June 2016 Clinton Creek Surface Water Quality and Hydrological Monitoring Program
Monthly Summary Report

Prepared for:
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File: 1343-005.17
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HEMMERA

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1.0 INTRODUCTION

This Work was performed in accordance with Contract C00033502 between Hemmera Envirochem Inc. ("Hemmera") and Government of Yukon (YG), dated May 13, 2016 ("Contract"). In performing this Work, Hemmera has relied in good faith on information provided by others, and has assumed that the information provided by those individuals is both complete and accurate. This Work was performed to current industry standard practice for similar environmental work, within the relevant jurisdiction and same locale. The findings presented herein should be considered within the context of the scope of work and project terms of reference; further, the findings are time sensitive and are considered valid only at the time the Report was produced. The conclusions and recommendations contained in this Report are based upon the applicable guidelines, regulations, and legislation existing at the time the Report was produced; any changes in the regulatory regime may alter the conclusions and/or recommendations.

Hemmera and Ecological Logistics & Research Ltd. (Hemmera/ELR) were retained by the YG, Assessment and Abandoned Mines (AAM) to conduct a water quality and hydrological monitoring program at the Clinton Creek Mine site during the 2016/2017 fiscal year.

The purpose of this 2016/17 sampling program is to monitor water quality, hydrology, and meteorological station data from the Site as part of the overall care, maintenance and closure program objectives for the Site. The water quality and hydrology scope of work was based on program recommendations developed by Hemmera/ELR in 2015 (Hemmera 2015), while the meteorological station was installed and is managed by AAM, with maintenance work performed by other contractors.

This monthly summary report forms part of our overall scope of work, and is intended to provide a summary of the scope of work performed, a brief overview of methods used, deviations from the intended program scope, as well as raw program data and data summaries.

2.0 JUNE 2016 MONITORING PROGRAM SCOPE

The specific scope of work for the June 2016 sampling event included:

- Visiting 17 surface water quality sampling stations and five (5) groundwater seep/pit lake stations to collect *in-situ* water quality measurements and samples for laboratory analysis, where possible
- Collection of manual discharge measurements at 14 stream locations including flow, stream width, stream depth, and other site characteristics. This will include the two sites where automated hydrometric stations are installed
- Collection of survey data, staff gauge readings, and stream gauging data at two hydrometric monitoring sites.
- Completion of a download of the meteorological station data and hydrometric station data that is satellite-linked (hosted by Northern AvCom). The data is downloaded each month and a visual check performed to ensure that the various sensors are functioning and continuing to collect data.
- Completion of a manual download of the standalone hydrometric station located on Wolverine Creek (Station E3[H]), including a check of battery power and functioning.
- Establishment of three (3) sites on Hudgeon Lake from which to collect *in-situ* water quality measurements and profiles.
- Collection of *in-situ* water quality measurements and profiles from three (3) sites on Hudgeon Lake at one (1) metre increments.
- Investigation of the groundwater seepage Site GWCC-1 to determine the feasibility of constructing a small weir to isolate the seepage from the remainder of the pond into which it flows.

3.0 SUMMARY OF FIELD ACTIVITIES

Hemmera/ELR successfully completed the monthly field monitoring program during June 13 to June 18, 2016. The program was completed by Christopher Harwood of Hemmera and Aaron Nicholson of ELR.

Table 1 presents a summary of the program sample site names and locations, as well as a summary of June 2016 data collection scope for water quality and hydrology. **Table 2** provides a brief summary of activities completed during the June 2016 field program. The location of field sampling stations is shown on **Figures 1 and 2**.

Table 1 Sample Site Descriptions and Locations – June 2016

Station Code	Hydrology Data Collected	Water Quality Data Collected	Station Description	Location (UTM, Zone 7N)	
				Easting	Northing
Exposed Sites					
E1		✓	Clinton Creek downstream of gabions	513645	7147111
E1(H)	✓	✓	Clinton Creek at the outlet of Hudgeon Lake	512806	7147438
E2	✓	✓[1]	Clinton Creek, downstream of Porcupine Creek but upstream of Wolverine Creek	514158	7147076
E3		✓[1]	Wolverine Creek, upstream of culvert	514178	7147189
E3(H)	✓		Wolverine Creek approximately 300 m upstream of the Clinton Creek confluence	514170	7147608
E4	✓	✓	Clinton Creek downstream of Wolverine Creek but upstream of Eagle Creek	515950	7145287
E7	✓	✓	Clinton Creek near mouth	519400	7142042
E8		✓	Forty Mile River downstream of Clinton Creek	519457	7142795
E9[2]			Porcupine Creek at its discharge into Clinton Creek	-	-
Reference Sites					
R1	✓	✓[1]	Clinton Creek upstream of Hudgeon Lake	510718	7147525
R2	✓	✓	Easter Creek upstream of Hudgeon Lake	512023	7148061
R3	✓	✓[1]	Wolverine Creek, upstream of tailings	513952	7148677
R4	✓	✓	Eagle Creek, upstream of culvert	515981	7145344
R6		✓	Forty Mile River, upstream of Clinton Creek	519485	7141731
R7	✓	✓	Porcupine Creek, upstream of waste rock	513026	7145669
R8	✓	✓	Unnamed creek that enters Hudgeon Lake west of Easter Creek	511885	7147805
R9	✓	✓	Unnamed stream input on the south side of Hudgeon Lake	512343	7146753
R11	✓[3]	✓[3]	Unnamed tributary to Wolverine Creek between R3 and E3(H).	514165	7147732

Station Code	Hydrology Data Collected	Water Quality Data Collected	Station Description	Location (UTM, Zone 7N)	
				Easting	Northing
Groundwater Seepage and Pit Sites					
GWCC-1		✓	Toe of the Waste Rock dump flowing into ponded area at Porcupine Creek	513902	7146960
GWCC-2		✓	Toe of the Waste Rock dump flowing into ponded area approx. 10 m northwest of GWCC-1	513899	7146968
GWCC-3		✓	Toe of the Waste Rock dump flowing into side channel, approx. 10 m northwest of GWCC-2	513882	7147038
GWCC-4		✓	Toe of the Waste Rock dump flowing into side channel, approx. 10 m northwest of GWCC-3	513868	7147052
GWCC-5	✓	✓	Groundwater flows in old Clinton Creek channel	513984	7147127
SL		✓[4]	Snowshoe Pit Lake from shore	513824	7146703
PL[5]			Porcupine Pit Lake from shore	-	-
Hudgeon Lake *In-Situ* Depth Profile Data Sites					
HL1		✓	Hudgeon Lake, near the west end	511284	7147219
HL2		✓	Hudgeon Lake, near the center	511924	7147168
HL3		✓	Hudgeon Lake, close to the outlet	512485	7147190

[1] – Asbestos sample collected monthly in addition to regular program analytical set
[2] – Site E9 was not established during the June program as there was no surface water flow at the site.
[3] – Site R11 established and sampled for first time during June 2016 event.
[4] – Survey data is also collected to record water elevation.
[5] – Porcupine Pit is included as a program station for water quality sampling, but has not been sampled due to concerns with pit wall stability.

512000

514000

7148000

7146000

R3
Water Quality/Hydrology

Easter Creek

R2
Water Quality/Hydrology

Wolverine Creek

R11
Water Quality/Hydrology

R8
Water Quality/Hydrology

R1
Water Quality/Hydrology

E3(H)
Hydrology

Clinton Creek

E1(H)
Water Quality / Hydrology

Hudgeon Lake

E1
Water Quality

E3
Water Quality

E2
Water Quality / Hydrology

HL1
In-situ/Depth Profile

HL2
In-situ/Depth Profile

HL3
In-situ/Depth Profile

Location of 2016 Snow Survey

SL
Water Quality / Water Level

E9
Water Quality/Hydrology

Site
Access
Road

PL
Water Quality

Porcupine
Pit
Lake

Snowshoe
Pit
Lake

R9
Water Quality/Hydrology

R7
Water Quality/Hydrology

Porcupine Creek

GWCC-5
Water Quality/Hydrology

E2
Water Quality / Hydrology

Clinton Creek (Old)

GWCC-4
Water Quality

Clinton Creek

GWCC-3
Water Quality

E9
Water Quality/Hydrology

GWCC-2
Water Quality

GWCC-1
Water Quality

NOTES:

Projection: UTM Zone 7 NAD83
Units: Meters
NTS Mapsheet: 116C07

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Clinton Creek Surface Water Quality and Hydrological Monitoring

Ecological Logistics & Research Ltd.

HEMMERA

Client:

Yukon
Energy, Mines and Resources
Assessment and Abandoned Mines

Legend

Water Type

- Surface Water
- Groundwater

Site Type

- Exposed
- Reference

- Topographic Watercourse Data
  (may not be truly representative of on-site conditions)

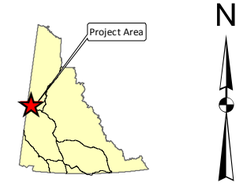

FIGURE 1

Sampling Stations

Site Area

Date: November 1, 2016	Scale: 1:15,000
ELR Project #: 16-240.2 Hemmera Project #: 1343-005.17	Rev. #: 1

514000
516000
518000
7144000
7142000

Clinton Creek
Eagle Creek
R4
Water Quality/Hydrology
E4
Water Quality/Hydrology
Site Access Road
Forty Mile River
E8
Water Quality
Clinton Creek
E7
Water Quality/Hydrology
R6
Water Quality

NOTES:

Projection: UTM Zone 7 NAD83
Units: Meters
NTS Mapsheet: 116C07

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Clinton Creek Surface Water Quality and Hydrological Monitoring

elr Ecological Logistics & Research Ltd.

HEMMERA

Client:

Yukon
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Assessment and Abandoned Mines

Legend

Water Type

Surface Water

Site Type

Exposed

Reference

Topographic Watercourse Data

(may not be truly representative of on-site conditions)

N

0 150 300 600

Meters

FIGURE 2

Sampling Stations

Forty Mile River Area

Date: November 1, 2016	Scale: 1:18,000
ELR Project #: 16-240.2 Hemmera Project #: 1343-005.17	Rev. #: 1

Table 2 Field Program Activity Summary

Task	Summary of Task and Program Observations / Anomalies
Surface Water Quality Sampling	Sampling was successfully completed at all 17 surface water stations and all samples were received by the lab within required hold times. Water quality reference site R11 was established and sampled for the first time.
Stream Gauging	Stream gauging was successfully completed at all 14 hydrology sites.
Surveying of Hydrometric Sites	Surveys of hydrometric sites were completed at 3 sites and compared on-site to previous surveys.
Meteorological Station and Hydrometric Station Download/Check	The meteorological station near E1(H) was visually assessed. Data was downloaded and reviewed and all data through to the end of June 2016 appear to be complete. The snow depth sensor still seems to be giving some erroneous readings, having both negative and very large values that did not correspond with general on-site field measurements during the winter of 2016. During the previous winter this accounted for upwards of 40 percent of recorded values in some cases. Hemmera/ELR are not aware of any specific investigations of the snow depth gauge.
Manual Download of Wolverine Creek Hydrometric Station	Hydrometric station data was manually downloaded from E3(H) on June 18, 2016 and a battery level check was completed. The data suggest that the sensor is functioning correctly and that battery levels are sufficient.
Hudgeon Lake In-Situ Measurements	Three (3) *in-situ* depth profile measurement sites were established (via GPS based on coordinates derived from bathymetric maps) and measured in 1 metre depth increments for identified parameters.
Investigation for Potential Weir at Site GWCC-1	The potential for construction and installation of a weir at GWCC-1 was determined to have a low chance of success due to unfavourable positioning, substrate, and location of water flow. Based on this, Hemmera/ELR do not consider the installation of a weir to be a viable option at this time without major works.

4.0 JUNE 2016 MONITORING PROGRAM RESULTS SUMMARY

4.1 SURFACE WATER QUALITY ANALYTICAL RESULTS AND EXCEEDANCES

Laboratory analytical results are summarized in **Table 3** attached. Laboratory analytical results are compared to Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Freshwater Aquatic Life (FAL; CCME, 2014) guidelines, where exceedances of CCME-FAL guidelines are shaded grey. In several instances, laboratory reportable detection limits (RDL) for parameters exceeded applicable CCME FAL standards (lightly shaded values in **Table 3**). In these cases, samples having elevated levels of certain parameters required laboratory dilution prior to performing the required analyses, thereby resulting in an elevated RDL. For the purpose of this report, samples where the reported RDL is greater than the applicable guideline have not been reported as CCME FAL exceedances. Laboratory analytical reports are provided in **Appendix 1**, while field forms are provided in **Appendix 2**.

For sites where duplicate samples were collected, corresponding monitoring and duplicate sample results were compared to the QA/QC analysis threshold of 20% Relative Percent Difference (RPD). The analytical results for field blanks and travel blanks were reviewed for any parameter detections. QA/QC results are provided in **Table 4**. For the June program, no exceedances of 20% RPD occurred, and only one detection was noted in a travel blank: a detection of Ammonia, which occurs normally from time to time in travel blanks.

A condensed summary of CCME FAL guideline exceedances in the June 2016 water quality results is provided in **Table 5** for ease of review.

Table 5 Summary of CCME FAL Guideline Exceedances for June 2016 Sampling Program

		Site Type	Reference Sites							
		Site Location	R1	R2	R3	R4	R6	R7	R9	R11
		Date Sampled	16/06/2016	16/06/2016	17/06/2016	15/06/2016	18/06/2016	17/06/2016	17/06/2016	17/06/2016
		Site Condition	Good	Good	Good	Good	Good	Good	Good	Good
Parameter	**Units**	CCME-FAL[1, 2, 3, 4]								
Physical Tests										
Field Dissolved Oxygen	mg/L	9.5 [6]					8.45			
Dissolved Metals										
Aluminum (Al)-Dissolved	mg/L	Varies [8]						0.107		
Aluminum CCME-FAL	mg/L	-						*0.1000*		
Arsenic (As)-Dissolved	mg/L	0.005								
Chromium (VI)-Dissolved	mg/L	0.001								
Copper (Cu)-Dissolved	mg/L	Varies [10]					0.00287	0.00454	0.00406	
Copper CCME-FAL	mg/L	-					*0.002087*	*0.002336*	*0.004*	
Iron (Fe)-Dissolved	mg/L	0.3						1.36	0.884	
Selenium (Se)-Dissolved	mg/L	0.001	0.00256			0.00163			0.00112	
Total Metals										
Aluminum (Al)-Total	mg/L	Varies [8]	0.175	0.109	1.93	0.365	0.149	0.470		0.151
Aluminum CCME-FAL	mg/L	-	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*		*0.1000*
Arsenic (As)-Total	mg/L	0.005								
Chromium (VI)-Total	mg/L	0.001				0.0011				
Cobalt (Co)-Total	mg/L	-								
Copper (Cu)-Total	mg/L	Varies [10]			0.00551		0.00291	0.00493	0.00408	
Copper CCME-FAL	mg/L	-			*0.004*		*0.002087*	*0.002336*	*0.004*	
Iron (Fe)-Total	mg/L	0.3	0.503	0.436	3.31	0.765	0.304	1.93	0.930	0.315
Selenium (Se)-Total	mg/L	0.001	0.00246			0.00159			0.00109	

Note: Please see the notes that follow **Tables 3** and **4** for full explanations of CCME-FAL Guidelines and superscript notes.

Table 5 Summary of CCME FAL Guideline Exceedances for June 2016 Sampling Program (con't)

		Site Type	Exposed Sites								Groundwater Seepage Sites				
		Site Location	E1	E1(H)	E2	E3	E4	E7	E8	SL	GWCC-1	GWCC-2	GWCC-3	GWCC-4	GWCC-5
		Date Sampled	14/06/2016	14/06/2016	15/06/2016	14/06/2016	15/06/2016	15/06/2016	15/06/2016	17/06/2016	15/06/2016	15/06/2016	15/06/2016	15/06/2016	14/06/2016
		Site Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Parameter	**Units**	CCME-FAL[1, 2, 3, 4]													
Physical Tests															
Field Dissolved Oxygen	mg/L	9.5 [6]			9.21					7.76	4.76	8.36	5.17	4.26	4.27
Dissolved Metals															
Aluminum (Al)-Dissolved	mg/L	Varies [8]													
Aluminum CCME-FAL	mg/L	-													
Arsenic (As)-Dissolved	mg/L	0.005								0.0168					
Chromium (VI)-Dissolved	mg/L	0.001								0.0016	0.0037	0.0019	-	-	-
Copper (Cu)-Dissolved	mg/L	Varies [10]													
Copper CCME-FAL	mg/L	-													
Iron (Fe)-Dissolved	mg/L	0.3													
Selenium (Se)-Dissolved	mg/L	0.001	0.00220	0.00213	0.00191		0.00153	0.00126		0.0163	0.00509	0.00359	0.00149	0.00101	0.00987
Total Metals															
Aluminum (Al)-Total	mg/L	Varies [8]				0.361			0.351	0.215					
Aluminum CCME-FAL	mg/L	-				*0.1000*			*0.1000*	*0.1000*					
Arsenic (As)-Total	mg/L	0.005								0.0163					
Chromium (VI)-Total	mg/L	0.001				0.0012				0.0019	0.0036	0.0021			
Cobalt (Co)-Total	mg/L	-													
Copper (Cu)-Total	mg/L	Varies [10]													
Copper CCME-FAL	mg/L	-													
Iron (Fe)-Total	mg/L	0.3				0.766			0.609	0.483					
Selenium (Se)-Total	mg/L	0.001	0.00219	0.00206	0.00198		0.00165	0.00126		0.0157	0.00501	0.00341	0.00153	0.00104	0.00935

Note: Please see the notes that follow **Tables 3** and **4** for full explanations of CCME-FAL Guidelines and superscript notes.

4.2 HUDGEON LAKE *IN-SITU* PROFILE DATA

The raw Hudgeon Lake *in-situ* profile data for the June 2016 monitoring event is provided in **Appendix 3**.

4.3 STREAM GAUGING DATA

The tabulated stream gauging data from the June 2016 monitoring event is provided in **Appendix 4**.

4.4 HYDROMETRIC STATION DOWNLOADED DATA AND SURVEY DATA

The raw data downloaded from the Wolverine Creek hydrometric station has been reviewed and accompanies the report as a data file, while the survey data collected from the Wolverine Creek and Hudgeon Lake hydrometric stations is provided in **Appendix 5**.

The survey data trends (July data and previous data) seem to suggest that one of the structures at the Hudgeon Lake hydrometric station site have moved slightly, however the data do not indicate which structure. In response to this, Hemmera/ELR plan to install a third benchmark at the Hudgeon Lake hydrometric station site during the July sampling event.

5.0 RECOMMENDATIONS

Hemmera/ELR have prepared the following recommendations based on the observations and results of the June 2016 water quality and hydrological monitoring program:

1. Continue sampling and monitoring flow at R11. The site appears viable with significant input into Wolverine Creek.
2. Given inconsistencies between survey events conducted in 2015 and 2016 and field conditions:
    - Staff gauges at E1(H) and SL should be reinforced (to be completed in July of 2016).
    - A third benchmark should be installed at Site E1(H) (to be completed in July of 2016).

6.0 CLOSURE

Hemmera/ELR are pleased to provide the Government of Yukon, Assessment and Abandoned Mines this report that summarizes the Winter 2016 water quality and hydrological monitoring program at the Clinton Creek Site. Please do not hesitate to contact us should you have any questions regarding this report.

Sincerely,

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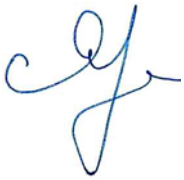

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7.0 REFERENCES

Canadian Council of Ministers of the Environment (CCME). 2014. Canadian Water Quality Guidelines for the Protection of Aquatic Life. Accessed online at http://st-ts.ccme.ca/, July 2014.

TABLES

Table 3: Analytical Chemistry Data

		Site Type	Reference Sites									Exposure Sites								Groundwater Seepage Sites				
		Sample Station	R1	R2	R3	R4	R6	R7	R8	R9	R11	E1	E1-H	E2	E3	E4	E7	E8	SL	GWCC-1	GWCC-2	GWCC-3	GWCC-4	GWCC-5
		Date Sampled	16/06/2016	16/06/2016	17/06/2016	15/06/2016	18/06/2016	17/06/2016	16/06/2016	17/06/2016	17/06/2016	14/06/2016	14/06/2016	15/06/2016	14/06/2016	15/06/2016	15/06/2016	15/06/2016	17/06/2016	15/06/2016	15/06/2016	15/06/2016	15/06/2016	14/06/2016
		ALS Work Order	L1785857	L1785857	L1785857	L1785001	L1785857	L1785857	L1785857	L1785857	L1785857	L1785001	L1785001	L1785001	L1785001	L1785001	L1785001	L1785001	L1785857	L1785001	L1785001	L1785001	L1785001	L1785001
Parameter	**Units**	CCME-FAL [1, 2, 3, 4]	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Physical Tests																								
Lab pH	pH units	6.5-9.0 [5]	8.17	8.22	8.26	8.22	7.86	7.51	7.57	7.85	7.86	8.04	8.04	8.11	8.20	8.12	8.12	7.69	8.25	8.05	8.12	8.07	8.05	8.09
Field pH	pH units	6.5-9.0 [5]	7.89	8.03	8.2	8.16	7.8	7.6	7.58	7.65	7.99	8.27	8	7.92	8.28	7.76	7.81	7.87	8.26	7.32	7.57	7.44	7.57	7.54
Field Temperature	C	-	9.3	6.9	9.6	5.3	16	5.7	6.4	5.6	6.7	14.9	14.9	13.7	8.4	13.3	11.8	12.4	17.7	2.7	4.4	6.4	6.4	9.4
Lab Conductivity	uS/cm	-	712	659	806	636	189	182	260	528	406	475	471	657	703	715	737	166	1470	2500	1810	1030	814	911
Field Conductivity	uS/cm	-	460.6	399.1	547	385.6	154.7	113.8	166.4	329.4	262.3	369.5	368.1	495.3	461.1	542	538	121.9	1261	1412	1071	641	501	620
Field Specific Conductivity	uS/cm	-	659	609	775	619	186.8	180	258.2	523	403	457.7	455.8	632	675	697	719	160.3	1466	2456	1763	993	777	882
Field Dissolved Oxygen	mg/L	9.5 [6]	11.23	12.2	11.46	13.5	8.45	11.8	11.65	12.04	12.77	9.68	9.74	9.21	11.58	10.29	10.52	11.43	7.76	4.76	8.36	5.17	4.26	4.27
Field Oxidation - Redox Potent	mV	-	90.1	84.5	33.9	94.9	7.5	-5.1	61.2	3.2	55.4	99.9	102.1	26.4	111.2	86.7	92	69.6	61.5	71	85.4	94.8	99.9	108.3
Total Suspended Solids	mg/L	-	7.3	7.3	68.7	19.3	10.7	19.3	4.7	<3.0	38.0	<3.0	<3.0	-	-	3.3	4.0	5.3	20.7	<3.0	<3.0	<3.0	<3.0	<3.0
Total Hardness (as CaCO3)	mg/L	-	392	356	461	368	86.4	98.6	132	310	214	264	262	373	393	415	427	75.8	967	1680	1160	622	474	530
Asbestos																								
Total Asbestos	MFL	-	<AS	-	<AS	-	-	-	-	-	-	-	-	7.33	17.1	-	-	-	-	-	-	-	-	-
Anions and Nutrients																								
Nitrate (as N)	mg/L	13	0.119	0.0448	0.0558	0.117	0.0265	0.0885	<0.0050	0.170	0.117	0.0253	0.0171	0.0478	0.0824	0.0446	0.0595	0.0365	0.019	0.550	0.385	0.154	0.0850	0.0156
Nitrite (as N)	mg/L	0.06	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	0.0022	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0050	<0.0050	<0.0020	<0.0010	<0.0010
Ammonia, Total (as N)	mg/L	Varies [7]	0.0194	0.0120	0.0177	0.0116	0.0082	0.0412	<0.0050	0.0396	-	0.0208	0.0108	0.0175	0.0083	0.0119	0.0067	0.0066	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Ammonia CCME-FAL	mg/L	-	*1.412*	*1.241*	*0.686*	*1.049*	*1.04*	*3.64*	*3.603*	*3.273*	*1.380*	*0.3959*	*0.7207*	*0.9433*	*0.6285*	*1.397*	*1.397*	*1.165*	*0.3316*	*8.836*	*4.331*	*4.966*	*3.686*	*3.114*
Sulfate (SO4)	mg/L	-	222	178	261	175	31.7	31.6	79.1	170	109	136	135	210	220	230	233	27.9	669	1290	860	380	258	279
Inorganic/Organic Carbon																								
Dissolved Organic Carbon	mg/L	-	11.6	8.99	12.8	13.0	15.2	28.3	14.7	23.6	-	15.5	16.2	13.9	13.8	13.1	13.3	17.9	-	5.72	7.22	9.24	10.1	7.45
Dissolved Metals																								
Aluminum (Al)-Dissolved	mg/L	Varies [8]	0.0214	0.0244	0.0251	0.0229	0.0997	0.107	0.0296	0.0431	0.0374	0.0280	0.0305	0.0215	0.0256	0.0158	0.0148	0.0977	0.0020	0.0012	0.0013	0.0018	0.0024	0.0021
Aluminum CCME-FAL	mg/L	-	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*
Antimony (Sb)-Dissolved	mg/L	-	0.00023	0.00045	0.00019	0.00036	0.00012	0.00021	0.00188	0.00021	0.00022	0.00027	0.00025	0.00042	0.00071	0.00048	0.00039	<0.00010	0.00270	0.00128	0.00113	0.00103	0.00116	0.00094
Arsenic (As)-Dissolved	mg/L	0.005	0.00054	0.00086	0.00060	0.00152	0.00055	0.00126	0.00033	0.00081	0.00049	0.00060	0.00056	0.00087	0.00101	0.00090	0.00079	0.00054	0.0168	0.00232	0.00152	0.00080	0.00107	0.00062
Barium (Ba)-Dissolved	mg/L	-	0.0518	0.0506	0.0566	0.0576	0.0346	0.0732	0.0476	0.0731	0.0541	0.0462	0.0458	0.0479	0.0519	0.0472	0.0486	0.0296	0.0288	0.0189	0.0173	0.0270	0.0273	0.0504
Beryllium (Be)-Dissolved	mg/L	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000024	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000031	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved	mg/L	1.5	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.031	0.052	0.043	0.039	<0.010	0.041	0.253	0.127	0.067	0.056	0.035
Cadmium (Cd)-Dissolved	mg/L	Varies [9]	0.0000607	0.0000180	0.0000068	0.0000534	0.0000143	0.0000093	0.0000254	0.0000367	0.0000193	0.0000355	0.0000304	0.0000474	0.0000121	0.0000377	0.0000422	0.0000137	0.0000187	0.000164	0.000147	0.0000690	0.0000421	0.000110
Cadmium CCME-FAL	mg/L	-	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.0001404*	*0.0001566*	*0.000200*	*0.00037*	*0.000298*	*0.000355*	*0.000353*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.0001259*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*
Calcium (Ca)-Dissolved	mg/L	-	89.7	63.0	89.3	81.6	22.1	22.5	32.7	71.6	49.2	58.2	57.9	72.8	67.8	77.7	79.5	19.3	220	199	162	106	85.0	122
Chromium (Cr)-Dissolved	mg/L	-	0.00023	0.00050	0.00044	0.00037	0.00037	0.00147	0.00070	0.00078	0.00081	0.00036	0.00029	0.00045	0.00085	0.00053	0.00052	0.00041	0.00124	0.00296	0.00125	0.00042	0.00043	0.00065
Chromium (III)-Dissolved	mg/L	0.0089	-	-	-	-	-	0.00147	-	-	-	-	-	-	-	-	-	-	<0.00042	<0.00064	<0.00042	-	-	-
Chromium (VI)-Dissolved	mg/L	0.001	-	-	-	-	-	<0.0010	-	-	-	-	-	-	-	-	-	-	0.0016	0.0037	0.0019	-	-	-
Cobalt (Co)-Dissolved	mg/L	-	0.00044	0.00017	0.00025	0.00051	0.00021	0.00068	<0.00010	0.00047	0.00012	0.00026	0.00033	0.00046	0.00022	0.00048	0.00051	0.00021	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Dissolved	mg/L	Varies [10]	0.00213	0.00133	0.00167	0.00205	0.00287	0.00454	0.00211	0.00406	0.00239	0.00242	0.00250	0.00216	0.00193	0.00194	0.00211	0.00312	0.00104	0.00093	0.00119	0.00133	0.00149	0.00086
Copper CCME-FAL	mg/L	-	*0.004*	*0.004*	*0.004*	*0.004*	*0.002087*	*0.002336*	*0.00300*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.02*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*
Iron (Fe)-Dissolved	mg/L	0.3	0.212	0.277	0.143	0.137	0.217	1.36	0.057	0.884	0.111	0.100	0.116	0.156	0.126	0.186	0.202	0.230	<0.010	<0.010	<0.010	<0.010	<0.010	0.020
Lead (Pb)-Dissolved	mg/L	Varies [11]	<0.000050	<0.000050	<0.000050	<0.000050	0.000051	0.000057	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lead CCME-FAL	mg/L	-	*0.007*	*0.007*	*0.007*	*0.007*	*0.002641*	*0.003125*	*0.00453*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.002236*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*
Lithium (Li)-Dissolved	mg/L	-	0.0037	0.0059	0.0042	0.0037	0.0035	<0.0010	<0.0010	<0.0010	<0.0010	0.0024	0.0024	0.0066	0.0040	0.0103	0.0110	0.0033	0.0110	0.0731	0.0131	0.0072	0.0068	0.0091
Magnesium (Mg)-Dissolved	mg/L	-	40.8	48.3	57.7	39.9	7.60	10.3	12.2	31.9	22.2	28.9	28.4	46.6	54.3	53.6	55.6	6.68	101	288	184	86.5	63.7	55.0
Manganese (Mn)-Dissolved	mg/L	-	0.231	0.0731	0.0840	0.0980	0.0235	0.218	0.00336	0.310	0.0102	0.0575	0.0762	0.0716	0.0589	0.0868	0.176	0.0126	0.00527	0.00017	<0.00010	<0.00010	0.00014	0.00135
Mercury (Hg)-Dissolved	mg/L	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000065	0.0000060	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.073	0.00130	0.000606	0.00121	0.00116	0.000397	0.000522	0.000726	0.00133	0.00100	0.00101	0.000941	0.00127	0.00127	0.00134	0.00130	0.000364	0.00184	0.00258	0.00252	0.00216	0.00204	0.00195
Nickel (Ni)-Dissolved	mg/L	Varies [12]	0.00407	0.00302	0.00309	0.0153	0.00242	0.00422	0.00336	0.00381	0.00279	0.00430	0.00370	0.0115	0.00817	0.0133	0.0128	0.00250	0.0156	0.0741	0.0386	0.0282	0.0298	0.0176
Nickel CCME-FAL	mg/L	-	*0.15*	*0.15*	*0.15*	*0.15*	*0.08553*	*0.09456*	*0.118*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.07743*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*
Phosphorus (P)-Dissolved	mg/L	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	0.63	0.83	0.89	0.56	0.95	0.20	<0.10	0.59	0.52	0.64	0.65	0.87	0.77	0.94	1.02	0.89	1.43	3.25	1.95	1.28	1.06	0.79
Selenium (Se)-Dissolved	mg/L	0.001	0.00256	0.000428	0.000471	0.00163	0.000161	0.000317	0.000518	0.00112	0.000692	0.00220	0.00213	0.00191	0.000919	0.00153	0.00126	0.000189	0.0163	0.00509	0.00359	0.00149	0.00101	0.00987
Silicon (Si)-Dissolved	mg/L	-	4.38	5.33	5.71	5.11	4.45	4.77	5.57	4.51	5.59	3.59	3.62	3.91	5.24	4.15	4.22	4.52	4.13	6.13	5.01	4.93	5.24	4.52
Silver (Ag)-Dissolved	mg/L	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	3.56	3.01	4.01	4.81	3.70	1.70	3.90	2.70	5.83	2.38	2.41	3.28	4.59	4.02	3.97	3.02	2.39	16.2	5.89	3.44	3.04	3.54
Strontium (Sr)-Dissolved	mg/L	-	0.401	0.318	0.397	0.408	0.124	0.0674	0.121	0.243	0.212	0.263	0.255	0.364	0.338	0.420	0.435	0.111	0.946	1.90	0.809	0.486	0.386	0.668
Sulfur (S)-Dissolved	mg/L	-	75.0	59.0	91.8	60.1	11.2	11.4	27.8	61.3	38.3	48.2	47.2	74.4	78.9	80.2	82.3	9.70	230	431	285	130	88.9	94.3
Thallium (Tl)-Dissolved	mg/L	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000015	<0.000010	0.000017	<0.000010	0.000014	<0.000010	<0.000010	0.000016	0.000085	0.000054	0.000058	0.000050	0.000014
Tin (Sn)-Dissolved	mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00021	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	0.00033	0.00038	0.00041	0.00062	0.00102	0.00246	0.00043	0.00124	0.00060	0.00030	0.00039	<0.00030	0.00057	0.00036	0.00037	0.00122	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium (U)-Dissolved	mg/L	0.015	0.00263	0.00387	0.00571	0.00418	0.000730	0.000084	0.000043	0.000926	0.00107	0.00178	0.00178	0.00184	0.00345	0.00204	0.00206	0.000602	0.00299	0.00656	0.00256	0.00138	0.00108	0.00210
Vanadium (V)-Dissolved	mg/L	-	<0.00050	<0.00050	0.00063	<0.00050	0.00072	0.00115	<0.00050	0.00051	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00069	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.03	0.0023	<0.0010	0.0013	0.0068	0.0077	0.0017	0.0024	0.0015	0.0033	0.0019	0.0043	0.0033	0.0013	0.0015	0.0025	0.0024	0.0021	0.0069	0.0045	0.0021	0.0037	<0.0010
Zirconium (Zr)-Dissolved	mg/L	-	0.00063	0.00042	0.00053	0.00119	0.00072	0.00115	0.00049	0.00104	0.00080	0.00060	0.00062	0.00052	0.00057	0.00068	0.00088	0.00085	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

Table 3: Analytical Chemistry Data

		Site Type	Reference Sites									Exposure Sites								Groundwater Seepage Sites				
		Sample Station	R1	R2	R3	R4	R6	R7	R8	R9	R11	E1	E1-H	E2	E3	E4	E7	E8	SL	GWCC-1	GWCC-2	GWCC-3	GWCC-4	GWCC-5
		Date Sampled	16/06/2016	16/06/2016	17/06/2016	15/06/2016	18/06/2016	17/06/2016	16/06/2016	17/06/2016	17/06/2016	14/06/2016	14/06/2016	15/06/2016	14/06/2016	15/06/2016	15/06/2016	15/06/2016	17/06/2016	15/06/2016	15/06/2016	15/06/2016	15/06/2016	14/06/2016
		ALS Work Order	L1785857	L1785857	L1785857	L1785001	L1785857	L1785857	L1785857	L1785857	L1785857	L1785001	L1785001	L1785001	L1785001	L1785001	L1785001	L1785001	L1785857	L1785001	L1785001	L1785001	L1785001	L1785001
Parameter	**Units**	CCME-FAL [1, 2, 3, 4]	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
Total Metals																								
Aluminum (Al)-Total	mg/L	Varies [8]	0.175	0.109	1.93	0.365	0.149	0.470	0.0581	0.0507	0.151	0.0420	0.0493	0.0321	0.361	0.0430	0.0473	0.351	0.215	<0.0030	<0.0030	<0.0030	0.0036	0.0031
Aluminum CCME-FAL	mg/L	-	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*	*0.1000*
Antimony (Sb)-Total	mg/L	-	0.00023	0.00047	0.00029	0.00040	0.00012	0.00022	0.00184	0.00023	0.00024	0.00029	0.00025	0.00045	0.00076	0.00048	0.00043	0.00012	0.00281	0.00130	0.00115	0.00103	0.00110	0.00098
Arsenic (As)-Total	mg/L	0.005	0.00066	0.00091	0.00194	0.00185	0.00061	0.00141	0.00040	0.00076	0.00061	0.00066	0.00062	0.00094	0.00137	0.00095	0.00085	0.00074	0.0163	0.00226	0.00148	0.00079	0.00103	0.00065
Barium (Ba)-Total	mg/L	-	0.0505	0.0476	0.117	0.0660	0.0352	0.0778	0.0483	0.0713	0.0551	0.0473	0.0457	0.0478	0.0657	0.0465	0.0498	0.0328	0.0298	0.0182	0.0170	0.0270	0.0257	0.0492
Beryllium (Be)-Total	mg/L	-	<0.000020	<0.000020	0.000077	<0.000020	<0.000020	0.000034	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000033	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Total	mg/L	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total	mg/L	1.5	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.031	0.058	0.045	0.040	<0.010	0.042	0.273	0.129	0.071	0.059	0.038
Cadmium (Cd)-Total	mg/L	Varies [9]	0.0000625	0.0000203	0.0000492	0.0000830	0.0000160	0.0000257	0.0000270	0.0000459	0.0000376	0.0000355	0.0000304	0.0000477	0.0000211	0.0000404	0.0000484	0.0000259	0.0000282	0.000170	0.000141	0.0000643	0.0000451	0.000107
Cadmium CCME-FAL	mg/L	-	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.0001404*	*0.0001566*	*0.000200*	*0.00037*	*0.000298*	*0.000355*	*0.000353*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.0001259*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*
Calcium (Ca)-Total	mg/L	-	82.9	59.6	82.7	74.5	21.0	20.9	31.4	67.2	48.2	56.2	55.8	70.0	68.0	73.9	76.4	19.5	210	195	158	99.9	81.8	119
Chromium (Cr)-Total	mg/L	-	<0.00070	<0.00070	0.00425	0.00141	<0.00050	0.00227	0.00093	0.00089	0.00108	0.00047	0.00046	0.00060	0.00171	0.00068	0.00072	0.00086	0.00725	0.00287	0.00135	0.00045	0.00050	0.00067
Chromium (III)-Total	mg/L	0.0089	-	-	0.00325	<0.00073	-	0.00127	-	-	<0.00072	-	-	-	<0.00074	-	-	-	0.00535	<0.00088	<0.00073	-	-	-
Chromium (VI)-Total	mg/L	0.001	-	-	0.0010	0.0011	-	0.0010	-	-	0.0010	-	-	-	0.0012	-	-	-	0.0019	0.0036	0.0021	-	-	-
Cobalt (Co)-Total	mg/L	-	0.00057	0.00022	0.00130	0.00075	0.00024	0.00086	<0.00010	0.00047	0.00021	0.00030	0.00037	0.00051	0.00039	0.00052	0.00056	0.00040	0.00075	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	Varies [10]	0.00250	0.00151	0.00551	0.00298	0.00291	0.00493	0.00221	0.00408	0.00280	0.00256	0.00255	0.00231	0.00253	0.00214	0.00217	0.00370	0.00205	0.00109	0.00134	0.00138	0.00145	0.00089
Copper CCME-FAL	mg/L	-	*0.004*	*0.004*	*0.004*	*0.004*	*0.002087*	*0.002336*	*0.00300*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.02*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*	*0.004*
Iron (Fe)-Total	mg/L	0.3	0.503	0.436	3.31	0.765	0.304	1.93	0.118	0.930	0.315	0.141	0.170	0.197	0.766	0.255	0.287	0.609	0.483	<0.010	<0.010	<0.010	<0.010	0.019
Lead (Pb)-Total	mg/L	Varies [11]	0.000258	0.000077	0.00132	0.000393	0.000063	0.000280	<0.000050	0.000051	0.000163	<0.000050	0.000054	<0.000050	0.000280	<0.000050	0.000084	0.000164	0.000244	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lead CCME-FAL	mg/L	-	*0.007*	*0.007*	*0.007*	*0.007*	*0.002641*	*0.003125*	*0.00453*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.002236*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*	*0.007*
Lithium (Li)-Total	mg/L	-	0.0037	0.0059	0.0057	0.0037	0.0033	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	0.0023	0.0065	0.0049	0.0100	0.0105	0.0034	0.0114	0.0764	0.0131	0.0069	0.0070	0.0092
Magnesium (Mg)-Total	mg/L	-	37.3	46.7	54.5	37.5	7.21	9.63	11.8	30.5	21.9	26.7	26.5	45.5	52.2	51.7	54.2	7.10	98.2	284	184	82.7	61.4	55.1
Manganese (Mn)-Total	mg/L	-	0.230	0.0750	0.133	0.115	0.0253	0.206	0.00425	0.300	0.0163	0.0717	0.0967	0.0812	0.0706	0.0965	0.169	0.0249	0.0138	0.00028	<0.00010	<0.00010	0.00030	0.00118
Mercury (Hg)-Total	mg/L	0.000026	0.0000051	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000061	<0.0000050	0.0000050	0.0000052	0.0000053	0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000058	0.0000060	0.0000059	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.073	0.00134	0.000648	0.00137	0.00130	0.000429	0.000529	0.000787	0.00143	0.00109	0.00110	0.00103	0.00140	0.00131	0.00146	0.00129	0.000392	0.00200	0.00261	0.00269	0.00229	0.00219	0.00208
Nickel (Ni)-Total	mg/L	Varies [12]	0.00431	0.00299	0.00880	0.0171	0.00239	0.00445	0.00347	0.00387	0.00307	0.00459	0.00380	0.0120	0.00970	0.0139	0.0126	0.00299	0.0241	0.0693	0.0396	0.0282	0.0304	0.0180
Nickel CCME-FAL	mg/L	-	*0.15*	*0.15*	*0.15*	*0.15*	*0.08553*	*0.09456*	*0.118*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.07743*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*	*0.15*
Phosphorus (P)-Total	mg/L	-	<0.050	<0.050	0.060	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	0.61	0.81	1.20	0.54	0.87	0.21	<0.10	0.54	0.54	0.62	0.62	0.84	0.90	0.89	0.98	1.01	1.40	3.21	1.91	1.21	1.03	0.81
Selenium (Se)-Total	mg/L	0.001	0.00246	0.000448	0.000570	0.00159	0.000150	0.000290	0.000561	0.00109	0.000696	0.00219	0.00206	0.00198	0.000881	0.00165	0.00126	0.000150	0.0157	0.00501	0.00341	0.00153	0.00104	0.00935
Silicon (Si)-Total	mg/L	-	4.28	5.29	8.94	5.34	4.38	5.11	5.53	4.31	5.77	3.59	3.62	3.90	6.22	4.13	4.20	5.12	4.74	6.17	4.99	4.74	5.19	4.49
Silver (Ag)-Total	mg/L	0.00025	<0.000010	<0.000010	0.000029	0.000015	<0.000010	<0.000010	<0.000010	<0.000010	0.000012	<0.000010	<0.000010	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	3.34	2.89	3.97	4.59	3.51	1.58	3.83	2.66	5.80	2.37	2.38	3.24	4.49	3.82	4.05	3.19	2.42	16.1	5.85	3.40	2.83	3.59
Strontium (Sr)-Total	mg/L	-	0.381	0.312	0.386	0.402	0.123	0.0648	0.120	0.246	0.213	0.267	0.256	0.370	0.345	0.427	0.432	0.115	0.949	1.80	0.813	0.489	0.393	0.679
Thallium (Tl)-Total	mg/L	0.0008	0.000010	<0.000010	0.000032	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000021	<0.000010	0.000016	<0.000010	<0.000010	0.000025	0.000080	0.000055	0.000054	0.000051	0.000014
Tin (Sn)-Total	mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	0.00438	0.00318	0.0515	0.00815	0.00296	0.0133	0.00107	0.00165	0.00431	0.00059	0.00070	0.00053	0.0102	0.00108	0.00135	0.0109	0.00486	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium (U)-Total	mg/L	0.015	0.00259	0.00390	0.00582	0.00443	0.000786	0.000103	0.000052	0.000955	0.00112	0.00185	0.00185	0.00192	0.00364	0.00211	0.00216	0.000650	0.00305	0.00616	0.00268	0.00143	0.00110	0.00217
Vanadium (V)-Total	mg/L	-	0.00060	0.00063	0.00599	0.00133	0.00088	0.00226	<0.00050	0.00054	0.00079	<0.00050	<0.00050	<0.00050	0.00164	<0.00050	<0.00050	0.00144	0.00075	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	0.0036	<0.0030	0.0115	0.0040	<0.0030	0.0031	<0.0030	<0.0030	0.0047	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0034	0.0034	0.0066	0.0049	<0.0030	<0.0030	<0.0030
Zirconium (Zr)-Total	mg/L	-	0.00056	0.00038	0.00085	0.00109	0.00069	0.00090	0.00047	0.00098	0.00078	0.00056	0.00060	0.00051	0.00065	0.00073	0.00084	0.00081	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

Table 4 Analytical Quality Assurance and Control

		Sample Station	E6			E1			E7			Field Blanks	Travel Blanks	
		Sample ID	DUP-3	R6	RPD (%)[13]	DUP01	E1	RPD (%)[13]	DUP-2	E7	RPD (%)[13]	E1 (FB1)	TRAVEL_BLANK	TRAVEL_BLANK
		Date Sampled	18/06/2016	18/06/2016		14/06/2016	14/06/2016		15/06/2016	15/06/2016		14/06/2016	17/06/2016	20/06/2016
		ALS Work Order	L1785857	L1785857		L1785001	L1785001		L1785001	L1785001		L1785001	L1785001	L1785857
Parameter	**Units**	CCME-FAL[1, 2, 3, 4]	Good	Good		Good	Good		Good	Good		-	-	-
Physical Tests														
Lab pH	pH units	6.5-9.0 [5]	7.84	7.86	0.25	8.08	8.04	0.50	8.13	8.12	0.12	5.19	5.44	5.18
Field pH	pH units	6.5-9.0 [5]	7.8	7.8	-	8.27	8.27	-	7.81	7.81	-	-	-	-
Field Temperature	C	-	16	16	-	14.9	14.9	-	11.8	11.8	-	-	-	-
Lab Conductivity	uS/cm	-	189	189	0.00	476	475	0.21	734	737	0.41	<2.0	<2.0	<2.0
Field Conductivity	uS/cm	-	154.7	154.7	-	369.5	369.5	-	538	538	-	-	-	-
Field Specific Conductivity	uS/cm	-	186.8	186.8	-	457.7	457.7	-	719	719	-	-	-	-
Field Dissolved Oxygen	mg/L	9.5 [6]	8.45	8.45	-	9.68	9.68	-	10.52	10.52	-	-	-	-
Field Oxidation - Redox Potent	mV	-	7.5	7.5	-	99.9	99.9	-	92	92	-	-	-	-
Total Suspended Solids	mg/L	-	8.7	10.7	nc	<3.0	<3.0	nc	6.0	4.0	nc	<3.0	<3.0	<3.0
Total Hardness (as CaCO3)	mg/L	-	87.3	86.4	1.04	265	264	0.38	428	427	0.23	<0.50	<0.50	<0.50
Asbestos														
Total Asbestos	MFL	-	-	-	-	-	-	-	-	-	-	-	-	-
Anions and Nutrients														
Nitrate (as N)	mg/L	13	0.0269	0.0265	1.50	0.0241	0.0253	4.86	0.0601	0.0595	1.00	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.06	<0.0010	<0.0010	nc	0.0015	0.0022	nc	<0.0010	<0.0010	nc	<0.0010	<0.0010	<0.0010
Ammonia, Total (as N)	mg/L	Varies [7]	0.0102	0.0082	nc	0.0194	0.0208	6.97	0.0078	0.0067	15.17	<0.0050	<0.0050	**0.0401**
Ammonia CCME-FAL	mg/L	-	*1.04*	*1.04*	*0.00*	*0.3959*	*0.3959*	*0.00*	*1.397*	*1.397*	*0.00*	-	-	-
Sulfate (SO4)	mg/L	-	31.6	31.7	0.32	136	136	0.00	233	233	0.00	<0.30	<0.30	<0.30
Inorganic/Organic Carbon														
Dissolved Organic Carbon	mg/L	-	15.2	15.2	0.00	15.4	15.5	0.65	13.1	13.3	1.52	<0.50	-	-
Dissolved Metals														
Aluminum (Al)-Dissolved	mg/L	Varies [8]	0.101	0.0997	1.30	0.0301	0.0280	7.23	0.0138	0.0148	6.99	<0.0010	-	-
Aluminum CCME-FAL	mg/L	-	*0.1000*	*0.1000*	*0.00*	*0.1000*	*0.1000*	*0.00*	*0.1000*	*0.1000*	*0.00*	-	-	-
Antimony (Sb)-Dissolved	mg/L	-	0.00012	0.00012	0.00	0.00027	0.00027	0.00	0.00041	0.00039	5.00	<0.00010	-	-
Arsenic (As)-Dissolved	mg/L	0.005	0.00056	0.00055	1.80	0.00061	0.00060	1.65	0.00071	0.00079	10.67	<0.00010	-	-
Barium (Ba)-Dissolved	mg/L	-	0.0348	0.0346	0.58	0.0457	0.0462	1.09	0.0494	0.0486	1.63	<0.000050	-	-
Beryllium (Be)-Dissolved	mg/L	-	<0.000020	<0.000020	nc	<0.000020	<0.000020	nc	<0.000020	<0.000020	nc	<0.000020	-	-
Bismuth (Bi)-Dissolved	mg/L	-	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	-	-
Boron (B)-Dissolved	mg/L	1.5	<0.010	<0.010	nc	<0.010	<0.010	nc	0.039	0.039	0.00	<0.010	-	-
Cadmium (Cd)-Dissolved	mg/L	Varies [9]	0.0000130	0.0000143	9.52	0.0000364	0.0000355	2.50	0.0000365	0.0000422	14.49	<0.0000050	-	-
Cadmium CCME-FAL	mg/L	-	*0.0001416*	*0.0001404*	*0.85*	*0.000356*	*0.000355*	*0.28*	*0.00037*	*0.00037*	*0.00*	-	-	-
Calcium (Ca)-Dissolved	mg/L	-	22.3	22.1	0.90	58.9	58.2	1.20	79.8	79.5	0.38	<0.050	-	-
Chromium (Cr)-Dissolved	mg/L	-	0.00040	0.00037	7.79	0.00037	0.00036	2.74	0.00053	0.00052	1.90	<0.00010	-	-
Chromium (III)-Dissolved	mg/L	0.0089	-	-	-	-	-	-	-	-	-	-	-	-
Hexavalent Chromium-Dissolved	mg/L	0.001	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (Co)-Dissolved	mg/L	-	0.00021	0.00021	0.00	0.00026	0.00026	0.00	0.00050	0.00051	1.98	<0.00010	-	-
Copper (Cu)-Dissolved	mg/L	Varies [10]	0.00291	0.00287	1.38	0.00245	0.00242	1.23	0.00207	0.00211	1.91	<0.00020	-	-
Copper CCME-FAL	mg/L	-	*0.002106*	*0.002087*	*0.91*	*0.004*	*0.004*	*0.00*	*0.004*	*0.004*	*0.00*	-	-	-
Iron (Fe)-Dissolved	mg/L	0.3	0.207	0.217	4.72	0.100	0.100	0.00	0.203	0.202	0.49	<0.010	-	-
Lead (Pb)-Dissolved	mg/L	Varies [11]	<0.000050	0.000051	nc	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	-	-
Lead CCME-FAL	mg/L	-	*0.002676*	*0.002641*	*1.32*	*0.007*	*0.007*	*0.00*	*0.007*	*0.007*	*0.00*	-	-	-
Lithium (Li)-Dissolved	mg/L	-	0.0035	0.0035	0.00	0.0024	0.0024	0.00	0.0111	0.0110	0.90	<0.0010	-	-
Magnesium (Mg)-Dissolved	mg/L	-	7.71	7.60	1.44	28.7	28.9	0.69	55.5	55.6	0.18	<0.10	-	-
Manganese (Mn)-Dissolved	mg/L	-	0.0239	0.0235	1.69	0.0583	0.0575	1.38	0.167	0.176	5.25	<0.00010	-	-
Mercury (Hg)-Dissolved	mg/L	0.000026	<0.0000050	<0.0000050	nc	<0.0000050	0.0000050	nc	<0.0000050	<0.0000050	nc	<0.0000050	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.073	0.000384	0.000397	3.33	0.000965	0.00101	4.56	0.00123	0.00130	5.53	<0.000050	-	-
Nickel (Ni)-Dissolved	mg/L	Varies [12]	0.00239	0.00242	1.25	0.00435	0.00430	1.16	0.0125	0.0128	2.37	<0.00050	-	-
Nickel CCME-FAL	mg/L	-	*0.08620*	*0.08553*	*0.78*	*0.15*	*0.15*	*0.00*	*0.15*	*0.15*	*0.00*	-	-	-
Phosphorus (P)-Dissolved	mg/L	-	<0.050	<0.050	nc	<0.050	<0.050	nc	<0.050	<0.050	nc	<0.050	-	-
Potassium (K)-Dissolved	mg/L	-	0.97	0.95	2.08	0.66	0.64	3.08	1.04	1.02	1.94	<0.10	-	-
Selenium (Se)-Dissolved	mg/L	0.001	0.000179	0.000161	10.59	0.00217	0.00220	1.37	0.00123	0.00126	2.41	<0.000050	-	-
Silicon (Si)-Dissolved	mg/L	-	4.50	4.45	1.12	3.63	3.59	1.11	4.23	4.22	0.24	<0.050	-	-
Silver (Ag)-Dissolved	mg/L	0.00025	<0.000010	<0.000010	nc	<0.000010	<0.000010	nc	<0.000010	<0.000010	nc	<0.000010	-	-
Sodium (Na)-Dissolved	mg/L	-	3.69	3.70	0.27	2.39	2.38	0.42	4.11	3.97	3.47	<0.050	-	-
Strontium (Sr)-Dissolved	mg/L	-	0.123	0.124	0.81	0.256	0.263	2.70	0.431	0.435	0.92	<0.00020	-	-
Sulfur (S)-Dissolved	mg/L	-	11.2	11.2	0.00	47.1	48.2	2.31	81.2	82.3	1.35	<0.50	-	-
Thallium (Tl)-Dissolved	mg/L	0.0008	<0.000010	<0.000010	nc	<0.000010	0.000015	nc	<0.000010	<0.000010	nc	<0.000010	-	-
Tin (Sn)-Dissolved	mg/L	-	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc	<0.00010	-	-
Titanium (Ti)-Dissolved	mg/L	-	0.00098	0.00102	4.00	0.00042	0.00030	nc	0.00034	0.00037	8.45	<0.00030	-	-
Uranium (U)-Dissolved	mg/L	0.015	0.000731	0.000730	0.14	0.00173	0.00178	2.85	0.00205	0.00206	0.49	<0.000010	-	-
Vanadium (V)-Dissolved	mg/L	-	0.00072	0.00072	0.00	<0.00050	<0.00050	nc	<0.00050	<0.00050	nc	<0.00050	-	-
Zinc (Zn)-Dissolved	mg/L	0.03	0.0068	0.0077	12.41	0.0019	0.0019	0.00	0.0024	0.0025	4.08	<0.0010	-	-
Zirconium (Zr)-Dissolved	mg/L	-	0.00073	0.00072	1.38	0.00058	0.00060	3.39	0.00086	0.00088	2.30	<0.00030	-	-

Table 4 Analytical Quality Assurance and Control

		Sample Station	E6			E1			E7			Field Blanks	Travel Blanks	
		Sample ID	DUP-3	R6	RPD (%)[13]	DUP01	E1	RPD (%)[13]	DUP-2	E7	RPD (%)[13]	E1 (FB1)	TRAVEL_BLANK	TRAVEL_BLANK
		Date Sampled	18/06/2016	18/06/2016		14/06/2016	14/06/2016		15/06/2016	15/06/2016		14/06/2016	17/06/2016	20/06/2016
		ALS Work Order	L1785857	L1785857		L1785001	L1785001		L1785001	L1785001		L1785001	L1785001	L1785857
Parameter	**Units**	CCME-FAL[1, 2, 3, 4]	Good	Good		Good	Good		Good	Good		-	-	-
Total Metals														
Aluminum (Al)-Total	mg/L	Varies [8]	0.156	0.149	4.59	0.0373	0.0420	11.85	0.0434	0.0473	8.60	<0.0030	<0.0030	<0.0030
Aluminum CCME-FAL	mg/L	-	*0.1000*	*0.1000*	*0.00*	*0.1000*	*0.1000*	*0.00*	*0.1000*	*0.1000*	*0.00*	-	-	-
Antimony (Sb)-Total	mg/L	-	0.00012	0.00012	0.00	0.00031	0.00029	6.67	0.00045	0.00043	4.55	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.005	0.00060	0.00061	1.65	0.00061	0.00066	7.87	0.00084	0.00085	1.18	<0.00010	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	-	0.0345	0.0352	2.01	0.0466	0.0473	1.49	0.0524	0.0498	5.09	<0.000050	<0.000050	<0.000050
Beryllium (Be)-Total	mg/L	-	<0.000020	<0.000020	nc	<0.000020	<0.000020	nc	<0.000020	<0.000020	nc	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Total	mg/L	-	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	<0.000050	nc	<0.000050	<0.000050	<0.000050
Boron (B)-Total	mg/L	1.5	<0.010	<0.010	nc	<0.010	<0.010	nc	0.042	0.040	4.88	<0.010	<0.010	<0.010
Cadmium (Cd)-Total	mg/L	Varies [9]	0.0000169	0.0000160	5.47	0.0000408	0.0000355	13.89	0.0000471	0.0000484	2.72	<0.0000050	<0.0000050	<0.0000050
Cadmium CCME-FAL	mg/L	-	*0.0001416*	*0.0001404*	*0.85*	*0.000356*	*0.000355*	*0.28*	*0.00037*	*0.00037*	*0.00*	-	-	-
Calcium (Ca)-Total	mg/L	-	21.9	21.0	4.20	56.9	56.2	1.24	78.5	76.4	2.71	<0.050	<0.050	<0.050
Chromium (Cr)-Total	mg/L	-	<0.00050	<0.00050	nc	0.00048	0.00047	2.11	0.00068	0.00072	5.71	<0.00010	<0.00010	<0.00010
Chromium (III)-Total	mg/L	0.0089	-	-	nc	-	-	nc	-	-	nc	-	-	-
Hexavalent Chromium	mg/L	0.001	-	-	nc	-	-	nc	-	-	nc	-	-	-
Cobalt (Co)-Total	mg/L	-	0.00027	0.00024	11.76	0.00031	0.00030	3.28	0.00054	0.00056	3.64	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total	mg/L	Varies [10]	0.00305	0.00291	4.70	0.00262	0.00256	2.32	0.00216	0.00217	0.46	<0.00050	<0.00050	<0.00050
Copper CCME-FAL	mg/L	-	*0.002106*	*0.002087*	*0.91*	*0.004*	*0.004*	*0.00*	*0.004*	*0.004*	*0.00*	-	-	-
Iron (Fe)-Total	mg/L	0.3	0.314	0.304	3.24	0.140	0.141	0.71	0.292	0.287	1.73	<0.010	<0.010	<0.010
Lead (Pb)-Total	mg/L	Varies [11]	0.000088	0.000063	nc	<0.000050	<0.000050	nc	0.000065	0.000084	nc	<0.000050	<0.000050	<0.000050
Lead CCME-FAL	mg/L	-	*0.002676*	*0.002641*	*1.32*	*0.007*	*0.007*	*0.00*	*0.007*	*0.007*	*0.00*	-	-	-
Lithium (Li)-Total	mg/L	-	0.0034	0.0033	2.99	0.0022	0.0023	4.44	0.0109	0.0105	3.74	<0.0010	<0.0010	<0.0010
Magnesium (Mg)-Total	mg/L	-	7.56	7.21	4.74	28.2	26.7	5.46	55.4	54.2	2.19	<0.10	<0.10	<0.10
Manganese (Mn)-Total	mg/L	-	0.0268	0.0253	5.76	0.0727	0.0717	1.39	0.175	0.169	3.49	<0.00010	<0.00010	<0.00010
Mercury (Hg)-Total	mg/L	0.000026	<0.0000050	<0.0000050	nc	<0.0000050	0.0000050	nc	<0.0000050	<0.0000050	nc	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.073	0.000431	0.000429	0.47	0.00109	0.00110	0.91	0.00131	0.00129	1.54	<0.000050	<0.000050	<0.000050
Nickel (Ni)-Total	mg/L	Varies [12]	0.00252	0.00239	5.30	0.00463	0.00459	0.87	0.0130	0.0126	3.13	<0.00050	<0.00050	<0.00050
Nickel CCME-FAL	mg/L	-	*0.08620*	*0.08553*	*0.78*	*0.15*	*0.15*	*0.00*	*0.15*	*0.15*	*0.00*	-	-	-
Phosphorus (P)-Total	mg/L	-	<0.050	<0.050	nc	<0.050	<0.050	nc	<0.050	<0.050	nc	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	0.91	0.87	4.49	0.65	0.62	4.72	1.01	0.98	3.02	<0.10	<0.10	<0.10
Selenium (Se)-Total	mg/L	0.001	0.000170	0.000150	12.50	0.00208	0.00219	5.15	0.00118	0.00126	6.56	<0.000050	<0.000050	<0.000050
Silicon (Si)-Total	mg/L	-	4.59	4.38	4.68	3.64	3.59	1.38	4.27	4.20	1.65	<0.050	<0.050	<0.050
Silver (Ag)-Total	mg/L	0.00025	<0.000010	<0.000010	nc	<0.000010	<0.000010	nc	<0.000010	<0.000010	nc	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	3.69	3.51	5.00	2.41	2.37	1.67	4.16	4.05	2.68	<0.050	<0.050	<0.050
Strontium (Sr)-Total	mg/L	-	0.124	0.123	0.81	0.264	0.267	1.13	0.440	0.432	1.83	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	0.0008	<0.000010	<0.000010	nc	0.000011	<0.000010	nc	<0.000010	<0.000010	nc	<0.000010	<0.000010	<0.000010
Tin (Sn)-Total	mg/L	-	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc	<0.00010	<0.00010	nc	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	0.00280	0.00296	5.56	0.00058	0.00059	1.71	0.00107	0.00135	nc	<0.00030	<0.00030	<0.00030
Uranium (U)-Total	mg/L	0.015	0.000761	0.000786	3.23	0.00184	0.00185	0.54	0.00219	0.00216	1.38	<0.000010	<0.000010	<0.000010
Vanadium (V)-Total	mg/L	-	0.00093	0.00088	5.52	<0.00050	<0.00050	nc	<0.00050	<0.00050	nc	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	<0.0030	<0.0030	nc	<0.0030	<0.0030	nc	0.0031	<0.0030	nc	<0.0030	<0.0030	<0.0030
Zirconium (Zr)-Total	mg/L	-	0.00070	0.00069	1.44	0.00058	0.00056	3.51	0.00082	0.00084	2.41	<0.00030	<0.00030	<0.00030

Notes

(1) CCME guideline exceedences shaded with dark grey. Light grey shading denotes reportable detection limit in exceedence of CCME Guideline. Where guideline value is dependent on hardness or pH, reported values have been compared against a guideline value calculated for each site based on the relevant value, and the guideline value has been noted as "varies".

(2) - = No standard or not analyzed

(3) CCME = Canadian Council of Ministers of the Environment, Canadian Environmental Quality Guidelines, 1999, updated to July 2016

(4) CCME FAL = Chapter 4, Canadian Water Quality Guidelines for the Protection of Aquatic Life, Freshwater, updated to July 2016

(5) CCME FAL stipulates pH not < 6.5 and not > 9

(6) Guideline note: Lowest acceptable dissolved oxygen concentration for cold-water biota, early life stages

(7) Ammonia varies with pH and temperature for CCME FAL; see the CCME ammonia fact sheet for details regarding the applicable criteria, ammonia-NH3 versus total ammonia-N,and other usage guidelines. CCME values listed in the table are expressed as ammonia (N) When field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(8) Aluminum varies with pH as follows for CCME FAL:

0.005	if	pH<6.5
0.1	if	pH>=6.5

when field pH is not available, lab pH is used. When field and lab pH are both not available, the most stringent guideline has been used.

(9) Cadmium varies with Hardness in mg/L as follows for CCME FAL:

0.00	if	H<17
0.00004 - 0.00037	if	H>=17 and H<=280 as follows; CWQG (µg/L) = 10{0.83(log[hardness]) – 2.46 }
0.00	if	H>280

(10) Copper varies with Hardness in mg/L as follows for CCME FAL:

0.002	if	H<82
0.002 - 0.004	if	H>=82 and H<=180 as follows; CWQG (µg/L) = 0.2 * e{0.8545[ln(hardness)]-1.465}
0.004	if	H>180

(11) Lead varies with Hardness in mg/L as follows for CCME FAL:

0.001	if	H<60
.001 - 0.0(	if	H>=60 and H<=180 as follows; CWQG (µg/L)= e{1.273[ln(hardness)]-4.705}
0.007	if	H>180

(12) Nickel varies with Hardness in mg/L as follows for CCME FAL:

0.025	if	H<60
025 - 0.15	if	H>=60 and H<=180 as follows; CWQG (µg/L) = e{0.76[ln(hardness)]+1.06}
0.15	if	H>180

(13) RPD = Relative Percent Difference. The difference between a sample and its field duplicate over the average of two values. *nc* = not calculated. RPD is not calculated if either the sample or the field duplicate concentration is less than five times the detection limit.

Italics text indicates the parameter-specific standard (calculated) for a particular sample.

Bold and underlined indicates values above RDL in Field Blank of Travel Blank

Bold and Italic Indicates QAQC values exceed expected results (i.e. RDP values exceed 20%).

APPENDIX 1

Laboratory Certificates of Analysis

HEMMERA ENVIROCHEM INC.
ATTN: Natasha Sandys
230 - 2237 2nd Avenue
Whitehorse YK Y1A 0K7

Date Received: 17-JUN-16
Report Date: 15-JUL-16 11:09 (MT)
Version: FINAL REV. 2

Client Phone: 867-456-4865

Certificate of Analysis

Lab Work Order #: L1785001

Project P.O. #: NOT SUBMITTED
Job Reference: 1343-005.17
C of C Numbers: 1, 2
Legal Site Desc:

Comments: 15-JUL-2016 This report replaces the previous version and contains additional analyses, as requested.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1785001-1	L1785001-2	L1785001-3	L1785001-4	L1785001-5
Description	Water	Water	Water	Water	Water
Sampled Date	14-JUN-16	14-JUN-16	14-JUN-16	14-JUN-16	17-JUN-16
Sampled Time	14:45	14:45	14:45	14:00	
Client ID	FB1	E1	DUP01	E1(H)	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	<2.0	475	476	471	<2.0
Hardness (as CaCO3) (mg/L)	<0.50	264	265	262	<0.50
pH (pH)	5.19	8.04	8.08	8.04	5.44
Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients Ammonia, Total (as N) (mg/L)	<0.0050	0.0208	0.0194	0.0108	<0.0050
Nitrate (as N) (mg/L)	<0.0050	0.0253	0.0241	0.0171	<0.0050
Nitrite (as N) (mg/L)	<0.0010	0.0022	0.0015	<0.0010	<0.0010
Phosphorus (P)-Total (mg/L)	<0.0020	0.0064	0.0072	0.0077	<0.0020
Sulfate (SO4) (mg/L)	<0.30	136	136	135	<0.30
Organic / Inorganic Carbon Dissolved Organic Carbon (mg/L)	<0.50	15.5	15.4	16.2	
Total Organic Carbon (mg/L)					1.18
Total Metals Aluminum (Al)-Total (mg/L)	<0.0030	0.0420	0.0373	0.0493	<0.0030
Antimony (Sb)-Total (mg/L)	<0.00010	0.00029	0.00031	0.00025	<0.00010
Arsenic (As)-Total (mg/L)	<0.00010	0.00066	0.00061	0.00062	<0.00010
Barium (Ba)-Total (mg/L)	<0.000050	0.0473	0.0466	0.0457	<0.000050
Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (mg/L)	<0.0000050	0.0000355	0.0000408	0.0000304	<0.0000050
Calcium (Ca)-Total (mg/L)	<0.050	56.2	56.9	55.8	<0.050
Chromium (Cr)-Total (mg/L)	<0.00010	0.00047	0.00048	0.00046	<0.00010
Cobalt (Co)-Total (mg/L)	<0.00010	0.00030	0.00031	0.00037	<0.00010
Copper (Cu)-Total (mg/L)	<0.00050	0.00256	0.00262	0.00255	<0.00050
Iron (Fe)-Total (mg/L)	<0.010	0.141	0.140	0.170	<0.010
Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	0.000054	<0.000050
Lithium (Li)-Total (mg/L)	<0.0010	0.0023	0.0022	0.0023	<0.0010
Magnesium (Mg)-Total (mg/L)	<0.10	26.7	28.2	26.5	<0.10
Manganese (Mn)-Total (mg/L)	<0.00010	0.0717	0.0727	0.0967	<0.00010
Mercury (Hg)-Total (mg/L)	<0.0000050	0.0000050	<0.0000050	0.0000052	<0.0000050
Molybdenum (Mo)-Total (mg/L)	<0.000050	0.00110	0.00109	0.00103	<0.000050
Nickel (Ni)-Total (mg/L)	<0.00050	0.00459	0.00463	0.00380	<0.00050
Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total (mg/L)	<0.10	0.62	0.65	0.62	<0.10
Selenium (Se)-Total (mg/L)	<0.000050	0.00219	0.00208	0.00206	<0.000050
Silicon (Si)-Total (mg/L)	<0.050	3.59	3.64	3.62	<0.050
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1785001-6	L1785001-7	L1785001-8	L1785001-9	L1785001-10
Description	Water	Water	Water	Water	Water
Sampled Date	15-JUN-16	15-JUN-16	15-JUN-16	15-JUN-16	15-JUN-16
Sampled Time	15:30	14:13	14:13	14:13	12:00
Client ID	E8	E7	DUP02	E4	R4
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	166	737	734	715	636
Hardness (as CaCO3) (mg/L)	75.8	427	428	415	368
pH (pH)	7.69	8.12	8.13	8.12	8.22
Total Suspended Solids (mg/L)	5.3	4.0	6.0	3.3	19.3
Anions and Nutrients Ammonia, Total (as N) (mg/L)	0.0066	0.0067	0.0078	0.0119	0.0116
Nitrate (as N) (mg/L)	0.0365	0.0595	0.0601	0.0446	0.117
Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total (mg/L)	0.0077	0.0025	0.0044	0.0055	0.0122
Sulfate (SO4) (mg/L)	27.9	233	233	230	175
Organic / Inorganic Carbon Dissolved Organic Carbon (mg/L)	17.9	13.3	13.1	13.1	13.0
Total Organic Carbon (mg/L)					
Total Metals Aluminum (Al)-Total (mg/L)	0.351	0.0473	0.0434	0.0430	0.365
Antimony (Sb)-Total (mg/L)	0.00012	0.00043	0.00045	0.00048	0.00040
Arsenic (As)-Total (mg/L)	0.00074	0.00085	0.00084	0.00095	0.00185
Barium (Ba)-Total (mg/L)	0.0328	0.0498	0.0524	0.0465	0.0660
Beryllium (Be)-Total (mg/L)	0.000033	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total (mg/L)	<0.010	0.040	0.042	0.045	<0.010
Cadmium (Cd)-Total (mg/L)	0.0000259	0.0000484	0.0000471	0.0000404	0.0000830
Calcium (Ca)-Total (mg/L)	19.5	76.4	78.5	73.9	74.5
Chromium (Cr)-Total (mg/L)	0.00086	0.00072	0.00068	0.00068	0.00141
Cobalt (Co)-Total (mg/L)	0.00040	0.00056	0.00054	0.00052	0.00075
Copper (Cu)-Total (mg/L)	0.00370	0.00217	0.00216	0.00214	0.00298
Iron (Fe)-Total (mg/L)	0.609	0.287	0.292	0.255	0.765
Lead (Pb)-Total (mg/L)	0.000164	0.000084	0.000065	<0.000050	0.000393
Lithium (Li)-Total (mg/L)	0.0034	0.0105	0.0109	0.0100	0.0037
Magnesium (Mg)-Total (mg/L)	7.10	54.2	55.4	51.7	37.5
Manganese (Mn)-Total (mg/L)	0.0249	0.169	0.175	0.0965	0.115
Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total (mg/L)	0.000392	0.00129	0.00131	0.00146	0.00130
Nickel (Ni)-Total (mg/L)	0.00299	0.0126	0.0130	0.0139	0.0171
Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total (mg/L)	1.01	0.98	1.01	0.89	0.54
Selenium (Se)-Total (mg/L)	0.000150	0.00126	0.00118	0.00165	0.00159
Silicon (Si)-Total (mg/L)	5.12	4.20	4.27	4.13	5.34
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000015

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1785001-11 Water 15-JUN-16 09:40 GWCC-4	L1785001-12 Water 15-JUN-16 08:30 GWCC-1	L1785001-13 Water 15-JUN-16 09:15 GWCC-3	L1785001-14 Water 15-JUN-16 09:00 GWCC-2	L1785001-15 Water 14-JUN-16 16:10 GWCC-5
WATER						
Physical Tests	Conductivity (uS/cm)	814	2500	1030	1810	911
	Hardness (as CaCO3) (mg/L)	474	1680	622	1160	530
	pH (pH)	8.05	8.05	8.07	8.12	8.09
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	<3.0	<3.0
Anions and Nutrients	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Nitrate (as N) (mg/L)	0.0850	0.550 DLDS	0.154 DLDS	0.385 DLDS	0.0156
	Nitrite (as N) (mg/L)	<0.0010	<0.0050	<0.0020	<0.0050	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	0.0048
	Sulfate (SO4) (mg/L)	258	1290	380	860	279
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	10.1	5.72	9.24	7.22	7.45
	Total Organic Carbon (mg/L)					
Total Metals	Aluminum (Al)-Total (mg/L)	0.0036	<0.0030	<0.0030	<0.0030	0.0031
	Antimony (Sb)-Total (mg/L)	0.00110	0.00130	0.00103	0.00115	0.00098
	Arsenic (As)-Total (mg/L)	0.00103	0.00226	0.00079	0.00148	0.00065
	Barium (Ba)-Total (mg/L)	0.0257	0.0182	0.0270	0.0170	0.0492
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.059	0.273	0.071	0.129	0.038
	Cadmium (Cd)-Total (mg/L)	0.0000451	0.000170	0.0000643	0.000141	0.000107
	Calcium (Ca)-Total (mg/L)	81.8	195	99.9	158	119
	Chromium (Cr)-Total (mg/L)	0.00050	0.00287	0.00045	0.00135	0.00067
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Total (mg/L)	0.00145	0.00109	0.00138	0.00134	0.00089
	Iron (Fe)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	0.019
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Total (mg/L)	0.0070	0.0764	0.0069	0.0131	0.0092
	Magnesium (Mg)-Total (mg/L)	61.4	284	82.7	184	55.1
	Manganese (Mn)-Total (mg/L)	0.00030	0.00028	<0.00010	<0.00010	0.00118
	Mercury (Hg)-Total (mg/L)	0.0000059	<0.0000050	0.0000060	0.0000058	<0.0000050
	Molybdenum (Mo)-Total (mg/L)	0.00219	0.00261	0.00229	0.00269	0.00208
	Nickel (Ni)-Total (mg/L)	0.0304	0.0693	0.0282	0.0396	0.0180
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	1.03	3.21	1.21	1.91	0.81
	Selenium (Se)-Total (mg/L)	0.00104	0.00501	0.00153	0.00341	0.00935
	Silicon (Si)-Total (mg/L)	5.19	6.17	4.74	4.99	4.49
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1785001-16	L1785001-17			
Description	Water	Water			
Sampled Date	14-JUN-16	15-JUN-16			
Sampled Time	17:00	10:20			
Client ID	E3	E2			
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	703	657			
Hardness (as CaCO3) (mg/L)	393	373			
pH (pH)	8.20	8.11			
Total Suspended Solids (mg/L)					
Anions and Nutrients Ammonia, Total (as N) (mg/L)	0.0083	0.0175			
Nitrate (as N) (mg/L)	0.0824	0.0478			
Nitrite (as N) (mg/L)	<0.0010	<0.0010			
Phosphorus (P)-Total (mg/L)	0.0106	0.0056			
Sulfate (SO4) (mg/L)	220	210			
Organic / Inorganic Carbon Dissolved Organic Carbon (mg/L)	13.8	13.9			
Total Organic Carbon (mg/L)					
Total Metals Aluminum (Al)-Total (mg/L)	0.361	0.0321			
Antimony (Sb)-Total (mg/L)	0.00076	0.00045			
Arsenic (As)-Total (mg/L)	0.00137	0.00094			
Barium (Ba)-Total (mg/L)	0.0657	0.0478			
Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020			
Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050			
Boron (B)-Total (mg/L)	0.058	0.031			
Cadmium (Cd)-Total (mg/L)	0.0000211	0.0000477			
Calcium (Ca)-Total (mg/L)	68.0	70.0			
Chromium (Cr)-Total (mg/L)	0.00171	0.00060			
Cobalt (Co)-Total (mg/L)	0.00039	0.00051			
Copper (Cu)-Total (mg/L)	0.00253	0.00231			
Iron (Fe)-Total (mg/L)	0.766	0.197			
Lead (Pb)-Total (mg/L)	0.000280	<0.000050			
Lithium (Li)-Total (mg/L)	0.0049	0.0065			
Magnesium (Mg)-Total (mg/L)	52.2	45.5			
Manganese (Mn)-Total (mg/L)	0.0706	0.0812			
Mercury (Hg)-Total (mg/L)	0.0000050	0.0000053			
Molybdenum (Mo)-Total (mg/L)	0.00131	0.00140			
Nickel (Ni)-Total (mg/L)	0.00970	0.0120			
Phosphorus (P)-Total (mg/L)	<0.050	<0.050			
Potassium (K)-Total (mg/L)	0.90	0.84			
Selenium (Se)-Total (mg/L)	0.000881	0.00198			
Silicon (Si)-Total (mg/L)	6.22	3.90			
Silver (Ag)-Total (mg/L)	0.000011	<0.000010			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1785001-1	L1785001-2	L1785001-3	L1785001-4	L1785001-5
Description	Water	Water	Water	Water	Water
Sampled Date	14-JUN-16	14-JUN-16	14-JUN-16	14-JUN-16	17-JUN-16
Sampled Time	14:45	14:45	14:45	14:00	
Client ID	FB1	E1	DUP01	E1(H)	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Total Metals Sodium (Na)-Total (mg/L)	<0.050	2.37	2.41	2.38	<0.050
Strontium (Sr)-Total (mg/L)	<0.00020	0.267	0.264	0.256	<0.00020
Sulfur (S)-Total (mg/L)	<0.50	48.5	48.3	46.8	<0.50
Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	0.000011	<0.000010	<0.000010
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	<0.00030	0.00059	0.00058	0.00070	<0.00030
Uranium (U)-Total (mg/L)	<0.000010	0.00185	0.00184	0.00185	<0.000010
Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium (Zr)-Total (mg/L)	<0.00030	0.00056	0.00058	0.00060	<0.00030
Dissolved Metals Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	
Aluminum (Al)-Dissolved (mg/L)	<0.0010	0.0280	0.0301	0.0305	
Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00027	0.00027	0.00025	
Arsenic (As)-Dissolved (mg/L)	<0.00010	0.00060	0.00061	0.00056	
Barium (Ba)-Dissolved (mg/L)	<0.000050	0.0462	0.0457	0.0458	
Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
Cadmium (Cd)-Dissolved (mg/L)	<0.0000050	0.0000355	0.0000364	0.0000304	
Calcium (Ca)-Dissolved (mg/L)	<0.050	58.2	58.9	57.9	
Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00036	0.00037	0.00029	
Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00026	0.00026	0.00033	
Copper (Cu)-Dissolved (mg/L)	<0.00020	0.00242	0.00245	0.00250	
Iron (Fe)-Dissolved (mg/L)	<0.010	0.100	0.100	0.116	
Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
Lithium (Li)-Dissolved (mg/L)	<0.0010	0.0024	0.0024	0.0024	
Magnesium (Mg)-Dissolved (mg/L)	<0.10	28.9	28.7	28.4	
Manganese (Mn)-Dissolved (mg/L)	<0.00010	0.0575	0.0583	0.0762	
Mercury (Hg)-Dissolved (mg/L)	<0.0000050	0.0000050	<0.0000050	<0.0000050	
Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	0.00101	0.000965	0.000941	
Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00430	0.00435	0.00370	
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	
Potassium (K)-Dissolved (mg/L)	<0.10	0.64	0.66	0.65	
Selenium (Se)-Dissolved (mg/L)	<0.000050	0.00220	0.00217	0.00213	
Silicon (Si)-Dissolved (mg/L)	<0.050	3.59	3.63	3.62	
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1785001-6 Water 15-JUN-16 15:30 E8	L1785001-7 Water 15-JUN-16 14:13 E7	L1785001-8 Water 15-JUN-16 14:13 DUP02	L1785001-9 Water 15-JUN-16 14:13 E4	L1785001-10 Water 15-JUN-16 12:00 R4
WATER						
Total Metals	Sodium (Na)-Total (mg/L)	3.19	4.05	4.16	3.82	4.59
	Strontium (Sr)-Total (mg/L)	0.115	0.432	0.440	0.427	0.402
	Sulfur (S)-Total (mg/L)	9.68	81.9	83.3	79.9	58.3
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000016	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.0109	0.00135	0.00107	0.00108	0.00815
	Uranium (U)-Total (mg/L)	0.000650	0.00216	0.00219	0.00211	0.00443
	Vanadium (V)-Total (mg/L)	0.00144	<0.00050	<0.00050	<0.00050	0.00133
	Zinc (Zn)-Total (mg/L)	0.0034	<0.0030	0.0031	<0.0030	0.0040
	Zirconium (Zr)-Total (mg/L)	0.00081	0.00084	0.00082	0.00073	0.00109
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0977	0.0148	0.0138	0.0158	0.0229
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00039	0.00041	0.00048	0.00036
	Arsenic (As)-Dissolved (mg/L)	0.00054	0.00079	0.00071	0.00090	0.00152
	Barium (Ba)-Dissolved (mg/L)	0.0296	0.0486	0.0494	0.0472	0.0576
	Beryllium (Be)-Dissolved (mg/L)	0.000031	<0.000020	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	<0.010	0.039	0.039	0.043	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.0000137	0.0000422	0.0000365	0.0000377	0.0000534
	Calcium (Ca)-Dissolved (mg/L)	19.3	79.5	79.8	77.7	81.6
	Chromium (Cr)-Dissolved (mg/L)	0.00041	0.00052	0.00053	0.00053	0.00037
	Cobalt (Co)-Dissolved (mg/L)	0.00021	0.00051	0.00050	0.00048	0.00051
	Copper (Cu)-Dissolved (mg/L)	0.00312	0.00211	0.00207	0.00194	0.00205
	Iron (Fe)-Dissolved (mg/L)	0.230	0.202	0.203	0.186	0.137
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0033	0.0110	0.0111	0.0103	0.0037
	Magnesium (Mg)-Dissolved (mg/L)	6.68	55.6	55.5	53.6	39.9
	Manganese (Mn)-Dissolved (mg/L)	0.0126	0.176	0.167	0.0868	0.0980
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.000364	0.00130	0.00123	0.00134	0.00116
	Nickel (Ni)-Dissolved (mg/L)	0.00250	0.0128	0.0125	0.0133	0.0153
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.89	1.02	1.04	0.94	0.56
	Selenium (Se)-Dissolved (mg/L)	0.000189	0.00126	0.00123	0.00153	0.00163
	Silicon (Si)-Dissolved (mg/L)	4.52	4.22	4.23	4.15	5.11
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1785001-11 Water 15-JUN-16 09:40 GWCC-4	L1785001-12 Water 15-JUN-16 08:30 GWCC-1	L1785001-13 Water 15-JUN-16 09:15 GWCC-3	L1785001-14 Water 15-JUN-16 09:00 GWCC-2	L1785001-15 Water 14-JUN-16 16:10 GWCC-5
WATER						
Total Metals	Sodium (Na)-Total (mg/L)	2.83	16.1	3.40	5.85	3.59
	Strontium (Sr)-Total (mg/L)	0.393	1.80	0.489	0.813	0.679
	Sulfur (S)-Total (mg/L)	89.2	432	126	284	98.7
	Thallium (Tl)-Total (mg/L)	0.000051	0.000080	0.000054	0.000055	0.000014
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Uranium (U)-Total (mg/L)	0.00110	0.00616	0.00143	0.00268	0.00217
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	<0.0030	0.0066	<0.0030	0.0049	<0.0030
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0024	0.0012	0.0018	0.0013	0.0021
	Antimony (Sb)-Dissolved (mg/L)	0.00116	0.00128	0.00103	0.00113	0.00094
	Arsenic (As)-Dissolved (mg/L)	0.00107	0.00232	0.00080	0.00152	0.00062
	Barium (Ba)-Dissolved (mg/L)	0.0273	0.0189	0.0270	0.0173	0.0504
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	0.056	0.253	0.067	0.127	0.035
	Cadmium (Cd)-Dissolved (mg/L)	0.0000421	0.000164	0.0000690	0.000147	0.000110
	Calcium (Ca)-Dissolved (mg/L)	85.0	199	106	162	122
	Chromium (Cr)-Dissolved (mg/L)	0.00043	0.00296	0.00042	0.00125	0.00065
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00149	0.00093	0.00133	0.00119	0.00086
	Iron (Fe)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	0.020
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0068	0.0731	0.0072	0.0131	0.0091
	Magnesium (Mg)-Dissolved (mg/L)	63.7	288	86.5	184	55.0
	Manganese (Mn)-Dissolved (mg/L)	0.00014	0.00017	<0.00010	<0.00010	0.00135
	Mercury (Hg)-Dissolved (mg/L)	0.0000060	<0.0000050	0.0000065	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.00204	0.00258	0.00216	0.00252	0.00195
	Nickel (Ni)-Dissolved (mg/L)	0.0298	0.0741	0.0282	0.0386	0.0176
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	1.06	3.25	1.28	1.95	0.79
	Selenium (Se)-Dissolved (mg/L)	0.00101	0.00509	0.00149	0.00359	0.00987
	Silicon (Si)-Dissolved (mg/L)	5.24	6.13	4.93	5.01	4.52
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1785001-16	L1785001-17			
	Description	Water	Water			
	Sampled Date	14-JUN-16	15-JUN-16			
	Sampled Time	17:00	10:20			
	Client ID	E3	E2			
Grouping	**Analyte**					
WATER						
Total Metals	Sodium (Na)-Total (mg/L)	4.49	3.24			
	Strontium (Sr)-Total (mg/L)	0.345	0.370			
	Sulfur (S)-Total (mg/L)	79.2	74.6			
	Thallium (Tl)-Total (mg/L)	<0.000010	0.000021			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.0102	0.00053			
	Uranium (U)-Total (mg/L)	0.00364	0.00192			
	Vanadium (V)-Total (mg/L)	0.00164	<0.00050			
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030			
	Zirconium (Zr)-Total (mg/L)	0.00065	0.00051			
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD			
	Dissolved Metals Filtration Location	FIELD	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.0256	0.0215			
	Antimony (Sb)-Dissolved (mg/L)	0.00071	0.00042			
	Arsenic (As)-Dissolved (mg/L)	0.00101	0.00087			
	Barium (Ba)-Dissolved (mg/L)	0.0519	0.0479			
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020			
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050			
	Boron (B)-Dissolved (mg/L)	0.052	0.031			
	Cadmium (Cd)-Dissolved (mg/L)	0.0000121	0.0000474			
	Calcium (Ca)-Dissolved (mg/L)	67.8	72.8			
	Chromium (Cr)-Dissolved (mg/L)	0.00085	0.00045			
	Cobalt (Co)-Dissolved (mg/L)	0.00022	0.00046			
	Copper (Cu)-Dissolved (mg/L)	0.00193	0.00216			
	Iron (Fe)-Dissolved (mg/L)	0.126	0.156			
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050			
	Lithium (Li)-Dissolved (mg/L)	0.0040	0.0066			
	Magnesium (Mg)-Dissolved (mg/L)	54.3	46.6			
	Manganese (Mn)-Dissolved (mg/L)	0.0589	0.0716			
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050			
	Molybdenum (Mo)-Dissolved (mg/L)	0.00127	0.00127			
	Nickel (Ni)-Dissolved (mg/L)	0.00817	0.0115			
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050			
	Potassium (K)-Dissolved (mg/L)	0.77	0.87			
	Selenium (Se)-Dissolved (mg/L)	0.000919	0.00191			
	Silicon (Si)-Dissolved (mg/L)	5.24	3.91			
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010			

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1785001-1 Water 14-JUN-16 14:45 FB1	L1785001-2 Water 14-JUN-16 14:45 E1	L1785001-3 Water 14-JUN-16 14:45 DUP01	L1785001-4 Water 14-JUN-16 14:00 E1(H)	L1785001-5 Water 17-JUN-16 TRAVEL BLANK
WATER						
Dissolved Metals	Sodium (Na)-Dissolved (mg/L)	<0.050	2.38	2.39	2.41	
	Strontium (Sr)-Dissolved (mg/L)	<0.00020	0.263	0.256	0.255	
	Sulfur (S)-Dissolved (mg/L)	<0.50	48.2	47.1	47.2	
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000015	<0.000010	<0.000010	
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	0.00030	0.00042	0.00039	
	Uranium (U)-Dissolved (mg/L)	<0.000010	0.00178	0.00173	0.00178	
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0019	0.0019	0.0043	
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	0.00060	0.00058	0.00062	
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)					
	Hexavalent Chromium (mg/L)					
	Hexavalent Chromium-Dissolved (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1785001-6	L1785001-7	L1785001-8	L1785001-9	L1785001-10
	Description	Water	Water	Water	Water	Water
	Sampled Date	15-JUN-16	15-JUN-16	15-JUN-16	15-JUN-16	15-JUN-16
	Sampled Time	15:30	14:13	14:13	14:13	12:00
	Client ID	E8	E7	DUP02	E4	R4
Grouping	**Analyte**					
WATER						
Dissolved Metals	Sodium (Na)-Dissolved (mg/L)	3.02	3.97	4.11	4.02	4.81
	Strontium (Sr)-Dissolved (mg/L)	0.111	0.435	0.431	0.420	0.408
	Sulfur (S)-Dissolved (mg/L)	9.70	82.3	81.2	80.2	60.1
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	0.000014	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	0.00122	0.00037	0.00034	0.00036	0.00062
	Uranium (U)-Dissolved (mg/L)	0.000602	0.00206	0.00205	0.00204	0.00418
	Vanadium (V)-Dissolved (mg/L)	0.00069	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0024	0.0025	0.0024	0.0015	0.0068
	Zirconium (Zr)-Dissolved (mg/L)	0.00085	0.00088	0.00086	0.00068	0.00119
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)					<0.00073
	Hexavalent Chromium (mg/L)					0.0011
	Hexavalent Chromium-Dissolved (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1785001-11 Water 15-JUN-16 09:40 GWCC-4	L1785001-12 Water 15-JUN-16 08:30 GWCC-1	L1785001-13 Water 15-JUN-16 09:15 GWCC-3	L1785001-14 Water 15-JUN-16 09:00 GWCC-2	L1785001-15 Water 14-JUN-16 16:10 GWCC-5
WATER						
Dissolved Metals	Sodium (Na)-Dissolved (mg/L)	3.04	16.2	3.44	5.89	3.54
	Strontium (Sr)-Dissolved (mg/L)	0.386	1.90	0.486	0.809	0.668
	Sulfur (S)-Dissolved (mg/L)	88.9	431	130	285	94.3
	Thallium (Tl)-Dissolved (mg/L)	0.000050	0.000085	0.000058	0.000054	0.000014
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)	0.00108	0.00656	0.00138	0.00256	0.00210
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0037	0.0069	0.0021	0.0045	<0.0010
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Speciated Metals	Chromium (III)-Dissolved (mg/L)		<0.00064		<0.00042	
	Chromium (III)-Total (mg/L)		<0.00088		<0.00073	
	Hexavalent Chromium (mg/L)		0.0036		0.0021	
	Hexavalent Chromium-Dissolved (mg/L)		0.0037		0.0019	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1785001-16	L1785001-17			
	Description	Water	Water			
	Sampled Date	14-JUN-16	15-JUN-16			
	Sampled Time	17:00	10:20			
	Client ID	E3	E2			
Grouping	**Analyte**					
WATER						
Dissolved Metals	Sodium (Na)-Dissolved (mg/L)	4.59	3.28			
	Strontium (Sr)-Dissolved (mg/L)	0.338	0.364			
	Sulfur (S)-Dissolved (mg/L)	78.9	74.4			
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000017			
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Dissolved (mg/L)	0.00057	<0.00030			
	Uranium (U)-Dissolved (mg/L)	0.00345	0.00184			
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Dissolved (mg/L)	0.0013	0.0033			
	Zirconium (Zr)-Dissolved (mg/L)	0.00057	0.00052			
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)	<0.00074				
	Hexavalent Chromium (mg/L)	0.0012				
	Hexavalent Chromium-Dissolved (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Beryllium (Be)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Aluminum (Al)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Antimony (Sb)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Cadmium (Cd)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Copper (Cu)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Lead (Pb)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Silver (Ag)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Tin (Sn)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Vanadium (V)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Zirconium (Zr)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Beryllium (Be)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Antimony (Sb)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Cadmium (Cd)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Chromium (Cr)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Lead (Pb)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Selenium (Se)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Silver (Ag)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Thallium (Tl)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Vanadium (V)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Zirconium (Zr)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Beryllium (Be)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Antimony (Sb)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Chromium (Cr)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Silver (Ag)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Tin (Sn)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Vanadium (V)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Zirconium (Zr)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Selenium (Se)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Chromium (Cr)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Copper (Cu)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Lead (Pb)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Selenium (Se)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Silver (Ag)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Tin (Sn)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Vanadium (V)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Zinc (Zn)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Zirconium (Zr)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Aluminum (Al)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Duplicate	Selenium (Se)-Dissolved	DLA	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Boron (B)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Total	MS-B	L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9
Matrix Spike	Sulfur (S)-Total	MS-B	L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Total Organic Carbon	MS-B	L1785001-5
Matrix Spike	Dissolved Organic Carbon	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -3, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Aluminum (Al)-Total	MS-B	L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9
Matrix Spike	Manganese (Mn)-Total	MS-B	L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9
Matrix Spike	Nickel (Ni)-Total	MS-B	L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9
Matrix Spike	Strontium (Sr)-Total	MS-B	L1785001-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -7, -8, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1785001-15, -16, -17
Matrix Spike	Strontium (Sr)-Total	MS-B	L1785001-15, -16, -17
Matrix Spike	Dissolved Organic Carbon	MS-B	L1785001-2, -4, -6
Matrix Spike	Dissolved Organic Carbon	MS-B	L1785001-2, -4, -6
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1785001-6
Matrix Spike	Strontium (Sr)-Total	MS-B	L1785001-6
Matrix Spike	Arsenic (As)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Cadmium (Cd)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Nickel (Ni)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1785001-1, -10, -11, -12, -13, -14, -15, -16, -17, -2, -3, -4, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BE-D-L-CCMS-VA	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BE-T-L-CCMS-VA	Water	Total Be (Low) in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Reference Information

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310B TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310B TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CR-CR3-DIS-CALC-ED Water Dissolved Trivalent Chromium in Water CALCULATION

Chromium (III)-Dissolved is calculated as the difference between the dissolved chromium and the dissolved hexavalent chromium (Cr(VI)) results.

CR-CR3-TOT-CALC-ED Water Total Trivalent Chromium in Water CALCULATION

Chromium (III)-Total is calculated as the difference between the total chromium and the hexavalent chromium (Cr(VI)) results.

CR-CR6-ED Water Chromium, Hexavalent (Cr +6) APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on an un-filtered, field-preserved sample.

CR6-D-IC-ED Water Chromium, Dissolved Hexavalent (Cr +6) APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on a field-filtered, field-preserved sample.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-CVAA-VA Water Total Mercury in Water by CVAAS or CVAFS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-TOT-LOW-ICP-VA Water Total Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method

Reference Information

6010B).

NH3-F-VA	Water	Ammonia in Water by Fluorescence	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NH3-F-VA	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-WR	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WR	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-PRES-COL-VA	Water	Total P in Water by Colour	APHA 4500-P Phosphorus

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA	Water	Total Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-IC-N-WR	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TSS-MAN-WR	Water	Total Suspended Solids by Gravimetric	APHA 2540 D

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids are determined by filtering a sample through a glass fibre filter and drying the filter at 104 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

Reference Information

WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1 2

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Contact: Brent Mack
Company: ALS Laboratory Group
Address: 8081 Lougheed Hwy., Suite 100,
Burnaby, BC V5A 1W9

REFERENCE DATA

Project / Location: L1785001
PO Number: L1785001
ALS Work Order: 1606743

TEM Water Narrative: Analysis performed on FEI Tecnai TEM with integrated EDXA capabilities. Morphology, EDXA, and SAED measurements used to determine fiber species. Representative EDXA spectra of each asbestos type detected included. Compliance samples must be received and filtered within 48 hours of collection. Collection is performed outside ALS and is the responsibility of the client. Samples disposed after 60 days. TEM grids archived 3 years. Results apply only to portions analyzed.

TEM Water Methods: "EPA 100.2" refers to drinking water samples filtered on 47mm, 0.22µm pore MCE filters. "EPA 100.1" refers to drinking water samples filtered on 47mm, 0.1µm pore Polycarbonate filters. No standard method for asbestos in nonpotable water exists. All TEM waters (potable and nonpotable) analyzed at >10,000x magnification for asbestos fibers >10µm long. Whenever possible, sufficient volume is analyzed to yield an AS of <0.20 MFL based on the detection of 1 confirmed asbestos fiber in the total area analyzed. However, the volume analyzed is dependent upon a filter loading of <25% particulate. Samples containing excessive suspended solids may not reach the recommended AS of <0.20 MFL. In any case, a minimum of 4 and a maximum of 10 openings are analyzed regardless of the AS reached or asbestos concentration detected. ALS will report results directly to state of origin only when;

a) the Chain of Custody clearly states "drinking water for state compliance",
b) the appropriate state drinking water form is submitted with the samples,
c) the state form is completely filled out by the client prior to submittal, and
d) the address to which the form is to be sent is provided.

NOTES: *NA=Not Applicable, ND=None Detected, AS=Analytical Sensitivity, MFL=Millions of Fibers per Liter. † Act-Tremolite concentrations include Actinolite as well as the Libby Amphiboles; Tremolite, Winchite, & Richterite.*

OH Lab ID: #4077, Ohio Analysts; P. Johnson #2268, A. Sohn #3431

PA Lab ID: #68-01320, Cert. #003

NELAC accredited through New York ELAP, LAB #11371

TEM ANALYSIS DATA

EDXA Resolution (eV): <175
Accelerating Voltage (keV): 100
Prep Start Date: 6/22/2016
Calibration Constant (µm/cm): 0.74
Camera Constant (mm-Å): 129.25
Analysis Start Date: 6/24/2016

Pamela Johnson
ALS TEM Analyst

Shawn Smythe
ALS Project Manager

IDENTIFICATION

	L1785001-16	L1785001-17
Client Sample ID:	E3	E2
ALS Sample ID:	1606743-01	1606743-02
Method:	EPA 100.2	EPA 100.2
Date of Collection:	6/14/2016	6/15/2016
Time of Collection:	10:50	10:50

FILTRATION & ANALYSIS

Date of Filtration:	6/21/2016	6/21/2016
Time of Filtration:	15:20	15:20
Volume Filtered (L):	0.01	0.01
Openings Analyzed:	4	4
Avg. Opening Area (mm^2):	0.011	0.011
AS (MFL):	2.44	2.44

ASBESTOS COUNT

Chrysotile:	7	3
Amosite:	0	0
Crocidolite:	0	0
Act-Tremolite†:	0	0
Anthophyllite:	0	0
Total Asbestos:	7	3

ASBESTOS CONCENTRATION (MFL)

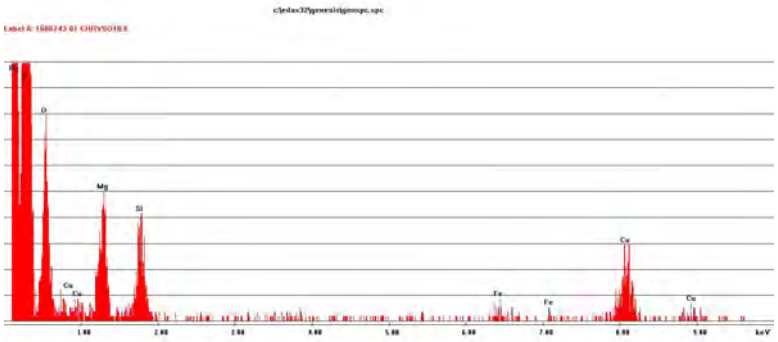
Chrysotile:	17.10	7.33
Amosite:	<AS	<AS
Crocidolite:	<AS	<AS
Act-Tremolite†:	<AS	<AS
Anthophyllite:	<AS	<AS
Total Asbestos:	**17.10**	**7.33**

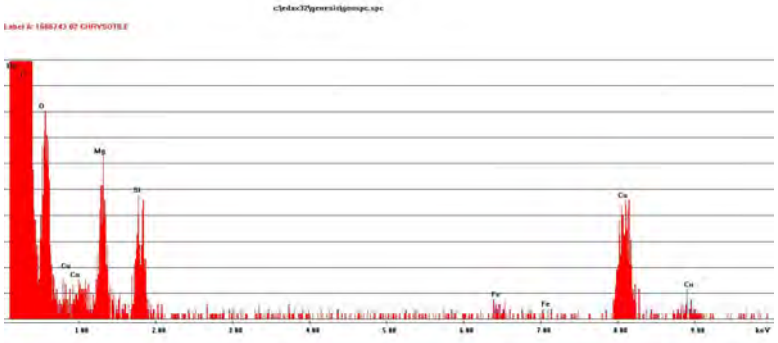
NOTES

Samples L1785001-16 E3 and L1785001-17 E2 were received past the method hold time of 48 hours. Both samples contained many additional asbestos structures which were too small to be counted by this method. Analysis was terminated after the completion of the minimum 4 grid openings analyzed per sample.

EDXA SPECTRA

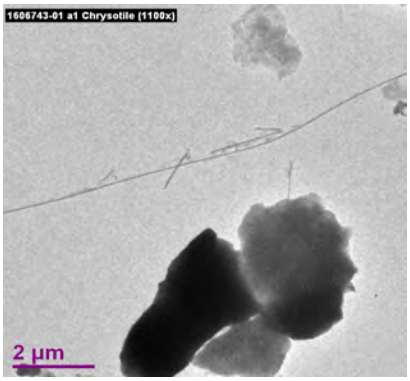
NOTE: Spurious peaks may originate from low background sample holder, column pole pieces, TEM grids, prep solutions or matrix materials.

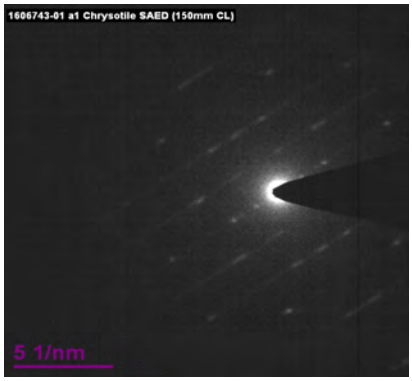


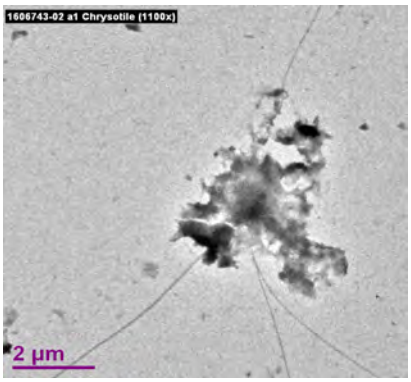


PHOTOMICROGRAPHS

Collected using Gatan Digital Micrograph.







12-Jul-2016

Brent Mack
ALS Laboratory Group
8081 Lougheed Hwy., Suite 100
Burnaby, BC V5A 1W9

Tel: (604) 253-4188
Fax: (604) 253-6700

Re: L1785001 Work Order: **1607133**

Dear Brent,

ALS Environmental received 2 samples on 06-Jul-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 8.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Shawn Smythe

Shawn Smythe
Project Manager

ALS Environmental

Date: 12-Jul-16

Client: ALS Laboratory Group
Project: L1785001
Work Order: **1607133**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1607133-01	L1785001-16	Water		6/14/2016	7/6/2016	☐
1607133-02	L1785001-17	Water		6/15/2016	7/6/2016	☐

ALS Environmental

Date: 12-Jul-16

Client: ALS Laboratory Group
Project: L1785001
Work Order: 1607133

Case Narrative

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

ALS Environmental

Date: *12-Jul-16*

Client: ALS Laboratory Group
Project: L1785001
Work Order: 1607133
Sample ID: L1785001-16
Lab ID: 1607133-01
Collection Date: 6/14/2016
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**12**	H	**3.0**	**mg/L**	1	7/8/2016

Note:

ALS Environmental

Date: *12-Jul-16*

Client: ALS Laboratory Group
Project: L1785001 **Work Order:** 1607133
Sample ID: L1785001-17 **Lab ID:** 1607133-02
Collection Date: 6/15/2016 **Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS BY SM2540 D			**SM2540 D**			Analyst: **rmb**
Total suspended solids	**3.0**	H	**3.0**	**mg/L**	1	7/8/2016

Note:

ALS Environmental

Date: 12-Jul-16

Client: ALS Laboratory Group

Work Order: 1607133

Project: L1785001

QC BATCH REPORT

Batch ID: **R130830** Instrument ID: **WETCHEM** Method: **SM2540 D**

MBLK Sample ID: **MB-R130830-R130830** Units: **mg/L** Analysis Date: **7/8/2016**

Client ID: Run ID: **WETCHEM_160708A** SeqNo: **1317828** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	ND	3.0								

LCS Sample ID: **LCS-R130830-R130830** Units: **mg/L** Analysis Date: **7/8/2016**

Client ID: Run ID: **WETCHEM_160708A** SeqNo: **1317829** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	968.8	3.0	1000	0	96.9	70-130	0			

DUP Sample ID: **1607125-01A Dup** Units: **mg/L** Analysis Date: **7/8/2016**

Client ID: Run ID: **WETCHEM_160708A** SeqNo: **1317831** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	28.37	3.0	0	0	0		29.47	3.8		

DUP Sample ID: **1607210-02A Dup** Units: **mg/L** Analysis Date: **7/8/2016**

Client ID: Run ID: **WETCHEM_160708A** SeqNo: **1317839** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total suspended solids	4.25	3.0	0	0	0		3.25	26.7		

The following samples were analyzed in this batch: 1607133-01A 1607133-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 12-Jul-16

Client: ALS Laboratory Group
Project: L1785001
WorkOrder: **1607133**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
mg/L	

ALS Environmental

Sample Receipt Checklist

Client Name: **ALS-BURNABY** Date/Time Received: **06-Jul-16 00:00**

Work Order: **1607133** Received by: **RDN**

Checklist completed by: Jan Wilcox 06-Jul-16 Reviewed by: Shawn Smythe 07-Jul-16

eSignature | Date | eSignature | Date

Matrices:

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	9.4		
Cooler(s)/Kit(s):			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1785001-COFC

COC Number: 1

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hemmera Environchem Inc.	Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Natasha Sandys	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	230 - 2237 2nd Avenue Whitehorse, YT	☐ Criteria on Report - provide details below if box checked	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-456-4885	Email 1 or Fax nsandys@hemmera.com	Specify Date Required for E2,E or P:
		Email 2 chris@elr.ca	

Invoice To		Invoice Distribution
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☑ EMAIL ☑ MAIL ☐ FAX
	Copy of Invoice with Report ☐ Yes ☑ No	
Company:	Hemmera Environchem Inc.	Email 1 or Fax nsandys@hemmera.com
Contact:	Natasha Sandys	Email 2 chris@elr.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56044	Approver ID:	Cost Center:
Job #:	1343-005.17	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: AN/CH

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	F/P Low Level Diss. Met (incl. Hg) and Hardness	P Low Level Tot. Met (incl. Hg) and Hardness	P Chromium Speciation (III/VI) - Total	F/P Chromium Speciation (III/VI) - Dissolved	P Ammonia - N	F/P Dissolved Organic Carbon (DOC)	Nitrate-N	Nitrite - N	Total Phosphorus	Sulphate	pH, Conductivity, Total Susp Solids			Number of Containers
	FB1	14-Jun-16	14:45	Water	R	R			R	R	R	R	R	R	R			9
	E1	14-Jun-16	14:45	Water	R	R			R	R	R	R	R	R	R			9
	Dup01	14-Jun-16	14:45	Water	R	R			R	R	R	R	R	R	R			9
	E1(H)	14-Jun-16	14:00	Water	R	R			R	R	R	R	R	R	R			9
	Travel Blank			Water		R			R	R	R	R	R	R	R			6
	E8	16-Jun-16	15:30	Water	R	R			R	R	R	R	R	R	R			9
	E7	15-Jun-16	14:13	Water	R	R			R	R	R	R	R	R	R			9
	Dup02	15-Jun-16	14:13	Water	R	R			R	R	R	R	R	R	R			9
	E4	15-Jun-16	14:13	Water	R	R			R	R	R	R	R	R	R			9
	R4	15-Jun-16	12:00	Water	R	R			R	R	R	R	R	R	R			9
	GWCC-4	15-Jun-16	9:40	Water	R	R			R	R	R	R	R	R	R			9
	GWCC-1	15-Jun-16	8:30	Water	R	R			R	R	R	R	R	R	R			9

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs Yes ☑ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
5.2 5.4	6.1	5.7	5.4.8	8.4.5	10°C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: C. Jostrab	Date: 17-Jun-16	Time: 09:40	Received by:	Date: 17 JUN 16	Time: 9:45	Received by: JC	Date: 21 JUN	Time: 13:25

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1785001-COFC

COC Number: 1

Page 2 of 2

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hemmera Envirochem Inc.	Select Report Format: ☑PDF ☑EXCEL ☑EDD (DIGITAL)	R ☑Regular (Standard TAT if received by 3 pm - business days)
Contact:	Natasha Sandys	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	230 - 2237 2nd Avenue Whitehorse, YT	☐Criteria on Report - provide details below if box checked Select Distribution: ☑EMAIL ☐MAIL ☐FAX	E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-456-4865	Email 1 or Fax nsandys@hemmera.com Email 2 chris@elr.ca	Specify Date Required for E2, E or P:

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution: ☑EMAIL ☑MAIL ☐FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No	Email 1 or Fax nsandys@hemmera.com	
Company:	Hemmera Envirochem Inc.	Email 2 chris@elr.ca	
Contact:	Natasha Sandys		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56044	Approver ID:	Cost Center:
Job #:	1343-005.17	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: AN/CH

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Low Level Diss. Met (incl. Hg) and Hardness F/P	Low Level Tot. Met (incl. Hg) and Hardness P	Chromium Speciation (III/VI) - Total P	Chromium Speciation (III/VI) - Dissolved F/P	Ammonia - N P	Dissolved Organic Carbon (DOC) F/P	Nitrate-N	Nitrite - N	Total Phosphorus	Sulphate	pH, Conductivity, Total Susp Solids	Asbestos-TEM-AD		Number of Containers
	GWCC-3	15-Jun-16	9:15	Water	R	R			R	R	R	R	R	R	R			9
	GWCC-2	15-Jun-16	9:00	Water	R	R			R	R	R	R	R	R	R			9
	GWCC-5	14-Jun-16	16:10	Water	R	R			R	R	R	R	R	R	R			9
	E3	14-Jun-16	17:00	Water	R	R			R	R	R	R	R	R	R	R		10
	E2	16-Jun-16	10:20	Water	R	R			R	R	R	R	R	R	R	R		10

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No ☐
Ice packs	Yes ☑	No ☐	Custody seal intact	Yes ☐	No ☐
Cooling Initiated	☑			

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
5.2, 5.4	6.1	5.7	5, 4, 8	8, 4, 5	10.1

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: C. Jostadski	Date: 17-Jun-16	Time: 09:40	Received by:	Date: 17-Jun-16	Time: 9:45	Received by: JC	Date: 21 JUN	Time: 13:25

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

HEMMERA ENVIROCHEM INC.
ATTN: Natasha Sandys
230 - 2237 2nd Avenue
Whitehorse YK Y1A 0K7

Date Received: 20-JUN-16
Report Date: 15-JUL-16 11:12 (MT)
Version: FINAL REV. 2

Client Phone: 867-456-4865

Certificate of Analysis

Lab Work Order #: L1785857

Project P.O. #: NOT SUBMITTED
Job Reference: 1343-005.17
C of C Numbers: 1, 2
Legal Site Desc:

Comments:

15-JUL-2016 This report replaces the previous version and contains additional analyses, as requested.

Brent Mack, B.Sc.
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1785857-1	L1785857-2	L1785857-3	L1785857-4	L1785857-5
Description	Water	Water	Water	Water	Water
Sampled Date	16-JUN-16	17-JUN-16	16-JUN-16	17-JUN-16	20-JUN-16
Sampled Time	14:45	10:30	13:30	10:30	
Client ID	R1	R1	R2	R2	TRAVEL BLANK
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)		712		659	<2.0
Hardness (as CaCO3) (mg/L)	392		356		<0.50
pH (pH)		8.17		8.22	5.18
Total Suspended Solids (mg/L)		7.3		7.3	<3.0
Anions and Nutrients Ammonia, Total (as N) (mg/L)	0.0194		0.0120		0.0401 RRV
Nitrate (as N) (mg/L)		0.119		0.0448	<0.0050
Nitrite (as N) (mg/L)		<0.0010		<0.0010	<0.0010
Phosphorus (P)-Total (mg/L)	0.0106		0.0087		<0.0020
Sulfate (SO4) (mg/L)		222		178	<0.30
Organic / Inorganic Carbon Dissolved Organic Carbon (mg/L)	11.6		8.99		
Total Organic Carbon (mg/L)					<0.50
Total Metals Aluminum (Al)-Total (mg/L)	0.175		0.109		<0.0030
Antimony (Sb)-Total (mg/L)	0.00023		0.00047		<0.00010
Arsenic (As)-Total (mg/L)	0.00066		0.00091		<0.00010
Barium (Ba)-Total (mg/L)	0.0505		0.0476		<0.000050
Beryllium (Be)-Total (mg/L)	<0.000020		<0.000020		<0.000020
Bismuth (Bi)-Total (mg/L)	<0.000050		<0.000050		<0.000050
Boron (B)-Total (mg/L)	<0.010		0.011		<0.010
Cadmium (Cd)-Total (mg/L)	0.0000625		0.0000203		<0.0000050
Calcium (Ca)-Total (mg/L)	82.9		59.6		<0.050
Chromium (Cr)-Total (mg/L)	<0.00070 DLB		<0.00070 DLB		<0.00010
Cobalt (Co)-Total (mg/L)	0.00057		0.00022		<0.00010
Copper (Cu)-Total (mg/L)	0.00250		0.00151		<0.00050
Iron (Fe)-Total (mg/L)	0.503		0.436		<0.010
Lead (Pb)-Total (mg/L)	0.000258		0.000077		<0.000050
Lithium (Li)-Total (mg/L)	0.0037		0.0059		<0.0010
Magnesium (Mg)-Total (mg/L)	37.3		46.7		<0.10
Manganese (Mn)-Total (mg/L)	0.230		0.0750		<0.00010
Mercury (Hg)-Total (mg/L)	0.0000051		<0.0000050		<0.0000050
Molybdenum (Mo)-Total (mg/L)	0.00134		0.000648		<0.000050
Nickel (Ni)-Total (mg/L)	0.00431		0.00299		<0.00050
Phosphorus (P)-Total (mg/L)	<0.050		<0.050		<0.050
Potassium (K)-Total (mg/L)	0.61		0.81		<0.10
Selenium (Se)-Total (mg/L)	0.00246		0.000448		<0.000050
Silicon (Si)-Total (mg/L)	4.28		5.29		<0.050
Silver (Ag)-Total (mg/L)	<0.000010		<0.000010		<0.000010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1785857-6	L1785857-7	L1785857-8	L1785857-9	L1785857-10
Description	Water	Water	Water	Water	Water
Sampled Date	17-JUN-16	18-JUN-16	18-JUN-16	17-JUN-16	16-JUN-16
Sampled Time	16:45	11:00	11:00	12:45	12:45
Client ID	R3	R6	DUP-3	R7	R8
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	806	189	189	182	
Hardness (as CaCO3) (mg/L)	461	86.4	87.3	98.6	132
pH (pH)	8.26	7.86	7.84	7.51	
Total Suspended Solids (mg/L)	68.7	10.7	8.7	19.3	
Anions and Nutrients Ammonia, Total (as N) (mg/L)	0.0177	0.0082	0.0102	0.0412	<0.0050
Nitrate (as N) (mg/L)	0.0558	0.0265	0.0269	0.0885	
Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
Phosphorus (P)-Total (mg/L)	0.0055	0.0078	0.0075	0.0292	0.0052
Sulfate (SO4) (mg/L)	261	31.7	31.6	31.6	
Organic / Inorganic Carbon Dissolved Organic Carbon (mg/L)	12.8	15.2	15.2	28.3	14.7
Total Organic Carbon (mg/L)					
Total Metals Aluminum (Al)-Total (mg/L)	1.93	0.149	0.156	0.470	0.0581
Antimony (Sb)-Total (mg/L)	0.00029	0.00012	0.00012	0.00022	0.00184
Arsenic (As)-Total (mg/L)	0.00194	0.00061	0.00060	0.00141	0.00040
Barium (Ba)-Total (mg/L)	0.117	0.0352	0.0345	0.0778	0.0483
Beryllium (Be)-Total (mg/L)	0.000077	<0.000020	<0.000020	0.000034	<0.000020
Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (mg/L)	0.0000492	0.0000160	0.0000169	0.0000257	0.0000270
Calcium (Ca)-Total (mg/L)	82.7	21.0	21.9	20.9	31.4
Chromium (Cr)-Total (mg/L)	0.00425	<0.00050 DLB	<0.00050 DLB	0.00227	0.00093
Cobalt (Co)-Total (mg/L)	0.00130	0.00024	0.00027	0.00086	<0.00010
Copper (Cu)-Total (mg/L)	0.00551	0.00291	0.00305	0.00493	0.00221
Iron (Fe)-Total (mg/L)	3.31	0.304	0.314	1.93	0.118
Lead (Pb)-Total (mg/L)	0.00132	0.000063	0.000088	0.000280	<0.000050
Lithium (Li)-Total (mg/L)	0.0057	0.0033	0.0034	<0.0010	<0.0010
Magnesium (Mg)-Total (mg/L)	54.5	7.21	7.56	9.63	11.8
Manganese (Mn)-Total (mg/L)	0.133	0.0253	0.0268	0.206	0.00425
Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total (mg/L)	0.00137	0.000429	0.000431	0.000529	0.000787
Nickel (Ni)-Total (mg/L)	0.00880	0.00239	0.00252	0.00445	0.00347
Phosphorus (P)-Total (mg/L)	0.060	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total (mg/L)	1.20	0.87	0.91	0.21	<0.10
Selenium (Se)-Total (mg/L)	0.000570	0.000150	0.000170	0.000290	0.000561
Silicon (Si)-Total (mg/L)	8.94	4.38	4.59	5.11	5.53
Silver (Ag)-Total (mg/L)	0.000029	<0.000010	<0.000010	<0.000010	<0.000010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1785857-11	L1785857-12	L1785857-13	L1785857-14	L1785857-15
Description	Water	Water	Water	Water	Water
Sampled Date	17-JUN-16	17-JUN-16	17-JUN-16	17-JUN-16	17-JUN-16
Sampled Time	10:35	09:50	17:50	14:40	10:15
Client ID	R8	R9	R11	SL	R9
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	260		406	1470	528
Hardness (as CaCO3) (mg/L)		310	214	967	
pH (pH)	7.57		7.86	8.25	7.85
Total Suspended Solids (mg/L)	4.7		38.0	20.7	<3.0
Anions and Nutrients Ammonia, Total (as N) (mg/L)		0.0396			
Nitrate (as N) (mg/L)	<0.0050		0.117	0.019	0.170
Nitrite (as N) (mg/L)	<0.0010		<0.0010	<0.0020 DLDS	0.0011
Phosphorus (P)-Total (mg/L)		0.0105			
Sulfate (SO4) (mg/L)	79.1		109	669	170
Organic / Inorganic Carbon Dissolved Organic Carbon (mg/L)		23.6			
Total Organic Carbon (mg/L)					
Total Metals Aluminum (Al)-Total (mg/L)		0.0507	0.151	0.215	
Antimony (Sb)-Total (mg/L)		0.00023	0.00024	0.00281	
Arsenic (As)-Total (mg/L)		0.00076	0.00061	0.0163	
Barium (Ba)-Total (mg/L)		0.0713	0.0551	0.0298	
Beryllium (Be)-Total (mg/L)		<0.000020	<0.000020	<0.000020	
Bismuth (Bi)-Total (mg/L)		<0.000050	<0.000050	<0.000050	
Boron (B)-Total (mg/L)		<0.010	<0.010	0.042	
Cadmium (Cd)-Total (mg/L)		0.0000459	0.0000376	0.0000282	
Calcium (Ca)-Total (mg/L)		67.2	48.2	210	
Chromium (Cr)-Total (mg/L)		0.00089	0.00108	0.00725	
Cobalt (Co)-Total (mg/L)		0.00047	0.00021	0.00075	
Copper (Cu)-Total (mg/L)		0.00408	0.00280	0.00205	
Iron (Fe)-Total (mg/L)		0.930	0.315	0.483	
Lead (Pb)-Total (mg/L)		0.000051	0.000163	0.000244	
Lithium (Li)-Total (mg/L)		<0.0010	<0.0010	0.0114	
Magnesium (Mg)-Total (mg/L)		30.5	21.9	98.2	
Manganese (Mn)-Total (mg/L)		0.300	0.0163	0.0138	
Mercury (Hg)-Total (mg/L)		0.0000061	<0.0000050	<0.0000050	
Molybdenum (Mo)-Total (mg/L)		0.00143	0.00109	0.00200	
Nickel (Ni)-Total (mg/L)		0.00387	0.00307	0.0241	
Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	
Potassium (K)-Total (mg/L)		0.54	0.54	1.40	
Selenium (Se)-Total (mg/L)		0.00109	0.000696	0.0157	
Silicon (Si)-Total (mg/L)		4.31	5.77	4.74	
Silver (Ag)-Total (mg/L)		<0.000010	0.000012	<0.000010	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1785857-1	L1785857-2	L1785857-3	L1785857-4	L1785857-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	16-JUN-16	17-JUN-16	16-JUN-16	17-JUN-16	20-JUN-16
	Sampled Time	14:45	10:30	13:30	10:30	
	Client ID	R1	R1	R2	R2	TRAVEL BLANK
Grouping	**Analyte**					
WATER						
Total Metals	Sodium (Na)-Total (mg/L)	3.34		2.89		<0.050
	Strontium (Sr)-Total (mg/L)	0.381		0.312		<0.00020
	Sulfur (S)-Total (mg/L)	71.4		59.3		<0.50
	Thallium (Tl)-Total (mg/L)	0.000010		<0.000010		<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010		<0.00010		<0.00010
	Titanium (Ti)-Total (mg/L)	0.00438		0.00318		<0.00030
	Uranium (U)-Total (mg/L)	0.00259		0.00390		<0.000010
	Vanadium (V)-Total (mg/L)	0.00060		0.00063		<0.00050
	Zinc (Zn)-Total (mg/L)	0.0036		<0.0030		<0.0030
	Zirconium (Zr)-Total (mg/L)	0.00056		0.00038		<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD		FIELD		
	Dissolved Metals Filtration Location	FIELD		FIELD		
	Aluminum (Al)-Dissolved (mg/L)	0.0214		0.0244		
	Antimony (Sb)-Dissolved (mg/L)	0.00023		0.00045		
	Arsenic (As)-Dissolved (mg/L)	0.00054		0.00086		
	Barium (Ba)-Dissolved (mg/L)	0.0518		0.0506		
	Beryllium (Be)-Dissolved (mg/L)	<0.000020		<0.000020		
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050		<0.000050		
	Boron (B)-Dissolved (mg/L)	<0.010		0.010		
	Cadmium (Cd)-Dissolved (mg/L)	0.0000607		0.0000180		
	Calcium (Ca)-Dissolved (mg/L)	89.7		63.0		
	Chromium (Cr)-Dissolved (mg/L)	0.00023		0.00050		
	Cobalt (Co)-Dissolved (mg/L)	0.00044		0.00017		
	Copper (Cu)-Dissolved (mg/L)	0.00213		0.00133		
	Iron (Fe)-Dissolved (mg/L)	0.212		0.277		
	Lead (Pb)-Dissolved (mg/L)	<0.000050		<0.000050		
	Lithium (Li)-Dissolved (mg/L)	0.0037		0.0059		
	Magnesium (Mg)-Dissolved (mg/L)	40.8		48.3		
	Manganese (Mn)-Dissolved (mg/L)	0.231		0.0731		
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050		<0.0000050		
	Molybdenum (Mo)-Dissolved (mg/L)	0.00130		0.000606		
	Nickel (Ni)-Dissolved (mg/L)	0.00407		0.00302		
	Phosphorus (P)-Dissolved (mg/L)	<0.050		<0.050		
	Potassium (K)-Dissolved (mg/L)	0.63		0.83		
	Selenium (Se)-Dissolved (mg/L)	0.00256		0.000428		
	Silicon (Si)-Dissolved (mg/L)	4.38		5.33		
	Silver (Ag)-Dissolved (mg/L)	<0.000010		<0.000010		

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1785857-6 Water 17-JUN-16 16:45 R3	L1785857-7 Water 18-JUN-16 11:00 R6	L1785857-8 Water 18-JUN-16 11:00 DUP-3	L1785857-9 Water 17-JUN-16 12:45 R7	L1785857-10 Water 16-JUN-16 12:45 R8
Sample ID / **Description** / **Sampled Date** / **Sampled Time** / **Client ID**						
WATER						
Total Metals	Sodium (Na)-Total (mg/L)	3.97	3.51	3.69	1.58	3.83
	Strontium (Sr)-Total (mg/L)	0.386	0.123	0.124	0.0648	0.120
	Sulfur (S)-Total (mg/L)	87.4	11.1	11.2	10.9	27.6
	Thallium (Tl)-Total (mg/L)	0.000032	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.0515	0.00296	0.00280	0.0133	0.00107
	Uranium (U)-Total (mg/L)	0.00582	0.000786	0.000761	0.000103	0.000052
	Vanadium (V)-Total (mg/L)	0.00599	0.00088	0.00093	0.00226	<0.00050
	Zinc (Zn)-Total (mg/L)	0.0115	<0.0030	<0.0030	0.0031	<0.0030
	Zirconium (Zr)-Total (mg/L)	0.00085	0.00069	0.00070	0.00090	0.00047
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0251	0.0997	0.101	0.107	0.0296
	Antimony (Sb)-Dissolved (mg/L)	0.00019	0.00012	0.00012	0.00021	0.00188
	Arsenic (As)-Dissolved (mg/L)	0.00060	0.00055	0.00056	0.00126	0.00033
	Barium (Ba)-Dissolved (mg/L)	0.0566	0.0346	0.0348	0.0732	0.0476
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	0.000024	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.0000068	0.0000143	0.0000130	0.0000093	0.0000254
	Calcium (Ca)-Dissolved (mg/L)	89.3	22.1	22.3	22.5	32.7
	Chromium (Cr)-Dissolved (mg/L)	0.00044	0.00037	0.00040	0.00147	0.00070
	Cobalt (Co)-Dissolved (mg/L)	0.00025	0.00021	0.00021	0.00068	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00167	0.00287	0.00291	0.00454	0.00211
	Iron (Fe)-Dissolved (mg/L)	0.143	0.217	0.207	1.36	0.057
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000051	<0.000050	0.000057	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0042	0.0035	0.0035	<0.0010	<0.0010
	Magnesium (Mg)-Dissolved (mg/L)	57.7	7.60	7.71	10.3	12.2
	Manganese (Mn)-Dissolved (mg/L)	0.0840	0.0235	0.0239	0.218	0.00336
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.00121	0.000397	0.000384	0.000522	0.000726
	Nickel (Ni)-Dissolved (mg/L)	0.00309	0.00242	0.00239	0.00422	0.00336
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.89	0.95	0.97	0.20	<0.10
	Selenium (Se)-Dissolved (mg/L)	0.000471	0.000161	0.000179	0.000317	0.000518
	Silicon (Si)-Dissolved (mg/L)	5.71	4.45	4.50	4.77	5.57
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1785857-11	L1785857-12	L1785857-13	L1785857-14	L1785857-15
Description	Water	Water	Water	Water	Water
Sampled Date	17-JUN-16	17-JUN-16	17-JUN-16	17-JUN-16	17-JUN-16
Sampled Time	10:35	09:50	17:50	14:40	10:15
Client ID	R8	R9	R11	SL	R9
Grouping / **Analyte**					
WATER					
Total Metals Sodium (Na)-Total (mg/L)		2.66	5.80	2.42	
Strontium (Sr)-Total (mg/L)		0.246	0.213	0.949	
Sulfur (S)-Total (mg/L)		61.1	38.8	227	
Thallium (Tl)-Total (mg/L)		<0.000010	<0.000010	0.000025	
Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	
Titanium (Ti)-Total (mg/L)		0.00165	0.00431	0.00486	
Uranium (U)-Total (mg/L)		0.000955	0.00112	0.00305	
Vanadium (V)-Total (mg/L)		0.00054	0.00079	0.00075	
Zinc (Zn)-Total (mg/L)		<0.0030	0.0047	0.0034	
Zirconium (Zr)-Total (mg/L)		0.00098	0.00078	<0.00030	
Dissolved Metals Dissolved Mercury Filtration Location		FIELD	FIELD	FIELD	
Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	
Aluminum (Al)-Dissolved (mg/L)		0.0431	0.0374	0.0020	
Antimony (Sb)-Dissolved (mg/L)		0.00021	0.00022	0.00270	
Arsenic (As)-Dissolved (mg/L)		0.00081	0.00049	0.0168	
Barium (Ba)-Dissolved (mg/L)		0.0731	0.0541	0.0288	
Beryllium (Be)-Dissolved (mg/L)		<0.000020	<0.000020	<0.000020	
Bismuth (Bi)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050	
Boron (B)-Dissolved (mg/L)		<0.010	<0.010	0.041	
Cadmium (Cd)-Dissolved (mg/L)		0.0000367	0.0000193	0.0000187	
Calcium (Ca)-Dissolved (mg/L)		71.6	49.2	220	
Chromium (Cr)-Dissolved (mg/L)		0.00078	0.00081	0.00124	
Cobalt (Co)-Dissolved (mg/L)		0.00047	0.00012	0.00014	
Copper (Cu)-Dissolved (mg/L)		0.00406	0.00239	0.00104	
Iron (Fe)-Dissolved (mg/L)		0.884	0.111	<0.010	
Lead (Pb)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050	
Lithium (Li)-Dissolved (mg/L)		<0.0010	<0.0010	0.0110	
Magnesium (Mg)-Dissolved (mg/L)		31.9	22.2	101	
Manganese (Mn)-Dissolved (mg/L)		0.310	0.0102	0.00527	
Mercury (Hg)-Dissolved (mg/L)		<0.0000050	<0.0000050	<0.0000050	
Molybdenum (Mo)-Dissolved (mg/L)		0.00133	0.00100	0.00184	
Nickel (Ni)-Dissolved (mg/L)		0.00381	0.00279	0.0156	
Phosphorus (P)-Dissolved (mg/L)		<0.050	<0.050	<0.050	
Potassium (K)-Dissolved (mg/L)		0.59	0.52	1.43	
Selenium (Se)-Dissolved (mg/L)		0.00112	0.000692	0.0163	
Silicon (Si)-Dissolved (mg/L)		4.51	5.59	4.13	
Silver (Ag)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1785857-1	L1785857-2	L1785857-3	L1785857-4	L1785857-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	16-JUN-16	17-JUN-16	16-JUN-16	17-JUN-16	20-JUN-16
	Sampled Time	14:45	10:30	13:30	10:30	
	Client ID	R1	R1	R2	R2	TRAVEL BLANK
Grouping	**Analyte**					
WATER						
Dissolved Metals	Sodium (Na)-Dissolved (mg/L)	3.56		3.01		
	Strontium (Sr)-Dissolved (mg/L)	0.401		0.318		
	Sulfur (S)-Dissolved (mg/L)	75.0		59.0		
	Thallium (Tl)-Dissolved (mg/L)	<0.000010		<0.000010		
	Tin (Sn)-Dissolved (mg/L)	<0.00010		<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	0.00033		0.00038		
	Uranium (U)-Dissolved (mg/L)	0.00263		0.00387		
	Vanadium (V)-Dissolved (mg/L)	<0.00050		<0.00050		
	Zinc (Zn)-Dissolved (mg/L)	0.0023		<0.0010		
	Zirconium (Zr)-Dissolved (mg/L)	0.00063		0.00042		
Speciated Metals	Chromium (III)-Dissolved (mg/L)					
	Chromium (III)-Total (mg/L)					
	Hexavalent Chromium (mg/L)					
	Hexavalent Chromium-Dissolved (mg/L)					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1785857-6 Water 17-JUN-16 16:45 R3	L1785857-7 Water 18-JUN-16 11:00 R6	L1785857-8 Water 18-JUN-16 11:00 DUP-3	L1785857-9 Water 17-JUN-16 12:45 R7	L1785857-10 Water 16-JUN-16 12:45 R8
Sample ID / **Description** / **Sampled Date** / **Sampled Time** / **Client ID**						
WATER						
Dissolved Metals	Sodium (Na)-Dissolved (mg/L)	4.01	3.70	3.69	1.70	3.90
	Strontium (Sr)-Dissolved (mg/L)	0.397	0.124	0.123	0.0674	0.121
	Sulfur (S)-Dissolved (mg/L)	91.8	11.2	11.2	11.4	27.8
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00021
	Titanium (Ti)-Dissolved (mg/L)	0.00041	0.00102	0.00098	0.00246	0.00043
	Uranium (U)-Dissolved (mg/L)	0.00571	0.000730	0.000731	0.000084	0.000043
	Vanadium (V)-Dissolved (mg/L)	0.00063	0.00072	0.00072	0.00115	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0013	0.0077	0.0068	0.0017	0.0024
	Zirconium (Zr)-Dissolved (mg/L)	0.00053	0.00072	0.00073	0.00115	0.00049
Speciated Metals	Chromium (III)-Dissolved (mg/L)				0.00147	
	Chromium (III)-Total (mg/L)	0.00325			0.00127	
	Hexavalent Chromium (mg/L)	0.0010			0.0010	
	Hexavalent Chromium-Dissolved (mg/L)				<0.0010	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1785857-11 Water 17-JUN-16 10:35 R8	L1785857-12 Water 17-JUN-16 09:50 R9	L1785857-13 Water 17-JUN-16 17:50 R11	L1785857-14 Water 17-JUN-16 14:40 SL	L1785857-15 Water 17-JUN-16 10:15 R9
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
WATER						
Dissolved Metals	Sodium (Na)-Dissolved (mg/L)		2.70	5.83	2.39	
	Strontium (Sr)-Dissolved (mg/L)		0.243	0.212	0.946	
	Sulfur (S)-Dissolved (mg/L)		61.3	38.3	230	
	Thallium (Tl)-Dissolved (mg/L)		<0.000010	<0.000010	0.000016	
	Tin (Sn)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)		0.00124	0.00060	<0.00030	
	Uranium (U)-Dissolved (mg/L)		0.000926	0.00107	0.00299	
	Vanadium (V)-Dissolved (mg/L)		0.00051	<0.00050	<0.00050	
	Zinc (Zn)-Dissolved (mg/L)		0.0015	0.0033	0.0021	
	Zirconium (Zr)-Dissolved (mg/L)		0.00104	0.00080	<0.00030	
Speciated Metals	Chromium (III)-Dissolved (mg/L)				<0.00042	
	Chromium (III)-Total (mg/L)			<0.00072	0.00535	
	Hexavalent Chromium (mg/L)			0.0010	0.0019	
	Hexavalent Chromium-Dissolved (mg/L)				0.0016	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Chromium (Cr)-Total	DLB	L1785857-1, -10, -12, -13, -14, -3, -5, -6, -7, -8, -9
Method Blank	Chromium (Cr)-Total	MB-LOR	L1785857-1, -10, -12, -13, -14, -3, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1785857-11, -13, -14, -15, -2, -4, -5, -6, -7, -8, -9
Matrix Spike	Phosphorus (P)-Total	MS-B	L1785857-1, -10, -12, -3, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Total	MS-B	L1785857-1, -10, -12, -13, -14, -3, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Total	MS-B	L1785857-1, -10, -12, -13, -14, -3, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Total	MS-B	L1785857-1, -10, -12, -13, -14, -3, -5, -6, -7, -8, -9
Matrix Spike	Dissolved Organic Carbon	MS-B	L1785857-12, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BE-D-L-CCMS-VA	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

BE-T-L-CCMS-VA	Water	Total Be (Low) in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310B TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310B TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

CR-CR3-DIS-CALC-ED	Water	Dissolved Trivalent Chromium in Water	CALCULATION

Chromium (III)-Dissolved is calculated as the difference between the dissolved chromium and the dissolved hexavalent chromium (Cr(VI)) results.

CR-CR3-TOT-CALC-ED	Water	Total Trivalent Chromium in Water	CALCULATION

Chromium (III)-Total is calculated as the difference between the total chromium and the hexavalent chromium (Cr(VI)) results.

CR-CR6-ED	Water	Chromium, Hexavalent (Cr +6)	APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on an un-filtered, field-preserved sample.

CR6-D-IC-ED	Water	Chromium, Dissolved Hexavalent (Cr +6)	APHA 3500-Cr C (Ion Chromatography)

This analysis is carried out using procedures adapted from method 3500-Cr C in "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1636 published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.
Results are based on a field-filtered, field-preserved sample.

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

Reference Information

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA	Water	Diss. Mercury in Water by CVAAS or CVAFS	APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-CVAA-VA	Water	Total Mercury in Water by CVAAS or CVAFS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-DIS-LOW-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-TOT-LOW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

NH3-F-VA	Water	Ammonia in Water by Fluorescence	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NH3-F-VA	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-WR	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-WR	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-PRES-COL-VA	Water	Total P in Water by Colour	APHA 4500-P Phosphorus

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

S-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United

Reference Information

States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

S-TOT-ICP-VA Water Total Sulfur in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

SO4-IC-N-WR Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TSS-MAN-WR Water Total Suspended Solids by Gravimetric APHA 2540 D

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids are determined by filtering a sample through a glass fibre filter and drying the filter at 104 degrees celsius.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1 2

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Contact: Brent Mack
Company: ALS Environmental
Address: 8081 Lougheed HWY, Suite 100
Burnaby, BC V5A1W9

REFERENCE DATA

Project / Location: L1785857
PO Number: L1785857
ALS Work Order: 1606852

TEM Water Narrative: Analysis performed on FEI Tecnai TEM with integrated EDXA capabilities. Morphology, EDXA, and SAED measurements used to determine fiber species. Representative EDXA spectra of each asbestos type detected included. Compliance samples must be received and filtered within 48 hours of collection. Collection is performed outside ALS and is the responsibility of the client. Samples disposed after 60 days. TEM grids archived 3 years. Results apply only to portions analyzed.

TEM Water Methods: "EPA 100.2" refers to drinking water samples filtered on 47mm, 0.22µm pore MCE filters. "EPA 100.1" refers to drinking water samples filtered on 47mm, 0.1µm pore Polycarbonate filters. No standard method for asbestos in nonpotable water exists. All TEM waters (potable and nonpotable) analyzed at >10,000x magnification for asbestos fibers >10µm long. Whenever possible, sufficient volume is analyzed to yield an AS of <0.20 MFL based on the detection of 1 confirmed asbestos fiber in the total area analyzed. However, the volume analyzed is dependent upon a filter loading of <25% particulate. Samples containing excessive suspended solids may not reach the recommended AS of <0.20 MFL. In any case, a minimum of 4 and a maximum of 10 openings are analyzed regardless of the AS reached or asbestos concentration detected. ALS will report results directly to state of origin only when;

a) the Chain of Custody clearly states "drinking water for state compliance",
b) the appropriate state drinking water form is submitted with the samples,
c) the state form is completely filled out by the client prior to submittal, and
d) the address to which the form is to be sent is provided.

NOTES: *NA=Not Applicable, ND=None Detected, AS=Analytical Sensitivity, MFL=Millions of Fibers per Liter. † Act-Tremolite concentrations include Actinolite as well as the Libby Amphiboles; Tremolite, Winchite, & Richterite.*

OH Lab ID: #4077, Ohio Analysts; P. Johnson #2268, A. Sohn #3431

PA Lab ID: #68-01320, Cert. #003

NELAC accredited through New York ELAP, LAB #11371

TEM ANALYSIS DATA

EDXA Resolution (eV): <175
Accelerating Voltage (keV): 100
Prep Start Date: 6/27/2016
Calibration Constant (µm/cm): 0.74
Camera Constant (mm-Å): 129.25
Analysis Start Date: 6/28/2016

Pamela Johnson
ALS TEM Analyst

Shawn Smythe
ALS Project Manager

IDENTIFICATION		
Client Sample ID:	L1785857-2 R1	L1785857-6 R3
ALS Sample ID:	1606852-01	1606852-02
Method:	EPA 100.2	EPA 100.2
Date of Collection:	6/17/2016	6/17/2016
Time of Collection:	9:56	9:56
FILTRATION & ANALYSIS		
Date of Filtration:	6/23/2016	6/23/2016
Time of Filtration:	15:35	15:35
Volume Filtered (L):	0.01	0.005
Openings Analyzed:	10	10
Avg. Opening Area (mm^2):	0.011	0.011
AS (MFL):	0.98	1.95
ASBESTOS COUNT		
Chrysotile:	0	0
Amosite:	0	0
Crocidolite:	0	0
Act-Tremolite†:	0	0
Anthophyllite:	0	0
Total Asbestos:	0	0
ASBESTOS CONCENTRATION (MFL)		
Chrysotile:	<AS	<AS
Amosite:	<AS	<AS
Crocidolite:	<AS	<AS
Act-Tremolite†:	<AS	<AS
Anthophyllite:	<AS	<AS
Total Asbestos:	**<AS**	**<AS**

NOTES

Samples L1785857-2 R1 and L1785857-6 R3 were received past the method hold time of 48 hours from time and date of sample collection written on sample bottle labels.

EDXA SPECTRA

NOTE: Spurious peaks may originate from low background sample holder, column pole pieces, TEM grids, prep solutions or matrix materials.

NONE: No asbestos detected.

PHOTOMICROGRAPHS

Collected using Gatan Digital Micrograph.

NONE: No asbestos detected.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1785857-COFC

COC Number: 1

Page 1 of 2

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hemmera Environchem Inc.	Select Report Format: ☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Natasha Sandys	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	230 - 2237 2nd Avenue Whitehorse, YT	☐ Criteria on Report - provide details below if box checked	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-456-4865	Email 1 or Fax nsandys@hemmera.com	Specify Date Required for E2,E or P:
		Email 2 chris@elr.ca	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution: ☑ EMAIL ☑ MAIL ☐ FAX
Company:	Hemmera Environchem Inc.	Email 1 or Fax nsandys@hemmera.com
Contact:	Natasha Sandys	Email 2 chris@elr.ca

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56044	Approver ID:	Cost Center:
Job #:	1343-005.17	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Sampler: AN/CH

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Low Level Diss. Met (incl. Hg) and Hardness F/P	Low Level Tot. Met (incl. Hg) and Hardness P	Chromium Speciation (III/VI) - Total P	Chromium Speciation (III/VI) - Dissolved F/P	Ammonia - N P	Dissolved Organic Carbon (DOC) F/P	Nitrate-N	Nitrite - N	Total Phosphorus	Sulphate	pH, Conductivity, Total Susp Solids	Asbestos-TEM-AD		Number of Containers
1	R1	16-Jun-16	14:45	Water	R	R			R	R								8
2	R1	17-Jun-16	10:50	Water							R	R	R	R	R	R		2
3	R2	16-Jun-16	13:30	Water	R	R			R	R								8
4	R2	17-Jun-16	10:30	Water							R	R	R	R	R			1
5	Travel Blank			Water		R			R	R	R	R	R	R	R			6
6	R3	17-Jun-16	16:45	Water	R	R			R	R	R	R	R	R	R	R		10
7	R6	18-Jun-16	11:00	Water	R	R			R	R	R	R	R	R	R			9
8	DUP-3	18-Jun-16	11:00	Water	R	R			R	R	R	R	R	R	R			9
9	R7	17-Jun-16	12:45	Water	R	R			R	R	R	R	R	R	R			9
10	R8	16-Jun-16	12:45	Water	R	R			R	R								8
11	R8	17-Jun-16	10:35	Water							R	R	R	R	R			1
12	R9	17-Jun-16	9:50	Water	R	R			R	R								8

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice packs ☑ Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
1.1	1.6		10.4	8.8	4.5

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Jun. 20	Time: 9:15	Received by:	Date: 20-Jun-16	Time: 9:30	Received by: JC	Date: 21 JUN	Time: 13:25

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0328e v09 Front04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1785857-COFC

COC Number: 1

Page 2 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hemmera Environchem Inc.	Select Report Format:	☑PDF ☑EXCEL ☑EDD (DIGITAL)	R ☑Regular (Standard TAT if received by 3 pm - business days)
Contact:	Natasha Sandys	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	230 - 2237 2nd Avenue Whitehorse, YT	☐Criteria on Report - provide details below if box checked		E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution:	☑EMAIL ☐MAIL ☐FAX	E2 ☐Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-456-4865	Email 1 or Fax	nsandys@hemmera.com	Specify Date Required for E2,E or P:
		Email 2	chris@elr.ca	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution		Analysis Request
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution:	☑EMAIL ☑MAIL ☐FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:	Hemmera Environchem Inc.	Email 1 or Fax	nsandys@hemmera.com	
Contact:	Natasha Sandys	Email 2	chris@elr.ca	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q56044	Approver ID:	Cost Center:
Job #:	1343-005.17	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact:	Sampler: AN/CH

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Low Level Diss. Met (incl. Hg) and Hardnes	Low Level Tot. Met (incl. Hg) and Hardness	Chromium Speciation (III/VI) - Total	Chromium Speciation (III/VI) - Dissolved	Ammonia - N	Dissolved Organic Carbon (DOC)	Nitrate-N	Nitrite - N	Total Phosphorus	Sulphate	pH, Conductivity, Total Susp Solids	Asbestos-TEM-AD		Number of Containers
					F/P	P	P	F/P	P	F/P								
13	R11	17-Jun-16	17:50	Water	R	R			R	R	R	R	R	R	R			9
14	SL	17-Jun-16	14:40	Water	R	R			R	R	R	R	R	R	R			9
15	R9	17-Jun-16	10:15	Water							R	R	R	R	R			1

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No	Please hold samples for total and dissolved Chromium III/VI pending regular metals analysis results. Please supply ELR EQWIN EDD file with results.	Frozen ☐ SIF Observations Yes ☐ No ☐ Ice packs Yes ☑ No ☐ Custody seal intact Yes ☐ No ☐ Cooling Initiated ☑
Are samples for human drinking water use? ☐ Yes ☑ No		INITIAL COOLER TEMPERATURES °C: 8.1 / 8.1 / 7.6 — FINAL COOLER TEMPERATURES °C: 10.2 / 8.5 / 4.5

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: Jun. 20	Time: 9:15	Received by:	Date: 20-JUN-16	Time: 9:30	Received by: JC	Date: 21 JUN	Time: 13:25

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326a v06 Front/04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX 2

Water Quality Field Forms

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E1	**Project Number:**	16-240.2	**Date:**	Jun. 14/2016
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	AN, CH.
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Light rain overcast ~8°C
Photos	Cam SLR Nos. 623-626				
Sample Time (24h)	14:45				
Field Blank Collected:	☒ Yes ☐ No Name FB1	**Duplicate Collected:**	☒ Yes ☐ No Name DUP01		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	0.1
Temperature (°C)	14.9
pH (pH Units)	8.26
Cond. (µs/cm)	370.0
Specific Cond. (µs/cm)	458.8
Redox (mV)	101.8
DO (mg/L)	9.67
DO (%)	95.8
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 15:12
Sample Time	(hh:mm) 14:45
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): E1

Sample Date (Con't): Jun. 13/2016

Sample Time (Con't): 14:45

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: Jun. 13/2016
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time: 14:45
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:		

General Notes: Light rain during FBI preparation. Potential to effect results. Also, DI water provided by ALS did not have label (i.e. provided in clear plastic 1.L bottles with no label or batch #. and no preperation date.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	EI(H)	**Project Number:**	16-240.2	**Date:**	Jun. 14/2016
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	AN, CH.
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Light rain/ wind. ~8°C.
Photos	Cam ECR Nos. 603-622				
Sample Time (24h)	14:00				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD.
Sample Depth (m)	0.2
Temperature (°C)	14.9
pH (pH Units)	7.99
Cond. (µs/cm)	368.1
Specific Cond. (µs/cm)	455.8
Redox (mV)	100.0
DO (mg/L)	9.72
DO (%)	96.4
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear / light brown/ slight turbid.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 13:57
Sample Time	(hh:mm) 14:00
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): E1(H)

Sample Date (Con't): Jun. 13/2016.

Sample Time (Con't): 14:00

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: Jun. 13 / 14:00
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☐ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:		

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E2	**Project Number:**	16-240.2	**Date:**	July 15, 2016
UTM Coordinates	Z ___ E ___ N	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AN
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ~15°C
Photos	Cam ELR Nos. 647-649				
Sample Time (24h)	10:20				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	0.10 m
Temperature (°C)	13.6
pH (pH Units)	7.92
Cond. (µs/cm)	444.4
Specific Cond. (µs/cm)	631.4
Redox (mV)	52.6
DO (mg/L)	9.26
DO (%)	89.1
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear, "tea" coloured.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 10:23
Sample Time	(hh:mm) 10:20
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): E2

Sample Date (Con't): June 15, 2016

Sample Time (Con't): 10:20

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☑		
				☐		
				Total:		

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E3	**Project Number:**	16-240.2	**Date:**	June 14, 2016
UTM Coordinates	Z__ E_____ N_____	**Client:**	Yukon Government (AAM)	**Samplers:**	CH & AN.
Waypoint	GPS_____ Name_____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Partly Cloudy 10°C
Photos	Cam ELR Nos. 631-634				
Sample Time (24h)	17:00				
Field Blank Collected:	☐ Yes ☒ No Name –	**Duplicate Collected:**	☐ Yes ☑ No Name –		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	~0.10 m
Temperature (°C)	8.5
pH (pH Units)	8.27
Cond. (µs/cm)	671.6
Specific Cond. (µs/cm)	675.5
Redox (mV)	111.2
DO (mg/L)	11.76
DO (%)	100.1
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	slightly cloudy, brown. No odours.

Site Sketch

Field Measurements Log	
YSI Logged?	☑ Yes ☐ No
Time Logged on YSI	(hh:mm) 16:59:47
Sample Time	(hh:mm) 17:00
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): E3

Sample Date (Con't): Jun. 14 / 2016

Sample Time (Con't): 17:00

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time:
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E4	**Project Number:**	16-240.2	**Date:**	June 15, 2016
UTM Coordinates	Z ___ E _____ N _____	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AV
Waypoint	GPS _____ Name _____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Partly cloudy ≈ 12°C
Photos	Cam ELR Nos. 657-660				
Sample Time (24h)	12:45				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good.
Sample Depth (m)	0.20
Temperature (°C)	13.4
pH (pH Units)	7.82
Cond. (µs/cm)	542
Specific Cond. (µs/cm)	697
Redox (mV)	94.9
DO (mg/L)	10.36
DO (%)	99.0
Turbidity (NTU)	-
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear. Tea coloured.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 12:46
Sample Time	(hh:mm) 12:45
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): E4

Sample Date (Con't): June 15th 12

Sample Time (Con't): 12:45

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	E7	**Project Number:**	16-240.2	**Date:**	June 15, 2016
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AW
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ≈15°C
Photos	Cam EFR Nos. 661-664				
Sample Time (24h)	14:15				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☒ Yes ☐ No Name DUP-2		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	0.20 m
Temperature (°C)	11.8
pH (pH Units)	7.82
Cond. (µs/cm)	538
Specific Cond. (µs/cm)	719
Redox (mV)	59.6
DO (mg/L)	10.49
DO (%)	97.2
Turbidity (NTU)	-
Appearance & Odour (Clear, Silty, HC odours, etc.)	clear. Tea coloured

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 14:17
Sample Time	(hh:mm) 14:15
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): E7

Sample Date (Con't): June 15, 2016

Sample Time (Con't): 14:15

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	18 including DUP.

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	ES	**Project Number:**	16-240.2	**Date:**	June 15, 2016
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH & AW
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny 15°C
Photos	Cam ELR Nos. 665 - 668				
Sample Time (24h)	15:30				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	0.20
Temperature (°C)	12.5
pH (pH Units)	8.03
Cond. (µs/cm)	122.0
Specific Cond. (µs/cm)	160.2
Redox (mV)	67.2
DO (mg/L)	11.56
DO (%)	108.0
Turbidity (NTU)	-
Appearance & Odour (Clear, Silty, HC odours, etc.)	slightly cloudy, brown/tea colored.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 15:36
Sample Time	(hh:mm) 15:30
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): E8

Sample Date (Con't): June 15, 2016

Sample Time (Con't): 15:30

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:		

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R1	**Project Number:**	16-240.2	**Date:**	June 16
UTM Coordinates	Z__ E _____ N _____	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AV
Waypoint	GPS _____ Name _____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Partly Cloudy ~15C
Photos	Cam ER Nos. 676-679				
Sample Time (24h)	14:45				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	~0.10m
Temperature (°C)	9.3
pH (pH Units)	7.90
Cond. (µs/cm)	460.9
Specific Cond. (µs/cm)	659.1
Redox (mV)	93.8
DO (mg/L)	11.32
DO (%)	99.7
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	Slightly silty.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 14:47
Sample Time	(hh:mm) 14:45
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): R1

Sample Date (Con't): June 16th

Sample Time (Con't): 14:45

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time: June 17 10:50
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time: June 16th 14:45
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☑		June 17th 10:50
				☐		
				Total:		

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	K2	**Project Number:**	16-240.2	**Date:**	June 16
UTM Coordinates	Z__ E____ N____	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AW
Waypoint	GPS____ Name____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ≈ 9/5°C
Photos	Cam ELR Nos. 672-675				
Sample Time (24h)					
Field Blank Collected:	☐ Yes ☒ No Name____	**Duplicate Collected:**	☐ Yes ☒ No Name____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	0.020
Temperature (°C)	6.9
pH (pH Units)	8.03
Cond. (µs/cm)	399.2
Specific Cond. (µs/cm)	609.2
Redox (mV)	85.4
DO (mg/L)	12.19
DO (%)	100.5
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 13:28
Sample Time	(hh:mm) 13:30
Unit Used	☒ Pro Plus ☐ Pen Unit Other____

Sample Site (Con't): R2

Sample Date (Con't): June 16, 2016

Sample Time (Con't): 13:30

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☐		Date/Time: June 17 10:30
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☐		Date/Time: June 16 13:30
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☐ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R3	**Project Number:**	16-240.2	**Date:**	June 17
UTM Coordinates	Z__ E____ N____	**Client:**	Yukon Government (AAM)	**Samplers:**	CH & AR
Waypoint	GPS____ Name____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ~25°C
Photos	Cam ECR Nos. 712-715				
Sample Time (24h)	16:45				
Field Blank Collected:	☐ Yes ☒ No Name____	**Duplicate Collected:**	☐ Yes ☒ No Name____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	~0.30m
Temperature (°C)	9.6
pH (pH Units)	8.20
Cond. (µs/cm)	546
Specific Cond. (µs/cm)	774
Redox (mV)	342
DO (mg/L)	11.46
DO (%)	100.8
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	cloudy Brown

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 16:46
Sample Time	(hh:mm) 16:45
Unit Used	☒ Pro Plus ☐ Pen Unit Other____

Sample Site (Con't): R3

Sample Date (Con't): Jun. 17/2016

Sample Time (Con't): 16:45

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time: June 17
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time: 16:45
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☑		
				☐		
				Total:		

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R4	**Project Number:**	16-240.2	**Date:**	June 15
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AV
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ≈15°C
Photos	Cam EAR Nos. 653-655				
Sample Time (24h)	12:00				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	-0.010m
Temperature (°C)	~~8.16~~ 5.2
pH (pH Units)	8.16
Cond. (µs/cm)	385.4
Specific Cond. (µs/cm)	618.9
Redox (mV)	96.5
DO (mg/L)	13.65
DO (%)	107.8
Turbidity (NTU)	-
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 12:00
Sample Time	(hh:mm) 12:00
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): R4

Sample Date (Con't): June 15, 2016

Sample Time (Con't): 12:00

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R6 40m u/s	**Project Number:**	16-240.2	**Date:**	June 18, 2016
UTM Coordinates	Z__ E____ N____	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AM
Waypoint	GPS____ Name____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ≈ 20°C
Photos	Cam EIR Nos.____				
Sample Time (24h)	11:00				
Field Blank Collected:	☐ Yes ☒ No Name____	**Duplicate Collected:**	☒ Yes ☐ No Name DUP-03		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	~0.20
Temperature (°C)	15.9
pH (pH Units)	7.90
Cond. (µs/cm)	156.1
Specific Cond. (µs/cm)	188.7
Redox (mV)	11.8
DO (mg/L)	8.58
DO (%)	86.8
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	Brown / tea-colored. slightly cloudy / silty

Site Sketch

Logged under US40M. with YSI.

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 11:02
Sample Time	(hh:mm) 11:00
Unit Used	☒ Pro Plus ☐ Pen Unit Other____

Sample Site (Con't): RL6

Sample Date (Con't): June 18

Sample Time (Con't): 11:00

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑	2	Date/Time: June 18, 11:00
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑	2	Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑	2	
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☐	2	
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑	2	
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑	2	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑	2	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☐	2	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑	2	✓
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	18	including DUP.

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R7	**Project Number:**	16-240.2	**Date:**	June 17
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AW
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ~20°C
Photos	Cam ELR Nos. 699-703				
Sample Time (24h)					
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Had to walk upstream
Sample Depth (m)	-0.20
Temperature (°C)	5.7
pH (pH Units)	7.62
Cond. (µs/cm)	113.7
Specific Cond. (µs/cm)	180.0
Redox (mV)	-5.6
DO (mg/L)	11.76
DO (%)	93.9
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	Silty, brown

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 12:49
Sample Time	(hh:mm) 12:45
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): R7

Sample Date (Con't): June 17th

Sample Time (Con't): 12:45

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time: 12:45
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☐		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☐		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☐ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R8	**Project Number:**	16-240.2	**Date:**	June 16
UTM Coordinates	Z ~~E~~ ~~N~~	**Client:**	Yukon Government (AAM)	**Samplers:**	CH AN
Waypoint	~~GPS~~ _____ Name _____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Cloudy 15°C
Photos	Cam ELR Nos. 669-671				
Sample Time (24h)	12:45				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good, fairly low flow.
Sample Depth (m)	~0.010 m
Temperature (°C)	6.4
pH (pH Units)	7.58
Cond. (µs/cm)	167.2
Specific Cond. (µs/cm)	259.2
Redox (mV)	61.6
DO (mg/L)	11.80
DO (%)	94.9
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 12:46
Sample Time	(hh:mm) 12:45
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Sample Site (Con't): R8

Sample Date (Con't): June 16, 2016

Sample Time (Con't): 12:45

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☐		Date/Time: June 17 10:35
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time: June 16. 12:45
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R9	**Project Number:**	16-240.2	**Date:**	June 1-7
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AM
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ~10°C
Photos	Cam ELR Nos. 692-695				
Sample Time (24h)	9:50 - 10:15				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	~0.10m
Temperature (°C)	5.6
pH (pH Units)	7.65
Cond. (µs/cm)	329.4
Specific Cond. (µs/cm)	523.4
Redox (mV)	1.9
DO (mg/L)	11.94
DO (%)	95.1
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 9:54
Sample Time	(hh:mm) 9:50
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): R9

Sample Date (Con't): June 17th

Sample Time (Con't): 9:50

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time: June 17th 10:15
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time: June 17th 9:50
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:		

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	R11	**Project Number:**	16-240.2	**Date:**	June 17
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH & AM
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ~20°C
Photos	Cam ELR Nos. 716-723				
Sample Time (24h)	17:50				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	~0.20
Temperature (°C)	6.7
pH (pH Units)	8.01
Cond. (µs/cm)	262.4
Specific Cond. (µs/cm)	403.3
Redox (mV)	58.2
DO (mg/L)	12.84
DO (%)	105.2
Turbidity (NTU)	-
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 17:51
Sample Time	(hh:mm) 17:50
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): R11

Sample Date (Con't): June 17

Sample Time (Con't): 17:58

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☐ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☐ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☐ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☐ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:		

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	SL	**Project Number:**	16-240.2	**Date:**	June 17/2016
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH & AN
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ~25°C
Photos	Cam ELR Nos. 704-711				
Sample Time (24h)	14:40				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	~~1.5~~ 0.40
Temperature (°C)	17.5
pH (pH Units)	8.25
Cond. (µs/cm)	1261
Specific Cond. (µs/cm)	1471
Redox (mV)	62.0
DO (mg/L)	8.24
DO (%)	86.1
Turbidity (NTU)	-
Appearance & Odour (Clear, Silty, HC odours, etc.)	slightly cloudy green

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 14:38
Sample Time	(hh:mm) 14:40
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): SL

Sample Date (Con't): June 17

Sample Time (Con't): 14:40

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time: June 17 14:40
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:		

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-1	**Project Number:**	16-240.2	**Date:**	June 15, 2016
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH & AW
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ~15°C
Photos	Cam ELR Nos. 635-640				
Sample Time (24h)	8:30				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	~0.10 m
Temperature (°C)	2.7
pH (pH Units)	7.32
Cond. (µs/cm)	~~2461~~ 1413
Specific Cond. (µs/cm)	2461
Redox (mV)	70.4
DO (mg/L)	4.78
DO (%)	35.4
Turbidity (NTU)	-
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 8:32
Sample Time	(hh:mm) 8:30
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): GWCC-1

Sample Date (Con't): June 15, 2016

Sample Time (Con't): 8:30

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

No weir possible. Boulder strewn stream bed. water flows under boulders.

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-2	**Project Number:**	16-240.2	**Date:**	June 15 2016
UTM Coordinates	Z ___ E ___ N ___	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AN.
Waypoint	GPS ___ Name ___	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny 15°C
Photos	Cam E/R Nos. 641-642				
Sample Time (24h)	9:00				
Field Blank Collected:	☐ Yes ☒ No Name ___	**Duplicate Collected:**	☐ Yes ☒ No Name ___		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	0.05m
Temperature (°C)	4.5
pH (pH Units)	7.57
Cond. (µs/cm)	1069
Specific Cond. (µs/cm)	1763
Redox (mV)	85.0
DO (mg/L)	8.37
DO (%)	64.8
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	clear

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 8:53
Sample Time	(hh:mm) 9:00
Unit Used	☒ Pro Plus ☐ Pen Unit Other ___

Sample Site (Con't): GWCC-2

Sample Date (Con't): June 15, 2016

Sample Time (Con't): 9:00

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☐ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-3	**Project Number:**	16-240.2	**Date:**	June 15, 2016
UTM Coordinates	~~Z__ E__ N__~~	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AW
Waypoint	~~GPS~~ _____ Name _____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny ~15°C
Photos	Cam E4R Nos. 643-644				
Sample Time (24h)	9:15				
Field Blank Collected:	☐ Yes ☒ No Name _____	**Duplicate Collected:**	☐ Yes ☒ No Name _____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	0.05m
Temperature (°C)	6.4
pH (pH Units)	7.46
Cond. (µs/cm)	642
Specific Cond. (µs/cm)	994
Redox (mV)	95.0
DO (mg/L)	4.73
DO (%)	38.5
Turbidity (NTU)	-
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear.

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 9:12
Sample Time	(hh:mm) 9:15
Unit Used	☒ Pro Plus ☐ Pen Unit Other _____

Site Sketch

Sample Site (Con't): GWCC-3

Sample Date (Con't): June 15, 2016

Sample Time (Con't): 9:15

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☑		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-4	**Project Number:**	16-240.2	**Date:**	June 15, 2016
UTM Coordinates	Z__ E_____ N_____	**Client:**	Yukon Government (AAM)	**Samplers:**	CH + AN.
Waypoint	GPS_____ Name_____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Sunny 15°C
Photos	Cam ELR Nos. 645-646				
Sample Time (24h)	9:40				
Field Blank Collected:	☐ Yes ☒ No Name_____	**Duplicate Collected:**	☐ Yes ☒ No Name_____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	GOOD
Sample Depth (m)	0.05 m
Temperature (°C)	6.4
pH (pH Units)	7.59
Cond. (µs/cm)	501
Specific Cond. (µs/cm)	777
Redox (mV)	100.4
DO (mg/L)	4.26
DO (%)	34.7
Turbidity (NTU)	–
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 9:36
Sample Time	(hh:mm) 9:40
Unit Used	☒ Pro Plus ☐ Pen Unit Other_____

Sample Site (Con't): GWCC-4

Sample Date (Con't): June 15, 2016

Sample Time (Con't): 9:40

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☑		Date/Time:
125 ml (plastic)	Total Metals	-	☑ Nitric Acid	☑		Date/Time:
125 ml (plastic)	Dissolved Metals	☑ Field Filtered	☑ Nitric Acid	☑		
40 ml (glass)	Total Mercury		☑ Hydrochloric Acid	☑		
40 ml (glass)	Dissolved Mercury	☑ Field Filtered	☑ Hydrochloric Acid	☑		
125 ml (amber)	Ammonia (NH3)		☑ Sulfuric Acid	☑		
125 ml (amber)	Dissolved Organic Carbon (DOC)	☑ Field Filtered	☑ Sulfuric Acid	☑		
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☑ NaOH	☑		
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☑ Field Filtered	☑ NaOH	☑		
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

SURFACE WATER SAMPLE COLLECTION SHEET

Sample Site:	GWCC-5	**Project Number:**	16-240.2	**Date:**	Jan. 13/2016
UTM Coordinates	Z__ E_____ N_____	**Client:**	Yukon Government (AAM)	**Samplers:**	AN, CH.
Waypoint	GPS_____ Name_____	**Project Name:**	Clinton Creek Surface Water Monitoring Program	**Weather/Temp:**	Overcast ~8°C.
Photos	Cam ECR Nos. 627-630				
Sample Time (24h)	16:10				
Field Blank Collected:	☐ Yes ☒ No Name_____	**Duplicate Collected:**	☐ Yes ☒ No Name_____		

Field Parameter Measurements (note units if different than those stated)	
Station Status	Good
Sample Depth (m)	0.1
Temperature (°C)	9.5
pH (pH Units)	7.56
Cond. (µs/cm)	620
Specific Cond. (µs/cm)	882
Redox (mV)	132.1
DO (mg/L)	4.35
DO (%)	38.0
Turbidity (NTU)	—
Appearance & Odour (Clear, Silty, HC odours, etc.)	Clear. Algae growth in pond u/s of site.

Site Sketch

Field Measurements Log	
YSI Logged?	☒ Yes ☐ No
Time Logged on YSI	(hh:mm) 16:11
Sample Time	(hh:mm) 16:10
Unit Used	☒ Pro Plus ☐ Pen Unit Other_____

Sample Site (Con't): GWCC-5

Sample Date (Con't): Jun. 13/2016

Sample Time (Con't): 16:10

Bottle Type	Parameters Analyzed	Sample Treatment ☒	Preservative Added ☒	Collected ☒	No. Bottles	Comments (note number of bottles in duplicate)
500 ml (plastic)	General Chemistry	-	-	☒	1	Date/Time: Jun. 13/2016.
125 ml (plastic)	Total Metals	-	☒ Nitric Acid	☒	1	Date/Time:
125 ml (plastic)	Dissolved Metals	☒ Field Filtered	☒ Nitric Acid	☒	1	
40 ml (glass)	Total Mercury		☒ Hydrochloric Acid	☒	1	
40 ml (glass)	Dissolved Mercury	☒ Field Filtered	☒ Hydrochloric Acid	☒	1	
125 ml (amber)	Ammonia (NH3)		☒ Sulfuric Acid	☒	1	
125 ml (amber)	Dissolved Organic Carbon (DOC)	☒ Field Filtered	☒ Sulfuric Acid	☒	1	
125 ml (plastic)	Total Speciated Chromium – Cr(VI) and CR(III)		☒ NaOH	☒	1	
125 ml (plastic)	Dissolved Speciated Chromium – Cr(VI) and CR(III)	☒ Field Filtered	☒ NaOH	☒	1	
500 ml (plastic)	Asbestos	-	-	☐		
				☐		
				Total:	9	

General Notes:

APPENDIX 3

Hudgeon Lake *In-Situ* Profile Data

Site	Depth (m)	Date/Time	Conductivity (uS/cm)	Specific Conductance (uS/cm)	Dissolved Oxygen (mg/L)	ORP_1 (mV)	pH_1 (Units)	Temperature (C)
HL1	0	16/06/2016 16:32	398.8	470.8	9.09	94.1	7.92	17.0
HL1	1	16/06/2016 16:33	382.8	477.4	9.35	94.1	7.91	14.6
HL1	2	16/06/2016 16:34	371.8	486.5	10.11	95.4	7.85	12.7
HL1	3	16/06/2016 16:35	371.3	537	10.04	99.3	7.69	8.9
HL1	4	16/06/2016 16:37	418.2	697	5.34	105.2	7.40	4.0
HL1	5	16/06/2016 16:38	438.6	761	3.19	106.8	7.30	2.8
HL1	6	16/06/2016 16:39	443.9	774	2.38	108.6	7.24	2.7
HL1	7	16/06/2016 16:41	450.1	792	1.47	108.2	7.21	2.4
HL1	8	16/06/2016 16:42	454.6	804	0.96	108.0	7.19	2.3
HL1	9	16/06/2016 16:48	490.1	871	0.23	-6.5	7.17	2.1
HL1	10	16/06/2016 16:50	565	1011	0.21	-77.6	7.17	1.9
HL1	11	16/06/2016 16:52	548	982	0.2	-85.7	7.19	1.9
HL1	12	16/06/2016 16:55	537	963	0.24	-114.0	7.25	1.9
HL1	13	16/06/2016 16:56	537	963	0.24	-118.6	7.25	1.9
HL1	14	16/06/2016 17:00	538	964	0.14	-131.4	7.25	1.9
HL1	15	16/06/2016 17:02	539	964	0.1	-135.0	7.25	1.9
HL1	16	16/06/2016 17:03	539	965	0.11	-136.9	7.24	1.9
HL2	1	16/06/2016 17:39	403	467.2	9.66	22.3	7.98	17.8
HL2	2	16/06/2016 17:42	397.8	470.9	9.53	27.6	7.94	16.9
HL2	3	16/06/2016 17:46	366.6	499.7	9.52	40.7	7.73	11.0
HL2	4	16/06/2016 17:50	359.1	560	7.85	56.4	7.43	6.2
HL2	5	16/06/2016 17:55	435.9	746	3.64	62.1	7.27	3.2
HL2	6	16/06/2016 17:57	441.2	774	2.43	63.3	7.25	2.5
HL2	7	16/06/2016 17:58	447	790	1.35	63.7	7.25	2.3
HL2	8	16/06/2016 18:00	452.1	801	0.85	63.3	7.21	2.2
HL2	9	16/06/2016 18:03	474.7	842	0.18	59.5	7.21	2.2
HL2	10	16/06/2016 18:06	521	925	0.13	-58.7	7.19	2.1
HL2	11	16/06/2016 18:09	584	1042	0.11	-76.8	7.19	2.0
HL2	12	16/06/2016 18:11	604	1084	0.1	-80.4	7.19	1.8
HL2	13	16/06/2016 18:13	614	1103	0.1	-83.7	7.18	1.8
HL2	14	16/06/2016 18:15	622	1121	0.06	-87.9	7.21	1.7
HL2	15	16/06/2016 18:18	631	1138	0.07	-89.3	7.25	1.6
HL2	16	16/06/2016 18:20	648	1177	0.06	-92.1	7.21	1.5
HL2	17	16/06/2016 18:21	683	1249	0.06	-96.9	7.22	1.3
HL2	18	16/06/2016 18:24	732	1346	0.07	-100.6	7.21	1.1
HL2	19	16/06/2016 18:25	750	1383	0.05	-102.1	7.20	1.0
HL2	20	16/06/2016 18:29	752	1387	0.06	-104.5	7.20	1.0
HL2	21	16/06/2016 18:30	751	1386	0.04	-105.8	7.20	1.0
HL3	1	17/06/2016 8:39	393.5	466	8.67	52.7	7.97	16.9
HL3	2	17/06/2016 8:42	392	466.3	9.29	57.0	7.97	16.7
HL3	3	17/06/2016 8:45	359.6	494.9	9.01	67.3	7.69	10.7
HL3	4	17/06/2016 8:49	347.7	519	8.27	75.4	7.48	7.7
HL3	5	17/06/2016 8:55	409.1	678	5.44	83.7	7.31	4.2
HL3	6	17/06/2016 8:58	436.6	763	2.44	84.4	7.24	2.6
HL3	7	17/06/2016 9:03	445.8	789	1.31	82.8	7.19	2.2
HL3	8	17/06/2016 9:05	451.8	800	0.72	83.0	7.19	2.2
HL3	9	17/06/2016 9:07	474.3	839	0.2	82.6	7.16	2.2

Site	Depth (m)	Date/Time	Conductivity (uS/cm)	Specific Conductance (uS/cm)	Dissolved Oxygen (mg/L)	ORP_1 (mV)	pH_1 (Units)	Temperature (C)
HL3	10	17/06/2016 9:12	546	964	0.12	-73.6	7.18	2.3
HL3	11	17/06/2016 9:13	582	1030	0.11	-81.3	7.18	2.2
HL3	12	17/06/2016 9:15	608	1085	0.1	-86.5	7.16	2.0
HL3	13	17/06/2016 9:16	615	1103	0.11	-87.9	7.15	1.9
HL3	14	17/06/2016 9:17	621	1116	0.11	-87.9	7.16	1.8
HL3	15	17/06/2016 9:18	627	1129	0.09	-88.7	7.15	1.7
HL3	16	17/06/2016 9:19	636	1150	0.09	-89.3	7.14	1.6
HL3	17	17/06/2016 9:20	668	1218	0.1	-93.9	7.14	1.4
HL3	18	17/06/2016 9:21	687	1255	0.1	-95.8	7.14	1.3
HL3	19	17/06/2016 9:22	734	1350	0.1	-98.0	7.13	1.1
HL3	20	17/06/2016 9:23	755	1390	0.08	-100.2	7.13	1.1
HL3	21	17/06/2016 9:26	842	1558	0.07	-104.4	7.12	0.9
HL3	22	17/06/2016 9:27	912	1696	0.07	-105.2	7.09	0.8
HL3	23	17/06/2016 9:28	1045	1957	0.08	-106.1	7.07	0.6
HL3	24	17/06/2016 9:29	1137	2143	0.07	-106.0	7.06	0.4
HL3	25	17/06/2016 9:30	1199	2271	0.08	-107.0	7.05	0.3
HL3	26	17/06/2016 9:31	1260	2396	0.06	-109.5	7.04	0.2

APPENDIX 4

Tabulated Stream Gauging Data

Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E1(H)
Date and Time:	Jun.13/2016, 13:45
Staff:	AN,CH
UTM Coordinates:	512800. 7147438
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	14.9/~8
Crossing Number	1

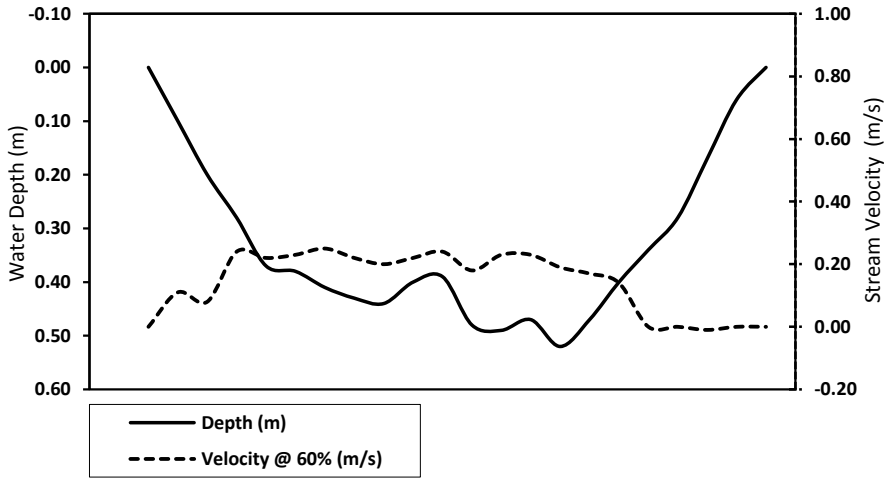
Left Bank	2
Right Bank	12.44
Wet.Width	10.44

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	2.00	0.250	0.00	0.00	0.000	0.0000
1	2.50	0.500	0.10	0.11	0.050	0.0055
2	3.00	0.650	0.20	0.08	0.130	0.0104
3	3.80	0.500	0.28	0.24	0.140	0.0336
4	4.00	0.350	0.37	0.22	0.130	0.0285
5	4.50	0.500	0.38	0.23	0.190	0.0437
6	5.00	0.500	0.41	0.25	0.205	0.0513
7	5.50	0.500	0.43	0.22	0.215	0.0473
8	6.00	0.500	0.44	0.20	0.220	0.0440
9	6.50	0.500	0.40	0.22	0.200	0.0440
10	7.00	0.500	0.39	0.24	0.195	0.0468
11	7.50	0.500	0.48	0.18	0.240	0.0432
12	8.00	0.500	0.49	0.23	0.245	0.0564
13	8.50	0.500	0.47	0.23	0.235	0.0541
14	9.00	0.500	0.52	0.19	0.260	0.0494
15	9.50	0.500	0.47	0.17	0.235	0.0400
16	10.00	0.500	0.40	0.14	0.200	0.0280
17	10.50	0.500	0.34	0.00	0.170	0.0000
18	11.00	0.500	0.28	0.00	0.140	0.0000
19	11.50	0.500	0.17	-0.01	0.085	-0.0009
20	12.00	0.470	0.06	0.00	0.028	0.0000
21	12.44	0.220	0.00	0.00	0.000	0.0000
end	12.44					

Mean Depth (m)	0.32
Mean Velocity (m/s)	0.14

Discharge (m^3/s)	0.6251

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E1(H)
Date and Time:	Jun.13/2016, 13:45
Staff:	AN,CH
UTM Coordinates:	512800. 7147438
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	14.9/~8
Crossing Number	2

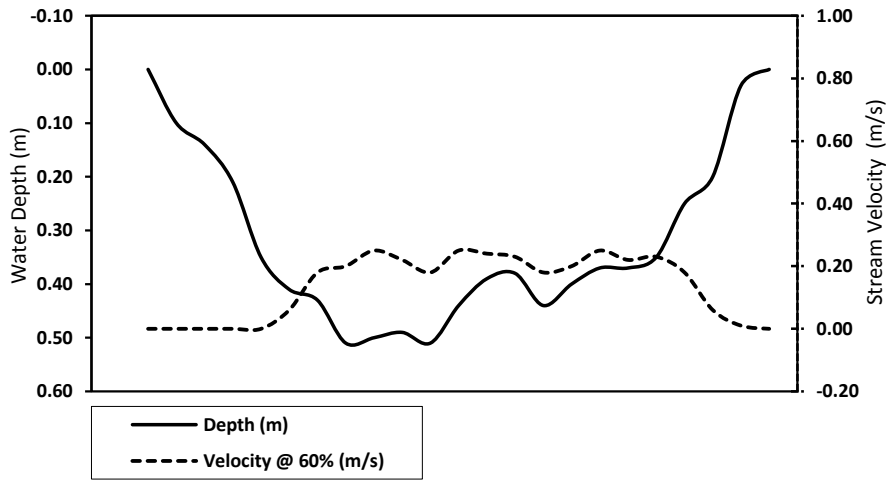
Left Bank	2
Right Bank	12.44
Wet.Width	10.44

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	12.44	0.095	0.00	0.00	0.000	0.0000
1	12.25	0.345	0.10	0.00	0.035	0.0000
2	11.75	0.500	0.14	0.00	0.070	0.0000
3	11.25	0.500	0.21	0.00	0.105	0.0000
4	10.75	0.500	0.35	0.00	0.175	0.0000
5	10.25	0.500	0.41	0.06	0.205	0.0123
6	9.75	0.500	0.43	0.18	0.215	0.0387
7	9.25	0.500	0.51	0.20	0.255	0.0510
8	8.75	0.500	0.50	0.25	0.250	0.0625
9	8.25	0.500	0.49	0.22	0.245	0.0539
10	7.75	0.500	0.51	0.18	0.255	0.0459
11	7.25	0.500	0.44	0.25	0.220	0.0550
12	6.75	0.500	0.39	0.24	0.195	0.0468
13	6.25	0.500	0.38	0.23	0.190	0.0437
14	5.75	0.500	0.44	0.18	0.220	0.0396
15	5.25	0.500	0.40	0.20	0.200	0.0400
16	4.75	0.500	0.37	0.25	0.185	0.0463
17	4.25	0.500	0.37	0.22	0.185	0.0407
18	3.75	0.500	0.35	0.23	0.175	0.0403
19	3.25	0.500	0.25	0.18	0.125	0.0225
20	2.75	0.500	0.20	0.06	0.100	0.0060
21	2.25	0.375	0.03	0.01	0.011	0.0001
22	2.00	0.125	0.00	0.00	0.000	0.0000
end	2.00					

Mean Depth (m)	0.32
Mean Velocity (m/s)	0.14

Discharge (m^3/s)	0.6452

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E2
Date and Time:	Jun.15/2016, 11:20
Staff:	AN,CH
UTM Coordinates:	514149. 7147189
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	13.6/~15
Crossing Number	1

Ecological Logistics & Research Ltd.

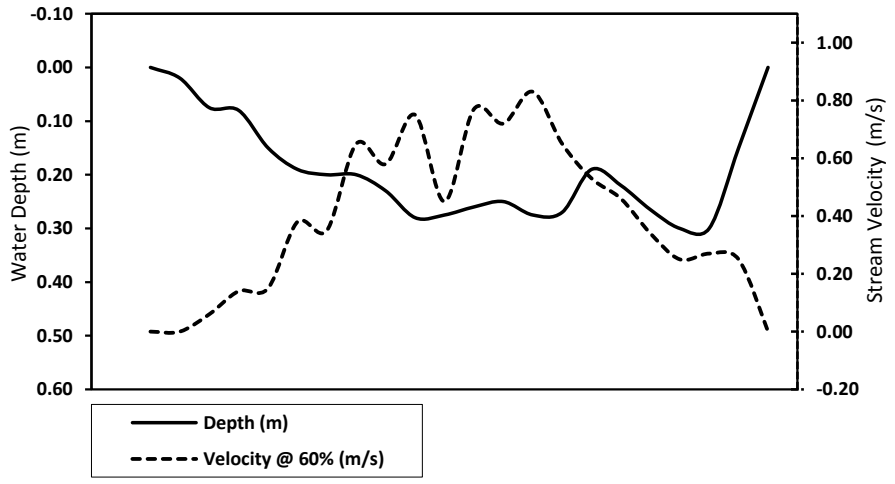
Left Bank	1.4
Right Bank	7.75
Wet.Width	6.35

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.40	0.150	0.00	0.00	0.000	0.0000
1	1.70	0.300	0.02	0.00	0.006	0.0000
2	2.00	0.300	0.08	0.06	0.023	0.0014
3	2.30	0.300	0.08	0.14	0.024	0.0034
4	2.60	0.300	0.15	0.15	0.045	0.0068
5	2.90	0.300	0.19	0.38	0.057	0.0217
6	3.20	0.300	0.20	0.35	0.060	0.0210
7	3.50	0.300	0.20	0.65	0.060	0.0390
8	3.80	0.300	0.23	0.58	0.069	0.0400
9	4.10	0.300	0.28	0.75	0.084	0.0630
10	4.40	0.300	0.28	0.45	0.083	0.0371
11	4.70	0.300	0.26	0.77	0.078	0.0601
12	5.00	0.300	0.25	0.72	0.075	0.0540
13	5.30	0.300	0.28	0.83	0.083	0.0685
14	5.60	0.300	0.27	0.65	0.081	0.0527
15	5.90	0.300	0.19	0.53	0.057	0.0302
16	6.20	0.300	0.22	0.46	0.066	0.0304
17	6.50	0.300	0.27	0.34	0.080	0.0270
18	6.80	0.300	0.30	0.25	0.090	0.0225
19	7.10	0.300	0.30	0.27	0.090	0.0243
20	7.40	0.325	0.15	0.25	0.049	0.0122
21	7.75	0.175	0.00	0.00	0.000	0.0000
end	7.75					

Mean Depth (m)	0.19
Mean Velocity (m/s)	0.39

Discharge (m^3/s)	0.6150

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E2
Date and Time:	Jun.15/2016, 11:20
Staff:	AN,CH
UTM Coordinates:	514149. 7147189
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	13.6/~15
Crossing Number	2

Ecological Logistics & Research Ltd.

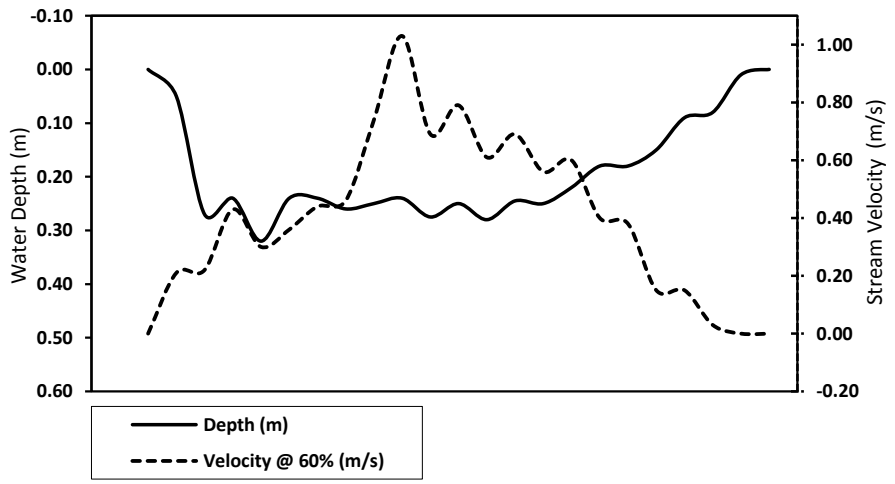
Left Bank	1.4
Right Bank	7.75
Wet.Width	6.35

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	7.75	0.075	0.00	0.00	0.000	0.0000
1	7.60	0.225	0.05	0.21	0.011	0.0024
2	7.30	0.300	0.27	0.22	0.081	0.0178
3	7.00	0.300	0.24	0.43	0.072	0.0310
4	6.70	0.300	0.32	0.30	0.096	0.0288
5	6.40	0.300	0.24	0.36	0.072	0.0259
6	6.10	0.300	0.24	0.44	0.072	0.0317
7	5.80	0.300	0.26	0.46	0.078	0.0359
8	5.50	0.300	0.25	0.74	0.075	0.0555
9	5.20	0.300	0.24	1.03	0.072	0.0742
10	4.90	0.300	0.28	0.69	0.083	0.0569
11	4.60	0.300	0.25	0.79	0.075	0.0593
12	4.30	0.300	0.28	0.61	0.084	0.0512
13	4.00	0.300	0.25	0.69	0.074	0.0507
14	3.70	0.300	0.25	0.56	0.075	0.0420
15	3.40	0.300	0.22	0.60	0.066	0.0396
16	3.10	0.300	0.18	0.40	0.054	0.0216
17	2.80	0.300	0.18	0.38	0.054	0.0205
18	2.50	0.300	0.15	0.15	0.045	0.0068
19	2.20	0.300	0.09	0.15	0.027	0.0041
20	1.90	0.300	0.08	0.03	0.024	0.0007
21	1.60	0.250	0.01	0.00	0.003	0.0000
22	1.40	0.100	0.00	0.00	0.000	0.0000
end	1.40					

Mean Depth (m)	0.19
Mean Velocity (m/s)	0.40

Discharge (m^3/s)	0.6565

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

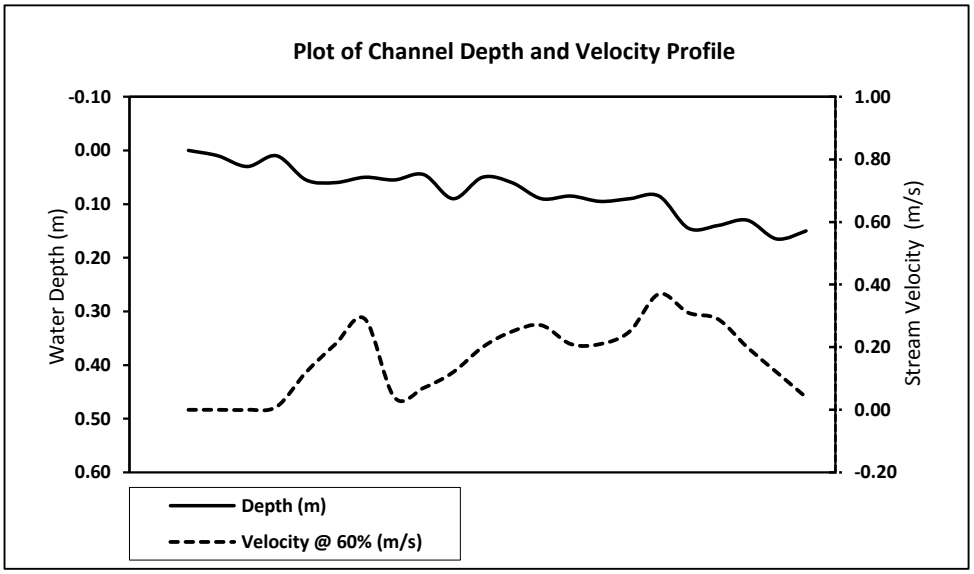
ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Wolverine Creek
Station Name:	E3(H)
Date and Time:	Jun.18/2016, 9:00
Staff:	AN,CH
UTM Coordinates:	514170. 7147608
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	not measured/~10
Crossing Number	1

Left Bank	3.94
Right Bank	0.58
Wet.Width	3.36

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	3.94	0.075	0.00	0.00	0.000	0.0000
1	3.80	0.145	0.01	0.00	0.001	0.0000
2	3.65	0.150	0.03	0.00	0.005	0.0000
3	3.50	0.150	0.01	0.01	0.002	0.0000
4	3.35	0.150	0.06	0.12	0.008	0.0010
5	3.20	0.150	0.06	0.21	0.009	0.0019
6	3.05	0.150	0.05	0.29	0.008	0.0022
7	2.90	0.150	0.06	0.04	0.008	0.0003
8	2.75	0.150	0.05	0.07	0.007	0.0005
9	2.60	0.150	0.09	0.12	0.014	0.0016
10	2.45	0.150	0.05	0.20	0.008	0.0015
11	2.30	0.150	0.06	0.25	0.009	0.0023
12	2.15	0.150	0.09	0.27	0.014	0.0036
13	2.00	0.150	0.09	0.21	0.013	0.0027
14	1.85	0.150	0.10	0.21	0.014	0.0030
15	1.70	0.150	0.09	0.25	0.014	0.0034
16	1.55	0.150	0.09	0.37	0.013	0.0047
17	1.40	0.150	0.15	0.31	0.022	0.0067
18	1.25	0.150	0.14	0.29	0.021	0.0061
19	1.10	0.150	0.13	0.20	0.020	0.0039
20	0.95	0.260	0.17	0.12	0.043	0.0051
21	0.58	0.185	0.15	0.04	0.028	0.0011
end	0.58					

Mean Depth (m)	0.08
Mean Velocity (m/s)	0.16

Discharge (m^3/s)	0.0516



Stream Flow & Discharge Calculation

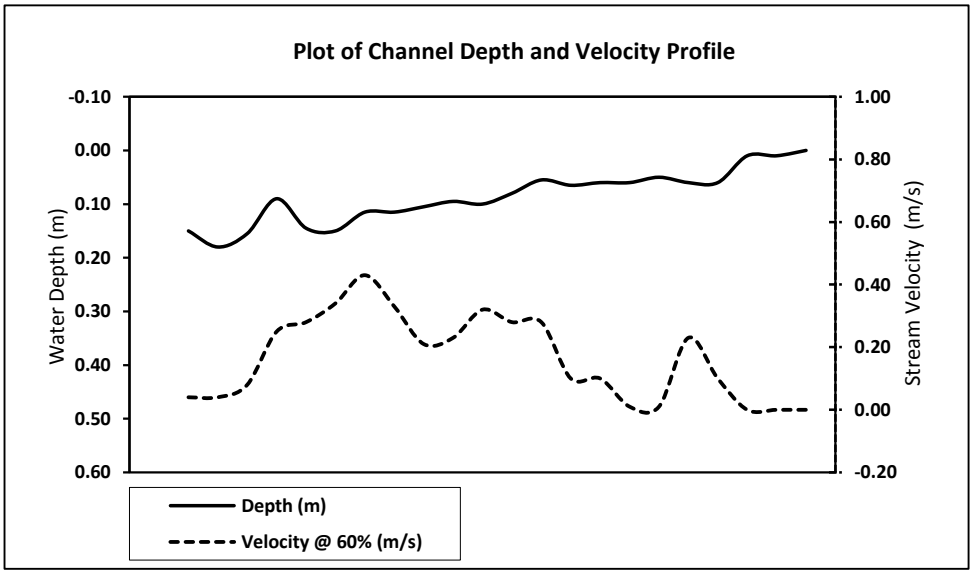
ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Wolverine Creek
Station Name:	E3(H)
Date and Time:	Jun.18/2016, 9:00
Staff:	AN,CH
UTM Coordinates:	514170. 7147608
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	not measured/~10
Crossing Number	2

Left Bank	3.94
Right Bank	0.58
Wet.Width	3.36

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.58	0.085	0.15	0.04	0.013	0.0005
1	0.75	0.160	0.18	0.04	0.029	0.0012
2	0.90	0.150	0.16	0.08	0.023	0.0019
3	1.05	0.150	0.09	0.25	0.014	0.0034
4	1.20	0.150	0.15	0.28	0.022	0.0061
5	1.35	0.150	0.15	0.34	0.023	0.0077
6	1.50	0.150	0.12	0.43	0.017	0.0074
7	1.65	0.150	0.12	0.33	0.017	0.0057
8	1.80	0.150	0.11	0.21	0.016	0.0033
9	1.95	0.150	0.10	0.23	0.014	0.0033
10	2.10	0.150	0.10	0.32	0.015	0.0048
11	2.25	0.150	0.08	0.28	0.012	0.0034
12	2.40	0.150	0.06	0.28	0.008	0.0023
13	2.55	0.150	0.07	0.10	0.010	0.0010
14	2.70	0.150	0.06	0.10	0.009	0.0009
15	2.85	0.150	0.06	0.01	0.009	0.0001
16	3.00	0.150	0.05	0.01	0.008	0.0001
17	3.15	0.150	0.06	0.23	0.009	0.0021
18	3.30	0.150	0.06	0.10	0.009	0.0009
19	3.45	0.150	0.01	0.00	0.002	0.0000
20	3.60	0.245	0.01	0.00	0.002	0.0000
21	3.94	0.170	0.00	0.00	0.000	0.0000
end	3.94					

Mean Depth (m)	0.09
Mean Velocity (m/s)	0.17

Discharge (m^3/s)	0.0558



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E4
Date and Time:	Jun.15/2016, 13:30
Staff:	AN,CH
UTM Coordinates:	515950. 7145287
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	13.4/~12
Crossing Number	1

Ecological Logistics & Research Ltd.

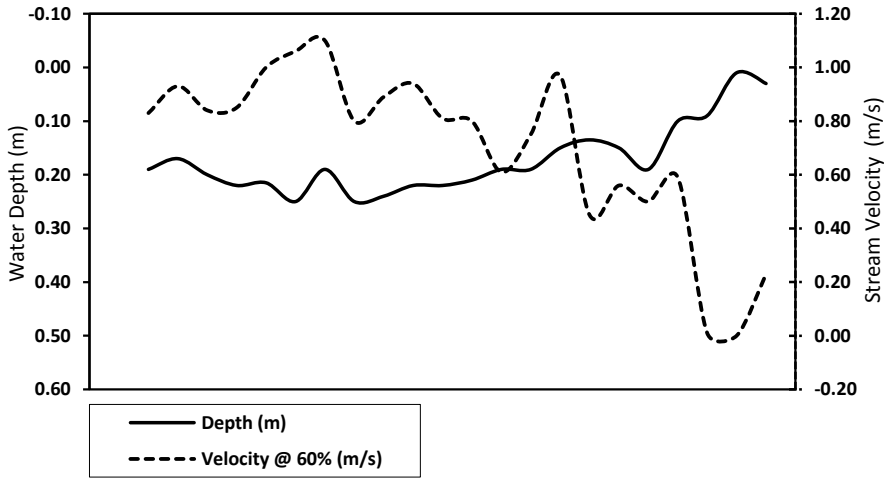
Left Bank	0.2
Right Bank	6.5
Wet.Width	6.3

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.20	0.150	0.19	0.83	0.029	0.0237
1	0.50	0.300	0.17	0.93	0.051	0.0474
2	0.80	0.300	0.20	0.84	0.060	0.0504
3	1.10	0.300	0.22	0.85	0.066	0.0561
4	1.40	0.300	0.22	1.00	0.065	0.0645
5	1.70	0.300	0.25	1.06	0.075	0.0795
6	2.00	0.300	0.19	1.10	0.057	0.0627
7	2.30	0.300	0.25	0.80	0.075	0.0600
8	2.60	0.300	0.24	0.89	0.072	0.0641
9	2.90	0.300	0.22	0.94	0.066	0.0620
10	3.20	0.300	0.22	0.81	0.066	0.0535
11	3.50	0.300	0.21	0.80	0.063	0.0504
12	3.80	0.300	0.19	0.61	0.057	0.0348
13	4.10	0.300	0.19	0.75	0.057	0.0428
14	4.40	0.300	0.15	0.97	0.045	0.0437
15	4.70	0.300	0.14	0.45	0.041	0.0182
16	5.00	0.300	0.15	0.56	0.045	0.0252
17	5.30	0.300	0.19	0.50	0.057	0.0285
18	5.60	0.300	0.10	0.59	0.030	0.0177
19	5.90	0.250	0.09	0.01	0.023	0.0002
20	6.10	0.300	0.01	0.00	0.003	0.0000
21	6.50	0.200	0.03	0.23	0.006	0.0014
end	6.50					

Mean Depth (m)	0.17
Mean Velocity (m/s)	0.71

Discharge (m^3/s)	0.8867

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

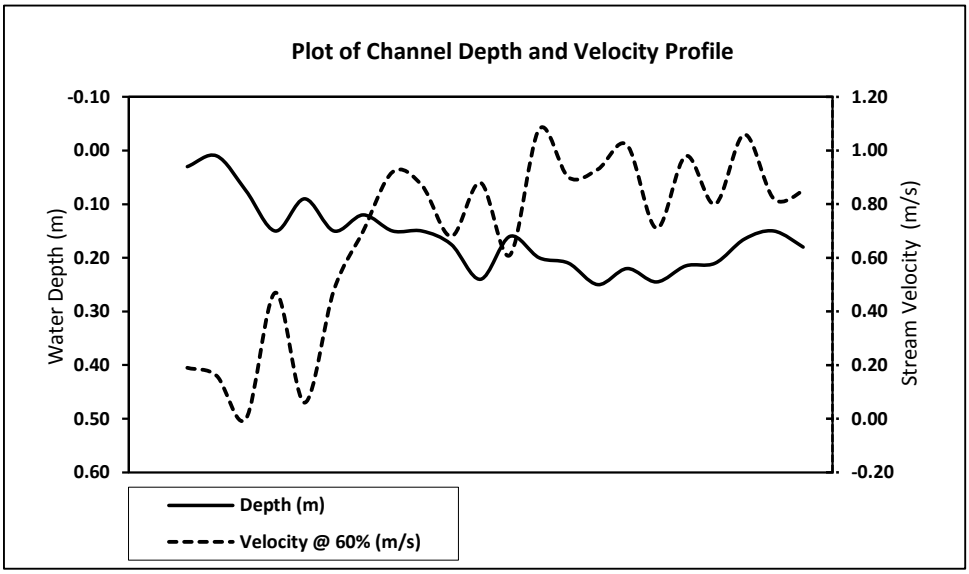
ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E4
Date and Time:	Jun.15/2016, 13:30
Staff:	AN,CH
UTM Coordinates:	515950. 7145287
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	13.4/~12
Crossing Number	2

Left Bank	0.4
Right Bank	6.5
Wet.Width	6.1

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	6.50	0.100	0.03	0.19	0.003	0.0006
1	6.30	0.250	0.01	0.16	0.003	0.0004
2	6.00	0.300	0.08	0.00	0.023	0.0000
3	5.70	0.300	0.15	0.47	0.045	0.0212
4	5.40	0.300	0.09	0.06	0.027	0.0016
5	5.10	0.300	0.15	0.48	0.045	0.0216
6	4.80	0.300	0.12	0.70	0.036	0.0252
7	4.50	0.300	0.15	0.92	0.045	0.0414
8	4.20	0.300	0.15	0.87	0.045	0.0392
9	3.90	0.300	0.18	0.68	0.053	0.0357
10	3.60	0.300	0.24	0.88	0.072	0.0634
11	3.30	0.300	0.16	0.61	0.048	0.0293
12	3.00	0.300	0.20	1.08	0.060	0.0648
13	2.70	0.300	0.21	0.90	0.063	0.0567
14	2.40	0.300	0.25	0.93	0.075	0.0698
15	2.10	0.300	0.22	1.02	0.066	0.0673
16	1.80	0.300	0.25	0.71	0.074	0.0522
17	1.50	0.300	0.22	0.98	0.065	0.0632
18	1.20	0.300	0.21	0.80	0.063	0.0504
19	0.90	0.300	0.17	1.06	0.050	0.0525
20	0.60	0.250	0.15	0.82	0.038	0.0308
21	0.40	0.100	0.18	0.85	0.018	0.0153
end	0.40					

Mean Depth (m)	0.16
Mean Velocity (m/s)	0.69

Discharge (m^3/s)	0.8023



Stream Flow & Discharge Calculation

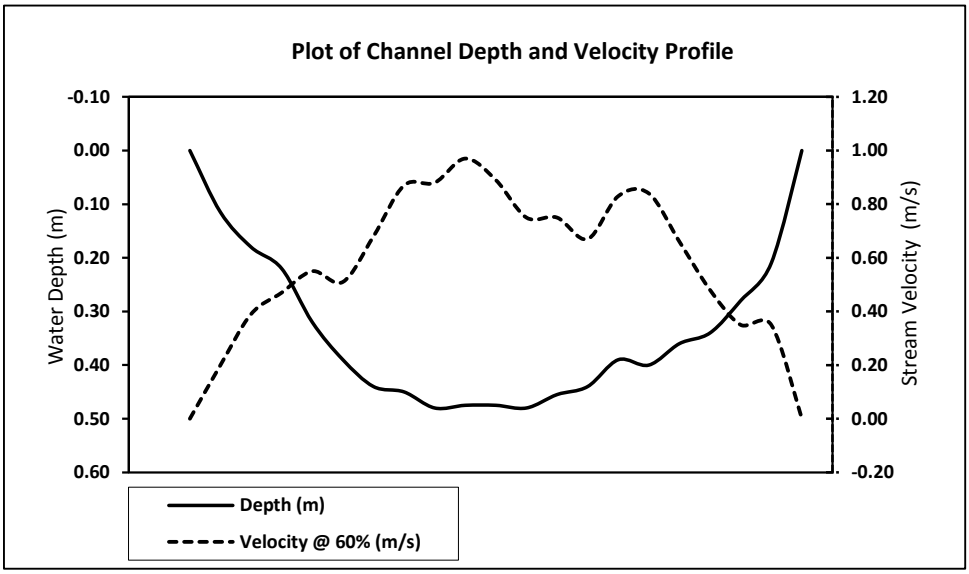
ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E7
Date and Time:	Jun.15/2016, 15:15
Staff:	AN,CH
UTM Coordinates:	519400. 7142042
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	11.8/~15
Crossing Number	1

Left Bank	0.5
Right Bank	4.6
Wet.Width	4.1

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	4.60	0.100	0.00	0.00	0.000	0.0000
1	4.40	0.200	0.12	0.20	0.023	0.0046
2	4.20	0.200	0.18	0.39	0.036	0.0140
3	4.00	0.200	0.22	0.47	0.044	0.0207
4	3.80	0.200	0.32	0.55	0.064	0.0352
5	3.60	0.200	0.39	0.51	0.078	0.0398
6	3.40	0.200	0.44	0.68	0.088	0.0598
7	3.20	0.200	0.45	0.87	0.090	0.0783
8	3.00	0.200	0.48	0.88	0.096	0.0845
9	2.80	0.200	0.48	0.97	0.095	0.0922
10	2.60	0.200	0.48	0.89	0.095	0.0846
11	2.40	0.200	0.48	0.75	0.096	0.0720
12	2.20	0.200	0.46	0.75	0.091	0.0683
13	2.00	0.200	0.44	0.67	0.088	0.0590
14	1.80	0.200	0.39	0.83	0.078	0.0647
15	1.60	0.200	0.40	0.84	0.080	0.0672
16	1.40	0.200	0.36	0.66	0.072	0.0475
17	1.20	0.200	0.34	0.48	0.068	0.0326
18	1.00	0.200	0.28	0.35	0.056	0.0196
19	0.80	0.250	0.21	0.35	0.053	0.0184
20	0.50	0.150	0.00	0.00	0.000	0.0000
end	0.50					

Mean Depth (m)	0.33
Mean Velocity (m/s)	0.58

Discharge (m^3/s)	0.9629



Stream Flow & Discharge Calculation

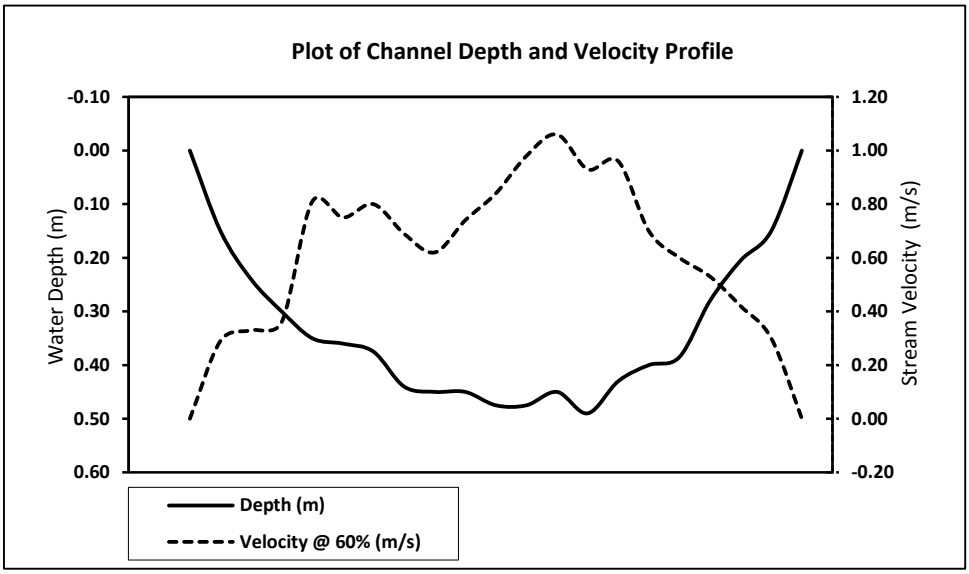
ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Clinton Creek
Station Name:	E7
Date and Time:	Jun.15/2016, 15:15
Staff:	AN,CH
UTM Coordinates:	519400. 7142042
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	11.8/~15
Crossing Number	2

Left Bank	0.5
Right Bank	4.6
Wet.Width	4.1

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.50	0.100	0.00	0.00	0.000	0.0000
1	0.70	0.200	0.15	0.29	0.030	0.0087
2	0.90	0.200	0.24	0.33	0.048	0.0158
3	1.10	0.200	0.30	0.36	0.060	0.0216
4	1.30	0.200	0.35	0.81	0.070	0.0567
5	1.50	0.200	0.36	0.75	0.072	0.0540
6	1.70	0.200	0.38	0.80	0.075	0.0600
7	1.90	0.200	0.44	0.69	0.088	0.0607
8	2.10	0.200	0.45	0.62	0.090	0.0558
9	2.30	0.200	0.45	0.74	0.090	0.0666
10	2.50	0.200	0.48	0.84	0.095	0.0798
11	2.70	0.200	0.48	0.98	0.095	0.0931
12	2.90	0.200	0.45	1.06	0.090	0.0954
13	3.10	0.200	0.49	0.93	0.098	0.0911
14	3.30	0.200	0.43	0.96	0.086	0.0826
15	3.50	0.200	0.40	0.70	0.080	0.0560
16	3.70	0.200	0.39	0.60	0.077	0.0462
17	3.90	0.200	0.28	0.53	0.056	0.0297
18	4.10	0.200	0.21	0.42	0.041	0.0172
19	4.30	0.250	0.15	0.30	0.038	0.0113
20	4.60	0.150	0.00	0.00	0.000	0.0000
end	4.60					

Mean Depth (m)	0.33
Mean Velocity (m/s)	0.61

Discharge (m^3/s)	1.0023



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Groundwater Seep
Station Name:	GWCC-5
Date and Time:	Jun.13/2016, 16:35
Staff:	AN,CH
UTM Coordinates:	513984. 7147127
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	9.5/~8
Crossing Number	1

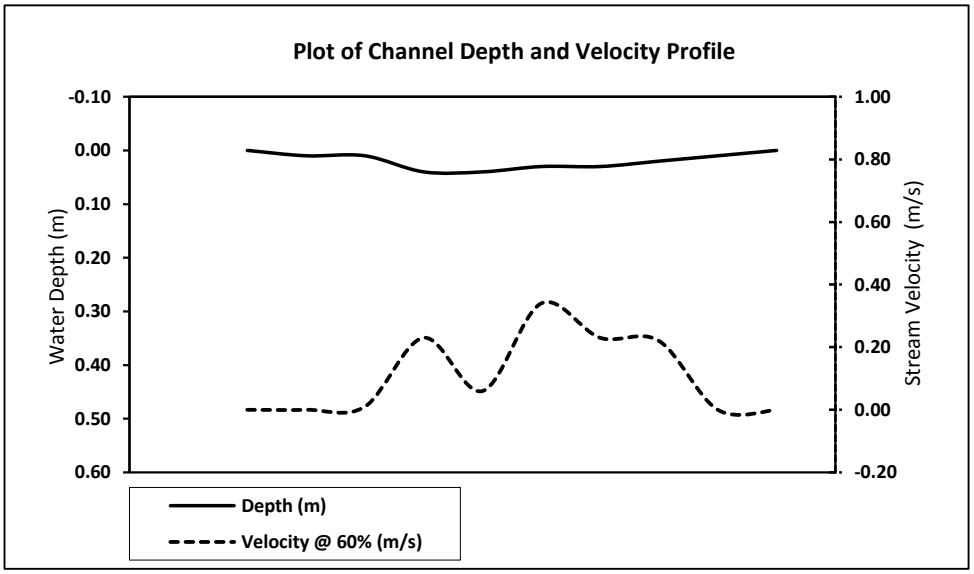
Ecological Logistics & Research Ltd.

Left Bank	1.3
Right Bank	2.2
Wet.Width	0.9

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.30	0.050	0.00	0.00	0.000	0.0000
1	1.40	0.100	0.01	0.00	0.001	0.0000
2	1.50	0.100	0.01	0.01	0.001	0.0000
3	1.60	0.100	0.04	0.23	0.004	0.0009
4	1.70	0.100	0.04	0.06	0.004	0.0002
5	1.80	0.100	0.03	0.34	0.003	0.0010
6	1.90	0.100	0.03	0.23	0.003	0.0007
7	2.00	0.100	0.02	0.22	0.002	0.0004
8	2.10	0.100	0.01	0.00	0.001	0.0000
9	2.20	0.050	0.00	0.00	0.000	0.0000
end	2.20					

Mean Depth (m)	0.02
Mean Velocity (m/s)	0.11

Discharge (m^3/s)	0.0033



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Groundwater Seep
Station Name:	GWCC-5
Date and Time:	Jun.13/2016, 16:35
Staff:	AN,CH
UTM Coordinates:	513984. 7147127
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	9.5/~8
Crossing Number	2

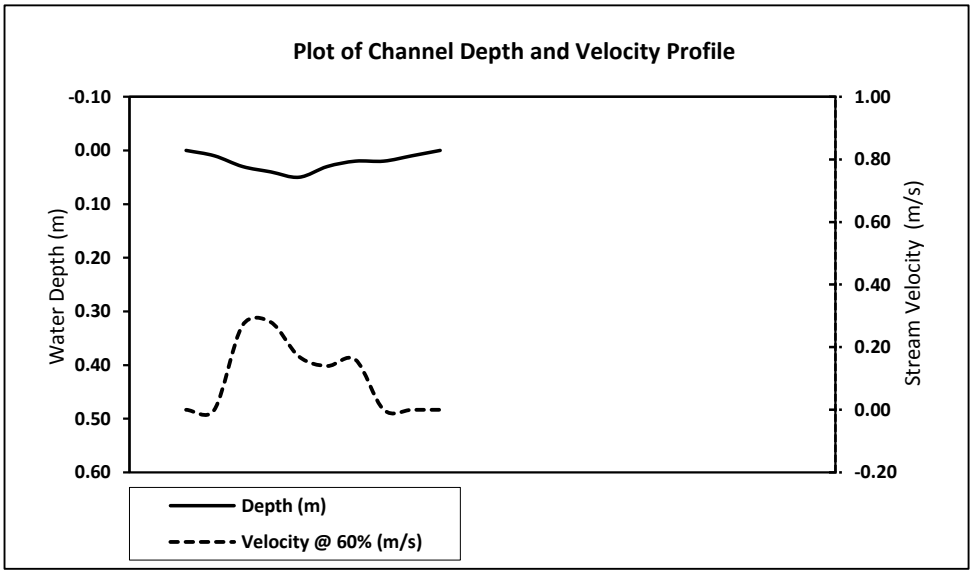
Ecological Logistics & Research Ltd.

Left Bank	1.3
Right Bank	2.2
Wet.Width	0.9

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	2.20	0.050	0.00	0.00	0.000	0.0000
1	2.10	0.100	0.01	0.00	0.001	0.0000
2	2.00	0.100	0.03	0.27	0.003	0.0008
3	1.90	0.100	0.04	0.28	0.004	0.0011
4	1.80	0.100	0.05	0.17	0.005	0.0009
5	1.70	0.100	0.03	0.14	0.003	0.0004
6	1.60	0.100	0.02	0.16	0.002	0.0003
7	1.50	0.100	0.02	0.00	0.002	0.0000
8	1.40	0.100	0.01	0.00	0.001	0.0000
9	1.30	0.050	0.00	0.00	0.000	0.0000
end	1.30					
end						

Mean Depth (m)	0.02
Mean Velocity (m/s)	0.10

Discharge (m^3/s)	0.0035



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Upper Clinton Creek
Station Name:	R1
Date and Time:	Jun.16/2016, 15:15
Staff:	AN,CH
UTM Coordinates:	510718. 7147525
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	9.3/~15
Crossing Number	1

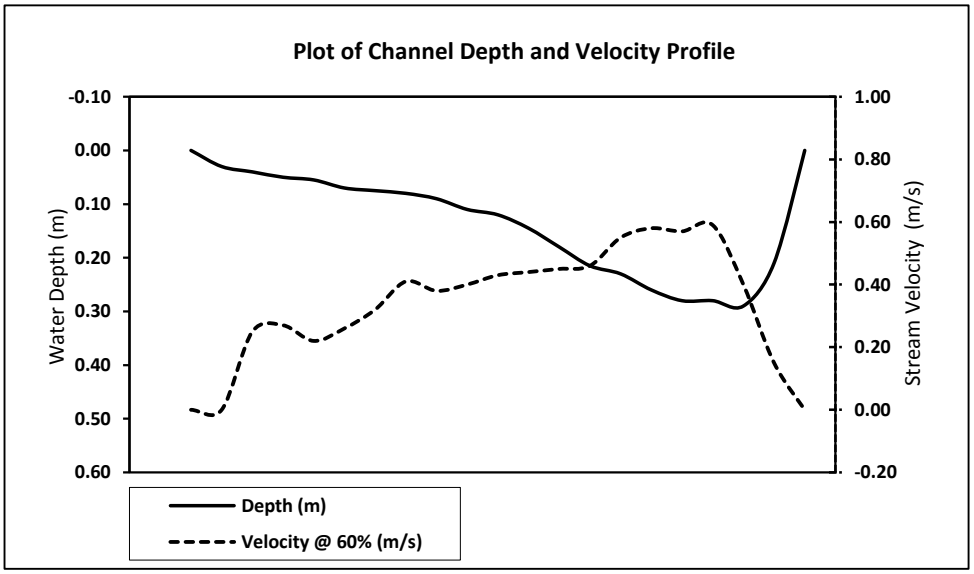
Ecological Logistics & Research Ltd.

Left Bank	0.2
Right Bank	6.3
Wet.Width	6.1

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	6.30	0.150	0.00	0.00	0.000	0.0000
1	6.00	0.300	0.03	0.00	0.009	0.0000
2	5.70	0.300	0.04	0.25	0.012	0.0030
3	5.40	0.300	0.05	0.27	0.015	0.0041
4	5.10	0.300	0.06	0.22	0.017	0.0036
5	4.80	0.300	0.07	0.26	0.021	0.0055
6	4.50	0.300	0.08	0.32	0.023	0.0072
7	4.20	0.300	0.08	0.41	0.024	0.0098
8	3.90	0.300	0.09	0.38	0.027	0.0103
9	3.60	0.300	0.11	0.40	0.033	0.0132
10	3.30	0.300	0.12	0.43	0.036	0.0155
11	3.00	0.300	0.15	0.44	0.044	0.0191
12	2.70	0.300	0.18	0.45	0.054	0.0243
13	2.40	0.300	0.22	0.46	0.065	0.0297
14	2.10	0.300	0.23	0.55	0.069	0.0380
15	1.80	0.300	0.26	0.58	0.078	0.0452
16	1.50	0.300	0.28	0.57	0.084	0.0479
17	1.20	0.300	0.28	0.59	0.084	0.0496
18	0.90	0.300	0.29	0.40	0.087	0.0348
19	0.60	0.350	0.21	0.15	0.074	0.0110
20	0.20	0.200	0.00	0.00	0.000	0.0000
end	0.20					

Mean Depth (m)	0.13
Mean Velocity (m/s)	0.34

Discharge (m^3/s)	0.3717



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Upper Clinton Creek
Station Name:	R1
Date and Time:	Jun.16/2016, 15:15
Staff:	AN,CH
UTM Coordinates:	510718. 7147525
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	9.3/~15
Crossing Number	2

Ecological Logistics & Research Ltd.

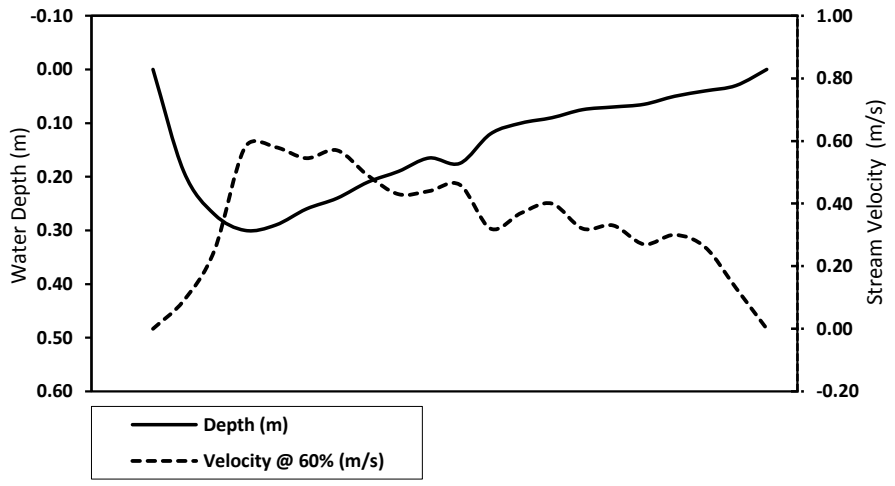
Left Bank	0.2
Right Bank	6.3
Wet.Width	6.1

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.20	0.150	0.00	0.00	0.000	0.0000
1	0.50	0.300	0.19	0.09	0.057	0.0051
2	0.80	0.300	0.27	0.25	0.081	0.0203
3	1.10	0.300	0.30	0.58	0.090	0.0522
4	1.40	0.300	0.29	0.58	0.087	0.0505
5	1.70	0.300	0.26	0.55	0.078	0.0425
6	2.00	0.300	0.24	0.57	0.072	0.0410
7	2.30	0.300	0.21	0.49	0.063	0.0309
8	2.60	0.300	0.19	0.43	0.057	0.0245
9	2.90	0.300	0.17	0.44	0.050	0.0218
10	3.20	0.300	0.18	0.46	0.053	0.0242
11	3.50	0.300	0.12	0.32	0.036	0.0115
12	3.80	0.300	0.10	0.37	0.030	0.0111
13	4.10	0.300	0.09	0.40	0.027	0.0108
14	4.40	0.300	0.08	0.32	0.023	0.0072
15	4.70	0.300	0.07	0.33	0.021	0.0069
16	5.00	0.300	0.07	0.27	0.020	0.0053
17	5.30	0.300	0.05	0.30	0.015	0.0045
18	5.60	0.300	0.04	0.26	0.012	0.0031
19	5.90	0.350	0.03	0.13	0.011	0.0014
20	6.30	0.200	0.00	0.00	0.000	0.0000
end	6.30					

Mean Depth (m)	0.14
Mean Velocity (m/s)	0.34

Discharge (m^3/s)	0.3747

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Easter Creek
Station Name:	R2
Date and Time:	Jun.16/2016, 13:30
Staff:	AN,CH
UTM Coordinates:	512023. 7148061
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.9/~15
Crossing Number	1

Ecological Logistics & Research Ltd.

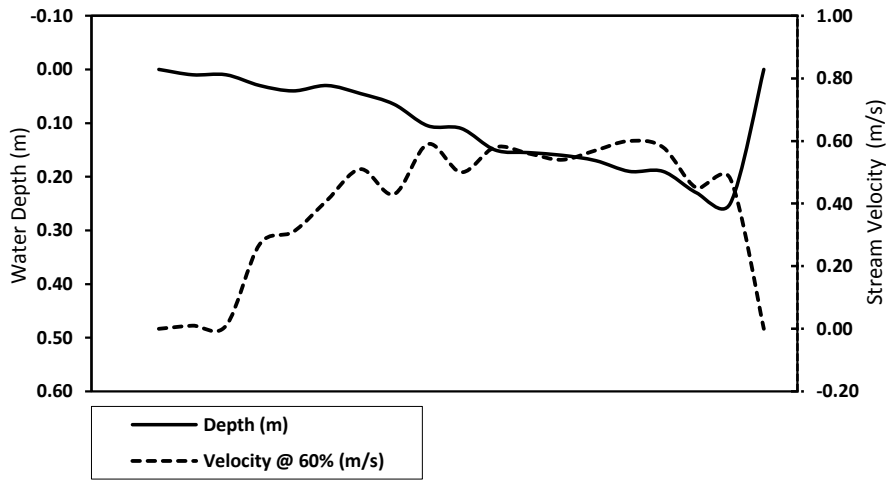
Left Bank	2.1
Right Bank	0.43
Wet.Width	1.67

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.43	0.045	0.00	0.00	0.000	0.0000
1	0.52	0.090	0.01	0.01	0.001	0.0000
2	0.61	0.090	0.01	0.01	0.001	0.0000
3	0.70	0.090	0.03	0.27	0.003	0.0007
4	0.79	0.090	0.04	0.31	0.004	0.0011
5	0.88	0.090	0.03	0.41	0.003	0.0011
6	0.97	0.090	0.05	0.51	0.004	0.0021
7	1.06	0.090	0.07	0.43	0.006	0.0025
8	1.15	0.090	0.11	0.59	0.009	0.0056
9	1.24	0.090	0.11	0.50	0.010	0.0050
10	1.33	0.090	0.15	0.58	0.014	0.0078
11	1.42	0.090	0.16	0.56	0.014	0.0078
12	1.51	0.090	0.16	0.54	0.014	0.0078
13	1.60	0.090	0.17	0.57	0.015	0.0087
14	1.69	0.090	0.19	0.60	0.017	0.0103
15	1.78	0.090	0.19	0.58	0.017	0.0099
16	1.87	0.090	0.23	0.45	0.021	0.0093
17	1.96	0.115	0.25	0.48	0.029	0.0138
18	2.10	0.070	0.00	0.00	0.000	0.0000
end	2.10					

Mean Depth (m)	0.10
Mean Velocity (m/s)	0.39

Discharge (m^3/s)	0.0935

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Easter Creek
Station Name:	R2
Date and Time:	Jun.16/2016, 13:30
Staff:	AN,CH
UTM Coordinates:	512023. 7148061
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.9/~15
Crossing Number	1

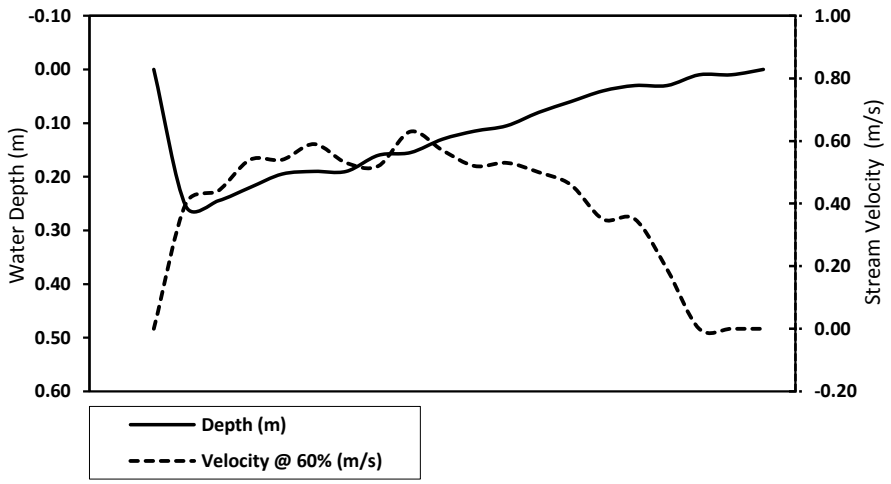
Left Bank	2.1
Right Bank	0.43
Wet.Width	1.67

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	2.10	0.045	0.00	0.00	0.000	0.0000
1	2.01	0.090	0.26	0.40	0.023	0.0092
2	1.92	0.090	0.25	0.44	0.022	0.0097
3	1.83	0.090	0.22	0.54	0.020	0.0107
4	1.74	0.090	0.20	0.54	0.018	0.0095
5	1.65	0.090	0.19	0.59	0.017	0.0101
6	1.56	0.090	0.19	0.53	0.017	0.0091
7	1.47	0.090	0.16	0.52	0.014	0.0075
8	1.38	0.090	0.16	0.63	0.014	0.0088
9	1.29	0.090	0.13	0.57	0.012	0.0067
10	1.20	0.090	0.12	0.52	0.010	0.0054
11	1.11	0.090	0.11	0.53	0.009	0.0050
12	1.02	0.090	0.08	0.50	0.007	0.0036
13	0.93	0.090	0.06	0.46	0.005	0.0025
14	0.84	0.090	0.04	0.35	0.004	0.0013
15	0.75	0.090	0.03	0.35	0.003	0.0009
16	0.66	0.090	0.03	0.19	0.003	0.0005
17	0.57	0.100	0.01	0.00	0.001	0.0000
18	0.46	0.070	0.01	0.00	0.001	0.0000
19	0.43	0.015	0.00	0.00	0.000	0.0000
end	0.43					

Mean Depth (m)	0.11
Mean Velocity (m/s)	0.38

Discharge (m^3/s)	0.1003

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Wolverine Creek
Station Name:	R3
Date and Time:	Jun.17/2016, 17:05
Staff:	AN,CH
UTM Coordinates:	513952. 7148677
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	9.6/~25
Crossing Number	1

Ecological Logistics & Research Ltd.

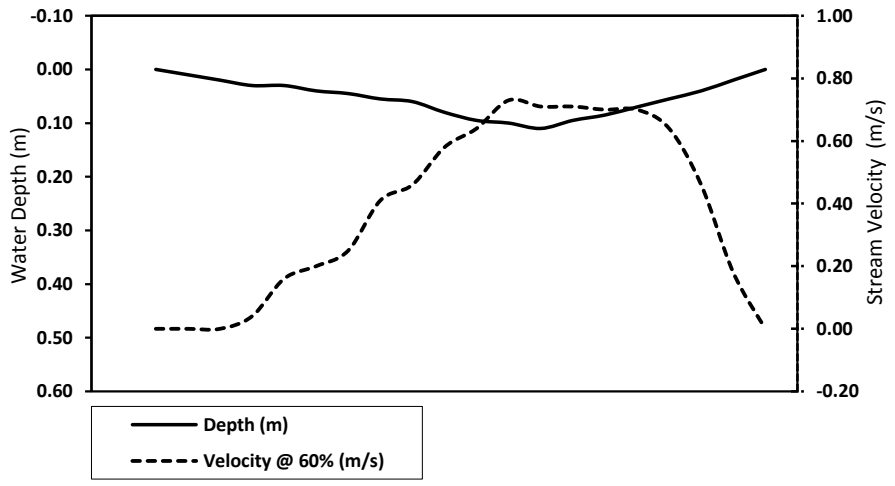
Left Bank	0.4
Right Bank	1.96
Wet.Width	1.56

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.96	0.040	0.00	0.00	0.000	0.0000
1	1.88	0.080	0.01	0.00	0.001	0.0000
2	1.80	0.080	0.02	0.00	0.002	0.0000
3	1.72	0.080	0.03	0.04	0.002	0.0001
4	1.64	0.080	0.03	0.16	0.002	0.0004
5	1.56	0.080	0.04	0.20	0.003	0.0006
6	1.48	0.080	0.05	0.25	0.004	0.0009
7	1.40	0.080	0.06	0.41	0.004	0.0018
8	1.32	0.080	0.06	0.46	0.005	0.0022
9	1.24	0.080	0.08	0.58	0.006	0.0037
10	1.16	0.080	0.10	0.64	0.008	0.0049
11	1.08	0.080	0.10	0.73	0.008	0.0058
12	1.00	0.080	0.11	0.71	0.009	0.0062
13	0.92	0.080	0.10	0.71	0.008	0.0054
14	0.84	0.080	0.09	0.70	0.007	0.0048
15	0.76	0.080	0.07	0.70	0.006	0.0039
16	0.68	0.080	0.06	0.64	0.004	0.0028
17	0.60	0.080	0.04	0.46	0.003	0.0015
18	0.52	0.100	0.02	0.18	0.002	0.0004
19	0.40	0.060	0.00	0.00	0.000	0.0000
end	0.40					

Mean Depth (m)	0.05
Mean Velocity (m/s)	0.38

Discharge (m^3/s)	0.0454

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Wolverine Creek
Station Name:	R3
Date and Time:	Jun.17/2016, 17:05
Staff:	AN,CH
UTM Coordinates:	513952. 7148677
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	9.6/~25
Crossing Number	1

Ecological Logistics & Research Ltd.

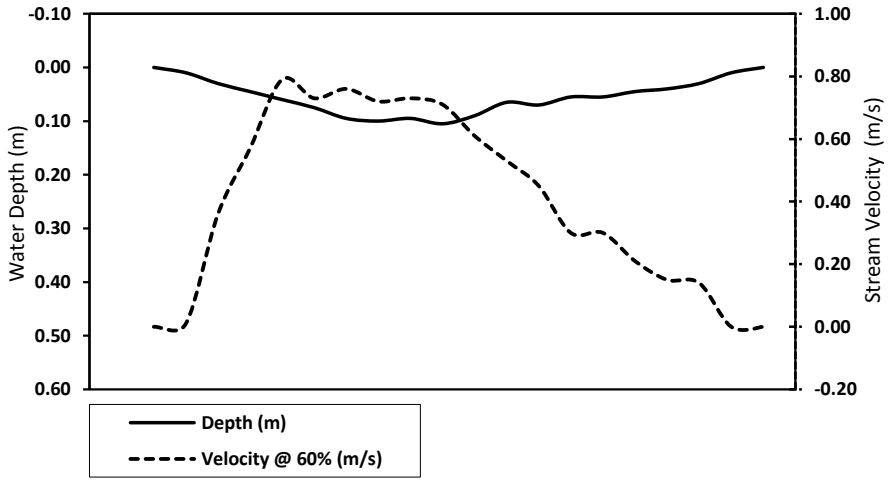
Left Bank	0.4
Right Bank	1.96
Wet.Width	1.56

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.40	0.040	0.00	0.00	0.000	0.0000
1	0.48	0.080	0.01	0.01	0.001	0.0000
2	0.56	0.080	0.03	0.36	0.002	0.0009
3	0.64	0.080	0.05	0.57	0.004	0.0021
4	0.72	0.080	0.06	0.79	0.005	0.0038
5	0.80	0.080	0.08	0.73	0.006	0.0044
6	0.88	0.080	0.10	0.76	0.008	0.0058
7	0.96	0.080	0.10	0.72	0.008	0.0058
8	1.04	0.080	0.10	0.73	0.008	0.0055
9	1.12	0.080	0.11	0.71	0.008	0.0060
10	1.20	0.080	0.09	0.61	0.007	0.0044
11	1.28	0.080	0.07	0.53	0.005	0.0028
12	1.36	0.080	0.07	0.45	0.006	0.0025
13	1.44	0.080	0.06	0.30	0.004	0.0013
14	1.52	0.080	0.06	0.30	0.004	0.0013
15	1.60	0.080	0.05	0.21	0.004	0.0008
16	1.68	0.080	0.04	0.15	0.003	0.0005
17	1.76	0.080	0.03	0.14	0.002	0.0003
18	1.84	0.100	0.01	0.00	0.001	0.0000
19	1.96	0.060	0.00	0.00	0.000	0.0000
end	1.96					

Mean Depth (m)	0.05
Mean Velocity (m/s)	0.40

Discharge (m^3/s)	0.0480

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

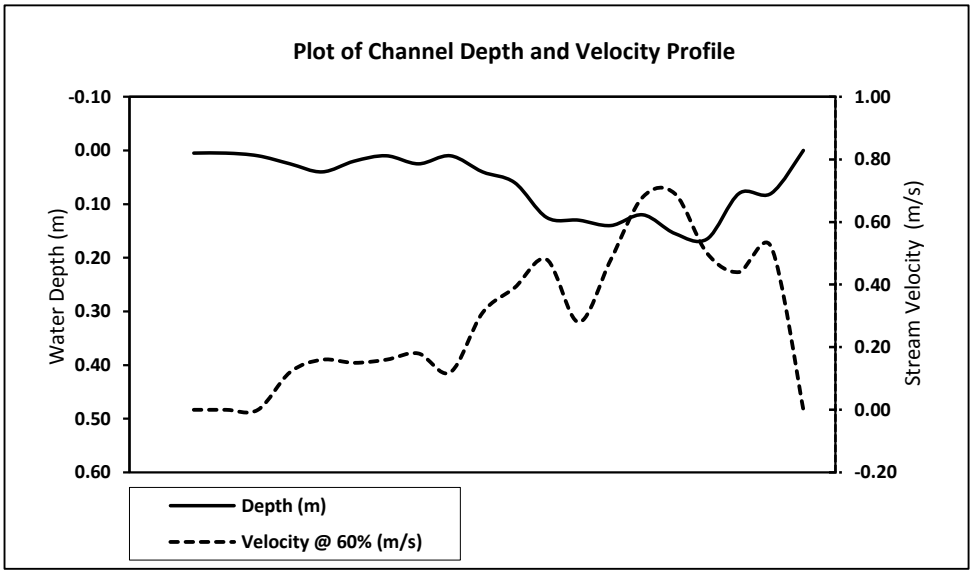
ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Eagle Creek
Station Name:	R4
Date and Time:	Jun.15/2016, 12:40
Staff:	AN,CH
UTM Coordinates:	515981. 7145344
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	5.2/~15
Crossing Number	1

Left Bank	0.24
Right Bank	2.1
Wet.Width	1.86

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.24	0.030	0.01	0.00	0.000	0.0000
1	0.30	0.080	0.01	0.00	0.000	0.0000
2	0.40	0.100	0.01	0.00	0.001	0.0000
3	0.50	0.100	0.03	0.12	0.003	0.0003
4	0.60	0.100	0.04	0.16	0.004	0.0006
5	0.70	0.100	0.02	0.15	0.002	0.0003
6	0.80	0.100	0.01	0.16	0.001	0.0002
7	0.90	0.100	0.03	0.18	0.003	0.0005
8	1.00	0.100	0.01	0.12	0.001	0.0001
9	1.10	0.100	0.04	0.31	0.004	0.0012
10	1.20	0.100	0.06	0.39	0.006	0.0023
11	1.30	0.100	0.13	0.48	0.013	0.0060
12	1.40	0.100	0.13	0.28	0.013	0.0036
13	1.50	0.100	0.14	0.48	0.014	0.0067
14	1.60	0.100	0.12	0.68	0.012	0.0082
15	1.70	0.100	0.16	0.69	0.016	0.0107
16	1.80	0.100	0.17	0.50	0.017	0.0083
17	1.90	0.100	0.08	0.44	0.008	0.0035
18	2.00	0.100	0.08	0.52	0.008	0.0042
19	2.10	0.050	0.00	0.00	0.000	0.0000
end	2.10					

Mean Depth (m)	0.06
Mean Velocity (m/s)	0.28

Discharge (m^3/s)	0.0567



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Eagle Creek
Station Name:	R4
Date and Time:	Jun.15/2016, 12:40
Staff:	AN,CH
UTM Coordinates:	515981. 7145344
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	5.2/~15
Crossing Number	2

Ecological Logistics & Research Ltd.

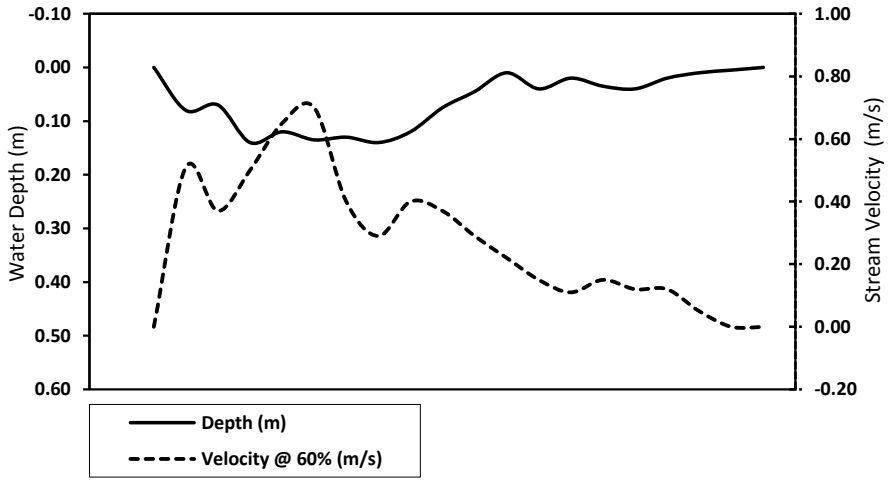
Left Bank	0.24
Right Bank	2.1
Wet.Width	1.86

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	2.10	0.050	0.00	0.00	0.000	0.0000
1	2.00	0.100	0.08	0.51	0.008	0.0041
2	1.90	0.100	0.07	0.37	0.007	0.0026
3	1.80	0.100	0.14	0.50	0.014	0.0070
4	1.70	0.100	0.12	0.65	0.012	0.0078
5	1.60	0.100	0.14	0.70	0.014	0.0095
6	1.50	0.100	0.13	0.40	0.013	0.0052
7	1.40	0.100	0.14	0.29	0.014	0.0041
8	1.30	0.100	0.12	0.40	0.012	0.0048
9	1.20	0.100	0.08	0.37	0.008	0.0028
10	1.10	0.100	0.05	0.29	0.005	0.0013
11	1.00	0.100	0.01	0.22	0.001	0.0002
12	0.90	0.100	0.04	0.15	0.004	0.0006
13	0.80	0.100	0.02	0.11	0.002	0.0002
14	0.70	0.100	0.04	0.15	0.004	0.0005
15	0.60	0.100	0.04	0.12	0.004	0.0005
16	0.50	0.100	0.02	0.12	0.002	0.0002
17	0.40	0.100	0.01	0.05	0.001	0.0001
18	0.30	0.080	0.01	0.00	0.000	0.0000
19	0.24	0.030	0.00	0.00	0.000	0.0000
end	0.24					

Mean Depth (m)	0.06
Mean Velocity (m/s)	0.27

Discharge (m^3/s)	0.0514

Plot of Channel Depth and Velocity Profile



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Porcupine Creek
Station Name:	R7
Date and Time:	Jun.17/2016, 13:20
Staff:	AN,CH
UTM Coordinates:	513026. 7145669
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.7/~20
Crossing Number	1

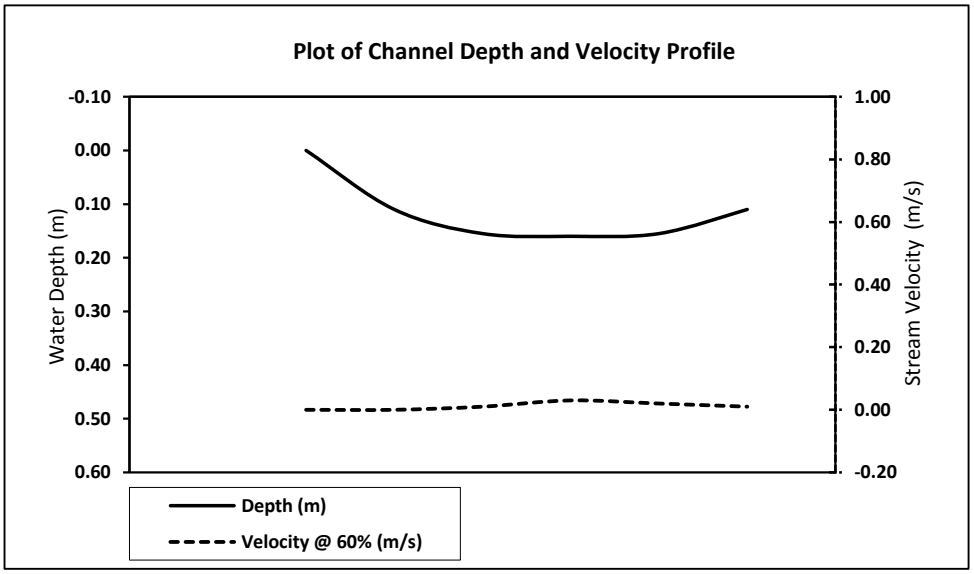
Ecological Logistics & Research Ltd.

Left Bank	0.5
Right Bank	0.12
Wet.Width	0.38

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.12	0.040	0.00	0.00	0.000	0.0000
1	0.20	0.080	0.11	0.00	0.009	0.0000
2	0.28	0.080	0.16	0.01	0.012	0.0001
3	0.36	0.080	0.16	0.03	0.013	0.0004
4	0.44	0.070	0.16	0.02	0.011	0.0002
5	0.50	0.030	0.11	0.01	0.003	0.0000
end	0.50					

Mean Depth (m)	0.12
Mean Velocity (m/s)	0.01

Discharge (m^3/s)	0.0008



Stream Flow & Discharge Calculation

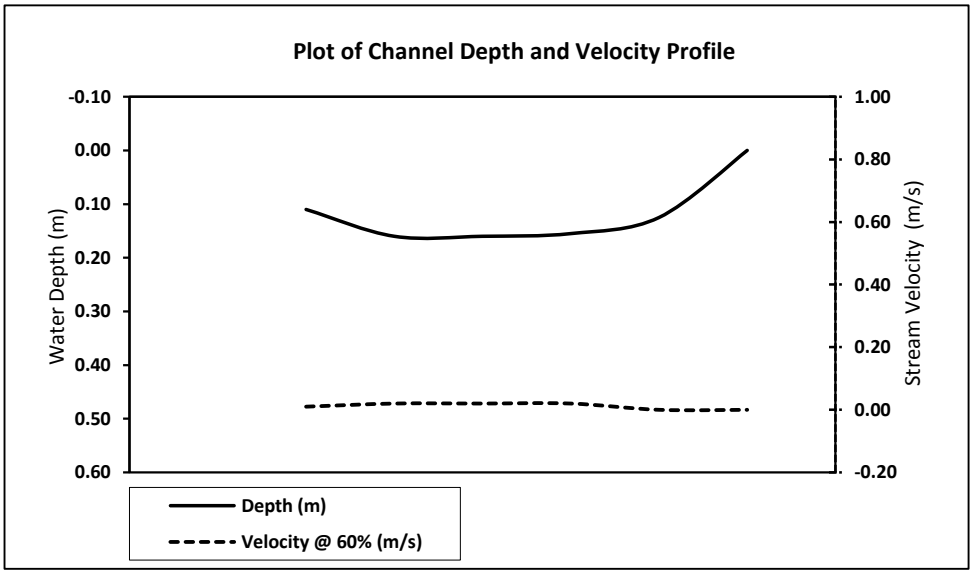
ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Porcupine Creek
Station Name:	R7
Date and Time:	Jun.17/2016, 13:20
Staff:	AN,CH
UTM Coordinates:	513026. 7145669
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.7/~20
Crossing Number	2

Left Bank	0.5
Right Bank	0.12
Wet.Width	0.38

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.50	0.040	0.11	0.01	0.004	0.0000
1	0.42	0.080	0.16	0.02	0.013	0.0003
2	0.34	0.080	0.16	0.02	0.013	0.0003
3	0.26	0.080	0.16	0.02	0.012	0.0002
4	0.18	0.070	0.13	0.00	0.009	0.0000
5	0.12	0.030	0.00	0.00	0.000	0.0000
end	0.12					

Mean Depth (m)	0.12
Mean Velocity (m/s)	0.01

Discharge (m^3/s)	0.0008



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R8
Date and Time:	Jun.16/2016, 13:10
Staff:	AN,CH
UTM Coordinates:	511885. 7147805
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.4/~15
Crossing Number	1

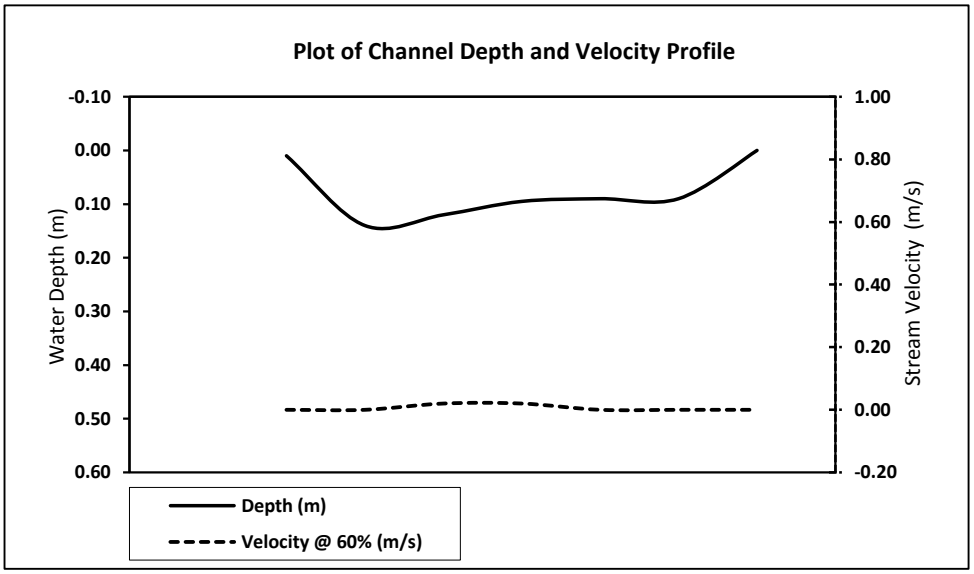
Ecological Logistics & Research Ltd.

Left Bank	0.19
Right Bank	0.78
Wet.Width	0.59

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.19	0.050	0.01	0.00	0.001	0.0000
1	0.29	0.100	0.14	0.00	0.014	0.0000
2	0.39	0.100	0.12	0.02	0.012	0.0002
3	0.49	0.100	0.10	0.02	0.010	0.0002
4	0.59	0.100	0.09	0.00	0.009	0.0000
5	0.69	0.095	0.09	0.00	0.009	0.0000
6	0.78	0.045	0.00	0.00	0.000	0.0000
end	0.78					

Mean Depth (m)	0.08
Mean Velocity (m/s)	0.01

Discharge (m^3/s)	0.0004



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R8
Date and Time:	Jun.16/2016, 13:10
Staff:	AN,CH
UTM Coordinates:	511885. 7147805
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.4/~15
Crossing Number	2

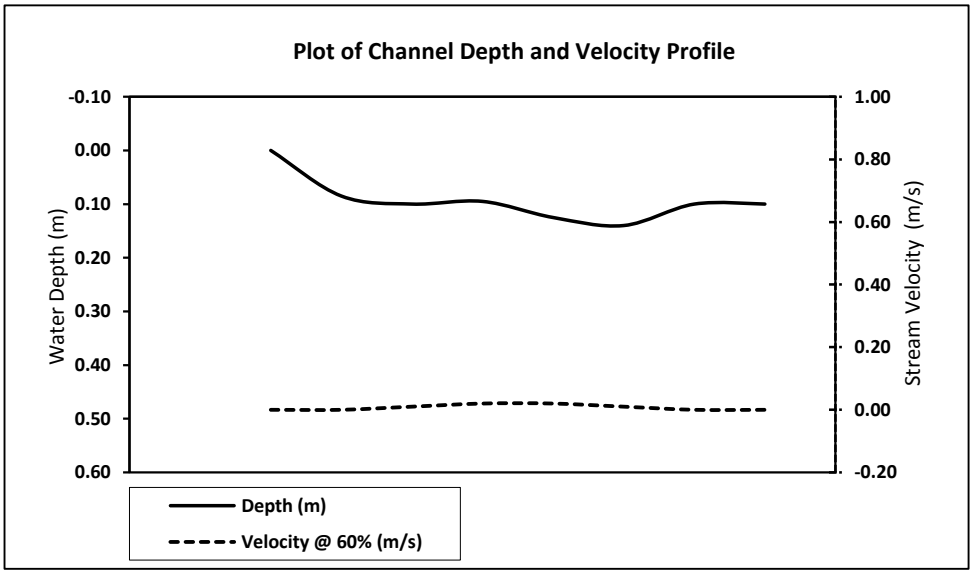
Ecological Logistics & Research Ltd.

Left Bank	0.19
Right Bank	0.78
Wet.Width	0.59

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.78	0.040	0.00	0.00	0.000	0.0000
1	0.70	0.090	0.09	0.00	0.008	0.0000
2	0.60	0.100	0.10	0.01	0.010	0.0001
3	0.50	0.100	0.10	0.02	0.010	0.0002
4	0.40	0.100	0.13	0.02	0.013	0.0003
5	0.30	0.100	0.14	0.01	0.014	0.0001
6	0.20	0.055	0.10	0.00	0.006	0.0000
7	0.19	0.005	0.10	0.00	0.001	0.0000
end	0.19					

Mean Depth (m)	0.09
Mean Velocity (m/s)	0.01

Discharge (m^3/s)	0.0007



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R9
Date and Time:	Jun.17/2016, 10:20
Staff:	AN,CH
UTM Coordinates:	512343. 7146753
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	5.6/~10
Crossing Number	1

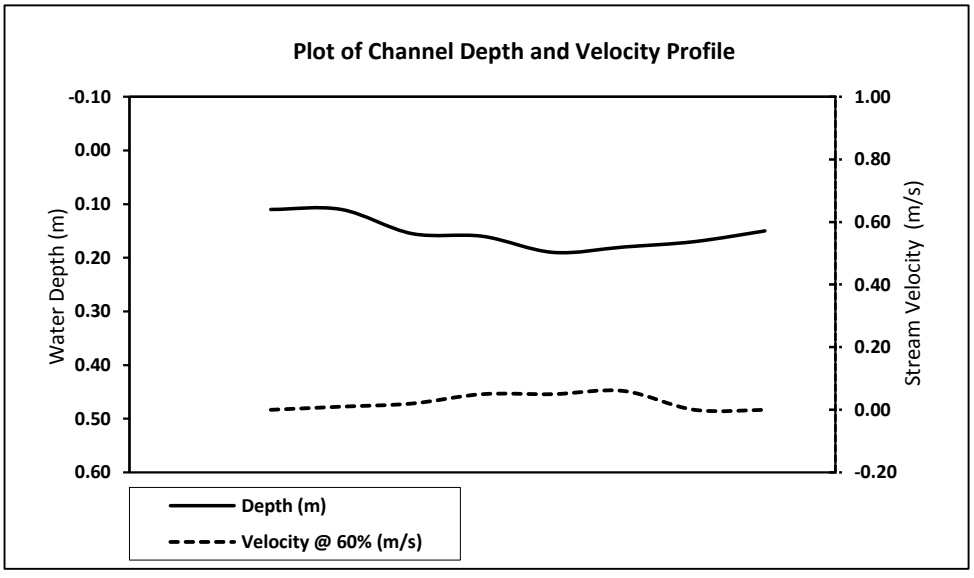
Ecological Logistics & Research Ltd.

Left Bank	1.05
Right Bank	0.38
Wet.Width	0.67

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.05	0.050	0.11	0.00	0.006	0.0000
1	0.95	0.100	0.11	0.01	0.011	0.0001
2	0.85	0.100	0.16	0.02	0.016	0.0003
3	0.75	0.100	0.16	0.05	0.016	0.0008
4	0.65	0.100	0.19	0.05	0.019	0.0010
5	0.55	0.100	0.18	0.06	0.018	0.0011
6	0.45	0.085	0.17	0.00	0.014	0.0000
7	0.38	0.035	0.15	0.00	0.005	0.0000
end	0.38					

Mean Depth (m)	0.15
Mean Velocity (m/s)	0.02

Discharge (m^3/s)	0.0033



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R9
Date and Time:	Jun.17/2016, 10:20
Staff:	AN,CH
UTM Coordinates:	512343. 7146753
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	5.6/~10
Crossing Number	1

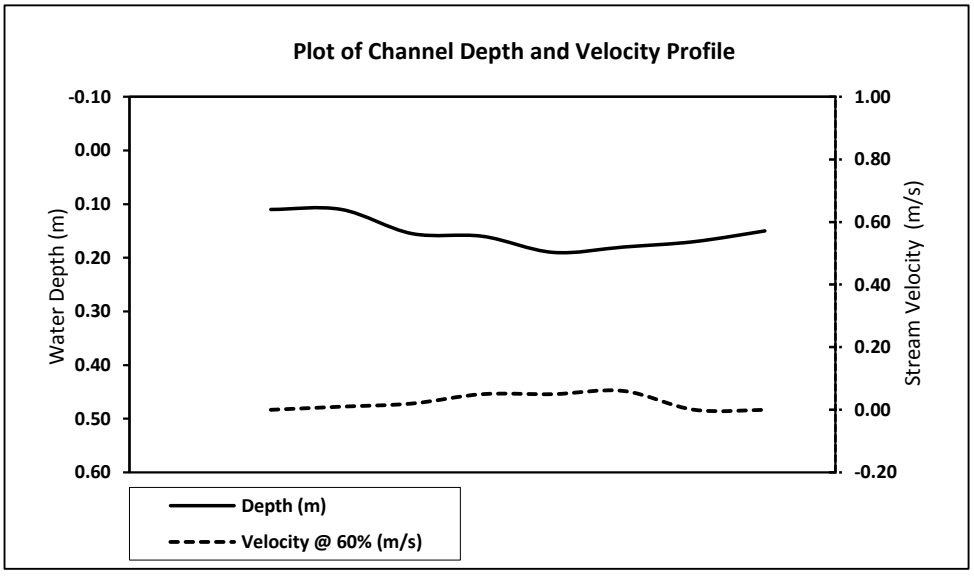
Ecological Logistics & Research Ltd.

Left Bank	1.05
Right Bank	0.38
Wet.Width	0.67

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	1.05	0.050	0.11	0.00	0.006	0.0000
1	0.95	0.100	0.11	0.01	0.011	0.0001
2	0.85	0.100	0.16	0.02	0.016	0.0003
3	0.75	0.100	0.16	0.05	0.016	0.0008
4	0.65	0.100	0.19	0.05	0.019	0.0010
5	0.55	0.100	0.18	0.06	0.018	0.0011
6	0.45	0.085	0.17	0.00	0.014	0.0000
7	0.38	0.035	0.15	0.00	0.005	0.0000
end	0.38					

Mean Depth (m)	0.15
Mean Velocity (m/s)	0.02

Discharge (m^3/s)	0.0033



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R11
Date and Time:	Jun.17/2016, 18:20
Staff:	AN,CH
UTM Coordinates:	514165. 7147732
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.7/~20
Crossing Number	1

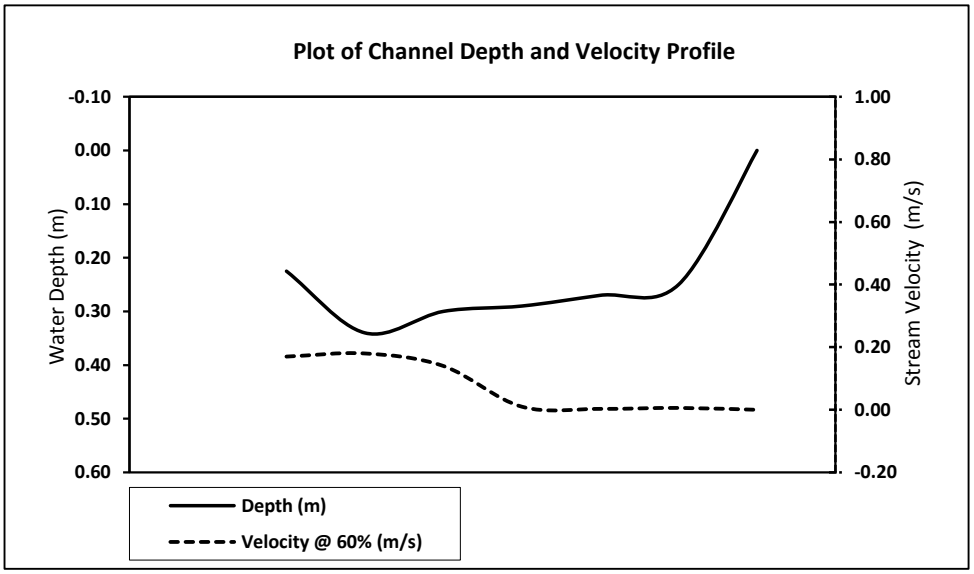
Ecological Logistics & Research Ltd.

Left Bank	0.5
Right Bank	-0.1
Wet.Width	0.6

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	-0.10	0.050	0.23	0.17	0.011	0.0019
1	0.00	0.100	0.34	0.18	0.034	0.0061
2	0.10	0.100	0.30	0.14	0.030	0.0042
3	0.20	0.100	0.29	0.01	0.029	0.0003
4	0.30	0.100	0.27	0.00	0.027	0.0001
5	0.40	0.100	0.25	0.01	0.025	0.0002
6	0.50	0.050	0.00	0.00	0.000	0.0000
end	0.50					

Mean Depth (m)	0.24
Mean Velocity (m/s)	0.07

Discharge (m^3/s)	0.0128



Stream Flow & Discharge Calculation

ELR Project No.	16-240.2
Site / Location:	Clinton Creek Site
Stream Name:	Unnamed Creek
Station Name:	R11
Date and Time:	Jun.17/2016, 18:20
Staff:	AN,CH
UTM Coordinates:	514165. 7147732
Technique:	Swoffer Flow Meter
Temp., Water/Air (°C)	6.7/~20
Crossing Number	1

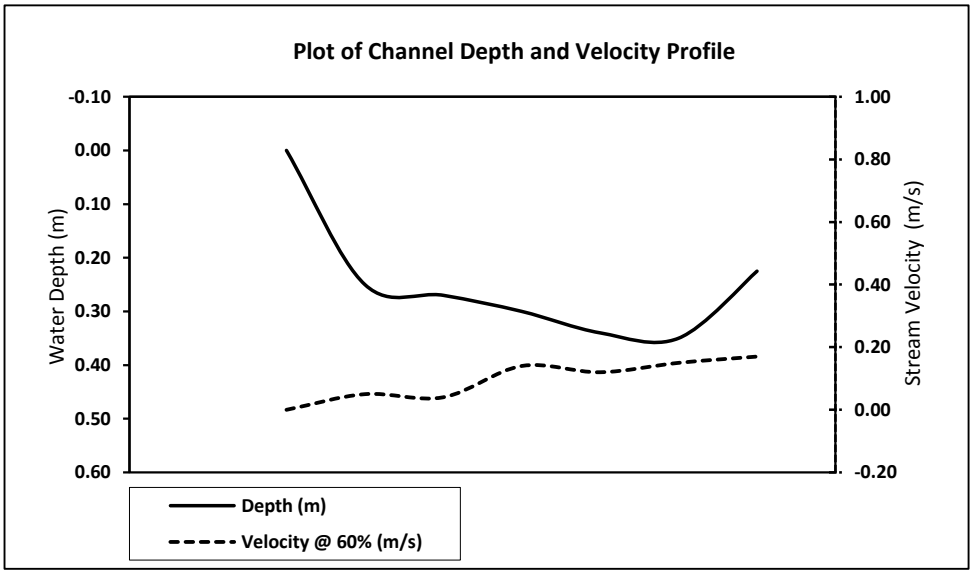
Ecological Logistics & Research Ltd.

Left Bank	0.5
Right Bank	-0.1
Wet.Width	6

Station No.	Distance (m)	Station Width (m)	Depth (m)	Velocity @ 60% (m/s)	Panel Area (m^2)	Panel Discharge (m^3/s)
0	0.50	0.050	0.00	0.00	0.000	0.0000
1	0.40	0.100	0.25	0.05	0.025	0.0013
2	0.30	0.100	0.27	0.04	0.027	0.0011
3	0.20	0.100	0.30	0.14	0.030	0.0042
4	0.10	0.100	0.34	0.12	0.034	0.0041
5	0.00	0.100	0.35	0.15	0.035	0.0053
6	-0.10	0.050	0.23	0.17	0.011	0.0019
end	-0.10					

Mean Depth (m)	0.25
Mean Velocity (m/s)	0.10

Discharge (m^3/s)	0.0178



APPENDIX 5

Survey Data

Hudgeon Lake Instruments - Survey Data

	Jul-15			Sep-15			Jan-16			Jun-16		
	m			m			m			m		
	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean
BM 1	3.222	3.221	3.222	3.082	3.080	3.081	2.971	2.970	2.971	2.765	2.763	2.764
BM 2	2.659	2.658	2.659	2.519	2.520	2.520	2.408	2.407	2.408	2.119	2.119	2.119
Staff Gauge Top (SG)	4.130	4.129	4.130	3.994	4.000	3.997	4.011	4.012	4.012	3.478	3.479	3.479
Station Casing (SC)	3.616	3.616	3.616	1.316	1.316	1.316	3.419	3.418	3.419	3.188	3.188	3.188
BM1-BM2 Difference			0.563			0.562			0.563			0.645
SG-BM1 difference			0.908			0.916			1.041			0.715
SG-BM2 difference			1.471			1.478			1.604			1.360
SC-BM1 difference			0.395			1.765			0.448			0.424
SC-BM2 difference			0.958			1.204			1.011			1.069

Wolverine Creek Instruments - Survey Data

	Oct-15			Jul-15			Jan-16			Jun-16		
	m			m			m			m		
	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean
BM 1	1.304	1.304	1.304	0.947	0.948	0.948	1.119	1.119	1.119	0.951	0.952	0.952
BM 2	0.691	0.691	0.691	0.332	0.331	0.332	0.518	0.518	0.518	0.340	0.341	0.341
Staff Gauge Top (SG)	1.595	1.597	1.596	1.248	1.249	1.249	1.415	1.414	1.415	1.234	1.233	1.234
Station casing (SC)	0.694	0.694	0.694	0.337	0.337	0.337	0.520	0.521	0.521	0.357	0.357	0.357
BM1-BM2 Difference			0.613			0.616			0.601			0.611
SG-BM1 difference			0.292			0.301			0.296			0.282
SG-BM2 difference			0.905			0.917			0.897			0.893
SC-BM1 difference			0.610			0.611			0.599			0.595
SC-BM2 difference			0.003			0.006			0.002			0.017

Snowshoe Pit Lake Instruments - Survey Data

	Oct-15			Jul-15			Jan-16			Jun-16		
	m			m			m			m		
	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean	Pass 1	Pass 2	Mean
BM 1	1.383	1.383	1.383	1.372	1.372	1.372	1.210	1.209	1.210	1.272	1.272	1.272
BM 2	1.295	1.294	1.295	1.282	1.282	1.282	1.122	1.122	1.122	1.182	1.182	1.182
Staff Gauge Top (SG)	1.38	1.387	1.384	1.369	1.368	1.369	1.202	1.202	1.202	1.267	1.269	1.268
Water Surface	2.895	2.873	2.884	-	-	0.994	-	-	-	3.070	3.070	3.070
BM1-BM2 Difference			0.089			0.090			0.087			0.090
SG-BM1 difference			0.000			0.004			0.008			0.004
SG-BM2 difference			0.089			0.087			0.080			0.086
SG-Water Difference			-1.501			0.375			-			-1.802

APPENDIX 6

Response to Comments Received on Draft Report

Response to Comments from Draft Report Version (as Received Sept 29, 2016)

Comment No.	Page	Comment	Response
1	1	I know that more detailed reports will be issued in September and February, but I think the summary reports would still benefit from the following: - Maps indicating where the stations are located. Were there any photos of sampling locations taken during the field event? It would be good to get an idea of the station conditions.	As discussed, maps have been included, and a decision has been made to include photos only in the more detailed reports.
2	4	Is this site scheduled for water quality sampling?	A note of clarification has been provided about the Porcupine Pit.
3	4	How frequently? Are the readings saying there is snow when there isn't? We encountered the same problem at Mount Nansen and installed a concrete pad below the sensor to try to correct this – what's the setup like at CC?	The text has been augmented to better describe what is being observed. We are not sure as to whether there is a concrete slab below the instrument, and it has not been specifically checked by Hemmera/ELR. Northern AvCom had mentioned potentially checking and calibrating the sensor but we don't know whether this was completed. In terms of the data, we are see wide variance of the data peppered through the date range of November 1 to Jan 31 2016 in particular. Many large negative values were present in amongst more believable positive values (950 negative values out of 2,250 data points). However, some very high values are also present that are likely not correct. Without some analysis, it's hard to say if there is any correlation with other parameters (e.g., temperature). The manual snow depth values collected on January 26 2016 (39 cm) roughly agree with the snow sensor readings for the same day (48 cm) but the survey is done in a different location from the sensor because a dirt plug is needed. The snow sensor is on waste rock.
4	7	Lots of notes in the table, but no legend to specify what the notes indicate	A general note linking to the detailed analytical tables has been added for these notes.
5	7	I'm assuming this is the condition of the site?	Correct – the table heading has been updated to reflect this.
6	7	Does the dash indicate something or should this just be a blank cell?	The dashes have been removed as they mean the same thing as blank cells.