



City of Caldwell
Wastewater Treatment Plant

Boise River Upstream Monitoring

This report is intended to satisfy the surface water monitoring submission requirement located in Part I.E.9 of NPDES Permit #ID0021504.

2017
Reporting
Year

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I. Introduction

NPDES Permit #ID0021504 requires Surface Water Monitoring as described in in Part I.E. This included Upstream Monitoring in 2017. This report is meant to satisfy the additional requirement of a yearly submission of Surface Water Monitoring for the previous year (by January 31 yearly), as described in Part I.E.9 of the permit.

II. NPDES Requirements

EPA issued NPDES Permit #ID0021504 includes specific Surface Water Monitoring Requirements as described in Part I.E.1-9, and as shown in Part I.E.9.Table 4 (below):

Table 4: Surface Water Monitoring Requirements		
Parameter	Upstream Sampling Frequency	Downstream Sampling Frequency
Flow, CFS	1/week	—
BOD ₅ , mg/L	1/month	—
Dissolved Oxygen, mg/L	1/month	—
Total Phosphorus, µg/L	1/month	1/month
Total Nitrogen, mg/L	1/month	1/month
Chlorophyll a, µg/L	1/month	1/month
Temperature, °C	Continuous	Continuous
pH, standard units	1/week	1/week
Turbidity, NTU	1/week	1/week
Hardness as CaCO ₃ , mg/L	—	1/month
Arsenic, total recoverable, µg/L	1/quarter ¹	—
Cadmium, dissolved, µg/L	1/quarter ¹	—
Chromium, all oxidation states, dissolved, µg/L	1/quarter ¹	—
Chromium VI, dissolved, µg/L	1/quarter ¹	—
Conductivity, µmhos/cm	—	1/quarter ¹
Copper, dissolved, µg/L	1/quarter ¹	—
Dissolved organic carbon, mg/L	—	1/quarter ¹
Lead, dissolved, µg/L	1/quarter ¹	—
Mercury, total recoverable, ng/L	1/quarter ¹	—
Nickel, dissolved, µg/L	1/quarter ¹	—
Silver, dissolved, µg/L	1/quarter ¹	—
Zinc, dissolved, µg/L	1/quarter ¹	—
1. Quarters are defined as January – March, April through June, July – September, and October – December. Monitoring results for pollutants with a sample frequency of quarterly must be reported on the March, June, September and December DMRs.		

Image 1 (above): Surface Water Monitoring Requirements taken from NPDES Permit#ID0021504 Part I.E.9.Table 4.

Upstream monitoring was to begin January 31, 2017, and Downstream monitoring is not to begin until October 31, 2018.

III. Sampling and Analysis

All analyses, with the exception of flow, temperature, dissolved oxygen, pH, mercury, and hexavalent chromium, during the 2017 Boise River Upstream Surface Monitoring were analyzed by the following laboratory:

Analytical Laboratories Inc.
1804 N 33rd Street
Boise, Idaho 83703
Phone: (208) 342-5515
Email: ali.analyticallaboratories.com

Temperature, dissolved oxygen, and pH were measured at the City of Caldwell Wastewater Treatment Plant Laboratory.

Low level mercury samples were analyzed at the following laboratory via Analytical Laboratories Inc., to achieve lower minimum detection limits:

Anatek Labs Inc.
1282 Alturas Drive
Moscow, ID 83843
Phone: (208) 883-2839
Email: sampling@anateklabs.com

Hexavalent chromium samples were analyzed at the following laboratory, to achieve lower minimum detection limits:

SVL Analytical
Kellogg Laboratory
One Government Gulch
Kellogg, ID 83837
Phone: (208)784-1258
Email: chris@svl.net

Additionally, each upstream sample was collected as a grab sample (except temperature and flow) at the Chicago Street Bridge, upstream from the Treatment Plant discharge, as described in NPDES Permit #ID0021504. The latitude and longitude of this sample site is as follows: 43° 40' 41.0304" N, 116° 41' 54.5532" W, as measured by GPS.

The Chain of Custody for each sample analyzed by Analytical Laboratories Inc., Anatek Labs Inc., and SVL Analytical are available in Appendix D.

IV. Monitoring Results

A. Flow

Boise River Upstream sampling frequency for flow is weekly, however, the City of Caldwell monitors flow via the USGS equipment installed next to the upstream sampling site, which conducts continuous measurements. The USGS location is "USGS 13211205". Results for the entire 2017 calendar year are available in 15 minute increments at waterdata.usgs.gov.

B. Biochemical Oxygen Demand

Biochemical Oxygen Demand analyses are required once per month. BOD samples were sent to Analytical Laboratories Inc. Results for each monthly test are shown in the table below:

Table 3.01: Biochemical Oxygen Demand							
Boise River Upstream Monitoring 2017							
Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method	
1703242	1/26/2017	4:25 PM	1/31/2017	<	3	3	SM 5210 B
1706323	2/15/2017	2:52 PM	2/21/2017		3	2	SM 5210 B
1707307	2/22/2017	12:22 PM	2/28/2017	<	3	3	SM 5210 B
1711593	3/22/2017	1:50 PM	3/28/2017	<	3	3	SM 5210 B
1713807	4/5/2017	2:05 PM	4/11/2017	<	3	3	SM 5210 B
1717085	4/26/2017	4:24 PM	5/2/2017	<	3	3	SM 5210 B
1718435	5/3/2017	2:40 PM	5/9/2017	<	3	3	SM 5210 B
1724191	6/7/2017	1:52 PM	6/13/2017	<	3	3	SM 5210 B
1730726	7/12/2017	12:43 PM	7/18/2017	<	3	3	SM 5210 B
1735971	8/9/2017	11:28 AM	8/15/2017	<	3	3	SM 5210 B
1742139	9/13/2017	1:38 PM	9/19/2017	<	3	3	SM 5210 B
1748891	10/18/2017	3:45 PM	10/24/2017	<	3	3	SM 5210 B
1754396	11/21/2017	2:56 PM	11/26/2017	<	2	2	SM 5210 B
1756851	12/6/2017	2:54 PM	12/12/2017	<	2	2	SM 5210 B
				Minimum	2		
				Maximum	3		
				Average	2.86		

The lab reports for the results in Table 3.01 are available in Appendix A.

C. Dissolved Oxygen

Dissolved Oxygen samples were taken once per month and measured at the City of Caldwell Wastewater Treatment Plant using a Thermo Scientific Orion Star A223 portable RDO/DO meter. Results for these analyses are summarized below:

Table 3.02: Dissolved Oxygen In-House					
Sample ID	Date	Time	DO (mg/L)	Temp. (C)	Initials
BRV-UP	2/8/2017	4:54 PM	11.74	8.9	RH
BRV-UP	2/8/2017	4:54 PM	11.73	9.0	RH
BRV-UP	2/15/2017	3:04 PM	12.23	7.5	RH
BRV-UP	2/15/2017	3:05 PM	12.29	6.9	RH
BRV-UP	2/22/2017	12:38 PM	11.75	6.6	RH
BRV-UP	2/22/2017	12:39 PM	11.78	6.6	RH
BRV-UP	3/8/2017	12:03 PM	11.50	7.0	RH
BRV-UP	3/8/2017	12:04 PM	11.56	6.9	RH
BRV-UP	4/5/2017	4:26 PM	10.82	11.7	RH
BRV-UP	4/5/2017	4:27 PM	10.89	11.7	RH
BRV-UP	5/3/2107	2:54 PM	10.93	13.3	RH
BRV-UP	5/3/2017	2:56 PM	10.97	13.2	RH
BRV-UP	6/7/2017	2:14 PM	8.94	17.0	RH
BRV-UP	6/7/2017	2:15 PM	8.97	17.0	RH
BRV-UP	7/12/2017	12:57 PM	8.52	19.3	RH
BRV-UP	7/12/2017	12:59 PM	8.57	19.2	RH
BRV-UP	8/9/2017	11:42 AM	8.10	20.6	RH
BRV-UP	8/9/2017	11:43 AM	8.11	20.6	RH
BRV-UP	9/13/2017	2:02 PM	8.43	21.1	RH
BRV-UP	9/13/2017	2:03 PM	8.45	21.1	RH
BRV-UP	10/25/2017	3:20 PM	10.61	13.9	KC
BRV-UP	10/25/2017	3:22 PM	10.70	13.8	KC
BRV-UP	11/21/2017	3:17 PM	10.87	11.7	RH
BRV-UP	11/21/2017	3:18 PM	10.90	11.7	RH
BRV-UP	12/6/2017	3:20 PM	12.30	8.3	RH
BRV-UP	12/6/2017	3:21 PM	12.46	8.1	RH
		Minimum	8.10	6.60	
		Maximum	12.46	21.1	
		Average	10.54	12.80	

The lab reports for the results in Table 3.02 are available in Appendix B. In addition to the results listed in Table 3.02 (Dissolved Oxygen In-House), two samples were also sent to Analytical Laboratories Inc., and are listed in the table below:

Table 3.02: Dissolved Oxygen (ALI)						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method
1703739	1/31/2017	10:33 AM	1/31/2017	15.5	0.5	SM 4500-OC
1704264	2/2/2017	10:34 AM	2/2/2017	14	0.5	SM 4500-OC
				Minimum	14	
				Maximum	15.5	
				Average	14.75	

The lab reports for the results in Table 3.03 are available in Appendix A.

D. Total Phosphorus

Total Phosphorus samples were taken once per month, and analyzed by Analytical Labs Inc. Results for each Phosphorus analysis are listed in the table below:

Total Phosphate (as P)						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method
1703242	1/26/2017	4:25 PM	1/30/2017	140	50	EPA 365.4
1706323	2/15/2017	2:52 PM	2/22/2017	170	50	EPA 365.4
1707307	2/22/2017	12:22 PM	3/2/2017	140	50	EPA 365.4
1711593	3/22/2017	1:50 PM	3/29/2017	90	50	EPA 365.4
1713807	4/5/2017	2:05 PM	4/12/2017	100	50	EPA 365.4
1717085	4/26/2017	4:24 PM	5/4/2017	60	50	EPA 365.4
1718435	5/3/2017	2:40 PM	5/10/2017	70	50	EPA 365.4
1730726	7/12/2017	12:43 PM	7/19/2017	160	50	EPA 365.4
1735971	8/9/2017	11:28 AM	8/16/2017	190	50	EPA 365.4
1737299	8/16/2017	1:30 PM	8/25/2017	170	50	EPA 365.5
1742139	9/13/2017	1:38 PM	9/20/2017	140	50	EPA 365.4
1724191	6/7/2017	1:52 PM	6/17/2017	90	5	EPA 365.1
1748891	10/18/2017	3:45 PM	10/22/2017	163	5	EPA 365.1
1754396	11/21/2017	2:56 PM	12/3/2017	152	5	EPA 365.1
1756851	12/6/2017	2:54 PM	12/10/2017	111	5	EPA 365.1
				Minimum	60	
				Maximum	190	
				Average	129.73	

The lab reports for the results in Table 3.04 are available in Appendix A.

E. Total Nitrogen

Total Nitrogen results were calculated by Analytical Laboratories monthly. Total Nitrogen calculations were the sum of Nitrate + Nitrite and Total Kjeldahl Nitrogen analyses results. Results for each Phosphorus analysis are listed in the table below:

Table 3.05: Total Nitrogen						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method
1703242	1/26/2017	4:25 PM	NA*	3.46	0.1	Calculation
1706323	2/15/2017	2:52 PM	3/1/2017	2.55	0.1	Calculation
1707307	2/22/2017	12:22 PM	3/7/2107	1.35	0.1	Calculation
1711593	3/22/2017	1:50 PM	4/4/2017	1.29	0.1	Calculation
1713807	4/5/2017	2:05 PM	4/18/2017	0.47	0.1	Calculation
1717085	4/26/2017	4:24 PM	5/9/2017	0.38	0.1	Calculation
1718435	5/3/2017	2:40 PM	5/17/2017	0.33	0.1	Calculation
1724191	6/7/2017	1:52 PM	6/20/2017	0.41	0.1	Calculation
1730726	7/12/2017	12:43 PM	7/25/2017	1.22	0.1	Calculation
1735971	8/9/2017	11:28 AM	8/23/2017	1.86	0.1	Calculation
1737299	8/16/2017	1:30 PM	8/30/2017	1.89	0.1	Calculation
1742139	9/13/2017	1:38 PM	9/26/2017	1.79	0.1	Calculation
1751079	10/31/2017	1:46 PM	11/9/2017	2.84	0.1	Calculation
1754396	11/21/2017	2:56 PM	12/6/2017	3.11	0.1	Calculation
1756851	12/6/2017	2:54 PM	12/20/2017	3.09	0.1	Calculation
*This sample was calculated In-House based on Nitrate + Nitrite and Total Kjeldahl Nitrogen samples (ALI)			Minimum	0.33		
			Maximum	3.46		
			Average	1.74		

The lab reports for the results in Table 3.05 are available in Appendix A.

F. Chlorophyll a

Chlorophyll a samples were taken once per month, and analyzed by Analytical Labs Inc. Results for each Phosphorus analysis are listed in the table below:

Table 3.06: Chlorophyll Residue						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method
1703242	1/26/2017	4:25 PM	1/31/2017	0.007	N/A	SM 10200
1707307	2/22/2017	12:22 PM	3/2/2017	0.018	N/A	SM 10200
1711593	3/22/2017	1:50 PM	3/24/2017	0.004	N/A	SM 10200
1713807	4/5/2017	2:05 PM	4/11/2017	0.007	N/A	SM 10200
1717085	4/26/2017	4:24 PM	4/28/2017	0.009	N/A	SM 10200
1718439	5/4/2017	9:55 AM	5/5/2017	0.007	N/A	SM 10200
1724191	6/7/2017	1:52 PM	6/13/2017	0.006	N/A	SM 10200
1730726	7/12/2017	12:43 PM	7/18/2017	0.0006	N/A	SM 10200
1735971	8/9/2017	11:28 AM	8/11/2017	0.007	N/A	SM 10200
1742139	9/13/2017	1:38 PM	9/19/2017	0.006	N/A	SM 10200
1748891	10/18/2017	3:45 PM	10/20/2017	0.0067	N/A	SM 10200
1754396	11/21/2017	2:56 PM	11/28/2017	0.009	N/A	SM 10200
1756851	12/6/2017	2:54 PM	12/8/2017	0.0009	N/A	SM 10200
				Minimum	0.0006	
				Maximum	0.018	
				Average	0.0068	

The lab reports for the results in Table 3.06 are available in Appendix A.

G. Temperature

Boise River Upstream sampling frequency for temperature is continuous. The City of Caldwell monitors temperature via the USGS equipment installed next to the upstream sampling site, which conducts continuous measurements. The USGS location is “USGS 13211205”. Results for the entire 2017 calendar year are available in 15 minute increments at waterdata.usgs.gov.

H. pH

pH samples were taken once per week and measured at the City of Caldwell Wastewater Treatment Plant using a Fisher Scientific Accumet XL250 Dual Channel pH/mV/ion probe. Results for the weekly in-house analyses are listed below:

Table 3.07: pH In-House

Boise River Upstream Monitoring 2017

Sample Number	Analysis Date	Analysis Time	Result (mg/L)	Temp (C)	Analyst Initials
1281	2/2/2017	10:48 AM	7.95	6.3	rh
1285	2/8/2017	4:50 PM	8.1	9.3	rh
1285	2/8/2017	4:51 PM	8.05	9	rh
1290	2/15/2017	3:02 PM	8.1	7.3	rh
1290	2/15/2017	3:04 PM	8.08	7.2	rh
1295	2/22/2017	12:30 PM	7.7	6.4	rh
1295	2/22/2017	12:32 PM	7.7	6.6	rh
1300	3/1/2017	12:10 PM	7.6	7.2	rh
1300	3/1/2017	12:11 PM	7.67	6.9	rh
1305	3/8/2017	11:57 AM	7.7	7.1	rh
1305	3/8/2017	11:58 AM	7.71	7	rh
1310	3/15/2017	12:05 PM	7.7	9.1	kc
1310	3/15/2017	12:06 PM	7.7	9.0	kc
1315	3/22/2017	1:59 PM	7.7	9.8	rh
1315	3/22/2017	2:01 PM	7.78	9.6	rh
1323	3/29/2017	1:40 PM	7.7	10.5	kc
1320	3/29/2017	1:40 PM	7.65	10.5	kc
1320	3/29/2017	1:43 PM	7.7	11.2	kc
1323	3/29/2017	1:43 PM	7.72	11.2	kc
1342	4/5/2017	2:15 PM	7.9	12.1	kc
1342	4/5/2017	2:17 PM	7.9	12.1	kc
1337	4/12/2017	2:17 PM	7.8	12.5	kc
1337	4/12/2017	2:18 PM	7.86	12.3	kc
1332	4/19/2017	2:27 PM	7.9	11.9	kc
1332	4/19/2017	2:28 PM	7.92	11.8	kc
1327	4/26/2017	4:32 PM	7.9	11.4	rh
1346	5/3/2017	4:50 PM	8.04	12.9	rh
1346	5/3/2017	4:51 PM	8.1	13.0	rh
1351	5/10/2017	2:28 PM	7.9	15.6	kc
1351	5/10/2017	2:29 PM	8.0	15.6	kc
1355	5/16/2017	3:07 PM	7.57	11.6	kc
1355	5/16/2017	3:08 PM	7.7	11.5	kc
1361	5/24/2017	7:50 AM	7.6	13.7	rh
1361	5/24/2017	7:51 AM	7.6	13.6	rh
1366	6/1/2017	9:06 AM	7.57	14.5	rh
1366	6/1/2017	9:08 AM	7.6	14.4	rh

Sample Number	Analysis Date	Analysis Time	Result (mg/L)	Temp (C)	Analyst Initials
1370	6/7/2017	1:58 PM	7.5	16.2	kc
1370	6/7/2017	1:59 PM	7.6	16.4	kc
1375	6/14/2017	2:44 PM	7.53	16.1	kc
1375	6/14/2017	2:46 PM	7.6	16.1	kc
1380	6/21/2017	3:12 PM	7.6	17.5	rh
1380	6/21/2017	3:13 PM	7.7	17.5	rh
1385	6/28/2017	4:30 PM	7.74	17.9	rh
1385	6/28/2017	4:31 PM	7.8	17.9	rh
1389	7/5/2017	4:40 PM	7.8	20.4	RH
1389	7/5/2017	4:42 PM	7.8	20.4	RH
1394	7/12/2017	12:53 PM	7.73	19.1	KC
1394	7/12/2017	12:53 PM	7.8	19.3	KC
1399	7/19/2017	2:24 PM	7.9	19.8	KC
1399	7/19/2017	2:24 PM	7.9	19.8	KC
1404	7/26/2017	3:00 PM	7.97	21.7	KC
1404	7/26/2017	3:01 PM	8.0	21.6	KC
1409	8/2/2017	3:56 PM	8.0	22.2	kc
1409	8/2/2017	3:58 PM	8.0	22.6	kc
1414	8/9/2017	11:36 AM	7.85	20.3	rh
1414	8/9/2017	11:37 AM	7.9	20.3	rh
1419	8/16/2017	1:40 PM	7.9	20.4	rh
1419	8/16/2017	1:42 PM	7.9	20.4	rh
1424	8/23/2017	1:09 PM	7.82	19.1	rh
1424	8/23/2017	1:10 PM	7.8	19.4	rh
1429	8/30/2017	2:55 PM	8.0	21.7	rh
1429	8/30/2017	2:56 PM	8.0	21.7	rh
1433	9/6/2017	3:48 PM	7.97	20.5	rh
1433	9/6/2017	3:49 PM	8.0	20.5	rh
1438	9/13/2017	1:51 PM	7.9	20.6	kc
1438	9/13/2017	1:52 PM	7.9	20.6	kc
1443	9/20/2017	3:49 PM	7.89	15.6	rh
1443	9/20/2017	3:50 PM	7.9	15.7	rh
1447	9/26/2017	11:42 AM	7.9	16.3	rh
1447	9/26/2017	11:43 AM	7.9	16.3	rh
1453	10/4/2017	4:17 PM	8.05	15.7	rh
1453	10/4/2017	4:18 PM	8.1	15.8	rh
1458	10/11/2017	4:06 PM	8.2	15.5	kc
1458	10/11/2017	4:07 PM	8.2	15.5	kc
1463	10/18/2017	4:20 PM	8.22	17	kc
1463	10/18/2017	4:21 PM	8.2	17.1	kc

Sample Number	Analysis Date	Analysis Time	Result (mg/L)	Temp (C)	Analyst Initials
1468	10/25/2017	3:10 PM	8.3	13.3	kc
1468	10/25/2017	3:11 PM	8.3	13.2	kc
1472	10/31/2017	1:55 PM	8.18	12.8	kc
1472	10/31/2017	1:56 PM	8.2	12.8	kc
1478	11/8/2017	2:50 PM	8.2	11.2	RH
1478	11/8/2017	2:51 PM	8.2	11.3	RH
1483	11/15/2017	4:25 PM	8.21	11.5	RH
1483	11/15/2017	4:26 PM	8.2	11.6	RH
1487	11/21/2017	3:08 PM	8.1	12.1	RH
1487	11/21/2017	3:09 PM	8.1	11.9	RH
1491	11/29/2017	4:14 PM	8.25	10.4	RH
1491	11/29/2017	4:14 PM	8.2	10.7	RH
1496	12/6/2017	3:04 PM	8.1	7.6	kc
1496	12/6/2017	3:05 PM	7.5	7.5	kc
1502	12/14/2017	8:07 AM	8.02	8	kc
1502	12/14/2017	8:08 AM	8.0	8.3	kc
1506	12/20/2017	4:34 PM	8.2	8.8	kc
1506	12/20/2017	4:35 PM	8.1	8.4	kc
1510	12/28/2017	8:58 AM	8.03	7.6	rh
1510	12/28/2017	9:01 AM	8.0	7.8	rh
	Minimum		7.50		
	Maximum		8.25		
	Average		7.90		

Hard copies of the In-House pH results are available upon request.

In addition to the results listed in Table 3.02 (Dissolved Oxygen In-House), two samples were also sent to Analytical Laboratories Inc., and are listed in the table below:

Table 3.08: pH (ALI)						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (S.U.)	MDL	Analysis Method
1703242	1/26/2017	4:25 PM	1/26/2017	7.7		SM 4500-H B
1717248	4/26/2017	4:24 PM	4/28/2017	7.5		SM 4500-H B
1717085	4/26/2017	4:24 PM	4/27/2017	6.4		SM 4500-H B
1730726	7/12/2017	12:43 PM	7/13/2017	7.4		SM 4500-H B
				Minimum	6.4	
				Maximum	7.7	
				Average	7.25	

The lab reports for the results in Table 3.08 are available in Appendix A.

I. Turbidity

Turbidity samples were taken once per week, and analyzed by Analytical Labs Inc. Results for each Phosphorus analysis are listed in the table below:

Table 3.09: Turbidity						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method
1703242	1/26/2017	4:25 PM	1/26/2017	5.1	0.5	EPA 180.1
1704264	2/2/2017	10:34 AM	2/2/2017	4.1	0.5	EPA 180.1
1705235	2/8/2017	4:35 PM	2/9/2017	15.9	0.5	EPA 180.1
1706323	2/15/2017	2:52 PM	2/16/2017	3.7	0.5	EPA 180.1
1707307	2/22/2017	12:22 PM	2/23/2017	15.5	0.5	EPA 180.1
1708311	3/1/2017	12:00 PM	3/2/2017	6.0	0.5	EPA 180.1
1709312	3/8/2017	11:48 AM	3/9/2017	6.7	0.5	EPA 180.1
1710504	3/15/2017	11:57 AM	3/16/2017	7.2	0.5	EPA 180.1
1711593	3/22/2017	1:50 PM	3/23/2017	12.1	0.5	EPA 180.1
1712623	3/29/2017	1:32 PM	3/30/2017	13.9	0.5	EPA 180.1
1713807	4/5/2017	2:05 PM	4/6/2017	14.4	0.5	EPA 180.1
1714844	4/12/2017	2:09 PM	4/14/2017	10.5	0.5	EPA 180.1
1715870	4/19/2017	2:02 PM	4/20/2017	7.6	0.5	EPA 180.1
1717085	4/26/2017	4:24 PM	4/27/2017	7.1	0.5	EPA 180.1
1718435	5/3/2017	2:40 PM	5/4/2018	5.3	0.5	EPA 180.1
1719579	5/10/2017	2:15 PM	5/11/2017	5.1	0.5	EPA 180.1
1720577	5/16/2017	3:00 PM	5/17/2017	13.2	0.5	EPA 180.1
1721793	5/24/2017	7:42 AM	5/24/2017	11.3	0.5	EPA 180.1
1723028	6/1/2017	8:55 AM	6/1/2017	8.8	0.5	EPA 180.1
1724191	6/7/2017	1:52 PM	6/8/2017	7.3	0.5	EPA 180.1
1725655	6/14/2017	2:35 PM	6/15/2017	10.4	0.5	EPA 180.1
1726991	6/21/2017	3:03 PM	6/22/2017	10.1	0.5	EPA 180.1
1728146	6/28/2017	4:22 PM	6/29/2017	11.3	0.5	EPA 180.1
1729336	7/5/2017	4:35 PM	7/6/2017	8.0	0.5	EPA 180.1
1730726	7/12/2017	12:43 PM	7/13/2017	15.1	0.5	EPA 180.1
1732135	7/19/2017	2:15 PM	7/20/2017	14.4	0.5	EPA 180.1
1733317	7/26/2017	2:50 PM	7/27/2017	9.7	0.5	EPA 180.1
1734531	8/2/2017	1:50 PM	8/3/2017	12.4	0.5	EPA 180.1
1735971	8/9/2017	11:28 AM	8/10/2017	14.7	0.5	EPA 180.1
1737299	8/16/2017	1:30 PM	8/16/2017	12.9	0.5	EPA 180.1
1738416	8/23/2017	1:00 PM	8/24/2017	10.9	0.5	EPA 180.1

Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method
1739591	8/30/2017	2:45 PM	8/31/2017	12.0	0.5	EPA 180.1
1740737	9/6/2017	3:40 PM	9/7/2017	6.7	0.5	EPA 180.1
1742139	9/13/2017	1:38 PM	9/14/2017	7.7	0.5	EPA 180.1
1743577	9/20/2017	3:39 PM	9/21/2017	4.4	0.5	EPA 180.1
1744785	9/26/2017	11:30 AM	9/27/2017	4.7	0.5	EPA 180.1
1746576	10/4/2017	4:00 PM	10/5/2017	4.4	0.5	EPA 180.1
1747786	10/11/2017	3:57 PM	10/12/2017	4.6	0.5	EPA 180.1
1748891	10/18/2017	3:45 PM	10/19/2017	4.4	0.5	EPA 180.1
1750085	10/25/2017	3:00 PM	10/26/2017	3.0	0.5	EPA 180.1
1751291	11/1/2017	10:30 AM	11/2/2017	2.2	0.5	EPA 180.1
1752512	11/8/2017	2:27 PM	11/9/2017	2.5	0.5	EPA 180.1
1753611	11/15/2017	4:15 PM	11/16/2017	2.9	0.5	EPA 180.1
1754396	11/21/2017	2:56 PM	11/22/2017	4.4	0.5	EPA 180.1
1755473	11/29/2017	4:01 PM	11/30/2018	3.3	0.5	EPA 180.1
1756851	12/6/2017	2:54 PM	12/7/2017	4.1	0.5	EPA 180.1
1758035	12/14/2017	7:54 AM	12/14/2017	3.0	0.5	EPA 180.1
1759351	12/20/2017	3:26 PM	12/21/2017	3.3	0.5	EPA 180.1
1760069	12/28/2017	8:51 AM	12/28/2017	6.2	0.5	EPA 180.1
				Minimum	2.20	
				Maximum	15.9	
				Average	8.05	

The lab reports for the results in Table 3.09 are available in Appendix A.

J. Arsenic

Arsenic samples were taken once per quarter, and analyzed by Analytical Labs Inc. Results for each Arsenic analysis are listed in the table below:

Table 3.10: Arsenic						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method
1703245	1/26/2017	4:25 PM	2/2/2017	4.0	2	EPA 200.8
1717085	4/26/2017	4:24 PM	5/5/2017	3.6	0.5	EPA 200.8
1730726	7/12/2017	12:43 PM	7/19/2017	3.6	0.5	EPA 200.8
1748891	10/18/2017	3:45 PM	11/2/2017	4.2	0.5	EPA 200.8
				Minimum	3.60	
				Maximum	4.2	
				Average	3.85	

The lab reports for the results in Table 3.10 are available in Appendix A.

K. Cadmium

Cadmium samples were taken once per quarter, and analyzed by Analytical Labs Inc. Results for each Cadmium analysis are listed in the table below:

Table 3.11: Cadmium						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method
1703245	1/26/2017	4:25 PM	2/2/2017	< 0.5	0.5	EPA 200.8
1717085	4/26/2017	4:24 PM	5/5/2017	< 0.25	0.25	EPA 200.8
1730728	7/12/2017	12:43 PM	7/17/2017	< 0.25	0.25	EPA 200.8
1748891	10/18/2017	3:45 PM	11/2/2017	< 0.25	0.25	EPA 200.8
				Minimum	0.25	
				Maximum	0.5	
				Average	0.31	

The lab reports for the results in Table 3.10 are available in Appendix A.

L. Chromium

Chromium samples were taken once per quarter, and analyzed by Analytical Labs Inc. Results for each Chromium analysis are listed in the table below:

Table 3.12: Chromium							
Boise River Upstream Monitoring 2017							
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method	
1703245	1/26/2017	4:25 PM	2/2/2017	<	2	2	EPA 200.8
1717085	4/26/2017	4:24 PM	5/5/2017	<	1	1	EPA 200.8
1730728	7/12/2017	12:43 PM	7/17/2017		4	1	EPA 200.8
1748891	10/18/2017	3:45 PM	11/2/2017	<	1	1	EPA 200.8
				Minimum	1		
				Maximum	4		
				Average	2		

The lab reports for the results in Table 3.12 are available in Appendix A.

M. Hexavalent Chromium

Hexavalent chromium samples were taken once per quarter. Analysis using EPA method 200.8 was performed by Analytical Laboratories Inc., while SVL Analytical was chosen for later samples based on EPA reference regarding detection limits, using SM 3500 Cr B. Analytical laboratories performed total chromium analysis on each samples, and reported the hexavalent chromium level as less than the total level, as shown in the table below:

Table 3.13: Hexavalent Chromium							
Boise River Upstream Monitoring 2017							
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method	
1703245	1/26/2017	4:25 PM	2/2/2017	< 2	2	EPA 200.8	
1712623	3/29/2017	1:32 PM	4/19/2017	< 1	1	EPA 200.8	
1717085	4/26/2017	4:24 PM	5/10/2017	< 1	1	EPA 200.8	
1730727	7/12/2017	12:43 PM	7/24/2017	< 1	1	EPA 200.8	
X7I0403-07*	9/13/2017	1:38 PM	9/27/2017	< 10	2**	SM 3500 Cr B	
X7J0459-01*	10/18/2017	3:45 PM	11/2/2017	< 10	2**	SM 3500 Cr B	
*Samples were analyzed by SVL Analytical			Minimum	1.00			
** Reporting Limit = 10 µg/L			Maximum	10			
			Average	4.17			

The lab reports for the results in Table 3.13 are available in Appendix A.

N. Copper

Copper samples were taken once per quarter, and analyzed by Analytical Labs Inc. Results for each Copper analysis are listed in the table below:

Table 3.14: Copper							
Boise River Upstream Monitoring 2017							
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method	
1703245	1/26/2017	4:25 PM	2/2/2017	< 5	5	EPA 200.7	
1717085	4/26/2017	4:24 PM	5/5/2017	< 2	2	EPA 200.8	
1730728	7/12/2017	12:43 PM	7/17/2017	2	2	EPA 200.8	
1748891	10/18/2017	3:45 PM	11/2/2017	< 2	2	EPA 200.8	
				Minimum	2		
				Maximum	5		
				Average	2.75		

The lab reports for the results in Table 3.14 are available in Appendix A.

O. Lead

Lead samples were taken once per quarter, and analyzed by Analytical Labs Inc. Results for each Lead analysis are listed in the table below:

Table 3.15: Lead							
Boise River Upstream Monitoring 2017							
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method	
1703245	1/26/2017	4:25 PM	2/2/2017	< 1	1	EPA 200.8	
1717085	4/26/2017	4:24 PM	5/5/2017	< 0.5	0.5	EPA 200.8	
1730728	7/12/2017	12:43 PM	7/17/2017	< 0.5	0.5	EPA 200.8	
1748891	10/18/2017	3:45 PM	11/2/2017	< 0.5	0.5	EPA 200.8	
				Minimum	0.5		
				Maximum	1		
				Average	0.63		

The lab reports for the results in Table 3.15 are available in Appendix A.

P. Mercury

Mercury samples were taken once per quarter, and analyzed by Anatek Laboratories, via Analytical Laboratories Inc. (except for Sample Number 1717085, which was analyzed at the Analytical Laboratories Inc. facility). Results for each Mercury analysis are listed in the table below:

Table 3.16: Mercury						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method
1703243*	1/26/2017	4:25 PM	2/13/2017	0.0014	0.0005	EPA 1631e
1712624*	3/29/2017	1:32 PM	4/19/2017	0.0062	0.0005	EPA 1631e
1717085	4/26/2017	4:24 PM	5/1/2017	< 0.2	0.2	EPA 245.1
1732136*	7/19/2017	2:15 PM	7/26/2017	0.0034	0.0005	EPA 1631e
1742140*	9/13/2017	1:38 PM	9/21/2017	0.0027	0.0005	EPA 1631e
1748892*	10/18/2017	3:45 PM	10/25/2017	0.0029	0.0005	EPA 1631e
*Samples sent to Analytical Laboratories for analysis			Minimum	0.0014		
			Maximum	0.2		
			Average	0.0361		

The lab reports for the results in Table 3.16 are available in Appendix A.

Q. Nickel

Nickel samples were taken once per quarter, and analyzed by Analytical Labs Inc. Results for each nickel analysis are listed in the table below:

Table 3.17: Nickel						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method
1703245	1/26/2017	4:25 PM	2/2/2017	< 5	5	EPA 200.7
1717085	4/26/2017	4:24 PM	5/5/2017	0.7	0.5	EPA 200.8
1730728	7/12/2017	12:43 PM	7/17/2018	< 0.5	0.5	EPA 200.8
1748891	10/18/2017	3:45 PM	11/2/2017	1.3	0.5	EPA 200.8
			Minimum	0.5		
			Maximum	5		

	Average	1.88
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The lab reports for the results in Table 3.17 are available in Appendix A.

R. Silver

Silver samples were taken once per quarter, and analyzed by Analytical Labs Inc. Results for each silver analysis are listed in the table below:

Table 3.18: Silver						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method
1703245	1/26/2017	4:25 PM	2/2/2017	< 1	1	EPA 200.8
1717085	4/26/2017	4:24 PM	5/5/2017	< 0.2	0.2	EPA 200.8
1730728	7/12/2017	12:43 PM	7/17/2017	< 0.2	0.2	EPA 200.8
1748891	10/18/2017	3:45 PM	11/2/2017	< 0.2	0.2	EPA 200.8
				Minimum	0.2	
				Maximum	1	
				Average	0.4	

The lab reports for the results in Table 3.18 are available in Appendix A.

S. Zinc

Zinc samples were taken once per quarter, and analyzed by Analytical Labs Inc. Results for each zinc analysis are listed in the table below:

Table 3.19: Zinc						
Boise River Upstream Monitoring 2017						
Sample Number	Collection Date	Collection Time	Completion Date	Result (µg/L)	MDL (µg/L)	Analysis Method
1703245	1/26/2017	4:25 PM	42768	8	5	EPA 200.7
1717085	4/26/2017	4:24 PM	42856	7	2	EPA 200.7
1730728	7/12/2017	12:43 PM	42933	5	2	EPA 200.7
1748891	10/18/2017	3:45 PM	43031	6	2	EPA 200.7
				Minimum	5	
				Maximum	8	
				Average	6.5	

The lab reports for the results in Table 3.19 are available in Appendix A.

T. Other Analyses

Analyses on the Boise River Upstream not required by the NPDES permit were completed in addition to those required and previously listed. These analyses included: ammonia, conductivity, dissolved organic carbon, hardness and total suspended solids. Each of these analyses were performed by Analytical Laboratories Inc. The results of these analyses are listed below:

Table 3.20: Ammonia							
Boise River Upstream Monitoring 2017							
Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method	
1748891	10/18/2017	3:45 PM	43031	< 0.04	0.04	EPA 350.1	
				Minimum	0.04		
				Maximum	0.04		
				Average	0.04		

Table 3.21: Conductivity							
Boise River Upstream Monitoring 2017							
Sample Number	Collection Date	Collection Time	Completion Date	Result (µhom/cm)	MDL (µhom/cm)	Analysis Method	
1703242	1/26/2017	4:25 PM	1/26/2017	373	2	SM 2510 B	
1717248	4/26/2017	4:24 PM	4/28/2017	101	2	SM 2510 B	
1717085	4/26/2017	4:24 PM	4/27/2017	98.1	2	SM 2510 B	
1730726	7/12/2017	12:43 PM	7/13/2017	171	2	SM 2510 B	
				Minimum	98.1		
				Maximum	373		
				Average	185.8		

Table 3.22: Dissolved Organic Carbon

Boise River Upstream Monitoring 2017

Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method
1703242	1/26/2017	4:25 PM	2/3/2017	2.11	0.1	EPA 415.1
1717248	4/26/2017	4:24 PM	5/4/2017	2.29	0.1	EPA 415.1
1717085	4/26/2017	4:24 PM	5/4/2017	2.25	0.1	EPA 415.2
1730726	7/12/2017	12:43 PM	7/17/2017	2.83	0.1	EPA 415.1
				Minimum	2.11	
				Maximum	2.83	
				Average	2.37	

Table 3.23: Hardness

Boise River Upstream Monitoring 2017

Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method
1703242	1/26/2017	4:25 PM	2/2/2017	118	5	SM 2340
1717085	4/26/2017	4:24 PM	5/6/2017	37.2	5	SM 2340-C
1730726	7/12/2017	12:43 PM	7/22/2017	57.5	5	SM 2340-C
				Minimum	37.2	
				Maximum	118	
				Average	70.9	

Table 3.24: Total Suspended Solids

Boise River Upstream Monitoring 2017

Sample Number	Collection Date	Collection Time	Completion Date	Result (mg/L)	MDL (mg/L)	Analysis Method
1730726	7/12/2017	12:43 PM	7/14/2017	29	2	USGS I-3765
				Minimum	29	
				Maximum	29	
				Average	29	

The lab reports for the results in Tables 3.20 to 3.24 are available in Appendix A.

V. Conclusion

Monitoring for 2018 will include all of the same required parameters for the Boise River Upstream surface water analyses performed in 2017.

Boise River Downstream surface water monitoring will begin by October 31, 2018 and will include these requirements: Total Phosphorus, Total Nitrogen, Chlorophyll a, Temperature, pH, Turbidity, Hardness, Conductivity and Dissolved Organic Carbon.

Downstream sampling will occur in the south channel of the Boise River, upstream of Indian Creek, and below the City's discharge site. Downstream samples will be composites of at least three samples from across the south channel of the Boise River, as described in NPDES Permit #ID0021504 Part I.E.5.