Water Quality Monitoring Report - 2020

Sacramento Municipal Utility District

Hydro License Implementation • May 2021

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
ºC	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

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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.

This Report describes the results of the sixth year (2020) 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 2020 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).

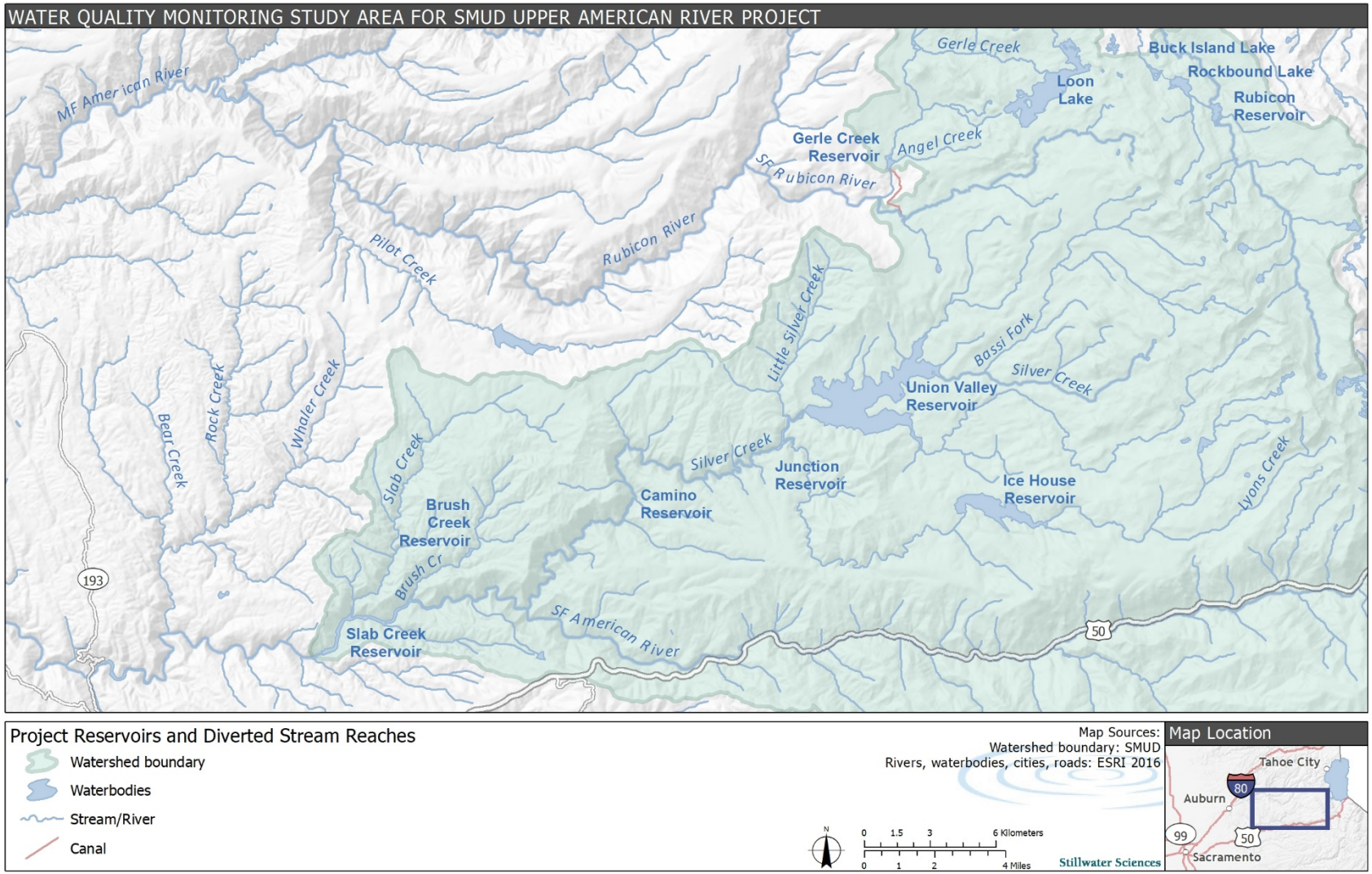

Figure 3-1. Study area for SMUD Upper American River Project *in situ* and bacteria monitoring.

4.0 SAMPLING FREQUENCY AND LOCATIONS

Year 6 (2020) sampling frequency for *in situ* water quality was consistent with winter, spring, summer, and fall monitoring periods designated in the 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 a 15-day period before Labor Day.

Table 4-1. Sampling Frequency for *In situ* Parameters and Bacteria.

Type	2020 (Year 6) Frequency
In situ reservoir	Once in spring – April/May Once in fall – October/November
In situ riverine	Once in winter – January/February Once in spring – April/May Once in summer – August Once in fall – November
Bacteria	Five samples within 30 days – around 4th of July Five samples within 30 days – around Labor Day[1]

[1] The Labor Day Bacteria sampling deviated from the sampling frequency schedule. Due to unhealthy air quality and recreational site closures resulting from the August–September 2020 California wildfires, only two bacteria samples were collected during a 15-day period before Labor Day.

Specific sampling locations within reservoirs and diverted stream reaches varied depending on the general constituent under study. As specified in the 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 safely sampled during the winter and spring survey periods due to snow accumulation (Table 4-4). Bacteria sampling occurred at 15 locations (Figure 4-1 and Figure 4-2, Table 4-5).

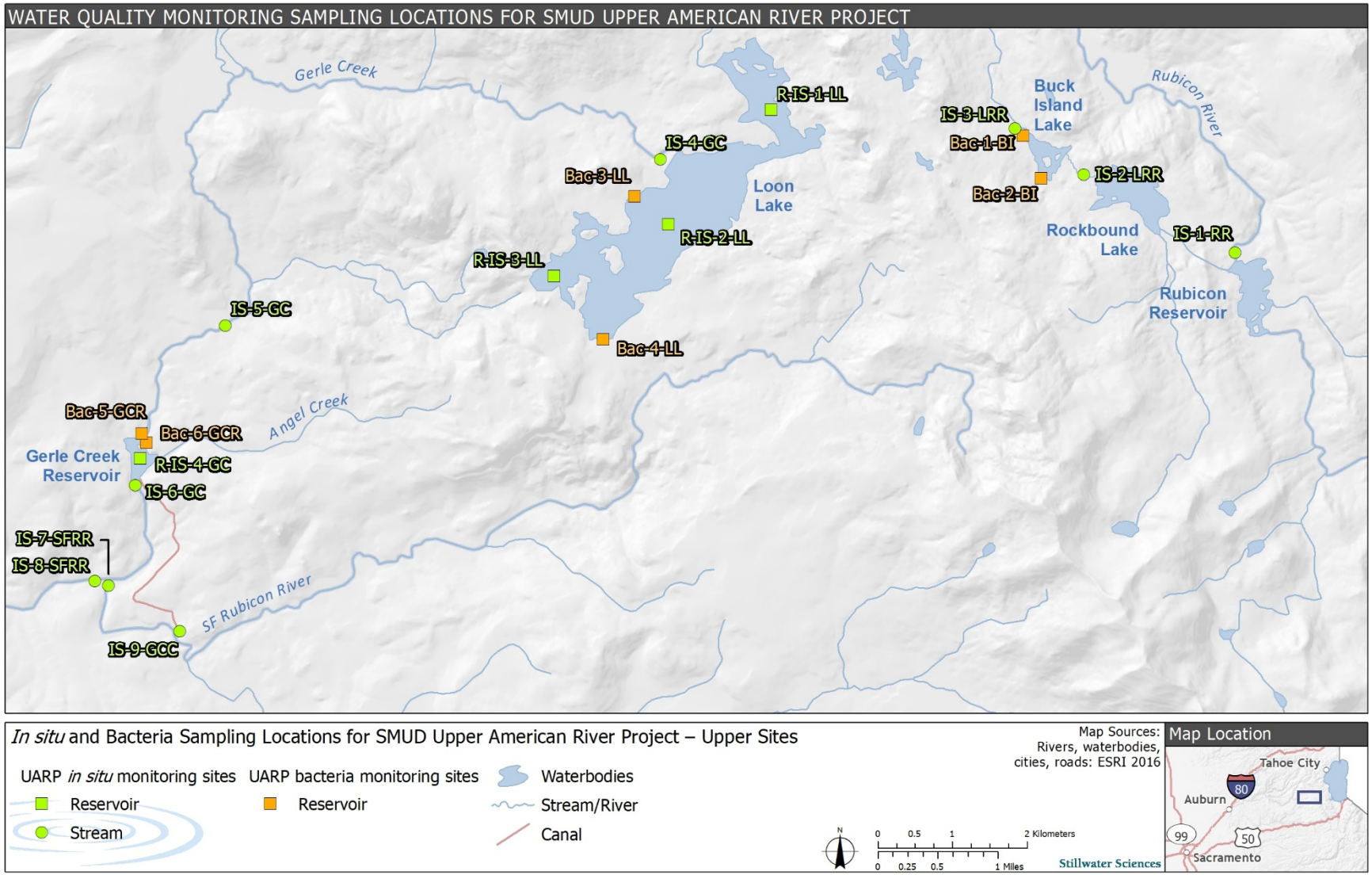

Figure 4-1. *In situ* water quality and bacteria sampling locations for SMUD Upper American River Project – upper sites.

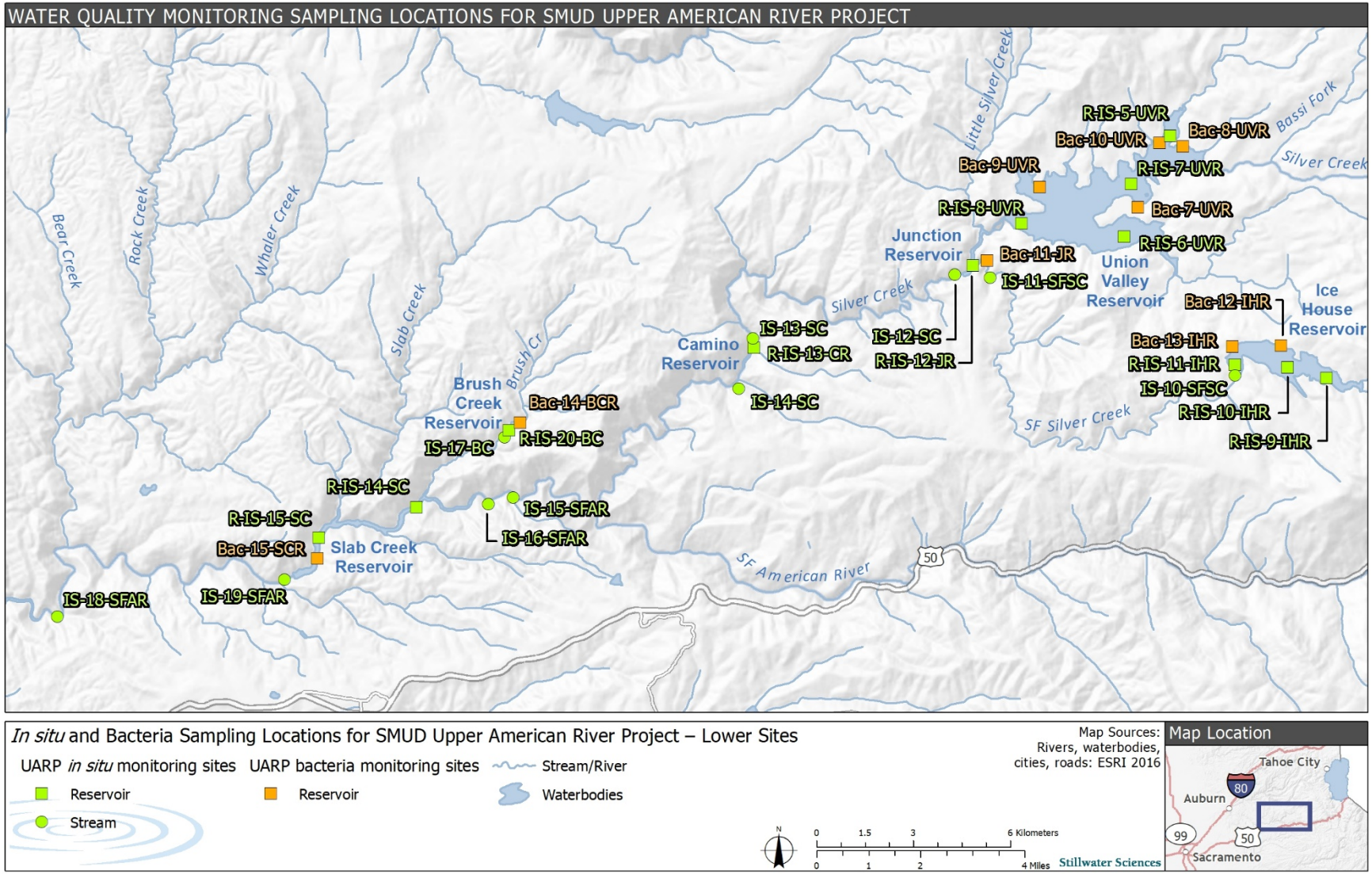

Figure 4-2. *In situ* water quality and bacteria sampling locations for SMUD Upper American River Project – lower sites.

Table 4-2. *In situ* Water Quality Sampling Locations and Dates for SMUD Upper American River Project Reservoir Sites.

SMUD Site Name	Site ID	Location	2020 *In situ* Survey Sample Date
R-4C	R-IS-1-LL	Loon Lake, upper reservoir (northeast body)	5/26, 10/29
R-4B	R-IS-2-LL	Loon Lake, mid-reservoir (west body)	5/26, 10/29
R-4A	R-IS-3-LL	Loon Lake, near dam	5/26, 10/29
R-5	R-IS-4-GC	Gerle Creek Reservoir, mid-reservoir	5/29, 10/30
R-6C	R-IS-5-UVR	Union Valley Reservoir, Robbs PH tailrace zone	5/27, 10/28
R-6D	R-IS-6-UVR	Union Valley Reservoir, Jones Fork Silver Creek arm	5/27, 10/28
R-6B	R-IS-7-UVR	Union Valley Reservoir, mid-reservoir	5/27, 10/28
R-6A	R-IS-8-UVR	Union Valley Reservoir, near dam	5/27, 10/28
R-7C	R-IS-9-IHR	Ice House Reservoir, upper lake body	5/22, 10/27
R-7B	R-IS-10-IHR	Ice House Reservoir, mid-reservoir	5/22, 10/27
R-7A	R-IS-11-IHR	Ice House Reservoir, near dam	5/22, 10/27
R-8	R-IS-12-JR	Junction Reservoir, mid-reservoir between arms	5/29, 10/30
R-9	R-IS-13-CR	Camino Reservoir, mid-reservoir	5/29, 10/30
R-11B	R-IS-14-SC	Slab Creek Reservoir, upper-reservoir	5/28, 11/5
R-11A	R-IS-15-SC	Slab Creek Reservoir, mid-reservoir	5/28, 11/5

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

SMUD Site Name	Site ID	Location	2020 *In situ* Survey Sample Date
2	IS-1-RR	Rubicon River outflow from Rubicon Reservoir	8/3, 11/2
5	IS-2-LRR	Little Rubicon River outflow from Rockbound Lake	8/3, 11/2
6	IS-3-LRR	Little Rubicon River outflow from Buck Island Lake	8/3, 11/2
7	IS-4-GC	Gerle Creek outflow from Loon Lake	5/19, 8/4, 11/4
14	IS-5-GC	Gerle Creek inflow to Gerle Creek Reservoir	5/19, 8/4, 11/4
15	IS-6-GC	Gerle Creek outflow from Gerle Creek Reservoir	1/24, 5/19, 8/4, 11/4
18	IS-7-SFRR	S.F. Rubicon upstream of Gerle Creek confluence	5/19, 8/4, 11/4
19	IS-8-SFRR	S.F. Rubicon downstream of Gerle Creek confluence	5/19, 8/4, 11/4
16	IS-9-GCC	Gerle Creek Canal inflow to Robbs Forebay	1/24, 5/19, 8/4, 11/4
25	IS-10-SFSC	S.F. Silver Creek outflow from Ice House Reservoir	1/24, 5/19, 8/4, 11/4
27	IS-11-SFSC	S.F. Silver Creek inflow to Junction Reservoir	1/23, 5/20, 8/5,11/3
29	IS-12-SC	Silver Creek outflow from Junction Reservoir	1/23, 5/20, 8/5, 11/4
32	IS-13-SC	Silver Creek inflow to Camino Reservoir	1/23, 5/20, 8/5,11/3
34	IS-14-SC	Silver Creek outflow from Camino Reservoir	1/23, 5/20, 8/5,11/3
38	IS-15-SFAR	South Fork American River (SFAR) upstream of Camino Powerhouse	1/23, 5/20, 8/5,11/3
41	IS-16-SFAR	SFAR downstream of Camino Powerhouse	1/23, 5/20, 8/5,11/3
40	IS-17-BC	Brush Creek outflow from Brush Creek Reservoir	1/23, 5/20, 8/5,11/3
60	IS-18-SFAR	SFAR upstream of White Rock Powerhouse	1/22, 5/21, 8/6, 11/6
43	IS-19-SFAR	SFAR downstream of Slab Creek Reservoir	1/22, 5/21, 8/6, 11/5

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

SMUD Site Name	Site ID	Location	Reason not sampled for 2020 *In situ* Survey
January (Winter)			
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
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
May (Spring)			
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

Table 4-5. Bacteria Sampling Locations and Dates for SMUD Upper American River Project Sites.

Reservoir	SMUD Site Name	Site ID	Location	2020 Sample Dates
Buck Island Reservoir (beach locations)[1]	R-3B	Bac-1-BI	On Northshore, near dam and Off-Highway Vehicle camping	8/19, 9/2
	77	Bac-2-BI	On south shore, near Rubicon hiking trail	8/19, 9/2
Loon Lake Reservoir (beach locations)[1]	64	Bac-3-LL	West of main dam, near Red Fir Campground	8/19, 9/2
	65	Bac-4-LL	West of Loon Lake Campground, near boat launch	8/19, 9/2
Gerle Creek Reservoir (beach locations)	66	Bac-5-GCR	Near Gerle Creek Campground	6/18, 6/25, 7/2, 7/9, 7/16
	67	Bac-6-GCR	Near Angel Creek picnic area	6/18, 6/25, 7/2, 7/9, 7/16
Union Valley Reservoir (swim areas)	R-6H	Bac-7-UVR	At Fashoda Beach	6/18, 6/25, 7/2, 7/9, 7/16
	R-6E	Bac-8-UVR	Near Wench Creek Campground	6/18, 6/25, 7/2, 7/9, 7/16
	FC-2	Bac-9-UVR	Near Camino Cove Campground	6/18, 6/25, 7/2, 7/9, 7/16
	R-6F	Bac-10-UVR	Near Yellowjacket Campground	6/18, 6/25, 7/2, 7/9, 7/16
Other UARP Locations	R-8B	Bac-11-JR	Junction Reservoir, near boat launch	6/17, 6/24, 7/1, 7/8, 7/15
Ice House Reservoir (beach locations)	68	Bac-12-IHR	Northshore near private campground access	6/17, 6/24, 7/1, 7/8, 7/15
	69	Bac-13-IHR	East of boat launch and picnic area	6/17, 6/24, 7/1, 7/8, 7/15
Other UARP locations	R-10B	Bac-14-BCR	Brush Creek Reservoir, near boat launch	6/17, 6/24, 7/1, 7/8, 7/15
	R-11C	Bac-15-SCR	Slab Creek Reservoir, near boat launch	6/17, 6/24, 7/1, 7/8, 7/15

[1] The five weeks of scheduled sampling within 30 days of Labor Day at Buck Island Reservoir and Loon Lake Reservoir were reduced to two weeks of sampling due unhealthy air quality and closures of recreational sites resulting from the August–September 2020 California wildfires.

5.0 METHODS

5.1 *IN SITU* PARAMETERS

Reservoir *in situ* water quality monitoring was conducted by watercraft to access mid-reservoir areas (Figure 5-1). A multi-probe Sonde (Yellow Springs Instruments [YSI] EXO2) was deployed from a 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-3-LL) at Loon Lake 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 to two minutes, as needed). 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 to two minutes, as needed) 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-18-SFAR) on the South Fork American River upstream of White Rock Powerhouse.

For both reservoir and riverine *in situ* monitoring, Sonde calibration was conducted prior to the start of each sampling day, and a post-sampling calibration check was conducted following each sampling day, using standard solutions and recorded on calibration logs (Appendix E). Comparisons between post-sampling and post-calibration values were made and Measurement Quality Objective (MQO) codes (Accept, Qualify, Reject) were assigned to each parameter. MQO criteria for each *in situ* parameter are provided in Table 5-2.

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 were 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 Plan (SMUD 2016).

Table 5-1. *In situ* Water Quality Parameters and Measurement Methods.

Parameter	Method	Units	Reporting Resolution
Water temperature	EPA 170.1	degrees Celsius (ºC)	0.1
Conductivity	SM 2510-B	microsiemens per centimeter (uS/cm)	1.0
DO	SM 4500-O(G)	milligrams per liter (mg/L)	0.1
pH	SM 4500-H	standard unit of pH (s.u.)	0.1
Turbidity	SM 2130B	Nephelometric Turbidity Unit (NTU)	0.1
Secchi depth (Secchi disk)	USGS	meter (m)	0.1

DO = dissolved oxygen
EPA = Environmental Protection Agency
SM = Standard Method
USGS = United States Geological Survey

Table 5-2. Measurement Quality Objectives Criteria for *In situ* Parameters.

Measurement Quality Objectives (MQO)				
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%

NTU = Nephelometric Turbidity Unit
s.u. = standard unit of pH
uS/cm = microsiemens per centimeter

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 wearing sterile gloves 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 5-3).

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

Table 5-3. Bacteria Analytical Methods and Field Hold Times.

Analyte	Method	Units	MDL	Hold Time
Escherichia coli	SM9223B (Quantitray)	MPN/100 mL	1.0	8 hr
Fecal coliform	SM9221E (MPN 15 or 25)	MPN/100 mL	1.8	8 hr

MDL = method detection limit
mL = milliliter
MPN = most probable 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. Riverine Sites

Detailed *in situ* water quality dates and measurements for UARP riverine sites can be found in Table 6-1, and field data sheets are provided in Appendix D. Several riverine sites were not sampled during the 2020 January (Winter) and May (Spring) sampling events due to safety issues associated with snow accumulation (Table 4-4).

January (Winter) In situ Water Quality Sampling Event

During the January sampling event, water temperatures ranged from 2.1 to 6.1 degrees Celsius (°C) and were variable by site. Riverine dissolved oxygen ranged from 11.3 to 12.5 milligrams per liter (mg/L) (85 to 101% saturation), with no measurements falling below the Basin Plan minimum concentration of 7.0 mg/L for cold freshwater habitat (COLD) and spawning, reproduction, and/or early development (SPWN) designated beneficial uses (CRWQCB 2016). pH at riverine sites ranged from 6.3 to 7.3 standard units (s.u.), with one instance of pH falling below the Basin Plan instantaneous minimum objective of 6.5 s.u. (Site IS-6-GC, 6.3 s.u.) and no exceedances of the Basin Plan instantaneous maximum objective of 8.5 s.u. (Table 6-1).

Typical of granitic watersheds, conductivity at the riverine sites was low, ranging from 6 to 40 microsiemens per centimeter (uS/cm) (Table 6-1).

Turbidity measurements during the January sampling event were low, ranging from 0.2 to 1.2 Nephelometric Turbidity Units (NTUs) (Table 6-1).

May (Spring) In situ Water Quality Sampling Event

During the May sampling event, water temperatures (5.3 to 11.8°C) exhibited a greater range and were generally higher than temperatures measured during the winter sampling event. Dissolved oxygen ranged from 9.6 to 11.0 mg/L (82 to 99% saturation) across all accessible riverine sites, which is well above the Basin Plan minimum concentration of 7.0 mg/L for COLD and SPWN. pH ranged from 6.3 to 7.4 s.u., with three instances of pH falling below the Basin Plan instantaneous minimum objective (6.5 s.u.) and no exceedences of the Basin Plan instantaneous maximum objective (8.5 s.u.). Measured pH below the Basin Plan instantanous minimum occurred at Site IS-9-GCC (6.3 s.u.), Site IS-5-GC (6.4 s.u.), and Site IS-8-SFRR (6.4 s.u.) (Table 6-1).

Conductivity at the riverine sites was low, ranging from 6 to 32 uS/cm during the May sampling event (Table 6-1).

Turbidity measurements were low, ranging from 0.3 to 18.4 NTU, and only one site (Site IS-17-BC) exhibiting turbidity greater than 3.0 NTU (Table 6-1).

August (Summer) In situ Water Quality Sampling Event

During the August sampling event, water temperatures ranged from 8.0 to 24.6°C and were variable by site. Riverine dissolved oxygen during the August sampling event ranged from 6.7 to 11.6 mg/L (78 to 103% saturation), with two measurements falling below the Basin Plan minimum concentration of 7.0 mg/L for COLD and SPWN. Dissolved oxygen below the criterion occurred at sites IS-1-RR (6.9 mg/L) and IS-3-LRR (6.7 mg/L). pH ranged from 5.6 to 7.5 s.u., with nine instances falling below the Basin Plan instantaneous minimum (6.5 s.u.) and no exceedences of the instantaneous maximum objective (8.5 s.u.). Measured pH below the Basin Plan instantanous minimum objective occurred at Site IS-4-GC (5.6 s.u.), Site IS-5-GC (6.2 s.u.), Site IS-6-GC (6.3 s.u.), Site IS-8-SFRR (6.4 s.u.), Site IS-9-GCC (6.4 s.u.), Site IS-10-SFSC (5.9 s.u.), Site IS-12-SC (6.2 s.u.), Site IS-14-SC (6.4 s.u.), and Site IS-16-SFAR (6.1 s.u.) (Table 6-1).

Conductivity at the riverine sites was low, ranging from 7 to 44 uS/cm in August (Table 6-1).

During the August sampling event, turbidity measurements were low, ranging from 0.0 to 4.7 NTU (Table 6-1).

November (Fall) In situ Water Quality Sampling Event

Water temperatures during the November sampling event ranged from 4.7 to 13.5°C. Riverine dissolved oxygen ranged from 7.6 to 11.5 mg/L (64 to 98% saturation), with no measurements falling below the Basin Plan instantaneous minimum concentration of 7.0 mg/L for COLD and SPWN. Riverine pH ranged from 6.5 to 7.8 s.u. with no measurements falling below the Basin Plan instantaneous minimum pH objective (6.5 s.u.) and no exceedances of the instantaneous maximum (8.5 s.u) (Table 6-1).

Conductivity at the riverine sites was low, ranging from 7 to 54 uS/cm during the November sampling event (Table 6-1).

Turbidity at riverine sites was low, ranging from 0.1 to 11.4 NTU, and only one site (Site IS-1-RR) exhibiting turbidity greater than 3.0 NTU (Table 6-1).

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

Site ID	2020 Sample Date	Water Temperature (°C)	pH (s.u.)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	Turbidity (NTU)
January (Winter)							
IS-1-RR	--	--	--	--	--	--	--
IS-2-LRR	--	--	--	--	--	--	--
IS-3-LRR	--	--	--	--	--	--	--
IS-4-GC	--	--	--	--	--	--	--
IS-5-GC	--	--	--	--	--	--	--
IS-6-GC	1/24	2.1	6.3	11.8	85	7	0.2
IS-7-SFRR	--	--	--	--	--	--	--
IS-8-SFRR	--	--	--	--	--	--	--
IS-9-GCC	1/24	2.3	6.5	11.7	86	7	0.2
IS-10-SFSC	1/24	4.0	6.6	11.3	86	6	0.4
IS-11-SFSC	1/23	2.9	6.9	12.0	89	9	0.3
IS-12-SC	1/23	3.1	7.0	11.7	87	9	0.4
IS-13-SC	1/23	4.4	6.7	12.2	94	10	0.3
IS-14-SC	1/23	4.5	6.9	12.2	94	13	0.3
IS-15-SFAR	1/23	5.2	7.3	12.4	97	40	0.5
IS-16-SFAR	1/23	4.8	7.2	12.5	98	38	0.6
IS-17-BC	1/23	6.0	7.0	11.5	92	17	1.2
IS-18-SFAR	1/22	6.1	7.2	12.5	101	30	0.3
IS-19-SFAR	1/22	4.9	6.7	12.5	97	22	0.4
May (Spring)							
IS-1-RR	--	--	--	--	--	--	--
IS-2-LRR	--	--	--	--	--	--	--
IS-3-LRR	--	--	--	--	--	--	--
IS-4-GC	5/19	9.6	6.5	9.6	82	6	0.9
IS-5-GC	5/19	5.3	6.4	10.8	85	7	0.8
IS-6-GC	5/19	7.9	6.8	10.1	85	7	0.3
IS-7-SFRR	5/19	7.5	6.7	10.4	86	8	0.3
IS-8-SFRR	5/19	7.9	6.4	10.4	87	8	0.3
IS-9-GCC	5/19	8.2	6.3	10.2	87	6	0.3
IS-10-SFSC	5/19	6.5	6.6	10.4	85	7	0.7
IS-11-SFSC	5/20	6.6	6.6	10.8	88	11	0.9
IS-12-SC	5/20	8.9	6.7	10.0	86	11	0.6

Site ID	2020 Sample Date	Water Temperature (°C)	pH (s.u.)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	Turbidity (NTU)
IS-13-SC	5/20	9.4	7.1	10.5	92	12	1.5
IS-14-SC	5/20	10.1	7.2	10.5	93	14	2.8
IS-15-SFAR	5/20	10.2	7.4	10.8	96	24	1.4
IS-16-SFAR	5/20	10.2	7.3	11.0	98	22	3.0
IS-17-BC	5/20	11.3	7.3	10.0	91	19	18.4
IS-18-SFAR	5/21	11.8	7.3	10.7	99	32	1.4
IS-19-SFAR	5/21	10.8	7.1	10.7	97	21	2.0
August (Summer)							
IS-1-RR	8/3	21.8	6.5	6.9	78	14	0.4
IS-2-LRR	8/3	24.6	6.9	7.0	84	13	0.1
IS-3-LRR	8/3	22.7	6.5	6.7	78	10	0.2
IS-4-GC	8/4	11.7	5.6	8.8	81	7	0.2
IS-5-GC	8/4	13.1	6.2	8.8	83	10	0.1
IS-6-GC	8/4	15.4	6.3	8.3	84	8	0.1
IS-7-SFRR	8/4	14.0	6.6	8.8	85	8	0.1
IS-8-SFRR	8/4	14.6	6.4	8.8	86	9	0.1
IS-9-GCC	8/4	15.4	6.4	8.5	85	8	0.0
IS-10-SFSC	8/4	8.2	5.9	10.1	85	7	0.5
IS-11-SFSC	8/5	13.9	7.0	9.0	87	12	0.3
IS-12-SC	8/5	8.0	6.2	10.2	86	9	0.2
IS-13-SC	8/5	16.5	6.9	8.9	91	14	0.5
IS-14-SC	8/5	11.8	6.4	10.2	94	12	0.2
IS-15-SFAR	8/5	21.7	7.5	8.7	98	44	0.4
IS-16-SFAR	8/5	10.3	6.1	11.6	103	12	0.4
IS-17-BC	8/5	16.2	6.9	8.9	91	26	4.7
IS-18-SFAR	8/6	20.7	7.5	9.1	101	26	0.4
IS-19-SFAR	8/6	13.7	6.5	9.9	95	15	0.5
November (Fall)							
IS-1-RR	11/2	8.1	6.5	7.6	64	49	11.4
IS-2-LRR	11/2	8.2	7.4	10.0	84	11	0.1
IS-3-LRR	11/2	13.5	7.8	9.8	94	33	0.5
IS-4-GC	11/4	11.1	7.1	9.1	82	7	0.2
IS-5-GC	11/4	7.7	7.0	10.2	85	8	0.1
IS-6-GC	11/4	8.5	6.9	9.7	83	8	0.2

Site ID	2020 Sample Date	Water Temperature (°C)	pH (s.u.)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	Turbidity (NTU)
IS-7-SFRR	11/4	7.4	7.1	10.3	86	9	0.1
IS-8-SFRR	11/4	7.2	7.0	10.5	87	9	0.1
IS-9-GCC	11/4	11.4	7.0	9.3	85	9	0.1
IS-10-SFSC	11/4	8.5	6.9	9.9	85	9	0.7
IS-11-SFSC	11/3	8.4	7.5	10.4	88	11	0.2
IS-12-SC	11/4	4.7	6.8	11.0	86	9	0.1
IS-13-SC	11/3	7.7	7.4	11.1	93	11	0.1
IS-14-SC	11/3	9.1	7.5	10.9	95	11	0.2
IS-15-SFAR	11/3	8.0	7.5	11.5	97	54	0.2
IS-16-SFAR	11/3	9.1	6.9	11.3	98	17	0.1
IS-17-BC	11/3	12.3	7.2	9.8	92	20	2.3
IS-18-SFAR	11/6	9.4	7.4	11.1	97	21	0.6
IS-19-SFAR	11/5	9.9	7.0	10.8	96	15	0.7

°C = degrees Celsius
s.u. = standard unit of pH
mg/L = milligrams per liter
% sat = percent saturation
uS/cm = microsiemens per centimeter
NTU = Nephelometric Turbidity Unit
"–" Indicates that data were not collected due to site inaccessibility. See Table 4-4.

6.1.2. Reservoir Sites

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 similar 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 2020, consistent with the Plan (SMUD 2016).

May (Spring) In situ Water Quality Sampling Event

During the May (Spring) sampling event, reservoir water temperatures ranged from approximately 13 to 20°C in surface waters to 6 to 15°C in bottom waters (Figure 6-1 and Appendix B, Figures B-3 through B-8). The onset of thermal stratification was apparent in Loon Lake, Union Valley, Junction, and Camino reservoirs. In Loon Lake, water temperature decreased gradually and consistently with depth, varying by approximately 3 to 4°C between the surface and bottom waters (Appendix B, Figures B-1 and B-2). The deep Union Valley Reservoir exhibited a broad thermocline extending from the water surface to approximately 20 m (Figure 6-1 and Appendix B, Figures B-3 and B-4), and in the more shallow Junction and Camino reservoirs, a broad thermocline extended from the surface to approximately 5 m to 15 m (Appendix B, Figures B-6 and B-7). In Ice House and Slab Creek reservoirs, the thermocline was more distinct and compact, located between 5 m and 10 m from the surface in Ice House Reservoir (Appendix B, Figures B-5 and B-6) and between 2.5 m or 5 m from the surface in Slab Creek Reservoir, depending on measurement location (Figure 6-1 and Appendix B, Figures B-7 and B-8). The relatively shallow Gerle Creek Reservoir water column appeared well mixed, with a slight (0.5°C) drop in temperature from the surface to 1 m depth (Appendix B, Figure B-2).

In Union Valley, Ice House, and Junction reservoirs, dissolved oxygen concentrations increased slightly (0.1 to 1.3 mg/L) within the developing thermoclines before decreasing gradually with depth. Dissolved oxygen concentrations in Loon Lake, Gerle Creek, Camino, and Slab Creek reservoirs were generally consistent with depth. Dissolved oxygen concentrations were above 8.6 mg/L at all reservoir sites during the May (Spring) sampling event, which is 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 6.2 to 7.2 s.u. Three sites (R-IS-7-UVR, R-IS-8-UVR, and R-IS-12-JR) exhibited pH values that fell 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.). pH measurements from two reservoirs, Ice House Reservoir and Loon Lake were rejected due to a malfunctioning pH sensor that exhibited excessive instrument drift. Turbidity levels were very low and were generally consistent with depth (less than or equal to 1.8 NTU) across all reservoir monitoring sites.

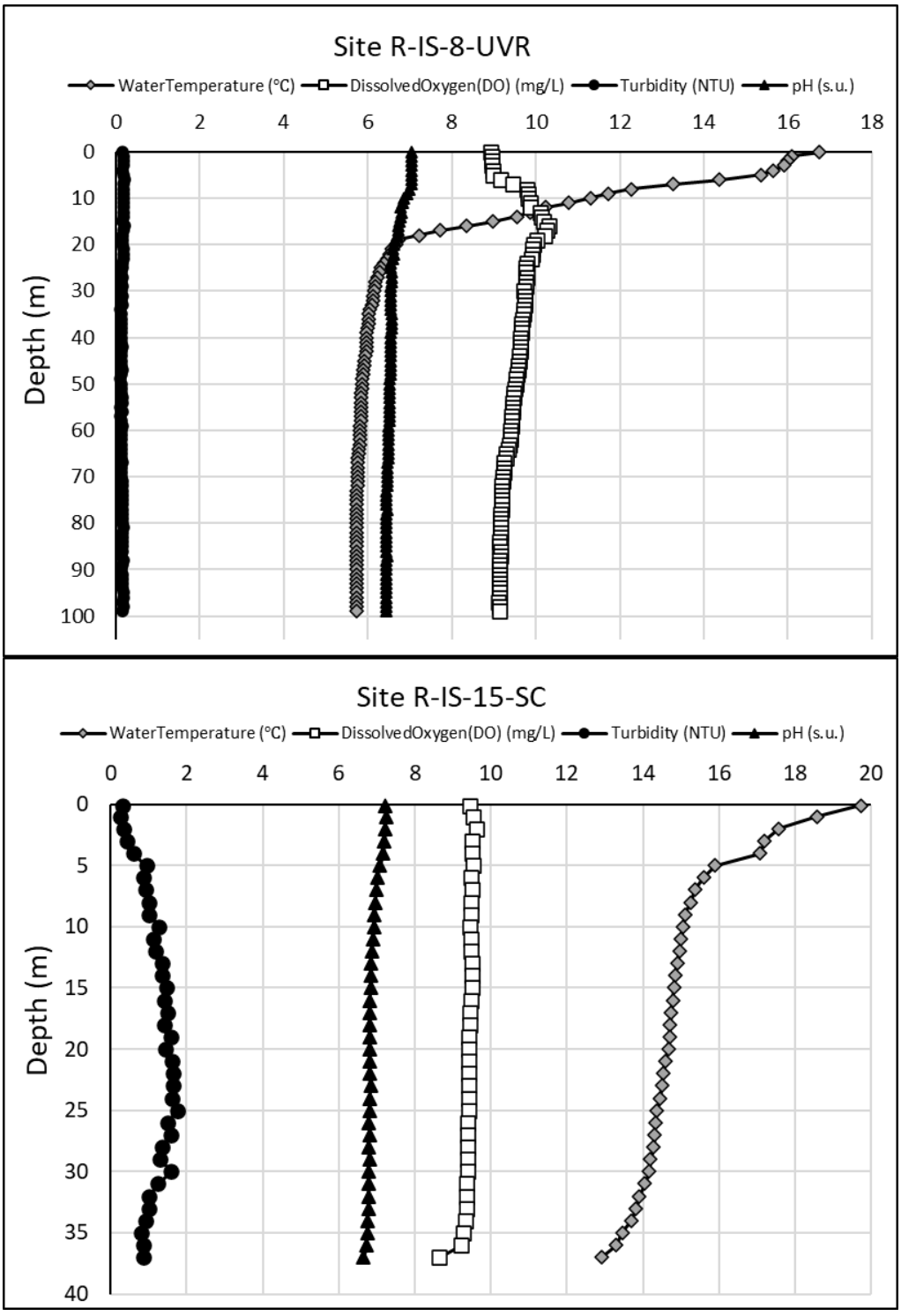

Figure 6-1. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir and Slab Creek Reservoir sites R-IS-8-UVR (top) and R-IS-15-SC (bottom) during May (Spring) 2020.

October and November (Fall) In situ Sampling Event

During the October and November (Fall) sampling events, surface water temperatures across all reservoir sites ranged from approximately 9 to 17°C and bottom water temperatures ranged from 7 to 16°C. Most sites exhibited little to no variation in water temperature with depth, indicating that the reservoirs were generally well mixed (Figure 6-2 and Appendix B, Figures B-9 through B-11 and B-13 through B-16). Thermal stratification was observed at Union Valley Reservoir and Ice House Reservoir at sites R-IS-7-UVR, R-IS-8-UVR, and R-IS-11-IHR, where thermoclines were located at depths of 32 m, 28 m, and 15 m from the surface, respectively (Figure 6-2 and Appendix B, Figures B-12 and B-14).

Dissolved oxygen, pH, and turbidity at all reservoir sites were generally consistent with depth; exceptions occured at sites R-IS-7-UVR, R-IS-8-UVR, and R-IS-11-IHR, where dissolved oxygen concentrations and pH decreased along with decreases in water temperature within the thermoclines (Figure 6-2 and Appendix B, Figures B-12 and B-14). Dissolved oxygen concentrations fell below the Basin Plan instantaneous minimum concentration of 7.0 mg/L for COLD and SPAWN designated uses below the thermoclines of sites R-IS-7-UVR, R-IS-8-UVR, and R-IS-11-IHR, as well at the bottom sample of Site R-IS-9-IHR (Appendix B, Figures B-12 through B-14). The minimum dissolved oxygen concentration across all sites was 4.5 mg/L (Appendix A, Table A-2). Loon Lake (Site R-IS-1-LL), Union Valley Reservoir (Site R-IS-8-UVR), Ice House Reservoir (sites R-IS-9-IHR and R-IS-11-IHR), Junction Reservoir (Site R-IS-12-JR), Camino Reservoir (Site R-IS-13-CR), and Slab Creek Reservoir (Site R-IS-15-SC) all exhibited values below the Basin Plan instantaneous minimum pH objective (6.5 s.u.), either throughout the water column or in the deeper portions of the water column (Appendix B, Figures B-9 and B-12 through B-15). There were no exceedences of the instantaneous maximim pH objective (8.5 s.u.). Turbidity levels were low (less than or equal to 6.3 NTU).

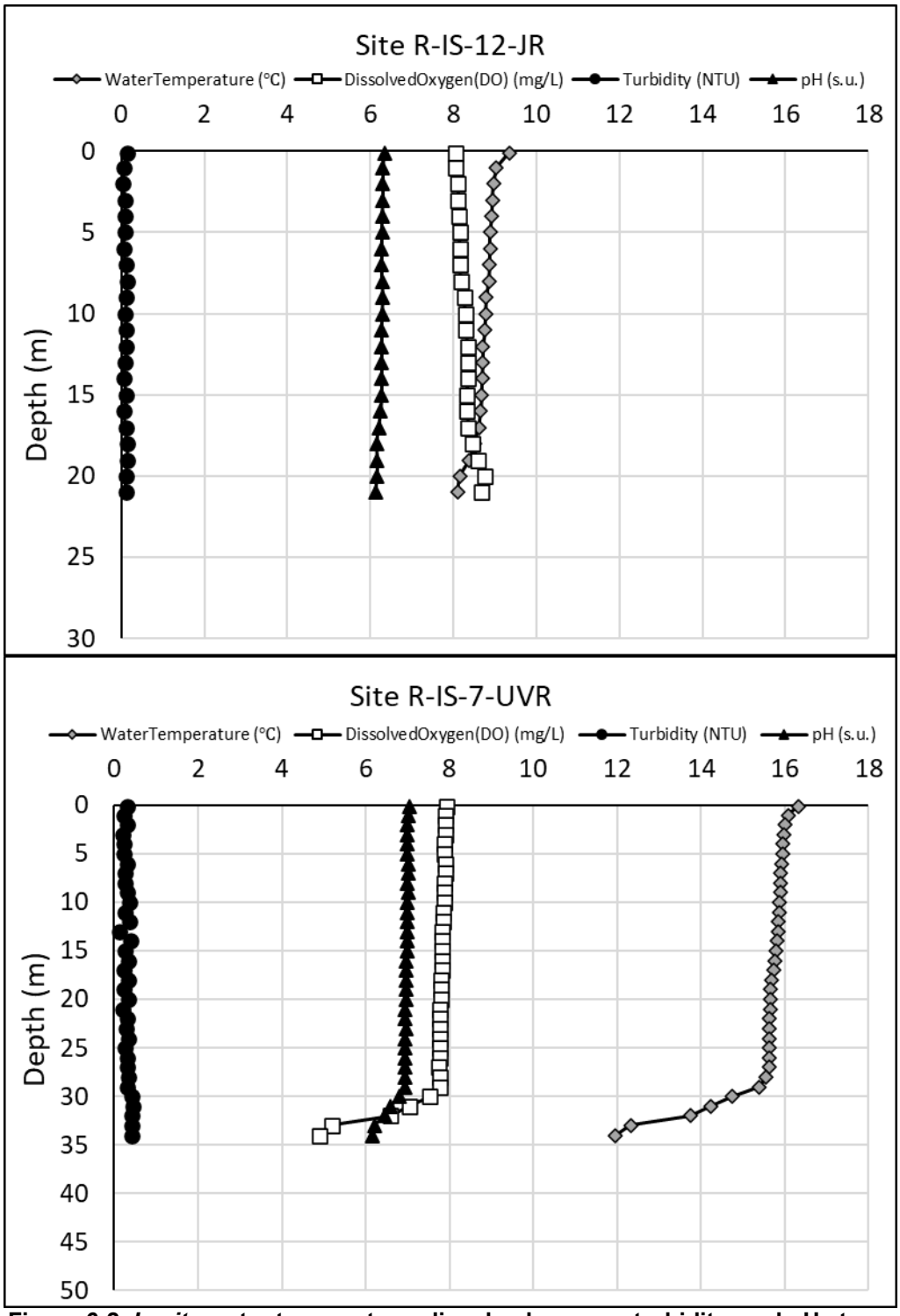

Figure 6-2. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Junction Reservoir and Union Valley Reservoir sites R-IS-12-JR (top) and R-IS-7-UVR (bottom) during October (Fall) 2020.

6.2. BACTERIA

Instantaneous fecal coliform counts ranged from less than the method detection limit (MDL) (i.e., 1.8 most probable number per 100 milliliters [MPN/100 mL]) to 540.0 MPN/100 mL during both the 2020 Independence Day and Labor Day sampling events (Appendix C, Tables C-1 and C-2). Two of the 2020 samples exceeded the instantaneous maximum Basin Plan objective of 400 MPN/100 mL; both of these samples exhibited instantaneous fecal coliform counts of 540 MPN/100 mL and occurred at Site Bac-11-JR (Appendix C, Table C-1).

Fecal coliform geometric mean counts in 2020 were well below the Basin Plan objective of 200 MPN/100 mL for the recreational water contact (REC-1) designated beneficial use. The lowest fecal coliform geometric mean count (0.9 MPN/100 mL) was calculated for samples from Ice House Reservoir (Site Bac-13-IHR) during the Independence Day sampling event. The highest geometric mean fecal coliform count (75.5 MPN/100 mL) occurred at Junction Reservoir (Site Bac-11-JR) during the Independence Day sampling event (Table 6-3). The 2020 Labor Day sampling event was reduced to two surveys occurring over a 15-day period due to unhealthy air quality and recreational site closures resulting from the August–September California wildfires. As a result, the geometric means for sites Bac-1-BI, Bac-2-BI, Bac-3-LL, and Bac-4-LL were calculated using the instantaneous results of two samples instead of five.

Instantaneous *Escherichia coli* (*E. coli*) counts ranged from less than the MDL (i.e., <1.0 MPN/100 mL) to 866.4 MPN/100 mL during the 2020 Independence Day and Labor Day sampling events (Appendix C, Tables C-1 and C-2). There is no Basin Plan numeric objective for *E. coli*.

E. coli geometric mean counts in 2020 ranged from 0.6 MPN/100 mL, calculated for samples from Ice House Reservoir (Site Bac-13-IHR) during the Independence Day sampling event, to 25.1 MPN/100 mL, calculated for samples from Gerle Creek Reservoir (Site Bac-5-GCR) during the Independence Day sampling event (Table 6-3). The Labor Day sampling event was reduced to two surveys occurring over a 15 day period due to unhealthy air quality and recreational site closures resulting from the August–September California wildfires. As a result, the geometric means for sites Bac-1-BI, Bac-2-BI, Bac-3-LL, and Bac-4-LL were calculated using the instantaneous results of two samples instead of five.

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

Site ID	Fecal Coliform Geometric Mean [1,2] (MPN/100 mL)	*E. coli* Geometric Mean (MPN/100 mL)
Independence Day		
Bac-5-GCR	26.4	25.1
Bac-6-GCR	16.2	9.9
Bac-7-UVR	5.7	12.3
Bac-8-UVR	2.8	1.8
Bac-9-UVR	3.7	6.6
Bac-10-UVR	2.6	1.0
Bac-11-JR	75.5	23.0
Bac-12-IHR	1.2	0.7
Bac-13-IHR	0.9	0.6
Bac-14-BCR	2.5	0.8
Bac-15-SCR	3.4	3.0
Labor Day[3]		
Bac-1-BI	1.3	0.7
Bac-2-BI	1.3	0.7
Bac-3-LL	2.0	1.4
Bac-4-LL	21.9	4.9

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 for fecal coliform is 200 MPN/100 mL expressed as the geometric mean of five samples collected over 30 days.

3 Three of five scheduled samples were not collected during the Labor Day sampling event due to unhealthy air quality and recreational site closures resulting from the August–September California wildfires. The Labor Day geometric means were calculated using the instantaneous counts from two samples collected before Labor Day.

7.0 CONCLUSIONS

Based on 2020 *in situ* monitoring results, riverine water quality in the UARP study area generally met Basin Plan water quality objectives. There were two instances (out of 66 total measurements) 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 twelve instances of pH measured below the Basin Plan instantaneous minimum objective (6.5 s.u.) (21% of total pH measurements), which was more than measured during 2015, 2017, 2018, and 2019 *in situ* water quality monitoring at riverine sites but less than what was measured in 2016 (Table 7-1). The occasionally low pH values are likely due to the low buffering capacity characteristic of headwater reaches in granitic watersheds, whereby the relatively low weathering rates of the predominant geology (i.e., granite) results in low alkalinity (<17 mg/L across all sites in 2017; SMUD [2018]) and low hardness (<20 mg/L across all sites in 2017; SMUD [2018]) making the waters susceptible to pH decreases when naturally acidic inputs occur, such as snow melt, rainfall, and tannins from surrounding vegetation. The occasionally low pH level measured during the 2015−2020 monitoring period may represent background conditions for the UARP watershed, particularly in the upper reaches of the study area. There were no instances of pH measured above the Basin Plan instantaneous maximum objective (8.5 s.u.) in 2020. There were no instances of elevated turbidity in 2020, supporting prior statements that elevated turbidity levels measured at low elevation sites during 2015–2017 were a direct result of sediment influx due to vegetation loss from the 2014 King Fire event.

Table 7-1. *In situ* pH Measurements below Basin Plan Instantaneous Minimum Objective (6.5 s.u.) for UARP Riverine Sites, 2015–2020.

Year	Number of pH Measurements below Basin Plan Objective	Percentage of pH Measurements below Basin Plan Objective
2015	3	8%
2016	30	46%
2017	5	7%
2018	6	9%
2019	2	3%
2020	12	21%

Reservoir *in situ* water quality in 2020 was also generally good, with occasional values measured below the Basin Plan instantaneous minimum objectives for dissolved oxygen (7 mg/L) for COLD and SPAWN designated beneficial uses in the bottom waters of the larger reservoirs (i.e., Union Valley Reservoir and Ice House Reservoir), a result that 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.), 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 in 2020, supporting prior statements that elevated turbidity levels measured at low elevation sites during 2015–2017 were a direct result of sediment influx due to vegetation loss from the 2014 King Fire event.

Sampling results for 2020 indicated no exceedances of the fecal coliform Basin Plan objective of 200 MPN/100 mL (geometric mean of five samples collected over 30 days), and only two of 63 samples exceeded the instantaneous maximum Basin Plan objective of 400 MPN/100 mL. The 2020 sampling results are generally consistent with results reported in the Five-Year Monitoring Summary (SMUD 2020). Of the 15 locations monitored for fecal coliform and *E. coli* during the 2015−2020 period, none exhibited exceedances of the Basin Plan fecal coliform geometric mean objective of 200 MPN/100 mL. During 2015−2020, the following 10 locations also exhibited no exceedances of either Basin Plan fecal coliform objective for protection of REC-1 designated waters: Bac-1-BI, Bac-2-BI, Bac-3-LL, Bac-4-LL, Bac-5-GCR, Bac-6-GCR, Bac-8-UVR, Bac-9-UVR, Bac-12-IHR, and Bac-14-BCR.

Despite occasional low dissolved oxygen and pH measurements and a small number of elevated instantaneous fecal coliform measurements, 2020 monitoring results indicate that overall, surface waters of the UARP study area consistently 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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Table A-1. Vertical Profile Data for UARP Reservoir Sites – May (Spring) *In situ* Surveys.

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
Loon Lake Reservoir									
R-IS-1-LL	5/26	0.1	13.3	8.9	85	6	--[1]	0.0	9.9
		1	12.7	9.0	85	6	--[1]	0.0	
		2	12.0	9.1	85	6	--[1]	0.0	
		3	11.7	9.1	84	6	--[1]	0.0	
		4	11.5	9.2	84	6	--[1]	0.1	
		5	11.1	9.2	83	6	--[1]	0.1	
		6	10.7	9.2	83	6	--[1]	0.1	
		7	10.6	9.2	83	6	--[1]	0.1	
		8	10.3	9.2	82	6	--[1]	0.1	
		9	10.0	9.2	82	6	--[1]	0.1	
		10	9.8	9.2	82	6	--[1]	0.1	
		11	9.7	9.2	81	6	--[1]	0.1	
		12	9.5	9.2	81	6	--[1]	0.1	
		13	9.4	9.2	80	6	--[1]	0.1	
		14	9.3	9.1	80	6	--[1]	0.1	
		15	9.3	9.1	80	6	--[1]	0.1	
		16	9.2	9.1	80	6	--[1]	0.1	
		17	9.2	9.1	79	6	--[1]	0.1	
R-IS-2-LL	5/26	0.1	12.7	9.1	85	6	--[1]	0.0	9.5
		1	12.2	9.1	85	6	--[1]	0.0	
		2	11.9	9.1	84	6	--[1]	0.0	
		3	11.2	9.2	84	6	--[1]	0.1	
		4	11.1	9.2	83	6	--[1]	0.1	
		5	10.8	9.2	83	6	--[1]	0.0	
		6	10.7	9.2	83	6	--[1]	0.0	
		7	10.6	9.2	83	6	--[1]	0.1	
		8	10.4	9.2	82	6	--[1]	0.1	
		9	10.1	9.2	82	6	--[1]	0.0	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		10	9.9	9.2	81	6	--[1]	0.1	
		11	9.9	9.2	81	6	--[1]	0.1	
		12	9.7	9.2	81	6	--[1]	0.1	
		13	9.6	9.2	81	6	--[1]	0.1	
		14	9.5	9.2	80	6	--[1]	0.1	
		15	9.3	9.2	80	6	--[1]	0.1	
		16	9.3	9.2	80	6	--[1]	0.1	
		17	9.3	9.2	80	6	--[1]	0.1	
		18	9.2	9.2	80	6	--[1]	0.1	
R-IS-3-LL	5/26	0.1	11.7	9.1	84	6	--[1]	0.0	10.5
		1	11.2	9.1	83	6	--[1]	0.0	
		2	11.0	9.2	83	6	--[1]	0.0	
		3	10.9	9.2	83	6	--[1]	0.0	
		4	10.8	9.2	83	6	--[1]	0.0	
		5	10.7	9.2	83	6	--[1]	0.0	
		6	10.6	9.2	83	6	--[1]	0.1	
		7	10.6	9.2	83	6	--[1]	0.1	
		8	10.4	9.2	82	6	--[1]	0.1	
		9	10.2	9.2	82	6	--[1]	0.0	
		10	10.0	9.2	82	6	--[1]	0.1	
		11	10.0	9.2	81	6	--[1]	0.1	
		12	9.8	9.2	81	6	--[1]	0.1	
		13	9.7	9.1	80	6	--[1]	0.1	
		14	9.5	9.1	80	6	--[1]	0.1	
		15	9.4	9.1	79	6	--[1]	0.1	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
Gerle Reservoir									
R-IS-4-GC	5/29	0.1	11.4	9.5	87	7	6.6	0.2	8.0
		1	11.1	9.6	87	7	6.5	0.2	
		2	11.1	9.5	87	7	6.6	0.2	
		3	11.0	9.5	87	7	6.5	0.2	
		4	11.0	9.5	86	7	6.5	0.3	
		5	11.0	9.5	86	7	6.5	0.2	
		6	11.0	9.5	86	7	6.5	0.2	
		7	10.9	9.5	86	7	6.5	0.3	
Union Valley Reservoir									
R-IS-5-UVR	5/27	0.1	18.0	8.9	94	11	7.1	0.1	7.4
		1	17.7	8.9	94	11	7.1	0.1	
		2	16.8	9.0	92	10	7.1	0.2	
		3	15.7	9.2	92	10	7.1	0.2	
		4	15.1	9.2	91	10	7.0	0.2	
		5	13.3	9.4	90	9	7.0	0.2	
		6	13.0	9.4	90	9	6.9	0.2	
		7	12.6	9.5	89	9	6.9	0.2	
		8	12.0	9.5	89	9	6.8	0.2	
		9	11.8	9.5	88	9	6.8	0.1	
		10	11.4	9.6	87	8	6.8	0.1	
		11	11.0	9.6	87	8	6.8	0.2	
		12	10.4	9.6	86	8	6.8	0.2	
		13	10.0	9.7	86	8	6.7	0.2	
		14	9.3	9.8	85	8	6.7	0.2	
		15	8.9	9.8	84	8	6.7	0.2	
		16	8.6	9.7	84	8	6.7	0.2	
		17	7.7	9.7	81	8	6.6	0.2	
		18	7.4	9.7	80	8	6.6	0.2	
		19	7.0	9.5	78	8	6.6	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		20	6.7	9.4	77	8	6.5	0.2[2]	
R-IS-6-UVR	5/27	0.1	18.3	8.8	93	11	7.1	0.1	6.2
		1	17.7	8.9	92	11	7.1	0.2	
		2	15.9	9.1	92	10	7.1	0.2	
		3	15.1	9.2	91	10	7.1	0.2	
		4	14.6	9.3	91	10	7.1	0.2	
		5	13.8	9.4	90	10	7.1	0.2	
		6	13.5	9.4	90	10	7.1	0.2	
		7	13.1	9.5	91	9	7.1	0.2	
		8	12.3	9.7	91	9	7.0	0.2	
		9	12.0	9.7	90	9	7.0	0.2	
		10	11.4	9.8	90	9	6.9	0.2	
		11	11.0	9.9	89	9	6.9	0.2	
		12	10.7	9.9	89	9	6.9	0.2	
		13	10.4	9.9	88	9	6.8	0.2	
		14	9.6	9.9	87	9	6.8	0.2	
		15	9.4	10.0	87	9	6.8	0.2	
		16	9.1	10.0	87	9	6.8	0.2	
		17	8.6	10.1	87	8	6.8	0.2	
		18	8.1	10.1	85	8	6.7	0.2	
		19	7.7	9.7	82	8	6.7	0.2	
		20	7.4	9.7	81	8	6.6	0.2	
		21	6.9	9.7	80	8	6.6	0.2	
		22	6.7	9.8	80	8	6.6	0.2	
		23	6.7	9.7	80	8	6.6	0.2	
		24	6.6	9.7	80	8	6.6	0.2	
		25	6.5	9.8	80	8	6.6	0.2	
		26	6.5	9.8	79	8	6.6	0.2	
		27	6.5	9.8	79	8	6.6	0.2	
		28	6.4	9.7	79	8	6.6	0.1	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		29	6.3	9.7	78	8	6.6	0.2	
		30	6.3	9.7	78	8	6.6	0.1	
		31	6.3	9.7	78	8	6.6	0.1	
		32	6.3	9.6	78	8	6.6	0.1	
		33	6.2	9.6	77	8	6.6	0.1	
		34	6.2	9.6	77	8	6.6	0.1	
		35	6.1	9.4	76	8	6.6	0.2	
		36	6.1	9.4	76	8	6.6	0.1	
R-IS-7-UVR	5/27	0.1	16.5	9.0	92	10	6.9	0.1	7.8
		1	16.2	9.0	92	10	7.0	0.2	
		2	15.8	9.1	92	10	7.0	0.2	
		3	14.7	9.3	91	10	6.9	0.2	
		4	14.1	9.3	91	10	6.9	0.2	
		5	13.7	9.4	90	9	6.9	0.2	
		6	13.3	9.4	90	9	6.9	0.2	
		7	12.9	9.4	89	9	6.8	0.2	
		8	12.3	9.5	89	9	6.8	0.2	
		9	11.7	9.6	89	9	6.8	0.2	
		10	11.1	9.7	88	9	6.8	0.2	
		11	10.7	9.8	88	9	6.7	0.2	
		12	10.5	9.8	88	9	6.7	0.2	
		13	10.0	9.8	87	8	6.7	0.2	
		14	9.3	9.9	86	8	6.6	0.2	
		15	8.7	9.9	85	8	6.6	0.2	
		16	8.0	10.1	85	8	6.5	0.2	
		17	7.6	10.1	84	8	6.4	0.2	
		18	7.3	10.1	84	8	6.4	0.2	
		19	7.1	10.0	83	8	6.3	0.2	
		20	6.8	9.9	81	8	6.3	0.2	
		21	6.7	9.8	80	8	6.3	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		22	6.6	9.7	79	8	6.3	0.2	
		23	6.6	9.7	79	8	6.3	0.2	
		24	6.5	9.7	79	8	6.2	0.2	
		25	6.5	9.6	78	8	6.2	0.1	
		26	6.4	9.6	78	8	6.2	0.1	
		27	6.3	9.6	77	8	6.2	0.1	
		28	6.2	9.5	77	8	6.2	0.1	
		29	6.2	9.5	77	8	6.2	0.1	
		30	6.2	9.5	77	8	6.2	0.2	
		31	6.2	9.5	77	8	6.2	0.1	
		32	6.2	9.5	77	8	6.2	0.1	
		33	6.1	9.5	77	8	6.2	0.1	
		34	6.1	9.5	77	8	6.2	0.1	
		35	6.1	9.5	77	8	6.2	0.1	
		36	6.1	9.5	77	8	6.2	0.1	
		37	6.1	9.5	76	8	6.2	0.1	
		38	6.1	9.5	76	8	6.2	0.1	
		39	6.0	9.5	76	8	6.3	0.1	
		40	6.0	9.5	76	8	6.2	0.1	
		41	6.0	9.4	76	8	6.3	0.1	
		42	6.0	9.4	75	8	6.2	0.1	
		43	6.0	9.4	75	8	6.2	0.1	
		44	6.0	9.4	75	8	6.2	0.1	
		45	6.0	9.4	75	8	6.2	0.1	
		46	5.9	9.4	75	8	6.2	0.1	
		47	5.9	9.4	75	8	6.2	0.1	
		48	5.9	9.3	75	8	6.2	0.2	
		49	5.9	9.3	75	8	6.2	0.2	
R-IS-8-UVR	5/27	0.1	16.8	8.9	92	10	7.0	0.2	6.6
		1	16.1	9.0	91	10	7.0	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		2	16.0	9.0	91	10	7.0	0.2	
		3	15.9	8.9	90	10	7.0	0.2	
		4	15.6	9.0	90	10	7.1	0.2	
		5	15.4	9.0	90	10	7.1	0.2	
		6	14.4	9.2	90	10	7.1	0.2	
		7	13.3	9.4	90	10	7.0	0.2	
		8	12.3	9.8	91	9	7.0	0.2	
		9	11.7	9.8	91	9	6.9	0.2	
		10	11.3	9.8	90	9	6.9	0.2	
		11	10.8	9.9	89	9	6.8	0.2	
		12	10.2	9.9	88	9	6.8	0.2	
		13	9.9	10.1	89	9	6.8	0.2	
		14	9.6	10.1	89	9	6.8	0.2	
		15	9.0	10.2	88	9	6.8	0.2	
		16	8.4	10.3	88	9	6.7	0.2	
		17	7.7	10.3	86	9	6.7	0.2	
		18	7.2	10.2	85	8	6.7	0.2	
		19	6.7	10.0	82	8	6.7	0.2	
		20	6.7	9.9	81	8	6.6	0.2	
		21	6.6	9.9	81	8	6.6	0.2	
		22	6.5	9.9	81	8	6.6	0.2	
		23	6.5	9.9	80	8	6.6	0.2	
		24	6.4	9.8	79	8	6.6	0.2	
		25	6.3	9.8	79	8	6.6	0.2	
		26	6.3	9.8	79	8	6.6	0.1	
		27	6.2	9.8	79	8	6.6	0.2	
		28	6.2	9.8	79	8	6.6	0.1	
		29	6.2	9.8	79	8	6.6	0.2	
		30	6.1	9.7	78	8	6.6	0.1	
		31	6.1	9.7	79	8	6.5	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		32	6.1	9.7	79	8	6.6	0.1	
		33	6.1	9.7	78	8	6.5	0.2	
		34	6.1	9.7	78	8	6.6	0.1	
		35	6.0	9.7	78	8	6.6	0.1	
		36	6.0	9.7	78	8	6.6	0.1	
		37	6.0	9.7	78	8	6.6	0.1	
		38	6.0	9.7	78	8	6.6	0.1	
		39	6.0	9.7	78	8	6.6	0.1	
		40	6.0	9.6	77	8	6.6	0.1	
		41	6.0	9.6	77	8	6.6	0.1	
		42	6.0	9.6	77	8	6.5	0.2	
		43	6.0	9.6	77	8	6.5	0.1	
		44	5.9	9.6	77	8	6.5	0.1	
		45	5.9	9.6	77	8	6.6	0.1	
		46	5.9	9.6	77	8	6.5	0.1	
		47	5.9	9.6	77	8	6.5	0.2	
		48	5.9	9.6	77	8	6.5	0.1	
		49	5.9	9.5	76	8	6.5	0.1	
		50	5.9	9.5	76	8	6.5	0.1	
		51	5.9	9.5	76	8	6.5	0.1	
		52	5.8	9.5	76	8	6.5	0.1	
		53	5.8	9.5	76	8	6.5	0.2	
		54	5.8	9.5	76	8	6.5	0.2	
		55	5.8	9.5	76	8	6.5	0.1	
		56	5.8	9.4	76	8	6.5	0.2	
		57	5.8	9.4	75	8	6.5	0.1	
		58	5.8	9.4	75	8	6.5	0.1	
		59	5.8	9.4	75	8	6.5	0.2	
		60	5.8	9.4	75	8	6.5	0.1	
		61	5.8	9.4	75	8	6.5	0.1	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		62	5.8	9.4	75	8	6.5	0.1	
		63	5.8	9.4	75	8	6.5	0.1	
		64	5.8	9.3	75	8	6.5	0.1	
		65	5.8	9.3	74	8	6.5	0.1	
		66	5.8	9.3	74	8	6.5	0.1	
		67	5.8	9.3	74	8	6.5	0.2	
		68	5.8	9.2	74	8	6.5	0.1	
		69	5.8	9.2	74	8	6.5	0.1	
		70	5.8	9.2	74	8	6.5	0.1	
		71	5.8	9.2	74	8	6.5	0.2	
		72	5.8	9.2	73	8	6.5	0.2	
		73	5.7	9.2	73	8	6.5	0.2	
		74	5.7	9.2	73	8	6.5	0.2	
		75	5.7	9.2	73	8	6.5	0.2	
		76	5.7	9.2	73	8	6.5	0.2	
		77	5.7	9.2	73	8	6.5	0.2	
		78	5.7	9.2	73	8	6.5	0.2	
		79	5.7	9.2	73	8	6.5	0.2	
		80	5.7	9.2	73	8	6.4	0.2	
		81	5.7	9.2	73	8	6.4	0.2	
		82	5.7	9.2	73	8	6.5	0.2	
		83	5.7	9.2	73	8	6.4	0.2	
		84	5.7	9.1	73	8	6.4	0.2	
		85	5.7	9.1	73	8	6.5	0.2	
		86	5.7	9.2	73	8	6.5	0.2	
		87	5.7	9.2	73	8	6.5	0.1	
		88	5.7	9.1	73	8	6.5	0.2	
		89	5.7	9.1	73	8	6.4	0.2	
		90	5.7	9.1	73	8	6.4	0.1	
		91	5.7	9.1	73	8	6.4	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		92	5.7	9.1	73	8	6.4	0.2	
		93	5.7	9.1	73	8	6.4	0.2	
		94	5.7	9.1	73	8	6.5	0.2	
		95	5.7	9.1	73	8	6.4	0.2	
		96	5.7	9.1	73	8	6.4	0.2	
		97	5.7	9.1	73	8	6.4	0.2	
		98	5.7	9.1	73	8	6.4	0.2	
		99	5.7	9.1	73	8	6.5	0.2	
Ice House Reservoir									
R-IS-9-IHR	5/22	0.1	12.8	9.0	85	8	--[1]	0.2	6.3
		1	12.8	9.0	85	8	--[1]	0.3	
		2	12.6	9.0	85	8	--[1]	0.3	
		3	12.5	9.0	85	8	--[1]	0.3	
		4	12.5	9.0	85	8	--[1]	0.3	
		5	12.0	9.2	85	8	--[1]	0.3	
		6	11.4	9.3	85	7	--[1]	0.3	
		7	10.5	9.4	85	7	--[1]	0.3	
		8	9.9	9.5	84	7	--[1]	0.3	
		9	9.8	9.5	84	7	--[1]	0.3	
		10	8.7	9.7	83	7	--[1]	0.3	
		11	8.0	9.7	82	7	--[1]	0.3	
		12	7.7	9.7	81	6	--[1]	0.3	
		13	7.5	9.6	80	7	--[1]	0.3	
		14	7.4	9.6	80	7	--[1]	0.4	
R-IS-10-IHR	5/22	0.1	12.7	9.1	85	8	--[1]	0.5	7.1
		1	12.7	9.1	86	8	--[1]	0.2	
		2	12.7	9.1	85	8	--[1]	0.2	
		3	12.7	9.1	85	8	--[1]	0.3	
		4	12.5	9.1	85	8	--[1]	0.3	
		5	12.1	9.2	85	8	--[1]	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		6	11.0	9.4	85	7	--[1]	0.3	
		7	9.9	9.6	85	7	--[1]	0.3	
		8	9.4	9.7	85	7	--[1]	0.3[1]	
R-IS-11-IHR	5/22	0.1	12.6	9.1	86	8	--[1]	0.3	7.1
		1	12.6	9.1	85	8	--[1]	0.2	
		2	12.2	9.1	85	8	--[1]	0.2	
		3	12.2	9.1	85	8	--[1]	0.3	
		4	12.1	9.1	85	8	--[1]	0.2	
		5	12.1	9.1	84	8	--[1]	0.3	
		6	11.9	9.1	85	8	--[1]	0.2	
		7	10.3	10.0	89	7	--[1]	0.3	
		8	9.5	10.1	88	7	--[1]	0.3	
		9	8.4	10.2	87	7	--[1]	0.3	
		10	7.8	10.2	85	7	--[1]	0.3	
		11	7.2	9.8	81	7	--[1]	0.4	
		12	7.0	9.8	81	7	--[1]	0.4	
		13	7.0	9.8	81	7	--[1]	0.3	
		14	6.8	9.7	80	7	--[1]	0.3	
		15	6.8	9.7	79	7	--[1]	0.3	
		16	6.7	9.6	79	7	--[1]	0.4	
		17	6.7	9.6	79	7	--[1]	0.4	
		18	6.7	9.6	78	7	--[1]	0.4	
		19	6.6	9.5	78	7	--[1]	0.4	
		20	6.6	9.5	77	7	--[1]	0.3	
		21	6.6	9.5	77	7	--[1]	0.3	
		22	6.6	9.4	77	7	--[1]	0.4	
		23	6.6	9.4	77	7	--[1]	0.4	
		24	6.5	9.4	76	7	--[1]	0.4	
		25	6.5	9.3	76	7	--[1]	0.4	
		26	6.5	9.3	76	7	--[1]	0.4	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		27	6.5	9.3	76	7	--[1]	0.4	
		28	6.5	9.3	75	7	--[1]	0.4	
		29	6.5	9.2	75	7	--[1]	0.4	
		30	6.5	9.2	75	7	--[1]	0.4	
		31	6.5	9.2	75	7	--[1]	0.4	
		32	6.5	9.2	75	7	--[1]	0.4	
		33	6.4	9.1	74	7	--[1]	0.4	
Junction Reservoir									
R-IS-12-JR	5/29	0.1	17.7	8.6	91	13	6.9	0.3	6.8
		1	16.2	8.7	89	13	6.9	0.3	
		2	15.3	9.1	91	13	6.8	0.3	
		3	13.8	9.5	88	12	6.8	0.3	
		4	12.8	9.6	90	12	6.8	0.3	
		5	12.1	9.6	89	12	6.7	0.4	
		6	11.7	9.5	88	12	6.7	0.4	
		7	11.3	9.5	87	11	6.7	0.4	
		8	11.0	9.5	86	11	6.6	0.4	
		9	10.7	9.5	85	11	6.6	0.4	
		10	10.4	9.5	85	11	6.5	0.4	
		11	10.1	9.5	84	11	6.4	0.5	
		12	9.7	9.7	85	10	6.4	0.3	
		13	9.4	9.6	84	10	6.4	0.3	
		14	9.2	9.7	84	10	6.3	0.3	
Camino Reservoir									
R-IS-13-CR	5/29	0.1	15.7	9.4	94	14	6.9	0.4	5.3
		1	13.9	9.6	94	13	6.8	0.5	
		2	13.4	9.8	93	12	6.8	0.5	
		3	12.6	9.9	93	12	6.8	0.6	
		4	11.3	10.2	93	11	6.7	0.5	
		5	10.9	10.2	93	11	6.7	0.5	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
Slab Creek Reservoir									
R-IS-14-SC	5/28	0.1	17.5	9.2	99	28	7.1	0.6	4.0
		1	16.0	9.4	96	22	7.0	0.7	
		2	15.4	9.5	95	21	7.0	0.8	
		3	15.3	9.5	95	21	7.0	0.9	
		4	15.3	9.5	95	21	7.0	0.8	
		5	15.2	9.6	95	21	7.0	0.7	
		6	15.2	9.6	95	21	7.0	0.9	
		7	15.1	9.6	95	21	7.0	0.8	
		8	14.9	9.6	95	21	7.0	0.9	
		9	14.9	9.6	95	21	7.0	1.1	
R-IS-15-SC	5/28	0.1	19.7	9.4	103	27	7.2	0.3	4.0
		1	18.6	9.5	102	26	7.2	0.3	
		2	17.6	9.6	101	25	7.2	0.4	
		3	17.2	9.5	99	25	7.2	0.4	
		4	17.1	9.5	99	25	7.2	0.6	
		5	15.9	9.5	96	23	7.1	0.9	
		6	15.6	9.5	95	22	7.0	0.9	
		7	15.4	9.5	95	22	7.0	0.9	
		8	15.3	9.5	94	22	7.0	1.0	
		9	15.1	9.5	94	22	6.9	1.0	
		10	15.1	9.5	94	22	6.9	1.3	
		11	15.0	9.5	94	22	6.9	1.1	
		12	15.0	9.5	94	21	6.9	1.2	
		13	14.9	9.5	94	21	6.9	1.3	
		14	14.8	9.5	94	20	6.8	1.4	
		15	14.8	9.5	94	20	6.8	1.5	
		16	14.8	9.5	94	21	6.8	1.4	
		17	14.7	9.4	93	21	6.8	1.5	
		18	14.7	9.4	93	22	6.8	1.4	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		19	14.7	9.4	93	21	6.8	1.6	
		20	14.7	9.4	93	22	6.8	1.5	
		21	14.6	9.4	93	22	6.8	1.6	
		22	14.5	9.4	92	22	6.8	1.6	
		23	14.5	9.4	92	22	6.8	1.6	
		24	14.5	9.4	92	22	6.8	1.6	
		25	14.4	9.4	92	22	6.8	1.8	
		26	14.3	9.4	92	22	6.8	1.5	
		27	14.3	9.4	92	22	6.8	1.6	
		28	14.3	9.4	92	23	6.8	1.4	
		29	14.2	9.4	91	23	6.8	1.3	
		30	14.2	9.4	91	23	6.8	1.6	
		31	14.0	9.4	91	23	6.8	1.3	
		32	13.9	9.4	91	24	6.8	1.0	
		33	13.8	9.4	91	24	6.8	1.0	
		34	13.7	9.3	90	24	6.8	0.9	
		35	13.5	9.3	89	24	6.8	0.8	
		36	13.3	9.2	88	25	6.7	0.9	
		37	12.9	8.6	82	26	6.7	0.9[2]	

°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 Turbidity Unit

[1] pH measurements were rejected due to malfunctioning sensor exhibiting excessive instrument drift.

[2] 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.

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

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
Loon Lake									
R-IS-1-LL	10/29	0.1	11.2	8.5	77	7	6.9	0.2	6.9
		1	11.2	8.5	77	7	6.9	0.2	
		2	11.2	8.5	77	7	6.8	0.1	
		3	11.2	8.5	77	7	6.8	0.1	
		4	11.2	8.5	77	7	6.8	0.1	
		5	11.2	8.5	77	7	6.8	0.0	
		6	11.2	8.4	77	7	6.8	0.1	
		7	11.2	8.4	77	7	6.8	0.2	
		8	11.2	8.4	77	7	6.8	0.1	
		9	11.2	8.4	77	7	6.7	0.2	
		10	11.1	8.4	76	7	6.8	0.2	
		11	11.1	8.4	76	7	6.7	0.1	
		12	11.2	8.4	76	7	6.7	0.2	
		13	11.1	8.4	76	7	6.7	0.1	
		14	11.1	8.3	76	7	6.7	0.2	
		15	11.1	8.3	76	7	6.7	0.1	
		16	11.1	8.3	76	7	6.7	0.2	
		17	11.1	8.3	76	7	6.7	0.2	
		18	11.1	8.3	76	7	6.7	0.1	
		19	11.1	8.3	76	7	6.6	0.1	
		20	11.1	8.3	76	7	6.5	0.2	
		21	11.1	8.3	75	7	6.4	0.2[1]	
R-IS-2-LL	10/29	0.1	11.6	8.5	78	7	6.7	0.1	8.1
		1	11.6	8.5	78	7	6.6	0.0	
		2	11.5	8.5	78	7	6.6	0.0	
		3	11.5	8.5	78	7	6.6	0.0	
		4	11.5	8.5	78	7	6.5	0.1	
		5	11.5	8.5	78	7	6.5	0.1	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		6	11.5	8.5	78	7	6.5	0.1	
		7	11.5	8.5	78	7	6.6	0.0	
		8	11.5	8.5	78	7	6.6	0.1	
		9	11.5	8.5	78	7	6.5	0.0	
		10	11.5	8.5	78	7	6.5	0.0[1]	
R-IS-3-LL	10/29	0.1	11.3	8.6	79	7	6.8	0.0	7.5
		1	11.3	8.6	79	7	6.7	0.1	
		2	11.3	8.6	79	7	6.7	0.1	
		3	11.3	8.6	79	7	6.7	0.0	
		4	11.2	8.6	78	7	6.7	0.1	
		5	11.2	8.6	78	7	6.6	0.1	
		6	11.2	8.6	78	7	6.6	0.0	
		7	11.2	8.6	78	7	6.6	0.2	
		8	11.2	8.6	78	7	6.7	0.2	
		9	11.2	8.6	78	7	6.6	0.1	
		10	11.2	8.6	78	7	6.7	0.1[1]	
Gerle Creek Reservoir									
R-IS-4-GC	10/30	0.1	11.1	9.0	82	9	6.8	0.2	6.3
		1	10.5	9.0	81	9	6.7	0.2	
		2	10.4	9.0	80	9	6.7	0.2	
		3	10.3	9.0	80	9	6.7	0.2	
		4	10.3	9.0	80	9	6.8	0.2	
		5	10.2	9.0	80	9	6.7	0.2	
		6	9.7	8.9	78	9	6.7	0.2	
		7	9.7	8.7	76	12	6.6	0.2[1]	
Union Valley Reservoir									
R-IS-5-UVR	10/28	0.1	15.8	8.0	81	11	7.0	0.2	6.2
		1	15.5	8.1	81	11	7.0	0.2	
		2	15.3	8.1	80	11	7.0	0.3	
		3	15.1	8.1	80	11	7.0	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		4	15.0	8.1	80	11	7.0	0.4	
		5	14.9	8.1	80	11	7.0	0.2	
		6	14.4	8.2	80	11	7.0	0.4	
		7	13.9	8.2	80	11	6.9	0.4	
R-IS-6-UVR	10/28	0.1	16.7	7.9	82	11	7.0	0.2	6.1
		1	16.7	7.9	81	11	7.0	0.2	
		2	16.3	7.9	81	11	7.0	0.2	
		3	16.2	8.0	81	11	7.0	0.3	
		4	16.1	7.9	81	11	7.0	0.4	
		5	16.1	7.9	80	11	7.0	0.3	
		6	16.1	7.9	80	11	7.0	0.3	
		7	16.0	7.9	80	11	7.0	0.3	
		8	16.0	7.9	80	11	7.0	0.2	
		9	16.0	7.9	80	11	7.0	0.3	
		10	16.0	7.9	80	11	7.0	0.3	
		11	16.0	7.9	80	11	7.0	0.2	
		12	16.0	7.9	80	11	7.0	0.2	
		13	16.0	7.9	80	11	7.0	0.3	
		14	16.0	7.9	80	11	7.0	0.2	
		15	16.0	7.9	80	11	7.0	0.2	
		16	16.0	7.9	80	11	7.0	0.3	
		17	16.0	7.8	80	11	7.0	0.3	
		18	16.0	7.8	79	11	7.0	0.2	
		19	16.0	7.8	79	11	7.0	0.2	
		20	16.0	7.8	79	11	7.0	0.2	
		21	16.0	7.8	79	11	7.0	0.3	
		22	15.9	7.8	78	11	7.0	0.2	
		23	15.8	7.7	77	11	6.9	0.3	
R-IS-7-UVR	10/28	0.1	16.3	7.9	81	11	7.0	0.3	7.7
		1	16.1	7.9	80	11	7.0	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		2	16.0	7.9	80	11	7.0	0.3	
		3	16.0	7.9	80	11	7.0	0.2	
		4	16.0	7.9	80	11	7.0	0.2	
		5	16.0	7.9	80	11	7.0	0.2	
		6	15.9	7.9	80	11	7.0	0.3	
		7	15.9	7.9	80	11	7.0	0.3	
		8	15.9	7.9	80	11	7.0	0.3	
		9	15.9	7.9	80	11	7.0	0.3	
		10	15.9	7.9	80	11	7.0	0.4	
		11	15.9	7.9	79	11	7.0	0.3	
		12	15.9	7.8	79	11	7.0	0.4	
		13	15.9	7.8	79	11	7.0	0.1	
		14	15.8	7.8	79	11	7.0	0.4	
		15	15.8	7.8	79	11	7.0	0.3	
		16	15.8	7.8	79	11	7.0	0.3	
		17	15.7	7.8	79	11	7.0	0.2	
		18	15.7	7.8	79	11	7.0	0.3	
		19	15.7	7.8	78	11	7.0	0.2	
		20	15.7	7.8	78	11	7.0	0.3	
		21	15.7	7.8	78	11	7.0	0.2	
		22	15.6	7.8	78	11	7.0	0.3	
		23	15.6	7.8	78	11	7.0	0.3	
		24	15.6	7.8	78	11	7.0	0.3	
		25	15.6	7.8	78	11	7.0	0.3	
		26	15.6	7.8	78	11	7.0	0.3	
		27	15.6	7.8	78	11	7.0	0.3	
		28	15.6	7.8	78	11	6.9	0.3	
		29	15.4	7.8	78	11	6.9	0.3	
		30	14.7	7.5	74	11	6.8	0.4	
		31	14.2	7.0	68	11	6.6	0.5	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		32	13.7	6.6	63	11	6.5	0.4	
		33	12.3	5.2	48	11	6.2	6.3	
		34	12.0	4.9	45	11	6.2	1.1	
R-IS-8-UVR	10/28	0.1	16.9	8.0	81	11	7.1	0.2	6.5
		1	16.2	7.9	81	11	7.0	0.2	
		2	16.1	7.9	80	11	7.0	0.2	
		3	16.1	7.9	80	11	7.0	0.2	
		4	16.1	7.9	80	11	7.0	0.3	
		5	16.1	7.9	80	11	7.0	0.3	
		6	16.1	7.9	80	11	7.0	0.3	
		7	16.1	7.9	80	11	7.0	0.3	
		8	16.1	7.9	80	11	7.0	0.2	
		9	16.1	7.9	80	11	7.0	0.2	
		10	16.1	7.9	80	11	6.9	0.2	
		11	16.1	7.9	80	11	6.9	0.3	
		12	16.1	7.8	80	11	6.9	0.3	
		13	16.1	7.8	79	11	6.9	0.3	
		14	16.1	7.8	79	11	6.8	0.2	
		15	16.1	7.8	79	11	6.8	0.3	
		16	16.1	7.8	79	11	6.8	0.3	
		17	16.1	7.8	79	11	6.8	0.2	
		18	16.1	7.8	79	11	6.8	0.3	
		19	16.1	7.8	79	11	6.7	0.2	
		20	16.1	7.8	79	11	6.7	0.3	
		21	16.1	7.8	79	11	6.7	0.2	
		22	16.0	7.7	78	11	6.7	0.2	
		23	16.0	7.7	78	11	6.7	0.2	
		24	16.0	7.7	78	11	6.7	0.3	
		25	16.0	7.7	78	11	6.6	0.3	
		26	15.9	7.6	76	11	6.6	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		27	15.6	7.5	75	11	6.4	0.1	
		28	15.3	7.3	73	11	6.3	0.2	
		29	14.1	7.0	68	10	6.1	0.1	
		30	13.4	6.9	66	10	6.0	0.1	
		31	12.9	6.9	66	10	6.0	0.1	
		32	12.5	7.0	65	10	6.0	0.1	
		33	12.3	7.0	65	10	6.0	0.2	
		34	12.1	7.0	65	10	6.0	0.1	
		35	12.0	7.0	65	10	6.0	0.1	
		36	11.8	7.0	64	10	5.9	0.1	
		37	11.6	6.9	64	10	5.9	0.1	
		38	11.4	7.0	64	9	5.9	0.1	
		39	11.2	7.0	64	9	5.9	0.0	
		40	11.0	7.1	64	9	5.9	0.1	
		41	10.8	7.1	64	9	5.9	0.1	
		42	10.7	7.2	65	9	5.9	0.1	
		43	10.5	7.2	64	9	5.9	0.0	
		44	10.4	7.2	65	9	5.9	0.1	
		45	10.3	7.2	64	9	5.9	0.0	
		46	10.2	7.2	64	9	5.9	0.0	
		47	10.1	7.2	64	9	5.9	0.1	
		48	9.9	7.2	64	9	5.9	0.2	
		49	9.8	7.2	64	9	5.9	0.1	
		50	9.7	7.2	63	9	5.9	0.1	
		51	9.5	7.1	63	9	5.9	0.1	
		52	9.4	7.1	62	9	5.8	0.1	
		53	9.4	7.0	61	9	5.8	0.1	
		54	9.3	6.9	60	9	5.8	0.1	
		55	9.2	6.8	59	9	5.8	0.2	
		56	9.1	6.7	58	9	5.8	0.1	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		57	8.9	6.6	57	9	5.8	0.1	
		58	8.8	6.5	56	9	5.8	0.1	
		59	8.5	6.4	55	9	5.8	0.1	
		60	8.2	6.3	54	9	5.8	0.1	
		61	7.8	6.3	53	9	5.7	0.2	
		62	7.1	6.5	54	9	5.8	0.1	
		63	6.8	6.8	56	9	5.8	0.2	
		64	6.6	6.9	57	9	5.8	0.2	
		65	6.6	7.0	57	9	5.8	0.2	
		66	6.5	7.0	57	9	5.8	0.1	
Ice House Reservoir									
R-IS-9-IHR	10/27	0.1	14.0	7.9	77	9	7.0	0.1	9.2
		1	14.0	7.9	76	9	6.9	0.1	
		2	14.0	7.9	76	9	6.9	0.1	
		3	14.0	7.9	76	9	6.5	0.1	
		4	13.9	7.9	76	9	6.4	0.1	
		5	13.9	7.9	76	9	6.3	0.2	
		6	13.9	7.9	76	9	6.3	0.1	
		7	13.9	7.8	76	9	6.3	0.1	
		8	13.9	7.8	76	9	6.3	0.1	
		9	13.9	7.8	76	9	6.3	0.1	
		10	13.9	7.8	76	9	6.3	0.1	
		11	13.9	7.8	76	9	6.3	0.1	
		12	13.9	7.8	76	9	6.3	0.1	
		13	13.9	7.8	76	9	6.3	0.2	
		14	13.9	7.8	75	9	6.3	0.1	
		15	12.9	6.5	62	9	6.4	0.2	
R-IS-10-IHR	10/27	0.1	14.0	8.0	78	9	7.0	0.1	9.3
		1	14.0	8.0	78	9	7.0	0.1	
		2	14.0	8.0	78	9	7.0	0.0	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		3	14.0	8.0	78	9	7.0	0.0	
		4	14.0	8.0	78	9	7.0	0.1	
		5	14.0	8.0	77	9	6.9	0.0	
		6	14.0	8.0	77	9	6.9	0.0	
		7	14.0	8.0	77	9	6.9	0.0	
		8	14.0	8.0	77	9	6.9	0.0	
		9	14.0	8.0	77	9	6.9	0.0	
		10	14.0	7.9	77	9	6.9	0.0	
		11	14.0	7.9	77	9	6.9	0.0	
		12	13.9	7.9	77	9	6.9	0.1	
R-IS-11-IHR	10/27	0.1	14.1	8.0	78	9	7.0	0.2	9.1
		1	14.1	8.0	78	9	7.0	0.2	
		2	14.0	8.0	78	9	7.0	0.2	
		3	14.0	8.0	78	9	7.0	0.1	
		4	14.0	8.0	78	9	6.9	0.2	
		5	14.0	8.0	78	9	6.9	0.2	
		6	14.0	8.0	78	9	6.9	0.1	
		7	14.0	8.0	77	9	6.9	0.2	
		8	14.0	8.0	77	9	6.9	0.2	
		9	14.0	8.0	77	9	6.9	0.2	
		10	14.0	8.0	77	9	6.9	0.2	
		11	14.0	7.9	77	9	6.9	0.1	
		12	14.0	7.9	77	9	6.9	0.2	
		13	14.0	7.9	77	9	6.9	0.1	
		14	14.0	7.9	77	9	6.9	0.2	
		15	13.7	7.7	75	9	6.8	0.2	
		16	11.7	6.0	55	9	6.2	0.2	
		17	10.1	4.7	42	8	6.0	0.3	
		18	9.4	4.7	41	8	5.9	0.3	
		19	8.9	4.7	40	8	5.9	0.2	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		20	8.7	4.5	39	8	5.9	0.3	
Junction Reservoir									
R-IS-12-JR	10/30	0.1	9.3	8.1	70	9	6.3	0.1	9.8
		1	9.0	8.0	70	9	6.3	0.1	
		2	9.0	8.1	70	9	6.3	0.0	
		3	8.9	8.1	70	9	6.3	0.1	
		4	8.9	8.1	70	9	6.3	0.1	
		5	8.9	8.2	70	9	6.3	0.1	
		6	8.9	8.2	70	9	6.3	0.1	
		7	8.9	8.2	70	9	6.3	0.1	
		8	8.9	8.2	71	9	6.3	0.1	
		9	8.8	8.3	71	9	6.3	0.1	
		10	8.8	8.3	71	9	6.3	0.1	
		11	8.8	8.3	71	9	6.3	0.1	
		12	8.7	8.3	72	9	6.3	0.1	
		13	8.7	8.4	72	9	6.3	0.1	
		14	8.7	8.3	72	9	6.3	0.1	
		15	8.7	8.3	72	9	6.3	0.1	
		16	8.7	8.3	72	9	6.3	0.1	
		17	8.6	8.4	72	9	6.2	0.1	
		18	8.5	8.5	72	9	6.2	0.1	
		19	8.4	8.6	73	9	6.2	0.2	
		20	8.2	8.8	74	9	6.2	0.1	
		21	8.1	8.7	73	10	6.1	0.1[1]	
Camino Reservoir									
R-IS-13-CR	10/30	0.1	8.8	10.7	92	9	6.5	0.1	6.6
		1	8.8	10.7	92	9	6.5	0.1	
		2	8.8	10.7	92	9	6.4	0.1	
		3	8.8	10.7	92	9	6.4	0.1	
		4	8.8	10.7	92	9	6.4	0.1	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		5	8.8	10.7	92	9	6.4	0.1	
			8.8	10.7	92	9	6.4	0.1	
			8.7	10.7	91	10	6.4	0.1[1]	
Slab Creek Reservoir									
R-IS-14-SC	11/5	0.1	9.4	11.1	97	15	6.7	0.0	5.0
		1	9.4	11.2	98	15	6.6	0.0	
		2	9.4	11.2	98	15	6.6	0.1	
		3	9.4	11.2	98	14	6.6	0.0	
		4	9.4	11.2	98	15	6.6	0.0	
		5	9.4	11.2	98	14	6.6	0.3	
R-IS-15-SC	11/5	0.1	10.8	10.0	90	18	6.7	0.4	4.9
		1	10.6	10.0	90	17	6.7	0.5	
		2	10.2	10.1	90	17	6.7	0.5	
		3	10.2	10.1	90	17	6.7	0.3	
		4	10.1	10.1	90	17	6.7	0.4	
		5	10.1	10.1	89	17	6.7	0.5	
		6	10.1	10.1	89	17	6.7	0.5	
		7	10.1	10.1	89	17	6.6	0.5	
		8	10.1	10.1	89	17	6.6	0.4	
		9	10.0	10.1	89	17	6.4	0.2	
		10	10.0	10.1	89	17	6.4	0.4	
		11	10.0	10.1	89	17	6.4	0.5	
		12	9.9	10.1	90	16	6.4	0.3	
		13	9.8	10.2	90	16	6.4	0.4	
		14	9.8	10.1	89	16	6.3	0.6	
		15	9.8	10.1	89	16	6.3	0.4	
		16	9.8	10.2	90	16	6.3	0.5	
		17	9.8	10.2	90	16	6.3	0.4	
		18	9.8	10.2	90	16	6.3	0.3	
		19	9.8	10.3	90	15	6.3	0.3	

Site ID	2020 Sample Date	Sample Depth (m)	Water Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% sat)	Conductivity (uS/cm)	pH (s.u.)	Turbidity (NTU)	Secchi disk (m)
		20	9.7	10.3	91	15	6.3	0.3	
		21	9.7	10.3	91	15	6.3	0.3	
		22	9.7	10.3	91	15	6.3	0.3	
		23	9.7	10.4	91	15	6.3	0.3	
		24	9.7	10.4	92	15	6.3	0.3	
		25	9.7	10.4	92	15	6.3	0.4	
		26	9.7	10.4	92	15	6.3	0.4	
		27	9.6	10.4	92	15	6.3	0.4	
		28	9.6	10.4	92	15	6.3	0.4	
		29	9.6	10.5	92	15	6.3	0.4	
		30	9.6	10.5	92	14	6.3	0.4	
		31	9.6	10.4	92	14	6.3	0.7	
		32	9.5	10.4	91	14	6.3	1.0	
		33	9.5	10.0	88	15	6.2	1.0[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 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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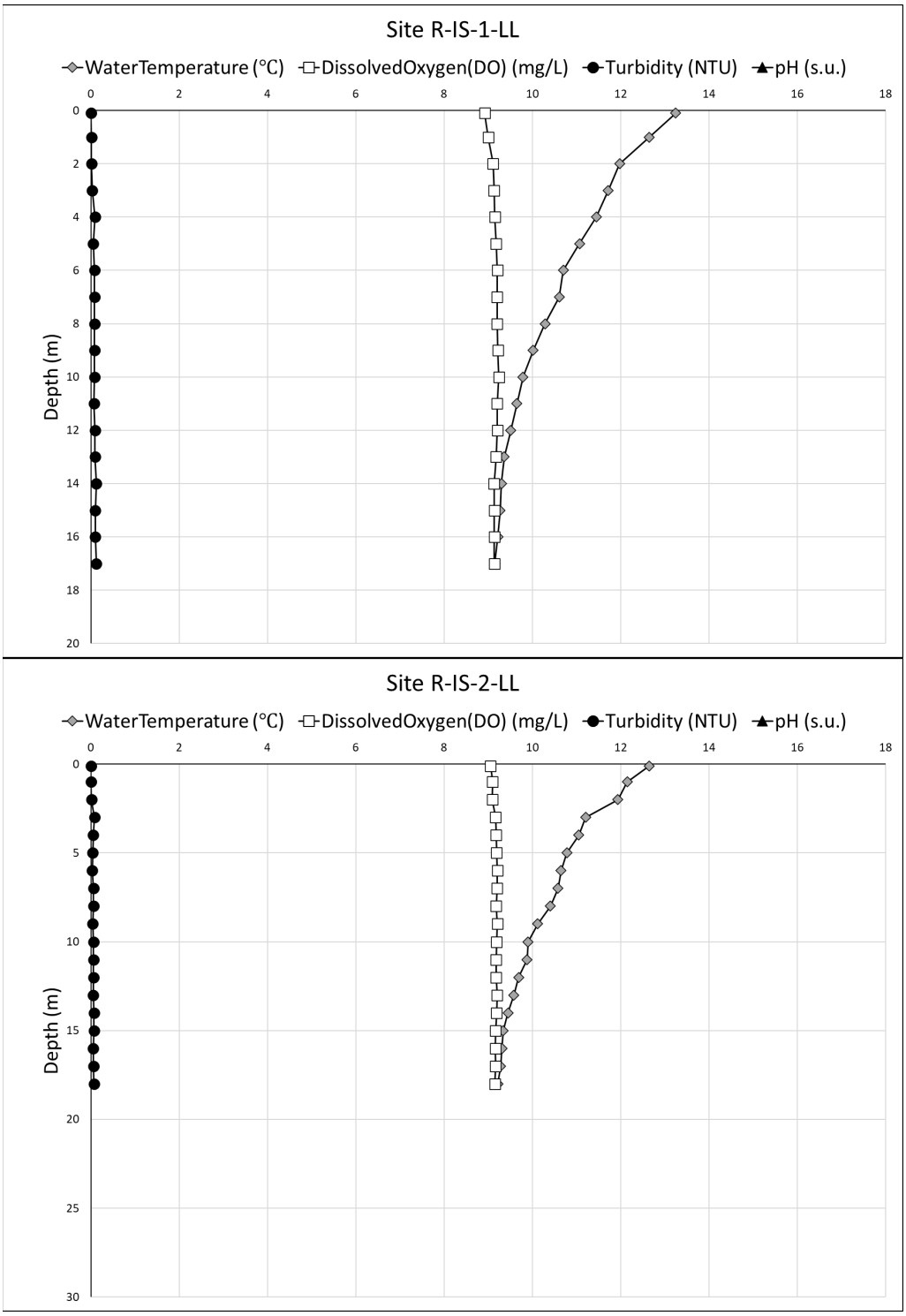

Figure B-1. *In situ* water temperature, dissolved oxygen, and turbidity at Loon Lake sites R-IS-1-LL and R-IS-2-LL during May (Spring) 2020.

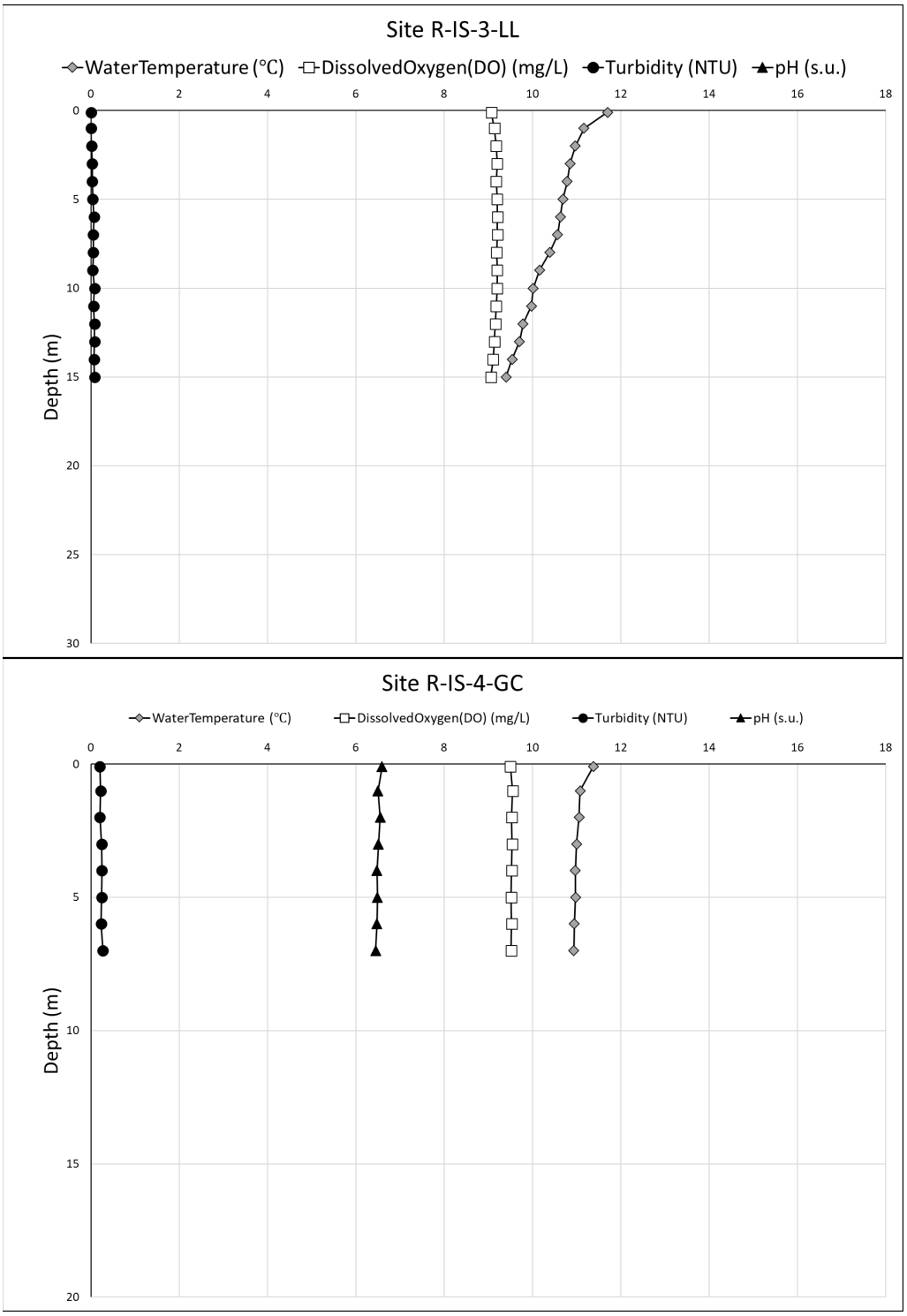

Figure B-2. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Loon Lake and Gerle Creek Reservoir sites R-IS-3-LL and R-IS-4-GC during May (Spring) 2020.

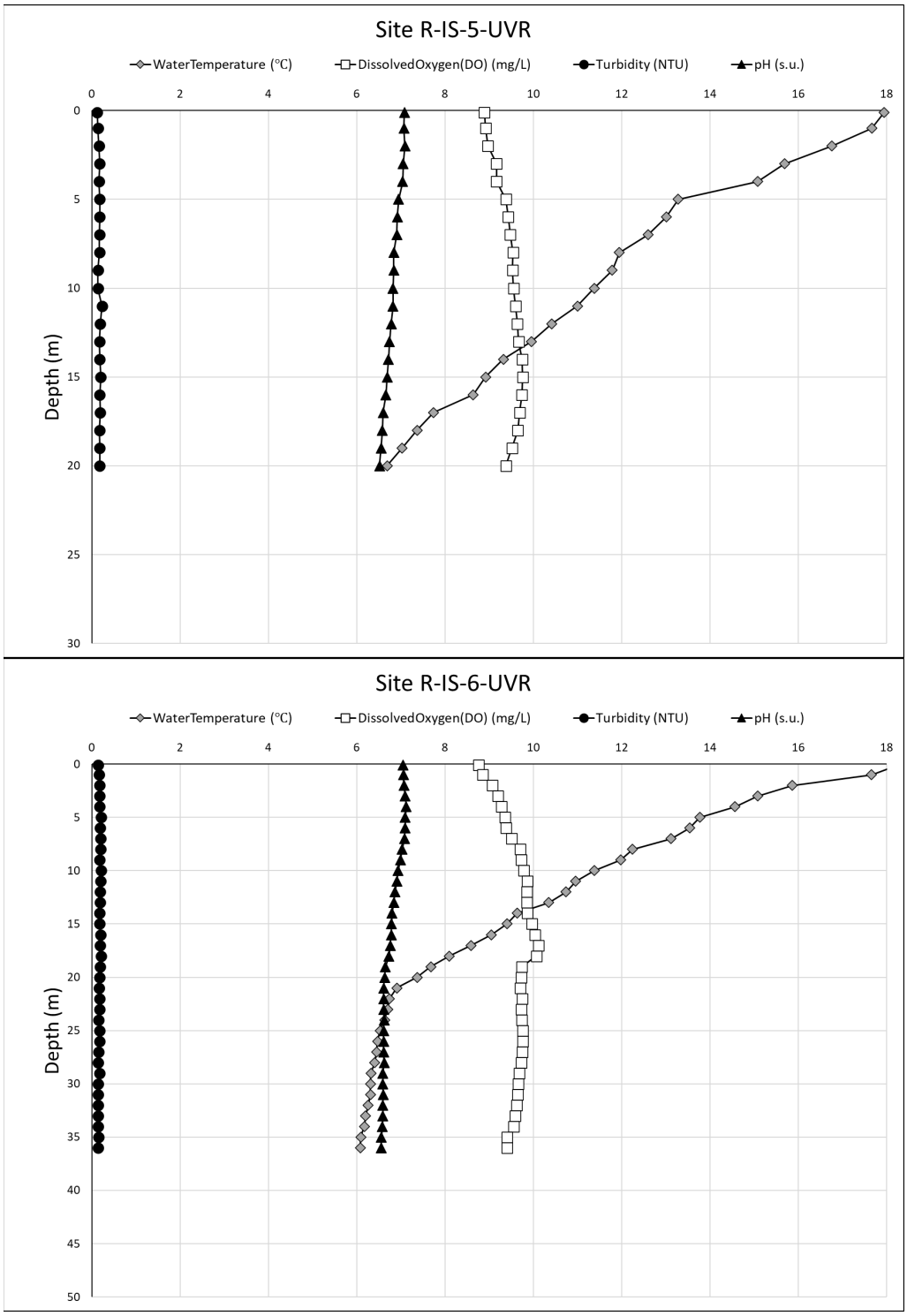

Figure B-3. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir sites R-IS-5-UVR and R-IS-6-UVR during May (Spring) 2020.

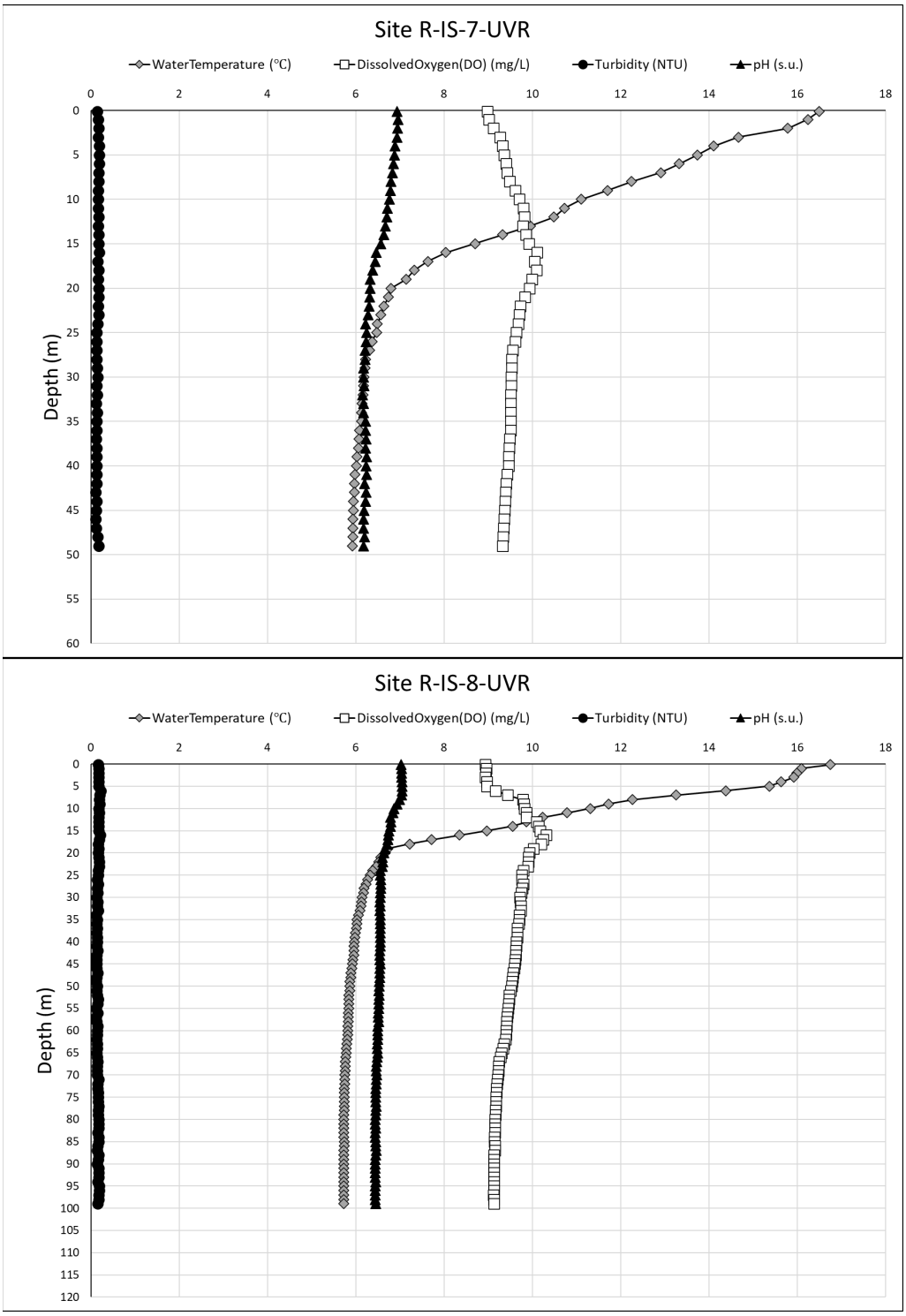

Figure B-4. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir sites R-IS-7-UVR and R-IS-8-UVR during May (Spring) 2020.

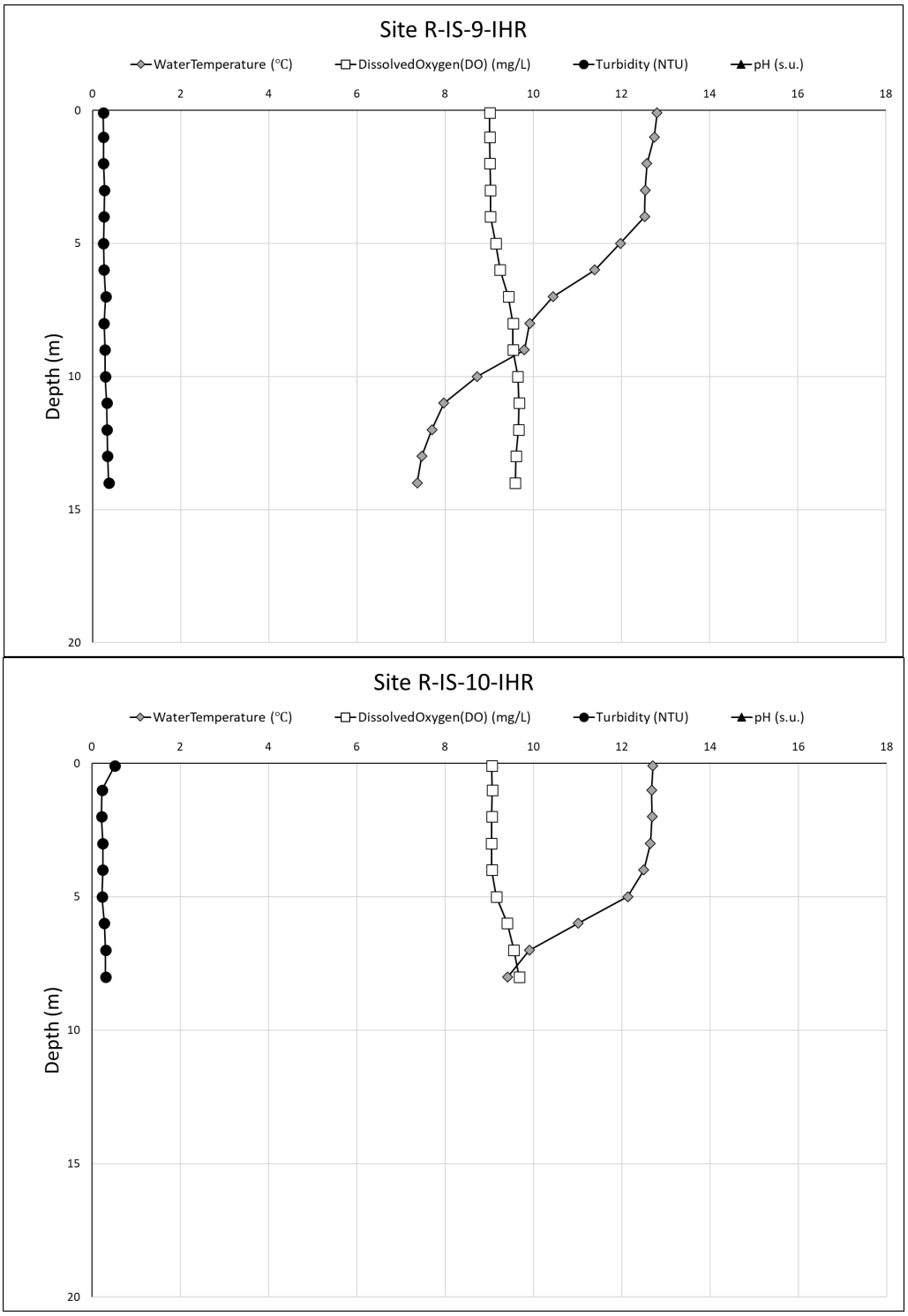

Figure B-5. *In situ* water temperature, dissolved oxygen, and turbidity at Ice House Reservoir sites R-IS-9-IHR and R-IS-10-IHR during May (Spring) 2020.

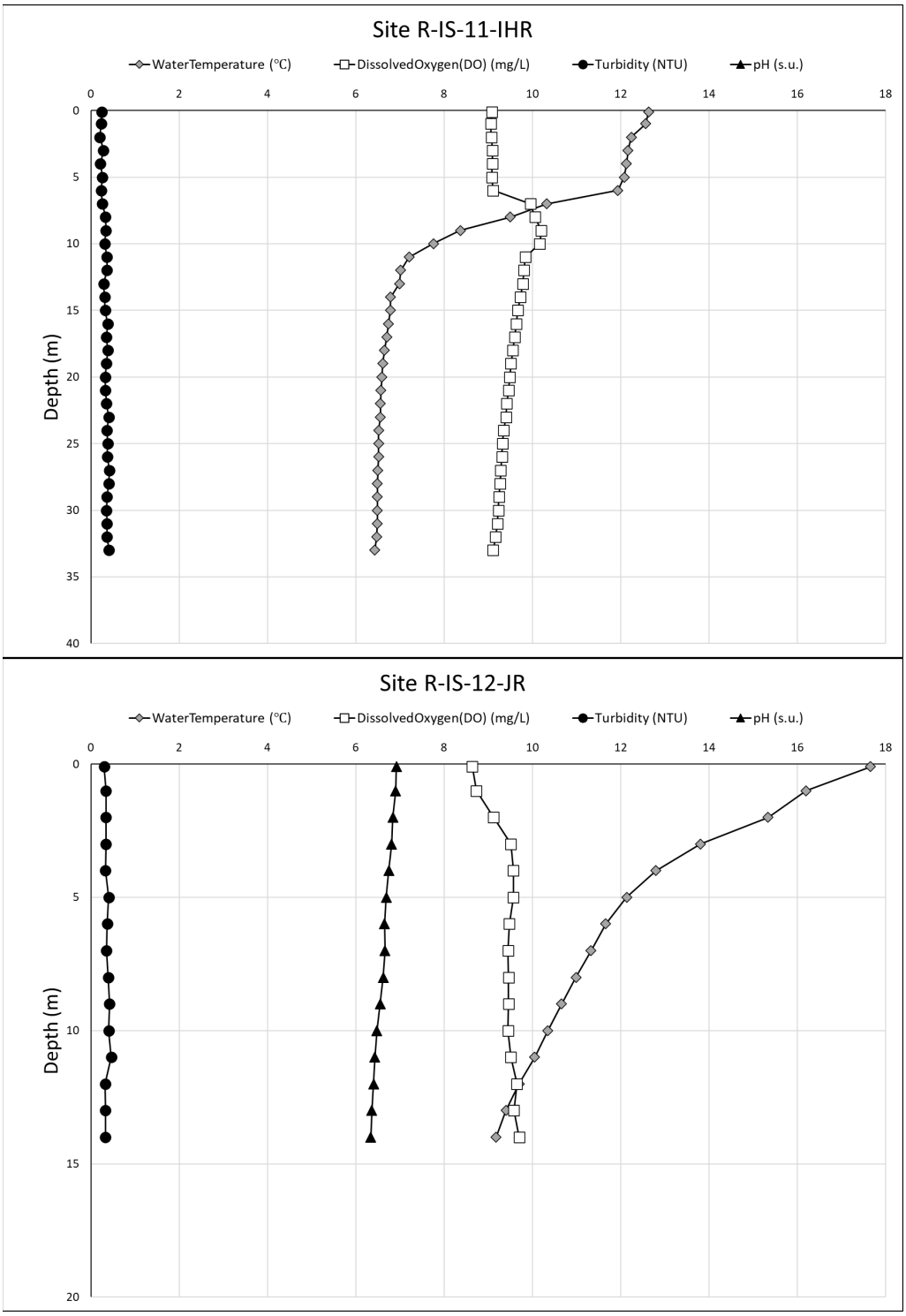

Figure B-6. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Ice House Reservoir and Junction Reservoir sites R-IS-11-IHR and R-IS-12-JR during May (Spring) 2020.

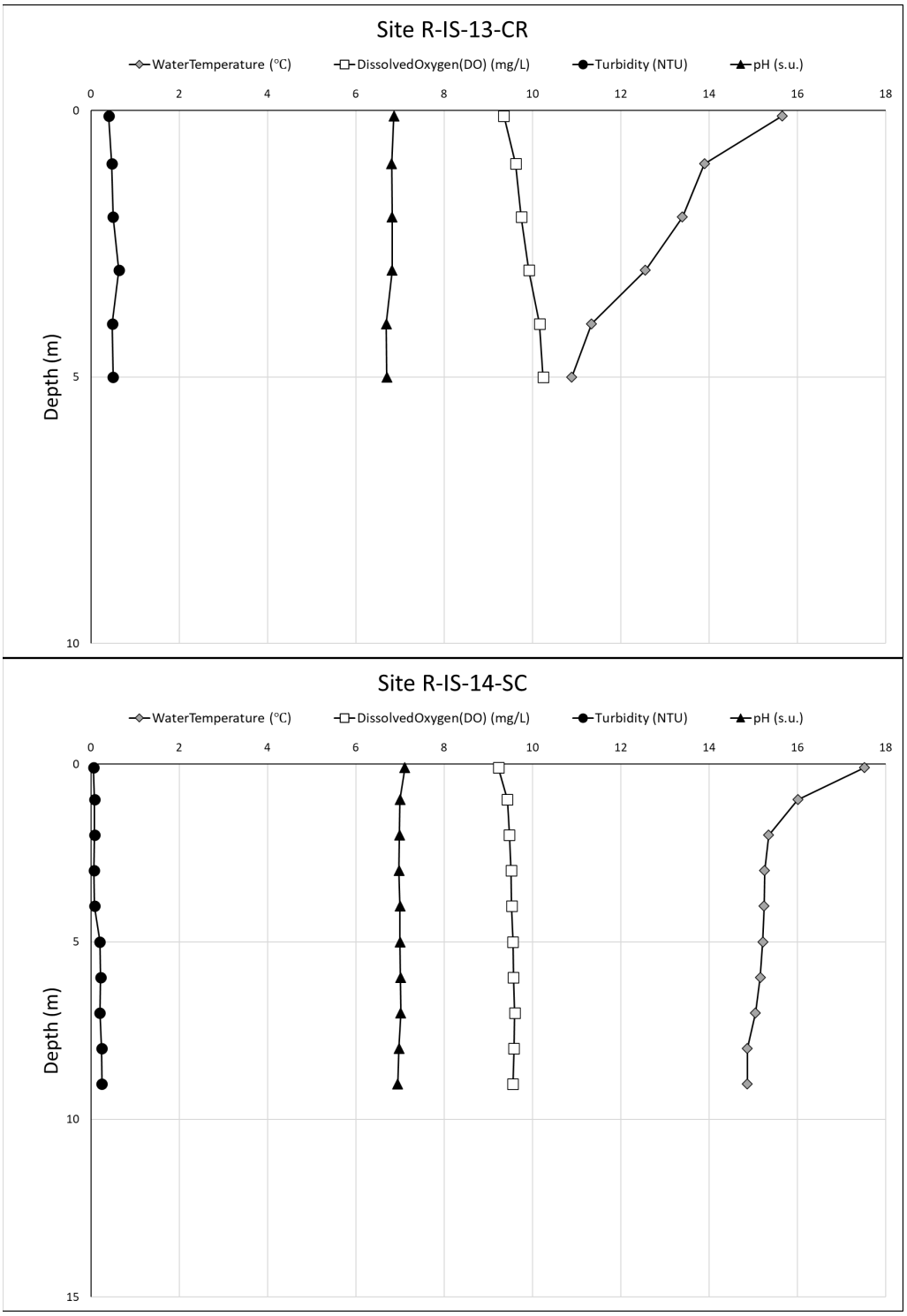

Figure B-7. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Camino Reservoir and Slab Creek Reservoir sites R-IS-13-CR and R-IS-14-SC during May (Spring) 2020.

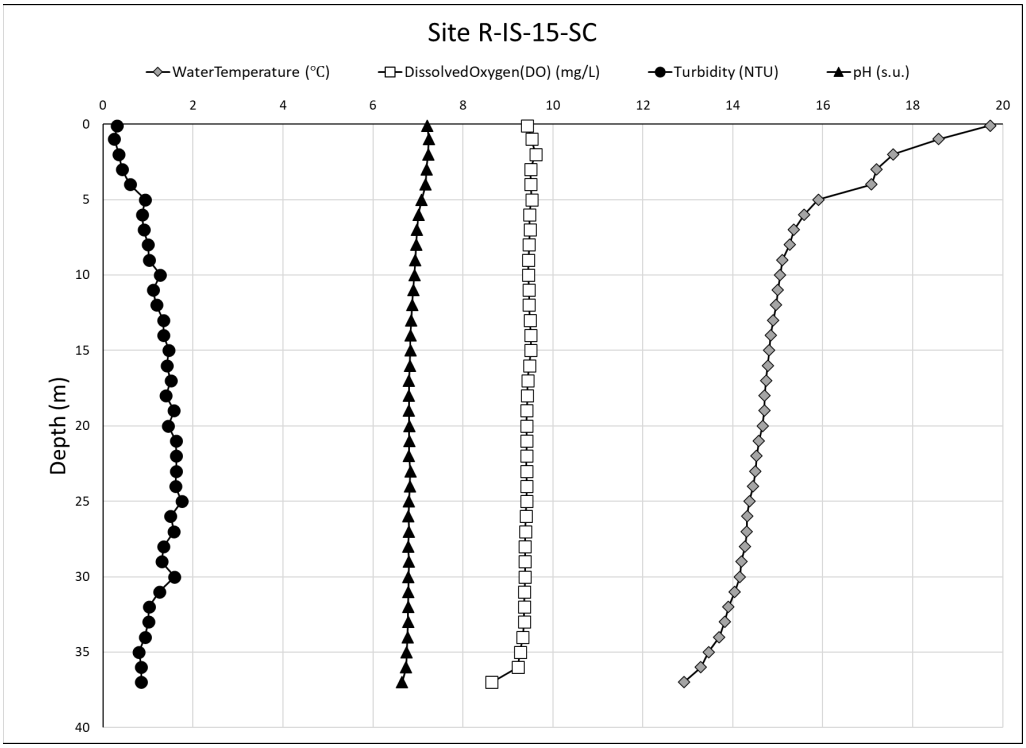

Figure B-8. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Slab Creek Reservoir Site R-IS-15-SC during May (Spring) 2020.

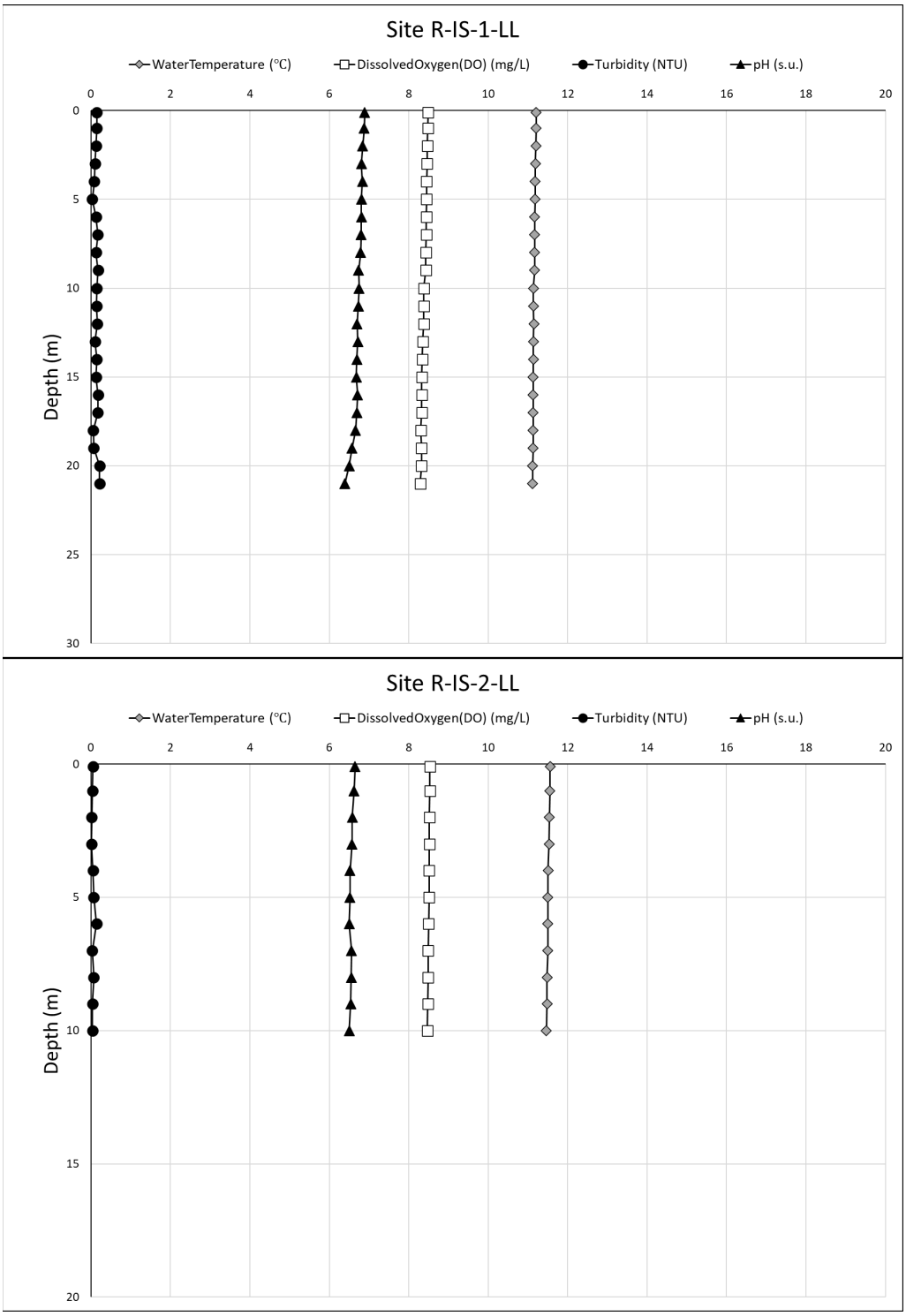

Figure B-9. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Loon Lake Reservoir sites R-IS-1-LL and R-IS-2-LL during October (Fall) 2020.

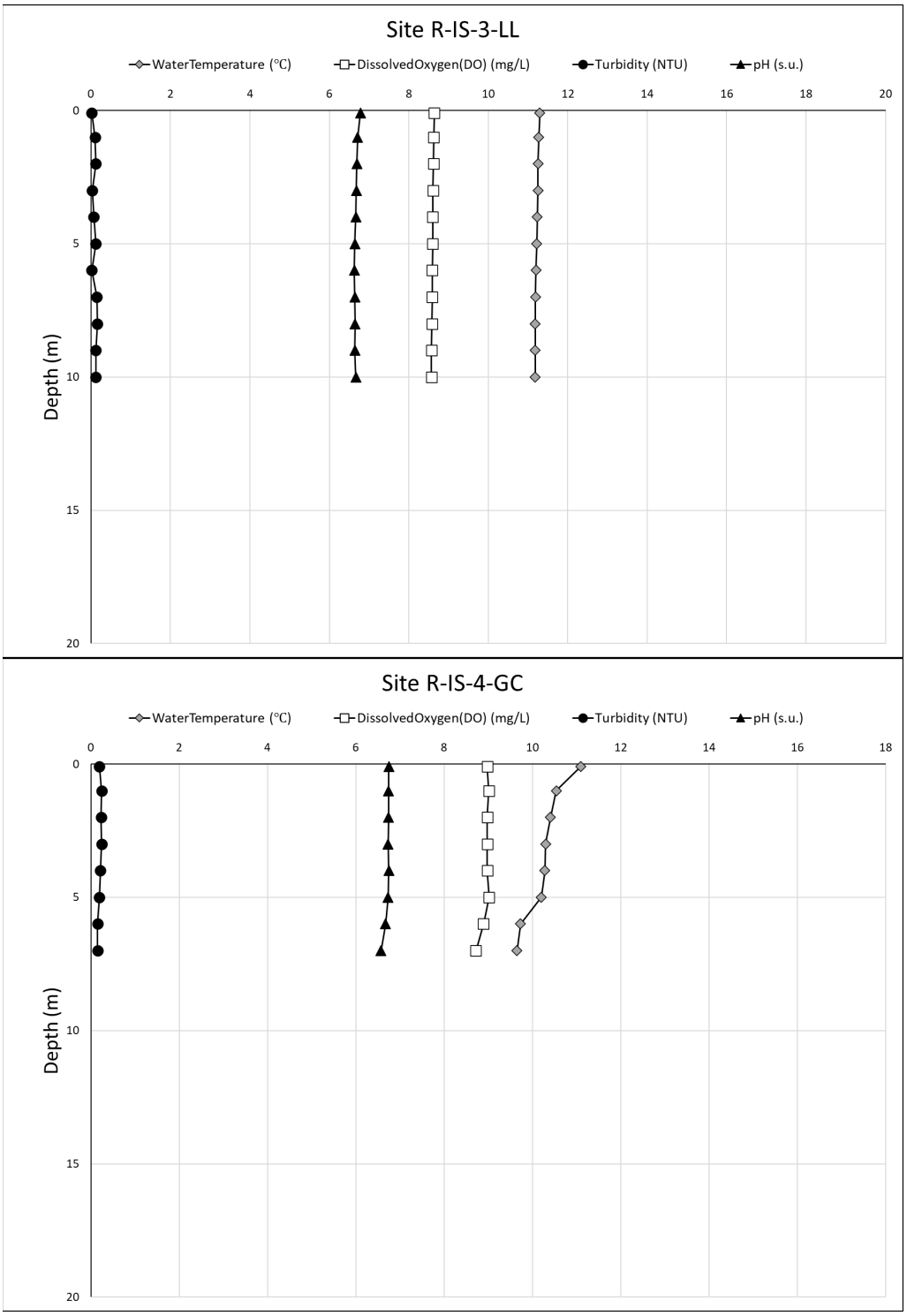

Figure B-10. *In situ* water temperature, dissolved oxygen, turbidity, and pH Loon Lake Reservoir and Gerle Creek Reservoir sites R-IS-3-LL and R-IS-4-GC during October (Fall) 2020.

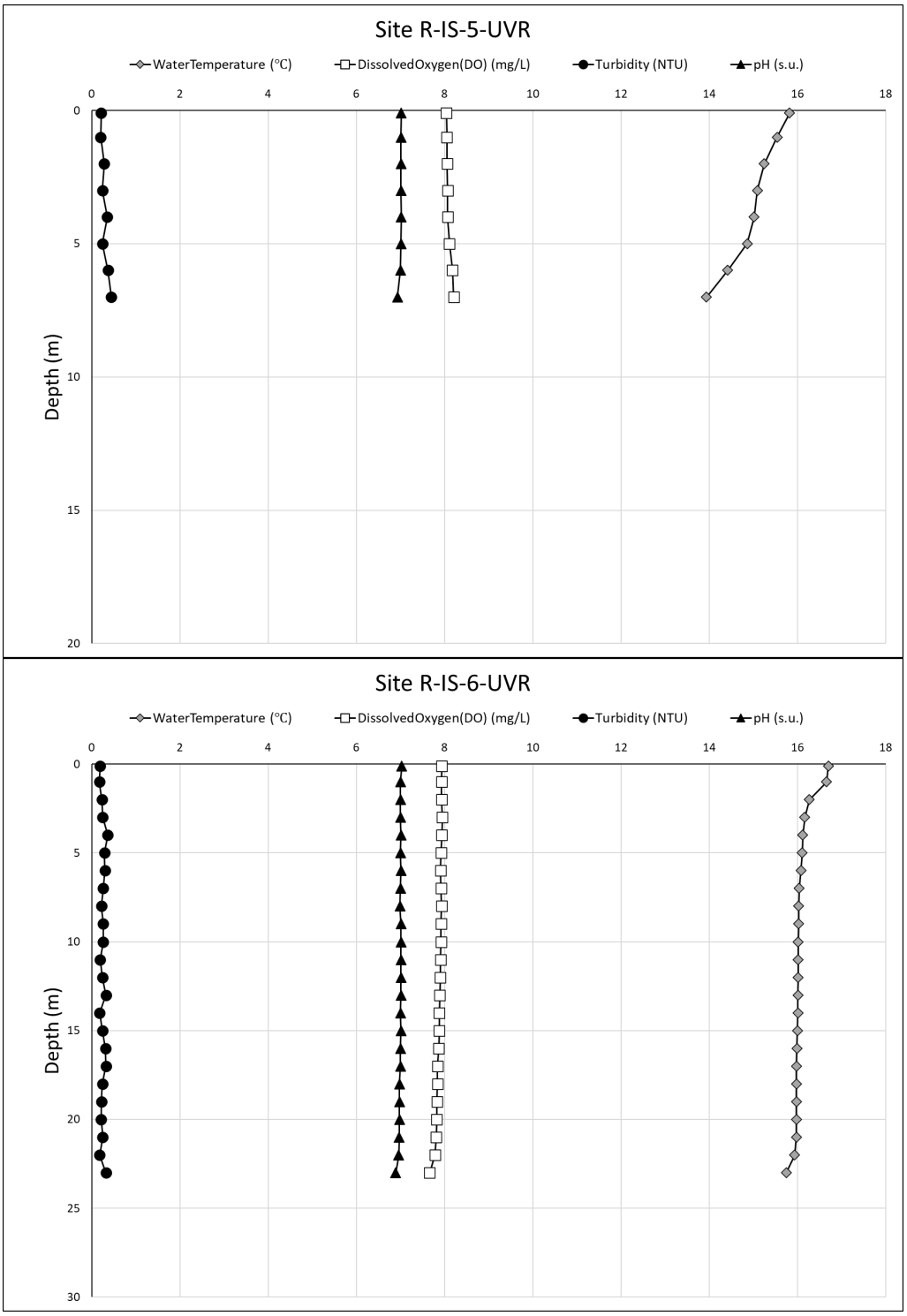

Figure B-11. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir sites R-IS-5-UVR and R-IS-6-UV during October (Fall) 2020.

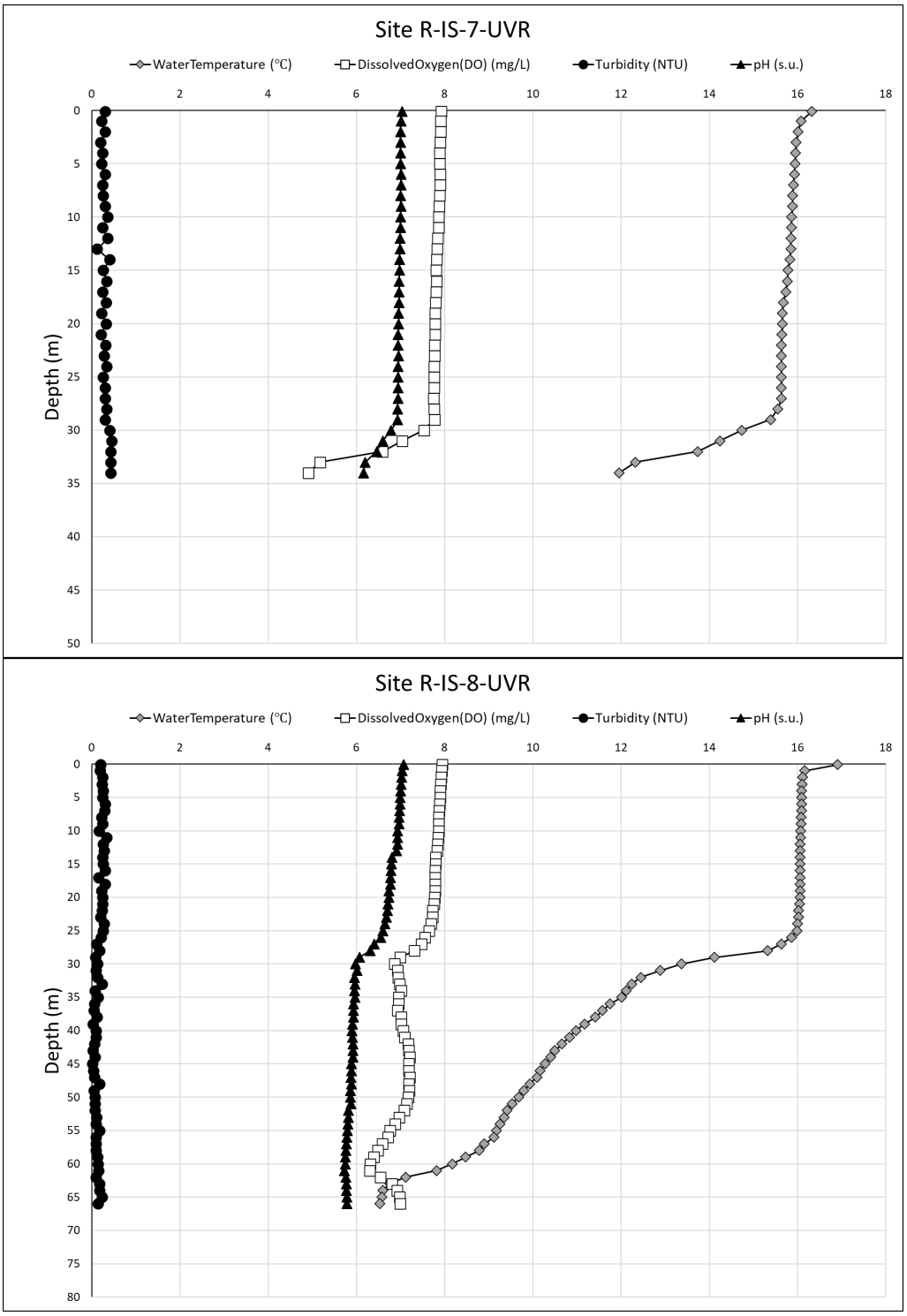

Figure B-12. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Union Valley Reservoir sites R-IS-7-UVR and R-IS-8-UVR during October (Fall) 2020.

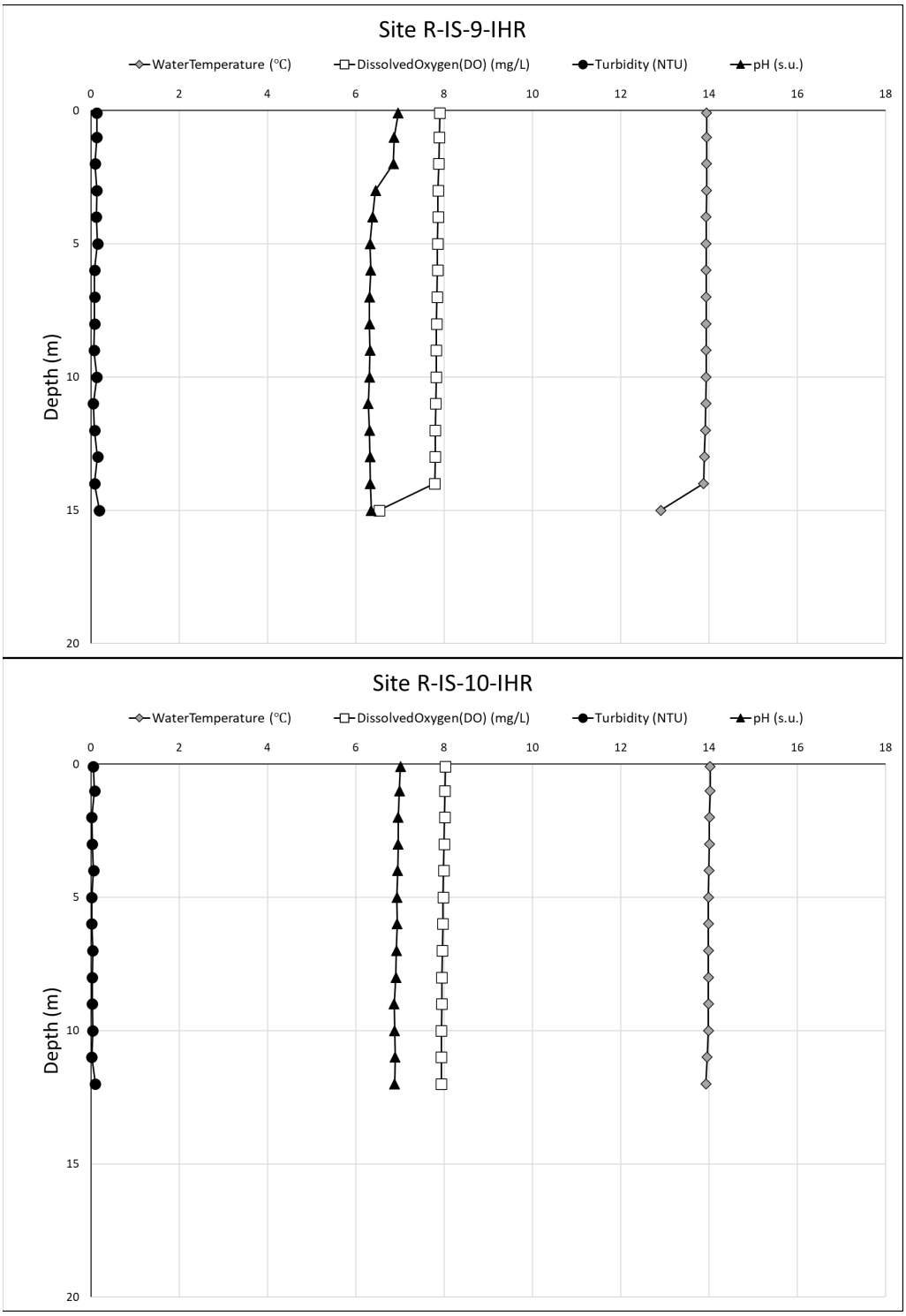

Figure B-13. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Ice House Reservoir sites R-IS-9-IHR and R-IS-10-IHR during October (Fall) 2020.

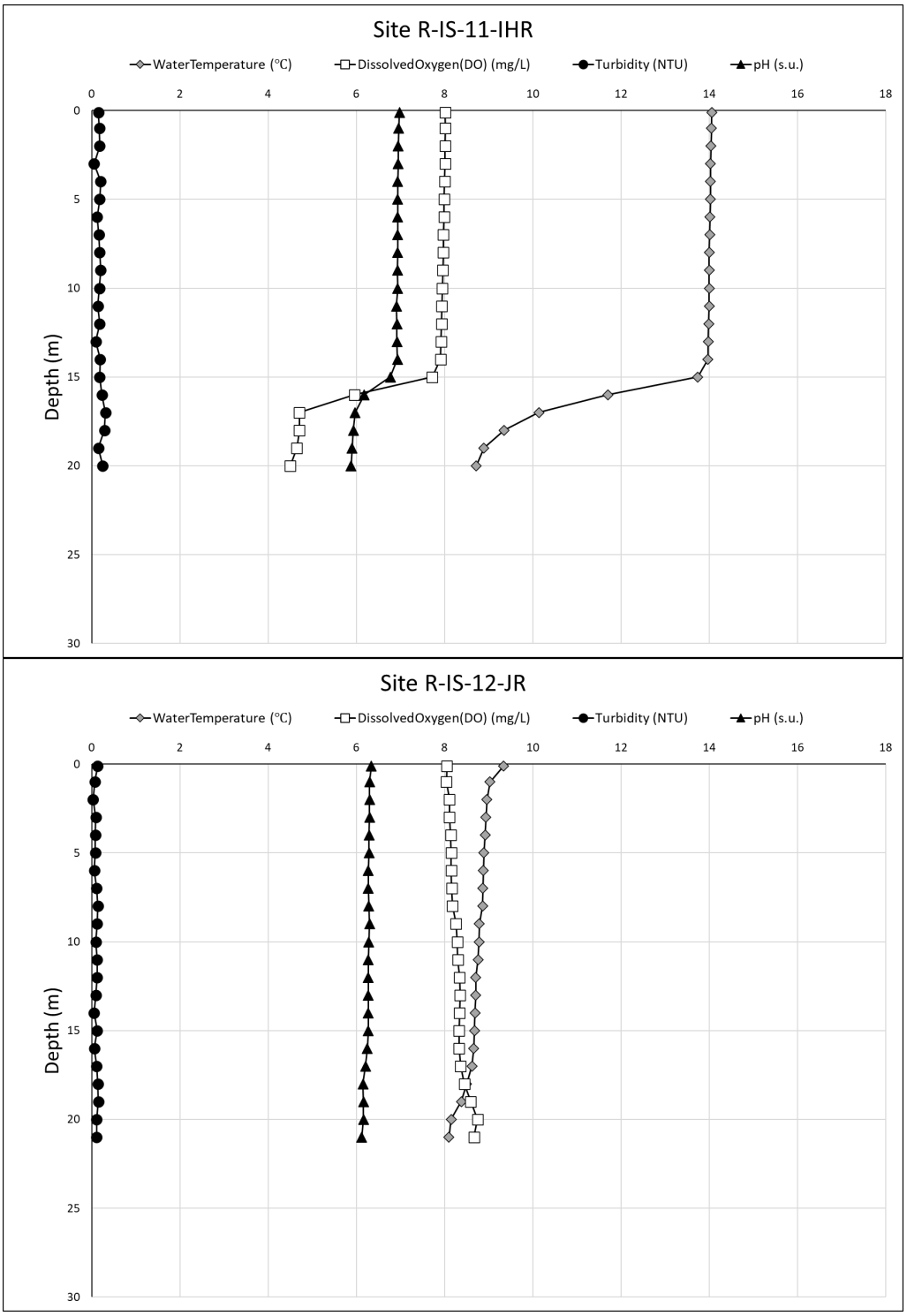

Figure B-14. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Ice House Reservoir and Junction Reservoir sites R-IS-11-IHR and R-IS-12-JR during October (Fall) 2020.

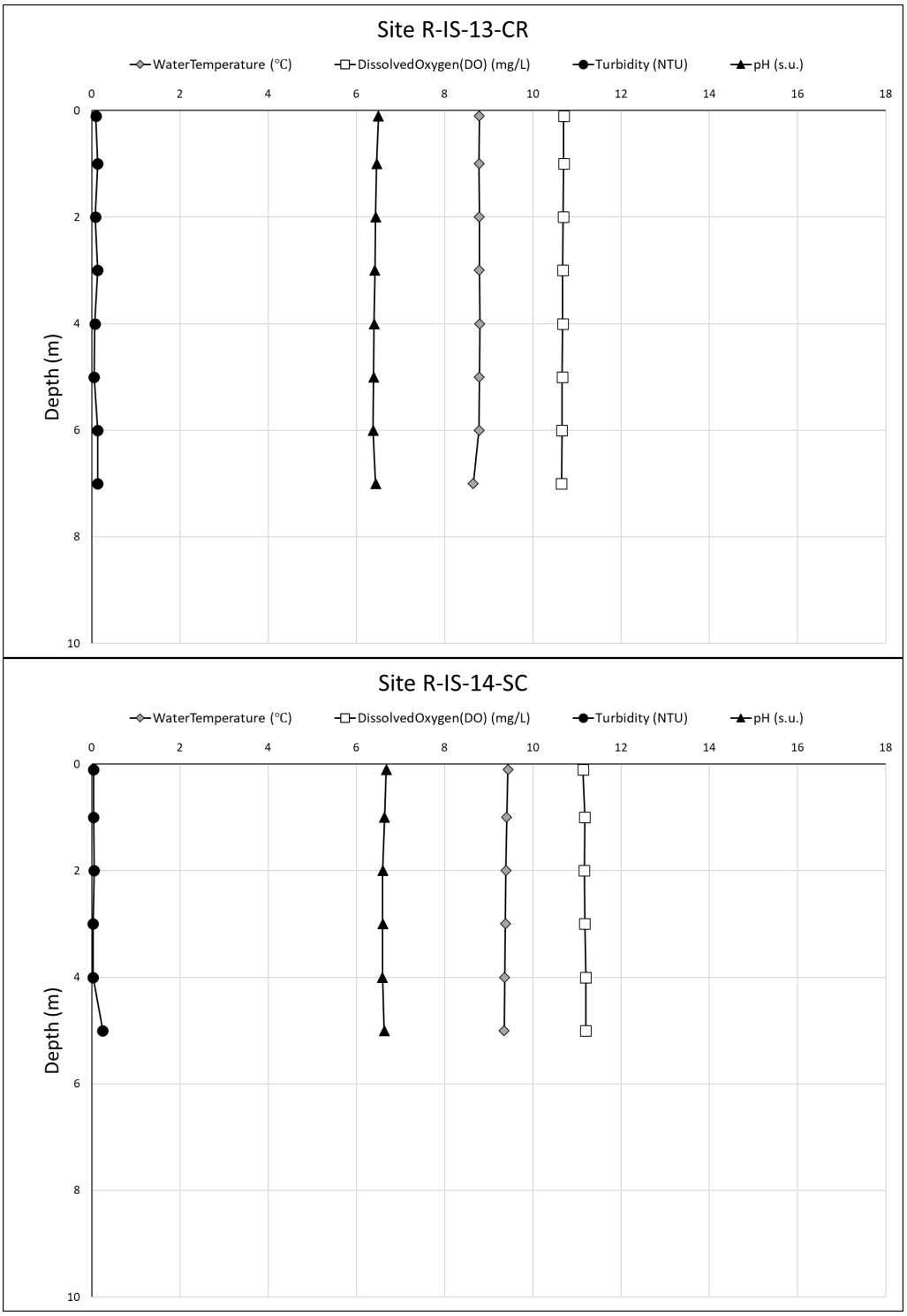

Figure B-15. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Camino Reservoir and Slab Creek Reservoir sites R-IS-13-CR and R-IS-14-SCR during October and November (Fall) 2020.

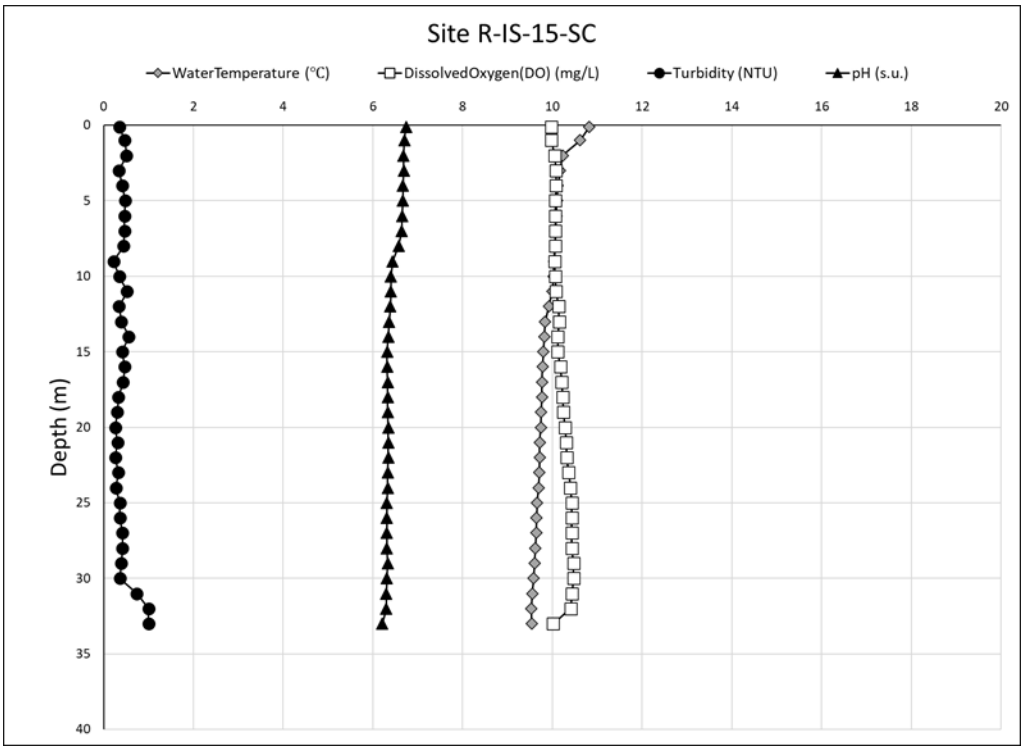

Figure B-16. *In situ* water temperature, dissolved oxygen, turbidity, and pH at Slab Creek Reservoir sites R-IS-15-SCR during November (Fall) 2020.

APPENDIX C
Bacteria Results for UARP Reservoir and Riverine Sites

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

Site ID	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5		Fecal coliform geometric mean[1]	*E. coli* geometric mean[1]
	Fecal coliform	*E. coli*	Fecal coliform	*E. coli*	Fecal coliform	*E. coli*	Fecal coliform	*E. coli*	Fecal coliform	*E. coli*		
Bac-5-GCR	7.8	5.2	240.0	325.5	49	48.7	4.5	11.0	31.0	11.0	26.4	25.1
Bac-6-GCR	4.5	2.0	33.0	26.9	350	275.5	<1.8	1.0	24.0	6.3	16.2	9.9
Bac-7-UVR	<1.8	1.0	4.0	3.1	4.5	8.6	46.0	866.4	7.8	12.0	5.7	12.3
Bac-8-UVR	<1.8	1.0	23.0	17.1	2.0	1.0	4.5	1.0	<1.8	1.0	2.8	1.8
Bac-9-UVR	<1.8	2.0	4.5	3.0	2.0	16.0	13.0	30.9	6.8	4.1	3.7	6.6
Bac-10-UVR	4.5	<1	7.8	17.3	4.0	<1	<1.8	<1	<1.8	<1	2.6	1.0
Bac-11-JR	11.0	1.0	540.0	39.9	4.5	3.0	170.0	137.6	540.0	387.3	75.5	23.0
Bac-12-IHR	<1.8	<1	<1.8	1.0	2.0	<1	<1.8	1.0	2.0	<1	1.2	0.7
Bac-13-IHR	<1.8	<1	<1.8	<1	<1.8	1.0	<1.8	<1	<1.8	<1	0.9	0.6
Bac-14-BCR	<1.8	<1	7.8	2.0	2.0	<1	<1.8	<1	7.8	1.0	2.5	0.8
Bac-15-SCR	4.5	2.0	1.8	4.1	31	27.9	<1.8	<1	2.0	2.0	3.4	3.0
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	-	-

[1] Individual results < MDL were treated as 0.5 x MDL for the geometric mean calculations.
MDL = method detection limit
MRL = method reporting limit

Table C-2. Bacteria (MPN/100mL) for UARP Sites During the 30-day Period Surrounding Labor Day[1].

Site ID	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5		Fecal coliform geometric mean [1]	*E. coli* geometric mean [1]
	Fecal coliform	*E. coli*	Fecal coliform	*E. coli*	Fecal coliform	*E. coli*	Fecal coliform	*E. coli*	Fecal coliform	*E. coli*		
Bac-1-BI	<1.8	<1	2.0	1.0	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	1.3	0.7
Bac-2-BI	<1.8	<1	2.0	1.0	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	1.3	0.7
Bac-3-LL	2.0	2.0	2.0	1.0	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	2.0	1.4
Bac-4-LL	240.0	47.1	2.0	<1	--[2]	--[2]	--[2]	--[2]	--[2]	--[2]	21.9	4.9
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	-	-

[1] Individual results <MDL were treated as 0.5 x MDL for the geometric mean calculations.
[2] Sample not collected due to unhealthy air quality and reduced recreational usage resulting from the August–September California wildfires.
MDL = method detection limit
MRL = method reporting limit

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: YSI EXO **Crew:** AML EES

Site Location: IS-19-SPAR GPS:
Date: 1/22/2020 Time: 08:52
Photos: 4757 & 4758 Weather: OVERCAST / COOL
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
4.90	12.46	97.3	22.2	0.036	6.65	0.40	724.0 mm Hg

Site Location: IS-18-SFAR GPS:
Date: 1/22/2020 Time: 10:17
Photos: 4759 & 4760 Weather: OVERCAST / COOL
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
6.11	12.47	100.5	30.0	0.047	7.15	0.34	741.7 mmHg

Site Location: IS-13-SC GPS:
Date: 1/23/2020 Time: 09:48
Photos: 4777 & 4778 Weather: overcast/cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
4.39	12.16	93.7	10.4	0.017	6.68	0.32	691.2 mmHg

Stillwater Sciences

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

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Instrument(s) used: YSI EXO **Crew:** AML EES

Site Location: IS-14-SC GPS:
Date: 1/23/2020 Time: 10:23
Photos: 4779 – 4783 Weather: Overcast/cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
4.48	12.21	94.3	12.6	0.021	6.93	0.30	695.1 mm Hg

Site Location: IS-11-SESC GPS:
Date: 1/23/2020 Time: 11:39
Photos: 4784 & 4785 Weather: cool/overcast
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
2.89	11.99	88.8	9.1	0.016	6.86	0.31	652.8 mm Hg

Site Location: IS-12-SC GPS:
Date: 1/23/2020 Time: 12:17
Photos: 4786 – 4788 Weather: cool/cloudy
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
3.14	11.7	87.2	8.5	0.015	7.01	0.40	656.4 mm Hg

Stillwater Sciences

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

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Instrument(s) used: YSI EXO **Crew:** EES AMC

Site Location: IS-17-BC GPS:
Date: 1/23/2020 Time: 14:07
Photos: 4789 & 4790 Weather: cool/overcast
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
6.01	11.50	92.4	16.7	0.026	6.96	1.15	694.1 mmHg

Site Location: IS-15-SFAR GPS:
Date: 1/23/2020 Time: 14:46
Photos: 4791-4793 Weather: cool/cloudy
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
5.16	12.39	97.4	39.5	0.064	7.28	0.46	716.2 mmHg

Site Location: IS-16-SFAR GPS:
Date: 1/23/2020 Time: 15:02
Photos: 4794 Weather: cool/cloudy
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
4.81	12.54	97.8	37.6	0.061	7.17	0.56	716.2 mmHg

Stillwater Sciences

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

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Instrument(s) used: YSI EXO **Crew:** GES AML

Site Location: 1S-6-GC GPS:
Date: 1/24/2020 Time: 0943
Photos: 4795 - 4796 Weather: overcast, cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
2.05	11.78	85.3	7.1	0.013	6.26	0.19	634.1 mm Hg

Site Location: 1S-9-GCC GPS:
Date: 1/24/2020 Time: 1045
Photos: 4797 - 4799 Weather: overcast, cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
2.33	11.73	85.6	7.2	0.013	6.52	0.17	633.3 mm Hg

Site Location: 1S-10-SFSC GPS:
Date: 1/24/2020 Time: 1142
Photos: 4800 - 4801 Weather: overcast cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
3.98	11.26	85.9	6.4	0.011	6.55	0.44	631.3

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Instrument(s) used: YSI EXO

Crew: EES DKR

Site Location: 15-41-GC
Date: 5-19-2020
Photos: 120-0070, 0071
Notes:
GPS:
Time: 1000
Weather: overcast, cool, snow flurries

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.30	9.61	81.7	5.7	0.008	6.48	0.88	603.0 mm Hg

Site Location: 15-5-GC
Date: 5-19-2020
Photos: 120-0072, 0073, 0074
Notes:
GPS:
Time: 1105
Weather: overcast, cool, drizzle

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
5.25	10.79	85.0	6.8	0.011	6.37	0.83	625.1 mm Hg

Site Location: 15-6-GC
Date: 5-19-2020
Photos: 120-0075 → 0077
Notes:
GPS:
Time: 1135
Weather: overcast, cool, drizzle

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7.87	10.12	85.1	6.5	0.010	6.78	0.30	629.7 mm Hg

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Instrument(s) used: YSI-EXO **Crew:** EES DKR

Site Location: I5-9-GCC GPS:
Date: 5-19-20 Time: 1200
Photos: 0078 Weather: overcast, cool, drizzle
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.24	10.19	86.6	6.4	0.009	6.29	0.26	628.5 mmHg

Site Location: I5-7-SFRR GPS:
Date: 5-19-20 Time: 1250
Photos: 0079-0080 Weather: overcast, cool)
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7.51	10.36	86.4	8.1	0.012	6.71	0.28	633.9

Site Location: I5-8-SFRR GPS:
Date: 5-19-20 Time: 1305
Photos: 0081-0083 Weather: overcast, cool), drizzle
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7.89	10.35	87.2	8.2	0.012	6.40	0.25	635.1

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Instrument(s) used: YSI-EXO **Crew:** EES DKR

Site Location: IS-10-SFSC GPS:
Date: 5-19-20 Time: 1415
Photos: 0084 Weather: overcast, cool, drizzle
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
6.47	10.44	84.9	6.9	0.011	6.60	0.68	627.3 mmhg

Site Location: IS-11-SFSC GPS:
Date: 5-20-20 Time: 0918
Photos: 0085 - 0086 Weather: overcast, cool, drizzle
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
6.57	10.75	87.6	11.0	0.017	6.61	0.87	650.1 mmhg

Site Location: IS-12-SC GPS:
Date: 5-20-20 Time: 1000
Photos: 0087 - 0088 Weather: overcast, cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.93	10.01	86.4	11.3	0.016	6.70	0.56	654.4 mmhg

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Instrument(s) used: YSI-EXO Crew: EES-DKR

Site Location: IS-13-SC GPS:
Date: 5-20-20 Time: 1110
Photos: 0089-0090 Weather: ptly cldy, cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
9,42	10,52	91,9	12,4	0,018	7,08	1,45	686.5 mm hg

Site Location: IS-14-SC GPS:
Date: 5-20-20 Time: 1155
Photos: 0091-0092 Weather: ptly cldy, warm
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
10,06	10,46	92,9	13,9	0,019	7,19	2,80	692,1 mmhg

Site Location: IS-17-BC GPS:
Date: 5-20-20 Time: 1420
Photos: 0093-0095 Weather: ptly Cldy, warm
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
11,26	10.01	91.3	18,6	0,025	7,28	18.44	692,7 mmhg

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Instrument(s) used: YSI - EXO

Crew: EES - DKR

Site Location: IS-15-SFAR
Date: 5-20-20
Photos: 0096 - 0097
Notes:

GPS:
Time: 1505
Weather: ptly cldy, warm

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
10.21	10.52	96.3	24.2	0.034	7.37	1.39	714.4 mmhg

Site Location: IS-16-SFAR
Date: 5-20-20
Photos: 0098
Notes:

GPS:
Time: 1520
Weather: ptly cldy, warm

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
10.17	11.01	97.9	21.8	0.030	7.32	3.02	714.8 mmhg

Site Location: FS-18-SFAR
Date: 5-21-20
Photos: 0099 - 0100
Notes:

GPS:
Time: 0833
Weather: clear, sunny, cool

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
11.75	10.67	98.5	32.2	0.043	7.32	1.39	736.0 mmhg

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Instrument(s) used: YSI-EXO Crew: EES DKR

Site Location: IS-19-SEAR GPS:
Date: 5-21-20 Time: 0942
Photos: 0101-0102 Weather: clear, sunny, warm
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
10.82	10.72	96.8	21.1	0.029	7.11	1.98	718.5 mmhg

Site Location: GPS:
Date: Time:
Photos: Weather:
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	

Site Location: GPS:
Date: Time:
Photos: Weather:
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	

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Instrument(s) used: YSI EXO **Crew:** EES AL

Site Location: IS-1-RR **GPS:**
Date: 8-3-20 **Time:** 1230
Photos: 128-0147 **Weather:** sunny, clear, hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes 605.4
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
21.77	6.88	78.3	14.3	0.015	6.52	0.37	

Site Location: IS-2-LRR **GPS:**
Date: 8-3-20 **Time:** 1340
Photos: 148-149 **Weather:** windy, sunny
Notes: Not much water; slow trickle

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes 606.0
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
24.61	7.00	84.1	12.9	0.013	6.89	0.10	

Site Location: IS-3-LRR **GPS:**
Date: 8-3-2020 **Time:** 1435
Photos: 150 **Weather:** clear, sunny
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
22.72	6.73	78.0	9.6	0.010	6.51	0.22	607.5

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Instrument(s) used: YSI EXO **Crew:** EES AL

Site Location: IS-4-GC GPS:
Date: 8/4/20 Time: 0837
Photos: 151-152 Weather: clear, breezy
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
11.66	8.81	81.1	6.7	0.009	5.60	0.22	608.9 mm Hg

Site Location: IS-5-GC GPS:
Date: 8/4/2020 Time: 0914
Photos: 153-154 Weather: cool, clear
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	629.4 mm Hg
13.06	8.75	83.2	9.7	0.013	6.16	0.10	

Site Location: IS-6-GC GPS:
Date: 8/4/20 Time: 0942
Photos: 155-156 Weather: clear, warm
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	633.6 mm Hg
15.44	8.34	83.5	7.9	0.010	6.26	0.10	

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Instrument(s) used: YSI EXO Crew: GS AL

Site Location: 1S-9-GCC GPS:
Date: 8/4/2020 Time: 1015
Photos: 157-158 Weather: clear, warm
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
15.43	8.45	84.5	7.8	0.010	6.36	0.02	632.3 mm Hg

Site Location: 1S-7-SFRR GPS:
Date: 8/4/20 Time: 1101
Photos: 159-161 Weather: clear, hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
13.99	8.81	85.4	8.3	0.011	6.59	0.06	637.4 mm Hg

Site Location: 1S-8-SFRR GPS:
Date: 8/4/20 Time: 1124
Photos: 162-163 Weather: clear, hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	638.3 mm Hg
14.60	8.78	86.3	8.6	0.011	6.38	0.07	

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Instrument(s) used: _____ **Crew:** ES AL

Site Location: 15-10-SFSC GPS:
Date: 8/4/20 Time: 1228
Photos: 164-165 Weather: clear, hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.20	10.07	85.4	7.2	0.011	5.87	0.52	630.2 mm Hg

Site Location: 15-11-SFSC GPS:
Date: 8/5/20 Time: 0900
Photos: 166 Weather: clear, cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
13.89	8.97	86.9	0.015	11.6	7.01	0.27	648.4 mm Hg

Site Location: 15-12-SC GPS:
Date: 8/5/20 Time: 0940
Photos: 167 Weather: clear, warm
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.02	10.17	85.9	8.8	0.013	6.23	0.21	651.9 mm Hg

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Instrument(s) used: YSI EXO **Crew:** ES AL

Site Location: IS-13-SC GPS:
Date: 8/5/20 Time: 1131
Photos: 168 Weather: clear hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
16.52	8.90	91.1	14.1	0.017	6.88	0.52	

Site Location: IS-14-SC GPS:
Date: 8/5/20 Time: 1225
Photos: 169 Weather: clear hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
11.76	10.16	93.8	11.6	0.016	6.40	0.15	

Site Location: IS-17-SC GPS:
Date: 8/5/20 Time: 1521
Photos: 170 Weather: clear hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
16.24	8.94	91.0	25.8	0.031	6.91	4.70	

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Instrument(s) used: YSI EXO **Crew:** ES AL

Site Location: IS-15-SFAR GPS:
Date: 8/5/20 Time: 1609
Photos: 171 Weather: clear, hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
21.70	8.65	98.4	44.3	0.047	7.46	0.43	709.3 mm Hg

Site Location: IS-16-SFAR GPS:
Date: 8/5/20 Time: 1636
Photos: 172 Weather: clear, hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
10.26	11.58	103.2	11.8	0.016	6.14	0.35	709.5

Site Location: IS-18-SFAR GPS:
Date: 8/6/20 Time: 1614
Photos: 180-181 Weather: cool, clear
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
20.70	9.09	101.4	26.1	0.028	7.49	0.39	730.9 mm Hg

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Instrument(s) used: YSI EXO Crew: ES DR

Site Location: IS-19 - SFAR GPS:
Date: 8-6-20 Time: 1730
Photos: — Weather: clear, hot
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes 713.2 mm Hg
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
13.69	9.87	95.1	15.4	0.020	6.46	0.51	

Site Location: GPS:
Date: Time:
Photos: Weather:
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	

Site Location: GPS:
Date: Time:
Photos: Weather:
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	

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Instrument(s) used: EXO **Crew:** AML, EES

Site Location: IS-1-RR **GPS:**
Date: 11/02/2020 Time: 1312
Photos: Weather: clear and sunny
Notes: Rubicon Reservoir is almost dry, water very murky

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.13	7.56	64.0	49.2	0.073	6.50	11.42	

Site Location: IS-2-LRR **GPS:**
Date: 11/02/2020 Time: 1430
Photos: Weather: clear and sunny
Notes: No running water, sampled at pool immediately upstream

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.22	9.95	84.4	10.6	0.016	7.43	0.05	

Site Location: IS-3-LRR **GPS:**
Date: 11/02/2020 Time: 1515
Photos: Weather: clear & sunny
Notes: River was dry at normal location, sampled in stillwater just downstream of dam

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
13.48	9.81	94.1	33.1	0.042	7.84	0.51	

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Instrument(s) used: EXO Crew: AML, EES

Site Location: IS-16-SFAR GPS:
Date: 11/03/2020 Time: 0935
Photos: Weather: clear & cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
9.09	11.31	98.1	17.0	0.024	6.87	0.05	

Site Location: IS-17-BC GPS:
Date: 11/03/2020 Time: 1018
Photos: Weather: clear & cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
12.31	9.84	92.0	19.7	0.026	7.20	2.25	

Site Location: IS-15-SFAR GPS:
Date: 11/03/2020 Time: 1100
Photos: Weather: clear & sunny
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.03	11.49	97.1	53.7	0.08	7.54	0.21	

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Instrument(s) used: EXO **Crew:** AML, EES

Site Location: IS-13-SC GPS:
Date: 11/03/2020 Time: 1258
Photos: Weather: clear
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7.70	11.09	93.0	11.4	0.017	7.37	0.11	

Site Location: IS-14-SC GPS:
Date: 11/03/2020 Time: 1336
Photos: Weather: clear & cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
9.12	10.90	94.6	11.0	0.016	7.48	0.20	

Site Location: IS-11-SFSC GPS:
Date: 11/03/2020 Time: 1450
Photos: Weather: clear & cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.39	10.37	88.2	11.0	0.016	7.54	0.15	

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Instrument(s) used: EXO **Crew:** EES, AML

Site Location: IS-12-SS GPS:
Date: 11/04/2020 Time: 0940
Photos: Weather: clear & cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
4.73	11.01	85.6	8.5	0.014	6.82	0.09	

Site Location: IS-10-SFSC GPS:
Date: 11/04/2020 Time: 1115
Photos: Weather: clear & sunny
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.51	9.92	84.8	8.5	0.012	6.90	0.72	

Site Location: IS-4-GC GPS:
Date: 11/05/2020 Time: 1219
Photos: Weather: clear & sunny
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
11.14	9.05	82.3	6.6	0.009	7.05	0.23	

Stillwater Sciences

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

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Instrument(s) used: EXO **Crew:** AML, EES

Site Location: IS-5-GC **GPS:**
Date: 11/04/2020 Time: 1254
Photos: Weather: clear & sunny
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7.68	10.18	85.3	7.6	0.011	7.00	0.08	

Site Location: IS-6-GC **GPS:**
Date: 11/04/2020 Time: 1313
Photos: Weather: clear & sunny
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
8.48	9.68	82.7	8.4	0.002	6.90	0.15	

Site Location: IS-9-GCC **GPS:**
Date: 11/04/2020 Time: 1334
Photos: Weather: clear & sunny
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
11.37	9.28	84.8	9.1	0.012	7.04	0.13	

Stillwater Sciences

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

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Instrument(s) used: EXO **Crew:** AML, EES

Site Location: IS-7-SFRR GPS:
Date: 11/04/2020 Time: 1411
Photos: Weather: clear & cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7.38	10.32	85.9	9.3	0.014	7.05	0.09	

Site Location: IS-8-SFRR GPS:
Date: 11/04/2020 Time: 1423
Photos: Weather: clear & cool
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
7.20	10.48	86.8	8.8	0.013	7.02	0.09	

Site Location: IS-19-SFAR GPS:
Date: 11/05/2021 Time: 1347
Photos: Weather: clear & sunny
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
9.88	10.84	95.8	15.1	0.021	7.04	0.67	

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Instrument(s) used: EXO **Crew:** AML, FES

Site Location: IS-18 - SFAR GPS:
Date: 11/06/2020 Time: 0857
Photos: Weather: overcast & misty
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	
9.41	11.12	97.2	21.4	0.030	7.38	0.55	

Site Location: GPS:
Date: Time:
Photos: Weather:
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	

Site Location: GPS:
Date: Time:
Photos: Weather:
Notes:

In situ

Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Notes
(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)	

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

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Reservoir - Water Quality Vertical Profiles

Date: 5/26/2020
Time: 1150

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

Instrument used: YSI EXO
Water depth: 57.8 ft

Secchi (ft): 32.5

Personnel: EES DLB

Site Notes: Photos 124-0127, 0128
606.0 mmhg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		13.25	8.92	85.0	6.1	0.008	6.34	0.00		
3.3	1	12.65	9.00	84.8	6.0	0.008	6.27	0.01		
6.6	2	11.98	9.11	84.5	5.9	0.008	6.20	0.01		
9.8	3	11.72	9.13	84.2	5.9	0.008	6.10	0.03		
13.1	4	11.45	9.15	83.9	5.9	0.008	6.10	0.09		
16.4	5	11.07	9.18	83.4	5.8	0.008	6.05	0.05		
19.7	6	10.70	9.21	82.9	5.8	0.008	6.02	0.08		
23.0	7	10.61	9.20	82.6	5.7	0.008	5.93	0.08		
26.2	8	10.29	9.20	82.0	5.6	0.008	5.90	0.08		
29.5	9	10.02	9.22	81.8	5.6	0.008	5.85	0.08		
32.8	10	9.79	9.24	81.5	5.6	0.008	5.89	0.08		
36.1	11	9.65	9.20	80.8	5.6	0.008	5.91	0.07		
39.4	12	9.51	9.21	80.6	5.5	0.008	5.88	0.09		
42.7	13	9.36	9.18	80.1	5.5	0.008	5.84	0.09		
45.9	14	9.30	9.13	79.6	5.6	0.008	5.83	0.12		
49.2	15	9.27	9.14	79.6	5.5	0.008	5.80	0.10		
52.5	16	9.22	9.14	79.5	5.5	0.008	5.78	0.10		
55.8	17	9.15	9.14	79.4	5.5	0.008	5.78	0.12		bottom
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 Sciences

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

Reservoir - Water Quality Vertical Profiles

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Date: 5/26/2020
Time: 1110

Site Location: R-1S-2-LL
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 62.5 ft

Personnel: EES DLB

Secchi (ft): 31.2

Site Notes: Photos 124-0124, 0125
605.9 mmhg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		12.65	9.05	85.1	6.0	0.008	6.45	0.00		
3.3	1	12.15	9.10	84.8	5.9	0.008	6.38	0.00		
6.6	2	11.94	9.09	84.3	5.9	0.008	6.30	0.01		
9.8	3	11.21	9.17	83.6	5.8	0.008	6.22	0.08		
13.1	4	11.05	9.18	83.3	5.8	0.008	6.15	0.05		
16.4	5	10.78	9.19	82.9	5.7	0.008	6.12	0.04		
19.7	6	10.65	9.21	82.9	5.7	0.008	6.11	0.03		
23.0	7	10.58	9.20	82.7	5.7	0.008	6.08	0.06		
26.2	8	10.41	9.18	82.1	5.6	0.008	6.08	0.06		
29.5	9	10.12	9.21	81.8	5.6	0.008	6.01	0.04		
32.8	10	9.90	9.19	81.3	5.6	0.008	6.05	0.06		
36.1	11	9.88	9.18	81.1	5.6	0.008	5.99	0.06		
39.4	12	9.69	9.18	80.8	5.5	0.008	5.99	0.06		
42.7	13	9.58	9.20	80.8	5.5	0.008	5.92	0.05		
45.9	14	9.45	9.19	80.4	5.5	0.008	5.88	0.07		
49.2	15	9.34	9.17	79.9	5.5	0.008	5.85	0.07		
52.5	16	9.31	9.16	79.8	5.5	0.008	5.85	0.05		
55.8	17	9.28	9.17	79.9	5.5	0.008	5.84	0.06		
59.1	18	9.22	9.15	79.6	5.5	0.008	5.80	0.07		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									

Stillwater Sciences

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

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Reservoir - Water Quality Vertical Profiles

Date: 5-26-2020
Time: 1036

Site Location: R-15-3-LL
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 54.1 ft

Secchi (ft): 34.4

Personnel: ES DLB

Site Notes: Photos 124-0112, 0113
605.9 mmHg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		11.70	9.07	83.6	5.8	0.008	6.60	0.00		
3.3	1	11.17	9.14	83.2	5.7	0.008	6.40	0.00		
6.6	2	10.97	9.18	83.2	5.7	0.008	6.33	0.01		
9.8	3	10.85	9.20	83.1	5.7	0.008	6.21	0.03		
13.1	4	10.79	9.18	82.8	5.7	0.008	6.25	0.03		
16.4	5	10.69	9.20	82.8	5.7	0.008	6.20	0.04		
19.7	6	10.63	9.21	82.8	5.7	0.008	6.15	0.07		
23.0	7	10.57	9.21	82.7	5.7	0.008	6.08	0.05		
26.2	8	10.39	9.19	82.2	5.6	0.008	6.03	0.05		
29.5	9	10.16	9.20	81.9	5.6	0.008	5.95	0.04		
32.8	10	10.02	9.20	81.6	5.6	0.008	5.89	0.09		
36.1	11	9.98	9.18	81.2	5.6	0.008	5.88	0.06		
39.4	12	9.79	9.16	80.8	5.6	0.008	5.82	0.08		
42.7	13	9.71	9.14	80.4	5.6	0.008	5.81	0.08		
45.9	14	9.54	9.11	79.8	5.6	0.008	5.78	0.07		
49.2	15	9.40	9.06	79.1	5.6	0.008	5.73	0.08		bottom
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 Sciences

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

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Date: 5/29/2020
Time: 940

Reservoir - Water Quality Vertical Profiles

Site Location: R-1S-4-GC
Lat/Long (NAD83):

Instrument used: YSI-EXO
Water depth: 26.1 ft

Secchi (ft): 26.1

Personnel: EES DLB

Site Notes: Photo 127-0142
630.4 mmhg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		11.38	9.50	86.9	6.8	0.009	6.59	0.20		
3.3	1	11.08	9.55	86.7	6.6	0.009	6.50	0.22		
6.6	2	11.06	9.53	86.5	6.6	0.009	6.51	0.20		
9.8	3	11.00	9.54	86.6	6.6	0.009	6.51	0.24		
13.1	4	10.97	9.53	86.3	6.6	0.009	6.48	0.25		
16.4	5	10.98	9.52	86.3	6.6	0.009	6.49	0.24		
19.7	6	10.95	9.53	86.3	6.6	0.009	6.48	0.23		
23.0	7	10.94	9.52	86.2	6.5	0.009	6.45	0.27		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									

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

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Reservoir - Water Quality Vertical Profiles

Date: 5/27/2020
Time: 1315

Site Location: R-1S-5-UVR
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 67.7 ft

Secchi (ft): 24.2

Personnel: EES DLB

Site Notes: Photos 125-0135, 136
@40.2 mmhg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		17.95	8.89	93.8	10.6	0.012	7.08	0.12		
3.3	1	17.67	8.92	93.6	10.5	0.012	7.07	0.14		
6.6	2	16.76	8.97	92.4	10.3	0.012	7.09	0.16		
9.8	3	15.69	9.17	92.3	10.0	0.012	7.05	0.18		
13.1	4	15.08	9.17	91.2	9.7	0.012	7.04	0.16		
16.4	5	13.28	9.38	89.6	9.1	0.012	6.95	0.18		
19.7	6	13.01	9.43	89.5	9.1	0.012	6.92	0.18		
23.0	7	12.60	9.48	89.3	8.9	0.012	6.91	0.17		
26.2	8	11.95	9.54	88.5	8.6	0.011	6.84	0.17		
29.5	9	11.79	9.53	88.0	8.5	0.011	6.84	0.14		
32.8	10	11.38	9.55	87.3	8.4	0.011	6.82	0.14		
36.1	11	11.00	9.60	87.1	8.3	0.011	6.82	0.23		
39.4	12	10.42	9.64	86.3	8.2	0.011	6.78	0.19		
42.7	13	9.96	9.67	85.5	8.1	0.011	6.74	0.17		
45.9	14	9.32	9.75	85.1	7.9	0.011	6.72	0.18		
49.2	15	8.92	9.76	84.3	7.8	0.011	6.69	0.20		
52.5	16	8.64	9.74	83.5	7.7	0.011	6.66	0.18		
55.8	17	7.74	9.69	81.2	7.8	0.012	6.60	0.19		
59.1	18	7.37	9.65	80.3	7.8	0.012	6.58	0.17		
62.3	19	7.03	9.52	78.4	7.9	0.012	6.55	0.18		
65.6	20	6.69	9.38	76.7	8.0	0.012	6.52	33.43		Bottom
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

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Reservoir - Water Quality Vertical Profiles

Date: 5/27/2020
Time: 1410

Site Location: R-15-6-UVR
Lat/Long (NAD83):

Instrument used: YSI-EXO
Water depth: 121 ft

Secchi (ft): 20.2

Personnel: EES DLB

Site Notes: Photos 125-0137, 0138
640.1 mmHg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		18.25	8.76	93.0	10.9	0.012	7.05	0.14		
3.3	1	17.66	8.85	92.1	10.6	0.012	7.06	0.16		
6.6	2	15.87	9.07	91.6	10.2	0.012	7.07	0.17		
9.8	3	15.08	9.20	91.4	9.9	0.012	7.10	0.17		
13.1	4	14.57	9.28	91.1	9.8	0.012	7.12	0.18		
16.4	5	13.77	9.36	90.4	9.6	0.012	7.10	0.21		
19.7	6	13.54	9.38	90.1	9.5	0.012	7.10	0.19		
23.0	7	13.12	9.51	90.6	9.4	0.012	7.08	0.20		
26.2	8	12.25	9.71	90.6	9.2	0.012	7.03	0.20		
29.5	9	11.98	9.73	90.2	9.0	0.012	6.99	0.18		
32.8	10	11.38	9.79	89.6	8.8	0.012	6.94	0.21		
36.1	11	10.96	9.86	89.3	8.8	0.012	6.91	0.20		
39.4	12	10.74	9.85	88.7	8.7	0.012	6.87	0.19		
42.7	13	10.35	9.85	88.0	8.7	0.012	6.84	0.19		
45.9	14	9.63	9.87	86.6	8.7	0.012	6.80	0.18		
49.2	15	9.40	9.97	87.1	8.5	0.012	6.79	0.18		
52.5	16	9.05	10.04	87.1	8.5	0.012	6.78	0.20		
55.8	17	8.59	10.12	86.7	8.4	0.012	6.76	0.19		
59.1	18	8.10	10.07	85.2	8.4	0.012	6.73	0.21		
62.3	19	7.68	9.74	81.6	8.4	0.013	6.65	0.19		
65.6	20	7.37	9.73	81.0	8.3	0.013	6.63	0.18		
68.9	21	6.91	9.70	79.7	8.3	0.013	6.61	0.16		
72.2	22	6.74	9.75	79.8	8.3	0.013	6.61	0.17		
75.5	23	6.70	9.73	79.6	8.3	0.013	6.61	0.18		
78.7	24	6.63	9.74	79.5	8.3	0.013	6.62	0.15		
82.0	25	6.53	9.76	79.5	8.3	0.013	6.61	0.17		
85.3	26	6.47	9.76	79.4	8.2	0.013	6.61	0.17		
88.6	27	6.45	9.75	79.3	8.2	0.013	6.61	0.15		
91.9	28	6.41	9.73	79.0	8.2	0.013	6.62	0.14		
95.1	29	6.32	9.68	78.4	8.2	0.013	6.59	0.17		
98.4	30	6.31	9.66	78.2	8.2	0.013	6.59	0.14		
101.7	31	6.31	9.65	78.2	8.2	0.013	6.60	0.14		
105.0	32	6.26	9.62	77.8	8.2	0.013	6.59	0.14		
108.3	33	6.20	9.59	77.4	8.2	0.013	6.59	0.14		
111.5	34	6.17	9.56	77.1	8.2	0.013	6.58	0.14		

Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

R-15-6-UVR 5/27/2020

Depth		Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Water Sample	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)		
(CONTINUED)										
114.8	35	6.09	9.40	79.7	8.2	0.013	6.56	0.15		
118.1	36	6.08	9.41	75.7	8.2	0.013	6.55	0.14		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									

Stillwater Sciences

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

Page 1 of 2

Date: 5/27/2020
Time: 0938

Reservoir - Water Quality Vertical Profiles

Site Location: R-15-7-UVR
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 167 ft

Secchi (ft): 25.5

Personnel: EES DLB

Site Notes: Photos 125-0129, 131
640.4 mmhg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		16.50	8.98	92.0	10.3	0.012	6.94	0.14		
3.3	1	16.24	9.01	91.7	10.2	0.012	6.96	0.16		
6.6	2	15.79	9.12	92.0	10.1	0.012	6.95	0.17		
9.8	3	14.67	9.27	91.2	9.7	0.012	6.93	0.16		
13.1	4	14.11	9.33	90.8	9.5	0.012	6.89	0.19		
16.4	5	13.74	9.36	90.2	9.3	0.012	6.88	0.19		
19.7	6	13.33	9.41	89.9	9.2	0.012	6.85	0.19		
23.0	7	12.91	9.43	89.4	9.0	0.012	6.83	0.18		
26.2	8	12.25	9.49	88.5	8.8	0.012	6.80	0.17		
29.5	9	11.71	9.61	88.6	8.7	0.012	6.78	0.16		
32.8	10	11.11	9.70	88.1	8.6	0.012	6.76	0.16		
36.1	11	10.73	9.80	88.4	8.6	0.012	6.72	0.16		
39.4	12	10.49	9.82	88.0	8.6	0.012	6.71	0.17		
42.7	13	9.96	9.78	86.6	8.2	0.012	6.67	0.16		
45.9	14	9.32	9.85	85.9	8.1	0.012	6.64	0.18		
49.2	15	8.70	9.92	85.2	8.0	0.012	6.57	0.18		
52.5	16	8.04	10.11	85.4	8.2	0.012	6.46	0.19		
55.8	17	7.62	10.05	84.1	8.0	0.012	6.44	0.15		
59.1	18	7.32	10.09	83.8	8.1	0.012	6.38	0.18		
62.3	19	7.14	9.99	82.6	8.1	0.012	6.33	0.16		
65.6	20	6.80	9.93	81.4	8.1	0.012	6.33	0.18		
68.9	21	6.74	9.83	80.4	8.1	0.012	6.31	0.17		
72.2	22	6.63	9.73	79.4	8.0	0.012	6.30	0.16		
75.5	23	6.57	9.71	79.1	8.0	0.012	6.28	0.17		
78.7	24	6.49	9.68	78.8	8.0	0.012	6.27	0.15		
82.0	25	6.47	9.64	78.4	8.0	0.012	6.24	0.13		
85.3	26	6.37	9.61	77.9	8.0	0.012	6.23	0.13		
88.6	27	6.31	9.56	77.4	8.1	0.013	6.21	0.13		
91.9	28	6.22	9.53	77.0	8.1	0.013	6.21	0.13		
95.1	29	6.21	9.53	76.9	8.1	0.013	6.17	0.14		
98.4	30	6.19	9.52	76.8	8.1	0.013	6.18	0.15		
101.7	31	6.18	9.52	76.8	8.1	0.013	6.19	0.13		
105.0	32	6.16	9.51	76.7	8.1	0.013	6.15	0.14		
108.3	33	6.14	9.51	76.7	8.1	0.013	6.18	0.12		
111.5	34	6.13	9.51	76.7	8.1	0.013	6.17	0.14		

Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

R-1S-7-UVR 5/27/2020

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
(CONTINUED)										
114.8	35	6.13	9.51	76.6	8.1	0.013	6.22	0.13		
118.1	36	6.08	9.51	76.5	8.1	0.013	6.22	0.13		
121.4	37	6.07	9.49	76.3	8.1	0.013	6.23	0.12		
124.7	38	6.06	9.47	76.2	8.1	0.013	6.22	0.13		
128.0	39	6.03	9.46	76.0	8.1	0.013	6.25	0.13		
131.2	40	6.01	9.46	76.0	8.1	0.013	6.23	0.13		
134.5	41	5.98	9.43	75.7	8.2	0.013	6.25	0.13		
137.8	42	5.97	9.40	75.4	8.2	0.013	6.20	0.13		
141.1	43	5.97	9.39	75.4	8.2	0.013	6.23	0.11		
144.4	44	5.95	9.38	75.2	8.2	0.013	6.22	0.13		
147.6	45	5.95	9.37	75.2	8.2	0.013	6.19	0.12		
150.9	46	5.93	9.36	75.0	8.2	0.013	6.18	0.11		
154.2	47	5.93	9.35	75.0	8.2	0.013	6.18	0.12		
157.5	48	5.93	9.34	74.9	8.2	0.013	6.20	0.15		
160.8	49	5.92	9.33	74.8	8.2	0.013	6.17	0.18		bottom
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									

Stillwater Sciences

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

Page 1 of 3

Date: 5-27-2020
Time: 1112

Reservoir - Water Quality Vertical Profiles

Site Location: R-15 & 8 - UVR
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 308 ft

Personnel: EES DLB

Secchi (ft): 21.5

Site Notes: Photos 125-0135, 0134
6040.2 mmhg

★ Ending Depth = 349 ft

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		16.75	8.93	92.0	10.4	0.012	7.03	0.16		
3.3	1	16.10	8.96	91.0	10.3	0.012	7.04	0.18		
6.6	2	15.99	8.95	90.7	10.2	0.012	7.04	0.18		
9.8	3	15.92	8.94	90.4	10.2	0.012	7.04	0.18		
13.1	4	15.64	8.97	90.2	10.1	0.012	7.05	0.17		
16.4	5	15.37	8.97	89.9	10.1	0.012	7.05	0.18		
19.7	6	14.38	9.17	89.7	9.8	0.012	7.05	0.22		
23.0	7	13.26	9.44	90.1	9.5	0.012	7.04	0.20		
26.2	8	12.27	9.78	91.3	9.1	0.012	6.99	0.19		
29.5	9	11.73	9.81	90.5	8.9	0.012	6.93	0.20		
32.8	10	11.31	9.82	89.7	8.7	0.012	6.87	0.18		
36.1	11	10.79	9.87	89.1	8.6	0.012	6.84	0.19		
39.4	12	10.23	9.87	87.9	8.5	0.012	6.78	0.18		
42.7	13	9.87	10.09	89.2	8.6	0.012	6.80	0.18		
45.9	14	9.55	10.14	88.9	8.5	0.012	6.78	0.18		
49.2	15	8.97	10.18	88.0	8.5	0.012	6.75	0.17		
52.5	16	8.35	10.31	87.8	8.5	0.012	6.74	0.21		
55.8	17	7.72	10.25	86.0	8.5	0.013	6.73	0.19		
59.1	18	7.22	10.20	84.5	8.4	0.013	6.71	0.16		
62.3	19	6.73	10.03	82.0	8.3	0.013	6.66	0.17		
65.6	20	6.67	9.94	81.2	8.3	0.013	6.63	0.16		
68.9	21	6.57	9.91	80.8	8.2	0.013	6.60	0.18		
72.2	22	6.52	9.91	80.6	8.3	0.013	6.61	0.19		
75.5	23	6.46	9.90	80.4	8.3	0.013	6.60	0.19		
78.7	24	6.38	9.80	79.4	8.2	0.013	6.55	0.16		
82.0	25	6.32	9.76	79.1	8.2	0.013	6.55	0.16		
85.3	26	6.27	9.76	79.0	8.1	0.013	6.57	0.14		
88.6	27	6.23	9.80	79.2	8.2	0.013	6.57	0.16		
91.9	28	6.19	9.77	78.8	8.2	0.013	6.57	0.14		
95.1	29	6.17	9.75	78.6	8.2	0.013	6.55	0.15		
98.4	30	6.14	9.72	78.4	8.2	0.013	6.55	0.13		
101.7	31	6.13	9.73	78.5	8.2	0.013	6.54	0.15		
105.0	32	6.12	9.74	78.5	8.2	0.013	6.55	0.14		
108.3	33	6.10	9.74	78.4	8.2	0.013	6.54	0.16		
111.5	34	6.06	9.71	78.1	8.2	0.013	6.55	0.12		

Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

R-15-8-UVR 5/27/2020

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
(CONTINUED)										
114.8	35	6.03	9.70	77.9	8.2	0.013	6.56	0.14		
118.1	36	6.03	9.69	77.9	8.2	0.013	6.56	0.13		
121.4	37	6.01	9.66	77.7	8.2	0.013	6.56	0.14		
124.7	38	5.99	9.66	77.6	8.2	0.013	6.56	0.13		
128.0	39	5.98	9.66	77.5	8.2	0.013	6.55	0.14		
131.2	40	5.97	9.64	77.4	8.2	0.013	6.55	0.14		
134.5	41	5.96	9.63	77.3	8.2	0.013	6.55	0.13		
137.8	42	5.96	9.62	77.2	8.2	0.013	6.54	0.15		
141.1	43	5.96	9.62	77.2	8.2	0.013	6.54	0.13		
144.4	44	5.94	9.61	77.1	8.2	0.013	6.54	0.13		
147.6	45	5.92	9.60	77.0	8.2	0.013	6.55	0.13		
150.9	46	5.91	9.59	76.8	8.2	0.013	6.54	0.13		
154.2	47	5.89	9.57	76.7	8.2	0.013	6.54	0.15		
157.5	48	5.89	9.56	76.5	8.2	0.013	6.54	0.13		
160.8	49	5.87	9.54	76.3	8.2	0.013	6.53	0.12		
164.0	50	5.87	9.53	76.3	8.2	0.013	6.53	0.14		
167.3	51	5.86	9.51	76.1	8.2	0.013	6.52	0.13		
170.6	52	5.84	9.47	75.8	8.2	0.013	6.53	0.14		
173.9	53	5.84	9.47	75.7	8.2	0.013	6.52	0.16		
177.2	54	5.84	9.46	75.6	8.2	0.013	6.52	0.15		
180.4	55	5.84	9.45	75.6	8.2	0.013	6.52	0.12		
183.7	56	5.83	9.44	75.5	8.2	0.013	6.51	0.15		
187.0	57	5.83	9.43	75.4	8.2	0.013	6.51	0.12		
190.3	58	5.83	9.42	75.3	8.2	0.013	6.52	0.13		
193.6	59	5.82	9.42	75.3	8.2	0.013	6.50	0.15		
196.8	60	5.82	9.40	75.2	8.2	0.013	6.50	0.14		
200.1	61	5.82	9.40	75.1	8.2	0.013	6.50	0.14		
203.4	62	5.81	9.39	75.0	8.2	0.013	6.50	0.13		
206.7	63	5.80	9.36	74.8	8.2	0.013	6.49	0.14		
210.0	64	5.79	9.34	74.6	8.2	0.013	6.49	0.14		
213.3	65	5.78	9.30	74.3	8.2	0.013	6.50	0.13		
216.5	66	5.77	9.28	74.1	8.2	0.013	6.49	0.14		
219.8	67	5.76	9.25	73.8	8.2	0.013	6.47	0.15		
223.1	68	5.76	9.23	73.7	8.2	0.013	6.46	0.14		
226.4	69	5.76	9.23	73.7	8.2	0.013	6.46	0.14		
229.7	70	5.75	9.22	73.6	8.2	0.013	6.47	0.14		
232.9	71	5.75	9.21	73.5	8.2	0.013	6.46	0.17		
236.2	72	5.75	9.20	73.4	8.2	0.013	6.46	0.15		

Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

R-1S-8-UVR 5/27/2020

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
(CONTINUED)										
239.5	73	5.74	9.19	73.3	8.2	0.013	6.45	0.15		
242.8	74	5.74	9.19	73.3	8.2	0.013	6.45	0.16		
246.1	75	5.74	9.18	73.3	8.2	0.013	6.45	0.16		
249.3	76	5.74	9.18	73.3	8.2	0.013	6.45	0.16		
252.6	77	5.74	9.18	73.2	8.2	0.013	6.46	0.17		
255.9	78	5.74	9.17	73.1	8.2	0.013	6.45	0.16		
259.2	79	5.73	9.16	73.1	8.2	0.013	6.45	0.16		
262.5	80	5.73	9.15	73.0	8.2	0.013	6.44	0.17		
265.7	81	5.73	9.15	73.0	8.2	0.013	6.44	0.18		
269.0	82	5.73	9.15	73.0	8.2	0.013	6.45	0.17		
272.3	83	5.73	9.15	73.0	8.2	0.013	6.44	0.15		
275.6	84	5.73	9.14	72.9	8.2	0.013	6.44	0.17		
278.9	85	5.74	9.14	73.0	8.2	0.013	6.45	0.17		
282.1	86	5.74	9.15	73.0	8.2	0.013	6.45	0.15		
285.4	87	5.73	9.15	73.0	8.2	0.013	6.46	0.14		
288.7	88	5.73	9.13	72.8	8.2	0.013	6.45	0.18		
292.0	89	5.73	9.13	72.9	8.2	0.013	6.44	0.16		
295.3	90	5.73	9.13	72.9	8.2	0.013	6.44	0.14		
298.6	91	5.73	9.13	72.8	8.2	0.013	6.44	0.17		
301.8	92	5.73	9.13	72.8	8.2	0.013	6.44	0.17		
305.1	93	5.73	9.13	72.8	8.2	0.013	6.44	0.17		
308.4	94	5.73	9.13	72.8	8.2	0.013	6.45	0.15		
311.7	95	5.73	9.13	72.8	8.2	0.013	6.44	0.19		
315.0	96	5.73	9.13	72.8	8.2	0.013	6.44	0.19		
318.2	97	5.73	9.12	72.8	8.2	0.013	6.44	0.17		
321.5	98	5.73	9.13	72.8	8.2	0.013	6.44	0.18		
324.8	99	5.73	9.13	72.8	8.2	0.013	6.45	0.15		End of Cable
328.1	100									
331.4	101									
334.6	102									

Stillwater Sciences

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

Page 1 of 1

Reservoir - Water Quality Vertical Profiles

Date: 5/22/2020
Time: 1010

Site Location: R-15-9-IHR
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 54.4 ft

Secchi (ft): 20.8

Personnel: EES DLB

Site Notes: 623.0 mmhg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		12.81	9.01	85.1	7.9	0.010	6.42	0.24		Photos 123-0115 116, 117
3.3	1	12.75	9.01	85.0	7.9	0.010	6.38	0.25		
6.6	2	12.68	9.02	84.8	7.9	0.010	6.36	0.25		
9.8	3	12.54	9.03	84.9	7.9	0.010	6.35	0.27		
13.1	4	12.53	9.03	84.8	7.9	0.010	6.33	0.26		
16.4	5	11.98	9.15	85.0	7.7	0.010	6.32	0.25		
19.7	6	11.40	9.25	84.8	7.4	0.010	6.30	0.26		
23.0	7	10.45	9.44	84.6	7.1	0.010	6.28	0.30		
26.2	8	9.92	9.54	84.4	6.9	0.010	6.26	0.26		
29.5	9	9.80	9.54	84.1	6.8	0.010	6.23	0.28		
32.8	10	8.73	9.65	83.1	6.6	0.010	6.18	0.29		
36.1	11	7.97	9.68	81.7	6.5	0.010	6.13	0.32		
39.4	12	7.70	9.67	81.0	6.4	0.010	6.07	0.33		
42.7	13	7.47	9.61	80.1	6.5	0.010	6.00	0.34		
45.9	14	7.37	9.59	79.7	6.5	0.010	5.95	0.37		bottom
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 Sciences

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

Page 1 of 1

Date: 5/22/2020
Time: 1053

Reservoir - Water Quality Vertical Profiles

Site Location: R-15-10-IMR
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 32.8 ft
Secchi (ft): 23.2

Personnel: EES DLB

Site Notes: PHOTOS 123-0118, 0119 622.9 mm Hg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		12.71	9.06	85.11	7.9	0.010	7.01	0.52		
3.3	1	12.68	9.07	85.5	7.9	0.010	6.88	0.23		
6.6	2	12.69	9.06	85.4	7.9	0.010	6.85	0.22		
9.8	3	12.65	9.05	85.2	7.8	0.010	6.75	0.25		
13.1	4	12.50	9.06	85.0	7.9	0.010	6.75	0.25		
16.4	5	12.14	9.16	85.3	7.7	0.010	6.68	0.23		
19.7	6	11.01	9.41	85.3	7.3	0.010	6.60	0.28		
23.0	7	9.91	9.56	84.6	6.9	0.010	6.50	0.31		
26.2	8	9.42	9.68	84.5	6.7	0.010	6.42	124.29		
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 Sciences

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

Reservoir - Water Quality Vertical Profiles

Page 1 of 1

Date: 5/22/2020
Time: 1126

Site Location: R-1S-11-T&R
Lat/Long (NAD83):

Personnel: EES- DLB

Instrument used: YSI EXO
Water depth: 114
Secchi (ft): 23.3

Site Notes: Photos 123 0120, 0121
623.1 mahg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		12.63	9.08	85.5	8.0	0.010	6.90	0.25		
3.3	1	12.57	9.06	85.1	7.9	0.010	6.78	0.23		
6.6	2	12.24	9.07	84.7	7.9	0.010	6.72	0.20		
9.8	3	12.17	9.10	84.7	7.9	0.010	6.75	0.28		
13.1	4	12.13	9.09	84.5	7.9	0.010	6.72	0.21		
16.4	5	12.08	9.08	84.4	7.9	0.010	6.64	0.26		
19.7	6	11.94	9.11	84.5	7.7	0.010	6.59	0.23		
23.0	7	10.32	9.96	88.9	7.1	0.010	6.49	0.26		
26.2	8	9.50	10.06	88.0	7.1	0.010	6.29	0.33		
29.5	9	8.37	10.20	86.9	7.1	0.010	6.30	0.34		
32.8	10	7.76	10.17	85.4	7.1	0.011	6.21	0.31		
36.1	11	7.21	9.84	81.4	7.2	0.011	6.12	0.36		
39.4	12	7.02	9.81	80.9	7.1	0.011	6.07	0.36		
42.7	13	6.99	9.78	80.5	7.0	0.011	6.02	0.29		
45.9	14	6.79	9.73	79.6	7.0	0.011	5.93	0.31		
49.2	15	6.78	9.67	79.2	6.9	0.011	5.88	0.32		
52.5	16	6.74	9.64	78.8	6.9	0.011	5.87	0.38		
55.8	17	6.70	9.60	78.5	6.9	0.011	5.86	0.35		
59.1	18	6.65	9.56	78.0	6.9	0.011	5.82	0.38		
62.3	19	6.61	9.51	77.6	6.9	0.011	5.78	0.35		
65.6	20	6.59	9.49	77.4	6.9	0.011	5.77	0.32		
68.9	21	6.57	9.46	77.0	6.9	0.011	5.74	0.33		
72.2	22	6.56	9.42	76.7	6.9	0.011	5.73	0.35		
75.5	23	6.56	9.40	76.5	6.9	0.011	5.71	0.40		
78.7	24	6.52	9.35	76.0	6.9	0.011	5.69	0.36		
82.0	25	6.52	9.32	75.8	6.9	0.011	5.70	0.38		
85.3	26	6.52	9.31	75.7	6.9	0.011	5.68	0.37		
88.6	27	6.50	9.28	75.5	6.9	0.011	5.64	0.42		
91.9	28	6.49	9.27	75.3	6.9	0.011	5.65	0.40		
95.1	29	6.49	9.24	75.2	6.9	0.011	5.64	0.36		
98.4	30	6.49	9.23	75.1	6.9	0.011	5.63	0.35		
101.7	31	6.49	9.21	74.9	6.9	0.011	5.63	0.36		
105.0	32	6.47	9.17	74.5	6.9	0.011	5.62	0.36		
108.3	33	6.93	9.11	73.9	7.0	0.011	5.61	0.41		bottom
111.5	34									

Stillwater Sciences

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

Page 1 of 1

Date: 5/29/2020
Time: 1445

Reservoir - Water Quality Vertical Profiles

Site Location: R-1S-12-SR
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 43.7 ft+

Secchi (ft): 22.4

Personnel: EES DLB

Site Notes: Photos 127-145, 146

647.3 mm Hg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		17.66	8.64	90.6	13.3	0.015	6.92	0.30		
3.3	1	16.20	8.73	88.8	12.9	0.015	6.90	0.34		
6.6	2	15.34	9.12	90.6	12.5	0.015	6.84	0.34		
9.8	3	13.81	9.51	88.0	12.0	0.015	6.81	0.34		
13.1	4	12.80	9.57	89.8	12.0	0.016	6.75	0.33		
16.4	5	12.14	9.57	88.9	11.8	0.016	6.69	0.40		
19.7	6	11.66	9.48	88.0	11.6	0.016	6.65	0.37		
23.0	7	11.33	9.45	86.6	11.4	0.015	6.66	0.35		
26.2	8	10.99	9.4	85.6	11.3	0.015	6.62	0.39		
29.5	9	10.66	9.416	85.1	11.3	0.016	6.55	0.412		
32.8	10	10.35	9.45	84.5	11.2	0.016	6.48	0.40		
36.1	11	10.05	9.51	84.4	10.9	0.015	6.43	0.46		
39.4	12	9.70	9.65	84.9	10.4	0.015	6.46	0.32		
42.7	13	9.40	9.58	83.7	10.3	0.015	6.36	0.33		
45.9	14	9.18	9.70	84.3	10.1	0.014	6.31	0.33		Bottom
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 Sciences

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

Page 1 of 1

Date: 5/29/2020
Time: 1230

Reservoir - Water Quality Vertical Profiles

Site Location: R-15-13-CR
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 17.5
Secchi (ft): 17.5

Personnel: EES DLB

Site Notes: 683.3 mm 1dy

Photos 0127-0143, 0144

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		15.66	9.35	93.6	13.8	0.017	6.86	0.40		
3.3	1	13.96	9.62	94.1	12.8	0.016	6.81	0.47		
6.6	2	13.40	9.75	93.1	12.4	0.016	6.82	0.50		
9.8	3	12.56	9.92	93.3	12.0	0.016	6.82	0.63		
13.1	4	11.34	10.16	92.8	11.3	0.015	6.69	0.48		
16.4	5	10.89	10.24	92.6	11.1	0.015	6.70	0.50		BOTTOM
19.7	6									
23.0	7									
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									

Stillwater Sciences

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

Page 1 of 1

Reservoir - Water Quality Vertical Profiles

Date: 5/28/20
Time: 1215

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

Instrument used: EXO
Water depth: 31.9

Secchi (ft): 13.1

Personnel: EES DLB

Site Notes: 710.6 mm Hg
Photos 126-139

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		17.52	9.23	98.5	27.8	0.030	7.11	0.58		
3.3	1	16.01	9.43	95.5	21.5	0.026	7.00	0.68		
6.6	2	15.35	9.48	94.7	21.3	0.026	6.99	0.84		
9.8	3	15.26	9.52	94.9	21.3	0.026	6.98	0.87		
13.1	4	15.25	9.53	95.0	21.3	0.026	7.00	0.81		
16.4	5	15.22	9.56	95.2	21.3	0.026	7.00	0.71		
19.7	6	15.16	9.57	95.2	21.3	0.026	7.01	0.86		
23.0	7	15.05	9.60	95.3	21.3	0.026	7.02	0.77		
26.2	8	14.87	9.58	94.7	21.3	0.026	6.98	0.94		
29.5	9	14.87	9.56	94.5	21.3	0.026	6.95	1.07		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									

Stillwater Sciences

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

Page 1 of 2

Date: 5/28/2020
Time: 1315

Reservoir - Water Quality Vertical Profiles

Site Location: R-1S-15-SC
Lat/Long (NAD83):

Instrument used: YSI EXO
Water depth: 126 ft

Secchi (ft): 13.2

Personnel: EES DLB

Site Notes: 126 - 0140, 0141
710.4 mmhg

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		19.72	9.43	103.3	26.7	0.030	7.21	0.31		
3.3	1	18.58	9.53	101.9	26.0	0.030	7.24	0.25		
6.6	2	17.57	9.62	100.7	25.4	0.030	7.23	0.35		
9.8	3	17.20	9.50	98.7	25.0	0.029	7.19	0.42		
13.1	4	17.08	9.51	98.6	24.8	0.029	7.17	0.66		
16.4	5	15.90	9.53	96.4	23.4	0.028	7.08	0.94		
19.7	6	15.59	9.48	95.2	22.4	0.027	7.01	0.87		
23.0	7	15.36	9.49	94.8	22.0	0.027	6.98	0.91		
26.2	8	15.26	9.47	94.4	22.0	0.027	6.96	1.00		
29.5	9	15.10	9.46	94.0	21.8	0.027	6.94	1.02		
32.8	10	15.05	9.45	93.9	21.5	0.026	6.92	1.27		
36.1	11	15.00	9.47	93.9	21.5	0.027	6.90	1.11		
39.4	12	14.96	9.47	93.9	21.3	0.026	6.87	1.19		
42.7	13	14.90	9.49	93.9	20.7	0.026	6.85	1.34		
45.9	14	14.84	9.51	94.0	20.2	0.025	6.83	1.35		
49.2	15	14.81	9.51	93.9	20.3	0.025	6.83	1.46		
52.5	16	14.78	9.48	93.6	20.5	0.025	6.82	1.42		
55.8	17	14.74	9.44	93.1	21.0	0.026	6.80	1.51		
59.1	18	14.71	9.43	92.9	21.6	0.026	6.80	1.40		
62.3	19	14.70	9.42	92.7	21.4	0.027	6.80	1.58		
65.6	20	14.66	9.41	92.7	21.7	0.027	6.81	1.45		
68.9	21	14.58	9.42	92.6	21.7	0.027	6.81	1.62		
72.2	22	14.53	9.41	92.4	21.7	0.027	6.80	1.63		
75.5	23	14.50	9.41	92.3	21.7	0.027	6.83	1.63		
78.7	24	14.45	9.42	92.3	22.0	0.028	6.82	1.61		
82.0	25	14.37	9.41	92.1	22.2	0.028	6.80	1.75		
85.3	26	14.32	9.40	91.8	22.3	0.082	6.79	1.50		
88.6	27	14.31	9.39	91.7	22.4	0.028	6.80	1.58		
91.9	28	14.27	9.38	91.5	22.6	0.028	6.78	1.35		
95.1	29	14.19	9.38	91.4	22.9	0.029	6.80	1.30		
98.4	30	14.16	9.38	91.3	22.9	0.029	6.79	1.59		
101.7	31	14.04	9.37	91.0	23.0	0.029	6.79	1.25		
105.0	32	13.90	9.36	90.6	23.5	0.030	6.78	1.07		
108.3	33	13.82	9.36	90.5	23.6	0.030	6.78	1.01		
111.5	34	13.70	9.33	89.9	23.9	0.030	6.77	0.93		

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Stillwater Sciences

Reservoir - Water Quality Vertical Profiles

R-15-15-SC 5/28/2020

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
(CONTINUED)										
114.8	35	13.46	9.27	88.8	24.3	0.031	6.75	0.80		
118.1	36	13.29	9.22	88.0	24.5	0.032	6.74	0.85		
121.4	37	12.91	8.64	81.8	25.8	0.033	6.65	2.97		Bottom
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									

Stillwater Sciences

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

Page 1 of 1

Date: 10/29/2020
Time: 1004

Reservoir - Water Quality Vertical Profiles

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

Instrument used: EXO
Water depth: 68

Secchi (ft): 22.6

Personnel: ES, LY

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		11.21	8.49	77.4	6.7	0.009	6.89	0.15		
3.3	1	11.21	8.48	77.3	6.7	0.009	6.88	0.15		
6.6	2	11.20	8.47	77.1	6.7	0.009	6.84	0.13		
9.8	3	11.19	8.46	77.0	6.7	0.009	6.81	0.10		
13.1	4	11.18	8.45	76.9	6.7	0.009	6.83	0.08		
16.4	5	11.18	8.45	76.9	6.7	0.009	6.81	0.03		
19.7	6	11.17	8.44	76.9	6.7	0.009	6.81	0.13		
23.0	7	11.17	8.44	76.9	6.7	0.009	6.80	0.17		
26.2	8	11.17	8.43	76.8	6.7	0.009	6.79	0.13		
29.5	9	11.17	8.43	76.7	6.7	0.009	6.74	0.18		
32.8	10	11.14	8.38	76.3	6.7	0.009	6.75	0.15		
36.1	11	11.14	8.38	76.2	6.7	0.009	6.73	0.14		
39.4	12	11.15	8.38	76.3	6.7	0.009	6.70	0.16		
42.7	13	11.14	8.35	76.0	6.7	0.009	6.72	0.10		
45.9	14	11.14	8.34	75.9	6.7	0.009	6.69	0.15		
49.2	15	11.13	8.33	75.8	6.7	0.009	6.68	0.13		
52.5	16	11.13	8.33	75.8	6.7	0.009	6.71	0.18		
55.8	17	11.13	8.33	75.7	6.7	0.009	6.69	0.17		
59.1	18	11.13	8.30	75.5	6.7	0.009	6.66	0.06		
62.3	19	11.13	8.32	75.6	6.7	0.009	6.57	0.07		
65.6	20	11.12	8.32	75.6	6.7	0.009	6.50	0.22		
68.9	21	11.12	8.29	75.4	6.7	0.009	6.39	125.8		Bottom
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 1 of 1

Date: 10/29/2020
Time: 1112

Reservoir - Water Quality Vertical Profiles

Site Location: R-15-2-LL
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 35.3

Secchi (ft): 26.7

Personnel: ES, LY

Site Notes:

Depth		Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Water Sample	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)		
surface		11.56	8.53	78.4	6.7	0.009	6.65	0.05		
3.3	1	11.55	8.53	78.4	6.7	0.009	6.62	0.04		
6.6	2	11.54	8.52	78.3	6.7	0.009	6.58	0.02		
9.8	3	11.53	8.52	78.2	6.7	0.009	6.57	0.01		
13.1	4	11.51	8.51	78.1	6.7	0.009	6.52	0.05		
16.4	5	11.50	8.51	78.0	6.7	0.009	6.52	0.07		
19.7	6	11.50	8.50	78.0	6.7	0.009	6.50	0.14		
23.0	7	11.50	8.49	77.9	6.7	0.009	6.56	0.03		
26.2	8	11.48	8.49	77.8	6.7	0.009	6.55	0.07		
29.5	9	11.48	8.48	77.8	6.7	0.009	6.54	0.04		
32.8	10	11.46	8.47	77.6	6.7	0.009	6.50	115.3		Bottom
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 Sciences

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

Page 1 of 1

Date: 10/29/20
Time: 1131

Reservoir - Water Quality Vertical Profiles

Instrument used: EXO
Water depth: 32.9
Secchi (ft): 24.6

Site Location: R-1S-3-LL
Lat/Long (NAD83):

Personnel: ES, LY

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		11.30	8.64	78.9	6.6	0.009	6.78	0.02		
3.3	1	11.27	8.63	78.7	6.7	0.009	6.71	0.16		
6.6	2	11.25	8.62	78.6	6.7	0.009	6.69	0.12		
9.8	3	11.25	8.61	78.5	6.7	0.009	6.68	0.03		
13.1	4	11.23	8.60	78.4	6.7	0.009	6.67	0.07		
16.4	5	11.22	8.60	78.4	6.6	0.009	6.64	0.12		
19.7	6	11.20	8.59	78.3	6.6	0.009	6.63	0.02		
23.0	7	11.19	8.59	78.2	6.6	0.009	6.64	0.15		
26.2	8	11.18	8.58	78.1	6.7	0.009	6.65	0.16		
29.5	9	11.18	8.57	78.1	6.6	0.009	6.64	0.12		
32.8	10	11.18	8.57	78.0	6.6	0.009	6.67	10.40		Bottom
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 Sciences

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

Page 1 of 1

Date: 10/30/2020
Time: 1411

Reservoir - Water Quality Vertical Profiles

Site Location: R-IS-4-GC
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 21.9

Secchi (ft): 20.8

Personnel: EES, LHY

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		11.09	8.98	81.6	9.3	0.013	6.75	0.19		
3.3	1	10.54	9.01	80.8	9.2	0.013	6.74	0.24		
6.6	2	10.41	8.98	80.3	9.2	0.013	6.74	0.23		
9.8	3	10.30	8.98	80.1	9.2	0.013	6.73	0.24		
13.1	4	10.28	8.98	80.1	9.2	0.013	6.75	0.21		
16.4	5	10.26	9.02	80.2	9.2	0.013	6.73	0.19		
19.7	6	9.73	8.89	78.3	9.1	0.013	6.67	0.15		
23.0	7	9.65	8.72	76.0	12.3	0.018	6.57	67.44		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									

Stillwater Sciences

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

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Reservoir - Water Quality Vertical Profiles

Date: 10/28/2020
Time: 1324

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

Instrument used: EXO
Water depth: 25.1 FT

Personnel: AMR EES

Secchi (ft): 20.5

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		15.82	8.04	81.3	10.9	0.013	7.02	0.21		
3.3	1	15.54	8.05	80.7	10.8	0.013	7.01	0.20		
6.6	2	15.25	8.06	80.3	10.8	0.013	7.01	0.28		
9.8	3	15.09	8.07	80.2	10.8	0.013	7.01	0.24		
13.1	4	15.02	8.07	80.1	10.7	0.013	7.02	0.35		
16.4	5	14.86	8.11	80.2	10.7	0.013	7.01	0.24		
19.7	6	14.42	8.18	80.1	10.7	0.013	7.00	0.37		
23.0	7	13.94	8.21	79.5	10.8	0.014	6.93	0.44		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									

Stillwater Sciences

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

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Date: 10-28-2020
Time: 1347

Reservoir - Water Quality Vertical Profiles

Site Location: R-15-6-UVR
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 80.0

Personnel: EES AML

Secchi (ft): 19.9

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		16.70	7.94	81.6	10.9	0.013	7.03	0.19		
3.3	1	16.66	7.93	81.4	10.9	0.013	7.00	0.17		
6.6	2	16.27	7.93	80.8	10.8	0.013	7.00	0.23		
9.8	3	16.17	7.95	80.8	10.8	0.013	7.00	0.25		
13.1	4	16.12	7.94	80.6	10.8	0.013	7.01	0.36		
16.4	5	16.11	7.92	80.4	10.8	0.013	7.00	0.29		
19.7	6	16.08	7.91	80.3	10.8	0.013	7.01	0.30		
23.0	7	16.04	7.92	80.3	10.8	0.013	7.00	0.26		
26.2	8	16.03	7.93	80.3	10.8	0.013	6.99	0.22		
29.5	9	16.05	7.92	80.3	10.8	0.013	7.01	0.26		
32.8	10	16.02	7.92	80.2	10.8	0.013	7.01	0.26		
36.1	11	16.03	7.91	80.2	10.8	0.013	7.01	0.19		
39.4	12	16.02	7.90	80.0	10.8	0.013	7.01	0.24		
42.7	13	16.01	7.89	80.0	10.8	0.013	7.01	0.32		
45.9	14	16.01	7.88	79.9	10.8	0.013	7.00	0.18		
49.2	15	16.00	7.88	79.9	10.8	0.013	7.01	0.24		
52.5	16	15.99	7.87	79.6	10.8	0.013	7.00	0.31		
55.8	17	15.93	7.84	79.5	10.8	0.013	7.00	0.32		
59.1	18	15.98	7.84	79.4	10.8	0.013	6.98	0.24		
62.3	19	15.98	7.83	79.3	10.8	0.013	6.98	0.22		
65.6	20	15.95	7.82	79.2	10.8	0.013	6.98	0.21		
68.9	21	15.93	7.81	79.0	10.8	0.013	6.97	0.25		
72.2	22	15.94	7.78	77.7	10.8	0.013	6.96	0.18		
75.5	23	15.75	7.66	77.1	10.8	0.013	6.89	0.32		bottom
78.7	24					0.01				
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

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Date: 10/28/20
Time: 1240

Reservoir - Water Quality Vertical Profiles

Site Location: R-15-7-UVR
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 116

Secchi (ft): 25.2

Personnel: EES, AML

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		16.32	7.92	80.7	10.9	0.013	7.04	0.36		
3.3	1	16.08	7.91	80.3	10.9	0.013	7.01	0.22		
6.6	2	16.02	7.91	80.1	10.8	0.013	7.00	0.30		
9.8	3	15.97	7.90	80.0	10.8	0.013	7.00	0.20		
13.1	4	15.96	7.89	79.9	10.8	0.013	7.00	0.24		
16.4	5	15.95	7.89	79.8	10.8	0.013	7.00	0.22		
19.7	6	15.93	7.90	79.8	10.8	0.013	7.01	0.30		
23.0	7	15.91	7.90	79.9	10.8	0.013	7.01	0.25		
26.2	8	15.89	7.89	79.9	10.9	0.013	7.00	0.26		
29.5	9	15.89	7.88	79.6	10.9	0.013	7.01	0.30		
32.8	10	15.87	7.87	79.5	10.8	0.013	7.00	0.36		
36.1	11	15.86	7.86	79.3	10.8	0.013	7.00	0.25		
39.4	12	15.85	7.84	79.2	10.8	0.013	6.99	0.36		
42.7	13	15.85	7.83	79.1	10.8	0.013	6.99	0.12		
45.9	14	15.83	7.82	78.9	10.8	0.013	6.98	0.46		
49.2	15	15.79	7.81	78.8	10.8	0.013	6.98	0.26		
52.5	16	15.77	7.82	78.9	10.8	0.013	6.97	0.34		
55.8	17	15.74	7.81	78.7	10.8	0.013	6.97	0.24		
59.1	18	15.68	7.80	78.5	10.8	0.013	6.97	0.33		
62.3	19	15.66	7.79	78.4	10.8	0.013	6.96	0.22		
65.6	20	15.66	7.79	78.3	10.8	0.013	6.96	0.33		
68.9	21	15.65	7.78	78.2	10.8	0.013	6.95	0.21		
72.2	22	15.64	7.77	78.2	10.8	0.013	6.95	0.31		
75.5	23	15.64	7.77	78.1	10.8	0.013	6.96	0.28		
78.7	24	15.64	7.76	78.1	10.8	0.013	6.95	0.34		
82.0	25	15.64	7.76	78.0	10.8	0.013	6.95	0.26		
85.3	26	15.64	7.76	78.0	10.8	0.013	6.95	0.30		
88.6	27	15.64	7.75	77.9	10.8	0.013	6.95	0.30		
91.9	28	15.56	7.76	77.9	10.8	0.013	6.93	0.34		
95.1	29	15.39	7.77	77.7	10.8	0.013	6.94	0.30		
98.4	30	14.74	7.53	74.2	10.9	0.014	6.79	0.41		
101.7	31	14.24	7.04	68.4	10.8	0.014	6.60	0.45		
105.0	32	13.74	6.59	63.1	10.8	0.014	6.46	0.43		
108.3	33	12.33	5.18	48.2	10.6	0.014	6.26	6.32		
111.5	34	11.96	4.91	45.4	10.7	0.014	6.16	1.08		Bottom

Stillwater Sciences

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

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Date: 10/28/2020
Time: 1105

Reservoir - Water Quality Vertical Profiles

Instrument used: EXO
Water depth: 224

Site Location: R-15-8-UVR
Lat/Long (NAD83):

Secchi (ft): 21.3

Personnel: EES, AML

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		16.91	7.95	90.9	10.9	0.013	7.07	0.20		
3.3	1	16.17	7.94	80.7	10.8	0.013	7.04	0.19		
6.6	2	16.12	7.92	80.4	10.8	0.013	7.03	0.24		
9.8	3	16.11	7.91	80.3	10.8	0.013	7.02	0.23		
13.1	4	16.10	7.90	80.3	10.8	0.013	7.00	0.26		
16.4	5	16.10	7.90	80.2	10.8	0.013	6.99	0.25		
19.7	6	16.09	7.89	80.1	10.8	0.013	6.99	0.30		
23.0	7	16.09	7.88	80.0	10.8	0.013	6.98	0.29		
26.2	8	16.08	7.87	79.9	10.8	0.013	6.97	0.22		
29.5	9	16.08	7.86	79.8	10.8	0.013	6.97	0.24		
32.8	10	16.07	7.86	79.7	10.8	0.013	6.94	0.16		
36.1	11	16.07	7.85	79.6	10.8	0.013	6.94	0.34		
39.4	12	16.06	7.84	79.6	10.8	0.013	6.94	0.26		
42.7	13	16.06	7.83	79.4	10.8	0.013	6.91	0.28		
45.9	14	16.06	7.80	79.2	10.8	0.013	6.81	0.24		
49.2	15	16.06	7.80	79.1	10.8	0.013	6.80	0.26		
52.5	16	16.06	7.79	79.0	10.8	0.013	6.79	0.30		
55.8	17	16.06	7.78	79.0	10.8	0.013	6.77	0.15		
59.1	18	16.06	7.78	78.9	10.8	0.013	6.77	0.30		
62.3	19	16.06	7.78	78.9	10.8	0.013	6.74	0.22		
65.6	20	16.06	7.77	78.7	10.8	0.013	6.74	0.25		
68.9	21	16.05	7.76	78.7	10.8	0.013	6.72	0.24		
72.2	22	16.03	7.73	78.4	10.8	0.013	6.71	0.23		
75.5	23	16.03	7.73	78.3	10.8	0.013	6.68	0.20		
78.7	24	16.00	7.69	77.9	10.8	0.013	6.65	0.28		
82.0	25	15.99	7.65	77.5	10.8	0.013	6.60	0.26		
85.3	26	15.87	7.56	76.4	10.8	0.013	6.55	0.21		
88.6	27	15.64	7.47	75.0	10.8	0.013	6.40	0.11		
91.9	28	15.33	7.31	72.9	10.6	0.013	6.31	0.18		
95.1	29	14.12	6.99	67.8	10.2	0.013	6.07	0.08		
98.4	30	13.37	6.86	65.6	9.9	0.013	5.98	0.13		
101.7	31	12.89	6.93	65.7	9.8	0.013	6.01	0.10		
105.0	32	12.45	6.95	65.2	9.7	0.013	5.96	0.13		
108.3	33	12.25	6.98	65.1	9.6	0.013	5.97	0.23		
111.5	34	12.12	7.02	65.4	9.6	0.013	5.96	0.07		

Stillwater Sciences

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R-15-8-UVR

Reservoir - Water Quality Vertical Profiles

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
(CONTINUED)										
114.8	35	12.01	6.96	64.6	9.5	0.013	5.97	0.14		
118.1	36	11.75	6.96	64.2	9.5	0.013	5.94	0.06		
121.4	37	11.58	6.93	63.7	9.5	0.013	5.94	0.05		
124.7	38	11.42	7.02	64.2	9.4	0.013	5.93	0.12		
128.0	39	11.18	7.01	63.8	9.4	0.013	5.91	0.03		
131.2	40	10.98	7.06	64.0	9.4	0.013	5.90	0.09		
134.5	41	10.83	7.10	64.1	9.3	0.013	5.91	0.10		
137.8	42	10.66	7.17	64.5	9.3	0.013	5.92	0.06		
141.1	43	10.50	7.19	64.4	9.3	0.013	5.92	0.03		
144.4	44	10.41	7.21	64.5	9.2	0.013	5.92	0.07		
147.6	45	10.28	7.19	64.1	9.2	0.013	5.89	0.02		
150.9	46	10.17	7.19	64.0	9.2	0.013	5.89	0.04		
154.2	47	10.09	7.21	64.0	9.2	0.013	5.88	0.06		
157.5	48	9.94	7.19	63.6	9.1	0.013	5.89	0.18		
160.8	49	9.80	7.20	63.5	9.1	0.013	5.87	0.05		
164.0	50	9.68	7.18	63.2	9.1	0.013	5.87	0.07		
167.3	51	9.53	7.14	62.5	9.1	0.013	5.88	0.07		
170.6	52	9.42	7.08	61.8	9.2	0.013	5.82	0.07		
173.9	53	9.35	6.97	60.7	9.2	0.013	5.82	0.11		
177.2	54	9.26	6.88	59.8	9.2	0.013	5.81	0.09		
180.4	55	9.18	6.76	58.7	9.2	0.013	5.80	0.18		
183.7	56	9.12	6.72	58.3	9.2	0.013	5.78	0.10		
187.0	57	8.90	6.59	56.8	9.2	0.013	5.77	0.16		
190.3	58	8.78	6.49	55.8	9.2	0.013	5.76	0.10		
193.6	59	8.48	6.39	54.5	9.2	0.013	5.75	0.13		
196.8	60	8.17	6.31	53.5	9.2	0.014	5.75	0.14		
200.1	61	7.82	6.30	53.0	9.1	0.014	5.73	0.15		
203.4	62	7.12	6.54	54.2	8.9	0.014	5.76	0.10		
206.7	63	6.76	6.81	55.8	8.8	0.014	5.77	0.17		
210.0	64	6.60	6.92	56.5	8.8	0.014	5.77	0.18		
213.3	65	6.58	6.98	56.9	8.8	0.014	5.79	0.23		
216.5	66	6.53	6.99	56.9	8.8	0.014	5.79	0.14		Bottom
219.8	67									
223.1	68									
226.4	69									
229.7	70									
232.9	71									
236.2	72									

Stillwater Sciences

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

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Date: 10/27/2020
Time: 0930

Reservoir - Water Quality Vertical Profiles

Instrument used: EXO
Water depth: 53.7
Secchi (ft): 30.3

Site Location: R-15-9-IHR
Lat/Long (NAD83):

Personnel: EES, LHY

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		13.95	7.90	76.6	8.9	0.011	6.96	0.13		
3.3	1	13.95	7.89	76.4	8.9	0.011	6.87	0.13		
6.6	2	13.95	7.88	76.4	8.9	0.011	6.85	0.09		
9.8	3	13.95	7.86	76.1	8.9	0.011	6.45	0.13		
13.1	4	13.94	7.86	76.2	8.9	0.011	6.38	0.12		
16.4	5	13.94	7.85	76.1	8.9	0.011	6.32	0.15		
19.7	6	13.94	7.85	76.1	8.9	0.011	6.34	0.08		
23.0	7	13.94	7.84	76.0	8.9	0.011	6.31	0.08		
26.2	8	13.94	7.83	75.9	8.9	0.011	6.31	0.08		
29.5	9	13.94	7.82	75.8	8.9	0.011	6.32	0.07		
32.8	10	13.94	7.82	75.8	8.9	0.011	6.31	0.13		
36.1	11	13.93	7.81	75.7	8.9	0.011	6.28	0.05		
39.4	12	13.92	7.80	75.6	8.9	0.011	6.31	0.08		
42.7	13	13.90	7.80	75.5	8.9	0.011	6.32	0.15		
45.9	14	13.88	7.79	75.4	8.9	0.011	6.33	0.08		
49.2	15	12.91	6.53	62.2	9.0	0.012	6.35	0.19		Bottom
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 Sciences

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

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Date: 10/27/2020
Time: 1011

Reservoir - Water Quality Vertical Profiles

Site Location: R-1S-10-IHR
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 40.7

Secchi (ft): 30.4

Personnel: EES, LHY

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		14.03	8.03	77.9	8.8	0.011	7.01	0.05		
3.3	1	14.03	8.02	77.9	8.8	0.011	6.99	0.08		
6.6	2	14.01	8.01	77.7	8.8	0.011	6.96	0.02		
9.8	3	14.01	8.00	77.6	8.8	0.011	6.96	0.03		
13.1	4	14.00	7.99	77.5	8.8	0.011	6.95	0.06		
16.4	5	13.99	7.98	77.4	8.8	0.011	6.93	0.02		
19.7	6	13.99	7.97	77.3	8.8	0.011	6.94	0.02		
23.0	7	13.99	7.96	77.3	8.8	0.011	6.92	0.04		
26.2	8	13.99	7.95	77.1	8.8	0.011	6.91	0.03		
29.5	9	13.99	7.95	77.1	8.8	0.011	6.87	0.03		
32.8	10	13.99	7.94	77.0	8.8	0.011	6.88	0.04		
36.1	11	13.96	7.94	76.9	8.8	0.011	6.89	0.02		
39.4	12	13.93	7.94	77.0	8.8	0.011	6.88	0.10		Bottom
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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SMUD *In situ* Monitoring in the Upper American River Project and Chili Bar Project

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Date: 10/27/2020
Time: 1038

Reservoir - Water Quality Vertical Profiles

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

Instrument used: EXO
Water depth: 69

Secchi (ft): 29.7

Personnel: EES, LHY

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		14.01	8.01	77.8	8.8	0.011	6.98	0.15		
3.3	1	14.05	8.02	77.9	8.8	0.011	6.96	0.17		
6.6	2	14.04	8.01	77.8	8.8	0.011	6.95	0.18		
9.8	3	14.03	8.01	77.7	8.8	0.011	6.95	0.05		
13.1	4	14.03	8.00	77.6	8.8	0.011	6.94	0.20		
16.4	5	14.03	7.99	77.6	8.8	0.011	6.94	0.18		
19.7	6	14.02	7.99	77.5	8.8	0.011	6.94	0.12		
23.0	7	14.01	7.97	77.4	8.8	0.011	6.94	0.16		
26.2	8	14.00	7.97	77.3	8.8	0.011	6.94	0.18		
29.5	9	14.00	7.96	77.2	8.8	0.011	6.93	0.20		
32.8	10	14.06	7.95	77.1	8.8	0.011	6.94	0.17		
36.1	11	14.00	7.94	77.1	8.8	0.011	6.91	0.14		
39.4	12	13.99	7.93	76.9	8.8	0.011	6.92	0.18		
42.7	13	13.98	7.92	76.8	8.8	0.011	6.92	0.09		
45.9	14	13.97	7.91	76.7	8.8	0.011	6.93	0.19		
49.2	15	13.74	7.72	74.5	8.8	0.011	6.77	0.18		
52.5	16	11.71	5.96	54.9	8.5	0.011	6.18	0.23		
55.8	17	10.14	4.71	41.7	8.4	0.012	5.97	0.31		
59.1	18	9.35	4.71	41.1	8.1	0.012	5.93	0.29		
62.3	19	8.89	4.65	40.1	8.0	0.012	5.90	0.15		
65.6	20	8.72	4.50	38.6	8.0	0.012	5.88	0.25		Bottom
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

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Date: 10/30/2020
Time: 1150

Reservoir - Water Quality Vertical Profiles

Site Location: R-15-12-JR
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 70

Secchi (ft): 32.1

Personnel: EES, LHY

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		9.34	8.05	70.2	9.4	0.013	6.34	0.13		
3.3	1	9.03	8.04	69.6	9.2	0.013	6.30	0.07		
6.6	2	8.96	8.11	70.1	9.2	0.013	6.30	0.03		
9.8	3	8.94	8.11	70.1	9.2	0.013	6.30	0.09		
13.1	4	8.92	8.14	70.3	9.2	0.013	6.29	0.08		
16.4	5	8.89	8.15	70.4	9.2	0.013	6.29	0.08		
19.7	6	8.88	8.15	70.3	9.2	0.013	6.27	0.06		
23.0	7	8.87	8.16	70.4	9.2	0.013	6.27	0.11		
26.2	8	8.86	8.18	70.5	9.1	0.013	6.28	0.14		
29.5	9	8.79	8.26	71.1	9.2	0.013	6.30	0.12		
32.8	10	8.78	8.29	71.4	9.1	0.013	6.28	0.09		
36.1	11	8.76	8.30	71.4	9.1	0.013	6.27	0.12		
39.4	12	8.71	8.34	71.7	9.1	0.013	6.27	0.12		
42.7	13	8.71	8.35	71.7	9.1	0.013	6.27	0.09		
45.9	14	8.69	8.34	71.6	9.1	0.013	6.27	0.05		
49.2	15	8.68	8.33	71.5	9.1	0.013	6.27	0.12		
52.5	16	8.66	8.33	71.5	9.1	0.013	6.25	0.06		
55.8	17	8.62	8.36	71.7	9.1	0.013	6.21	0.11		
59.1	18	8.50	8.45	72.3	9.2	0.013	6.15	0.14		
62.3	19	8.38	8.59	73.3	9.3	0.014	6.16	0.15		
65.6	20	8.15	8.75	74.2	9.4	0.014	6.16	0.11		
68.9	21	8.10	8.67	73.4	9.5	0.014	6.12	5.47		Bottom
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

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Date: 10/30/2026
Time: 1007

Reservoir - Water Quality Vertical Profiles

Site Location: R-15-13-CR
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 22.3

Secchi (ft): 21.5 (max)

Personnel: EES, LHY

Site Notes:

Depth		Temp	DO		Conductivity	Specific Conductance	pH	Turbidity	Water Sample	Notes
(ft)	(m)	(°C)	(mg/L)	(%)	(µS/cm)	(mS/cm)	(s.u.)	(NTU)		
surface		8.79	10.70	92.1	9.4	0.014	6.50	0.09		
3.3	1	8.78	10.76	92.6	9.3	0.013	6.46	0.13		
6.6	2	8.79	10.69	92.6	9.3	0.013	6.44	0.08		
9.8	3	8.79	10.68	92.0	9.3	0.013	6.42	0.13		
13.1	4	8.80	10.68	91.9	9.3	0.013	6.40	0.07		
16.4	5	8.79	10.67	91.8	9.3	0.013	6.39	0.05		
19.7	6	8.78	10.66	91.7	9.3	0.013	6.38	0.13		
23.0	7	8.65	10.65	91.3	9.5	0.014	6.44	5.57		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									

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Date: 11/05/2020
Time: 1125

Reservoir - Water Quality Vertical Profiles

Site Location: R-I3-14-SC
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 16.4

Secchi (ft): 16.4 (max)

Personnel: AML, ECS

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		9.44	11.14	97.4	15.3	0.022	6.68	0.04		
3.3	1	9.41	11.18	97.6	15.2	0.022	6.64	0.04		
6.6	2	9.39	11.17	97.5	15.2	0.022	6.60	0.05		
9.8	3	9.38	11.18	97.6	14.2	0.021	6.60	0.03		
13.1	4	9.36	11.20	97.7	14.5	0.021	6.59	0.03		
16.4	5	9.35	11.20	97.7	14.5	0.020	6.63	0.25		
19.7	6									
23.0	7									
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									

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

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Reservoir - Water Quality Vertical Profiles

Date: 11/05/2020
Time: 1230

Site Location: R-IS-15-SC
Lat/Long (NAD83):

Instrument used: EXO
Water depth: 116

Secchi (ft): 16.1

Personnel: AML, CES

Site Notes:

Depth (ft)	Depth (m)	Temp (°C)	DO (mg/L)	DO (%)	Conductivity (µS/cm)	Specific Conductance (mS/cm)	pH (s.u.)	Turbidity (NTU)	Water Sample	Notes
surface		10.32	9.93	90.1	17.5	0.024	6.74	0.35		
3.3	1	10.62	9.98	89.5	17.3	0.024	6.70	0.47		
6.6	2	10.23	10.05	89.5	17.1	0.024	6.68	0.51		
9.8	3	10.17	10.08	89.6	17.0	0.024	6.69	0.34		
13.1	4	10.13	10.03	89.5	17.0	0.024	6.67	0.41		
16.4	5	10.10	10.07	89.9	17.0	0.024	6.67	0.98		
19.7	6	10.09	10.06	89.3	17.0	0.024	6.65	0.46		
23.0	7	10.07	10.07	89.3	16.9	0.024	6.64	0.46		
26.2	8	10.06	10.06	89.2	16.8	0.025	6.57	0.44		
29.5	9	10.04	10.05	89.2	16.7	0.023	6.44	0.22		
32.8	10	10.03	10.06	89.2	16.6	0.023	6.40	0.35		
36.1	11	10.06	10.08	89.4	16.5	0.023	6.40	0.52		
39.4	12	9.92	10.14	89.7	16.1	0.023	6.39	0.34		
42.7	13	9.84	10.15	89.6	15.9	0.022	6.36	0.39		
45.9	14	9.82	10.12	89.2	16.0	0.025	6.34	0.56		
49.2	15	9.80	10.12	89.2	15.9	0.022	6.32	0.41		
52.5	16	9.78	10.18	89.7	15.6	0.022	6.32	0.47		
55.8	17	9.77	10.21	90.0	15.6	0.022	6.33	0.43		
59.1	18	9.77	10.23	90.1	15.5	0.022	6.33	0.33		
62.3	19	9.75	10.25	90.4	15.4	0.022	6.33	0.30		
65.6	20	9.74	10.28	90.5	15.3	0.022	6.34	0.26		
68.9	21	9.72	10.31	90.7	15.2	0.022	6.34	0.31		
72.2	22	9.72	10.32	90.8	15.2	0.021	6.34	0.26		
75.5	23	9.71	10.36	91.2	15.1	0.021	6.33	0.33		
78.7	24	9.69	10.40	91.5	14.9	0.021	6.33	0.27		
82.0	25	9.66	10.43	91.7	14.8	0.021	6.31	0.36		
85.3	26	9.65	10.43	91.6	14.8	0.021	6.31	0.36		
88.6	27	9.64	10.43	91.7	14.7	0.021	6.31	0.42		
91.9	28	9.63	10.43	91.6	14.7	0.021	6.31	0.42		
95.1	29	9.60	10.47	91.9	14.5	0.021	6.33	0.39		
98.4	30	9.58	10.47	91.9	14.3	0.020	6.31	0.36		
101.7	31	9.55	10.44	91.5	14.1	0.020	6.30	0.74		
105.0	32	9.53	10.41	91.2	14.0	0.020	6.30	1.00		
108.3	33	9.54	10.07	87.7	14.5	0.021	6.21	525.02		bottom
111.5	34									

APPENDIX E
In situ Field Calibration Sheets

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Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: UARP WINTER WQ SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 1/22-24/2020

PRE-SAMPLING CALIBRATION

Date and time 1/22/2020 0520 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	16.45	978	1000	
Cond (uS/cm @ 25°C)	1,413	16.57	—	1447	
DO (%)	~100.5	16.59	100.8	100.8	766.4 mm Hg
DO (mg/L)*	~9.8	16.59	—	9.82	Check solubility table*
pH4	pH4	16.6	4.30	4.00	
pH 7	pH 7	16.3	7.16	7.04	
pH 10	pH 10	16.5	10.25	10.10	
Turbidity	0.0	14.6	-0.08	0.0	
Turbidity	12.4	15.6	12.24	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 1/22/2020 1600 Name ERIC SOMMERAUER

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	16.77	985	N		A	
Cond (uS/cm @ 25°C)	1,413	17.10	1438	N		A	
DO (%)	~94.5	16.52	95.5	N		A	717.4 mm Hg
*DO (mg/L)	~9.2	16.52	9.31	N		A	Check solubility table*
pH4	pH 4	17.53	3.92	N		A	
pH 7	pH 7	17.11	6.89	N		A	
pH 10	pH 10	17.43	10.02	N		A	
Turbidity	0.0	12.32	-0.02	N		A	
Turbidity	12.4	12.42	12.24	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	% 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%

Ver. 01/2016

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Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: UARP WINTER WQ SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 1/22–24/2020

PRE-SAMPLING CALIBRATION

Date and time 1/23/2020 0700 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	15.5	1023	1000	
Cond (uS/cm @ 25°C)	1,413	14.7	—	1407	
DO (%)	~94.5	16.8	93.8	94.4	717.8 mm Hg
DO (mg/L)*	~9.1	16.8	—	9.18	*Check solubility table*
pH4	pH4	16.7	3.86	4.00	
pH 7	pH 7	16.3	6.88	7.04	
pH 10	pH 10	15.1	10.08	10.12	
Turbidity	0.0	16.8	-0.30	0.00	
Turbidity	12.41	17.2	11.87	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 1/23/2020 1700 Name ERIC SOMMERAUER

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	18.23	983	N		A	
Cond (uS/cm @ 25°C)	1,413	18.25	1366	N		A	
DO (%)	~94	12.41	95.4	N		A	
*DO (mg/L)	~10.0	12.41	10.17	N		A	*Check solubility table*
pH4	pH 4	17.19	4.06	N		A	715.5 mm Hg
pH 7	pH 7	17.86	7.02	N		A	
pH 10	pH 10	17.85	10.07	N		A	
Turbidity	0	17.82	0.04	N		A	
Turbidity	12.4	16.90	12.58	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	% 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%

Ver. 01/2016

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Water Quality YSI 6920 Sonde Calibration – Daily Use

Project: UARP WINTER WQ SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 1/22 – 24/2020

PRE-SAMPLING CALIBRATION

Date and time 1/24/20 0630 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	18.99	980	1000	
Cond (uS/cm @ 25°C)	1,413	16.54	—	1440	
DO (%)	94	17.8	93.9	94.2	
DO (mg/L)*	~9.0	17.8	~	8.98	*Check solubility table**
pH4	pH4	18.9	4.08	4.00	715.9 mm Hg
pH 7	pH 7	19.0	7.03	7.03	
pH 10	pH 10	19.1	10.09	10.07	
Turbidity	0.0	17.3	0.00	0.00	
Turbidity	12.4	17.7	12.76	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 1/24/2020 1600 Name ERIC SOMMERAUER

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	19.1	1015	N		A	
Cond (uS/cm @ 25°C)	1,413	18.8	1424	N		A	
DO (%)	~100.5	17.5	100.2	N		A	
*DO (mg/L)	~9.6	17.5	9.59	N		A	*Check solubility table**
pH4	pH 4	19.2	4.01	N		A	764.0 mm Hg
pH 7	pH 7	18.9	6.99	N		A	
pH 10	pH 10	18.9	10.08	N		A	
Turbidity	0.0	16.0	0.09	N		A	
Turbidity	12.4	18.8	12.46	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	% 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 IN SITU WATER QUALITY SPRING SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 5/19–29/2020

PRE-SAMPLING CALIBRATION

Date and time 5/19/2020 0615 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	20.6	1008	1000	
Cond (uS/cm @ 25°C)	1,413	20.7	—	1395	
DO (%)	100	19.8	98.4	100.0	760.2 mm Hg
DO (mg/L)*	9.1	19.8	—	9.13	Check solubility table*
pH4	pH4	20.5	4.10	4.00	
pH 7	pH 7	20.8	7.00	7.02	
pH 10	pH 10	20.4	10.11	10.05	
Turbidity	0.0	20.9	-0.08	0.00	
Turbidity	12.4	21.0	12.30	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/19/2020 1718 Name ERIC SOMMERAUER

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	22.49	982	N		A	
Cond (uS/cm @ 25°C)	1,413	21.76	1393	N		A	
DO (%)	100	17.17	102.1	N		A	760.2 mm Hg
*DO (mg/L)	9.6	17.17	9.84	N		A	Check solubility table*
pH4	pH 4	21.36	4.06	N		A	
pH 7	pH 7	21.29	7.00	N		A	
pH 10	pH 10	21.87	10.02	N		A	
Turbidity	0.0	21.17	0.02	N		A	
Turbidity	12.4	21.39	12.34	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	% 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 UN STU WATER QUALITY SPRING SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 5/19-29/2020

PRE-SAMPLING CALIBRATION

Date and time 5/20/2020 0530 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	20.4	989	1000	
Cond (uS/cm @ 25°C)	1,413	20.0	–	1400	
DO (%)	100	18.6	101.9	100.4	
DO (mg/L)*	9.3	18.6	–	9.37	*Check solubility table**
pH4	pH4	20.4	4.01	4.00	762.8 mm Hg
pH 7	pH 7	20.5	7.03	7.02	
pH 10	pH 10	20.8	10.00	10.05	
Turbidity	0.0	19.8	-0.03	0.00	
Turbidity	12.4	20.9	12.32	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/20/2020 1700 Name ERIC SOMMERAUER

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	23.70	1000	N		A	
Cond (uS/cm @ 25°C)	1,413	24.30	1409	N		A	
DO (%)	100	21.02	99.6	N		A	761.7 mm Hg
*DO (mg/L)	8.9	21.04	8.88	N		A	*Check solubility table**
pH4	pH 4	23.49	4.06	N		A	
pH 7	pH 7	23.78	7.04	N		A	
pH 10	pH 10	23.95	10.06	N		A	
Turbidity	0.0	22.62	0.05	N		A	
Turbidity	12.4	23.89	12.419	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	% 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 IN SITU WATER QUALITY SPRING SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 5/19-29/2020

PRE-SAMPLING CALIBRATION

Date and time 5/20/2020 2035 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	23.72	1020	1000	
Cond (uS/cm @ 25°C)	1,413	23.78	—	1409	
DO (%)	100	19.0	99.2	100.2	761.7 mm Hg
DO (mg/L)*	9.3	19.0	—	9.31	*Check solubility table**
pH4	pH4	23.1	4.05	4.00	
pH 7	pH 7	22.7	7.03	7.01	
pH 10	pH 10	23.7	10.10	10.02	
Turbidity	0.0	23.5	0.11	0.00	
Turbidity	12.4	24.4	12.38	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/21/20 1700 Name ERIC SOMMERAUER

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	25.89	984	N		A	
Cond (uS/cm @ 25°C)	1,413	25.71	1391	N		A	
DO (%)	100	23.97	100.9	N		A	758.0 mm Hg
*DO (mg/L)	8.4	23.97	8.48	N		A	*Check solubility table**
pH4	pH 4	24.89	4.12	N		A	
pH 7	pH 7	24.39	7.05	N		A	
pH 10	pH 10	24.85	10.06	N		A	
Turbidity	0.0	22.11	0.03	N		A	
Turbidity	12.4	24.13	12.46	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	% 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 IN SITU WATER QUALITY SPRING SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 5/19-29/2020

PRE-SAMPLING CALIBRATION

Date and time 5/22/2020 0600 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	19.9	1002	1000	
Cond (uS/cm @ 25°C)	1,413	18.99	—	1409	757.6 mm Hg
DO (%)	100	17.8	100.5	99.7	
DO (mg/L)*	9.4	17.8	—	9.47	*Check solubility table**
pH4	pH4	18.3	4.08	4.00	
pH 7	pH 7	18.9	7.11	7.03	
pH 10	pH 10	19.1	10.12	10.07	
Turbidity	0.0	21.3	0.03	0.00	
Turbidity	12.4	21.4	12.65	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/22/2020 1530 Name ERIC SOMMERAUER

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	21.98	998	N		A	
Cond (uS/cm @ 25°C)	1,413	22.12	1410	N		A	
DO (%)	100	20.70	99.6	N		A	757.6 mm Hg
*DO (mg/L)	8.9	20.70	8.92	N		A	*Check solubility table**
pH4	pH 4	22.95	4.00	N		A	
pH 7	pH 7	22.57	6.98	N		A	
pH 10	pH 10	22.32	10.11	N		A	
Turbidity	0.0	20.62	0.07	N		A	
Turbidity	12.4	22.78	12.48	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	% 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 2020 IN SITU WATER QUALITY SPRING SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 5/19/2020 – 5/29/2020

PRE-SAMPLING CALIBRATION

Date and time 5/26/2020 0520 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	26.92	994	1000	
Cond (uS/cm @ 25°C)	1,413	25.92	—	1410	
DO (%)	99.5	27.28	98.6	99.5	
DO (mg/L)*	7.9	27.28	—	7.91	*Check solubility table**
pH4	pH4	26.3	4.25	4.01	756.4 mm Hg
pH 7	pH 7	25.8	7.25	7.00	
pH 10	pH 10	27.9	10.33	9.97	
Turbidity	0.0	24.4	0.00	0.00	
Turbidity	12.4	26.3	12.23	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/26/2020 2005 Name ERIC SOMMERAUER

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	32.24	1003	N		A	
Cond (uS/cm @ 25°C)	1,413	32.60	1377	N		A	
DO (%)	99.5	33.20	98.7	N		A	
*DO (mg/L)	7.1	33.20	7.04	N		A	*Check solubility table**
pH4	pH 4	32.64	3.78	N		Q	754.9 mm Hg
pH 7	pH 7	31.76	6.70	N		Q	
pH 10	pH 10	31.44	9.72	N		Q	
Turbidity	0.0	19.84	0.02	N		A	
Turbidity	12.4	32.12	12.32	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	% 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 IN SITU WATER QUALITY SPRING SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 5/19/2020 — 5/29/2020

PRE-SAMPLING CALIBRATION

Date and time 5/26/2020 0545 Name ERIC SOMMERVILLE

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	27.7	1000	1000	
Cond (uS/cm @ 25°C)	1,413	28.6	—	1409	
DO (%)	99.5	33.30	99.5	99.3	
DO (mg/L)*	7.1	33.30	7.11	7.10	*Check solubility table**
pH4	pH4	29.2	3.31	4.01	755.0 mm Hg
pH 7	pH 7	29.0	6.27	6.99	NEW PH sensor
pH 10	pH 10	28.7	9.32	9.96	
Turbidity	0.0	26.2	0.04	0.00	
Turbidity	12.4	29.1	12.33	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/27/2020 1810 Name ERIC SOMMERVILLE

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	31.59	1005	N		A	
Cond (uS/cm @ 25°C)	1,413	31.72	1440	N		A	
DO (%)	99.5	29.35	100.1	N		A	
*DO (mg/L)	7.5	29.35	7.65	N		A	*Check solubility table**
pH4	pH 4	32.31	4.07	N		A	755.5
pH 7	pH 7	32.58	7.02	N		A	
pH 10	pH 10	32.23	9.92	N		A	
Turbidity	0.0	26.33	0.02	N		A	
Turbidity	12.4	31.48	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	% 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 IN SITU WATER QUALITY SPRING SURVEYS

Unit ID: YSI EXO

Sampling Event Date(s): 5/19/2020 – 5/29/2020

PRE-SAMPLING CALIBRATION

Date and time 5/28/2020 0600 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	25.68	1002	1000	
Cond (uS/cm @ 25°C)	1,413		–	1409	
DO (%)	99.5	23.03	100.5	99.6	
DO (mg/L)*	~8.55	23.03	–	8.54	*Check solubility table**
pH4	pH4	23.4	4.10	4.00	756.9 mm Hg
pH 7	pH 7	24.1	7.09	7.01	
pH 10	pH 10	23.8	10.13	10.01	
Turbidity	0.0	25.9	0.05	0.00	
Turbidity	12.4	26.1	12.74	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/28/2020 2000 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Post-Sampling Value	Re-Cal Yes or No?	Post-Cal Value	MQO Code[1]	Notes
Cond (mS/cm @ 25°C)	1,000	27.36	0.999	N		A	
Cond (uS/cm @ 25°C)	1,413	27.00	1398	N		A	
DO (%)	~99.5	29.24	99.0	N		A	
*DO (mg/L)	~7.6	29.24	7.59	N		A	*Check solubility table**
pH4	pH 4	27.74	4.05	N		A	755.1 mm Hg
pH 7	pH 7	26.71	6.98	N		A	
pH 10	pH 10	26.75	10.01	N		A	
Turbidity	0.0	25.82	0.03	N		A	
Turbidity	12.4	27.08	12.40	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	% 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 IN SITU WATER QUALITY SPRING SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 5/19/2020 → 5/29/2020

PRE-SAMPLING CALIBRATION

Date and time 5/28/2020 2040 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	26.20	999	1000	
Cond (uS/cm @ 25°C)	1,413	26.11	—	1409	
DO (%)	~99.5	25.55	98.9	99.4	755.4 mm Hg
DO (mg/L)*	8.1	25.55	—	8.12	Check solubility table*
pH4	pH4	26.5	4.08	4.01	
pH 7	pH 7	26.8	7.03	7.00	
pH 10	pH 10	26.7	10.09	9.98	
Turbidity	0.0	25.5	-0.13	0.00	
Turbidity	12.4	26.6	12.65	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 5/29/2020 2030 Name ERIC SOMMERAUER

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	23.46	1002	N		A	
Cond (uS/cm @ 25°C)	1,413	23.48	1405	N		A	
DO (%)	~99.5	23.47	99.5	N		A	752.00 mm Hg
*DO (mg/L)	~8.5	23.47	8.46	N		A	Check solubility table*
pH4	pH 4	23.74	4.03	N		A	
pH 7	pH 7	23.70	6.93	N		A	
pH 10	pH 10	23.51	10.01	N		A	
Turbidity	0.0	23.49	0.04	N		A	
Turbidity	12.4	23.26	12.42	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	% 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 WQ INSTM SUMMER RIVERINE WQ

Unit ID: YSI EXO

Sampling Event Date(s): 8/3 – 6 / 2020

PRE-SAMPLING CALIBRATION

Date and time 8/2/20 2130 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	22.9	1005	1000	
Cond (uS/cm @ 25°C)	1,413	23.0	—	1409	
DO (%)	~100	23.2	101.3	100.0	
DO (mg/L)*	~8.6	23.2	8.86	8.52	Check solubility table* 758.8
pH4	pH4	23.0	3.96	4.00	
pH 7	pH 7	22.8	7.04	7.01	
pH 10	pH 10	22.9	10.30	10.03	
Turbidity	0.0	24.9	-0.02	0.00	
Turbidity	12.4	26.5	10.19	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 8/3/20 2035 Name ERIC SOMMERAUER

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	25.5	1000	N		A	
Cond (uS/cm @ 25°C)	1,413	25.2	1403	N		A	
DO (%)	~100	26.6	99.2	N		A	
*DO (mg/L)	8.0	26.6	7.96	N		A	Check solubility table*
pH4	pH 4	24.9	4.14	N		A	758.1
pH 7	pH 7	25.4	7.06	N		A	
pH 10	pH 10	25.1	10.07	N		A	
Turbidity	0.0	25.8	0.03	N		A	
Turbidity	12.4	24.9	12.49	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	% 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 WQ IN SITU RIVERINE SURVEY

Unit ID: YSI EXO

Sampling Event Date(s): 8/3-6 /2020

PRE-SAMPLING CALIBRATION

Date and time 8/3/20 2230 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	24.8	1004	1000	
Cond (uS/cm @ 25°C)	1,413	24.8	—	1408	
DO (%)	~100	24.3	99.8	99.8	
DO (mg/L)*	~8.4	24.3	—	8.36	Check solubility table* 758.2 mm Hg
pH4	pH4	23.8	4.15	4.00	
pH 7	pH 7	24.5	7.01	7.01	
pH 10	pH 10	24.5	10.04	10.01	
Turbidity	0.0	25.6	0.07	0.00	
Turbidity	12.4	25.2	12.44	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 8/4/20 1815 Name ERIC SOMMERAUER

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	25.9	1001	N		A	
Cond (uS/cm @ 25°C)	1,413	26.0	1404	N		A	
DO (%)	~99.5	26.5	99.2	N		A	756.1 mm Hg
*DO (mg/L)	~8.0	26.5	8.1	N		A	Check solubility table*
pH4	pH 4	24.6	3.99	N		A	
pH 7	pH 7	25.5	6.96	N		A	
pH 10	pH 10	25.8	10.07	N		A	
Turbidity	0.0	24.9	0.02	N		A	
Turbidity	12.4	25.8	12.44	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	% 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 WQ IN SITU RIVERINE

Unit ID: YSI EXO

Sampling Event Date(s): 8/3-6/2020

PRE-SAMPLING CALIBRATION

Date and time 8/5/2020 0500 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	23.1	999	1000	
Cond (uS/cm @ 25°C)	1,413	22.9	—	1412	
DO (%)	~100	22.9	99.4	99.7	757.5 mm Hg
DO (mg/L)*	8.6	22.9	—	8.56	*Check solubility table*
pH4	pH4	22.6	4.01	4.00	
pH 7	pH 7	22.9	6.93	7.01	
pH 10	pH 10	22.6	10.10	10.03	
Turbidity	0.0	24.0	-0.15	0.0	
Turbidity	12.4	22.5	12.40	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 8/5/2020 2100 Name ERIC SOMMERAUER

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	23.6	1001	N		A	
Cond (uS/cm @ 25°C)	1,413	23.7	1402	N		A	
DO (%)	~100	25.4	100.0	N		A	
*DO (mg/L)	~8.2	25.4	8.20	N		A	*Check solubility table*
pH4	pH 4	24.2	4.06	N		A	757.4 mm Hg
pH 7	pH 7	24.0	7.01	N		A	
pH 10	pH 10	24.0	10.07	N		A	
Turbidity	0.0	23.5	0.01	N		A	
Turbidity	12.4	23.8	12.48	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	% 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 SUMMER IN SITU RIVERINE

Unit ID: YSI EXO

Sampling Event Date(s): 8/3-6/2020

PRE-SAMPLING CALIBRATION

Date and time 8/6/2020 0500 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	22.2	998	1000	
Cond (uS/cm @ 25°C)	1,413	22.1	—	1417	
DO (%)	~100	21.8	100.0	99.6	757.3 mm Hg
DO (mg/L)*	~8.7	21.8	—	8.74	*Check solubility table**
pH4	pH4	22.2	4.36	4.00	
pH 7	pH 7	22.0	7.28	7.01	
pH 10	pH 10	23.3	10.37	10.02	
Turbidity	0.0	22.8	0.11	0.00	
Turbidity	12.4	23.0	12.67	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 8/6/2020 2130 Name ERIC SOMMERAUER

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	26.0	1002	N		A	
Cond (uS/cm @ 25°C)	1,413	26.1	1415	N		A	
DO (%)	~99.5	23.5	99.3	N		A	
*DO (mg/L)	~8.4	23.5	8.44	N		A	*Check solubility table**
pH4	pH 4	25.9	4.07	N		A	756.4 mm Hg
pH 7	pH 7	26.9	7.02	N		A	
pH 10	pH 10	26.1	10.08	N		A	
Turbidity	0.0	24.2	-0.02	N		A	
Turbidity	12.4	25.6	1226	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	% 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 WQ

Unit ID: EXO FALL

Sampling Event Date(s): 10/27 - 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 10/27/2020 0822 Name Eric Sommerauer

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	14.91	1003	1000	
Cond (uS/cm @ 25°C)	1,413		—	1418	
DO (%)	~82.5	16.8	84.9	82.4	
DO (mg/L)*	~7.9	16.8	8.23	8.00	*Check solubility table**
pH4	pH4	15.6	4.12	4.00	626.1 muddy
pH 7	pH 7	16.0	7.04	7.04	
pH 10	pH 10	15.5	9.86	10.12	
Turbidity	0.0	14.7	0.07	0.00	
Turbidity	12.4	14.6	12.69	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 10/27/2020 1620 Name ERIC SOMMERAUER

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	998	N		A	
Cond (uS/cm @ 25°C)	1,413	19.88	1408	N		A	
DO (%)	~100	20.98	97.8	N		A	
*DO (mg/L)	~8.9	20.98	8.71	N		A	*Check solubility table**
pH4	pH 4	19.32	3.92	N		A	761.3
pH 7	pH 7	19.59	7.06	N		A	
pH 10	pH 10	19.43	10.04	N		A	
Turbidity	0.0	20.05	0.05	N		A	
Turbidity	12.4	19.72	12.55	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	% 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 WQ

Unit ID: EX 0

Sampling Event Date(s): 10/27 – 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 10/27/2020 1655 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	17.96	996	1000	
Cond (uS/cm @ 25°C)	1,413	18.27	—	1419	
DO (%)	~100	19.69	97.9	100.2	761.4 mm Hg
DO (mg/L)*	~9.2	19.92	—	9.17	*Check solubility table**
pH4	pH4	19.5	3.95	4.00	
pH 7	pH 7	18.0	7.02	7.03	
pH 10	pH 10	17.8	10.10	10.09	
Turbidity	0.0	20.8	-0.11	0.00	
Turbidity	12.4	20.5	12.56	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 10/28/2020 1800 Name ERIC SOMMERAUER

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	22.94	998	N		A	
Cond (uS/cm @ 25°C)	1,413	23.06	1409	N		A	
DO (%)	~100	20.86	100.1	N		A	
*DO (mg/L)	~8.9	20.86	8.94	N		A	*Check solubility table**
pH4	pH 4	22.47	4.09	N		A	761.2 mm Hg
pH 7	pH 7	22.76	7.11	N		A	
pH 10	pH 10	22.72	10.16	N		A	
Turbidity	0.0	20.83	0.02	N		A	
Turbidity	12.4	20.95	12.39	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	% 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 WQ

Unit ID: EXO

Sampling Event Date(s): 10/27 – 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 10/29/2020 0845 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	14.77	995	1000	
Cond (uS/cm @ 25°C)	1,413	15.04	–	1405	
DO (%)	~80	17.2	80.1	79.9	607.2
DO (mg/L)*	~7.7	17.2	–	7.73	*Check solubility table**
pH4	pH4	16.9	4.07	4.00	
pH 7	pH 7	14.4	7.17	7.05	
pH 10	pH 10	15.3	10.15	10.12	
Turbidity	0.0	12.8	0.21	0.00	
Turbidity	12.4	16.7	12.13	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 10/29/2020 1815 Name ERIC SOMMERAUER

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	19.62	999	N		A	
Cond (uS/cm @ 25°C)	1,413	19.47	1409	N		A	
DO (%)	~80	21.19	81.6	N		A	605.0
*DO (mg/L)	~7.0	21.19	7.20	N		A	*Check solubility table**
pH4	pH 4	19.81	4.05	N		A	
pH 7	pH 7	19.16	7.10	N		A	
pH 10	pH 10	18.08	10.03	N		A	
Turbidity	0.0	18.01	0.05	N		A	
Turbidity	12.4	17.96	12.38	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	% 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 WQ

Unit ID: EXO

Sampling Event Date(s): 10/27- 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 10/30/2020 0733 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	14.57	1009	1000	
Cond (uS/cm @ 25°C)	1,413	10.34	–	1409	
DO (%)	~ 88	14.62	88.8	88.3	
DO (mg/L)*	~8.9	14.51	–	8.9	*Check solubility table**
pH4	pH4	15.9	4.08	4.00	671.4 mm Hg
pH 7	pH 7	15.2	7.07	7.04	
pH 10	pH 10	15.1	9.98	10.12	
Turbidity	0.0	15.5	-0.15	0.0	
Turbidity	12.4	13.5	12.60	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 10/30/2020 1617 Name ERIC SOMMERAUER

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	19.48	995	N		A	
Cond (uS/cm @ 25°C)	1,413	18.95	1366	N		A	
DO (%)	~88	24.416	87.5	N		A	
*DO (mg/L)	~7.3	24.44	7.31	N		A	*Check solubility table**
pH4	pH 4	22.78	3.91	N		A	669.8 mm Hg
pH 7	pH 7	20.02	7.08	N		A	
pH 10	pH 10	18.63	10.16	N		A	
Turbidity	0.0	20.44	0.04	N		A	
Turbidity	12.4	18.57	12.54	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	% 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 WQ

Unit ID: YSI EXO

Sampling Event Date(s): 10/27- 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 11/2/2020 0800 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	16.15	992	1000	
Cond (uS/cm @ 25°C)	1,413	15.78	—	1408	
DO (%)	~89	17.1	90.3	88.6	673.2
DO (mg/L)*	8.5	17.1	—	8.54	*Check solubility table**
pH4	pH4	18.0	3.97	4.00	
pH 7	pH 7	17.6	7.16	7.03	
pH 10	pH 10	15.6	10.13	10.11	
Turbidity	0.0	15.7	0.14	0.0	
Turbidity	12.4	15.2	12.61	12.4	

POST-SAMPLING CALIBRATION CHECK

Date and time 11/2/2020 2020 Name ERIC SOMMERAUER

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	17.67	1001	N		A	
Cond (uS/cm @ 25°C)	1,413	17.34	1418	N		A	
DO (%)	~100	18.02	98.7	N		A	
*DO (mg/L)	~9.4	18.02	9.23	N		A	*Check solubility table**
pH4	pH 4	17.45	3.96	N		A	762.4
pH 7	pH 7	17.57	7.07	N		A	
pH 10	pH 10	17.61	10.08	N		A	
Turbidity	0.0	19.82	0.01	N		A	
Turbidity	12.4	19.64	12.36	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	% 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 WQ

Unit ID: YSI EXO

Sampling Event Date(s): 10/27 – 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 11/3/2020 0905 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	17.75	1003	1000	
Cond (uS/cm @ 25°C)	1,413	17.91	—	1397	
DO (%)	~94	19.0	92.1	94.1	715.3 mm/hg
DO (mg/L)*	8.7	18.91	—	8.74	*Check solubility table**
pH4	pH4	19.2	4.06	4.00	
pH 7	pH 7	18.6	7.11	7.03	
pH 10	pH 10	17.9	10.10	10.09	
Turbidity	0.0	17.5	-0.09	0.0	
Turbidity	12.4	17.9	11.92	12.4	

POST-SAMPLING CALIBRATION CHECK

Date and time 11/3/2020 1524 Name ERIC SOMMERAUER

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	18.96	999	N		A	
Cond (uS/cm @ 25°C)	1,413	18.12	1402	N		A	
DO (%)	~84	15.40	85.1	N		A	
*DO (mg/L)	~8.3	15.56	8.48	N		A	*Check solubility table**
pH4	pH 4	21.15	3.93	N		A	634.8
pH 7	pH 7	22.21	7.00	N		A	
pH 10	pH 10	22.11	10.16	N		A	
Turbidity	0.0	22.81	-0.02	N		A	
Turbidity	12.4	22.96	12.31	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	% 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 UA

Unit ID: YSI EXO

Sampling Event Date(s): 10/27/2020 ~ 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 11/4/2020 0849 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	16.17	1011	1000	
Cond (uS/cm @ 25°C)	1,413	16.25	—	1398	
DO (%)	~85.5	17.7	86.0	85.7	
DO (mg/L)*	~8.1	17.6	—	8.19	Check solubility table*
pH4	pH4	16.9	3.92	4.00	651.1 mm Hg
pH 7	pH 7	16.8	7.09	7.04	
pH 10	pH 10	16.7	10.19	10.10	
Turbidity	0.0	16.6	0.02	0.00	
Turbidity	12.4	15.7	12.44	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 11/4/2020 1515 Name ERIC SOMMERAUER

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	19.77	1004	N		A	
Cond (uS/cm @ 25°C)	1,413	18.44	1392	N		A	
DO (%)	~83	13.73	84.8	N		A	630.8 mm Hg
*DO (mg/L)	~8.7	13.73	8.79	N		A	Check solubility table*
pH4	pH 4	17.54	4.02	N		A	
pH 7	pH 7	18.36	7.00	N		A	
pH 10	pH 10	19.00	10.07	N		A	
Turbidity	0.00	19.18	0.01	N		A	
Turbidity	12.4	19.69	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	% 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 WQ

Unit ID: YSI EXO

Sampling Event Date(s): 10/27 - 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 11/5/2020 1050 Name ERIC SOMMERAUER

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	18.74	1000	1000	
Cond (uS/cm @ 25°C)	1,413	18.60	—	1410	
DO (%)	~94	18.6	94.6	94.3	
DO (mg/L)*	~8.8	18.7	—	8.82	*Check solubility table**
pH4	pH4	19.0	4.02	4.00	716.3 mm Hg
pH 7	pH 7	18.8	6.97	7.03	
pH 10	pH 10	19.1	9.88	10.07	
Turbidity	0.0	19.1	-0.07	0.00	
Turbidity	12.4	18.6	12.38	12.40	

POST-SAMPLING CALIBRATION CHECK

Date and time 11/5/2020 1615 Name ERIC SOMMERAUER

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	21.15	1006	N		A	
Cond (uS/cm @ 25°C)	1,413	21.84	1391	N		A	
DO (%)	~100	21.57	99.6	N		A	759.3 mm Hg
*DO (mg/L)	8.8	21.57	8.79	N		A	*Check solubility table**
pH4	pH 4	21.57	3.90	N		A	
pH 7	pH 7	21.09	6.98	N		A	
pH 10	pH 10	21.65	9.95	N		A	
Turbidity	0.0	21.39	0.04	N		A	
Turbidity	12.4	24.27	12.42	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	% 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 WQ

Unit ID: YSI EXO

Sampling Event Date(s): 10/27 - 11/6/2020

PRE-SAMPLING CALIBRATION

Date and time 11/6/2020 0820 Name 2020

Parameter	Std. Value	Std. Temp (°C)	Pre-Cal Value	Post-Cal Value	Notes
Cond (uS/cm @ 25°C)	1,000	17.58	996	1000	
Cond (uS/cm @ 25°C)	1,413	17.27	–	1407	
DO (%)	~96	18.7	95.4	95.7	727.4 mm Hg
DO (mg/L)*	8.9	18.75	–	8.93	*Check solubility table*
pH4	pH4	18.8	3.97	4.00	
pH 7	pH 7	18.7	7.08	7.03	
pH 10	pH 10	18.0	10.27	10.08	
Turbidity	0.0	20.1	-0.13	0.0	
Turbidity	12.4	19.5	12.35	12.4	

POST-SAMPLING CALIBRATION CHECK

Date and time 11/6/2020 1700 Name ERIC SOMMERAUER

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	19.94	1004	N		A	
Cond (uS/cm @ 25°C)	1,413	20.08	1400	N		A	
DO (%)	~99	19.77	98.9	N		A	751.8
*DO (mg/L)	~8.9	19.77	9.04	N		A	*Check solubility table*
pH4	pH 4	20.08	4.02	N		A	
pH 7	pH 7	20.09	6.96	N		A	
pH 10	pH 10	19.80	10.11	N		A	
Turbidity	0.0	18.51	0.02	N		A	
Turbidity	12.4	19.71	12.46	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	% 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%

Ver. 01/2016

APPENDIX F
Analytical Laboratory Bacteria Reports

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CALIFORNIA LABORATORY SERVICES
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 06/25/20 13:43

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 20F1013
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-7-UVR (20F1013-01) Water	**Sampled: 06/18/20 08:55**	**Received: 06/18/20 14:20**							
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2004801	06/18/20 14:40	06/21/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2004812	06/18/20 14:30	06/19/20	SM9223	
Bac-8-UVR (20F1013-02) Water	**Sampled: 06/18/20 09:20**	**Received: 06/18/20 14:20**							
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2004801	06/18/20 14:40	06/21/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2004812	06/18/20 14:30	06/19/20	SM9223	
Bac-6-GCR (20F1013-03) Water	**Sampled: 06/18/20 09:55**	**Received: 06/18/20 14:20**							
Fecal Coliforms	**4.5**	1.8	MPN/100 mL	1	2004801	06/18/20 14:40	06/21/20	SM 9221	
E. Coli	**2.0**	1.0	"	"	2004812	06/18/20 14:30	06/19/20	SM9223	
Bac-5-GCR (20F1013-04) Water	**Sampled: 06/18/20 10:15**	**Received: 06/18/20 14:20**							
Fecal Coliforms	**7.8**	1.8	MPN/100 mL	1	2004801	06/18/20 14:40	06/21/20	SM 9221	
E. Coli	**5.2**	1.0	"	"	2004812	06/18/20 14:30	06/19/20	SM9223	
Bac-10-UVR (20F1013-05) Water	**Sampled: 06/18/20 10:45**	**Received: 06/18/20 14:20**							
Fecal Coliforms	**4.5**	1.8	MPN/100 mL	1	2004801	06/18/20 14:40	06/21/20	SM 9221	
E. Coli	<1	1.0	"	"	2004812	06/18/20 14:30	06/19/20	SM9223	
Bac-9-UVR (20F1013-06) Water	**Sampled: 06/18/20 11:15**	**Received: 06/18/20 14:20**							
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2004801	06/18/20 14:40	06/21/20	SM 9221	
E. Coli	**2.0**	1.0	"	"	2004812	06/18/20 14:30	06/19/20	SM9223	

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Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 20F1613 (1 of 1)

Report To:
Stillwater Sciences
2855 Telegraph Ave. Suite 400
Berkeley, CA 94705
Project Manager: Emily Applequist eapplequist@stillwatersci.com
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring
Sampled By: Emily Applequist, Pat Kearse
Job Description: Monitor seasonal bacteria levels in UARP reaches
Site Location: UARP

Client Job Number: 750.10 Task 0400.02
Destination Laboratory: Rancho Cordova
[x] CLS (916) 638-7301, 3249 Fitzgerald Road, Rancho Cordova, CA 95742, www.californialab.com
[ ] OTHER

ANALYSIS REQUESTED: Fecal coliform-15 Tube; E. coli Quanti-tray; PRESERVATIVES

GEOTRACKER
EDF REPORT YES [x] NO [ ]
GLOBAL ID:
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS 1	2	3	5	SPECIAL INSTRUCTIONS
6/18/20	0855	Bac-7-UVR		Surface water			6	X	X				X	
6/18/20	0920	Bac-8-UVR		Surface water			6	X	X				X	
6/18/20	0955	Bac-6-GCR		Surface water			6	X	X				X	
6/18/20	1015	Bac-5-GCR		Surface water			6	X	X				X	
6/18/20	1045	Bac-10-UVR		Surface water			6	X	X				X	
6/18/20	1115	Bac-9-UVR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS
SAMPLE RETENTION TIME
PRESERVATIVES (1) HCL (2) HNO3 (3) = COLD (4) = H2SO4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
	Emily Applequist/Stillwater	6/18/20 1420		

RECEIVED AT LAB BY: DATE/TIME: 6/19/20 1420 CONDITIONS/COMMENTS:
SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER AIR BILL #

CALIFORNIA LABORATORY SERVICES
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June 25, 2020

CLS Work Order #: 20F1013
COC #:

Emily Applequist
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 06/18/20 14:20. 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

CALIFORNIA LABORATORY SERVICES
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 06/24/20 11:25

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20F0957**
Berkeley, CA 94705	Project Manager: Emily Applequist	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

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CALIFORNIA LABORATORY SERVICES
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Page 1 of 2 06/24/20 11:25

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20F0957**
Berkeley, CA 94705	Project Manager: Emily Applequist	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-13-IHR (20F0957-01) Water Sampled: 06/17/20 08:05 Received: 06/17/20 13:55									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2004762	06/17/20 14:20	06/20/20	SM 9221	
E. Coli	<1	1.0	"	"	2004767	06/17/20 14:30	06/18/20	SM9223	
Bac-12-IHR (20F0957-02) Water Sampled: 06/17/20 08:25 Received: 06/17/20 13:55									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2004762	06/17/20 14:20	06/20/20	SM 9221	
E. Coli	<1	1.0	"	"	2004767	06/17/20 14:30	06/18/20	SM9223	
Bac-11-JR (20F0957-03) Water Sampled: 06/17/20 09:20 Received: 06/17/20 13:55									
Fecal Coliforms	**11**	1.8	MPN/100 mL	1	2004762	06/17/20 14:20	06/20/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2004767	06/17/20 14:30	06/18/20	SM9223	
Bac-14-BCR (20F0957-04) Water Sampled: 06/17/20 10:45 Received: 06/17/20 13:55									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2004762	06/17/20 14:20	06/20/20	SM 9221	
E. Coli	<1	1.0	"	"	2004767	06/17/20 14:30	06/18/20	SM9223	
Bac-15-SCR (20F0957-05) Water Sampled: 06/17/20 12:15 Received: 06/17/20 13:55									
Fecal Coliforms	**4.5**	1.8	MPN/100 mL	1	2004762	06/17/20 14:20	06/20/20	SM 9221	
E. Coli	**2.0**	1.0	"	"	2004767	06/17/20 14:30	06/18/20	SM9223	

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CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 20F0957 (1 of 1)

Report To:	Client Job Number: 750.10 Task 0400.02
Stillwater Sciences 2855 Telegraph Ave. Suite 400 Berkeley, CA 94705	Destination Laboratory: Rancho Cordova [X] CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com [ ] OTHER
Project Manager: Emily Applequist eapplequist@stillwatersci.com	
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring	
Sampled By: Emily Applequist, Pat Kouse	
Job Description: Monitor seasonal bacteria levels in UARP reaches.	
Site Location: UARP	

ANALYSIS REQUESTED: Fecal coliform-15 Tube; E. coli Quanti-tray

GEOTRACKER

EDF REPORT YES [X] NO [ ]

GLOBAL ID:

FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS 1	2	3	5	SPECIAL INSTRUCTIONS
6/17/20	0805	Bac-13-1HR		Surface water			6	X	X				X	
6/17/20	0825	Bac-12-1HR		Surface water			6	X	X				X	
6/17/20	0920	Bac-11-1R2		Surface water			6	X	X				X	
6/17/20	1045	Bac-14-BCR		Surface water			6	X	X				X	
6/17/20	1215	Bac-15-SCR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS

SAMPLE RETENTION TIME

PRESERVATIVES (1) HCL (2) HNO_3 (3) = COLD (4) = H_2SO_4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
[signature]	Emily Applequist/SSH	6/17/20 1355		

RECEIVED AT LAB BY: DATE/TIME: 6/17/20 1355 CONDITIONS/COMMENTS: 11/91

SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER AIR BILL #

CALIFORNIA LABORATORY SERVICES
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June 24, 2020

CLS Work Order #: 20F0957
COC #:

Emily Applequist
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 06/17/20 13:55. 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

CALIFORNIA LABORATORY SERVICES
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 07/23/20 10:39

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20G0924**
Berkeley, CA 94705	Project Manager: Emily Applequist	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

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CALIFORNIA LABORATORY SERVICES
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 07/23/20 10:39

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 20G0924
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-7-UVR (20G0924-01) Water	**Sampled: 07/16/20 09:00**	**Received: 07/16/20 13:45**							
Fecal Coliforms	**7.8**	1.8	MPN/100 mL	1	2005647	07/16/20 14:00	07/19/20	SM 9221	
E. Coli	**12.0**	1.0	"	"	2005651	07/16/20 13:45	07/17/20	SM9223	
Bac-8-UVR (20G0924-02) Water	**Sampled: 07/16/20 09:41**	**Received: 07/16/20 13:45**							
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005647	07/16/20 14:00	07/19/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2005651	07/16/20 13:45	07/17/20	SM9223	
Bac-6-GCR (20G0924-03) Water	**Sampled: 07/16/20 10:10**	**Received: 07/16/20 13:45**							
Fecal Coliforms	**24**	1.8	MPN/100 mL	1	2005647	07/16/20 14:00	07/19/20	SM 9221	
E. Coli	**6.3**	1.0	"	"	2005651	07/16/20 13:45	07/17/20	SM9223	
Bac-5-GCR (20G0924-04) Water	**Sampled: 07/16/20 10:30**	**Received: 07/16/20 13:45**							
Fecal Coliforms	**31**	1.8	MPN/100 mL	1	2005647	07/16/20 14:00	07/19/20	SM 9221	
E. Coli	**11.0**	1.0	"	"	2005651	07/16/20 13:45	07/17/20	SM9223	
Bac-10-UVR (20G0924-05) Water	**Sampled: 07/16/20 11:05**	**Received: 07/16/20 13:45**							
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005647	07/16/20 14:00	07/19/20	SM 9221	
E. Coli	<1	1.0	"	"	2005651	07/16/20 13:45	07/17/20	SM9223	
Bac-9-UVR (20G0924-06) Water	**Sampled: 07/16/20 11:25**	**Received: 07/16/20 13:45**							
Fecal Coliforms	**6.8**	1.8	MPN/100 mL	1	2005647	07/16/20 14:00	07/19/20	SM 9221	
E. Coli	**4.1**	1.0	"	"	2005651	07/16/20 13:45	07/17/20	SM9223	

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Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. _____ (1 of 1)

Report To:	Client Job Number 750.10 Task 0400.02
Stillwater Sciences 2855 Telegraph Ave. Suite 400 Berkeley, CA 94705	Destination Laboratory Rancho Cordova
Project Manager: Emily Applequist eapplequist@stillwatersci.com	[X] CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring	[ ] OTHER
Sampled By: Emily Applequist, David Rosen	
Job Description: Monitor seasonal bacteria levels in UARP reaches.	
Site Location: UARP	

ANALYSIS REQUESTED: Fecal coliform-15 Tube; E. coli Quanti-tray

GEOTRACKER
EDF REPORT YES [X] NO [ ]
GLOBAL ID: 20G0924
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS: 1	2	3	5	SPECIAL INSTRUCTIONS
7/16/20	0900	Bac-7-UVR		Surface water			6	X	X				X	
7/16/20	0940	Bac-8-UVR		Surface water			6	X	X				X	
7/16/20	1010	Bac-6-GCR		Surface water			6	X	X				X	
7/16/20	1030	Bac-5-GCR		Surface water			6	X	X				X	
7/16/20	1105	Bac-10-UVR		Surface water			6	X	X				X	
7/16/20	1125	Bac-9-UVR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS

SAMPLE RETENTION TIME

PRESERVATIVES (1) HCL (2) HNO_3 (3) = COLD (4)= H_2SO_4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
[signature]	Emily Applequist / Stillwater	7/16/20 1345		

RECEIVED AT LAB BY: _____ DATE/TIME: 7/16/20 1345 CONDITIONS/COMMENTS: 2-4 12-4

SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER _____ AIR BILL # _____

CALIFORNIA LABORATORY SERVICES
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July 23, 2020

CLS Work Order #: 20G0924
COC #:

Emily Applequist
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 07/16/20 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. 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

CALIFORNIA LABORATORY SERVICES
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 07/22/20 12:10

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20G0880**
Berkeley, CA 94705	Project Manager: Emily Applequist	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

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CALIFORNIA LABORATORY SERVICES
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 07/22/20 12:10

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 20G0880
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-13-1HR (20G0880-01) Water Sampled: 07/15/20 08:50 Received: 07/15/20 14:40									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005590	07/15/20 15:00	07/18/20	SM 9221	
E. Coli	<1	1.0	"	"	2005598	07/15/20 16:00	07/16/20	SM9223	
Bac-12-1HR (20G0880-02) Water Sampled: 07/15/20 09:10 Received: 07/15/20 14:40									
Fecal Coliforms	**2.0**	1.8	MPN/100 mL	1	2005590	07/15/20 15:00	07/18/20	SM 9221	
E. Coli	<1	1.0	"	"	2005598	07/15/20 16:00	07/16/20	SM9223	
Bac-11-JR (20G0880-03) Water Sampled: 07/15/20 10:05 Received: 07/15/20 14:40									
Fecal Coliforms	**540**	1.8	MPN/100 mL	1	2005590	07/15/20 15:00	07/18/20	SM 9221	
E. Coli	**387.3**	1.0	"	"	2005598	07/15/20 16:00	07/16/20	SM9223	
Bac-14-BCR (20G0880-04) Water Sampled: 07/15/20 11:30 Received: 07/15/20 14:40									
Fecal Coliforms	**7.8**	1.8	MPN/100 mL	1	2005590	07/15/20 15:00	07/18/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2005598	07/15/20 16:00	07/16/20	SM9223	
Bac-15-SCR (20G0880-05) Water Sampled: 07/15/20 12:50 Received: 07/15/20 14:40									
Fecal Coliforms	**2.0**	1.8	MPN/100 mL	1	2005590	07/15/20 15:00	07/18/20	SM 9221	
E. Coli	**2.0**	1.0	"	"	2005598	07/15/20 16:00	07/16/20	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

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 20G0880 (1 of 1)

Report To:
Stillwater Sciences
2855 Telegraph Ave. Suite 400
Berkeley, CA 94705
Project Manager: Emily Applequist eapplequist@stillwatersci.com
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring
Sampled By: Emily Applequist, David Rosen
Job Description: Monitor seasonal bacteria levels in UARP beaches.
Site Location: UARP

Client Job Number: 750.10 Task 0400.02
Destination Laboratory: Rancho Cordova
[X] CLS (916) 638-7301, 3249 Fitzgerald Road, Rancho Cordova, CA 95742, www.californialab.com
[ ] OTHER

ANALYSIS REQUESTED: PRESERVATIVES; Fecal coliform-15 Tube; E. coli Quanti-tray

GEOTRACKER
PDF REPORT: YES [X] NO [ ]
GLOBAL ID:
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	▼	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS 1	2	3	5	SPECIAL INSTRUCTIONS
7/15/20	0850	Bac-13-1HR		Surface water			6	X	X				X	
7/15/20	0910	Bac-12-1HL		Surface water			6	X	X				X	
7/15/20	1005	Bac-11-JR		Surface water			6	X	X				X	
7/15/20	1130	Bac-14-DCR		Surface water			6	X	X				X	
7/15/20	1250	Bac-15-SCR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS
SAMPLE RETENTION TIME
PRESERVATIVES (1) HCL (3) = COLD (2) HNO3 (4)= H2SO4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
[signature]	Emily Applequist/Stillwater	7/15/20 1440		

RECEIVED AT LAB BY: [signature] DATE/TIME: 7-15 20 CONDITIONS/COMMENTS: 1440 2.5/20

SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER _____ AIR BILL # _____

CALIFORNIA LABORATORY SERVICES
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July 22, 2020

CLS Work Order #: 20G0880
COC #:

Emily Applequist
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 07/15/20 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

CALIFORNIA LABORATORY SERVICES
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 07/16/20 11:20

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20G0523**
Berkeley, CA 94705	Project Manager: Emily Applequist	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

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CALIFORNIA LABORATORY SERVICES
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 07/16/20 11:20

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 20G0523
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-7-UVR (20G0523-01) Water	**Sampled: 07/09/20 08:50**	**Received: 07/09/20 12:10**							
Fecal Coliforms	**46**	1.8	MPN/100 mL	1	2005412	07/09/20 13:15	07/12/20	SM 9221	
E. Coli	**866.4**	1.0	"	"	2005421	07/09/20 15:15	07/10/20	SM9223	
Bac-8-UVR (20G0523-02) Water	**Sampled: 07/09/20 09:20**	**Received: 07/09/20 12:10**							
Fecal Coliforms	**4.5**	1.8	MPN/100 mL	1	2005412	07/09/20 13:15	07/12/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2005421	07/09/20 15:15	07/10/20	SM9223	
Bac-6-GCR (20G0523-03) Water	**Sampled: 07/09/20 09:45**	**Received: 07/09/20 12:10**							
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005412	07/09/20 13:15	07/12/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2005421	07/09/20 15:15	07/10/20	SM9223	
Bac-5-GCR (20G0523-04) Water	**Sampled: 07/09/20 10:05**	**Received: 07/09/20 12:10**							
Fecal Coliforms	**4.5**	1.8	MPN/100 mL	1	2005412	07/09/20 13:15	07/12/20	SM 9221	
E. Coli	**11.0**	1.0	"	"	2005421	07/09/20 15:15	07/10/20	SM9223	
Bac-10-UVR (20G0523-05) Water	**Sampled: 07/09/20 10:40**	**Received: 07/09/20 12:10**							
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005412	07/09/20 13:15	07/12/20	SM 9221	
E. Coli	<1	1.0	"	"	2005421	07/09/20 15:15	07/10/20	SM9223	
Bac-9-UVR (20G0523-06) Water	**Sampled: 07/09/20 11:00**	**Received: 07/09/20 12:10**							
Fecal Coliforms	**13**	1.8	MPN/100 mL	1	2005412	07/09/20 13:15	07/12/20	SM 9221	
E. Coli	**30.9**	1.0	"	"	2005421	07/09/20 15:15	07/10/20	SM9223	

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CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 206523 (1 of 1)

Report To:
Stillwater Sciences
2855 Telegraph Ave. Suite 400
Berkeley, CA 94705
Project Manager: Emily Applequist eapplequist@stillwatersci.com
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring
Sampled By: Emily Applequist, Pat Kavanagh
Job Description: Monitor seasonal bacteria levels in UARP reaches.
Site Location: UARP

Client Job Number: 750.10 Task 0400.02
Destination Laboratory: Rancho Cordova
[x] CLS (916) 638-7301, 3249 Fitzgerald Road, Rancho Cordova, CA 95742, www.californialab.com
[ ] OTHER

ANALYSIS REQUESTED: Fecal coliform-15 Tube; E. coli Quanti-tray
PRESERVATIVES
GEOTRACKER
EDF REPORT: YES [x] NO [ ]
GLOBAL ID:
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS: 1	2	3	5	SPECIAL INSTRUCTIONS
7/9/20	0850	Bac-7-UVR		Surface water			6	X	X				X	
7/9/20	0900	Bac-8-UVR		Surface water			6	X	X				X	
7/9/20	0945	Bac-6-GCR		Surface water			6	X	X				X	
7/9/20	1005	Bac-5-GCR		Surface water			6	X	X				X	
7/9/20	1040	Bac-10-UVR		Surface water			6	X	X				X	
7/9/20	1100	Bac-9-UVR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS
SAMPLE RETENTION TIME:
PRESERVATIVES (1) HCL (2) HNO3 (3) = COLD (4) = H2SO4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
[signature]	Emily Applequist/Stillwater	7/9/20 1310		

RECEIVED AT LAB BY: [signature] DATE/TIME: 7/9/20 2012 CONDITIONS/COMMENTS: 1-5/1-5

SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER AIR BILL #

CALIFORNIA LABORATORY SERVICES
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July 16, 2020

CLS Work Order #: 20G0523
COC #:

Emily Applequist
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 07/09/20 12:10. 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

CALIFORNIA LABORATORY SERVICES
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 07/15/20 11:09

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20G0428**
Berkeley, CA 94705	Project Manager: Emily Applequist	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

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CALIFORNIA LABORATORY SERVICES
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Page 1 of 2 07/15/20 11:09

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 20G0428
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-13-1HR (20G0428-01) Water Sampled: 07/08/20 08:45 Received: 07/08/20 14:20									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005359	07/08/20 14:30	07/11/20	SM 9221	
E. Coli	<1	1.0	"	"	2005374	07/08/20 15:30	07/09/20	SM9223	
Bac-12-1HR (20G0428-02) Water Sampled: 07/08/20 09:05 Received: 07/08/20 14:20									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005359	07/08/20 14:30	07/11/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2005374	07/08/20 15:30	07/09/20	SM9223	
Bac-11-JR (20G0428-03) Water Sampled: 07/08/20 09:55 Received: 07/08/20 14:20									
Fecal Coliforms	**170**	1.8	MPN/100 mL	1	2005359	07/08/20 14:30	07/11/20	SM 9221	
E. Coli	**137.6**	1.0	"	"	2005374	07/08/20 15:30	07/09/20	SM9223	
Bac-14-BCR (20G0428-04) Water Sampled: 07/08/20 11:15 Received: 07/08/20 14:20									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005359	07/08/20 14:30	07/11/20	SM 9221	
E. Coli	<1	1.0	"	"	2005374	07/08/20 15:30	07/09/20	SM9223	
Bac-15-SCR (20G0428-05) Water Sampled: 07/08/20 12:40 Received: 07/08/20 14:20									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005359	07/08/20 14:30	07/11/20	SM 9221	
E. Coli	<1	1.0	"	"	2005374	07/08/20 15:30	07/09/20	SM9223	

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 2007028 (1 of 1)

Report To:
Stillwater Sciences
2855 Telegraph Ave. Suite 400
Berkeley, CA 94705
Project Manager: Emily Applequist eapplequist@stillwatersci.com
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring
Sampled By: Emily Applequist, Pat Koonse
Job Description: Monitor seasonal bacteria levels in UARP reaches.
Site Location: UARP

Client Job Number: 750.10 Task 0400.02
Destination Laboratory: Rancho Cordova
[x] CLS (916) 638-7301, 3249 Fitzgerald Road, Rancho Cordova, CA 95742, www.californialab.com
[ ] OTHER

ANALYSIS REQUESTED: Fecal coliform-15 Tube; E. coli Quanti-tray
PRESERVATIVES

GEOTRACKER
EDF REPORT YES [x] NO [ ]
GLOBAL ID.
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS 1	2	3	5	SPECIAL INSTRUCTIONS
7/8/20	0845	Bac-13-1HR		Surface water			6	X	X				X	
7/8/20	0905	Bac-12-1HR		Surface water			6	X	X				X	
7/8/20	0955	Bac-11-DR		Surface water			6	X	X				X	
7/8/20	1115	Bac-14-BCR		Surface water			6	X	X				X	
7/8/20	1240	Bac-15-SCR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS
SAMPLE RETENTION TIME
PRESERVATIVES (1) HCL (2) HNO_3 (3) = COLD (4) = H_2SO_4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
	Emily Applequist/Stillwater	7/8/20 1420		

RECEIVED AT LAB BY: DATE/TIME: 7/9/20 1420 CONDITIONS/COMMENTS: 7/17

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CALIFORNIA LABORATORY SERVICES
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July 15, 2020

CLS Work Order #: 20G0428
COC #:

Emily Applequist
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 07/08/20 14:20. 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

CALIFORNIA LABORATORY SERVICES
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07/10/20 11:51

Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0400.02	**CLS Work Order #: 20G0129**
Berkeley, CA 94705	Project Manager:	Emily Applequist	COC #:

Notes and Definitions

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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Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES
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07/10/20 11:51

Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0400.02	**CLS Work Order #: 20G0129**
Berkeley, CA 94705	Project Manager:	Emily Applequist	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-7-UVR (20G0129-01) Water	**Sampled: 07/02/20 08:50**	**Received: 07/02/20 14:00**							
E. Coli	**8.6**	1.0	MPN/100 mL	1	2005220	07/02/20	07/03/20	SM9223	
Fecal Coliforms	**4.5**	1.8	"	"	2005213	07/02/20	07/05/20	SM 9221	
Bac-8-UVR (20G0129-02) Water	**Sampled: 07/02/20 09:25**	**Received: 07/02/20 14:00**							
E. Coli	**1.0**	1.0	MPN/100 mL	1	2005220	07/02/20	07/03/20	SM9223	
Fecal Coliforms	**2.0**	1.8	"	"	2005213	07/02/20	07/05/20	SM 9221	
Bac-6-GCR (20G0129-03) Water	**Sampled: 07/02/20 09:55**	**Received: 07/02/20 14:00**							
E. Coli	**275.5**	1.0	MPN/100 mL	1	2005220	07/02/20	07/03/20	SM9223	
Fecal Coliforms	**350**	1.8	"	"	2005213	07/02/20	07/05/20	SM 9221	
Bac-5-GCR (20G0129-04) Water	**Sampled: 07/02/20 10:20**	**Received: 07/02/20 14:00**							
E. Coli	**48.7**	1.0	MPN/100 mL	1	2005220	07/02/20	07/03/20	SM9223	
Fecal Coliforms	**49**	1.8	"	"	2005213	07/02/20	07/05/20	SM 9221	
Bac-10-UVR (20G0129-05) Water	**Sampled: 07/02/20 11:00**	**Received: 07/02/20 14:00**							
E. Coli	<1	1.0	MPN/100 mL	1	2005220	07/02/20	07/03/20	SM9223	
Fecal Coliforms	**4.0**	1.8	"	"	2005213	07/02/20	07/05/20	SM 9221	
Bac-9-UVR (20G0129-06) Water	**Sampled: 07/02/20 11:25**	**Received: 07/02/20 14:00**							
E. Coli	**16.0**	1.0	MPN/100 mL	1	2005220	07/02/20	07/03/20	SM9223	
Fecal Coliforms	**2.0**	1.8	"	"	2005213	07/02/20	07/05/20	SM 9221	

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 200829 (1 of 1)

Report To:
Stillwater Sciences
2855 Telegraph Ave. Suite 400
Berkeley, CA 94705
Project Manager: Emily Applequist eapplequist@stillwatersci.com
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring
Sampled By: Emily Applequist, David Rosen
Job Description: Monitor seasonal bacteria levels in UARP reaches.
Site Location: UARP

Client Job Number: 750.10 Task 0400.02
Destination Laboratory: Rancho Cordova
[x] CLS (916) 638-7301, 3249 Fitzgerald Road, Rancho Cordova, CA 95742, www.californialab.com
[ ] OTHER

GEOTRACKER
EDF REPORT: YES [x] NO [ ]
GLOBAL ID:
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	ANALYSIS REQUESTED: Fecal coliform-15 Tube	ANALYSIS REQUESTED: E. coli Quanti-tray	TURNAROUND TIME IN DAYS: 1	2	3	5	SPECIAL INSTRUCTIONS
7/2/20	0750	Bac-7-UVR		Surface water			6	X	X				X	
7/2/20	0825	Bac-8-UVR		Surface water			6	X	X				X	
7/2/20	0955	Bac-6-GCR		Surface water			6	X	X				X	
7/2/20	1020	Bac-5-GCR		Surface water			6	X	X				X	
7/2/20	1100	Bac-10-UVR		Surface water			6	X	X				X	
7/2/20	1125	Bac-9-UVR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS
SAMPLE RETENTION TIME
PRESERVATIVES (1) HCL (2) HNO_3 (3) = COLD (4) = H_2SO_4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
	Emily Applequist/Stillwater	7/2/20 1400		

RECEIVED AT LAB BY: DATE/TIME: 7/2/20 1700
CONDITIONS/COMMENTS:
SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER AIR BILL #

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

July 10, 2020

CLS Work Order #: 20G0129
COC #:

Emily Applequist
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 07/02/20 14:00. 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

CALIFORNIA LABORATORY SERVICES
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 07/09/20 15:16

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20G0083**
Berkeley, CA 94705	Project Manager: Emily Applequist	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

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Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

 07/09/20 15:16

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 20G0083
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-13-IHR (20G0083-01) Water Sampled: 07/01/20 08:10 Received: 07/01/20 13:20									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2005176	07/01/20 13:30	07/04/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2005187	"	07/02/20	SM9223	
Bac-12-IHR (20G0083-02) Water Sampled: 07/01/20 08:25 Received: 07/01/20 13:20									
Fecal Coliforms	**2.0**	1.8	MPN/100 mL	1	2005176	07/01/20 13:30	07/04/20	SM 9221	
E. Coli	<1	1.0	"	"	2005187	"	07/02/20	SM9223	
Bac-11-JR (20G0083-03) Water Sampled: 07/01/20 09:15 Received: 07/01/20 13:20									
Fecal Coliforms	**4.5**	1.8	MPN/100 mL	1	2005176	07/01/20 13:30	07/04/20	SM 9221	
E. Coli	**3.0**	1.0	"	"	2005187	"	07/02/20	SM9223	
Bac-14-BCR (20G0083-04) Water Sampled: 07/01/20 10:35 Received: 07/01/20 13:20									
Fecal Coliforms	**2.0**	1.8	MPN/100 mL	1	2005176	07/01/20 13:30	07/04/20	SM 9221	
E. Coli	<1	1.0	"	"	2005187	"	07/02/20	SM9223	
Bac-15-SCR (20G0083-05) Water Sampled: 07/01/20 12:05 Received: 07/01/20 13:20									
Fecal Coliforms	**31**	1.8	MPN/100 mL	1	2005176	07/01/20 13:30	07/04/20	SM 9221	
E. Coli	**27.9**	1.0	"	"	2005187	"	07/02/20	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

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 2060083 (1 of 1)

Report To:	Client Job Number: 750.10 Task 0400.02
Stillwater Sciences 2855 Telegraph Ave. Suite 400 Berkeley, CA 94705	Destination Laboratory: Rancho Cordova [x] CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com [ ] OTHER
Project Manager: Emily Applequist eapplequist@stillwatersci.com	
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring	
Sampled By: Emily Applequist, David Rosen	
Job Description: Monitor seasonal bacteria levels in UARP reaches.	
Site Location: UARP	

ANALYSIS REQUESTED: Fecal coliform-LS Tube; E. coli Quanti-tray

GEOTRACKER EDF REPORT: YES [x] NO [ ]
GLOBAL ID:
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-LS Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS 1	2	3	5	SPECIAL INSTRUCTIONS
7/1/20	0810	Bac-B-1HR		Surface water			6	X	X				X	
7/1/20	0825	Bac-R-1HR		Surface water			6	X	X				X	
7/1/20	0915	Bac-11-JR		Surface water			6	X	X				X	
7/1/20	1035	Bac-M-BCR		Surface water			6	X	X				X	
7/1/20	1205	Bac-B-SCR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS | SAMPLE RETENTION TIME | PRESERVATIVES (1) HCL (2) HNO_3 (3) = COLD (4) = H2SO4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
[signature]	Emily Applequist / Stillwater	7/1/20/1320		
RECEIVED AT LAB BY: [signature]		DATE/TIME: 7/1/20 1320	CONDITIONS/COMMENTS:	2.8/2.9
SHIPPED BY:	[ ] FED EX [ ] UPS [ ] OTHER		AIR BILL #	

CALIFORNIA LABORATORY SERVICES
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July 09, 2020

CLS Work Order #: 20G0083
COC #:

Emily Applequist
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 07/01/20 13:20. 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

CALIFORNIA LABORATORY SERVICES
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 07/02/20 14:44

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20F1337**
Berkeley, CA 94705	Project Manager: Emily Applequist	COC #:

Notes and 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

CALIFORNIA LABORATORY SERVICES
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 07/02/20 14:44

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 20F1337
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-7-UVR (20F1337-01) Water	**Sampled: 06/25/20 08:45**	**Received: 06/25/20 13:25**							
Fecal Coliforms	**4.0**	1.8	MPN/100 mL	1	2005013	06/25/20 13:30	06/28/20	SM 9221	
E. Coli	**3.1**	1.0	"	"	2005019	06/25/20 15:00	06/26/20	SM9223	
Bac-8-UVR (20F1337-02) Water	**Sampled: 06/25/20 09:20**	**Received: 06/25/20 13:25**							
Fecal Coliforms	**23**	1.8	MPN/100 mL	1	2005013	06/25/20 13:30	06/28/20	SM 9221	
E. Coli	**17.1**	1.0	"	"	2005019	06/25/20 15:00	06/26/20	SM9223	
Bac-6-GCR (20F1337-03) Water	**Sampled: 06/25/20 10:00**	**Received: 06/25/20 13:25**							
Fecal Coliforms	**33**	1.8	MPN/100 mL	1	2005013	06/25/20 13:30	06/28/20	SM 9221	
E. Coli	**26.9**	1.0	"	"	2005019	06/25/20 15:00	06/26/20	SM9223	
Bac-5-GCR (20F1337-04) Water	**Sampled: 06/25/20 10:25**	**Received: 06/25/20 13:25**							
Fecal Coliforms	**240**	1.8	MPN/100 mL	1	2005013	06/25/20 13:30	06/28/20	SM 9221	
E. Coli	**325.5**	1.0	"	"	2005019	06/25/20 15:00	06/26/20	SM9223	
Bac-10-UVR (20F1337-05) Water	**Sampled: 06/25/20 11:00**	**Received: 06/25/20 13:25**							
Fecal Coliforms	**7.8**	1.8	MPN/100 mL	1	2005013	06/25/20 13:30	06/28/20	SM 9221	
E. Coli	**17.3**	1.0	"	"	2005019	06/25/20 15:00	06/26/20	SM9223	
Bac-9-UVR (20F1337-06) Water	**Sampled: 06/25/20 11:30**	**Received: 06/25/20 13:25**							
Fecal Coliforms	**4.5**	1.8	MPN/100 mL	1	2005013	06/25/20 13:30	06/28/20	SM 9221	
E. Coli	**3.0**	1.0	"	"	2005019	06/25/20 15:00	06/26/20	SM9223	

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 20F1357 (1 of 1)

Report To:	Client Job Number: 750.10 Task 0400.02
Stillwater Sciences 2855 Telegraph Ave. Suite 400 Berkeley, CA 94705	Destination Laboratory: Rancho Cordova [x] CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com [ ] OTHER
Project Manager: Emily Applequist eapplequist@stillwatersci.com	
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring	
Sampled By: Emily Applequist, David Rosen	
Job Description: Monitor seasonal bacteria levels in UARP reaches.	
Site Location: UARP	

ANALYSIS REQUESTED: Fecal coliform-15 Tube; E. coli Quanti-tray

PRESERVATIVES

GEOTRACKER
EDF REPORT YES [x] NO [ ]
GLOBAL ID:
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS: 1	2	3	5	SPECIAL INSTRUCTIONS
6/25/20	0845	Bac-7-UNR		Surface water			6	X	X				X	
6/25/20	0920	Bac-8-UNR		Surface water			6	X	X				X	
6/25/20	1000	Bac-6-GCR		Surface water			6	X	X				X	
6/25/20	1025	Bac-5-GCR		Surface water			6	X	X				X	
6/25/20	1100	Bac-10-UNR		Surface water			6	X	X				X	
6/25/20	1130	Bac-9-UNR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS

SAMPLE RETENTION TIME

PRESERVATIVES (1) HCL (2) HNO3 (3) = COLD (4) = H2SO4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
[signature]	Emily Applequist/Stillwater	6/25/20 1525		

RECEIVED AT LAB BY: [signature] DATE/TIME: 6/25/2020 1325 CONDITIONS/COMMENTS: 1.1/1.1

SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER AIR BILL#

Page 2 of 4

CALIFORNIA LABORATORY SERVICES
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July 02, 2020

CLS Work Order #: 20F1337
COC #:

Emily Applequist
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 06/25/20 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

CA SWRCB ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES
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 07/01/20 11:47

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20F1308**
Berkeley, CA 94705	Project Manager: Emily Applequist	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

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CALIFORNIA LABORATORY SERVICES
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 07/01/20 11:47

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 20F1308
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-13-IHR (20F1308-01) Water Sampled: 06/24/20 08:50 Received: 06/24/20 14:15									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2004962	06/24/20 14:30	06/27/20	SM 9221	
E. Coli	<1	1.0	"	"	2004990	06/24/20 15:30	06/25/20	SM9223	
Bac-12-IHR (20F1308-02) Water Sampled: 06/24/20 09:10 Received: 06/24/20 14:15									
Fecal Coliforms	<1.8	1.8	MPN/100 mL	1	2004962	06/24/20 14:30	06/27/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2004990	06/24/20 15:30	06/25/20	SM9223	
Bac-11-JR (20F1308-03) Water Sampled: 06/24/20 10:00 Received: 06/24/20 14:15									
Fecal Coliforms	**540**	1.8	MPN/100 mL	1	2004962	06/24/20 14:30	06/27/20	SM 9221	
E. Coli	**39.9**	1.0	"	"	2004990	06/24/20 15:30	06/25/20	SM9223	
Bac-14-BCR (20F1308-04) Water Sampled: 06/24/20 11:30 Received: 06/24/20 14:15									
Fecal Coliforms	**7.8**	1.8	MPN/100 mL	1	2004962	06/24/20 14:30	06/27/20	SM 9221	
E. Coli	**2.0**	1.0	"	"	2004990	06/24/20 15:30	06/25/20	SM9223	
Bac-15-SCR (20F1308-05) Water Sampled: 06/24/20 12:50 Received: 06/24/20 14:15									
Fecal Coliforms	**1.8**	1.8	MPN/100 mL	1	2004962	06/24/20 14:30	06/27/20	SM 9221	
E. Coli	**4.1**	1.0	"	"	2004990	06/24/20 15:30	06/25/20	SM9223	

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Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 20F308 (1 of 1)

Report To:
Stillwater Sciences
2855 Telegraph Ave. Suite 400
Berkeley, CA 94705
Project Manager: Emily Applequist eapplequist@stillwatersci.com
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring
Sampled By: Emily Applequist, David Rosen
Job Description: Monitor seasonal bacteria levels in UARP reaches.
Site Location: UARP

Client Job Number: 750.10 Task 0400.02
Destination Laboratory: Rancho Cordova
[x] CLS (916) 638-7301, 3249 Fitzgerald Road, Rancho Cordova, CA 95742, www.californialab.com
[ ] OTHER

ANALYSIS REQUESTED: Fecal coliform-15 Tube; E. coli Quanti-tray
PRESERVATIVES

GEOTRACKER
EDF REPORT: YES [x] NO [ ]
GLOBAL ID:
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS: 1	2	3	5	SPECIAL INSTRUCTIONS
6/24/20	0850	Bac-B-1HR		Surface water			6	X	X				X	
6/24/20	0910	Bac-12-1HR		Surface water			6	X	X				X	
6/24/20	1000	Bac-11-JR		Surface water			6	X	X				X	
6/24/20	1130	Bac-14-BCR		Surface water			6	X	X				X	
6/24/20	1250	Bac-15-SCR		Surface water			6	X	X				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS
SAMPLE RETENTION TIME
PRESERVATIVES (1) HCL (2) HNO3 (3) = COLD (4) = H2SO4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
[signature]	Emily Applequist /St	6/24/20 1415		

RECEIVED AT LAB BY: [signature] DATE/TIME: 6/24/20 1415 CONDITIONS/COMMENTS: 12/12

SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER AIR BILL #

CALIFORNIA LABORATORY SERVICES
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July 01, 2020

CLS Work Order #: 20F1308
COC #:

Emily Applequist
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 06/24/20 14:15. 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. 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

CALIFORNIA LABORATORY SERVICES
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 06/25/20 13:43

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 20F1013**
Berkeley, CA 94705	Project Manager: Emily Applequist	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

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Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES
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 09/10/20 15:11

Stillwater Sciences	Project: SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number: 750.10 Task 0400.02	**CLS Work Order #: 2010172**
Berkeley, CA 94705	Project Manager: Emily Applequist	COC #:

Notes and Definitions

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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Small Business #2916 | ELAP #1233 | NAICS #541380 | CA SWRCB ELAP Accreditation/Registration Number 1233

CALIFORNIA LABORATORY SERVICES
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 09/10/20 15:11

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

Project: SMUD In situ, Bac-T, & Chemistry Monitoring
Project Number: 750.10 Task 0400.02
Project Manager: Emily Applequist

CLS Work Order #: 2010172
COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-1-B1 (2010172-01) Surface Water Sampled: 09/02/20 09:55 Received: 09/02/20 15:30									
Fecal Coliforms	**2.0**	1.8	MPN/100 mL	1	2007094	09/02/20 15:45	09/05/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2007110	09/02/20 16:00	09/03/20	SM9223	
Bac-2-B1 (2010172-02) Surface Water Sampled: 09/02/20 10:20 Received: 09/02/20 15:30									
Fecal Coliforms	**2.0**	1.8	MPN/100 mL	1	2007094	09/02/20 15:45	09/05/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2007110	09/02/20 16:00	09/03/20	SM9223	
Bac-4-LL (2010172-03) Surface Water Sampled: 09/02/20 13:15 Received: 09/02/20 15:30									
Fecal Coliforms	**2.0**	1.8	MPN/100 mL	1	2007094	09/02/20 15:45	09/05/20	SM 9221	
E. Coli	<1	1.0	"	"	2007110	09/02/20 16:00	09/03/20	SM9223	
Bac-3-LL (2010172-04) Surface Water Sampled: 09/02/20 13:35 Received: 09/02/20 15:30									
Fecal Coliforms	**2.0**	1.8	MPN/100 mL	1	2007094	09/02/20 15:45	09/05/20	SM 9221	
E. Coli	**1.0**	1.0	"	"	2007110	09/02/20 16:00	09/03/20	SM9223	

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 201072 (1 of 1)

Report To:
Stillwater Sciences
2855 Telegraph Ave. Suite 400
Berkeley, CA 94705
Project Manager: Emily Applequist eapplequist@stillwatersci.com
Project Name: SMUD In situ, Bac-T, & Chemistry Monitoring
Sampled By: Emily Applequist, Pat Kavanagh
Job Description: Monitor seasonal bacteria levels in UARP reaches.
Site Location: UARP

Client Job Number: 750.10 Task 0400.02
Destination Laboratory: Rancho Cordova
[x] CLS (916) 638-7301, 3249 Fitzgerald Road, Rancho Cordova, CA 95742, www.californialab.com
[ ] OTHER

ANALYSIS REQUESTED: Fecal coliform-15 Tube; E. coli Quanti-tray
PRESERVATIVES

GEOTRACKER
EDF REPORT: YES [x] NO [ ]
GLOBAL ID:
FIELD CONDITIONS:

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	CONTAINER MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-15 Tube	E. coli Quanti-tray	TURNAROUND TIME IN DAYS 1	2	3	5	SPECIAL INSTRUCTIONS
9/2/20	0955	Bac-1-BL		Surface water			6	X	X				X	
9/2/20	1020	Bac-2-BL		Surface water			6	X	X				X	
9/2/20	1315	Bac-4-LL		Surface water			6	X	X				X	
9/2/20	1355	Bac-3-LL		Surface water			6	X	X				X	
				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS
SAMPLE RETENTION TIME
PRESERVATIVES (1) HCL (2) HNO_3 (3) = COLD (4) = H_2SO_4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
	Emily Applequist / Stillwater	9/2/20 15:30		

RECEIVED AT LAB BY: DATE/TIME: 9/2/20 1530
CONDITIONS/COMMENTS: 0.3
SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER AIR BILL #

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

September 10, 2020

CLS Work Order #: 20I0172
COC #:

Emily Applequist
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 09/02/20 15:30. 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. 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

CALIFORNIA LABORATORY SERVICES
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 08/26/20 11:23

Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0400.02	**CLS Work Order #: 20H1077**
Berkeley, CA 94705	Project Manager:	Emily Applequist	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

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 08/26/20 11:23

Stillwater Sciences	Project:	SMUD In situ, Bac-T, & Chemistry Monitoring	
2855 Telegraph Ave., Suite 400	Project Number:	750.10 Task 0400.02	**CLS Work Order #: 20H1077**
Berkeley, CA 94705	Project Manager:	Emily Applequist	COC #:

Microbiological Parameters by APHA Standard Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Bac-1-B1 (20H1077-01) Surface Water	**Sampled: 08/19/20 10:40**		**Received: 08/19/20 16:00**						
E. Coli	<1	1.0	MPN/100 mL	1	2006689	08/19/20	08/20/20	SM9223	
Fecal Coliforms	<1.8	1.8	"	"	2006673	"	08/22/20	SM 9221	
Bac-2-B1 (20H1077-02) Surface Water	**Sampled: 08/19/20 11:05**		**Received: 08/19/20 16:00**						
E. Coli	<1	1.0	MPN/100 mL	1	2006689	08/19/20	08/20/20	SM9223	
Fecal Coliforms	<1.8	1.8	"	"	2006673	"	08/22/20	SM 9221	
Bac-4-LL (20H1077-03) Surface Water	**Sampled: 08/19/20 13:40**		**Received: 08/19/20 16:00**						
E. Coli	**47.1**	1.0	MPN/100 mL	1	2006689	08/19/20	08/20/20	SM9223	
Fecal Coliforms	**240**	1.8	"	"	2006673	"	08/22/20	SM 9221	
Bac-3-LL (20H1077-04) Surface Water	**Sampled: 08/19/20 14:10**		**Received: 08/19/20 16:00**						
E. Coli	**2.0**	1.0	MPN/100 mL	1	2006689	08/19/20	08/20/20	SM9223	
Fecal Coliforms	**2.0**	1.8	"	"	2006673	"	08/22/20	SM 9221	

CALIFORNIA LABORATORY SERVICES CHAIN OF CUSTODY CLS ID. NO. 204077 (1 of 1)

Report To:	Client Job Number 750.10 Task 0400.02	ANALYSIS REQUESTED	GEOTRACKER
Stillwater Sciences 2855 Telegraph Ave. Suite 400 Berkeley, CA 94705	Destination Laboratory Rancho Cordova		EDF REPORT YES [X] NO [ ]
Project Manager Emily Applequist eapplequist@stillwatersci.com	[X] CLS (916) 638-7301 3249 Fitzgerald Road Rancho Cordova, CA 95742 www.californialab.com		GLOBAL ID:
Project Name SMUD In situ, Bac-T, & Chemistry Monitoring	[ ] OTHER		FIELD CONDITIONS:
Sampled By Emily Applequist, Pat Kemble			
Job Description Monitor seasonal bacteria levels in UARP reaches.			
Site Location UARP			TURNAROUND TIME IN DAYS: 1 2 3 5 — SPECIAL INSTRUCTIONS

DATE	TIME	SAMPLE IDENTIFICATION	FIELD ID.	MATRIX	CONTAINER NO.	CONTAINER TYPE	PRESERVATIVES	Fecal coliform-1.5 Tube	E. coli Quanti-tray	1	2	3	5	SPECIAL INSTRUCTIONS
8/19/20	1040	Bac-1-B1		Surface water			6	X	X				X	
8/19/20	11:05	Bac-2-B1		Surface water			6	X	X				X	
8/19/20	1340	Bac-4-LL		Surface water			6	X	X				X	
8/19/20	1410	Bac-3-LL		Surface water			6	X	X				X	
				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 0400.02
				Surface water			6						X	QUOTE#

SUSPECTED CONSTITUENTS — SAMPLE RETENTION TIME — PRESERVATIVES (1) HCL (2) HNO_3 (3) = COLD (4) = H_2SO_4

RELINQUISHED BY (Signature)	PRINT NAME/COMPANY	DATE/TIME	RECEIVED BY (Signature)	PRINT NAME/COMPANY
	Emily Applequist / Stillwater	8/19/20 1600		

RECEIVED AT LAB BY: DATE/TIME: 8/19/2020 1600 CONDITIONS/COMMENTS: 0.8

SHIPPED BY: [ ] FED EX [ ] UPS [ ] OTHER AIR BILL #

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CALIFORNIA LABORATORY SERVICES
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August 26, 2020

CLS Work Order #: 20H1077
COC #:

Emily Applequist
Stillwater Sciences
2855 Telegraph Ave., Suite 400
Berkeley, CA 94705

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

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Sincerely,

James Liang, Ph.D.
Laboratory Director

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