	56						
Fecal Coliforms	<1.8	1.8 MPN/10	0 mL 1	1805792	07/11/18 16:00	07/14/18	SM 9221			
E. Coli	<1	1.0 *		1805788	07/11/18 17:00	07/12/18	SM9223			
8AC-11-JR (18G0642-02) Surface Water Sampled: 07/11/18 11:05 Received: 07/11/18 14:56										
Fecal Coliforms	350	1.8 MPN/10) mL 1	1805792	07/11/18 16:00	07/14/18	SM 9221			
E. Coli	261.3	1.0 *		1805788	07/11/18 17:00	07/12/18	SM9223			
BAC-12-IHR (18G0642-03) Surface Water	Sampled: 07/11/18 12:05	Received: 0	7/11/18 14:5	56						
Fecal Coliforms	2.0	1.8 MPN/10	0 mL 1	1805792	07/11/18 16:00	07/14/18	SM 9221			
E. Coli	1.0	1.0 *		1805788	07/11/18 17:00	07/12/18	SM9223			
BAC-13-IHR (18G0642-04) Surface Water	Sampled: 07/11/18 11:45	Received: 0	7/11/18 14:5	6						
Fecal Coliforms	<1.8	1.8 MPN/10) mL 1	1805792	07/11/18 16:00	07/14/18	SM 9221			
E. Coli	2.0	1.0 *		1805788	07/11/18 17:00	07/12/18	SM9223			
BAC-15-SCR (18G0642-05) Surface Water	Sampled: 07/11/18 13:15	Received: 0	7/11/18 14:	56						
Fecal Coliforms	350	1.8 MPN/10) mL 1	1805792	07/11/18 16:00	07/14/18	SM 9221			
E. Coli	248.1	1.0 *		1805788	07/11/18 17:00	07/12/18	SM9223			





age 2 o	if 2		07/18/18 15:04
2855 Tel	er Sciences legraph Ave., Suite 400 y, CA 94705	Project: SMUD Ir Project Number: 750.10 Tasl Project Manager: Maia Singe	
		Notes and Definitions	
BT-4a	<1.8		
BT-4	<1		
DET	Analyte DETECTED		
ND	Analyte NOT DETECTED at or above the reporting	limit (or method detection limit when specified	0
NR	Not Reported		
iry	Sample results reported on a dry weight basis		
RPD	Relative Percent Difference		





July 19, 2018

CLS Work Order #: 18G0709 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 07/12/18 13:15. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.

Laboratory Director





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-9.6	190	18	12:32	

Stillwater Sciences		SMUD In situ, Bac-T, &	Chemistry Monitoring						
2855 Telegraph Ave., Suite 400		750.10 Task 0200.01	CLS Work Order #: 18G0709						
Berkeley, CA 94705		Maia Singer	COC #:						
Microbiological Parameters by APHA Standard Methods									

Analyte	Result	Rep MDL	orting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-7-UVR (18G0709-01) Surface Water	Sampled	1: 07/12/18 08:25	Rece	ived: 07/12	2/18 13:15					
E. Coli	1.0	1.0	1.0	MPN/100	1	1805807	07/12/18	07/13/18	SM9223	
Fecal Coliforms	2.0	1.8	1.8	mL. *		1805827	07/12/18	07/15/18	SM 9221	
BAC-8-UVR (18G0709-02) Surface Water	Sampled	1: 07/12/18 08:50	Recei	ived: 07/12	2/18 13:15					
E. Coli	<1	1.0	1.0	MPN/100 mL) 1	1805887	07/12/18	07/13/18	SM9223	
Fecal Coliforms	< 1.8	1.8	1.8	mL.		1805827	07/12/18	07/15/18	SM 9221	
BAC-9-UVR (18G0709-03) Surface Water Sampled: 07/12/18 09:50 Received: 07/12/18 13:15										
E. Coli	<1	1.0	1.0	MPN/100 mL) 1	1805887	07/12/18	07/13/18	SM9223	
Fecal Coliforms	2.0	1.8	1.8	* mL		1805827	07/12/18	07/15/18	SM 9221	
BAC-10-UVR (18G0709-04) Surface Water	Sample	d: 07/12/18 09:1	5 Rec	eived: 07/1	2/18 13:15					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1805887	07/12/18	07/13/18	SM9223	
Fecal Coliforms	2.0	1.8	1.8			1805827	07/12/18	07/15/18	SM 9221	
BAC-5-GCR (18G0709-05) Surface Water	Sampled	1: 07/12/18 11:05	Rece	ived: 07/12	2/18 13:15					
E. Coli	1.0	1.0	1.0	MPN/100 mL	1	1805807	07/12/18	07/13/18	SM9223	
Fecal Coliforms	< 1.8	1.8	1.8	· ·		1805827	07/12/18	07/15/18	SM 9221	
BAC-6-GCR (18G0709-06) Surface Water	Sampled	1: 07/12/18 10:40	Rece	ived: 07/12	2/18 13:15					
E. Coli	<1	1.0	1.0	MPN/100 mL) 1	1805887	07/12/18	07/13/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8	mL.		1805827	07/12/18	07/15/18	SM 9221	





07/19/18 12:32

2855 Tel	er Sciences legraph Ave., Suite 400 y, CA 94705	Project: Project Number: 75 Project Manager: M		Chemistry Monitoring CLS Work Order #: 18G0709 COC #:	
		Notes and Definiti	ions		
BT-4a	<1.8				
BT-4	<1				
DET	Analyte DETECTED				
ND	Analyte NOT DETECTED at or above the	eporting limit (or method detection limit who	en specified)		

- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.



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	ey, CA 9				X CLS	(916)	638-7301	13	alo		SII OI			GL	DBAD	ID.		
Project Manager Maia Singer maia@stillwatersci.com Project Name SMUD In situ, Bac-T, & Chemistry Monitoring Samptol By				3249	to Core	ald Road Iova, CA	PR	Fecal coliform-		coli Quanti-tray								
			www.californialab.com				5					FIE	ЦÐЮ	ONDI	THONS	i.		
Job Desen					□ OTHER			PRESERVATIVE	Tube			-26						
		ia levels in MARP reache	s					ES			1.1			TURNAROUND SPECIAL TIME IN DAYS INSTRUCTIONS				
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-12-18	0825	BAC-7-UVR			Surface water	_		6	24		x						x	
	0850	BAC-8-UVR			Surface water			6	x		x						х	
1-12-18	0950	BAC-9-UV	R		Surface water			6	x		X						x	
-12-18	0915	BAC- 10- V	/R		Surface water			6	x		x						x	
-12-18	1105	BAC - 5- 60	R		Surface water			6	×		k						x	
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					Surface whiter			6									х	Sciliwater Sciences
					Surface water			6									x	Same asabove
					Surface water			6									х	
					Surface water			6									х	Project No. 750.10 Tasl 0200.01
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JUSPECT	ED CONST	TUENTS							SAM	PLERI	TEND	IN TIME		PRE	SER	ATI	VES (I	1) HCL (3) = COLD 2) HNO ₃ (4)= H2SO4
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July 24, 2018

CLS Work Order #: 18G0947 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 07/17/18 15:45. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.

Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

Page 1 of 4





07/24/18 13:46

Stillwater Sciences	Project:	SMUD In situ, Bac-T	& Chemistry Monitoring
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0200.01	CLS Work Order #: 18G0947
Berkeley, CA 94705	Project Manager:	Maia Singer	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Rep MDL	porting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-11-JR (18G0947-01) Surface Water	Sampled:	: 07/17/18 12:50	Receiv	ed: 07/17/	18 15:45					
E. Coli	6.3	1.0	1.0	MPN/100	1	1805939	07/17/18	07/19/18	SM9223	
Fecal Coliforms	4.0	1.8	1.8	mL. *		1805940		07/20/18	SM 9221	
BAC-12-IHR (18G0947-02) Surface Water	Sample	d: 07/17/18 13:40	Rece	ived: 07/1	7/18 15:45					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1805939	07/17/18	07/19/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8	- mL -		1805940		07/20/18	SM 9221	
BAC-13-IHR (18G0947-03) Surface Water	Sample	d: 07/17/18 13:30	Rece	ived: 07/1	7/18 15:45					
E. Coli	73.8	1.0	1.0	MPN/100	1	1805939	07/17/18	07/19/18	SM9223	
Fecal Coliforms	23	1.8	1.8	mL. *		1805940		07/20/18	SM 9221	
BAC-14-BCR (18G0947-04) Surface Water	Sample	ed: 07/17/18 11:20	Rece	sived: 07/1	7/18 15:45					
E. Coli	<1	1.0	1.0	MPN/100	1	1805939	07/17/18	07/19/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8	mL •		1805940		07/20/18	SM 9221	
BAC-15-SCR (18G0947-05) Surface Water	Sample	ed: 07/17/18 09:30) Rece	sived: 07/1	7/18 15:45					
E. Coli	2.0	1.0	1.0	MPN/100	1	1805939	07/17/18	07/19/18	SM9223	
Feeal Coliforms	1.8	1.8	1.8	nl. ,		1805940		07/20/18	SM 9221	

3249 Fitsgeraid Road, Rancho Cordava, CA 95742 | 800.638.7301 | Tel: 916.638.7301 x102 | Fax: 916.638.4510 | www.californiaiab.com Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

Page 2 of 4





07/24/18 13:46

Stillwater 2855 Tele Berkeley,	graph Ave., Suite 400 Project		Control there are a control	try Monitoring CLS Work Order #: 18G0947 COC #:
	Notes an	nd Defini	tions	
BT-4a	<1.8			
BT-4	<1			
DET	Analyte DETECTED			
ND	Analyte NOT DETECTED at or above the reporting limit (or method detection)	ction limit w	hen specified)	

NR Not Reported

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

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Page 3 of 4



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July 25, 2018

CLS Work Order #: 18G0977 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 07/18/18 13:45. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.

Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

Page 1 of 4





07/25/18 07:21

Stillwater Sciences		SMUD In situ, Bac-T, & Chem	istry Monitoring
2855 Telegraph Ave., Suite 400		750.10 Task 0200.01	CLS Work Order #: 18G0977
Berkeley, CA 94705		Main Singer	COC #:
	Microbiological Parameters by	APHA Standard Metho	ods

Analyte	Result	Reg MDL	orting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-5-GCR (18G0977-01) Surface Water	Sampled	: 07/18/18 10:00	Recei	ved: 07/18	8/18 13:45					
E. Coli	1.0		1.0	MPN/100 mL) 1	1805972	07/18/18	07/19/18	SM9223	
Fecal Coliforms	7.8		1.8	mL.		1805974	07/18/18	07/21/18	SM 9221	
BAC-6-GCR (18G0977-02) Surface Water	Sampled	: 07/18/18 10:45	Recei	wed: 07/18	8/18 13:45					
E. Coli	2.0		1.0	MPN/100 mL) 1	1805972	07/18/18	07/19/18	SM9223	
Fecal Coliforms	<1.8		1.8	•		1805974	07/18/18	07/21/18	SM 9221	
BAC-7-UVR (18G0977-03) Surface Water	Sampled:	: 07/18/18 09:15	Recei	ved: 07/18	8/18 13:45					
E. Coli	<1		1.0	MPN/100 mL) 1	1805972	07/18/18	07/19/18	SM9223	
Fecal Coliforms	<1.8		1.8	- mL		1805974	07/18/18	07/21/18	SM 9221	
BAC-8-UVR (18G0977-04) Surface Water	Sampled:	: 07/18/18 09:30	Recei	ved: 07/18	8/18 13:45					
E. Coli	1.0		1.0	MPN/100 mL) 1	1805972	07/18/18	07/19/18	SM9223	
Fecal Coliforms	<1.8		1.8	- mil.		1805974	07/18/18	07/21/18	SM 9221	
BAC-9-UVR (18G0977-05) Surface Water	Sampled:	: 07/18/18 11:40	Recei	ved: 07/18	3/18 13:45					
E. Coli	3.1		1.0	MPN/100) 1	1805972	07/18/18	07/19/18	SM9223	
Feeal Coliforms	9.3		1.8	mL.		1805974	07/18/18	07/21/18	SM 9221	
BAC-10-UVR (18G0977-06) Surface Water	Samples	d: 07/18/18 11:10	Rece	ived: 07/1	18/18 13:45					
E. Coli	<1		1.0	MPN/100) 1	1805972	07/18/18	07/19/18	SM9223	
Fecal Coliforms	<1.8		1.8	mL "		1805974	07/18/18	07/21/18	SM 9221	

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Page 2 of 4





07/25/18 07:21

	Sciences graph Ave., Suite 400 CA 94705	Project: Project Number: 1 Project Manager: 1	750.10 Task 0200.01	Chemistry Monitoring CLS Work Order #: 18G0977 COC #:	
		Notes and Defini	tions		
BT-4a	<1.8				
BT-4	<1				
DET	Analyte DETECTED				

- ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.

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Page 3 of 4



		Report To:			Client 750.10				AN	AL	SIS RE	QUESTED	GE	GEOTRACKER			
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	singer ma	ua@stillwatersci.co	m		 3249 Fitzgerald Road Rancho Cordova, CA 95742 				oliforn		coli Quanti-tray						
SMUE Sampled B	In situ,	Bac-T, & Chemistry	Monitori	ng	www.californialab.com			ESERVI	Fecal coliform-15 Tube		Y		FIE	in c	OND	ITION3	5:
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mart	TIME	IDENTIFICATIO	ON ID.		MATRIX	NO	. TYPE	Ŧ					10	2	3	5	
718/18	1000	BAC-S-GC	-		Surface water			6	×		×					x	
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2/18/18	0915	BAC- 7- UV	R		Surface water			6 X X				x					
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Page 4 of 4



August 01, 2018

CLS Work Order #: 18G1398 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 07/25/18 13:25. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director



		Report To:			I Job Nu Task (i)			Al	AL	/SI	S REO	QUESTED	GB	OTR/	VCKI	R	
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			100.22	Surface water			6									х	
				Surface water			6									х	INVOICE TO:
				Surface water			6									х	Stillwrier Sciences
	i			Surface water			6									x	Same as above
				Surface water			6									x	
				Surface water			6									x	Project No. 750.10 Tas 0200.01
				Surface water	-		6			-						x	QUOTER
USPECT	ED CONST	TTUENTS						SAD	APLE .	RED	ENTIC	N TIME	PR	ESER	VAT		1) HCL (3) = COLD 2) HNO ₅ (4) = H2SO4
BUDNOUL	SHED, BY	Richaro)	PRINT NAM	ECOMPANY		DATE/TIME	1	-	RE	CEN	ED B	(Signature)	1.	-	-		NT NAME/COMPANY
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		(050A (1	STILLWAT			1325	1	500220					_				
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SHIPP	ED BY:	🗆 🗆 red ex /	🗆 UPS 🗖	OTHER			_		_		AIR	BILL#				_	
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CALIFORNIA LABORATORY SERVICES

Page 1 of 2		08/01/18 15:24
Stillwater Sciences 2855 Telegraph Ave., Suite 400	Project: SMUD In situ, Bac-T, & Project Number: 750.10 Task 0200.01	Chemistry Monitoring CLS Work Order #: 18G1398
Berkeley, CA 94705	Project Manager: Maia Singer	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	porting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-6-GCR (18G1398-01) Surface Water	Sampled: 07/25/18 11:15	Rece	ived: 07/2:	5/18 13:25	5				
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	1806149	07/25/18 14:00	07/28/18	SM 9221	
E. Coli	<1	1.0			1806147		07/26/18	SM9223	





Page 2 o	of 2		08/01/18 15:24
2855 Te	er Sciences legraph Ave., Suite 400 y, CA 94705	Project: SMUD In sit Project Number: 750.10 Task 02 Project Manager: Maia Singer	a, Bac-T, & Chemistry Monitoring 00.01 CLS Work Order #: 18G1398 COC #:
		Notes and Definitions	
BT-4a	<1.8		
BT-4	<1		
DET	Analyte DETECTED		
ND	Analyte NOT DETECTED at or above the repo	ting limit (or method detection limit when specified)	
NR	Not Reported		
dry	Sample results reported on a dry weight basis		
RPD	Relative Percent Difference		





August 30, 2018

CLS Work Order #: 18H1399 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 08/23/18 14:33. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.

Laboratory Director





08/30/18 14:08

Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0200.01 CLS Work Order #: 18H1399	
Berkeley, CA 94705	Project Manager:	Maia Singer COC #:	

Microbiological Parameters by APHA Standard Methods

Analyte Result MDL Reprint Limit Units Dilution Batch Prepared Analyzed Method Not BAC-1-BI (18H1399-01) Surface Water Sampled: 08/23/18 09:39 Received: 08/23/18 14:33 08/23/18 08											
E. Coli <1	Analyte	Result			Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Feed Coliforms 3.7 1.8 1.8 "IL INSTITUTE INSTITUTE Feed Coliforms 3.7 1.8 1.8 " 1807110 08/23/18 08/24/18 SM 9221 Total Coliforms 71.7 1.0 1.0 " " 1807108 08/23/18 08/24/18 SM 9223 BAC-2-BI (18H1399-02) Surface Water Sampled: 08/23/18 10:10 Received: 08/23/18 14:33 08/23/18 08/23/18 08/24/18 SM 9223 E. Coli <1 1.0 1.0 MPN100 1 1807100 08/23/18 08/24/18 SM 9223 Feeal Coliforms <1.8 1.8 1.8 " 1807100 08/23/18 08/24/18 SM 9223 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 08/23/18 08/24/18 SM 9223 E. Coli <1 1.0 1.0 MPN100 1 1807100 08/23/18 08/24/18 SM 9223 Feeal Coliforms <1.8 1.8 1.8 " <t< th=""><th>BAC-1-BI (18H1399-01) Surface Water</th><th>Sampled:</th><th>08/23/18 09:39</th><th>Receive</th><th>d: 08/23/1</th><th>8 14:33</th><th></th><th></th><th></th><th></th><th></th></t<>	BAC-1-BI (18H1399-01) Surface Water	Sampled:	08/23/18 09:39	Receive	d: 08/23/1	8 14:33					
Fecal Coliforms 3.7 1.8 1.8 * * 1807110 08/23/18 08/26/18 SM 9221 Total Coliforms 71.7 1.0 1.0 * * 1807108 08/23/18 08/24/18 SM 9221 BAC-2-BI (18H1399-02) Surface Water Sampled: 08/23/18 10:10 Received: 08/23/18 14:33 * 1807108 08/23/18 08/24/18 SM 9223 E. Coli <1	E. Coli	<1	1.0	1.0		1	1807108	08/23/18	08/24/18	SM9223	
BAC-2-BI (18H1399-02) Surface Water Sampled: 08/23/18 10:10 Received: 08/23/18 14:33 E. Coli <1 1.0 1.0 MPN100 1 1807108 08/23/18 08/24/18 SM9223 Fecal Coliforms <1.8 1.8 1.8 * * 1807108 08/23/18 08/24/18 SM9223 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 08/23/18 08/24/18 SM9223 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 08/23/18 08/23/18 08/24/18 SM9223 E. Coli <1 0 1.0 MPN100 1 1807108 08/23/18 08/24/18 SM9223 Fecal Coliforms <1.8 1.8 * * 1807100 08/23/18 08/24/18 SM9223 Fecal Coliforms <1.0 1.0 MPN100 1 1807100 08/23/18 08/26/18 SM 9221 Total Coliforms <1.8 1.8 * * 1807100 08/23/18	Fecal Coliforms	3.7	1.8	1.8			1807110	08/23/18	08/26/18	SM 9221	
E. Coli <1	Total Coliforms	71.7	1.0	1.0			1807108	08/23/18	08/24/18	SM9223	
mL mL mL mL Fecal Coliforms <1.8 1.8 1.8 " 1807110 08/23/18 08/26/18 SM 9221 Total Coliforms 980.4 1.0 1.0 " 1807100 08/23/18 08/26/18 SM 9221 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 E E E. Coli <1 1.0 1.0 MPN/100 1 1807108 08/23/18 08/26/18 SM 9223 Fecal Coliforms <1.8 1.8 1.8 " 1807100 08/23/18 08/26/18 SM 9223 Total Coliforms <1.8 1.8 1.8 " 1807100 08/23/18 08/26/18 SM 9223 BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 08/24/18 SM 9223 BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 08/23/18 08/24/18 SM 9223 E. Coli 1.0 1.0 MPN/100	BAC-2-BI (18H1399-02) Surface Water	Sampled:	08/23/18 10:10	Receive	d: 08/23/1	8 14:33					
Feed Colliforms 980.4 1.0 1.8 1.8 1.807108 08/23/18 08/24/18 53/9223 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 1.807108 08/23/18 08/24/18 SM/9223 E. Coli <1.0	E. Coli	<1	1.0	1.0		1	1807108	08/23/18	08/24/18	SM9223	
Interview Switch 1,0 <t< th=""><th>Fecal Coliforms</th><th>< 1.8</th><th>1.8</th><th>1.8</th><th></th><th></th><th>1807110</th><th>08/23/18</th><th>08/26/18</th><th>SM 9221</th><th></th></t<>	Fecal Coliforms	< 1.8	1.8	1.8			1807110	08/23/18	08/26/18	SM 9221	
E. Coli <1	Total Coliforms	980.4	1.0	1.0			1807108	08/23/18	08/24/18	SM9223	
mL mL mL mL Fecal Coliforms <1.8 1.8 1.8 " 1807110 08/23/18 08/26/18 SM 9221 Total Coliforms 365.4 1.0 1.0 " 1807108 08/23/18 08/24/18 SM 9221 BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 Received: 08/23/18 1.8 1.8 1.807108 08/23/18 08/24/18 SM 9223 Ec Coli 1.0 1.0 1.0 MPN/100 1 1807108 08/23/18 08/24/18 SM 9223 Fecal Coliforms <1.8	BAC-3-LL (18H1399-03) Surface Water	Sampled:	08/23/18 12:15	Receive	rd: 08/23/1	8 14:33					
Feed Coliforms <1.8	E. Coli	<1	1.0	1.0		1	1807108	08/23/18	08/24/18	SM9223	
BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 E. Coli 1.0 1.0 MPN/100 1 1807108 08/23/18 08/23/18 Fecal Coliforms <1.8	Fecal Coliforms	<1.8	1.8	1.8			1807110	08/23/18	08/26/18	SM 9221	
E. Coli 1.0 1.0 1.0 MPN/100 1 1807108 08/23/18 08/24/18 \$3049223 Fecal Coliforms <1.8 1.8 1.8 " 1807110 08/23/18 08/26/18 \$3049223	Total Coliforms	365.4	1.0	1.0			1807108	08/23/18	08/24/18	SM9223	
ml. ml. Fecal Coliforms <1.8 1.8 " 1807110 08/26/18 SM 9221	BAC-4-LL (18H1399-04) Surface Water	Sampled:	08/23/18 12:35	Receive	ed: 08/23/1	8 14:33					
	E. Coli	1.0	1.0	1.0		1	1807108	08/23/18	08/24/18	SM9223	
Total Collforms 325.5 1.0 1.0 " " 1807108 08/23/18 08/24/18 53/69223	Fecal Coliforms	<1.8	1.8	1.8			1807110	08/23/18	08/26/18	SM 9221	
	Total Coliforms	325.5	1.0	1.0			1807108	08/23/18	08/24/18	SM9223	





08/30/18 14:08

Stillwater 2855 Teley Berkeley, (graph Ave., Suite 400		SMUD In situ, Bac-T, & O 750.10 Task 0200.01 Maia Singer	Chemistry Monitoring CLS Work Order #: 18H1399 COC #:	
		Notes and Defin	itions		
BT-4a	<1.8				
BT-4	<1				
DET	Analyte DETECTED				

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.



		Report To:			Job Numb Task 0200J			ANAI	YSIS	REQU	ESTED	GE	OTR	ACKE	R	
Stillwa		nces h Ave. Suite 400			ion Labora ho Cordovi		1	Fe		iu U		EDF REPORT YES X NO			YES X NO	
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		naia@stillwatersci.com			ho Cordov	/a, CA	뭐	for		ti-tr						
Project Nat	ne	, Bac-T, & Chemistry Mon	itoring	9574 www.cali	z ifornialab	.com	PRESERVATIVES	Fecal coliform-15 Tube		ay		FIF	LDC	OND	ITIONS	:
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Site Locati	on UAR	P											URN			SPECIAL INSTRUCTIONS
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				Surface water			6								x	Stillwater Sciences
				Surface water			6								x	Same as above
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				Surface water			6								x	Project No. 750.10 Tasl 0200.01
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August 30, 2018

CLS Work Order #: 18H1399 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 08/23/18 14:33. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.

Laboratory Director





08/30/18 14:08

Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0200.01 CLS Work Order #: 18H1399	
Berkeley, CA 94705	Project Manager:	Maia Singer COC #:	

Microbiological Parameters by APHA Standard Methods

BAC-1-BI (18H1399-01) Surface Water Sampled: 08/23/18 09:39 Received: 08/23/18 14:33 E. Coli <1 1.0 1.0 MPN/100 1 1807108 08/23/18 08/24/18 SM922 Fecal Coliforms 3.7 1.8 1.8 * 1807106 08/23/18 08/24/18 SM922 Total Coliforms 3.7 1.8 1.8 * 1807106 08/23/18 08/24/18 SM922 BAC-2-BI (18H1399-02) Surface Water Sampled: 08/23/18 10:10 Received: 08/23/18 14:33 1807108 08/23/18 08/24/18 SM922 BAC-3-BI (18H1399-02) Surface Water Sampled: 08/23/18 10:10 Received: 08/23/18 14:33 1807108 08/23/18 08/24/18 SM922 Fecal Coliforms <1.8 1.8 1.8 * 1807110 08/23/18 08/24/18 SM922 Total Coliforms <1.8 1.8 1.8 * 1807108 08/23/18 08/24/18 SM922 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 <th></th>											
E. Coli <1	Analyte	Result			Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Fecal Coliforms 3.7 1.8 1.8 "IL mL BAC-2-BI (18H1399-02) Surface Water Sampled: 08/23/18 16:0 1:0 " 1:807100 08/23/18 08/26/18 SM 922 BAC-2-BI (18H1399-02) Surface Water Sampled: 08/23/18 10:10 Received: 08/23/18 1:807108 08/23/18 08/24/18 SM 922 E. Coli <1 1.0 1.0 MPN/100 1 1:807108 08/23/18 08/24/18 SM 922 Fecal Coliforms <1.8 1.8 1.8 " 1:807100 08/23/18 08/24/18 SM 922 Total Coliforms <1.8 1.8 1.8 " 1:807100 08/23/18 08/24/18 SM 922 Total Coliforms <1.8 1.8 1.8 " 1:807100 08/23/18 08/24/18 SM 922 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 E 08/23/18 08/23/18 08/23/18 08/23/18 08/23/18 08/23/18 08/23/18 08/23/18 08	BAC-1-BI (18H1399-01) Surface Water	Sampled:	08/23/18 09:39	Receive	d: 08/23/1	8 14:33					
Feed Colliforms 5.7 1.8 1.8 1.8 1.80/110 08/23/18	E. Coli	<1	1.0	1.0		1	1807108	08/23/18	08/24/18	SM9223	
BAC-2-BI (18H1399-02) Surface Water Sampled: 08/23/18 10:10 Received: 08/23/18 14:33 E. Coli <1 0 1.0 MPN100 1 1807108 08/23/18 08/24/18 SM922 Fecal Coliforms <1.8 1.8 1.8 " 1807108 08/23/18 08/24/18 SM922 Total Coliforms <1.8 1.8 1.8 " 1807108 08/23/18 08/24/18 SM922 BAC-3-BI (18H1399-02) Surface Water Sampled: 08/23/18 1.8 " 1807100 08/23/18 08/24/18 SM922 Fecal Coliforms <1.0 1.0 " " 1807108 08/23/18 08/24/18 SM922 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 E Coli <1 1.0 1.0 MPN100 1 1807108 08/23/18 08/24/18 SM922 E. Coli <1.1.0 1.0 MPN100 1 1807108 08/23/18 08/24/18 SM922 Total Coliforms <1.8<	Feeal Coliforms	3.7	1.8	1.8			1807110	08/23/18	08/26/18	SM 9221	
E. Coli <1	Total Coliforms	71.7	1.0	1.0			1807108	08/23/18	08/24/18	SM9223	
Fecal Coliforms <1.8	BAC-2-BI (18H1399-02) Surface Water	Sampled:	08/23/18 10:10	Receive	d: 08/23/1	8 14:33					
Feed Colliforms 980.4 1.8 1.8 1.8 1.807108 08/23/18 08/24/18 53/0422 BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 1.807108 08/23/18 08/24/18 SM922 E. Coli <1.0 1.0 1.0 1.0 1.807108 08/23/18 08/24/18 SM922 Feeal Coliforms <1.0 1.0 1.0 1.0 1.807108 08/23/18 08/24/18 SM922 Feeal Coliforms <1.8 1.8 1.8 1.8 1.8 1.807100 08/23/18 08/24/18 SM922 BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 1.807110 08/23/18 08/24/18 SM922 BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 1.807110 08/23/18 08/24/18 SM922 BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 1.807110 08/23/18 08/24/18 SM922 E. Coli 1.0 <td>E. Coli</td> <td><1</td> <td>1.0</td> <td>1.0</td> <td></td> <td>1</td> <td>1807108</td> <td>08/23/18</td> <td>08/24/18</td> <td>\$549223</td> <td></td>	E. Coli	<1	1.0	1.0		1	1807108	08/23/18	08/24/18	\$549223	
BAC-3-LL (18H1399-03) Surface Water Sampled: 08/23/18 12:15 Received: 08/23/18 14:33 E. Coli <1	Fecal Coliforms	<1.8	1.8	1.8			1807110	08/23/18	08/26/18	SM 9221	
E. Coli Coli E. Coli <1 1.0 1.0 MPN/100 1 1807108 08/23/18 08/24/18 SM922. Fecal Coliforms <1.8 1.8 1.8 " 1807100 08/23/18 08/24/18 SM922. Total Coliforms <1.8 1.8 1.8 " 1807100 08/23/18 08/24/18 SM922. BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 08/24/18 SM922. E. Coli 1.0 1.0 1.0 1 807100 08/23/18 08/24/18 SM922. E. Coli 1.0 1.0 1.0 1 807100 08/23/18 08/24/18 SM922. E. Coli 1.0 1.0 1.0 1.0 1 807100 08/23/18 08/24/18 SM922. E. Coli 1.0 1.0 1.0 1 807100 08/23/18 08/24/18 SM922. mL " 1807110 08/23/18 08/24/18 SM 922. ecal Coliforms <1.8	Total Coliforms	980.4	1.0	1.0			1807108	08/23/18	08/24/18	SM9223	
Fecal Coliforms <1.8	BAC-3-LL (18H1399-03) Surface Water	Sampled:	08/23/18 12:15	Receive	ed: 08/23/1	8 14:33					
Feed Colliforms <1.8 1.8	E. Coli	<1	1.0	1.0		1	1807108	08/23/18	08/24/18	SM9223	
BAC-4-LL (18H1399-04) Surface Water Sampled: 08/23/18 12:35 Received: 08/23/18 14:33 E. Coli 1.0 1.0 1.0 1.0 1.00 <td< td=""><td>Fecal Coliforms</td><td><1.8</td><td>1.8</td><td>1.8</td><td></td><td></td><td>1807110</td><td>08/23/18</td><td>08/26/18</td><td>SM 9221</td><td></td></td<>	Fecal Coliforms	<1.8	1.8	1.8			1807110	08/23/18	08/26/18	SM 9221	
E. Coli 1.0 1.0 1.0 MPN/100 1 1807108 08/23/18 08/24/18 SM922. Fecal Coliforms <1.8	Total Coliforms	365.4	1.0	1.0			1807108	08/23/18	08/24/18	SM9223	
Fecal Coliforms <1.8 1.8 1.8 " 1807110 08/23/18 08/26/18 SM 922	BAC-4-LL (18H1399-04) Surface Water	Sampled:	08/23/18 12:35	Receive	ed: 08/23/1	8 14:33					
1.0 1.0 1.0 004.010	E. Coli	1.0	1.0	1.0		1	1807108	08/23/18	08/24/18	SM9223	
Total Collforms 325.5 1.0 1.0 " 1807108 08/23/18 08/24/18 SM922	Fecal Coliforms	< 1.8	1.8	1.8			1807110	08/23/18	08/26/18	SM 9221	
	Total Coliforms	325.5	1.0	1.0			1807108	08/23/18	08/24/18	SM9223	





08/30/18 14:08

Stillwater 2855 Teley Berkeley,	graph Ave., Suite 400	,	SMUD In situ, Bac-T, & C 750.10 Task 0200.01 Maia Singer	Themistry Monitoring CLS Work Order #: 18H1399 COC #:	
		Notes and Defin	itions		
BT-4a	<1.8				
BT-4	<1				
DET	Analyte DETECTED				

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.



		Report To:			Job Numb Task 0200J			ANAI	YSIS	REQ	UESTED	GE	OTR/	ACKE	R		
	ter Scie	nces 1 Ave. Suite 400			ion Labora ho Cordovi			Fe		ET O		EDF REPORT YES X				YES X NO	
	y, CA				(916) 63	38.7301		cal		oliQ			OBA				
Project Ma	nager	aia@stillwatersci.com		3249 , Ranci	Fitzgerald ho Cordov	I Road	70	Fecal coliform-15 Tube		coli Quanti-tray		UL.	UBA	4L1D.			
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123/18	1215	BAC-3-42 BAC-4-LL		Surface water			6	×		×					X		
12302	1235	RAC-Y-LL		Surface water			6	×		×					x		
1 - patter		prine i		Surface water			6								х		
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				Surface water			6								х		
				Surface water			6								х	Project No. 750.10 Tas 0200.01	
				Surface water			6				++-				x	QUOTEA	
USPECT	ED CONS	TITUENTS		1			-	SAMPL	ERET	ENTION	TIME	FR	ESER	VATI	VES ()	1) HCL (3) = COLD 2) HNO ₃ (4)= H2SO4	
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September 07, 2018

CLS Work Order #: 18H1747 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 08/30/18 16:12. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.

Laboratory Director





09/07/	18.1	4:08
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Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705	,	SMUD In situ, Bac-T, & Ch 750.10 Task 0200.01 Maia Singer	emistry Monitoring CLS Work Order #: 18H1747 COC #:
	Microbiological Parameters by	APHA Standard Met	hods

Analyte	Result	R MDL	eporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-1-BI (18H1747-01) Surface Water	Sampled:	08/30/18 10:45	Receive	d: 08/30/18	8 16:12					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1807339	08/30/18	08/31/18	SM9223	
Fecal Coliforms	< 1.8	1.8	1.8			1807341		09/02/18	SM 9221	
BAC-2-BI (18H1747-02) Surface Water	Sampled:	08/30/18 11:10	Receive	d: 08/30/18	8 16:12					
E. Coli	10.9	1.0	1.0	MPN/100 mL	1	1807339	08/30/18	08/31/18	SM9223	
Fecal Coliforms	2.0	1.8	1.8	* *		1807341		09/02/18	SM 9221	
BAC-3-LL (18H1747-03) Surface Water	Sampled:	08/30/18 13:40	Receive	d: 08/30/1	8 16:12					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1807339	08/30/18	08/31/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8			1807341		09/02/18	SM 9221	
BAC-4-LL (18H1747-04) Surface Water	Sampled:	08/30/18 13:55	Receive	d: 08/30/1	8 16:12					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1807339	08/30/18	08/31/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8			1807341		09/02/18	SM 9221	





-09	07	(18)	14:08

Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705	Project: SMUD In situ, Ba Project Number: 750.10 Task 0200.0 Project Manager: Maia Singer	c-T, & Chemistry Monitoring 1 CLS Work Order #: 18H1747 COC #:
	Notes and Definitions	
BT-4a <1.8		

BT-4	<1	

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.



		Report To:			Job Numb Task 0200.0			AN	ALVSI	S REQ	UENTED	000	(BAI	жи			
	ter Scien elegraph	ces Ave. Suite 400			tion Labora abo Cordovi			Fee		E. coli		604	1111	INT.		VEN NO NO	
	y, CA 9				(916) 63			al o	13	Qu		01.01	IAI.	(D			
	Singer m	aia@stillwatersci.c	om	3249	Fitzgerald ho Cordov 2		PR	oliform		ami5-tray		-		ONDITION):			
Project Na SMUE Sampled B	In situ,	Bac-T, & Chemist	ry Monitoring		lifornialab	o.com	PRESERVATIVES	-15 Tu				PHOL	o co				
Joh Desan Moniter se		ria levels in UARP reaches.			ЕК		TIVES	be									
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1/30/18	1110	BAL-2- B1		Surface water			6	4		x					х		
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CALIFORNIA LABORATORY SERVICES

September 13, 2018

CLS Work Order #: 1810333 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 09/06/18 16:06. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness. Any comments and exceptions are addressed under the Notes and Definitions section.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

Page 1 of 4



		Report To:			Job Num Task 0200		ANALYSIS REQUESTED					GE	OTRA	CKE	R	
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Berkele	y, CA 9	4705		x CLS	(916) (538-7301		2 C		II Q		GI	GLOBAL ID.			
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11 1.0		IDENTIFICAT	ION ID.	MATRIX	NO.	TYPE	-	\square	-			<u> </u>	_	-	-	
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16/18		BAL- 2- 3I		Surface water		_	6	*	-	×		-			Х	
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Page 1 of 2	

Page 1 of 2	•		09/13/18 12:50
Stillwater Sciences	Project	SMUD In situ, Bac-T, & Che	emistry Monitoring
2855 Telegraph Ave., Suite 400	Project Number	: 750.10 Task 0200.02	CLS Work Order #: 1810333
Berkeley, CA 94705	Project Manager	: Main Singer	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-1-BI (1810333-01) Surface Water	Sampled: 09/06/18 10:56	Received	1: 09/06/18	16:06					
Fecal Coliforms	<1.8	1.8	MPN/100	1	1807542	09/06/18 16:30	09/09/18	SM 9221	
E. Coli	2.0	1.0	nL.		1807521		09/07/18	SM9223	
BAC-2-BI (1810333-02) Surface Water	Sampled: 09/06/18 11:20	Received	: 09/06/18	16:06					
Fecal Coliforms	<1.8	1.8	MPN/100	1	1807542	09/06/18 16:30	09/09/18	SM 9221	
E. Coli	<1	1.0	nl. *		1807521		09/07/18	SM9223	
BAC-3-LL (1810333-03) Surface Water	Sampled: 09/06/18 13:35	Receive	d: 09/06/18	8 16:06					
Fecal Coliforms	<1.8	1.8	MPN/100	1	1807542	09/06/18 16:30	09/09/18	SM 9221	
E. Coli	2.0	1.0	nL.		1807521		09/07/18	SM9223	
BAC-4-LL (1810333-04) Surface Water	Sampled: 09/06/18 13:55	Receive	d: 09/06/18	3 16:06					
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	1807542	09/06/18 16:30	09/09/18	SM 9221	
E. Coli	<1	1.0	nL.		1807521		09/07/18	SM9223	

3249 Fitzgerald Road, Rancho Cordova, CA 95742 | 800.638.7301 | Tel: 916.638.7301 x102 | Fax: 916.638.4510 | www.californialab.com Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

Page 3 of 4





Page 2 o	of 2			09/13/18 12::	50
2855 Te	er Sciences legraph Ave., Suite 400 y, CA 94705	Project: Project Number: Project Manager:	750.10 Task 0200.02	Chemistry Monitoring CLS Work Order #: 1810333 COC #:	
		Notes and Defini	tions		
BT-4a	<1.8				
BT-4	<1				
DET	Analyte DETECTED				
ND	Analyte NOT DETECTED at or above the repo	orting limit (or method detection limit w	when specified)		
NR	Not Reported				
dry	Sample results reported on a dry weight basis				
RPD	Relative Percent Difference				

3249 Fitzgerald Road, Rancho Cordova, CA 95742 | 800.638.7301 | Tel: 916.638.7301 x102 | Faic 916.638.4510 | www.californialab.com Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

Page 4 of 4



September 20, 2018

CALIFORNIA LABORATORY SERVICES Committed. Responsive. Flexible.

CLS Work Order #: 1810688 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 09/13/18 16:07. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D. Laboratory Director



		Report To:			Job Nun Task 820			ANA	LYSI	S RE	QUESTED	OE	OTRA	CKE	R				
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	y, CA 9			x CLS (916) 638-7301				alo		II Q1		GI	OBAL	ID,					
	Singer m	aia@stillwatersci.com		3249 Fitzgerald Road			몼	Fecal coliform-15	coli Quanti-tray										
Project No SMUE		Bac-T, & Chemistry Moni	itoring				PRESERVATIVES	n-15		Y		-191	HELD CONDITIONS:						
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9/13/18	100	Bactol- BI		Surface water	NO.		6	*		X		1			x				
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9/15/18		BN - 3- LL		Surface water			6	¥		X		1		-	x				
/13/18	1355	Bar - UF LL		Surface water			6	Y		×					х				
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Page 2 of 3	8			09/20/18 16:57
Stillwater Sciences		Project:	SMUD In situ, Bac-T, & Chemistry Mon	itoring
2855 Telegraph Ave., Suite 400		Project Number:	750.10 Task 0200.02	CLS Work Order #: 1810688
Berkeley, CA 94705		Project Manager:	Maia Singer	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-1-BI (1810688-01) Surface Water	Sampled: 09/13/18 11:00	Received:	09/13/18 1	16:07					
E. Coli	<1	1.0	MPN/100) 1	1807748	09/13/18	09/14/18	SM9223	
Fecal Coliforms	<1.8	1.8	mL		1807750	09/13/18	09/16/18	SM 9221	
Bac-2-BI (1810688-02) Surface Water	Sampled: 09/13/18 11:25	Received:	09/13/18 1	16:07					
E. Coli	<1	1.0	MPN/100) 1	1807748	09/13/18	09/14/18	SM9223	
Fecal Coliforms	<1.8	1.8	mL		1807750	09/13/18	09/16/18	SM 9221	
Bac-3-LL (1810688-03) Surface Water	Sampled: 09/13/18 13:40	Received:	09/13/18	16:07					
E. Coli	<1	1.0	MPN/100) 1	1807748	09/13/18	09/14/18	SM9223	
Fecal Coliforms	2.0	1.8	mL •		1807750	09/13/18	09/16/18	SM 9221	
Bac-4 LL (1810688-04) Surface Water	Sampled: 09/13/18 13:55	Received:	09/13/18	16:07					
E. Coli	<1	1.0	MPN/100) 1	1807748	09/13/18	09/14/18	SM9223	
Fecal Coliforms	<1.8	1.8	mL		1807750	09/13/18	09/16/18	SM 9221	





CALIFORNIA LABORATORY SERVICES

Berkeley, CA	iph Ave., Suite 400 Pro A 94705 Pro	oject: oject Number: oject Manager: Notes and I	SMUD In situ, Bac-T, & Chemistry 750.10 Task 0200.02 Maia Singer Definitions	Monitoring CLS Work Order #: 1810688 COC #:									
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		Notes and Definitions											
	:1.8												
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D Ar	analyte NOT DETECTED at or above the reporting limit (or	r method detection	limit when specified)										
R No	sot Reported												
ry Sa	sample results reported on a dry weight basis												
PD Re	telative Percent Difference												





September 27, 2018

CLS Work Order #: 1811081 COC #:

Maia Singer Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705

Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring

Enclosed are the results of analyses for samples received by the laboratory on 09/20/18 16:30. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.

Laboratory Director





09/27/18	15:02
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Stillwater Sciences		SMUD In situ, Bac-T, & Cl	emistry Monitoring
2855 Telegraph Ave., Suite 400		750.10 Task 0200.02	CLS Work Order #: 1811081
Berkeley, CA 94705		Main Singer	COC #:
L	Microbiological Parameters by	APHA Standard Me	hods

			Reporting							
Analyte	Result	MDL	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BAC-1-BI (18I1081-01) Surface Water	Sampled: 0	9/20/18 11:45	Received	: 09/20/18	16:30					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1807989	09/20/18	09/21/18	SM9223	
Fecal Coliforms	< 1.8	1.8	1.8			1807991		09/23/18	SM 9221	
BAC-2-BI (18I1081-02) Surface Water	Sampled: 0	9/20/18 12:10	Received	: 09/20/18	16:30					
E. Coli	<1	1.0	1.0	MPN/100	1	1807989	09/20/18	09/21/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8			1807991		09/23/18	SM 9221	
BAC-3-LL (1811081-03) Surface Water	Sampled: (09/20/18 14:10	Received	1: 09/20/18	8 16:30					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1807989	09/20/18	09/21/18	SM9223	
Fecal Coliforms	< 1.8	1.8	1.8			1807991		09/23/18	SM 9221	
BAC-4-LL (1811081-04) Surface Water	Sampled: (09/20/18 14:25	Received	1: 09/20/18	8 16:30					
E. Coli	<1	1.0	1.0	MPN/100 mL	1	1807989	09/20/18	09/21/18	SM9223	
Fecal Coliforms	<1.8	1.8	1.8			1807991		09/23/18	SM 9221	





09/27/18 15:02

Stillwater Sciences 2855 Telegraph Ave., Suite 400 Berkeley, CA 94705		Project: SMUD In situ, Bac-T, & Project Number: 750.10 Task 0200.02 Project Manager: Maia Singer	Chemistry Monitoring CLS Work Order #: 1811081 COC #:					
BT-4a	<1.8	Notes and Definitions						
	<1 Analyte DETECTED							

ND Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified)

- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

This is a "MDL Report", thus if the report denotes an "ND" for a particular analyte, it should be noted that the analyte was not detected at or above the MDL.



Report To:				Client Job Number 750.00 Task 0200.02				ANA	ALYS	IS RE	QUESTED	GEOTRACKER					
Stillwater Sciences 2855 Telegraph Ave. Suite 400 Berkeley, CA 94705 Projet Marager Maia Singer maia@stillwatersci.com Projet Name			Destination Laboratory Rancho Cordova X CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com			PRES	e l		m.o		EDE	REPO	RT		YES X NO		
									E. coli Quanti-tray		an	GLOBALID.					
							Fecal coliform-15				ant						
										FIELD CONDITIONS:							
		Bac-T, & Chemis	stry Monitor	ring				PRESERVATIVES	5	- 36							
iampled B	" EES	BRL							Tube								
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												TURNAROUND SPECIAL					
¥.		SAMPLI	8	FIELD		C	ONTAINER	v					T	MEINI	T		INSTRUCTIONS
DATE	TIME	IDENTIFICAT		ID.	MATRIX	NO	TYPE						1	2	3	5	
-20-18		Sac- 1- BI			Surface water			6	×		×				1	x	
-20-18		Bac-2-85			Surface water			6	×		×					x	
1-20-18	14 10	Bar - 3 - UL			Surface water			6	×		X				1	x	
9.20.18	1425	Bac-y-U		1	Surface water			6	×		X					x	
					Surface water			6								х	
					Surface water			6								x	
					Surface water			6								x	INVOICE TO:
					Surface water			6								x	Stillwater Sciences
					Surface water			6								x	Same as above
					Surface water			6		1	1					x	
					Surface water			6								x	Project No. 750.10 Tasl 0200.02
					Surface water			6		2	31.0					x	00001128
USPECT	ED CONST	TUENTS							SAMP	LERE	TENT	ON TIME	PRE	SERVA	VIT		
RELINQUISHED BY (Signature) PRINT NAM				IE/COMPANY DATE/TIME			RECEIVED BY (Signature)					(2) HNO, (4)= H2SO4 PRINT NAME/COMPANY					
42	-e-	-			Stillworter		9/20/2 1630						- 10				
2150-1-1								1						-			