September 12, 2019 Project No: 171-14563-00

Siobhan Burland Ross
Director
The Environment Act
Manitoba Sustainable Development
1007 Century Street
Winnipeg, MB R3H 0W4

Ms. Burland:

RE: RM. of St. Clements Lagoon – Client File No. 5584.00
Groundwater Monitoring – License No. 3058

As per Clause 43 of License No. 3058 regarding the RM of St. Clements wastewater treatment lagoon, a 3-year (2016-2018) groundwater monitoring plan to monitor water quality in the area surrounding the lagoon has been completed.

The objective of the groundwater monitoring plan was to record groundwater levels and monitor groundwater quality to ensure that wastewater from the recent constructed lagoon cells is not leaking from the cells and impacting upon the underlying groundwater.

Design of Monitoring Wells

Groundwater monitoring wells were constructed of 50mm PVC. The PVC bore casing was surrounded with a graded and washed coarse silica sand pack. The top collar of the bore casing was sealed with at least a 500 mm thick layer of bentonite. No glues or solvents were used in the well construction.

Parameters to be Monitored

All wells were sampled for the standard analytes, metals, volatile organic compounds, and isomers of dinitrotolunene as directed in the Manitoba Sustainable Development accepted well monitoring plan for the RM of St. Clements.

Monitoring Results

2016/2017:

- All parameters in these sampling years, with the exception of uranium, are below the MAC per the GCDWQ.

- Based on the sampling event analysis, there was insufficient evidence indicating environmental liability based on these events.

2018:

- Samples analyzed from all the MW's had an exceedance for uranium of approximately 1.5x to 9.3x times the guideline of 0.02 mg/L.
- The total dissolved solids, sulfate (except MW 3, 4 and 6), aluminum (except MW 1), iron (except MW 1, 2 and 5) and manganese (except MW 3, 5 and 6) were all parameters which exceeded the aesthetic guidelines found in the GCDWQ. Although these analytes exceed aesthetic guidelines, they do not exceed the Maximum Allowable Concentrations.
- 1,3-dinitrobenzene was detected just above the limit of detection in MW1. WSP recommended re-testing MW1 for the entire sampling suite to confirm any observable changes, and to further confirm the presence of dinitrotoluene isomers and similar explosive compounds.

2018 Re-Test:

- As per the License No. 3058 contingency plan, WSP retested MW1 on June 4th, 2019 to confirm the presence of the following chemical compounds.
- MW1 was re-tested on June 4th, 2019, laboratory re-test results confirmed non-detection for dinitrotoluene isomers and similar explosive compounds.
- Due to the original results being near the instrumental limit of detection, and that no chemical was detected during previous sampling events, this result is considered to be abnormal and a most probable false positive result.

Conclusions

Based on the 2017 to 2019 sampling events there is no indication of environmental liability. Furthermore, WSP considered that further testing for explosive compounds does is not justifiable given the lack of results in the project area of the design stage, and lack of results in the post-construction monitoring stage.

The monitoring program has established its baseline and satisfactory monitoring results. Given these results to date, WSP recommends that additional testing of routine parameters and explosive compounds is not warranted.

Attachments

- 2016/17/18 WSP Ground Water Monitoring Report
- 2018 Monitoring Program Re-Test ALS Laboratory Results (June 21, 2019)

Yours truly,

WSP Canada Inc.

[redacted]

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EAST SELKIRK LAGOON
GROUNDWATER MONITORING REPORT

Rural Municipality of St. Clements

Project no: 161-15379-00

Date: February 2017

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1 INTRODUCTION

On behalf of the RM of St. Clements, WSP conducted a groundwater monitoring event at the East Selkirk Wastewater Stabilization Pond (ESWSP) located on River Lots CLRL 89-95, Parish of St. Clements, approximately 2.0 kilometres (km) south of East Selkirk, Manitoba, herein referred to as the "Site". Groundwater monitoring was conducted at the Site on November 3rd, 2016 as part of the scheduled groundwater monitoring program as requested by Manitoba Sustainable Development (MSD).

This report summarizes the results of the 2016 groundwater sampling event completed for the ESWSP and compares the results with the Canadian Water Quality Guidelines (CWQG) have been applied for the groundwater monitoring event in order to assess changes in contaminants of concern potentially associated with the stabilization pond.

The monitoring program involved inspection of the monitoring wells, purging of the wells, collection of water samples, submission to the laboratory, with analysis, review and discussion of the laboratory results. Water quality parameters tested were by the Manitoba Sustainable Development approved groundwater monitoring plan, dated October 23, 2013.

1.1 BACKGROUND

As per Clause 43 of License No. 3058 regarding the RM of St. Clements ESWSP, a groundwater monitoring plan to monitor water quality in the area surrounding the lagoon has been approved by the former Manitoba Conservation and Water Stewardship, not Manitoba Sustainable Development.

The objective of groundwater monitoring is to record groundwater levels and monitor groundwater quality to ensure that wastewater from any of the lagoon cells is not leaking. A site plan, attached, highlights the seven proposed groundwater monitoring wells and the approximate locations. These locations encompass the perimeter of the lagoon cells, and with the expected groundwater flow directed north towards the Red River, these locations are expected to provide sufficient baseline and future monitoring data.

The attached drawing also highlights monitoring well construction details. The wells have been installed by a Manitoba licensed well driller.

2 SCOPE OF WORK

As per the October 23, 2013 approval of the submitted groundwater monitoring report, a groundwater sampling event was required to be completed twice a year in order to evaluate surface water and leachate management and the general transport of contaminates. The scope of work for the 2016 groundwater monitoring event was therefore based on the groundwater sampling program details outlined in the approved monitoring program are as follows:

- Evaluation of current monitoring well conditions.

- Physical monitoring of all wells, including depth to groundwater, and total well depth.
- Purging wells at least three well volumes or until dry.
- Obtain groundwater samples from each monitoring well, if functional (3 wells).
- Submission of groundwater samples to ALS Laboratories Group (CALA certified laboratory) for analysis for the following analytes:
- Comparison of sample results with Guidelines for Canadian Drinking Water Quality (GCDWQ). Dissolved samples were not field filtered.

  Standard Analytes:

  - Bicarbonate, Calcium, Carbonate, Chloride, Conductance (EC), Alkalinity, Hardness, Total Dissolved Solids (TDS), Total Solids (TS), Total Suspended Solids (TSS), Total Organic Carbon (TOC), Chemical Oxygen Demand (COD), Turbidity (NTU), Ammonia-Nitrogen (NH3-N), Chloride (Cl), Total Kjedahl Nitrogen (TKN), Nitrate-Nitrogen (NO3-N), Nitire-Nitrogen (NO2-N), Sulfate (SO42-), Phosphate (PO43-), Silicon Dioxide (SiO2), pH, Turbidity.

  Metals:

  - Aluminum (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Bismuth (Bi), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Phosphorus (P), Potassium (K), Selenium (Se), Silver (Ag), Sodium (Na), Strontium (Sr), Thallium (Tl), Tin (Sn), Titanium (Ti),Uranium (U), Vanadium (V), Zinc (Zn).

  Volatile Organic Compounds:

  - Acetone, Benzene, Bromobenzene, Bromochloromethane, Bromodichloromethane, Bromoform, Bromomethane, n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, Carbon disulfide, Carbon Tetrachloride, Chlorobenzene, Dibromochloromethane, Chloroethane, Chloroform, Chloromethane, 2-Chlorotoluene, 4-Chlorotoluene, 1,2-Dibromo-3- chloropropane, 1,2-Dibromoethane, Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Dichlorodifluoromethane, 1,1-dichloroethane, 1,2-Dichloroethane, 1,1-dichloroethene, cis-1,2-Dichloroethene, trans-1,2-Dichloroethene, Dichloromethane, 1,2-Dichloropropane, 1,3-Dichloropropane, 2,2-Dichloropropane, 1,1-Dichloropropene, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, Ethylbenzene, Hexachlorobutadiene, Hexane, 2-Hexanone (Methyl butyl ketone), Isopropylbenzene, 4-Isopropyltoluene, MEK, MIBK, MTBE, Naphthalene, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, Toluene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, Trichlorofluoromethane, 1,2,3-Trichloropropane, Trihalomethanes (total), 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Vinyl Chloride, o-Xylene, M+PXylenes, Xylenes.

Isomers of Dinitrotoluene:

- 2,4-Dinitrotoluene and 2,6-Dinitrotoluene.

- Preparation of this groundwater monitoring report, summarizing the findings and conclusions of the sampling event and submission of this report to Pinawa and MSD.

3 SITE CHARACTERIZATION

A summary of the site characteristics were completed and tabulated below.

Table 3-1: Site characterization

SITE CHARACTERISTIC	DESCRIPTION
Site Description and Land Use	The wastewater stabilization pond site used for the treatment of wastewater. Groundwater monitoring has historically has not been conducted on the site.
Surrounding Land Use	In all cardinal directions, the ESWSP is surrounded by farmed land, with minor forested areas occurring south-west of the site. Forests in the area are typically composed of mixed vegetation, with common tree species including ash, jack pine, white birch, black and white spruce, balsam fir, balsam poplar and trembling aspen
Topography	Although the site consists of generally flat topography throughout, with a gentle slope towards the north. Roughly 500 m from the site towards the north is the Red River.
Soil and Geology	Soil: According to the Canadian System of Soil Classification, the soils are classified as dominantly Gray Luvisols (Lettonia series), Dark Gray Luvisols (Whitemouth and Pine Valley series) and Dark Gray Chernozems (Thalberg and Framnes series), all developed on well to imperfectly drained lacustrine clay sediments.
	Geology: Soil materials in the municipality were deposited during the time of glacial Lake Agassiz and consist primarily of shallow to deep organic deposits and shallow to deep clayey and silty lacustrine sediments. Local areas of clay are underlain by stony, weakly calcareous to acidic glacial till. The Precambrian bedrock underlying the municipality outcrops mainly in the eastern portion of the area.
Water	Surface: The Site is located approximately 500 metres east of the Red River. Based on the elevations below, the groundwater flow direction is expected to flow southeast towards Seven Sisters Falls and the Winnipeg River.

Monitoring well locations is illustrated in the subsequent figure while elevations and depth to groundwater have been tabulated as follows:

Table 3-2: Groundwater monitoring well parameters (metres)

MONITORING WELL	UTM COORDINATES	SURVEY ELEVATION	TOP OF MONITORING WELL PVC LIP	ELEVATION TO GROUNDWATER	DEPTH TO GROUNDWATER
1	14U 653091 5554072	226.44	227.27	221.29	5.98
2	14U 652992 5554162	226.34	227.15	224.68	2.47
3	14U 652803 5553962	226.67	227.25	Dry	Dry
4	14U 652632 5553771	228.01	228.98	226.05	2.93
5	14U 652890 5553620	226.70	227.46	222.87	4.59
6	14U 652995 5553682	226.60	227.51	223.97	3.54
7	14U 653137 5553899	226.42	227.39	224.44	2.95

Figure 1: Groundwater monitoring well locations. Observed groundwater flow is towards the north.

4 METHOD

WSP completed a groundwater monitoring event, using the existing monitoring wells on-site on November 3, 2016. Methodologies and protocols are described as follows.

4.1 MONITORING WELL CONDITION

Each monitoring well's condition was evaluated based on visual inspections of each well for signs of cracking, breakage or tampering. All wells were in good condition and protected with lockable steel casings.

4.2 GROUNDWATER QUALITY PARAMETERS AND PROPERTIES

Groundwater was purged and sampled using a 1.5 in Supernova Proactive Environmental Well pump and polyethylene tubing. All wells were purged until dry and left to recharge for six hours.

4.3 GROUNDWATER SAMPLE COLLECTION

The wells were sampled after recharge. Collected groundwater samples were placed in clean, laboratory-supplied sample containers that were appropriately pre-labelled. Sample containers were

placed in a cooler with cold packs to maintain a temperature of 4°C for preservation. These samples were then delivered to ALS Laboratories for analysis on the same day as sampling. Standard chain-of-custody procedures were followed during sample handling and delivery.

4.4 ANALYTICAL TESTING

Groundwater samples collected were submitted to ALS Laboratories for analysis of parameters outlined in Section 2.0 Scope of Work.

4.4.1 DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN

No deviations were observed from the approved sampling and analysis plan.

4.5 QUALITY ASSURANCE AND QUALITY CONTROL

Quality Control is the process of verifying that work is technically correct and accurate. The following quality assurance and control measures were carried out during this monitoring program:

- Groundwater sampling was conducted in accordance with Manitoba Sustainable Development Groundwater Sampling at the RM of St. Clements Groundwater Monitoring Plan Proposal (dated October 4, 2013), and approved October 23, 2013.
- Disposable vinyl gloves were worn when handling sampling and containers and were replaced after use. Prior to re-use, non-dedicated sampling equipment and monitoring instruments were thoroughly cleaned.
- All samples for potential laboratory analysis were collected in the appropriate containers provided by the laboratory.
- ALS Laboratories completed a variety of quality assurance/quality control (QA/QC) measures on the samples submitted as part of the sampling program. These QA/QC measures include: sample replicates, matrix spiked laboratory blanks, and process blanks. Analytical and quality control data were reviewed and have been validated by ALS Laboratories. Copies of the Quality Assurance Reports and analytical methods are included with the Certificates of Analysis in Appendix A.

No issues with laboratory analysis, sample shipping, sample preservation, or field sampling techniques that could have a material effect on the interpretation of the reported results were identified as part of the QA/QC program.

4.6 REGULATORY CRITERIA

At the time of drafting, Manitoba does not have regulatory guidelines addressing residual environmental impacts to soil or groundwater (i.e., metals, petroleum hydrocarbons, nutrients) therefore the GCDWQ have been applied for the groundwater monitoring event. These guidelines are considered the more stringent due to their use in regulating limits of various present in potable water. MSD may direct future monitoring events to use alternative regulatory criteria, discussion post reporting should review this.

4.7 MONITORING WELL CONDITION

All monitoring wells appeared in good condition and protected with lockable steel casings.

4.8 GROUNDWATER QUALITY PARAMETERS AND PROPERTIES

Depth to groundwater ranged from 2.47 m to 5.98 m. All water levels are less than 10 mbgs and the area is considered to therefore have a high water table.

4.8.1 ANALYTICAL RESULTS

Groundwater results are presented in the following table, while the Chain of Custody is located in Appendix A. In addition to this, the baseline results of sampling from 2013 pre-lagoon comissioning have also been included.

Table 4-1: 2016 Sampling Results.

PARAMETER	UNITS	LIMIT OF DETECTION	GCDWQ AO/MAC LIMIT	MW1	MW2	MW3	MW4	MW5	MW6	MW7
12/22/2016 L1853274				L1853274-2	L1853274-3	L1853274-4	L1853274-5	L1853274-6	L1853274-7	L1853274-2
Conductivity	mg/L	1		2430	2590	1160	1330	3360	1070	3350
Hardness (as CaCO3)	mg/L	0.54		2070 *	2200 *	792 *	1080 *	3240 *	795 *	2520 *
pH	mg/L	0.1	AO <8.5	7.65	7.26	7.6	7.68	7.6	7.56	7.3
Total Suspended Solids	mg/L	5		53	39	16	315	40	920	65
Total Dissolved Solids	mg/L	20	AO <500	2670	3030	730	969	4570	709	3550
Total Solids	mg/L	10		2950	3290	820	1380	4920	1690	3810
Turbidity	mg/L	0.1		30.7	26.3	13.1	152	18.5	1260	50.6
Alkalinity, Total (as CaCO3)	mg/L	1		629	602	728	557	720	694	652
Ammonia, Total (as N)	mg/L	0.01		0.153	0.135	0.03	0.029	0.06	0.068	0.085
Bicarbonate (HCO3)	mg/L	1.2		767	734	888	679	878	846	795
Carbonate (CO3)	mg/L	0.6		<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Chloride (Cl)	mg/L	2.5	AO <250	<10 *	<10 *	<2.5 *	3.0 *	<10 *	21.9	<10 *
Hydroxide (OH)	mg/L	0.34		<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
Nitrate (as N)	mg/L	0.1	10.0	<0.40 *	<0.40 *	<0.10 *	<0.10 *	<0.40 *	0.63	<0.40 *
Nitrite (as N)	mg/L	0.05	1.0	<0.20 *	<0.20 *	<0.050 *	<0.050 *	<0.20 *	<0.050 *	<0.20 *
Total Kjeldahl Nitrogen	mg/L	0.2		0.88	0.57	0.39	0.22	0.93	0.43	0.35
Orthophosphate-Dissolved (as P)	mg/L	0.01		<0.010	0.013	<0.010	<0.010	0.02	0.021	0.014
Silica, Reactive (as SiO2)	mg/L	1		18.9	20.6	19.8	18.4	19.7	21.2 *	18.7
Sulfate (SO4)	mg/L	1.5	AO <500	1460	1700	22.9	290	2730	81.9	2030
Total Organic Carbon	mg/L	0.5		14.7	12.5	8.03	4.78	15.2	5.04	8.04
Aluminum (Al)-Total	mg/L	0.02	AO <0.1	1.5	0.404	0.198	2.86	0.542	2.45	0.345
Antimony (Sb)-Total	mg/L	0.001	0.006	0.0012	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic (As)-Total	mg/L	0.001	0.01 ALARA	0.0031	0.0014	<0.0010	0.0018	0.0012	0.0011	<0.0010
Barium (Ba)-Total	mg/L	0.0005	1.0	0.0294	0.0182	0.177	0.0635	0.0289	0.135	0.0137
Beryllium (Be)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	0.03	5	0.194	0.21	0.121	0.155	0.152	0.129	0.202
Cadmium (Cd)-Total	mg/L	0.0002	0.005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Calcium (Ca)-Total	mg/L	0.2		368	360	89.3	180	468	115	402
Cesium (Cs)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Total	mg/L	0.002	0.05	0.0041	<0.0020	<0.0020	0.0045	0.002	0.0031	<0.0020
Cobalt (Co)-Total	mg/L	0.0005	AO < 1.0	0.00501	0.00506	<0.00050	0.00173	0.0009	0.00219	0.00383
Copper (Cu)-Total	mg/L	0.002	AO <1.0	0.0067	0.002	0.0025	0.0053	0.0075	0.004	0.0032
Iron (Fe)-Total	mg/L	0.1	AO <0.3	1.5	0.47	0.22	3.8	0.57	1.86	0.28
Lead (Pb)-Total	mg/L	0.001	0.01	0.0025	<0.0010	<0.0010	0.003	0.0012	0.0018	<0.0010

PARAMETER	UNITS	LIMIT OF DETECTION	GCDWQ AO/MAC LIMIT	MW1	MW2	MW3	MW4	MW5	MW6	MW7
Lithium (Li)-Total	mg/L	0.002		0.347	0.384	0.169	0.155	0.42	0.125	0.372
Magnesium (Mg)-Total	mg/L	0.05		279	317	138	154	502	123	368
Manganese (Mn)-Total	mg/L	0.001		0.708	0.493	0.0701	0.22	0.32	0.222	0.475
Molybdenum (Mo)-Total	mg/L	0.0005		0.00219	0.00228	0.0075	0.00497	0.00345	0.00305	0.00283
Nickel (Ni)-Total	mg/L	0.002		0.017	0.013	0.0064	0.0068	0.0257	0.0074	0.0167
Phosphorus (P)-Total	mg/L	0.5		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Potassium (K)-Total	mg/L	0.1		8.36	8.72	4.35	6.29	10.5	5.21	9.47
Rubidium (Rb)-Total	mg/L	0.0005		0.00334	0.00126	0.00076	0.00646	0.00192	0.00532	0.00102
Selenium (Se)-Total	mg/L	0.005	0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)-Total	mg/L	0.3		14.9	12	12.3	16.9	12.8	16.4	11.6
Silver (Ag)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sodium (Na)-Total	mg/L	0.05	AO <200	101	135	25.7	39.1	189	40.6	175
Strontium (Sr)-Total	mg/L	0.0005		1.77	1.93	0.779	0.8	2.28	0.662	2
Tellurium (Te)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thallium (Tl)-Total	mg/L	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Thorium (Th)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	0.0013	<0.0010	<0.0010	<0.0010
Tin (Sn)-Total	mg/L	0.0006		0.00139	0.00128	0.00108	0.00077	0.00116	<0.00060	<0.00060
Titanium (Ti)-Total	mg/L	0.001		0.0632	0.0183	0.0062	0.136	0.0228	0.0894	0.0116
Tungsten (W)-Total	mg/L	0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Uranium (U)-Total	mg/L	0.0005	0.02	0.168	0.137	0.0346	0.0403	0.167	0.0354	0.189
Vanadium (V)-Total	mg/L	0.002		0.0042	<0.0020	<0.0020	0.0063	<0.0020	0.0062	<0.0020
Zinc (Zn)-Total	mg/L	0.02	AO <5.0	<0.020	0.023	<0.020	<0.020	0.021	<0.020	<0.020
Zirconium (Zr)-Total	mg/L	0.001		0.0023	<0.0010	<0.0010	0.003	0.0019	0.0027	0.0012
Chemical Oxygen Demand	mg/L	20		38	32	<20	21	40	51	24
Acetone	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzene	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromochloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromodichloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromoform	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromomethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
n-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
sec-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tert-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon disulfide	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon Tetrachloride	mg/L	0.0005	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0005	0.08	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromochloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloroethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2-Chlorotoluene	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
4-Chlorotoluene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromo-3-chloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromoethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromomethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichlorobenzene	mg/L	0.0005	0.2	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,4-Dichlorobenzene	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichlorodifluoromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-dichloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloroethane	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1-dichloroethene	mg/L	0.0005	0.014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,2-Dichloroethene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,2-Dichloroethene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichloromethane	mg/L	0.0005	0.05	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2,2-Dichloropropane	mg/L	0.001		<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *
1,1-Dichloropropene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,3-Dichloropropene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,3-Dichloropropene	mg/L	0.001		<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *
Ethylbenzene	mg/L	0.0005	0.14	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2-Hexanone (Methyl butyl ketone)	%	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Isopropylbenzene	%	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4-Isopropyltoluene	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MEK	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MIBK	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MTBE	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Styrene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1,2-Tetrachloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2,2-Tetrachloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethene	mg/L	0.0005	0.01	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0005	0.06	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

PARAMETER	UNITS	LIMIT OF DETECTION	GCDWQ AO/MAC LIMIT	MW1	MW2	MW3	MW4	MW5	MW6	MW7
1,1,1-Trichloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2-Trichloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichloroethene	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,3-Trichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trimethylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3,5-Trimethylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Vinyl Chloride	mg/L	0.0005	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
M+P-Xylenes	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (Total)	mg/L	0.0015	0.09	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
F1	mg/L	0.1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4-Bromofluorobenzene (SS)	mg/L	Surrogate		105.3	102.4	104	101.6	99.3	101.8	108.8
1,4-Difluorobenzene (SS)	mg/L	Surrogate		102.9	102.2	103.7	103.3	103	103.3	103.2
Total THMs	mg/L	0.001	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Applied Guideline: Guidelines for Canadian Drinking Water Quality (March, 2015)
AO = Aesthetic objectives noted (in orange), all other limits are Maximum Allowable Concentrations (MAC). MAX exceedances highlighted in red.
***Result qualified.**

4.8.2 SIDE BY SIDE LISTING OF BASELINE TO SAMPLING EVENT

PARAMETER	BASELINE SAMPLE MW1	MW1	BASELINE SAMPLE MW2	MW2	MW3	BASELINE SAMPLE MW4	MW4	BASELINE SAMPLE MW5	MW5	BASELINE SAMPLE MW6	MW6	BASELINE SAMPLE MW7	MW7
	L1548149-3	L1853274-1	L1548149-2	L1853274-2	L1853274-3	L1548149-1	L1853274-4	L1548149-4	L1853274-5	L1548149-5	L1853274-6	L1548149-6	L1853274-7
	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/2/2016 3:00:00 PM	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/18/2014 2:30:00 PM	11/2/2016 3:00:00 PM
Analyte	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Conductivity	2640	2430	3120	2590	1160	1490	1330	3850	3360	1360	1070	3550	3350
Hardness (as CaCO3)	1710	2070 *	1960	2200 *	792 *	14700	1080 *	2740	3240 *	728	795 *	2330	2520 *
pH	8.01	7.65	7.69	7.26	7.6	7.63	7.68	7.79	7.6	8.07	7.56	7.61	7.3
Total Suspended Solids	9	53	73	39	16	3020	315	7	40	1600	920	268	65
Total Dissolved Solids	2460	2670	3070	3030	730	1050	969	4100	4570	854	709	3570	3550
Total Solids	2560	2950	3230	3290	820	4070	1380	4250	4920	2490	1690	3980	3810
Turbidity	2.25	30.7	59.2	26.3	13.1	>4000	152	0.87	18.5	2970	1260	251	50.6
Alkalinity, Total (as CaCO3)	624	629	634	602	728	852	557	682	720	746	694	719	652
Ammonia, Total (as N)	0.124		0.089	0.135	0.03	0.05	0.029	0.026	0.06	0.032	0.068	<0.010	0.085
Bicarbonate (HCO3)	761	767	773	734	888	1040	679	832	878	910	846	877	795
Carbonate (CO3)	<12	<0.60	<12	<0.60	<0.60	<12	<0.60	<12	<0.60	<12	<0.60	<12	<0.60
Chloride	7.2	<10 *	4.6	<10 *	<2.5 *	3.57	3.0 *	2.9	<10 *	27.1	21.9	4.5	<10 *
Hydroxide (OH)	<6.8	<0.34	<6.8	<0.34	<0.34	<6.8	<0.34	<6.8	<0.34	<6.8	<0.34	<6.8	<0.34
Nitrate-N	<0.25 *	<0.40 *	<0.25 *	<0.40 *	<0.10 *	<0.050	<0.10 *	<0.25 *	<0.40 *	0.533	0.63	<0.25 *	<0.40 *
Nitrite-N	<0.25 *	<0.20 *	<0.25 *	<0.20 *	<0.050 *	<0.050	<0.050 *	<0.25 *	<0.20 *	<0.050	<0.050 *	<0.25 *	<0.20 *
Total Kjeldahl Nitrogen	0.81	0.88	0.75	0.57	0.39	1.46	0.22	0.68	0.93	0.47	0.43	0.56	0.35
Orthophosphate -Dissolved (as P)	0.023	<0.010	0.022	0.013	<0.010	<0.010	<0.010	0.04	0.02	0.02	0.021	<0.010	0.014
Silica, Reactive (as SiO2)	19.3	18.9	20.3	20.6	19.8	17.9	18.4	20.9	19.7	21.4	21.2 *	19.5	18.7
Sulfate	1360	1460	1690	1700	22.9	243	290	2300	2730	115	81.9	1960	2030
Total Organic Carbon	18.9	14.7	17	12.5	8.03	8.9	4.78	17	15.2	5.1	5.04	13.7	8.04
Aluminum (Al)-Total	0.053	1.5	0.216	0.404	0.198	102	2.86	0.199	0.542	0.83	2.45	1.24	0.345
Antimony (Sb)-Total	<0.0010	0.0012	0.0016	0.0011	<0.0010	0.0023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic (As)-Total	0.0011	0.0031	0.0012	0.0014	<0.0010	0.0921	0.0018	0.0012	0.0012	0.0022	0.0011	0.0011	<0.0010
Barium (Ba)-Total	0.0617	0.0294	0.042	0.0182	0.177	1.54	0.0635	0.0435	0.0289	0.094	0.135	0.0332	0.0137
Beryllium (Be)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0041	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00115	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	0.158	0.194	0.174	0.21	0.121	0.559	0.155	0.144	0.152	0.108	0.129	0.159	0.202
Cadmium (Cd)-Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00092	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Calcium (Ca)-Total	265	368	287	360	89.3	3470	180	402	468	112	115	340	402
Cesium (Cs)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Total	<0.0020	0.0041	0.0022	<0.0020	<0.0020	0.193	0.0045	<0.0020	0.002	<0.0020	0.0031	0.0024	<0.0020
Cobalt (Co)-Total	0.00151	0.00501	0.0046	0.00506	<0.00050	0.0765	0.00173	0.00092	0.0009	0.00212	0.00219	0.00475	0.00383
Copper (Cu)-Total	0.0049	0.0067	0.004	0.002	0.0025	0.252	0.0053	0.0044	0.0075	0.0041	0.004	0.0047	0.0032
Iron (Fe)-Total	<0.10	1.5	0.25	0.47	0.22	195	3.8	0.2	0.57	0.83	1.86	0.97	0.28
Lead (Pb)-Total	<0.0010	0.0025	<0.0010	<0.0010	<0.0010	0.144	0.003	<0.0010	0.0012	0.0021	0.0018	<0.0010	<0.0010
Lithium (Li)-Total	0.251	0.347	0.29	0.384	0.169	0.265	0.155	0.283	0.42	0.103	0.125	0.278	0.372
Magnesium (Mg)-Total	255	279	302	317	138	1470	154	421	502	109	123	359	368
Manganese (Mn)-Total	0.205	0.708	0.429	0.493	0.0701	5.57	0.22	0.22	0.32	0.263	0.222	0.517	0.475
Molybdenum (Mo)-Total	0.00433	0.00219	0.00218	0.00228	0.0075	0.0171	0.00497	0.00332	0.00345	0.0121	0.00305	0.003	0.00283
Nickel (Ni)-Total	0.0102	0.017	0.0134	0.013	0.0064	0.19	0.0068	0.018	0.0257	0.0062	0.0074	0.0168	0.0167
Phosphorus (P)-Total	<0.50	<0.50	<0.50	<0.50	<0.50	6.31	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Potassium (K)-Total	9.61	8.36	10.2	8.72	4.35	42.2	6.29	11.3	10.5	5.73	5.21	10.2	9.47
Rubidium (Rb)-Total	0.00163	0.00334	0.00285	0.00126	0.00076	0.22	0.00646	0.00205	0.00192	0.00254	0.00532	0.00397	0.00102
Selenium (Se)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)-Total	11.2	14.9	12.2	12	12.3	227	16.9	12.2	12.8	13.3	16.4	14.4	11.6

Parameter	BASELINE SAMPLE MW1	MW1	BASELINE SAMPLE MW2	MW2	MW3	BASELINE SAMPLE MW4	MW4	BASELINE SAMPLE MW5	MW5	BASELINE SAMPLE MW6	MW6	BASELINE SAMPLE MW7	MW7
Silver (Ag)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sodium (Na)-Total	99.9	101	135	135	25.7	74	39.1	163	189	145	40.6	179	175
Strontium (Sr)-Total	1.68	1.77	1.79	1.93	0.779	2.5	0.8	2.11	2.28	0.73	0.662	2.02	2
Tellurium (Te)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thallium (Tl)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Thorium (Th)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.073	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Tin (Sn)-Total	0.00228	0.00139	0.00182	0.00128	0.00108	0.00367	0.00077	0.00144	0.00116	0.00065	<0.00060	0.00161	<0.00060
Titanium (Ti)-Total	0.0026	0.0632	0.011	0.0183	0.0062	5.09	0.136	0.007	0.0228	0.02	0.0894	0.0582	0.0116
Tungsten (W)-Total	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Uranium (U)-Total	0.153	0.168	0.113	0.137	0.0346	0.0566	0.0403	0.155	0.167	0.033	0.0354	0.162	0.189
Vanadium (V)-Total	<0.0020	0.0042	<0.0020	<0.0020	<0.0020	0.242	0.0063	<0.0020	<0.0020	0.003	0.0062	0.0031	<0.0020
Zinc (Zn)-Total	<0.020	<0.020	<0.020	0.023	<0.020	0.469	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020
Zirconium (Zr)-Total	0.001	0.0023	0.0011	<0.0010	<0.0010	0.0377	0.003	0.0014	0.0019	0.0029	0.0027	0.0032	0.0012
Chemical Oxygen Demand	45	38	39	32	<20	47	21	38	40	24	51	35	24
Acetone	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromochloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromodichloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromoform	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromomethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
n-Butylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
sec-Butylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tert-Butylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon disulfide	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon Tetrachloride	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromochloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloroethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloromethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2-Chlorotoluene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
4-Chlorotoluene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromo-3-chloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromoethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromomethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,4-Dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichlorodifluoromethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-dichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloroethane	<0.0020 *	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1-dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,2-Dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,2-Dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2,2-Dichloropropane	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *
1,1-Dichloropropene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,3-Dichloropropene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,3-Dichloropropene	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *
Ethylbenzene	0.00096	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2-Hexanone (Methyl butyl ketone)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Isopropylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4-Isopropyltoluene	0.00132	<0.0010	0.00112	<0.0010	<0.0010	0.00117	<0.0010	0.00108	<0.0010	0.0012	<0.0010	0.00093	<0.0010
MEK	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MIBK	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MTBE	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Naphthalene	<0.00050	-	<0.00050	-	-	<0.00050	-	<0.00050	-	<0.00050	-	<0.00050	-
Styrene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1,2-Tetrachloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2,2-Tetrachloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,3-Trichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1-Trichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2-Trichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorofluoromethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,3-Trichloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trimethylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

PARAMETER	BASELINE SAMPLE MW1	MW1	BASELINE SAMPLE MW2	MW2	MW3	BASELINE SAMPLE MW4	MW4	BASELINE SAMPLE MW5	MW5	BASELINE SAMPLE MW6	MW6	BASELINE SAMPLE MW7	MW7
1,3,5-Trimethylbenzene	0.00067	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Vinyl Chloride	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	0.00113	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
M+P-Xylenes	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (Total)	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
F1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total THMs	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

* = Result Qualified
Note that no baseline data for MW3 was collected. MW3 was dry at baseline acquisition.

4.8.3 GCDWQ COMPARISON

The following dissolved metals exceeded the GCDWQ and have been noted in Table 5-1 and Appendix A:

- Samples analyzed from all the MW's had an exceedance for uranium of approximately 0.3x to 8.3x times the guideline of 0.02 mg/L. When this parameter was compared to the baseline data taken in 2014, relative percent differences for each well ranged from +21% to -29%, within anticipated various for this parameter, conditions, and time between sampling events.

- Total dissolved solids, sulfate (except MW 3,4 and 6), aluminum, and iron (except MW 3 and 7) were all parameters which exceeded the aesthetic guidelines found in the GCDWQ. Although they exceed aesthetic guidelines, they do not exceed or have MACs.

Although concentrations of various parameters remain low, based on the above preliminary analysis, there is little evidence for environmental liability based on this single event. Addition sampling events will facilitate inferring if there is potential contaminant movement.

5 CONCLUSIONS

As indicated in the previous section, all parameters in this sampling event, with the exception of uranium, are below the MAC per the GCDWQ.

Based on the sampling event analysis, there is insufficient evidence indicating environmental liability based on this single event. Addition sampling events will facilitate inferring if there is potential contaminant movement.

5.1 RECOMMENDATIONS

Based on the above conclusions, WSP recommends the following:

- Continued groundwater monitoring per the approved groundwater monitoring plane.

- Consultation with MSD outlining the groundwater sampling results outlined in this report and to confirm potential future steps if required, regarding the use of guidelines for future monitoring events.

6 CLOSURE

6.1 QUALIFIED PERSONS

Justin Rak-Banville is a Water Specialist with expertise in analytical chemistry and environmental engineering with the Manitoba Environmental Infrastructure Department. Justin provides professional project consulting experience on emerging water treatment technologies, disinfection mechanistic chemistry, hydro-electric development impact studies, environmental and contaminated site assessments and their combined impact on the concepts of water quality, treatment and analysis. Mr. Rak-Banville provides advisory to the development, implementation, and maintenance of potable water and wastewater systems quality control standards, inclusive to water quality/effluent analysis, modeling, treatability and impact analysis.

Iain Pimlott, B.Sc., C.Tech., is our Senior Environmental Specialist and is located in our Manitoba office in Winnipeg. Iain has acquired expertise in the environmental and civil engineering disciplines over a 19 year career in consulting. Iain's experience spans a broad scope that includes solid waste management and site design, feasibility studies, engineering design and regulatory approval, construction, commissioning and solid waste site operation. Iain's expertise also includes project management, contract administration, environmental site and impact assessments, impacted site remediation, surface and groundwater monitoring programs and environmental planning studies.

6.2 STANDARD LIMITATIONS

The findings and recommendations provided in this report were prepared by WSP (the Consultant) in accordance with generally accepted professional engineering principles and practices. This environmental site assessment does not constitute a legal opinion. The disclosure of any information contained in this report is the sole responsibility of the client. The principles, procedures and standards applied in conducting an environmental site assessment are neither regulated nor universally the same. The Consultant conducts its assessments in accordance with principles, procedures and standards that it has developed over the years, which are substantially the same as the environmental site assessment principles and practices of the Canadian Standards Association.
Accordingly, the assessments follow a similar format, and the assessment is made with regard to that is perceived as being good environmental management practice and in accordance with known applicable environmental regulations and standards at the time of report preparation.

It is important to note that the standard protocols and methods of evaluation employed, while aimed at minimizing the risk of unidentified environmental non-conformities to laws, regulations and generally accepted practices, cannot guarantee their absence. The Consultant has performed this assessment as specified in the engagement letter, terms of reference and scope of work agreed to with the client.

The information in this report is based on the representations made by others in response to requests for information made by the Consultant. The accuracy of the findings, opinions and conclusions expressed in this report are subject to any errors or omissions in, or refusal to provide that information.

This report is limited in scope to only those items that are specifically referenced in this report. There may be existing conditions that were not recorded in this report. Such conditions were not apparent to the Consultant due to the limitations imposed by the scope of work. The Consultant, therefore, accepts no liability for any costs incurred by the Client for subsequent discovery, manifestation or rectification of such conditions.

6.3 CERTIFICATION OF WORK

This report is intended solely for the Client named as a general indication of the visible or reported physical condition of the items addressed in the report at the time of the assessment. The material in this report reflects the Consultant's best judgment in light of the information available to it at the time of preparation.

This report and the information and data contained herein are to be treated as confidential and may be used only by the Client and its officers and employees in relation to the specific project that it was prepared for. Any use a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The report should be read in its entirety. Do not use any part of this report as a separate entity. All files, notes, source data, test results and master files are retained by the Consultant and remain the property of the Consultant.

6.4 REFERENCES

Canadian Council of Ministers of the Environment (1999) Canadian water quality guidelines for the protection of aquatic life. Canadian Council of Ministers of the Environment: Winnipeg.

6.5 FINAL REMARKS

We trust that this information satisfies your current needs. Should you have any questions or comments, please contact the under signed.

Prepared for:

Rural Municipality of St. Clements
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Box 2, Group 35, RR #1
East Selkirk, MB R0E 0M0

Prepared by:

WSP Canada Inc.
1600 Buffalo Place
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Report written by:

Justin Rak-Banville, M.Sc., P. Chem., C. Chem., EP
Water Specialist

Reviewed by:

Iain Pimlott, B.Sc., C.Tech.
Senior Environmental Specialist
Project Manager, Environmental Infrastructure

Appendix 1

ALS LABORATORY RESULTS

WSP Canada Inc.
ATTN: JUSTIN RAK-BANVILLE
1600 Buffalo Place
Winnipeg MB R3T 6B8

Date Received: 03-NOV-16
Report Date: 29-DEC-16 14:54 (MT)
Version: FINAL

Client Phone: 204-477-6650

Certificate of Analysis

Lab Work Order #: L1853274

Project P.O. #: NOT SUBMITTED
Job Reference: CLEMENTS
C of C Numbers:
Legal Site Desc:

[redacted]

Barb Bayer, B.Sc.
General Manager, Winnipeg

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-1 MW1 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	767		1.2	mg/L		07-NOV-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		07-NOV-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		07-NOV-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	629		1.0	mg/L		04-NOV-16	R3589373
Miscellaneous Parameters							
Ammonia, Total (as N)	0.153		0.010	mg/L		09-NOV-16	R3592194
Chemical Oxygen Demand	38		20	mg/L		08-NOV-16	R3590684
Chloride (Cl)	<10	DLM	10	mg/L		04-NOV-16	R3590363
Conductivity	2430		1.0	umhos/cm		04-NOV-16	R3589373
Hardness (as CaCO3)	2070	HTC	0.54	mg/L		10-NOV-16	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		04-NOV-16	R3590363
Nitrite (as N)	<0.20	DLM	0.20	mg/L		04-NOV-16	R3590363
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		07-NOV-16	R3589771
Silica, Reactive (as SiO2)	18.9		1.0	mg/L		04-NOV-16	R3587927
Special Request	See Attached					12-DEC-16	R3625059
Sulfate (SO4)	1460		6.0	mg/L		04-NOV-16	R3590363
Xylenes (Total)	<0.0015		0.0015	mg/L		15-NOV-16	
Total Dissolved Solids	2670		20	mg/L		09-NOV-16	R3594360
Total Kjeldahl Nitrogen	0.88		0.20	mg/L	15-NOV-16	17-NOV-16	R3597178
Total Organic Carbon	14.7		0.50	mg/L		15-NOV-16	R3595843
Total Solids	2950		10	mg/L		08-NOV-16	R3591372
Total Suspended Solids	53.0		5.0	mg/L		04-NOV-16	R3591158
Total THMs	<0.0010		0.0010	mg/L		15-NOV-16	
Turbidity	30.7		0.10	NTU		04-NOV-16	R3589360
pH	7.65		0.10	pH units		04-NOV-16	R3589373
Total Metals by ICP-MS							
Aluminum (Al)-Total	1.50		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Antimony (Sb)-Total	0.0012		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Arsenic (As)-Total	0.0031		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Barium (Ba)-Total	0.0294		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Boron (B)-Total	0.194		0.030	mg/L	09-NOV-16	09-NOV-16	R3591916
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	09-NOV-16	09-NOV-16	R3591916
Calcium (Ca)-Total	368		0.20	mg/L	09-NOV-16	09-NOV-16	R3591916
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Chromium (Cr)-Total	0.0041		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Cobalt (Co)-Total	0.00501		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Copper (Cu)-Total	0.0067		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Iron (Fe)-Total	1.50		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Lead (Pb)-Total	0.0025		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Lithium (Li)-Total	0.347		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Magnesium (Mg)-Total	279		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Manganese (Mn)-Total	0.708		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Molybdenum (Mo)-Total	0.00219		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Nickel (Ni)-Total	0.0170		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-1 MW1 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Total Metals by ICP-MS							
Phosphorus (P)-Total	<0.50		0.50	mg/L	09-NOV-16	09-NOV-16	R3591916
Potassium (K)-Total	8.36		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Rubidium (Rb)-Total	0.00334		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Selenium (Se)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Silicon (Si)-Total	14.9		0.30	mg/L	09-NOV-16	09-NOV-16	R3591916
Silver (Ag)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Sodium (Na)-Total	101		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Strontium (Sr)-Total	1.77		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Tellurium (Te)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Thallium (Tl)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Thorium (Th)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tin (Sn)-Total	0.00139		0.00060	mg/L	09-NOV-16	09-NOV-16	R3591916
Titanium (Ti)-Total	0.0632		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tungsten (W)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Uranium (U)-Total	0.168		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Vanadium (V)-Total	0.0042		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zinc (Zn)-Total	<0.020		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zirconium (Zr)-Total	0.0023		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		13-NOV-16	R3595381
Benzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromodichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromoform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromomethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
n-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
sec-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
tert-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon disulfide	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloroethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
Chloroform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
2-Chlorotoluene	<0.020		0.020	mg/L		13-NOV-16	R3595381
4-Chlorotoluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromoethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromomethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-1 MW1 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
1,2-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
1,1-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,3-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
Ethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
F1	<0.10		0.10	mg/L		13-NOV-16	R3595381
Hexachlorobutadiene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Hexane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-NOV-16	R3595381
Isopropylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
MEK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MIBK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MTBE	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Styrene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Tetrachloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Toluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Vinyl Chloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
M+P-Xylenes	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
o-Xylene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Surrogate: 4-Bromofluorobenzene (SS)	105.3		70-130	%		13-NOV-16	R3595381
Surrogate: 1,4-Difluorobenzene (SS)	102.9		70-130	%		13-NOV-16	R3595381
L1853274-2 MW2 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	734		1.2	mg/L		07-NOV-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		07-NOV-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		07-NOV-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	602		1.0	mg/L		04-NOV-16	R3589373
Miscellaneous Parameters							
Ammonia, Total (as N)	0.135		0.010	mg/L		09-NOV-16	R3592194
Chemical Oxygen Demand	32		20	mg/L		08-NOV-16	R3590684
Chloride (Cl)	<10	DLM	10	mg/L		04-NOV-16	R3590363

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-2 MW2 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Conductivity	2590		1.0	umhos/cm		04-NOV-16	R3589373
Hardness (as CaCO3)	2200	HTC	0.54	mg/L		10-NOV-16	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		04-NOV-16	R3590363
Nitrite (as N)	<0.20	DLM	0.20	mg/L		04-NOV-16	R3590363
Orthophosphate-Dissolved (as P)	0.013		0.010	mg/L		07-NOV-16	R3589771
Silica, Reactive (as SiO2)	20.6		1.0	mg/L		04-NOV-16	R3587927
Special Request	See Attached					12-DEC-16	R3625059
Sulfate (SO4)	1700		6.0	mg/L		04-NOV-16	R3590363
Xylenes (Total)	<0.0015		0.0015	mg/L		15-NOV-16	
Total Dissolved Solids	3030		20	mg/L		09-NOV-16	R3594360
Total Kjeldahl Nitrogen	0.57		0.20	mg/L	11-NOV-16	14-NOV-16	R3594665
Total Organic Carbon	12.5		0.50	mg/L		15-NOV-16	R3595843
Total Solids	3290		10	mg/L		08-NOV-16	R3591372
Total Suspended Solids	39.0		5.0	mg/L		04-NOV-16	R3591158
Total THMs	<0.0010		0.0010	mg/L		15-NOV-16	
Turbidity	26.3		0.10	NTU		04-NOV-16	R3589360
pH	7.26		0.10	pH units		04-NOV-16	R3589373
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.404		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Antimony (Sb)-Total	0.0011		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Arsenic (As)-Total	0.0014		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Barium (Ba)-Total	0.0182		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Boron (B)-Total	0.210		0.030	mg/L	09-NOV-16	09-NOV-16	R3591916
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	09-NOV-16	09-NOV-16	R3591916
Calcium (Ca)-Total	360		0.20	mg/L	09-NOV-16	09-NOV-16	R3591916
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Chromium (Cr)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Cobalt (Co)-Total	0.00506		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Copper (Cu)-Total	0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Iron (Fe)-Total	0.47		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Lead (Pb)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Lithium (Li)-Total	0.384		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Magnesium (Mg)-Total	317		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Manganese (Mn)-Total	0.493		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Molybdenum (Mo)-Total	0.00228		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Nickel (Ni)-Total	0.0130		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Phosphorus (P)-Total	<0.50		0.50	mg/L	09-NOV-16	09-NOV-16	R3591916
Potassium (K)-Total	8.72		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Rubidium (Rb)-Total	0.00126		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Selenium (Se)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Silicon (Si)-Total	12.0		0.30	mg/L	09-NOV-16	09-NOV-16	R3591916
Silver (Ag)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Sodium (Na)-Total	135		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Strontium (Sr)-Total	1.93		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Tellurium (Te)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Thallium (Tl)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Thorium (Th)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tin (Sn)-Total	0.00128		0.00060	mg/L	09-NOV-16	09-NOV-16	R3591916
Titanium (Ti)-Total	0.0183		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-2 MW2 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Total Metals by ICP-MS							
Tungsten (W)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Uranium (U)-Total	0.137		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Vanadium (V)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zinc (Zn)-Total	0.023		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zirconium (Zr)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		13-NOV-16	R3595381
Benzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromodichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromoform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromomethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
n-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
sec-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
tert-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon disulfide	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloroethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
Chloroform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
2-Chlorotoluene	<0.020		0.020	mg/L		13-NOV-16	R3595381
4-Chlorotoluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromoethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromomethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
1,1-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,3-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
Ethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
F1	<0.10		0.10	mg/L		13-NOV-16	R3595381
Hexachlorobutadiene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Hexane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-NOV-16	R3595381
Isopropylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-2 MW2 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
MEK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MIBK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MTBE	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Styrene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Tetrachloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Toluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Vinyl Chloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
M+P-Xylenes	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
o-Xylene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Surrogate: 4-Bromofluorobenzene (SS)	102.4		70-130	%		13-NOV-16	R3595381
Surrogate: 1,4-Difluorobenzene (SS)	102.2		70-130	%		13-NOV-16	R3595381
L1853274-3 MW3 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	888		1.2	mg/L		07-NOV-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		07-NOV-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		07-NOV-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	728		1.0	mg/L		04-NOV-16	R3589373
Miscellaneous Parameters							
Ammonia, Total (as N)	0.030		0.010	mg/L		09-NOV-16	R3592194
Chemical Oxygen Demand	<20		20	mg/L		08-NOV-16	R3590684
Chloride (Cl)	<2.5	DLM	2.5	mg/L		04-NOV-16	R3590363
Conductivity	1160		1.0	umhos/cm		04-NOV-16	R3589373
Hardness (as CaCO3)	792	HTC	0.54	mg/L		10-NOV-16	
Nitrate (as N)	<0.10	DLM	0.10	mg/L		04-NOV-16	R3590363
Nitrite (as N)	<0.050	DLM	0.050	mg/L		04-NOV-16	R3590363
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		07-NOV-16	R3589771
Silica, Reactive (as SiO2)	19.8		1.0	mg/L		04-NOV-16	R3587927
Special Request	See Attached					12-DEC-16	R3625059
Sulfate (SO4)	22.9		1.5	mg/L		04-NOV-16	R3590363
Xylenes (Total)	<0.0015		0.0015	mg/L		15-NOV-16	
Total Dissolved Solids	730		20	mg/L		09-NOV-16	R3594360
Total Kjeldahl Nitrogen	0.39		0.20	mg/L	11-NOV-16	14-NOV-16	R3594665
Total Organic Carbon	8.03		0.50	mg/L		15-NOV-16	R3595843

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-3 MW3 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Total Solids	820		10	mg/L		08-NOV-16	R3591372
Total Suspended Solids	16.0		5.0	mg/L		04-NOV-16	R3591158
Total THMs	<0.0010		0.0010	mg/L		15-NOV-16	
Turbidity	13.1		0.10	NTU		04-NOV-16	R3589360
pH	7.60		0.10	pH units		04-NOV-16	R3589373
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.198		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Antimony (Sb)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Arsenic (As)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Barium (Ba)-Total	0.177		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Boron (B)-Total	0.121		0.030	mg/L	09-NOV-16	09-NOV-16	R3591916
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	09-NOV-16	09-NOV-16	R3591916
Calcium (Ca)-Total	89.3		0.20	mg/L	09-NOV-16	09-NOV-16	R3591916
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Chromium (Cr)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Cobalt (Co)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Copper (Cu)-Total	0.0025		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Iron (Fe)-Total	0.22		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Lead (Pb)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Lithium (Li)-Total	0.169		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Magnesium (Mg)-Total	138		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Manganese (Mn)-Total	0.0701		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Molybdenum (Mo)-Total	0.00750		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Nickel (Ni)-Total	0.0064		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Phosphorus (P)-Total	<0.50		0.50	mg/L	09-NOV-16	09-NOV-16	R3591916
Potassium (K)-Total	4.35		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Rubidium (Rb)-Total	0.00076		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Selenium (Se)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Silicon (Si)-Total	12.3		0.30	mg/L	09-NOV-16	09-NOV-16	R3591916
Silver (Ag)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Sodium (Na)-Total	25.7		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Strontium (Sr)-Total	0.779		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Tellurium (Te)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Thallium (Tl)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Thorium (Th)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tin (Sn)-Total	0.00108		0.00060	mg/L	09-NOV-16	09-NOV-16	R3591916
Titanium (Ti)-Total	0.0062		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tungsten (W)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Uranium (U)-Total	0.0346		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Vanadium (V)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zinc (Zn)-Total	<0.020		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zirconium (Zr)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		13-NOV-16	R3595381
Benzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromodichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromoform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromomethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-3 MW3 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
n-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
sec-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
tert-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon disulfide	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloroethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
Chloroform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
2-Chlorotoluene	<0.020		0.020	mg/L		13-NOV-16	R3595381
4-Chlorotoluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromoethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromomethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
1,1-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,3-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
Ethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
F1	<0.10		0.10	mg/L		13-NOV-16	R3595381
Hexachlorobutadiene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Hexane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-NOV-16	R3595381
Isopropylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
MEK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MIBK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MTBE	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Styrene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Tetrachloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Toluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-3 MW3 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Vinyl Chloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
M+P-Xylenes	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
o-Xylene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Surrogate: 4-Bromofluorobenzene (SS)	104.0		70-130	%		13-NOV-16	R3595381
Surrogate: 1,4-Difluorobenzene (SS)	103.7		70-130	%		13-NOV-16	R3595381
L1853274-4 MW4 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	679		1.2	mg/L		07-NOV-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		07-NOV-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		07-NOV-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	557		1.0	mg/L		04-NOV-16	R3589373
Miscellaneous Parameters							
Ammonia, Total (as N)	0.029		0.010	mg/L		10-NOV-16	R3592194
Chemical Oxygen Demand	21		20	mg/L		08-NOV-16	R3590684
Chloride (Cl)	3.0	DLM	2.5	mg/L		04-NOV-16	R3590363
Conductivity	1330		1.0	umhos/cm		04-NOV-16	R3589373
Hardness (as CaCO3)	1080	HTC	0.54	mg/L		10-NOV-16	
Nitrate (as N)	<0.10	DLM	0.10	mg/L		04-NOV-16	R3590363
Nitrite (as N)	<0.050	DLM	0.050	mg/L		04-NOV-16	R3590363
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		07-NOV-16	R3589771
Silica, Reactive (as SiO2)	18.4		1.0	mg/L		04-NOV-16	R3587927
Special Request	See Attached					12-DEC-16	R3625059
Sulfate (SO4)	290		1.5	mg/L		04-NOV-16	R3590363
Xylenes (Total)	<0.0015		0.0015	mg/L		15-NOV-16	
Total Dissolved Solids	969		20	mg/L		09-NOV-16	R3594360
Total Kjeldahl Nitrogen	0.22		0.20	mg/L	11-NOV-16	14-NOV-16	R3594665
Total Organic Carbon	4.78		0.50	mg/L		15-NOV-16	R3595843
Total Solids	1380		10	mg/L		08-NOV-16	R3591372
Total Suspended Solids	315		5.0	mg/L		04-NOV-16	R3591158
Total THMs	<0.0010		0.0010	mg/L		15-NOV-16	
Turbidity	152		0.10	NTU		04-NOV-16	R3589360
pH	7.68		0.10	pH units		04-NOV-16	R3589373
Total Metals by ICP-MS							
Aluminum (Al)-Total	2.86		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Antimony (Sb)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Arsenic (As)-Total	0.0018		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Barium (Ba)-Total	0.0635		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-4 MW4 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Total Metals by ICP-MS							
Boron (B)-Total	0.155		0.030	mg/L	09-NOV-16	09-NOV-16	R3591916
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	09-NOV-16	09-NOV-16	R3591916
Calcium (Ca)-Total	180		0.20	mg/L	09-NOV-16	09-NOV-16	R3591916
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Chromium (Cr)-Total	0.0045		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Cobalt (Co)-Total	0.00173		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Copper (Cu)-Total	0.0053		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Iron (Fe)-Total	3.80		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Lead (Pb)-Total	0.0030		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Lithium (Li)-Total	0.155		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Magnesium (Mg)-Total	154		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Manganese (Mn)-Total	0.220		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Molybdenum (Mo)-Total	0.00497		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Nickel (Ni)-Total	0.0068		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Phosphorus (P)-Total	<0.50		0.50	mg/L	09-NOV-16	09-NOV-16	R3591916
Potassium (K)-Total	6.29		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Rubidium (Rb)-Total	0.00646		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Selenium (Se)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Silicon (Si)-Total	16.9		0.30	mg/L	09-NOV-16	09-NOV-16	R3591916
Silver (Ag)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Sodium (Na)-Total	39.1		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Strontium (Sr)-Total	0.800		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Tellurium (Te)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Thallium (Tl)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Thorium (Th)-Total	0.0013		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tin (Sn)-Total	0.00077		0.00060	mg/L	09-NOV-16	09-NOV-16	R3591916
Titanium (Ti)-Total	0.136		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tungsten (W)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Uranium (U)-Total	0.0403		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Vanadium (V)-Total	0.0063		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zinc (Zn)-Total	<0.020		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zirconium (Zr)-Total	0.0030		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		13-NOV-16	R3595381
Benzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromodichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromoform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromomethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
n-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
sec-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
tert-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon disulfide	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloroethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
Chloroform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
2-Chlorotoluene	<0.020		0.020	mg/L		13-NOV-16	R3595381
4-Chlorotoluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-4 MW4 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
Dibromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromoethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromomethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
1,1-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,3-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
Ethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
F1	<0.10		0.10	mg/L		13-NOV-16	R3595381
Hexachlorobutadiene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Hexane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-NOV-16	R3595381
Isopropylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
MEK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MIBK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MTBE	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Styrene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Tetrachloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Toluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Vinyl Chloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
M+P-Xylenes	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
o-Xylene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Surrogate: 4-Bromofluorobenzene (SS)	101.6		70-130	%		13-NOV-16	R3595381
Surrogate: 1,4-Difluorobenzene (SS)	103.3		70-130	%		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-5 MW5 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	878		1.2	mg/L		07-NOV-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		07-NOV-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		07-NOV-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	720		1.0	mg/L		04-NOV-16	R3589373
Miscellaneous Parameters							
Ammonia, Total (as N)	0.060		0.010	mg/L		10-NOV-16	R3592194
Chemical Oxygen Demand	40		20	mg/L		08-NOV-16	R3590684
Chloride (Cl)	<10	DLM	10	mg/L		04-NOV-16	R3590363
Conductivity	3360		1.0	umhos/cm		04-NOV-16	R3589373
Hardness (as CaCO3)	3240	HTC	0.54	mg/L		10-NOV-16	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		04-NOV-16	R3590363
Nitrite (as N)	<0.20	DLM	0.20	mg/L		04-NOV-16	R3590363
Orthophosphate-Dissolved (as P)	0.020		0.010	mg/L		07-NOV-16	R3589771
Silica, Reactive (as SiO2)	19.7		1.0	mg/L		04-NOV-16	R3587927
Special Request	See Attached					12-DEC-16	R3625059
Sulfate (SO4)	2730		6.0	mg/L		04-NOV-16	R3590363
Xylenes (Total)	<0.0015		0.0015	mg/L		15-NOV-16	
Total Dissolved Solids	4570		20	mg/L		09-NOV-16	R3594360
Total Kjeldahl Nitrogen	0.93		0.20	mg/L	11-NOV-16	14-NOV-16	R3594665
Total Organic Carbon	15.2		0.50	mg/L		15-NOV-16	R3595855
Total Solids	4920		10	mg/L		08-NOV-16	R3591372
Total Suspended Solids	40.0		5.0	mg/L		04-NOV-16	R3591158
Total THMs	<0.0010		0.0010	mg/L		15-NOV-16	
Turbidity	18.5		0.10	NTU		04-NOV-16	R3589360
pH	7.60		0.10	pH units		04-NOV-16	R3589373
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.542		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Antimony (Sb)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Arsenic (As)-Total	0.0012		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Barium (Ba)-Total	0.0289		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Boron (B)-Total	0.152		0.030	mg/L	09-NOV-16	09-NOV-16	R3591916
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	09-NOV-16	09-NOV-16	R3591916
Calcium (Ca)-Total	468		0.20	mg/L	09-NOV-16	09-NOV-16	R3591916
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Chromium (Cr)-Total	0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Cobalt (Co)-Total	0.00090		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Copper (Cu)-Total	0.0075		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Iron (Fe)-Total	0.57		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Lead (Pb)-Total	0.0012		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Lithium (Li)-Total	0.420		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Magnesium (Mg)-Total	502		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Manganese (Mn)-Total	0.320		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Molybdenum (Mo)-Total	0.00345		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Nickel (Ni)-Total	0.0257		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-5 MW5 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Total Metals by ICP-MS							
Phosphorus (P)-Total	<0.50		0.50	mg/L	09-NOV-16	09-NOV-16	R3591916
Potassium (K)-Total	10.5		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Rubidium (Rb)-Total	0.00192		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Selenium (Se)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Silicon (Si)-Total	12.8		0.30	mg/L	09-NOV-16	09-NOV-16	R3591916
Silver (Ag)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Sodium (Na)-Total	189		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Strontium (Sr)-Total	2.28		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Tellurium (Te)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Thallium (Tl)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Thorium (Th)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tin (Sn)-Total	0.00116		0.00060	mg/L	09-NOV-16	09-NOV-16	R3591916
Titanium (Ti)-Total	0.0228		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tungsten (W)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Uranium (U)-Total	0.167		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Vanadium (V)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zinc (Zn)-Total	0.021		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zirconium (Zr)-Total	0.0019		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		13-NOV-16	R3595381
Benzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromodichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromoform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromomethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
n-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
sec-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
tert-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon disulfide	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloroethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
Chloroform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
2-Chlorotoluene	<0.020		0.020	mg/L		13-NOV-16	R3595381
4-Chlorotoluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromoethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromomethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-5 MW5 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
1,2-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
1,1-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,3-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
Ethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
F1	<0.10		0.10	mg/L		13-NOV-16	R3595381
Hexachlorobutadiene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Hexane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-NOV-16	R3595381
Isopropylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
MEK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MIBK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MTBE	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Styrene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Tetrachloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Toluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Vinyl Chloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
M+P-Xylenes	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
o-Xylene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Surrogate: 4-Bromofluorobenzene (SS)	99.3		70-130	%		13-NOV-16	R3595381
Surrogate: 1,4-Difluorobenzene (SS)	103.0		70-130	%		13-NOV-16	R3595381
L1853274-6 MW6 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	846		1.2	mg/L		07-NOV-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		07-NOV-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		07-NOV-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	694		1.0	mg/L		04-NOV-16	R3589373
Miscellaneous Parameters							
Ammonia, Total (as N)	0.068		0.010	mg/L		10-NOV-16	R3592194
Chemical Oxygen Demand	51		20	mg/L		08-NOV-16	R3590684
Chloride (Cl)	21.9		2.5	mg/L		04-NOV-16	R3590363

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-6 MW6 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Conductivity	1070		1.0	umhos/cm		04-NOV-16	R3589373
Hardness (as CaCO3)	795	HTC	0.54	mg/L		10-NOV-16	
Nitrate (as N)	0.63		0.10	mg/L		04-NOV-16	R3590363
Nitrite (as N)	<0.050	DLM	0.050	mg/L		04-NOV-16	R3590363
Orthophosphate-Dissolved (as P)	0.021		0.010	mg/L		07-NOV-16	R3589771
Silica, Reactive (as SiO2)	21.2	DLM	2.0	mg/L		04-NOV-16	R3587927
Special Request	See Attached					12-DEC-16	R3625059
Sulfate (SO4)	81.9		1.5	mg/L		04-NOV-16	R3590363
Xylenes (Total)	<0.0015		0.0015	mg/L		15-NOV-16	
Total Dissolved Solids	709		20	mg/L		09-NOV-16	R3594360
Total Kjeldahl Nitrogen	0.43		0.20	mg/L	11-NOV-16	14-NOV-16	R3594665
Total Organic Carbon	5.04		0.50	mg/L		15-NOV-16	R3595855
Total Solids	1690		10	mg/L		08-NOV-16	R3591372
Total Suspended Solids	920		17	mg/L		04-NOV-16	R3591158
Total THMs	<0.0010		0.0010	mg/L		15-NOV-16	
Turbidity	1260		0.10	NTU		04-NOV-16	R3589360
pH	7.56		0.10	pH units		04-NOV-16	R3589373
Total Metals by ICP-MS							
Aluminum (Al)-Total	2.45		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Antimony (Sb)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Arsenic (As)-Total	0.0011		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Barium (Ba)-Total	0.135		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Boron (B)-Total	0.129		0.030	mg/L	09-NOV-16	09-NOV-16	R3591916
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	09-NOV-16	09-NOV-16	R3591916
Calcium (Ca)-Total	115		0.20	mg/L	09-NOV-16	09-NOV-16	R3591916
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Chromium (Cr)-Total	0.0031		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Cobalt (Co)-Total	0.00219		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Copper (Cu)-Total	0.0040		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Iron (Fe)-Total	1.86		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Lead (Pb)-Total	0.0018		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Lithium (Li)-Total	0.125		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Magnesium (Mg)-Total	123		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Manganese (Mn)-Total	0.222		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Molybdenum (Mo)-Total	0.00305		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Nickel (Ni)-Total	0.0074		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Phosphorus (P)-Total	<0.50		0.50	mg/L	09-NOV-16	09-NOV-16	R3591916
Potassium (K)-Total	5.21		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Rubidium (Rb)-Total	0.00532		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Selenium (Se)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Silicon (Si)-Total	16.4		0.30	mg/L	09-NOV-16	09-NOV-16	R3591916
Silver (Ag)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Sodium (Na)-Total	40.6		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Strontium (Sr)-Total	0.662		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Tellurium (Te)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Thallium (Tl)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Thorium (Th)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tin (Sn)-Total	<0.00060		0.00060	mg/L	09-NOV-16	09-NOV-16	R3591916
Titanium (Ti)-Total	0.0894		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-6 MW6 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Total Metals by ICP-MS							
Tungsten (W)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Uranium (U)-Total	0.0354		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Vanadium (V)-Total	0.0062		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zinc (Zn)-Total	<0.020		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zirconium (Zr)-Total	0.0027		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		13-NOV-16	R3595381
Benzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromodichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromoform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromomethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
n-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
sec-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
tert-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon disulfide	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloroethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
Chloroform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
2-Chlorotoluene	<0.020		0.020	mg/L		13-NOV-16	R3595381
4-Chlorotoluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromoethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromomethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
1,1-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,3-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
Ethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
F1	<0.10		0.10	mg/L		13-NOV-16	R3595381
Hexachlorobutadiene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Hexane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-NOV-16	R3595381
Isopropylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-6 MW6 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
MEK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MIBK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MTBE	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Styrene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Tetrachloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Toluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Vinyl Chloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
M+P-Xylenes	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
o-Xylene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Surrogate: 4-Bromofluorobenzene (SS)	101.8		70-130	%		13-NOV-16	R3595381
Surrogate: 1,4-Difluorobenzene (SS)	103.3		70-130	%		13-NOV-16	R3595381
L1853274-7 MW7 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	795		1.2	mg/L		08-NOV-16	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		08-NOV-16	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		08-NOV-16	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	652		1.0	mg/L		07-NOV-16	R3590224
Miscellaneous Parameters							
Ammonia, Total (as N)	0.085		0.010	mg/L		10-NOV-16	R3592194
Chemical Oxygen Demand	24		20	mg/L		08-NOV-16	R3590684
Chloride (Cl)	<10	DLM	10	mg/L		04-NOV-16	R3590363
Conductivity	3350		1.0	umhos/cm		07-NOV-16	R3590224
Hardness (as CaCO3)	2520	HTC	0.54	mg/L		10-NOV-16	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		04-NOV-16	R3590363
Nitrite (as N)	<0.20	DLM	0.20	mg/L		04-NOV-16	R3590363
Orthophosphate-Dissolved (as P)	0.014		0.010	mg/L		07-NOV-16	R3589771
Silica, Reactive (as SiO2)	18.7		1.0	mg/L		04-NOV-16	R3587927
Special Request	See Attached					12-DEC-16	R3625059
Sulfate (SO4)	2030		6.0	mg/L		04-NOV-16	R3590363
Xylenes (Total)	<0.0015		0.0015	mg/L		15-NOV-16	
Total Dissolved Solids	3550		20	mg/L		09-NOV-16	R3594360
Total Kjeldahl Nitrogen	0.35		0.20	mg/L	11-NOV-16	14-NOV-16	R3594665
Total Organic Carbon	8.04		0.50	mg/L		15-NOV-16	R3595855

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-7 MW7 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
Total Solids	3810		10	mg/L		08-NOV-16	R3591372
Total Suspended Solids	65.0		5.0	mg/L		04-NOV-16	R3591158
Total THMs	<0.0010		0.0010	mg/L		15-NOV-16	
Turbidity	50.6		0.10	NTU		04-NOV-16	R3589360
pH	7.30		0.10	pH units		07-NOV-16	R3590224
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.345		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Antimony (Sb)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Arsenic (As)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Barium (Ba)-Total	0.0137		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Beryllium (Be)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Boron (B)-Total	0.202		0.030	mg/L	09-NOV-16	09-NOV-16	R3591916
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L	09-NOV-16	09-NOV-16	R3591916
Calcium (Ca)-Total	402		0.20	mg/L	09-NOV-16	09-NOV-16	R3591916
Cesium (Cs)-Total	<0.00050		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Chromium (Cr)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Cobalt (Co)-Total	0.00383		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Copper (Cu)-Total	0.0032		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Iron (Fe)-Total	0.28		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Lead (Pb)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Lithium (Li)-Total	0.372		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Magnesium (Mg)-Total	368		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Manganese (Mn)-Total	0.475		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Molybdenum (Mo)-Total	0.00283		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Nickel (Ni)-Total	0.0167		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Phosphorus (P)-Total	<0.50		0.50	mg/L	09-NOV-16	09-NOV-16	R3591916
Potassium (K)-Total	9.47		0.10	mg/L	09-NOV-16	09-NOV-16	R3591916
Rubidium (Rb)-Total	0.00102		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Selenium (Se)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Silicon (Si)-Total	11.6		0.30	mg/L	09-NOV-16	09-NOV-16	R3591916
Silver (Ag)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Sodium (Na)-Total	175		0.050	mg/L	09-NOV-16	09-NOV-16	R3591916
Strontium (Sr)-Total	2.00		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Tellurium (Te)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Thallium (Tl)-Total	<0.0050		0.0050	mg/L	09-NOV-16	09-NOV-16	R3591916
Thorium (Th)-Total	<0.0010		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tin (Sn)-Total	<0.00060		0.00060	mg/L	09-NOV-16	09-NOV-16	R3591916
Titanium (Ti)-Total	0.0116		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
Tungsten (W)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Uranium (U)-Total	0.189		0.00050	mg/L	09-NOV-16	09-NOV-16	R3591916
Vanadium (V)-Total	<0.0020		0.0020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zinc (Zn)-Total	<0.020		0.020	mg/L	09-NOV-16	09-NOV-16	R3591916
Zirconium (Zr)-Total	0.0012		0.0010	mg/L	09-NOV-16	09-NOV-16	R3591916
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		13-NOV-16	R3595381
Benzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromodichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromoform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Bromomethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-7 MW7 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
n-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
sec-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
tert-Butylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon disulfide	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Carbon Tetrachloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloroethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
Chloroform	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Chloromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
2-Chlorotoluene	<0.020		0.020	mg/L		13-NOV-16	R3595381
4-Chlorotoluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromochloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dibromoethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dibromomethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,1-dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1-dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Dichloromethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3-Dichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
1,1-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
cis-1,3-Dichloropropene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		13-NOV-16	R3595381
Ethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
F1	<0.10		0.10	mg/L		13-NOV-16	R3595381
Hexachlorobutadiene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Hexane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		13-NOV-16	R3595381
Isopropylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
4-Isopropyltoluene	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
MEK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MIBK	<0.020		0.020	mg/L		13-NOV-16	R3595381
MTBE	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Styrene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Tetrachloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Toluene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Trichloroethene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1853274-7 MW7 C							
Sampled By: JRB on 02-NOV-16 @ 15:00							
Matrix: Water							
VOC plus F1 by GCMS							
Trichlorofluoromethane	<0.0010		0.0010	mg/L		13-NOV-16	R3595381
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Vinyl Chloride	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
M+P-Xylenes	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
o-Xylene	<0.00050		0.00050	mg/L		13-NOV-16	R3595381
Surrogate: 4-Bromofluorobenzene (SS)	108.8		70-130	%		13-NOV-16	R3595381
Surrogate: 1,4-Difluorobenzene (SS)	103.2		70-130	%		13-NOV-16	R3595381

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
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**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)

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

COD-WP	Water	Chemical Oxygen Demand	APHA 5220 D

The Chemical Oxygen Demand (COD) test is used to estimate the amount of organic matter in the water. The sample is added to HACH brand COD tubes, which contain a premixed volume of reagents. The sample is then heated for two hours on the COD reactor with a strong oxidizing agent, potassium dichromate. The COD reagents also contain silver and mercury ions. Silver is used as a catalyst and mercury is used to complex chloride interference. Oxidizable organic compounds react, reducing the dichromate ion to green chromic ion.

For the 10 - 150 mg/L range the remaining Cr6+ is measured colormetrically and a decrease in absorbance at 420 nm is proportional to the COD. For the 100 - 1500 mg/L range the amount of Cr3+ produced is measured colormetrically and an increase in absorbance at 620 nm is proportional to the COD. Samples with concentrations > 1500 mg/L can be diluted into either linear range.

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

HARDNESS-CALC-WP	Water	Hardness Calculated	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.

MET-T-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-T

This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	APHA 4500 NorgD (modified)

Aqueous samples are digested in a block digester with sulfuric acid and copper sulfate as a catalyst. Total Kjeldahl Nitrogen is then analyzed using a discrete analyzer with colorimetric detection.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
nitroprusside and measured colourmetrically.			
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PO4-DO-COL-WP	Water	Phosphate Ortho Dissolved in Water	APHA 4500 P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SIO2-COL-WP	Water	Reactive Silica by colour	APHA 4500 SIO2
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 "Silica". Molybdate Reactive Silica is determined by analysis of the sample using the heteropoly blue colourimetric method.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOT-WP	Water	Total Solids	APHA 2540 B (modified)
Total solids in aqueous matrices is determined gravimetrically after evaporation of the sample at 103 105°C.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
SPECIAL REQUEST-KL	Misc.	Special Request - Kelso	SEE SUBLET LAB RESULTS
TDS-WP	Water	Total Dissolved Solids (TDS)	APHA 2540 SOLIDS C,E
A well-mixed sample is filtered through a glass fiber filter paper. The filtrate is then evaportaed to dryness in a pre-weighed vial and dried at 180 – 2C. The increase in vial weight represents the total dissolved solids.			
THM-SUM-CALC-WP	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			
VOC+F1-HSMS-WP	Water	VOC plus F1 by GCMS	EPA 8260C / EPA 5021A
In this method samples are analyzed using a headspace autosampler interfaced to a dual column gas chromatograph with MS and Flame Ionization detectors.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** 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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
KL	ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
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
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
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.

Quality Control Report

Workorder: L1853274 Report Date: 29-DEC-16

Client: WSP Canada Inc.
1600 Buffalo Place
Winnipeg MB R3T 6B8
Contact: JUSTIN RAK-BANVILLE

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R3589373								
WG2427503-14 LCS								
Alkalinity, Total (as CaCO3)			98.1		%		85-115	04-NOV-16
WG2427503-11 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	04-NOV-16
Batch R3590224								
WG2428320-4 LCS								
Alkalinity, Total (as CaCO3)			96.3		%		85-115	07-NOV-16
WG2428320-1 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	07-NOV-16
C-TOC-HTC-WP	**Water**							
Batch R3595843								
WG2433504-2 LCS								
Total Organic Carbon			103.5		%		80-120	15-NOV-16
WG2433504-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	15-NOV-16
Batch R3595855								
WG2433511-2 LCS								
Total Organic Carbon			95.9		%		80-120	15-NOV-16
WG2433511-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	15-NOV-16
CL-IC-N-WP	**Water**							
Batch R3590363								
WG2426713-6 LCS								
Chloride (Cl)			100.3		%		90-110	04-NOV-16
WG2426713-5 MB								
Chloride (Cl)			<0.50		mg/L		0.5	04-NOV-16
COD-WP	**Water**							
Batch R3590684								
WG2428557-6 LCS								
Chemical Oxygen Demand			96.5		%		85-115	08-NOV-16
WG2428557-5 MB								
Chemical Oxygen Demand			<20		mg/L		20	08-NOV-16
EC-WP	**Water**							
Batch R3589373								
WG2427503-13 LCS								
Conductivity			101.2		%		90-110	04-NOV-16
WG2427503-11 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WP	**Water**							
Batch R3589373								
WG2427503-11 MB								
Conductivity			<1.0		umhos/cm		1	04-NOV-16
Batch R3590224								
WG2428320-3 LCS								
Conductivity			99.7		%		90-110	07-NOV-16
WG2428320-1 MB								
Conductivity			<1.0		umhos/cm		1	07-NOV-16
MET-T-MS-WP	**Water**							
Batch R3591916								
WG2429322-2 LCS								
Aluminum (Al)-Total			102.2		%		80-120	09-NOV-16
Antimony (Sb)-Total			96.7		%		80-120	09-NOV-16
Arsenic (As)-Total			101.3		%		80-120	09-NOV-16
Barium (Ba)-Total			105.8		%		80-120	09-NOV-16
Beryllium (Be)-Total			98.9		%		80-120	09-NOV-16
Bismuth (Bi)-Total			102.5		%		80-120	09-NOV-16
Boron (B)-Total			98.2		%		80-120	09-NOV-16
Cadmium (Cd)-Total			100.0		%		80-120	09-NOV-16
Calcium (Ca)-Total			99.4		%		80-120	09-NOV-16
Cesium (Cs)-Total			96.9		%		80-120	09-NOV-16
Chromium (Cr)-Total			102.5		%		80-120	09-NOV-16
Cobalt (Co)-Total			101.9		%		80-120	09-NOV-16
Copper (Cu)-Total			99.7		%		80-120	09-NOV-16
Iron (Fe)-Total			97.1		%		80-120	09-NOV-16
Lead (Pb)-Total			102.7		%		80-120	09-NOV-16
Lithium (Li)-Total			101.5		%		80-120	09-NOV-16
Magnesium (Mg)-Total			103.4		%		80-120	09-NOV-16
Manganese (Mn)-Total			103.8		%		80-120	09-NOV-16
Molybdenum (Mo)-Total			101.8		%		80-120	09-NOV-16
Nickel (Ni)-Total			101.6		%		80-120	09-NOV-16
Phosphorus (P)-Total			107.1		%		80-120	09-NOV-16
Potassium (K)-Total			103.5		%		80-120	09-NOV-16
Rubidium (Rb)-Total			105.7		%		80-120	09-NOV-16
Selenium (Se)-Total			95.1		%		80-120	09-NOV-16
Silicon (Si)-Total			108.1		%		80-120	09-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-MS-WP	**Water**							
Batch R3591916								
WG2429322-2 LCS								
Silver (Ag)-Total			98.1		%		80-120	09-NOV-16
Sodium (Na)-Total			103.9		%		80-120	09-NOV-16
Strontium (Sr)-Total			105.6		%		80-120	09-NOV-16
Tellurium (Te)-Total			98.3		%		80-120	09-NOV-16
Thallium (Tl)-Total			102.7		%		80-120	09-NOV-16
Thorium (Th)-Total			102.7		%		80-120	09-NOV-16
Tin (Sn)-Total			102.6		%		80-120	09-NOV-16
Titanium (Ti)-Total			101.7		%		80-120	09-NOV-16
Tungsten (W)-Total			102.2		%		80-120	09-NOV-16
Uranium (U)-Total			99.7		%		80-120	09-NOV-16
Vanadium (V)-Total			104.1		%		80-120	09-NOV-16
Zinc (Zn)-Total			97.4		%		80-120	09-NOV-16
Zirconium (Zr)-Total			96.2		%		80-120	09-NOV-16
WG2429322-1 MB								
Aluminum (Al)-Total			<0.020		mg/L		0.02	09-NOV-16
Antimony (Sb)-Total			<0.0010		mg/L		0.001	09-NOV-16
Arsenic (As)-Total			<0.0010		mg/L		0.001	09-NOV-16
Barium (Ba)-Total			<0.00050		mg/L		0.0005	09-NOV-16
Beryllium (Be)-Total			<0.0010		mg/L		0.001	09-NOV-16
Bismuth (Bi)-Total			<0.00050		mg/L		0.0005	09-NOV-16
Boron (B)-Total			<0.030		mg/L		0.03	09-NOV-16
Cadmium (Cd)-Total			<0.00020		mg/L		0.0002	09-NOV-16
Calcium (Ca)-Total			<0.20		mg/L		0.2	09-NOV-16
Cesium (Cs)-Total			<0.00050		mg/L		0.0005	09-NOV-16
Chromium (Cr)-Total			<0.0020		mg/L		0.002	09-NOV-16
Cobalt (Co)-Total			<0.00050		mg/L		0.0005	09-NOV-16
Copper (Cu)-Total			<0.0020		mg/L		0.002	09-NOV-16
Iron (Fe)-Total			<0.10		mg/L		0.1	09-NOV-16
Lead (Pb)-Total			<0.0010		mg/L		0.001	09-NOV-16
Lithium (Li)-Total			<0.0020		mg/L		0.002	09-NOV-16
Magnesium (Mg)-Total			<0.050		mg/L		0.05	09-NOV-16
Manganese (Mn)-Total			<0.0010		mg/L		0.001	09-NOV-16
Molybdenum (Mo)-Total			<0.00050		mg/L		0.0005	09-NOV-16
Nickel (Ni)-Total			<0.0020		mg/L		0.002	09-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-MS-WP	**Water**							
Batch R3591916								
WG2429322-1 MB								
Phosphorus (P)-Total			<0.50		mg/L		0.5	09-NOV-16
Potassium (K)-Total			<0.10		mg/L		0.1	09-NOV-16
Rubidium (Rb)-Total			<0.00050		mg/L		0.0005	09-NOV-16
Selenium (Se)-Total			<0.0050		mg/L		0.005	09-NOV-16
Silicon (Si)-Total			<0.30		mg/L		0.3	09-NOV-16
Silver (Ag)-Total			<0.0010		mg/L		0.001	09-NOV-16
Sodium (Na)-Total			<0.050		mg/L		0.05	09-NOV-16
Strontium (Sr)-Total			<0.00050		mg/L		0.0005	09-NOV-16
Tellurium (Te)-Total			<0.0010		mg/L		0.001	09-NOV-16
Thallium (Tl)-Total			<0.0050		mg/L		0.005	09-NOV-16
Thorium (Th)-Total			<0.0010		mg/L		0.001	09-NOV-16
Tin (Sn)-Total			<0.00060		mg/L		0.0006	09-NOV-16
Titanium (Ti)-Total			<0.0010		mg/L		0.001	09-NOV-16
Tungsten (W)-Total			<0.0020		mg/L		0.002	09-NOV-16
Uranium (U)-Total			<0.00050		mg/L		0.0005	09-NOV-16
Vanadium (V)-Total			<0.0020		mg/L		0.002	09-NOV-16
Zinc (Zn)-Total			<0.020		mg/L		0.02	09-NOV-16
Zirconium (Zr)-Total			<0.0010		mg/L		0.001	09-NOV-16
N-TOTKJ-WP	**Water**							
Batch R3594665								
WG2430741-2 LCS								
Total Kjeldahl Nitrogen			100.2		%		75-125	14-NOV-16
WG2430741-1 MB								
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	14-NOV-16
Batch R3597178								
WG2432107-10 LCS								
Total Kjeldahl Nitrogen			91.9		%		75-125	17-NOV-16
WG2432107-9 MB								
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	17-NOV-16
NH3-COL-WP	**Water**							
Batch R3592194								
WG2429568-2 LCS								
Ammonia, Total (as N)			101.3		%		85-115	09-NOV-16
WG2429568-6 LCS								
Ammonia, Total (as N)			99.7		%		85-115	09-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-COL-WP	**Water**							
Batch R3592194								
WG2429568-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	09-NOV-16
WG2429568-5 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	09-NOV-16
NO2-IC-N-WP	**Water**							
Batch R3590363								
WG2426713-6 LCS								
Nitrite (as N)			99.3		%		90-110	04-NOV-16
WG2426713-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	04-NOV-16
NO3-IC-N-WP	**Water**							
Batch R3590363								
WG2426713-6 LCS								
Nitrate (as N)			100.8		%		90-110	04-NOV-16
WG2426713-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	04-NOV-16
PH-WP	**Water**							
Batch R3589373								
WG2427503-12 LCS								
pH			7.42		pH units		7.3-7.5	04-NOV-16
Batch R3590224								
WG2428320-2 LCS								
pH			7.41		pH units		7.3-7.5	07-NOV-16
PO4-DO-COL-WP	**Water**							
Batch R3589771								
WG2427349-2 LCS								
Orthophosphate-Dissolved (as P)			99.3		%		80-120	07-NOV-16
WG2427349-1 MB								
Orthophosphate-Dissolved (as P)			<0.010		mg/L		0.01	07-NOV-16
SIO2-COL-WP	**Water**							
Batch R3587927								
WG2426415-2 LCS								
Silica, Reactive (as SiO2)			106.0		%		85-115	04-NOV-16
WG2426415-1 MB								
Silica, Reactive (as SiO2)			<1.0		mg/L		1	04-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WP	**Water**							
Batch R3590363								
WG2426713-6 LCS								
Sulfate (SO4)			100.8		%		90-110	04-NOV-16
WG2426713-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	04-NOV-16
SOLIDS-TOT-WP	**Water**							
Batch R3591372								
WG2428289-2 LCS								
Total Solids			98.0		%		85-115	08-NOV-16
WG2428289-1 MB								
Total Solids			<10		mg/L		10	08-NOV-16
SOLIDS-TOTSUS-WP	**Water**							
Batch R3591158								
WG2426127-11 DUP		**L1853274-1**						
Total Suspended Solids		53.0	54.0		mg/L	1.9	20	04-NOV-16
WG2426127-10 LCS								
Total Suspended Solids			104.7		%		85-115	04-NOV-16
WG2426127-9 MB								
Total Suspended Solids			<5.0		mg/L		5	04-NOV-16
TDS-WP	**Water**							
Batch R3594360								
WG2429170-2 LCS								
Total Dissolved Solids			99.3		%		85-115	09-NOV-16
WG2429170-1 MB								
Total Dissolved Solids			<10		mg/L		10	09-NOV-16
TURBIDITY-WP	**Water**							
Batch R3589360								
WG2427596-2 DUP		**L1853274-4**						
Turbidity		152	150		NTU	1.3	15	04-NOV-16
WG2427596-3 LCS								
Turbidity			100.0		%		85-115	04-NOV-16
WG2427596-1 MB								
Turbidity			<0.10		NTU		0.1	04-NOV-16
VOC+F1-HSMS-WP	**Water**							
Batch R3595381								
WG2432172-3 DUP		**L1853274-1**						
Acetone		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-NOV-16
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R3595381								
WG2432172-3 DUP		**L1853274-1**						
Bromobenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Bromochloromethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Bromodichloromethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Bromoform		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Bromomethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-NOV-16
n-Butylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
sec-Butylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
tert-Butylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Carbon disulfide		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Carbon Tetrachloride		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Chlorobenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Chloroethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-NOV-16
Chloroform		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Chloromethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-NOV-16
2-Chlorotoluene		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-NOV-16
4-Chlorotoluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Dibromochloromethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,2-Dibromo-3-chloropropane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,2-Dibromoethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Dibromomethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,2-Dichlorobenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,3-Dichlorobenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,4-Dichlorobenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Dichlorodifluoromethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-NOV-16
1,1-dichloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,2-Dichloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,1-dichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
cis-1,2-Dichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
trans-1,2-Dichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Dichloromethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,2-Dichloropropane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,3-Dichloropropane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
2,2-Dichloropropane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-NOV-16
1,1-Dichloropropene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R3595381								
WG2432172-3 DUP		**L1853274-1**						
cis-1,3-Dichloropropene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
trans-1,3-Dichloropropene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-NOV-16
Ethylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
F1		<0.10	<0.10	RPD-NA	mg/L	N/A	30	13-NOV-16
Hexachlorobutadiene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Hexane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
2-Hexanone (Methyl butyl ketone)		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-NOV-16
Isopropylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
4-Isopropyltoluene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	13-NOV-16
MEK		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-NOV-16
MIBK		<0.020	<0.020	RPD-NA	mg/L	N/A	30	13-NOV-16
MTBE		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Styrene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,1,1,2-Tetrachloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,1,2,2-Tetrachloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Tetrachloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Toluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,2,3-Trichlorobenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,2,4-Trichlorobenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,1,1-Trichloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,1,2-Trichloroethane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Trichloroethene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Trichlorofluoromethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	13-NOV-16
1,2,3-Trichloropropane		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,2,4-Trimethylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
1,3,5-Trimethylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
Vinyl Chloride		<0.00050	<0.00050	RPD-NA	mg/L	N/A	50	13-NOV-16
M+P-Xylenes		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
o-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	13-NOV-16
WG2432172-2 LCS								
Acetone			82.3		%		70-130	13-NOV-16
Benzene			107.5		%		70-130	13-NOV-16
Bromobenzene			111.2		%		70-130	13-NOV-16
Bromochloromethane			106.3		%		70-130	13-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R3595381								
WG2432172-2 LCS								
Bromodichloromethane			107.3		%		70-130	13-NOV-16
Bromoform			106.7		%		70-130	13-NOV-16
Bromomethane			100.7		%		60-140	13-NOV-16
n-Butylbenzene			129.6		%		70-130	13-NOV-16
sec-Butylbenzene			126.3		%		70-130	13-NOV-16
tert-Butylbenzene			128.4		%		70-130	13-NOV-16
Carbon disulfide			103.4		%		70-130	13-NOV-16
Carbon Tetrachloride			108.3		%		70-130	13-NOV-16
Chlorobenzene			113.1		%		70-130	13-NOV-16
Chloroethane			100.2		%		60-140	13-NOV-16
Chloroform			107.5		%		70-130	13-NOV-16
Chloromethane			91.8		%		60-140	13-NOV-16
2-Chlorotoluene			114.3		%		70-130	13-NOV-16
4-Chlorotoluene			116.0		%		70-130	13-NOV-16
Dibromochloromethane			113.5		%		70-130	13-NOV-16
1,2-Dibromo-3-chloropropane			94.2		%		70-130	13-NOV-16
1,2-Dibromoethane			111.3		%		70-130	13-NOV-16
Dibromomethane			106.4		%		70-130	13-NOV-16
1,2-Dichlorobenzene			111.7		%		70-130	13-NOV-16
1,3-Dichlorobenzene			119.9		%		70-130	13-NOV-16
1,4-Dichlorobenzene			118.2		%		70-130	13-NOV-16
Dichlorodifluoromethane			102.7		%		60-140	13-NOV-16
1,1-dichloroethane			105.3		%		70-130	13-NOV-16
1,2-Dichloroethane			102.0		%		70-130	13-NOV-16
1,1-dichloroethene			103.8		%		70-130	13-NOV-16
cis-1,2-Dichloroethene			107.8		%		70-130	13-NOV-16
trans-1,2-Dichloroethene			127.3		%		70-130	13-NOV-16
Dichloromethane			124.6		%		70-130	13-NOV-16
1,2-Dichloropropane			105.8		%		70-130	13-NOV-16
1,3-Dichloropropane			112.2		%		70-130	13-NOV-16
2,2-Dichloropropane			99.4		%		70-130	13-NOV-16
1,1-Dichloropropene			107.4		%		70-130	13-NOV-16
cis-1,3-Dichloropropene			103.3		%		70-130	13-NOV-16
trans-1,3-Dichloropropene			107.2		%		70-130	13-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R3595381								
WG2432172-2 LCS								
Ethylbenzene			115.1		%		70-130	13-NOV-16
F1			86.0		%		70-130	13-NOV-16
Hexachlorobutadiene			118.1		%		70-130	13-NOV-16
Hexane			110.4		%		70-130	13-NOV-16
2-Hexanone (Methyl butyl ketone)			103.1		%		70-130	13-NOV-16
Isopropylbenzene			123.5		%		70-130	13-NOV-16
4-Isopropyltoluene			126.5		%		70-130	13-NOV-16
MEK			110.7		%		70-130	13-NOV-16
MIBK			99.1		%		70-130	13-NOV-16
MTBE			112.5		%		70-130	13-NOV-16
Styrene			126.0		%		70-130	13-NOV-16
1,1,1,2-Tetrachloroethane			114.6		%		70-130	13-NOV-16
1,1,2,2-Tetrachloroethane			95.7		%		70-130	13-NOV-16
Tetrachloroethene			113.9		%		70-130	13-NOV-16
Toluene			116.3		%		70-130	13-NOV-16
1,2,3-Trichlorobenzene			104.3		%		70-130	13-NOV-16
1,2,4-Trichlorobenzene			103.5		%		70-130	13-NOV-16
1,1,1-Trichloroethane			107.5		%		70-130	13-NOV-16
1,1,2-Trichloroethane			113.2		%		70-130	13-NOV-16
Trichloroethene			106.3		%		70-130	13-NOV-16
Trichlorofluoromethane			104.1		%		60-140	13-NOV-16
1,2,3-Trichloropropane			101.9		%		70-130	13-NOV-16
1,2,4-Trimethylbenzene			123.6		%		70-130	13-NOV-16
1,3,5-Trimethylbenzene			126.4		%		70-130	13-NOV-16
Vinyl Chloride			97.8		%		60-140	13-NOV-16
M+P-Xylenes			116.3		%		70-130	13-NOV-16
o-Xylene			118.9		%		70-130	13-NOV-16
WG2432172-1 MB								
Acetone			<0.020		mg/L		0.02	13-NOV-16
Benzene			<0.00050		mg/L		0.0005	13-NOV-16
Bromobenzene			<0.00050		mg/L		0.0005	13-NOV-16
Bromochloromethane			<0.00050		mg/L		0.0005	13-NOV-16
Bromodichloromethane			<0.00050		mg/L		0.0005	13-NOV-16
Bromoform			<0.00050		mg/L		0.0005	13-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R3595381								
WG2432172-1 MB								
Bromomethane			<0.0010		mg/L		0.001	13-NOV-16
n-Butylbenzene			<0.00050		mg/L		0.0005	13-NOV-16
sec-Butylbenzene			<0.00050		mg/L		0.0005	13-NOV-16
tert-Butylbenzene			<0.00050		mg/L		0.0005	13-NOV-16
Carbon disulfide			<0.00050		mg/L		0.0005	13-NOV-16
Carbon Tetrachloride			<0.00050		mg/L		0.0005	13-NOV-16
Chlorobenzene			<0.00050		mg/L		0.0005	13-NOV-16
Chloroethane			<0.0010		mg/L		0.001	13-NOV-16
Chloroform			<0.00050		mg/L		0.0005	13-NOV-16
Chloromethane			<0.0010		mg/L		0.001	13-NOV-16
2-Chlorotoluene			<0.020		mg/L		0.02	13-NOV-16
4-Chlorotoluene			<0.00050		mg/L		0.0005	13-NOV-16
Dibromochloromethane			<0.00050		mg/L		0.0005	13-NOV-16
1,2-Dibromo-3-chloropropane			<0.00050		mg/L		0.0005	13-NOV-16
1,2-Dibromoethane			<0.00050		mg/L		0.0005	13-NOV-16
Dibromomethane			<0.00050		mg/L		0.0005	13-NOV-16
1,2-Dichlorobenzene			<0.00050		mg/L		0.0005	13-NOV-16
1,3-Dichlorobenzene			<0.00050		mg/L		0.0005	13-NOV-16
1,4-Dichlorobenzene			<0.00050		mg/L		0.0005	13-NOV-16
Dichlorodifluoromethane			<0.0010		mg/L		0.001	13-NOV-16
1,1-dichloroethane			<0.00050		mg/L		0.0005	13-NOV-16
1,2-Dichloroethane			<0.00050		mg/L		0.0005	13-NOV-16
1,1-dichloroethene			<0.00050		mg/L		0.0005	13-NOV-16
cis-1,2-Dichloroethene			<0.00050		mg/L		0.0005	13-NOV-16
trans-1,2-Dichloroethene			<0.00050		mg/L		0.0005	13-NOV-16
Dichloromethane			<0.00050		mg/L		0.0005	13-NOV-16
1,2-Dichloropropane			<0.00050		mg/L		0.0005	13-NOV-16
1,3-Dichloropropane			<0.00050		mg/L		0.0005	13-NOV-16
2,2-Dichloropropane			<0.00050		mg/L		0.0005	13-NOV-16
1,1-Dichloropropene			<0.00050		mg/L		0.0005	13-NOV-16
cis-1,3-Dichloropropene			<0.00050		mg/L		0.0005	13-NOV-16
trans-1,3-Dichloropropene			<0.00050		mg/L		0.0005	13-NOV-16
Ethylbenzene			<0.00050		mg/L		0.0005	13-NOV-16
F1			<0.10		mg/L		0.1	13-NOV-16

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch	**R3595381**							
WG2432172-1	**MB**							
Hexachlorobutadiene			<0.00050		mg/L		0.0005	13-NOV-16
Hexane			<0.00050		mg/L		0.0005	13-NOV-16
2-Hexanone (Methyl butyl ketone)			<0.020		mg/L		0.02	13-NOV-16
Isopropylbenzene			<0.00050		mg/L		0.0005	13-NOV-16
4-Isopropyltoluene			<0.0010		mg/L		0.001	13-NOV-16
MEK			<0.020		mg/L		0.02	13-NOV-16
MIBK			<0.020		mg/L		0.02	13-NOV-16
MTBE			<0.00050		mg/L		0.0005	13-NOV-16
Styrene			<0.00050		mg/L		0.0005	13-NOV-16
1,1,1,2-Tetrachloroethane			<0.00050		mg/L		0.0005	13-NOV-16
1,1,2,2-Tetrachloroethane			<0.00050		mg/L		0.0005	13-NOV-16
Tetrachloroethene			<0.00050		mg/L		0.0005	13-NOV-16
Toluene			<0.00050		mg/L		0.0005	13-NOV-16
1,2,3-Trichlorobenzene			<0.00050		mg/L		0.0005	13-NOV-16
1,2,4-Trichlorobenzene			<0.00050		mg/L		0.0005	13-NOV-16
1,1,1-Trichloroethane			<0.00050		mg/L		0.0005	13-NOV-16
1,1,2-Trichloroethane			<0.00050		mg/L		0.0005	13-NOV-16
Trichloroethene			<0.00050		mg/L		0.0005	13-NOV-16
Trichlorofluoromethane			<0.0010		mg/L		0.001	13-NOV-16
1,2,3-Trichloropropane			<0.00050		mg/L		0.0005	13-NOV-16
1,2,4-Trimethylbenzene			<0.00050		mg/L		0.0005	13-NOV-16
1,3,5-Trimethylbenzene			<0.00050		mg/L		0.0005	13-NOV-16
Vinyl Chloride			<0.00050		mg/L		0.0005	13-NOV-16
M+P-Xylenes			<0.00050		mg/L		0.0005	13-NOV-16
o-Xylene			<0.00050		mg/L		0.0005	13-NOV-16
Surrogate: 4-Bromofluorobenzene (SS)			98.2		%		70-130	13-NOV-16
Surrogate: 1,4-Difluorobenzene (SS)			102.2		%		70-130	13-NOV-16

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	02-NOV-16 15:00	04-NOV-16 11:11	0.25	44	hours	EHTR-FM
	2	02-NOV-16 15:00	04-NOV-16 11:11	0.25	44	hours	EHTR-FM
	3	02-NOV-16 15:00	04-NOV-16 11:11	0.25	44	hours	EHTR-FM
	4	02-NOV-16 15:00	04-NOV-16 11:11	0.25	44	hours	EHTR-FM
	5	02-NOV-16 15:00	04-NOV-16 11:11	0.25	44	hours	EHTR-FM
	6	02-NOV-16 15:00	04-NOV-16 11:11	0.25	44	hours	EHTR-FM
	7	02-NOV-16 15:00	07-NOV-16 10:38	0.25	116	hours	EHTR-FM
Anions and Nutrients							
Phosphate Ortho Dissolved in Water							
	1	02-NOV-16 15:00	06-NOV-16 13:00	48	94	hours	EHTL
	2	02-NOV-16 15:00	06-NOV-16 13:00	48	94	hours	EHTL
	3	02-NOV-16 15:00	06-NOV-16 13:00	48	94	hours	EHTL
	4	02-NOV-16 15:00	06-NOV-16 13:00	48	94	hours	EHTL
	5	02-NOV-16 15:00	06-NOV-16 13:00	48	94	hours	EHTL
	6	02-NOV-16 15:00	06-NOV-16 13:00	48	94	hours	EHTL
	7	02-NOV-16 15:00	06-NOV-16 13:00	48	94	hours	EHTL

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L1853274 were received on 03-NOV-16 16:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS Environmental
ALS Group USA, Corp
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Kelso, WA 98626
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www.alsglobal.com

December 29, 2016

Analytical Report for Service Request No: K1613684

Bea Ryback
ALS Environmental - Canada
Unit 12-1329 Niakwa Road East
Winnipeg, MB R2J 3T4

RE: L1853274

Dear Bea,

Enclosed are the results of the sample(s) submitted to our laboratory November 08, 2016
For your reference, these analyses have been assigned our service request number **K1613684.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

[redacted]

Kelley Lovejoy
Project Manager

ALS Environmental
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Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

ALS ENVIRONMENTAL

Client:	ALS Environmental - Canada	**Service Request No.:**	K1613684
Project:	L1853274	**Date Received:**	11/8/16
Sample Matrix:	Water		

Case Narrative

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt

Seven water samples were received for analysis at ALS Environmental on 11/8/16. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Explosives by EPA Method 8330

Elevated Detection Limits:
The detection limit was elevated for at least one analyte in a few field samples. The chromatogram indicated the presence of non-target background components. The matrix interference prevented adequate resolution and prevented qualitative/quantitative reporting of the target compounds at the normal limit. The results were flagged to indicate the matrix interference.

Sample Notes and Discussion:
Insufficient sample volume was received to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD). A Laboratory Control Sample/Duplicate Laboratory Control Sample (LCS/DLCS) was analyzed and reported in lieu of the MS/MSD for these samples.

Approved by_[redacted]_____

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

K 1613684

SHIP TO: ALS ENVIRONMENTAL – KELSO, WASHINGTON, USA
1317 S 13TH AVE
KELSO, WA 98626

CHAIN OF CUSTODY/ANALYTICAL REQUEST FORM

ALS LABORATORIES – Winnipeg
Unit 12 – 1329 Niakwa Rd E. Wpg, MB, R2J 3T4
Service Requested: Regular _____ Priority _____ Emergency

Quotation Number:
Work Order #: L1853274

Lab Number	Sample I.D.	Date/Time Sampled	Sample Type	EPA 8330B Explosives - isomers of Dinitrotoluene
L1853274-1	MW1 C	11/2/2016 3:00 PM	WATER	X
L1853274-2	MW2 C	11/2/2016 3:00 PM	WATER	X
L1853274-3	MW3 C	11/2/2016 3:00 PM	WATER	X
L1853274-4	MW4 C	11/2/2016 3:00 PM	WATER	X
L1853274-5	MW5 C	11/2/2016 3:00 PM	WATER	X
L1853274-6	MW6 C	11/2/2016 3:00 PM	WATER	X
L1853274-7	MW7 C	11/2/2016 3:00 PM	WATER	X

CLIENT INFORMATION:
REPORT TO: ALS LABORATORIES GROUP
Unit 12 – 1329 Niakwa Rd. E.
Winnipeg, MB, R2J 3T4
Phone: (204) 255-9720
Fax: (204) 255-9721
ATTENTION: BEA RYBACK/SHERIZA RAJACK-AHAMED
Bea.ryback@alsglobacl.com;sheriza.rajackahamed@alsglobal.com
INVOICE: As Above

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE: 11-8-16
	TIME:	[redacted]	TIME: 10:30

FOR LABORATORY USE ONLY

SAMPLE CONDITION UPON RECEIPT: FROZEN _____ COLD _____ AMBIENT
OTHER (BREAKAGE, LEAKAGE, ETC.):

ALS Environmental

L1853274

K1613684

WINNIPEG

Subcontract Request Form

WP-SHIPTO-KE-MON

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, US
1317 S. 13TH AVE
KELSO,WA 98626

NOTES: Please reference on final report and invoice: PO# *L1853274*
ALS requires QC data to be provided with your final results.

Please see enclosed 7 **sample(s) in** 7 **Container(s)**

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1853274-1 MW1 C	Special Request - Kelso (SPECIAL REQUEST-KL 14)	11/ 2/ 2016 11/17/2016	
L1853274-2 MW2 C	Special Request - Kelso (SPECIAL REQUEST-KL 14)	11/ 2/ 2016 11/17/2016	
L1853274-3 MW3 C	Special Request - Kelso (SPECIAL REQUEST-KL 14)	11/ 2/ 2016 11/17/2016	
L1853274-4 MW4 C	Special Request - Kelso (SPECIAL REQUEST-KL 14)	11/ 2/ 2016 11/17/2016	
L1853274-5 MW5 C	Special Request - Kelso (SPECIAL REQUEST-KL 14)	11/ 2/ 2016 11/17/2016	
L1853274-6 MW6 C	Special Request - Kelso (SPECIAL REQUEST-KL 14)	11/ 2/ 2016 11/17/2016	
L1853274-7 MW7 C	Special Request - Kelso (SPECIAL REQUEST-KL 14)	11/ 2/ 2016 11/17/2016	

ALS Environmental

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA
1317 S. 13TH AVE
KELSO,WA 98626

Subcontract Info Contact:	Judy Dalmaijer (204) 255-9749
Analysis and reporting info contact:	Shannon Sawatzky 12-1329 NIAKWA ROAD E WINNIPEG,MB R2J3T4 Phone: (204) 255-9749 Email: shannon.sawatzky@alsglobal.com

Please email confirmation of receipt to: **shannon.sawatzky@alsglobal.com**

Shipped By: [redacted] Date Shipped: 7/4

Received By: [redacted] Date Received: 11-8-16 10:30

Verified By: [redacted] Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

PC [redacted]

Cooler Receipt and Preservation Form

Client ALS Winnipeg CAN Service Request K16 13684

Received: 11-8-16 Opened: 11-8-16 By: [redacted] Unloaded: 11-8-16 By: [redacted]

1. Samples were received via? *USPS* *Fed Ex* (*UPS*) *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) (*Box*) *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where?_____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number NA	Filed
1.5	1.3	-	-	0.2	369		1266 2F45 6666 6618	3168

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves*
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? ~~NA~~ Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

*Notes, Discrepancies, & Resolutions:*_____

RUSH

7/25/16 *Page*____ *of*____

Nitroaromatics and Nitramines (Explosives)

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
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Analytical Results

Client:	ALS Environmental - Canada	**Service Request:**	K1613684
Project:	L1853274	**Date Collected:**	11/02/2016
Sample Matrix:	Water	**Date Received:**	11/08/2016

Nitroaromatics and Nitramines (Explosives)

Sample Name:	L1853274-1	**Units:**	ug/L
Lab Code:	K1613684-001	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	8330B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
RDX	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
1,3,5-Trinitrobenzene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
1,3-Dinitrobenzene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
3,5-Dinitroaniline	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
TETRYL	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
Nitrobenzene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
4-Amino-2,6-dinitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
2-Amino-4,6-dinitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
2,4,6-Trinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2,6-Dinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2,4-Dinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
4-Nitrotoluene	ND	Ui	0.16	1	11/09/16	12/12/16	KWG1610213	
3-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
Nitroglycerin	ND	U	1.0	1	11/09/16	12/12/16	KWG1610213	
Pentaerythritol Tetranitrate	ND	U	1.0	1	11/09/16	12/12/16	KWG1610213	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	79	23-98	12/12/16	Acceptable

Comments:

Client:	ALS Environmental - Canada	**Service Request:**	K1613684
Project:	L1853274	**Date Collected:**	11/02/2016
Sample Matrix:	Water	**Date Received:**	11/08/2016

Nitroaromatics and Nitramines (Explosives)

Sample Name:	L1853274-2	**Units:**	ug/L
Lab Code:	K1613684-002	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	8330B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
RDX	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
1,3,5-Trinitrobenzene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
1,3-Dinitrobenzene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
3,5-Dinitroaniline	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
TETRYL	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
Nitrobenzene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
4-Amino-2,6-dinitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
2-Amino-4,6-dinitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
2,4,6-Trinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2,6-Dinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2,4-Dinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
4-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
3-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
Nitroglycerin	ND	U	1.0	1	11/09/16	12/12/16	KWG1610213	
Pentaerythritol Tetranitrate	ND	U	1.0	1	11/09/16	12/12/16	KWG1610213	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	73	23-98	12/12/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Canada	**Service Request:**	K1613684
Project:	L1853274	**Date Collected:**	11/02/2016
Sample Matrix:	Water	**Date Received:**	11/08/2016

Nitroaromatics and Nitramines (Explosives)

Sample Name:	L1853274-3	**Units:**	ug/L
Lab Code:	K1613684-003	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	8330B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
RDX	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
1,3,5-Trinitrobenzene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
1,3-Dinitrobenzene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
3,5-Dinitroaniline	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
TETRYL	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
Nitrobenzene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
4-Amino-2,6-dinitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
2-Amino-4,6-dinitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
2,4,6-Trinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2,6-Dinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2,4-Dinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
4-Nitrotoluene	ND	Ui	0.31	1	11/09/16	12/12/16	KWG1610213	
3-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
Nitroglycerin	ND	U	1.1	1	11/09/16	12/12/16	KWG1610213	
Pentaerythritol Tetranitrate	ND	U	1.1	1	11/09/16	12/12/16	KWG1610213	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	53	23-98	12/12/16	Acceptable

Comments:

Client:	ALS Environmental - Canada	**Service Request:**	K1613684
Project:	L1853274	**Date Collected:**	11/02/2016
Sample Matrix:	Water	**Date Received:**	11/08/2016

Nitroaromatics and Nitramines (Explosives)

Sample Name:	L1853274-4	**Units:**	ug/L
Lab Code:	K1613684-004	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	8330B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
RDX	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
1,3,5-Trinitrobenzene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
1,3-Dinitrobenzene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
3,5-Dinitroaniline	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
TETRYL	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
Nitrobenzene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
4-Amino-2,6-dinitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
2-Amino-4,6-dinitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
2,4,6-Trinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2,6-Dinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2,4-Dinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
4-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
3-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
Nitroglycerin	ND	U	1.1	1	11/09/16	12/12/16	KWG1610213	
Pentaerythritol Tetranitrate	ND	U	1.1	1	11/09/16	12/12/16	KWG1610213	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	85	23-98	12/12/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Canada	**Service Request:**	K1613684
Project:	L1853274	**Date Collected:**	11/02/2016
Sample Matrix:	Water	**Date Received:**	11/08/2016

Nitroaromatics and Nitramines (Explosives)

Sample Name:	L1853274-5	**Units:**	ug/L
Lab Code:	K1613684-005	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	8330B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
RDX	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
1,3,5-Trinitrobenzene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
1,3-Dinitrobenzene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
3,5-Dinitroaniline	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
TETRYL	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
Nitrobenzene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
4-Amino-2,6-dinitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
2-Amino-4,6-dinitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
2,4,6-Trinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2,6-Dinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2,4-Dinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
4-Nitrotoluene	ND	Ui	0.25	1	11/09/16	12/12/16	KWG1610213	
3-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
Nitroglycerin	ND	U	1.0	1	11/09/16	12/12/16	KWG1610213	
Pentaerythritol Tetranitrate	ND	U	1.0	1	11/09/16	12/12/16	KWG1610213	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	74	23-98	12/12/16	Acceptable

Comments:

Client:	ALS Environmental - Canada	**Service Request:**	K1613684
Project:	L1853274	**Date Collected:**	11/02/2016
Sample Matrix:	Water	**Date Received:**	11/08/2016

Nitroaromatics and Nitramines (Explosives)

Sample Name:	L1853274-6	**Units:**	ug/L
Lab Code:	K1613684-006	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	8330B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
RDX	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
1,3,5-Trinitrobenzene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
1,3-Dinitrobenzene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
3,5-Dinitroaniline	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
TETRYL	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
Nitrobenzene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
4-Amino-2,6-dinitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
2-Amino-4,6-dinitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
2,4,6-Trinitrotoluene	ND	Ui	1.4	1	11/09/16	12/12/16	KWG1610213	
2,6-Dinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2,4-Dinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
4-Nitrotoluene	ND	Ui	0.15	1	11/09/16	12/12/16	KWG1610213	
3-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
Nitroglycerin	ND	U	1.1	1	11/09/16	12/12/16	KWG1610213	
Pentaerythritol Tetranitrate	ND	U	1.1	1	11/09/16	12/12/16	KWG1610213	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	71	23-98	12/12/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Canada	**Service Request:**	K1613684
Project:	L1853274	**Date Collected:**	11/02/2016
Sample Matrix:	Water	**Date Received:**	11/08/2016

Nitroaromatics and Nitramines (Explosives)

Sample Name:	L1853274-7	**Units:**	ug/L
Lab Code:	K1613684-007	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	8330B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
RDX	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
1,3,5-Trinitrobenzene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
1,3-Dinitrobenzene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
3,5-Dinitroaniline	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
TETRYL	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
Nitrobenzene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
4-Amino-2,6-dinitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
2-Amino-4,6-dinitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
2,4,6-Trinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2,6-Dinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2,4-Dinitrotoluene	ND	U	0.21	1	11/09/16	12/12/16	KWG1610213	
2-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
4-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
3-Nitrotoluene	ND	U	0.11	1	11/09/16	12/12/16	KWG1610213	
Nitroglycerin	ND	U	1.1	1	11/09/16	12/12/16	KWG1610213	
Pentaerythritol Tetranitrate	ND	U	1.1	1	11/09/16	12/12/16	KWG1610213	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	70	23-98	12/12/16	Acceptable

Comments:

Analytical Results

Client:	ALS Environmental - Canada	**Service Request:**	K1613684
Project:	L1853274	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA

Nitroaromatics and Nitramines (Explosives)

Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KWG1610213-3	**Basis:**	NA
Extraction Method:	EPA 3535A	**Level:**	Low
Analysis Method:	8330B		

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
HMX	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
RDX	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
1,3,5-Trinitrobenzene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
1,3-Dinitrobenzene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
3,5-Dinitroaniline	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
TETRYL	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
Nitrobenzene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
4-Amino-2,6-dinitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
2-Amino-4,6-dinitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
2,4,6-Trinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2,6-Dinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2,4-Dinitrotoluene	ND	U	0.20	1	11/09/16	12/12/16	KWG1610213	
2-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
4-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
3-Nitrotoluene	ND	U	0.10	1	11/09/16	12/12/16	KWG1610213	
Nitroglycerin	ND	U	1.0	1	11/09/16	12/12/16	KWG1610213	
Pentaerythritol Tetranitrate	ND	U	1.0	1	11/09/16	12/12/16	KWG1610213	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1-Chloro-3-nitrobenzene	68	23-98	12/12/16	Acceptable

Comments:

Client: ALS Environmental - Canada **Service Request:** K1613684
Project: L1853274
Sample Matrix: Water

Surrogate Recovery Summary
Nitroaromatics and Nitramines (Explosives)

Extraction Method: EPA 3535A **Units:** Percent
Analysis Method: 8330B **Level:** Low

Sample Name	Lab Code	Sur1
L1853274-1	K1613684-001	79
L1853274-2	K1613684-002	73
L1853274-3	K1613684-003	53
L1853274-4	K1613684-004	85
L1853274-5	K1613684-005	74
L1853274-6	K1613684-006	71
L1853274-7	K1613684-007	70
Method Blank	KWG1610213-3	68
Lab Control Sample	KWG1610213-1	78
Duplicate Lab Control Sample	KWG1610213-2	83

Surrogate Recovery Control Limits (%)

Sur1 = 1-Chloro-3-nitrobenzene 23-98

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Client: ALS Environmental - Canada
Project: L1853274
Sample Matrix: Water

Service Request: K1613684
Date Extracted: 11/09/2016
Date Analyzed: 12/12/2016

Lab Control Spike/Duplicate Lab Control Spike Summary
Nitroaromatics and Nitramines (Explosives)

Extraction Method: EPA 3535A
Analysis Method: 8330B

Units: ug/L
Basis: NA
Level: Low
Extraction Lot: KWG1610213

	Lab Control Sample KWG1610213-1 Lab Control Spike			Duplicate Lab Control Sample KWG1610213-2 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Spike Amount**	**%Rec**	**Result**	**Spike Amount**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
HMX	6.67	8.00	83	7.31	8.00	91	11-147	9	30
RDX	6.70	8.00	84	7.22	8.00	90	10-142	8	30
1,3,5-Trinitrobenzene	6.75	8.00	84	7.33	8.00	92	16-137	8	30
1,3-Dinitrobenzene	6.65	8.00	83	7.24	8.00	90	26-125	8	30
3,5-Dinitroaniline	6.45	8.00	81	7.06	8.00	88	30-133	9	30
TETRYL	6.51	8.00	81	7.08	8.00	89	29-123	8	30
Nitrobenzene	6.69	8.00	84	7.17	8.00	90	10-116	7	30
4-Amino-2,6-dinitrotoluene	6.68	8.00	84	7.31	8.00	91	55-117	9	30
2-Amino-4,6-dinitrotoluene	6.58	8.00	82	7.13	8.00	89	54-116	8	30
2,4,6-Trinitrotoluene	6.61	8.00	83	7.27	8.00	91	47-118	10	30
2,6-Dinitrotoluene	6.68	8.00	83	7.78	8.00	97	40-108	15	30
2,4-Dinitrotoluene	6.74	8.00	84	7.18	8.00	90	50-111	6	30
2-Nitrotoluene	6.50	8.00	81	7.15	8.00	89	12-110	10	30
4-Nitrotoluene	6.44	8.00	80	7.14	8.00	89	16-113	10	30
3-Nitrotoluene	6.33	8.00	79	7.09	8.00	89	13-109	11	30
Nitroglycerin	7.13	8.00	89	7.38	8.00	92	15-136	3	30
Pentaerythritol Tetranitrate	6.60	8.00	83	7.26	8.00	91	66-103	9	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1853274-COFC

COC Number: 15 - 572160

Page of

Report To	Contact and company name below will appear on the final report	Report Format / Di		P TATs with your AM - surcharges will apply
Company:	WSP	Select Report Format:	PDF EXCEL EDD (DIGITAL)	Regular [R] Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Zak Banville	Quality Control (QC) Report with Report	YES NO	PRIORITY (Business Days): 4 day [P4] 3 day [P3] 2 day [P2] — EMERGENCY: 1 Business day [E1] Same Day, Weekend or Statutory holiday [E0]
Phone:	2042269854	Compare Results to Criteria on Report - provide details below if box checked		
	Company address below will appear on the final report	Select Distribution:	EMAIL MAIL FAX	Date and Time Required for all E&P TATs:
Street:		Email 1 or Fax	Justin.zak.banville@wsp.com	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:		Email 2	Blaine.pinkett@wsp.com	
Postal Code:		Email 3		

Invoice To		Invoice Distribution	
	Same as Report To YES NO	Select Invoice Distribution:	EMAIL MAIL FAX
	Copy of Invoice with Report YES NO	Email 1 or Fax	
Company:	WSP	Email 2	
Contact:			

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:	Clements / Pinawa	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact: Skwatzky	Sampler: JRB

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	Q59198	Q48095	Number of Containers
1	MW1 C	Nov2	3:00pm	H_2O		X	
2	MW2 C					X	
3	MW3 C					X	
4	MW4 C					X	
5	MW5 C					X	
6	MW6 C					X	
7	MW7 C					X	
8	MW1 P		12:0		X		
9	MW2 P				X		
10	MW3 P				X		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? YES NO	
Are samples for human drinking water use? YES NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
11.8°C					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: [redacted]	Date: 3.11.16	Time: 4:00pm	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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**.

2017 EAST SELKIRK LAGOON GROUNDWATER MONITORING REPORT

Rural Municipality of St. Clements

Project no: 171-14563-00

Date: February 2017

WSP Canada Inc.
1600 Buffalo Place
Winnipeg, MB R3T 6B8

Phone: +204.477.6650
Fax: +204.474.2864
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1 INTRODUCTION

On behalf of the RM of St. Clements, WSP conducted a groundwater monitoring event at the East Selkirk Wastewater Stabilization Pond (ESWSP) located on River Lots CLRL 89-95, Parish of St. Clements, approximately 2.0 kilometres (km) south of East Selkirk, Manitoba, herein referred to as the "Site". Groundwater monitoring was conducted at the Site on October 12th, 2017 as part of the scheduled groundwater monitoring program as requested by Manitoba Sustainable Development (MSD).

This report summarizes the results of the 2017 groundwater sampling event completed for the ESWSP and compares the results with the Canadian Water Quality Guidelines (CWQG) have been applied for the groundwater monitoring event in order to assess changes in contaminants of concern potentially associated with the stabilization pond.

The monitoring program involved inspection of the monitoring wells, purging of the wells, collection of water samples, submission to the laboratory, with analysis, review and discussion of the laboratory results. Water quality parameters tested were by the Manitoba Sustainable Development approved groundwater monitoring plan, dated October 23, 2013.

1.1 BACKGROUND

As per Clause 43 of License No. 3058 regarding the RM of St. Clements ESWSP, a groundwater monitoring plan to monitor water quality in the area surrounding the lagoon has been approved by the former Manitoba Conservation and Water Stewardship, not Manitoba Sustainable Development.

The objective of groundwater monitoring is to record groundwater levels and monitor groundwater quality to ensure that wastewater from any of the lagoon cells is not leaking. A site plan, attached, highlights the seven proposed groundwater monitoring wells and the approximate locations. These locations encompass the perimeter of the lagoon cells, and with the expected groundwater flow directed north towards the Red River, these locations are expected to provide sufficient baseline and future monitoring data.

The attached drawing also highlights monitoring well construction details. The wells have been installed by a Manitoba licensed well driller.

2 SCOPE OF WORK

As per the October 23, 2013 approval of the submitted groundwater monitoring report, a groundwater sampling event was required to be completed twice a year in order to evaluate surface water and leachate management and the general transport of contaminates. The scope of work for the 2017 groundwater monitoring event was therefore based on the groundwater sampling program details outlined in the approved monitoring program are as follows:

- Evaluation of current monitoring well conditions.

- Physical monitoring of all wells, including depth to groundwater, and total well depth.
- Purging wells at least three well volumes or until dry.
- Obtain groundwater samples from each monitoring well, if functional (3 wells).
- Submission of groundwater samples to ALS Laboratories Group (CALA certified laboratory) for analysis for the following analytes:
- Comparison of sample results with Guidelines for Canadian Drinking Water Quality (GCDWQ). Dissolved samples were not field filtered.

Standard Analytes:

- Bicarbonate, Calcium, Carbonate, Chloride, Conductance (EC), Alkalinity, Hardness, Total Dissolved Solids (TDS), Total Solids (TS), Total Suspended Solids (TSS), Total Organic Carbon (TOC), Chemical Oxygen Demand (COD), Turbidity (NTU), Ammonia-Nitrogen (NH3-N), Chloride (Cl), Total Kjedahl Nitrogen (TKN), Nitrate-Nitrogen (NO3-N), Nitire-Nitrogen (NO2-N), Sulfate (SO42-), Phosphate (PO43-), Silicon Dioxide (SiO2), pH, Turbidity.

Metals:

- Aluminum (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Bismuth (Bi), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Phosphorus (P), Potassium (K), Selenium (Se), Silver (Ag), Sodium (Na), Strontium (Sr), Thallium (Tl), Tin (Sn), Titanium (Ti),Uranium (U), Vanadium (V), Zinc (Zn).

Volatile Organic Compounds:

- Acetone, Benzene, Bromobenzene, Bromochloromethane, Bromodichloromethane, Bromoform, Bromomethane, n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, Carbon disulfide, Carbon Tetrachloride, Chlorobenzene, Dibromochloromethane, Chloroethane, Chloroform, Chloromethane, 2-Chlorotoluene, 4-Chlorotoluene, 1,2-Dibromo-3- chloropropane, 1,2-Dibromoethane, Dibromomethane, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Dichlorodifluoromethane, 1,1-dichloroethane, 1,2-Dichloroethane, 1,1-dichloroethene, cis-1,2-Dichloroethene, trans-1,2-Dichloroethene, Dichloromethane, 1,2-Dichloropropane, 1,3-Dichloropropane, 2,2-Dichloropropane, 1,1-Dichloropropene, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene, Ethylbenzene, Hexachlorobutadiene, Hexane, 2-Hexanone (Methyl butyl ketone), Isopropylbenzene, 4-Isopropyltoluene, MEK, MIBK, MTBE, Naphthalene, Styrene, 1,1,1,2-Tetrachloroethane, 1,1,2,2-Tetrachloroethane, Tetrachloroethene, Toluene, 1,2,3-Trichlorobenzene, 1,2,4-Trichlorobenzene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, Trichlorofluoromethane, 1,2,3-Trichloropropane, Trihalomethanes (total), 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, Vinyl Chloride, o-Xylene, M+PXylenes, Xylenes.

Isomers of Dinitrotoluene:

- 2,4-Dinitrotoluene and 2,6-Dinitrotoluene.

- Preparation of this groundwater monitoring report, summarizing the findings and conclusions of the sampling event and submission of this report to Pinawa and MSD.

3 SITE CHARACTERIZATION

A summary of the site characteristics were completed and tabulated below.

Table 3-1: Site characterization

SITE CHARACTERISTIC	DESCRIPTION
Site Description and Land Use	The wastewater stabilization pond site used for the treatment of wastewater. Groundwater monitoring has historically has not been conducted on the site.
Surrounding Land Use	In all cardinal directions, the ESWSP is surrounded by farmed land, with minor forested areas occurring south-west of the site. Forests in the area are typically composed of mixed vegetation, with common tree species including ash, jack pine, white birch, black and white spruce, balsam fir, balsam poplar and trembling aspen
Topography	Although the site consists of generally flat topography throughout, with a gentle slope towards the north. Roughly 500 m from the site towards the north is the Red River.
Soil and Geology	Soil: According to the Canadian System of Soil Classification, the soils are classified as dominantly Gray Luvisols (Lettonia series), Dark Gray Luvisols (Whitemouth and Pine Valley series) and Dark Gray Chernozems (Thalberg and Framnes series), all developed on well to imperfectly drained lacustrine clay sediments.
	Geology: Soil materials in the municipality were deposited during the time of glacial Lake Agassiz and consist primarily of shallow to deep organic deposits and shallow to deep clayey and silty lacustrine sediments. Local areas of clay are underlain by stony, weakly calcareous to acidic glacial till. The Precambrian bedrock underlying the municipality outcrops mainly in the eastern portion of the area.
Water	Surface: The Site is located approximately 500 metres east of the Red River. Based on the elevations below, the groundwater flow direction is expected to flow southeast towards Seven Sisters Falls and the Winnipeg River.

Monitoring well locations is illustrated in the subsequent figure while elevations and depth to groundwater have been tabulated as follows:

Table 3-2: 2016-2017 Groundwater monitoring well parameters (metres)

2016 MONITORING WELL	UTM COORDINATES	SURVEY ELEVATION	TOP OF MONITORING WELL PVC LIP	ELEVATION OF GROUNDWATER	DEPTH TO GROUNDWATER
1	14U 653091 5554072	226.44	227.27	221.29	5.98
2	14U 652992 5554162	226.34	227.15	224.68	2.47
3	14U 652803 5553962	226.67	227.25	Dry	Dry
4	14U 652632 5553771	228.01	228.98	226.05	2.93
5	14U 652890 5553620	226.70	227.46	222.87	4.59
6	14U 652995 5553682	226.60	227.51	223.97	3.54
7	14U 653137 5553899	226.42	227.39	224.44	2.95
2017 MONITORING WELL	**UTM COORDINATES**	**SURVEY ELEVATION**	**TOP OF MONITORING WELL PVC LIP**	**ELEVATION OF GROUNDWATER**	**DEPTH TO GROUNDWATER**
1	14U 653091 5554072	226.44	227.27	225.30	1.14
2	14U 652992 5554162	226.34	227.15	224.75	1.59
3	14U 652803 5553962	226.67	227.25	224.09	2.58
4	14U 652632 5553771	228.01	228.98	226.71	1.30
5	14U 652890 5553620	226.70	227.46	224.75	1.95
6	14U 652995 5553682	226.60	227.51	224.67	1.93
7	14U 653137 5553899	226.42	227.39	224.31	2.11

Figure 1: Groundwater monitoring well locations. Observed groundwater flow is towards the north.

4 METHOD

WSP completed a groundwater monitoring event, using the existing monitoring wells on-site on October 12, 2017. Methodologies and protocols are described as follows.

4.1 MONITORING WELL CONDITION

Each monitoring well's condition was evaluated based on visual inspections of each well for signs of cracking, breakage or tampering. All wells were in good condition and protected with lockable steel casings.

4.2 GROUNDWATER QUALITY PARAMETERS AND PROPERTIES

Groundwater was purged and sampled using a 1.5 in Supernova Proactive Environmental Well pump and polyethylene tubing. All wells were purged until dry and left to recharge for six hours.

4.3 GROUNDWATER SAMPLE COLLECTION

The wells were sampled after recharge. Collected groundwater samples were placed in clean, laboratory-supplied sample containers that were appropriately pre-labelled. Sample containers were

placed in a cooler with cold packs to maintain a temperature of 4°C for preservation. These samples were then delivered to ALS Laboratories for analysis on the same day as sampling. Standard chain-of-custody procedures were followed during sample handling and delivery.

4.4 ANALYTICAL TESTING

Groundwater samples collected were submitted to ALS Laboratories for analysis of parameters outlined in Section 2.0 Scope of Work.

4.4.1 DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN

No deviations were observed from the approved sampling and analysis plan.

4.5 QUALITY ASSURANCE AND QUALITY CONTROL

Quality Control is the process of verifying that work is technically correct and accurate. The following quality assurance and control measures were carried out during this monitoring program:

- Groundwater sampling was conducted in accordance with Manitoba Sustainable Development Groundwater Sampling at the RM of St. Clements Groundwater Monitoring Plan Proposal (dated October 4, 2013), and approved October 23, 2013.
- Disposable vinyl gloves were worn when handling sampling and containers and were replaced after use. Prior to re-use, non-dedicated sampling equipment and monitoring instruments were thoroughly cleaned.
- All samples for potential laboratory analysis were collected in the appropriate containers provided by the laboratory.
- ALS Laboratories completed a variety of quality assurance/quality control (QA/QC) measures on the samples submitted as part of the sampling program. These QA/QC measures include: sample replicates, matrix spiked laboratory blanks, and process blanks. Analytical and quality control data were reviewed and have been validated by ALS Laboratories. Copies of the Quality Assurance Reports and analytical methods are included with the Certificates of Analysis in Appendix A.

No issues with laboratory analysis, sample shipping, sample preservation, or field sampling techniques that could have a material effect on the interpretation of the reported results were identified as part of the QA/QC program.

4.6 REGULATORY CRITERIA

At the time of drafting, Manitoba does not have regulatory guidelines addressing residual environmental impacts to soil or groundwater (i.e., metals, petroleum hydrocarbons, nutrients) therefore the GCDWQ have been applied for the groundwater monitoring event. These guidelines are considered the more stringent due to their use in regulating limits of various present in potable water. MSD may direct future monitoring events to use alternative regulatory criteria, discussion post reporting should review this.

4.7 MONITORING WELL CONDITION

All monitoring wells appeared in good condition and protected with lockable steel casings.

4.8 GROUNDWATER QUALITY PARAMETERS AND PROPERTIES

Depth to groundwater ranged from 2.47 m to 5.98 m. All water levels are less than 10 mbgs and the area is considered to therefore have a high water table.

4.8.1 ANALYTICAL RESULTS

Groundwater results are presented in the following table, while the Chain of Custody is located in Appendix A. In addition to this, the baseline results of sampling from 2013 pre-lagoon commissioning have also been included.

Table 4-1: 2016 Sampling Results.

PARAMETER	UNITS	LIMIT OF DETECTION	GCDWQ AO/MAC LIMIT	MW1	MW2	MW3	MW4	MW5	MW6	MW7
12/22/2016 L1853274				L1853274-2	L1853274-3	L1853274-4	L1853274-5	L1853274-6	L1853274-7	L1853274-2
Conductivity	mg/L	1		2430	2590	1160	1330	3360	1070	3350
Hardness (as CaCO3)	mg/L	0.54		2070 *	2200 *	792 *	1080 *	3240 *	795 *	2520 *
pH	mg/L	0.1	AO <8.5	7.65	7.26	7.6	7.68	7.6	7.56	7.3
Total Suspended Solids	mg/L	5		53	39	16	315	40	920	65
Total Dissolved Solids	mg/L	20	AO <500	2670	3030	730	969	4570	709	3550
Total Solids	mg/L	10		2950	3290	820	1380	4920	1690	3810
Turbidity	mg/L	0.1		30.7	26.3	13.1	152	18.5	1260	50.6
Alkalinity, Total (as CaCO3)	mg/L	1		629	602	728	557	720	694	652
Ammonia, Total (as N)	mg/L	0.01		0.153	0.135	0.03	0.029	0.06	0.068	0.085
Bicarbonate (HCO3)	mg/L	1.2		767	734	888	679	878	846	795
Carbonate (CO3)	mg/L	0.6		<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Chloride (Cl)	mg/L	2.5	AO <250	<10 *	<10 *	<2.5 *	3.0 *	<10 *	21.9	<10 *
Hydroxide (OH)	mg/L	0.34		<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
Nitrate (as N)	mg/L	0.1	10.0	<0.40 *	<0.40 *	<0.10 *	<0.10 *	<0.40 *	0.63	<0.40 *
Nitrite (as N)	mg/L	0.05	1.0	<0.20 *	<0.20 *	<0.050 *	<0.050 *	<0.20 *	<0.050 *	<0.20 *
Total Kjeldahl Nitrogen	mg/L	0.2		0.88	0.57	0.39	0.22	0.93	0.43	0.35
Orthophosphate-Dissolved (as P)	mg/L	0.01		<0.010	0.013	<0.010	<0.010	0.02	0.021	0.014
Silica, Reactive (as SiO2)	mg/L	1		18.9	20.6	19.8	18.4	19.7	21.2 *	18.7
Sulfate (SO4)	mg/L	1.5	AO <500	1460	1700	22.9	290	2730	81.9	2030
Total Organic Carbon	mg/L	0.5		14.7	12.5	8.03	4.78	15.2	5.04	8.04
Aluminum (Al)-Total	mg/L	0.02	AO <0.1	1.5	0.404	0.198	2.86	0.542	2.45	0.345
Antimony (Sb)-Total	mg/L	0.001	0.006	0.0012	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic (As)-Total	mg/L	0.001	0.01 ALARA	0.0031	0.0014	<0.0010	0.0018	0.0012	0.0011	<0.0010
Barium (Ba)-Total	mg/L	0.0005	1.0	0.0294	0.0182	0.177	0.0635	0.0289	0.135	0.0137
Beryllium (Be)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	0.03	5	0.194	0.21	0.121	0.155	0.152	0.129	0.202
Cadmium (Cd)-Total	mg/L	0.0002	0.005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Calcium (Ca)-Total	mg/L	0.2		368	360	89.3	180	468	115	402
Cesium (Cs)-Total	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Total	mg/L	0.002	0.05	0.0041	<0.0020	<0.0020	0.0045	0.002	0.0031	<0.0020
Cobalt (Co)-Total	mg/L	0.0005	AO < 1.0	0.00501	0.00506	<0.00050	0.00173	0.0009	0.00219	0.00383
Copper (Cu)-Total	mg/L	0.002	AO <1.0	0.0067	0.002	0.0025	0.0053	0.0075	0.004	0.0032
Iron (Fe)-Total	mg/L	0.1	AO <0.3	1.5	0.47	0.22	3.8	0.57	1.86	0.28
Lead (Pb)-Total	mg/L	0.001	0.01	0.0025	<0.0010	<0.0010	0.003	0.0012	0.0018	<0.0010

PARAMETER	UNITS	LIMIT OF DETECTION	GCDWQ AO/MAC LIMIT	MW1	MW2	MW3	MW4	MW5	MW6	MW7
Lithium (Li)-Total	mg/L	0.002		0.347	0.384	0.169	0.155	0.42	0.125	0.372
Magnesium (Mg)-Total	mg/L	0.05		279	317	138	154	502	123	368
Manganese (Mn)-Total	mg/L	0.001		0.708	0.493	0.0701	0.22	0.32	0.222	0.475
Molybdenum (Mo)-Total	mg/L	0.0005		0.00219	0.00228	0.0075	0.00497	0.00345	0.00305	0.00283
Nickel (Ni)-Total	mg/L	0.002		0.017	0.013	0.0064	0.0068	0.0257	0.0074	0.0167
Phosphorus (P)-Total	mg/L	0.5		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Potassium (K)-Total	mg/L	0.1		8.36	8.72	4.35	6.29	10.5	5.21	9.47
Rubidium (Rb)-Total	mg/L	0.0005		0.00334	0.00126	0.00076	0.00646	0.00192	0.00532	0.00102
Selenium (Se)-Total	mg/L	0.005	0.05	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)-Total	mg/L	0.3		14.9	12	12.3	16.9	12.8	16.4	11.6
Silver (Ag)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sodium (Na)-Total	mg/L	0.05	AO <200	101	135	25.7	39.1	189	40.6	175
Strontium (Sr)-Total	mg/L	0.0005		1.77	1.93	0.779	0.8	2.28	0.662	2
Tellurium (Te)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thallium (Tl)-Total	mg/L	0.005		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Thorium (Th)-Total	mg/L	0.001		<0.0010	<0.0010	<0.0010	0.0013	<0.0010	<0.0010	<0.0010
Tin (Sn)-Total	mg/L	0.0006		0.00139	0.00128	0.00108	0.00077	0.00116	<0.00060	<0.00060
Titanium (Ti)-Total	mg/L	0.001		0.0632	0.0183	0.0062	0.136	0.0228	0.0894	0.0116
Tungsten (W)-Total	mg/L	0.002		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Uranium (U)-Total	mg/L	0.0005	0.02	0.168	0.137	0.0346	0.0403	0.167	0.0354	0.189
Vanadium (V)-Total	mg/L	0.002		0.0042	<0.0020	<0.0020	0.0063	<0.0020	0.0062	<0.0020
Zinc (Zn)-Total	mg/L	0.02	AO <5.0	<0.020	0.023	<0.020	<0.020	0.021	<0.020	<0.020
Zirconium (Zr)-Total	mg/L	0.001		0.0023	<0.0010	<0.0010	0.003	0.0019	0.0027	0.0012
Chemical Oxygen Demand	mg/L	20		38	32	<20	21	40	51	24
Acetone	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzene	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromochloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromodichloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromoform	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromomethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
n-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
sec-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tert-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon disulfide	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon Tetrachloride	mg/L	0.0005	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0005	0.08	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromochloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloroethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2-Chlorotoluene	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
4-Chlorotoluene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromo-3-chloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromoethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromomethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichlorobenzene	mg/L	0.0005	0.2	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,4-Dichlorobenzene	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichlorodifluoromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-dichloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloroethane	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1-dichloroethene	mg/L	0.0005	0.014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,2-Dichloroethene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,2-Dichloroethene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichloromethane	mg/L	0.0005	0.05	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2,2-Dichloropropane	mg/L	0.001		<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *
1,1-Dichloropropene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,3-Dichloropropene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,3-Dichloropropene	mg/L	0.001		<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *
Ethylbenzene	mg/L	0.0005	0.14	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2-Hexanone (Methyl butyl ketone)	%	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Isopropylbenzene	%	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4-Isopropyltoluene	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MEK	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MIBK	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MTBE	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Styrene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1,2-Tetrachloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2,2-Tetrachloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethene	mg/L	0.0005	0.01	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0005	0.06	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

PARAMETER	UNITS	LIMIT OF DETECTION	GCDWQ AO/MAC LIMIT	MW1	MW2	MW3	MW4	MW5	MW6	MW7
1,1,1-Trichloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2-Trichloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichloroethene	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,3-Trichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trimethylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3,5-Trimethylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Vinyl Chloride	mg/L	0.0005	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
M+P-Xylenes	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (Total)	mg/L	0.0015	0.09	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
F1	mg/L	0.1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4-Bromofluorobenzene (SS)	mg/L	Surrogate		105.3	102.4	104	101.6	99.3	101.8	108.8
1,4-Difluorobenzene (SS)	mg/L	Surrogate		102.9	102.2	103.7	103.3	103	103.3	103.2
Total THMs	mg/L	0.001	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Applied Guideline: Guidelines for Canadian Drinking Water Quality (March, 2015)
AO = Aesthetic objectives noted (in orange), all other limits are Maximum Allowable Concentrations (MAC). MAX exceedances highlighted in red.
***Result qualified.**

4.8.2 SIDE BY SIDE LISTING OF BASELINE TO SAMPLING EVENT

PARAMETER	BASELINE SAMPLE MW1	MW1	BASELINE SAMPLE MW2	MW2	MW3	BASELINE SAMPLE MW4	MW4	BASELINE SAMPLE MW5	MW5	BASELINE SAMPLE MW6	MW6	BASELINE SAMPLE MW7	MW7
	L1548149-3	L1853274-1	L1548149-2	L1853274-2	L1853274-3	L1548149-1	L1853274-4	L1548149-4	L1853274-5	L1548149-5	L1853274-6	L1548149-6	L1853274-7
	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/2/2016 3:00:00 PM	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/18/2014 10:00:00 AM	11/2/2016 3:00:00 PM	11/18/2014 2:30:00 PM	11/2/2016 3:00:00 PM
Analyte	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Conductivity	2640	2430	3120	2590	1160	1490	1330	3850	3360	1360	1070	3550	3350
Hardness (as CaCO3)	1710	2070 *	1960	2200 *	792 *	14700	1080 *	2740	3240 *	728	795 *	2330	2520 *
pH	8.01	7.65	7.69	7.26	7.6	7.63	7.68	7.79	7.6	8.07	7.56	7.61	7.3
Total Suspended Solids	9	53	73	39	16	3020	315	7	40	1600	920	268	65
Total Dissolved Solids	2460	2670	3070	3030	730	1050	969	4100	4570	854	709	3570	3550
Total Solids	2560	2950	3230	3290	820	4070	1380	4250	4920	2490	1690	3980	3810
Turbidity	2.25	30.7	59.2	26.3	13.1	>4000	152	0.87	18.5	2970	1260	251	50.6
Alkalinity, Total (as CaCO3)	624	629	634	602	728	852	557	682	720	746	694	719	652
Ammonia, Total (as N)	0.124		0.089	0.135	0.03	0.05	0.029	0.026	0.06	0.032	0.068	<0.010	0.085
Bicarbonate (HCO3)	761	767	773	734	888	1040	679	832	878	910	846	877	795
Carbonate (CO3)	<12	<0.60	<12	<0.60	<0.60	<12	<0.60	<12	<0.60	<12	<0.60	<12	<0.60
Chloride	7.2	<10 *	4.6	<10 *	<2.5 *	3.57	3.0 *	2.9	<10 *	27.1	21.9	4.5	<10 *
Hydroxide (OH)	<6.8	<0.34	<6.8	<0.34	<0.34	<6.8	<0.34	<6.8	<0.34	<6.8	<0.34	<6.8	<0.34
Nitrate-N	<0.25 *	<0.40 *	<0.25 *	<0.40 *	<0.10 *	<0.050	<0.10 *	<0.25 *	<0.40 *	0.533	0.63	<0.25 *	<0.40 *
Nitrite-N	<0.25 *	<0.20 *	<0.25 *	<0.20 *	<0.050 *	<0.050	<0.050 *	<0.25 *	<0.20 *	<0.050	<0.050 *	<0.25 *	<0.20 *
Total Kjeldahl Nitrogen	0.81	0.88	0.75	0.57	0.39	1.46	0.22	0.68	0.93	0.47	0.43	0.56	0.35
Orthophosphate -Dissolved (as P)	0.023	<0.010	0.022	0.013	<0.010	<0.010	<0.010	0.04	0.02	0.02	0.021	<0.010	0.014
Silica, Reactive (as SiO2)	19.3	18.9	20.3	20.6	19.8	17.9	18.4	20.9	19.7	21.4	21.2 *	19.5	18.7
Sulfate	1360	1460	1690	1700	22.9	243	290	2300	2730	115	81.9	1960	2030
Total Organic Carbon	18.9	14.7	17	12.5	8.03	8.9	4.78	17	15.2	5.1	5.04	13.7	8.04
Aluminum (Al)-Total	0.053	1.5	0.216	0.404	0.198	102	2.86	0.199	0.542	0.83	2.45	1.24	0.345
Antimony (Sb)-Total	<0.0010	0.0012	0.0016	0.0011	<0.0010	0.0023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Arsenic (As)-Total	0.0011	0.0031	0.0012	0.0014	<0.0010	0.0921	0.0018	0.0012	0.0012	0.0022	0.0011	0.0011	<0.0010
Barium (Ba)-Total	0.0617	0.0294	0.042	0.0182	0.177	1.54	0.0635	0.0435	0.0289	0.094	0.135	0.0332	0.0137
Beryllium (Be)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0041	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00115	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	0.158	0.194	0.174	0.21	0.121	0.559	0.155	0.144	0.152	0.108	0.129	0.159	0.202
Cadmium (Cd)-Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00092	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Calcium (Ca)-Total	265	368	287	360	89.3	3470	180	402	468	112	115	340	402
Cesium (Cs)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chromium (Cr)-Total	<0.0020	0.0041	0.0022	<0.0020	<0.0020	0.193	0.0045	<0.0020	0.002	<0.0020	0.0031	0.0024	<0.0020
Cobalt (Co)-Total	0.00151	0.00501	0.0046	0.00506	<0.00050	0.0765	0.00173	0.00092	0.0009	0.00212	0.00219	0.00475	0.00383
Copper (Cu)-Total	0.0049	0.0067	0.004	0.002	0.0025	0.252	0.0053	0.0044	0.0075	0.0041	0.004	0.0047	0.0032
Iron (Fe)-Total	<0.10	1.5	0.25	0.47	0.22	195	3.8	0.2	0.57	0.83	1.86	0.97	0.28
Lead (Pb)-Total	<0.0010	0.0025	<0.0010	<0.0010	<0.0010	0.144	0.003	<0.0010	0.0012	0.0021	0.0018	<0.0010	<0.0010
Lithium (Li)-Total	0.251	0.347	0.29	0.384	0.169	0.265	0.155	0.283	0.42	0.103	0.125	0.278	0.372
Magnesium (Mg)-Total	255	279	302	317	138	1470	154	421	502	109	123	359	368
Manganese (Mn)-Total	0.205	0.708	0.429	0.493	0.0701	5.57	0.22	0.22	0.32	0.263	0.222	0.517	0.475
Molybdenum (Mo)-Total	0.00433	0.00219	0.00218	0.00228	0.0075	0.0171	0.00497	0.00332	0.00345	0.0121	0.00305	0.003	0.00283
Nickel (Ni)-Total	0.0102	0.017	0.0134	0.013	0.0064	0.19	0.0068	0.018	0.0257	0.0062	0.0074	0.0168	0.0167
Phosphorus (P)-Total	<0.50	<0.50	<0.50	<0.50	<0.50	6.31	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Potassium (K)-Total	9.61	8.36	10.2	8.72	4.35	42.2	6.29	11.3	10.5	5.73	5.21	10.2	9.47
Rubidium (Rb)-Total	0.00163	0.00334	0.00285	0.00126	0.00076	0.22	0.00646	0.00205	0.00192	0.00254	0.00532	0.00397	0.00102
Selenium (Se)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Silicon (Si)-Total	11.2	14.9	12.2	12	12.3	227	16.9	12.2	12.8	13.3	16.4	14.4	11.6
Silver (Ag)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Parameter	BASELINE SAMPLE MW1	MW1	BASELINE SAMPLE MW2	MW2	MW3	BASELINE SAMPLE MW4	MW4	BASELINE SAMPLE MW5	MW5	BASELINE SAMPLE MW6	MW6	BASELINE SAMPLE MW7	MW7
Sodium (Na)-Total	99.9	101	135	135	25.7	74	39.1	163	189	145	40.6	179	175
Strontium (Sr)-Total	1.68	1.77	1.79	1.93	0.779	2.5	0.8	2.11	2.28	0.73	0.662	2.02	2
Tellurium (Te)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Thallium (Tl)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Thorium (Th)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.073	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Tin (Sn)-Total	0.00228	0.00139	0.00182	0.00128	0.00108	0.00367	0.00077	0.00144	0.00116	0.00065	<0.00060	0.00161	<0.00060
Titanium (Ti)-Total	0.0026	0.0632	0.011	0.0183	0.0062	5.09	0.136	0.007	0.0228	0.02	0.0894	0.0582	0.0116
Tungsten (W)-Total	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Uranium (U)-Total	0.153	0.168	0.113	0.137	0.0346	0.0566	0.0403	0.155	0.167	0.033	0.0354	0.162	0.189
Vanadium (V)-Total	<0.0020	0.0042	<0.0020	<0.0020	<0.0020	0.242	0.0063	<0.0020	<0.0020	0.003	0.0062	0.0031	<0.0020
Zinc (Zn)-Total	<0.020	<0.020	<0.020	0.023	<0.020	0.469	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020
Zirconium (Zr)-Total	0.001	0.0023	0.0011	<0.0010	<0.0010	0.0377	0.003	0.0014	0.0019	0.0029	0.0027	0.0032	0.0012
Chemical Oxygen Demand	45	38	39	32	<20	47	21	38	40	24	51	35	24
Acetone	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromochloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromodichloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromoform	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromomethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
n-Butylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
sec-Butylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tert-Butylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon disulfide	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon Tetrachloride	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromochloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloroethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloromethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2-Chlorotoluene	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
4-Chlorotoluene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromo-3-chloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromoethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromomethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,4-Dichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichlorodifluoromethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-dichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloroethane	<0.0020 *	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1-dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,2-Dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,2-Dichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichloromethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2,2-Dichloropropane	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *
1,1-Dichloropropene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,3-Dichloropropene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,3-Dichloropropene	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *	<0.00050	<0.0010 *
Ethylbenzene	0.00096	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2-Hexanone (Methyl butyl ketone)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Isopropylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4-Isopropyltoluene	0.00132	<0.0010	0.00112	<0.0010	<0.0010	0.00117	<0.0010	0.00108	<0.0010	0.0012	<0.0010	0.00093	<0.0010
MEK	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MIBK	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MTBE	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Naphthalene	<0.00050	-	<0.00050	-	-	<0.00050	-	<0.00050	-	<0.00050	-	<0.00050	-
Styrene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1,2-Tetrachloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2,2-Tetrachloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,3-Trichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trichlorobenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1-Trichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2-Trichloroethane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichloroethene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorofluoromethane	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,3-Trichloropropane	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trimethylbenzene	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3,5-Trimethylbenzene	0.00067	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050

PARAMETER	BASELINE SAMPLE MW1	MW1	BASELINE SAMPLE MW2	MW2	MW3	BASELINE SAMPLE MW4	MW4	BASELINE SAMPLE MW5	MW5	BASELINE SAMPLE MW6	MW6	BASELINE SAMPLE MW7	MW7
Vinyl Chloride	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	0.00113	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
M+P-Xylenes	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Xylenes (Total)	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
F1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total THMs	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

* = Result Qualified
Note that no baseline data for MW3 was collected. MW3 was dry at baseline acquisition.

4.8.3 GCDWQ COMPARISON

The following dissolved metals exceeded the GCDWQ and have been noted in Table 5-1 and Appendix A:

- Samples analyzed from all the MW's had an exceedance for uranium of approximately 0.3x to 8.3x times the guideline of 0.02 mg/L. When this parameter was compared to the baseline data taken in 2014, relative percent differences for each well ranged from +21% to -29%, within anticipated various for this parameter, conditions, and time between sampling events.

- Total dissolved solids, sulfate (except MW 3,4 and 6), aluminum, and iron (except MW 3 and 7) were all parameters which exceeded the aesthetic guidelines found in the GCDWQ. Although they exceed aesthetic guidelines, they do not exceed or have MACs.

Although concentrations of various parameters remain low, based on the above preliminary analysis, there is little evidence for environmental liability based on this single event. Addition sampling events will facilitate inferring if there is potential contaminant movement.

5 CONCLUSIONS

As indicated in the previous section, all parameters in this sampling event, with the exception of uranium, are below the MAC per the GCDWQ.

Based on the sampling event analysis, there is insufficient evidence indicating environmental liability based on this single event. Addition sampling events will facilitate inferring if there is potential contaminant movement.

5.1 RECOMMENDATIONS

Based on the above conclusions, WSP recommends the following:

- Continued groundwater monitoring per the approved groundwater monitoring plane.

- Consultation with MSD outlining the groundwater sampling results outlined in this report and to confirm potential future steps if required, regarding the use of guidelines for future monitoring events.

6 CLOSURE

6.1 QUALIFIED PERSONS

Justin Rak-Banville is a Water Specialist with expertise in analytical chemistry and environmental engineering with the Manitoba Environmental Infrastructure Department. Justin provides professional project consulting experience on emerging water treatment technologies, disinfection mechanistic chemistry, hydro-electric development impact studies, environmental and contaminated site assessments and their combined impact on the concepts of water quality, treatment and analysis. Mr. Rak-Banville provides advisory to the development, implementation, and maintenance of potable water and wastewater systems quality control standards, inclusive to water quality/effluent analysis, modeling, treatability and impact analysis.

Iain Pimlott, B.Sc., C.Tech., is our Senior Environmental Specialist and is located in our Manitoba office in Winnipeg. Iain has acquired expertise in the environmental and civil engineering disciplines over a 19 year career in consulting. Iain's experience spans a broad scope that includes solid waste management and site design, feasibility studies, engineering design and regulatory approval, construction, commissioning and solid waste site operation. Iain's expertise also includes project management, contract administration, environmental site and impact assessments, impacted site remediation, surface and groundwater monitoring programs and environmental planning studies.

6.2 STANDARD LIMITATIONS

The findings and recommendations provided in this report were prepared by WSP (the Consultant) in accordance with generally accepted professional engineering principles and practices. This environmental site assessment does not constitute a legal opinion. The disclosure of any information contained in this report is the sole responsibility of the client. The principles, procedures and standards applied in conducting an environmental site assessment are neither regulated nor universally the same. The Consultant conducts its assessments in accordance with principles, procedures and standards that it has developed over the years, which are substantially the same as the environmental site assessment principles and practices of the Canadian Standards Association.
Accordingly, the assessments follow a similar format, and the assessment is made with regard to that is perceived as being good environmental management practice and in accordance with known applicable environmental regulations and standards at the time of report preparation.

It is important to note that the standard protocols and methods of evaluation employed, while aimed at minimizing the risk of unidentified environmental non-conformities to laws, regulations and generally accepted practices, cannot guarantee their absence. The Consultant has performed this assessment as specified in the engagement letter, terms of reference and scope of work agreed to with the client.

The information in this report is based on the representations made by others in response to requests for information made by the Consultant. The accuracy of the findings, opinions and conclusions expressed in this report are subject to any errors or omissions in, or refusal to provide that information.

This report is limited in scope to only those items that are specifically referenced in this report. There may be existing conditions that were not recorded in this report. Such conditions were not apparent to the Consultant due to the limitations imposed by the scope of work. The Consultant, therefore, accepts no liability for any costs incurred by the Client for subsequent discovery, manifestation or rectification of such conditions.

6.3 CERTIFICATION OF WORK

This report is intended solely for the Client named as a general indication of the visible or reported physical condition of the items addressed in the report at the time of the assessment. The material in this report reflects the Consultant's best judgment in light of the information available to it at the time of preparation.

This report and the information and data contained herein are to be treated as confidential and may be used only by the Client and its officers and employees in relation to the specific project that it was prepared for. Any use a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The report should be read in its entirety. Do not use any part of this report as a separate entity. All files, notes, source data, test results and master files are retained by the Consultant and remain the property of the Consultant.

6.4 REFERENCES

Canadian Council of Ministers of the Environment (1999) Canadian water quality guidelines for the protection of aquatic life. Canadian Council of Ministers of the Environment: Winnipeg.

6.5 FINAL REMARKS

We trust that this information satisfies your current needs. Should you have any questions or comments, please contact the under signed.

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Water Specialist

Reviewed by:

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Senior Environmental Specialist
Project Manager, Environmental Infrastructure

Appendix 1

ALS LABORATORY RESULTS

Sample Receipt Confirmation

Report Distribution:

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Invoice Email: mamie.moigula@wspgroup.com
Project #: N/A
Account #: W2638

Client Information:

Job Reference #: ST CLEMENTS GW MONITORING
Project PO #:
Legal Site Description: N/A
Quote #: Q48095
Date Sampled: 12-OCT-17
Date Received: 12-OCT-17
Sampled By: JRB
Chain Of Custody: --

Workorder Summary:

Lab Work Order #: **L2006280**
Estimated completion date: 25-OCT-17
7 Samples received at ALS in **WINNIPEG**
Client Job #: ST CLEMENTS GW MONITORING
Account Manager: Shannon Sawatzky
Estimated sample disposal date: See Sample Disposal Information section below.

Lab Sample ID	Client Sample ID	Date Sampled	Date Received	Sample Due Date	Priority Flag	Sample Type
L2006280-1	MW - 1	12-OCT-17 13:05	12-OCT-17 15:50	25-OCT-17		WATER
L2006280-2	MW - 2	12-OCT-17 13:27	12-OCT-17 15:50	25-OCT-17		WATER
L2006280-3	MW - 3	12-OCT-17 13:50	12-OCT-17 15:50	25-OCT-17		WATER
L2006280-4	MW - 4	12-OCT-17 14:18	12-OCT-17 15:50	25-OCT-17		WATER
L2006280-5	MW - 5	12-OCT-17 14:40	12-OCT-17 15:50	25-OCT-17		WATER
L2006280-6	MW - 6	12-OCT-17 14:56	12-OCT-17 15:50	25-OCT-17		WATER
L2006280-7	MW - 7	12-OCT-17 15:20	12-OCT-17 15:50	25-OCT-17		WATER

Analysis Requested :	Alkalinity species as HCO3, CO3, OH	Total Organic Carbon by Combustion	Chloride in Water by IC	Chemical Oxygen Demand	Conductivity	Hardness Calculated	Total Metals in Water by CRC ICPMS	Total Kjeldahl Nitrogen	Ammonia by colour	Nitrite in Water by IC	Nitrate in Water by IC	pH	Phosphate Ortho Dissolved in Water	Reactive Silica by colour	Sulfate in Water by IC	Total Solids	Total Suspended Solids	Total Dissolved Solids [TDS]
MW - 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW - 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW - 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW - 4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW - 5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW - 6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MW - 7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Analysis Requested :	Total Trihalomethanes [THMs]	Turbidity	VOC plus F1 by GCMS	Sum of Xylene Isomer Concentrations	Extra sample Bottle	Sample Handling and Disposal Fee	Special Request - Kelso
MW - 1	✓	✓	✓	✓	✓	✓	✓
MW - 2	✓	✓	✓	✓	✓	✓	✓
MW - 3	✓	✓	✓	✓	✓	✓	✓
MW - 4	✓	✓	✓	✓	✓	✓	✓
MW - 5	✓	✓	✓	✓	✓	✓	✓
MW - 6	✓	✓	✓	✓	✓	✓	✓
MW - 7	✓	✓	✓	✓	✓	✓	✓

Hold Time Exceedences: The following samples have exceeded recommended holding times prior to sample receipt.

Analysis Requested	Lab Sample ID	Recommended Hold Time	Date Sampled	Date Received
pH	L2006280-1, 2, 3, 4, 5, 6, 7	0.25 hours	12-OCT-17	12-OCT-17

Sample Integrity Observations: No observations were identified for this work order submission.

Notice of Sub-contract Laboratory Service

Please be advised that the following tests will be subcontracted to the corresponding laboratory:

Special Request - Kelso subcontracted to: ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA

Please contact your Account Manager immediately should you have questions or concerns regarding this arrangement. Approval of this arrangement shall be implied unless otherwise notified by you.

Sample Disposal Information:

Where possible, ALS will store samples for the following durations, measured from date of sample submission: 45 days for Soil and Water samples; 6 months for Tissue/Biota samples; 14 days for air samples collected on re-usable media; and 3 days for water samples submitted for microbiological testing. Longer storage times are available upon request.

For information about ALS accreditations and certifications please contact your Account Manager or visit our webpage at www.alsglobal.com (see Canada downloads).

ALS Group strives to deliver on-time results to our clients at all times. However, there are times when due to capacity issues or other unforeseen circumstances we are unable to meet our expected turnaround times. The information above is related to a recent workorder you have submitted to our laboratory. In the event that you have an inquiry, please refer to the Lab Work Order # when calling your Account Manager.

ALS Group appreciates your business. Thank you for the opportunity to work with you.

10- 225045

ALS Environmental

L2006280-COFC

Page ____ of ____

Report To WSP	**Report**	**Service Request:** (Rush subject to availability - Contact ALS to confirm TAT)
Company: 204 4776650	Standard: X Other (specify):	Regular (Standard Turnaround Times - Business Days)
Contact:	Select: PDF Excel Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address:	Email 1: justin.rak-banville@wsp.com	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
	Email 2: iain.pimlott@wsp.com	Same Day or Weekend Emergency - Contact ALS to confirm TAT
Phone: Fax:		**Analysis Request**
Invoice To Same as Report ? (circle) Yes or No (if No, provide details)	**Client / Project Information**	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) Yes or No	Job #: St. Clements GW Monitoring	
Company: WSP	PO / AFE:	Same quote used for L1853274 Q48095
Contact: Justin Rak-Banville	LSD:	
Address:		
Phone: Fax:	Quote #: See L1853274	
Lab Work Order # (lab use only)	**ALS Contact:** Judy **Sampler:** JRB	

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	MW-1	12-10-17	13:05	H_2O	
	MW-2		13:27		
	MW-3		13:50		
	MW-4		14:18		
	MW-5		14:40		
	MW-6		14:56		
	MW-7		15:20		

Special Instructions / Regulation with water or land use (CCME- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

large Cooler

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.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
			CM	12-10-17	3:50	12.6 °C				

RURAL MUNICIPALITY OF ST. CLEMENTS
2018 EAST SELKIRK LAGOON GROUNDWATER MONITORING REPORT

PROJECT NO.: 171-14563-00
DATE: JANUARY 2019

WSP
1600 BUFFALO PLACE
WINNIPEG, MB, CANADA R3T 6B8

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APPENDIX

1 INTRODUCTION

On behalf of the RM of St. Clements, WSP conducted a groundwater monitoring event at the East Selkirk Wastewater Stabilization Pond (ESWSP) located on River Lots CLRL 89-95, Parish of St. Clements, approximately 2.0 kilometres (km) south of East Selkirk, Manitoba, herein referred to as the "Site". Groundwater monitoring was conducted at the Site on September 26th, 2018 as part of the scheduled groundwater monitoring program as requested by Manitoba Sustainable Development (MSD).

This report summarizes the results of the 2018 groundwater sampling event completed for the ESWSP and compares the results with the Guideline for Canadian Water Quality (CWQG) have been applied for the groundwater monitoring event in order to assess changes in contaminants of concern potentially associated with the stabilization pond.

The monitoring program involved inspection of the monitoring wells, purging of the wells, collection of water samples, submission to the laboratory, with analysis, review and discussion of the laboratory results. Water quality parameters tested were assigned by the Manitoba Sustainable Development approved groundwater monitoring plan, dated October 23, 2013. As per Clause 43 of License No. 3058 regarding the RM of St. Clements ESWSP, a groundwater monitoring plan to monitor water quality in the area surrounding the lagoon has been approved by the former Manitoba Conservation and Water Stewardship, now Manitoba Sustainable Development.

A site plan, attached, highlights the seven proposed groundwater monitoring wells and the approximate locations. Encompassing the perimeter of the lagoon, and with the expected groundwater flow directed north towards the Red River, these locations are expected to provide sufficient baseline and future monitoring data.

The attached drawing also highlights monitoring well construction details. The wells have been installed by a Manitoba licensed well driller.

2 SCOPE OF WORK

The scope of work for the 2018 groundwater monitoring event is based on the groundwater sampling program as follows:

- Evaluation of current monitoring well conditions,
- Physical monitoring of all wells, including depth to groundwater, and total well depth,
- Purging wells at least three well volumes or until dry,
- Obtain groundwater samples from each monitoring well,
- Submission of groundwater samples to ALS Laboratories Group (CALA certified laboratory) for analysis for the following analytes,
- Comparison of sample results with Guidelines for Canadian Drinking Water Quality (GCDWQ). Dissolved samples were not field filtered.

  Standard Analytes:

  - bicarbonate, calcium, carbonate, chloride, conductance (EC), alkalinity, hardness, total dissolved solids (TDS), total solids (TS), total suspended solids (TSS), total organic carbon (TOC), chemical oxygen demand (COD), turbidity (NTU), ammonia-nitrogen (NH3-N), chloride (Cl), total kjedahl nitrogen (TKN), nitrate-nitrogen (NO3-N), nitire-nitrogen (NO2-N), sulfate (SO42-), phosphate (PO43-), silicon dioxide (SiO2), pH, turbidity.

  Metals:

  - aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), bismuth (Bi), boron (B), cadmium (Cd), calcium (Ca), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), molybdenum (Mo), nickel (Ni), phosphorus (P), potassium (K), selenium (Se), silver (Ag), sodium (Na), strontium (Sr), thallium (Tl), tin (Sn), titanium (Ti),uranium (U), vanadium (V), zinc (Zn).

  Volatile Organic Compounds:

  - acetone, benzene, bromobenzene, bromochloromethane, bromodichloromethane, bromoform, bromomethane, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, carbon disulfide, carbon tetrachloride, chlorobenzene, dibromochloromethane, chloroethane, chloroform, chloromethane, 2-chlorotoluene, 4-chlorotoluene, 1,2-dibromo-3- chloropropane, 1,2-dibromoethane, dibromomethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, dichlorodifluoromethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, dichloromethane, 1,2-dichloropropane, 1,3-dichloropropane, 2,2-dichloropropane, 1,1-dichloropropene, cis-1,3-dichloropropene, trans-1,3-dichloropropene, ethylbenzene, hexachlorobutadiene,

hexane, 2-hexanone (methyl butyl ketone), isopropylbenzene, 4-isopropyltoluene, MEK, MIBK, MTBE, naphthalene, styrene, 1,1,1,2-tetrachloroethane, 1,1,2,2-tetrachloroethane, tetrachloroethene, toluene, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene, trichlorofluoromethane, 1,2,3-trichloropropane, trihalomethanes (total), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, vinyl chloride, o-xylene, M+Pxylenes, xylenes, isomers of dinitrotoluene:

- 2,4-dinitrotoluene and 2,6-dinitrotoluene.

3 SITE CHARACTERIZATION

A summary of the site characteristics was completed and tabulated below.

Table 3-1: Site Characterization

SITE CHARACTERISTIC	DESCRIPTION
Site Description and Land Use	The wastewater stabilization pond site is used for the treatment of wastewater. Groundwater monitoring has historically has not been conducted on the site.
Surrounding Land Use	In all cardinal directions, the ESWSP is surrounded by farmed land, with minor forested areas occurring south-west of the site. Forests in the area are typically composed of mixed vegetation, with common tree species including ash, jack pine, white birch, black and white spruce, balsam fir, balsam poplar and trembling aspen
Topography	Although the site consists of generally flat topography throughout, with a gentle slope towards the north-northwest.
Soil and Geology	**Soil:** According to the Canadian System of Soil Classification, the soils are classified as dominantly Gray Luvisols (Lettonia series), Dark Gray Luvisols (Whitemouth and Pine Valley series) and Dark Gray Chernozems (Thalberg and Framnes series), all developed on well to imperfectly drained lacustrine clay sediments.
	Geology: Soil materials in the municipality were deposited during the time of glacial Lake Agassiz and consist primarily of shallow to deep organic deposits and shallow to deep clayey and silty lacustrine sediments. Local areas of clay are underlain by stony, weakly calcareous to acidic glacial till. The Precambrian bedrock underlying the municipality outcrops mainly in the eastern portion of the area.
Water	**Surface:** The Site is located approximately 500 metres south-southeast of the Red River. Based on the groundwater elevations, the flow direction is expected to flow north-northwest towards the Red River.

Monitoring well locations are illustrated in the subsequent figure while elevations and depth to groundwater have been tabulated as follows:

Table 3-2: Groundwater Monitoring Well Parameters (metres)

2016 MONITORING WELL	UTM COORDINATES	SURVEYED GROUND ELEVATION	TOP OF MONITORING WELL PVC LIP	ELEVATION OF GROUNDWATER	DEPTH TO GROUNDWATER
1	14U 653091 5554072	226.44	227.27	221.29	5.98
2	14U 652992 5554162	226.34	227.15	224.68	2.47
3	14U 652803 5553962	226.67	227.25	Dry	Dry
4	14U 652632 5553771	228.01	228.98	226.05	2.93
5	14U 652890 5553620	226.70	227.46	222.87	4.59
6	14U 652995 5553682	226.60	227.51	223.97	3.54
7	14U 653137 5553899	226.42	227.39	224.44	2.95
2017 MONITORING WELL	UTM COORDINATES	SURVEYED GROUND ELEVATION	TOP OF MONITORING WELL PVC LIP	ELEVATION OF GROUNDWATER	DEPTH TO GROUNDWATER
1	14U 653091 5554072	226.44	227.27	225.30	1.14
2	14U 652992 5554162	226.34	227.15	224.75	1.59
3	14U 652803 5553962	226.67	227.25	224.09	2.58
4	14U 652632 5553771	228.01	228.98	226.71	1.30
5	14U 652890 5553620	226.70	227.46	224.75	1.95
6	14U 652995 5553682	226.60	227.51	224.67	1.93
7	14U 653137 5553899	226.42	227.39	224.31	2.11
2018 MONITORING WELL	UTM COORDINATES	SURVEYED GROUND ELEVATION	TOP OF MONITORING WELL PVC LIP	ELEVATION OF GROUNDWATER	DEPTH TO GROUNDWATER
1	14U 653091 5554072	226.44	227.27	225.89	0.55
2	14U 652992 5554162	226.34	227.15	225.28	1.06
3	14U 652803 5553962	226.67	227.25	224.90	1.77
4	14U 652632 5553771	228.01	228.98	227.07	0.94
5	14U 652890 5553620	226.70	227.46	225.46	1.24
6	14U 652995 5553682	226.60	227.51	225.38	1.22
7	14U 653137 5553899	226.42	227.39	224.64	1.78

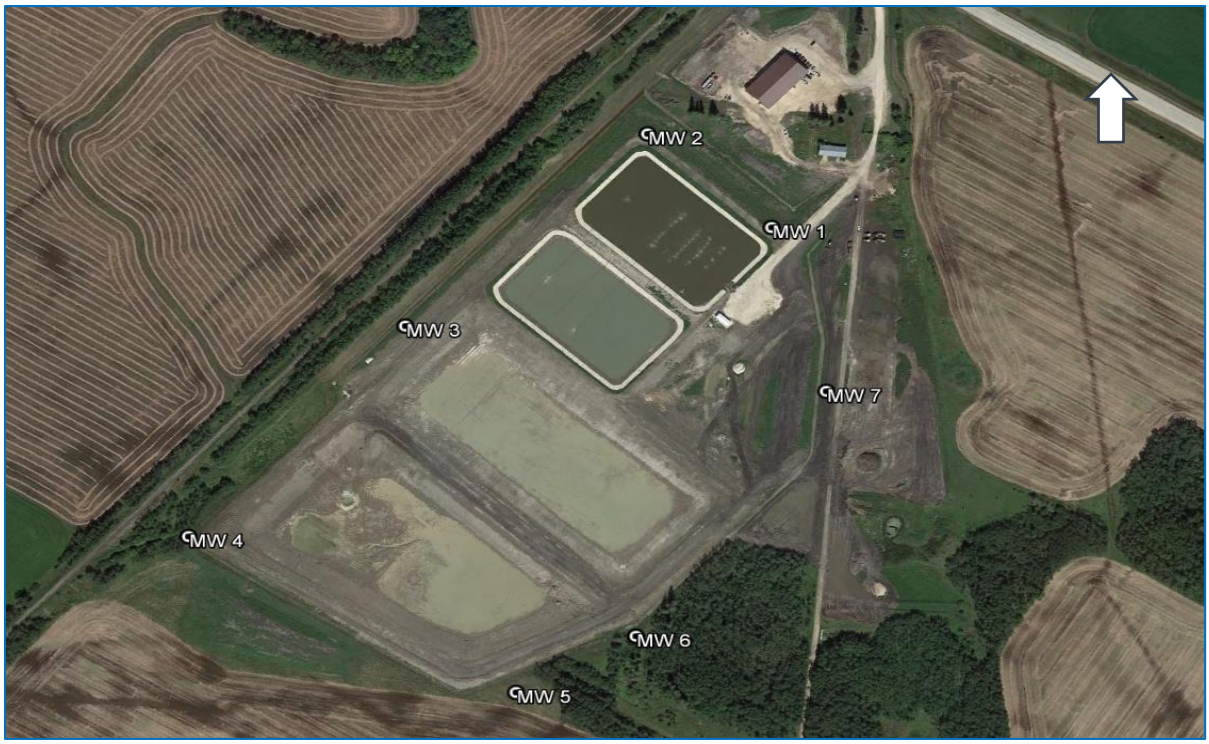

Figure 1: Groundwater Monitoring Well Locations. Observed groundwater flow is towards the north.

4 METHOD

WSP completed a groundwater monitoring event, using the existing monitoring wells on-site on September 26, 2018. Methodologies and protocols are described as follows.

4.1 MONITORING WELL CONDITION

Each monitoring well's condition was evaluated based on visual inspections of each well for signs of cracking, breakage or tampering. All wells were in good condition and protected with lockable steel casings.

4.2 GROUNDWATER QUALITY PARAMETERS AND PROPERTIES

WSP field staff measured all monitoring wells depth to groundwater and total well depth, using a clean Heron water interface measuring tape. Measurements were recorded at the lip of the PVC well casing. Groundwater was purged and sampled using Waterra 1.5 inch clear PVC bailers.

4.3 GROUNDWATER SAMPLE COLLECTION

The wells were sampled when more than three well volumes were removed, or if wells were purged dry. Collected groundwater samples were placed in clean, laboratory-supplied sample containers that were appropriately pre-labelled. Sample containers were placed in a cooler with cold packs to maintain a temperature of 4°C for preservation. These samples were then delivered to ALS Laboratories for analysis on the same day as sampling. Standard chain-of-custody procedures were followed during sample handling and delivery.

4.4 ANALYTICAL TESTING

Groundwater samples collected were submitted to ALS Laboratories for analysis of parameters outlined in Section 2.0 Scope of Work.

4.5 QUALITY ASSURANCE AND QUALITY CONTROL

Quality Control is the process of verifying that work is technically correct and accurate. The following quality assurance and control measures were carried out during this monitoring program:

- Groundwater sampling was conducted in accordance with Manitoba Conservation and Sustainable Development Groundwater Sampling at Waste Disposal Grounds and Waste Transfer Stations procedure number PR-18-1929-001 (October 23, 2014).
- Disposable vinyl gloves were worn when handling sampling and containers and were replaced after use. Prior to re-use, non-dedicated sampling equipment and monitoring instruments were thoroughly cleaned.

- All samples for potential laboratory analysis were collected in the appropriate containers provided by the laboratory.
- ALS Laboratories completed a variety of quality assurance/quality control (QA/QC) measures on the samples submitted as part of the sampling program. These QA/QC measures include: sample replicates, matrix spiked laboratory blanks, and process blanks. Analytical and quality control data were reviewed and have been validated by ALS Laboratories. Copies of the Quality Assurance Reports and analytical methods are included with the Certificates of Analysis in Appendix A.

No issues with laboratory analysis, sample shipping, sample preservation, or field sampling techniques that could have a material effect on the interpretation of the reported results were identified as part of the QA/QC program.

4.6 REGULATORY CRITERIA

At the time of drafting, Manitoba does not have regulatory guidelines addressing residual environmental impacts to soil or groundwater (i.e., metals, petroleum hydrocarbons, nutrients) therefore the GCDWQ have been applied for the groundwater monitoring event. These guidelines are considered stringent due to their use in regulating limits of various present in potable water. MSD may direct future monitoring events to use alternative regulatory criteria.

5 RESULTS

5.1 GROUNDWATER QUALITY PARAMETERS AND PROPERTIES

Depth to groundwater ranged from 0.55 m to 1.78 m below ground surface (mbgs). All water levels are less than 10 mbgs and the area is considered to therefore have a high water table.

5.1.1 ANALYTICAL RESULTS

Groundwater results are presented in the following table.

Table 5-1: 2018 Sampling Results

PARAMETER	UNITS	LIMIT OF DETECTION	GCDWQ AO/MAC LIMIT	MW1	MW2	MW3	MW4	MW5	MW6	MW7
09/26/2018 L2171249				L2171249-1	L2171249-2	L2171249-3	L2171249-7	L2171249-4	L2171249-5	L2171249-6
Conductivity	mg/L	1		2800	3150	1260	1390	4380	1060	3640
Hardness (as CaCO3)	mg/L	0.54		2020 *	2130 *	771 *	1600 *	3440 *	727 *	2680 *
pH	mg/L	0.1	AO <8.5	7.23	7.18	7.66	7.53	7.3	7.67	7.20
Total Suspended Solids	mg/L	5		5.3	23.5	112	607	25.5	75.2	31.1
Total Dissolved Solids	mg/L	20	AO <500	2650	2780	724	985	4640	619	3610
Total Solids	mg/L	10		2740	3120	976	1660	4370 *	796	3750
Turbidity	mg/L	0.1		4.26	14.1	50.4	158	9.55	60.7	18.6
Alkalinity, Total (as CaCO3)	mg/L	1		627	611	784	540	704	555	673
Ammonia, Total (as N)	mg/L	0.01		0.083	0.067	<0.010	0.021	<0.010	<0.010	0.018
Bicarbonate (HCO3)	mg/L	1.2		765	745	956	658	859	677	822
Carbonate (CO3)	mg/L	0.6		<0.60	<0.60	<0.60	<0.60	<0.60	<0.60	<0.60
Chloride (Cl)	mg/L	2.5	AO <250	<10 *	<10 *	<2.5 *	11.6	<10 *	12.3	<10 *
Hydroxide (OH)	mg/L	0.34		<0.34	<0.34	<0.34	<0.34	<0.34	<0.34	<0.34
Nitrate (as N)	mg/L	0.1	10.0	<0.40 *	<0.40 *	<0.10 *	0.26	<0.40 *	0.341	<0.40 *
Nitrite (as N)	mg/L	0.05	1.0	<0.20 *	<0.20 *	<0.050 *	<0.050 *	<0.20 *	<0.020 *	<0.20 *
Total Kjeldahl Nitrogen	mg/L	0.2		0.71	0.63	0.33	0.55	1.05	0.26	0.51
Orthophosphate-Dissolved (as P)	mg/L	0.01		0.0042	<0.0010	0.0025	<0.0010	0.0035	0.0016	0.0015
Silica, Reactive (as SiO2)	mg/L	1		18.8	19.9	20.3	17.9	19.8	14.7	18.4
Sulfate (SO4)	mg/L	1.5	AO <500	1360	1650	38.4	322	2860	73.9	2020
Total Organic Carbon	mg/L	0.5		11.3	9.68	5.76	4.52	13.7	3.79	7.96
Aluminum (Al)-Total	mg/L	0.02	AO <0.1	0.0342	0.122	1.21	4.01	0.11	0.412	0.616
Antimony (Sb)-Total	mg/L	0.001	0.006	0.00024	0.00016	0.00034	0.00016	0.00016	0.00011	<0.00010
Arsenic (As)-Total	mg/L	0.001	0.01 ALARA	0.00088	0.00086	0.00088	0.00370	0.00102	0.00061	0.00085
Barium (Ba)-Total	mg/L	0.0005	1.0	0.0104	0.0112	0.156	0.0782	0.0103	0.0982	0.0155
Beryllium (Be)-Total	mg/L	0.001		<0.00010	<0.00010	<0.00010	0.00024	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	0.0005		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total	mg/L	0.03	5	0.206	0.206	0.123	0.152	0.154	0.128	0.200
Cadmium (Cd)-Total	mg/L	0.0002	0.005	0.0000119	0.0000125	0.0000327	0.0000684	0.0000174	0.0000067	0.0000147
Calcium (Ca)-Total	mg/L	0.2		358	340	85.2	327	508	95.0	449
Cesium (Cs)-Total	mg/L	0.0005		<0.000010	0.000019	0.000184	0.000572	0.000015	0.000043	0.000081
Chromium (Cr)-Total	mg/L	0.002	0.05	0.00018	0.00037	0.00244	0.00756	0.00035	0.00070	0.00145
Cobalt (Co)-Total	mg/L	0.0005	AO < 1.0	0.00193	0.00252	0.00076	0.00360	0.0002	0.00034	0.00278
Copper (Cu)-Total	mg/L	0.002	AO <1.0	0.00229	0.00313	0.00651	0.0109	0.00488	0.00191	0.00425
Iron (Fe)-Total	mg/L	0.1	AO <0.3	0.072	0.197	1.36	7.25	0.158	0.366	0.741
Lead (Pb)-Total	mg/L	0.001	0.01	0.000117	0.000255	0.000971	0.00582	0.000337	0.000315	0.000529
Lithium (Li)-Total	mg/L	0.002		0.364	0.375	0.160	0.166	0.431	0.125	0.394
Magnesium (Mg)-Total	mg/L	0.05		275	312	136	190	527	119	379
Manganese (Mn)-Total	mg/L	0.001		0.567	0.426	0.0605	0.471	0.0399	0.0336	0.429
Molybdenum (Mo)-Total	mg/L	0.0005		0.00267	0.00258	0.00701	0.00490	0.00323	0.00497	0.00318

Parameter	Units	Limit of Detection	GCDWQ AO/MAC Limit	MW1	MW2	MW3	MW4	MW5	MW6	MW7
Nickel (Ni)-Total	mg/L	0.002		0.0116	0.0105	0.00634	0.0114	0.0124	0.00273	0.0161
Phosphorus (P)-Total	mg/L	0.5		<0.050	<0.050	0.089	0.320	0.056	<0.050	0.066
Potassium (K)-Total	mg/L	0.1		7.54	8.52	4.02	6.83	10.8	4.40	9.48
Rubidium (Rb)-Total	mg/L	0.0005		0.00042	0.00063	0.00338	0.0101	0.00077	0.00103	0.00183
Selenium (Se)-Total	mg/L	0.005	0.05	0.000194	0.000186	0.000444	0.000226	0.000426	0.000617	0.000273
Silicon (Si)-Total	mg/L	0.3		11.0	11.7	13.1	18.0	12.5	10.7	12.0
Silver (Ag)-Total	mg/L	0.001		<0.000010	<0.000010	0.000012	0.000050	<0.000010	<0.000010	0.000013
Sodium (Na)-Total	mg/L	0.05	AO <200	104	138	23.1	46.5	198	42.5	178
Strontium (Sr)-Total	mg/L	0.0005		1.86	2.07	0.675	0.907	2.54	0.670	2.22
Sulfur (S)-Total	mg/L	0.50		546	610	15.0	130	1060	34.1	792
Tellurium (Te)-Total	mg/L	0.001		0.00022	0.00021	<0.00020	<0.00020	0.00025	<0.00020	0.00031
Thallium (Tl)-Total	mg/L	0.005		<0.000010	<0.000010	0.000027	0.000102	<0.000010	<0.000010	0.000012
Thorium (Th)-Total	mg/L	0.001		<0.00010	<0.00010	0.00035	0.00341	<0.00010	0.00022	0.00030
Tin (Sn)-Total	mg/L	0.0006		0.00023	0.00039	0.00157	0.00053	0.00042	0.00020	0.00041
Titanium (Ti)-Total	mg/L	0.001		0.00142	0.00552	0.0483	0.190	0.00386	0.0139	0.0291
Tungsten (W)-Total	mg/L	0.002	0.02	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium (U)-Total	mg/L	0.0005		0.177	0.120	0.0312	0.0441	0.172	0.0351	0.185
Vanadium (V)-Total	mg/L	0.002	AO <5.0	0.00078	0.00080	0.00450	0.00999	0.001	0.00162	0.00195
Zinc (Zn)-Total	mg/L	0.02		<0.0030	<0.0030	0.0077	0.0173	0.0035	0.0032	0.0047
Zirconium (Zr)-Total	mg/L	0.001		0.000864	0.000701	0.00121	0.00254	0.00127	0.000600	0.00200
Chemical Oxygen Demand	mg/L	20		41	32	20	24	40	<20	25
Acetone	mg/L	0.02	0.005	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromochloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromodichloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromoform	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Bromomethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
n-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
sec-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
tert-Butylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon disulfide	mg/L	0.0005	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Carbon Tetrachloride	mg/L	0.0005	0.08	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromochloromethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloroethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Chloroform	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Chloromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
2-Chlorotoluene	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
4-Chlorotoluene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromo-3-chloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dibromoethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dibromomethane	mg/L	0.0005	0.2	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichlorobenzene	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,4-Dichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichlorodifluoromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,1-dichloroethane	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2-Dichloroethane	mg/L	0.0005	0.014	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1-dichloroethene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,2-Dichloroethene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
trans-1,2-Dichloroethene	mg/L	0.0005	0.05	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Dichloromethane	mg/L	0.0005		<0.0020 *	<0.0030 *	<0.0020 *	<0.0020 *	<0.0030 *	<0.0020 *	<0.0020 *
1,2-Dichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3-Dichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2,2-Dichloropropane	mg/L	0.001		<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *
1,1-Dichloropropene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
cis-1,3-Dichloropropene	mg/L	0.0005		<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *
trans-1,3-Dichloropropene	mg/L	0.001	0.14	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *	<0.0010 *
Ethylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexachlorobutadiene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Hexane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
2-Hexanone (Methyl butyl ketone)	%	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

PARAMETER	UNITS	LIMIT OF DETECTION	GCDWQ AO/MAC LIMIT	MW1	MW2	MW3	MW4	MW5	MW6	MW7
Isopropylbenzene	%	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
4-Isopropyltoluene	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
MEK	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MIBK	mg/L	0.02		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MTBE	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Styrene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1,2-Tetrachloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2,2-Tetrachloroethane	mg/L	0.0005	0.01	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Tetrachloroethene	mg/L	0.0005	0.06	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Toluene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,3-Trichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trichlorobenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,1-Trichloroethane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,1,2-Trichloroethane	mg/L	0.0005	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichloroethene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Trichlorofluoromethane	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
1,2,3-Trichloropropane	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,2,4-Trimethylbenzene	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
1,3,5-Trimethylbenzene	mg/L	0.0005	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Vinyl Chloride	mg/L	0.0005		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/L	0.0005		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
M+P-Xylenes	mg/L	0.0005	0.09	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylenes (Total)	mg/L	0.0015		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
F1	mg/L	0.1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
4-Bromofluorobenzene (SS)	mg/L	Surrogate		98.6	88.5	101.5	95.7	97.8	94.9	84.2
1,4-Difluorobenzene (SS)	mg/L	Surrogate		100.3	99.4	100.8	99.6	100	99.1	99.0
Total THMs	mg/L	0.001		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Applied Guideline: Guidelines for Canadian Drinking Water Quality (February 2017)
AO = Aesthetic objectives exceedances highlighted in orange, all other limits are Maximum Allowable Concentrations (MAC). MAX exceedances highlighted in red.
***Result qualified.**

5.1.2 GCDWQ COMPARISON

The following dissolved metals exceeded the GCDWQ and have been noted in Table 5-1 and Appendix A:

- Samples analyzed from all the MW's had an exceedance for uranium of approximately 1.5x to 9.3x times the guideline of 0.02 mg/L.

- Total dissolved solids, sulfate (except MW 3, 4 and 6), aluminum (except MW 1), iron (except MW 1, 2 and 5) and manganese (except MW 3, 5 and 6) were all parameters which exceeded the aesthetic guidelines found in the GCDWQ. Although they exceed aesthetic guidelines, they do not exceed the Maximum Allowable Concentrations.

Given the use of GCDWQ are intended for consumption, the parameters do not warrant significant concern. Based on the above analysis, there is little evidence for environmental liability.

5.1.3 EXPLOSIVE COMPOUNDS

The following chemical compounds were analyzed from monitoring wells 1-7.

- 4-Amino-2,6-dinitrotoluene
- 2-Amino-4,6-dinitrotoluene
- 3,5-Dinitroaniline
- 1,3-Dinitrobenzene

- 2,4-Dinitrotoluene
- 2,6-Dinitrotoluene

None of the above chemical compounds were detected in the monitoring wells apart from 1,3-dinitrobenzene. 1,3-dinitrobenzene is the most common isomer of nitrobenzene and it is used in the manufacture of explosives. Trace amounts (0.23 μg /L) of the chemical compound 1,3-dinitrobenzene was detected in a sample form Monitoring Well 1 (MW 1). MW 1 is in the approximate area of the former CIL Explosives Plant.

5.2 RECOMMENDATIONS

Based on the above conclusions, WSP recommends the following:

Retesting of samples only from Monitoring Well 1 to confirm the presence of the following chemical compounds;

- 4-amino-2,6-dinitrotoluene
- 2-amino-4,6-dinitrotoluene
- 3,5-dinitroaniline
- 1,3-dinitrobenzene
- 2,4-dinitrotoluene
- 2,6-dinitrotoluene

Consultation with MSD outlining the groundwater sampling results outlined in this report to confirm potential future steps as required.

6 CLOSURE

6.1 QUALIFIED PERSONS

Iain Pimlott, B.Sc., C.Tech., is our Senior Environmental Specialist and is located in our Manitoba office in Winnipeg. Iain has acquired expertise in the environmental and civil engineering disciplines over a 19 year career in consulting. Iain's experience spans a broad scope that includes solid waste management and site design, feasibility studies, engineering design and regulatory approval, construction, commissioning and solid waste site operation. Iain's expertise also includes project management, contract administration, environmental site and impact assessments, impacted site remediation, surface and groundwater monitoring programs and environmental planning studies.

Justin Rak-Banville is a Water Specialist with expertise in analytical chemistry and environmental engineering with the Manitoba Environmental Infrastructure Department. Justin provides professional project consulting experience on emerging water treatment technologies, disinfection mechanistic chemistry, hydro-electric development impact studies, environmental and contaminated site assessments and their combined impact on the concepts of water quality, treatment and analysis. Mr. Rak-Banville provides advisory to the development, implementation, and maintenance of potable water and wastewater systems quality control standards, inclusive to water quality/effluent analysis, modeling, treatability and impact analysis.

6.2 STANDARD LIMITATIONS

The findings and recommendations provided in this report were prepared by WSP (the Consultant) in accordance with generally accepted professional engineering principles and practices. This environmental site assessment does not constitute a legal opinion. The disclosure of any information contained in this report is the sole responsibility of the client. The principles, procedures and standards applied in conducting an environmental site assessment are neither regulated nor universally the same. The Consultant conducts its assessments in accordance with principles, procedures and standards that it has developed over the years, which are substantially the same as the environmental site assessment principles and practices of the Canadian Standards Association.

Accordingly, the assessments follow a similar format, and the assessment is made with regard to that is perceived as being good environmental management practice and in accordance with known applicable environmental regulations and standards at the time of report preparation.

It is important to note that the standard protocols and methods of evaluation employed, while aimed at minimizing the risk of unidentified environmental non-conformities to laws, regulations and generally accepted practices, cannot guarantee their absence. The Consultant has performed this assessment as specified in the engagement letter, terms of reference and scope of work agreed to with the client.

The information in this report is based on the representations made by others in response to requests for information made by the Consultant. The accuracy of the findings, opinions and conclusions expressed in this report are subject to any errors or omissions in, or refusal to provide that information.

This report is limited in scope to only those items that are specifically referenced in this report. There may be existing conditions that were not recorded in this report. Such conditions were not apparent to the Consultant due to the limitations imposed by the scope of work. The Consultant, therefore, accepts no

liability for any costs incurred by the Client for subsequent discovery, manifestation or rectification of such conditions.

6.3 CERTIFICATION OF WORK

This report is intended solely for the Client named as a general indication of the visible or reported physical condition of the items addressed in the report at the time of the assessment. The material in this report reflects the Consultant's best judgment in light of the information available to it at the time of preparation.

This report and the information and data contained herein are to be treated as confidential and may be used only by the Client and its officers and employees in relation to the specific project that it was prepared for. Any use a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The report should be read in its entirety. Do not use any part of this report as a separate entity. All files, notes, source data, test results and master files are retained by the Consultant and remain the property of the Consultant.

6.4 REFERENCES

Canadian Council of Ministers of the Environment (1999) Canadian water quality guidelines for the protection of aquatic life. Canadian Council of Ministers of the Environment: Winnipeg.

6.5 FINAL REMARKS

We trust that this information satisfies your current needs. Should you have any questions or comments, please contact the undersigned.

Prepared for:

Rural Municipality of St. Clements
1043 Kittson Road
Box 2, Group 35, RR #1
East Sekirk, MB R0E 0M0

Report written by:

[redacted]

Iain Pimlott, B.Sc., C.Tech.
Senior Environmental Specialist

Reviewed by:

[redacted]

Justin Rak-Banville, M.Sc., P.Chem., P. Eng.
Water Specialist

APPENDIX

ALS LABORATORY RESULTS

WSP Canada Inc.
ATTN: Iain Pimlott
1600 Buffalo Place
Winnipeg MB R3T 6B8

Date Received: 26-SEP-18
Report Date: 24-OCT-18 13:55 (MT)
Version: FINAL

Client Phone: 204-223-8018

Certificate of Analysis

Lab Work Order #: L2171249

Project P.O. #: NOT SUBMITTED
Job Reference: 171-14563.00
C of C Numbers:
Legal Site Desc:

[redacted]
Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-1 MW-1							
Sampled By: CLIENT on 26-SEP-18 @ 12:00							
Matrix: H2O							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	765		1.2	mg/L		28-SEP-18	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	627		1.0	mg/L		27-SEP-18	R4250830
Miscellaneous Parameters							
Ammonia, Total (as N)	0.083		0.010	mg/L		28-SEP-18	R4251762
Chemical Oxygen Demand	41		20	mg/L		28-SEP-18	R4251873
Chloride (Cl)	<10	DLM	10	mg/L		27-SEP-18	R4253767
Conductivity	2800		1.0	umhos/cm		27-SEP-18	R4250830
Hardness (as CaCO3)	2020	HTC	0.20	mg/L		03-OCT-18	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		27-SEP-18	R4253767
Nitrite (as N)	<0.20	DLM	0.20	mg/L		27-SEP-18	R4253767
Orthophosphate-Dissolved (as P)	0.0042		0.0010	mg/L		02-OCT-18	R4258571
Silica, Reactive (as SiO2)	18.8		1.0	mg/L		28-SEP-18	R4251064
Special Request	See Attached					11-OCT-18	R4296507
Sulfate (SO4)	1360		6.0	mg/L		27-SEP-18	R4253767
Xylenes (Total)	<0.00050		0.00050	mg/L		03-OCT-18	
Total Dissolved Solids	2650		20	mg/L		27-SEP-18	R4251038
Total Kjeldahl Nitrogen	0.71		0.20	mg/L	28-SEP-18	01-OCT-18	R4254070
Total Organic Carbon	11.3		0.50	mg/L		28-SEP-18	R4253828
Total Solids	2740		10	mg/L		28-SEP-18	R4253554
Total Suspended Solids	5.3		2.0	mg/L		29-SEP-18	R4253451
Total THMs	<0.0010		0.0010	mg/L		03-OCT-18	
Turbidity	4.26		0.10	NTU		27-SEP-18	R4250589
pH	7.23		0.10	pH units		27-SEP-18	R4250830
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0342		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Antimony (Sb)-Total	0.00024		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Arsenic (As)-Total	0.00088		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Barium (Ba)-Total	0.0104		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Boron (B)-Total	0.206		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cadmium (Cd)-Total	0.0000119		0.0000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Calcium (Ca)-Total	358		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Chromium (Cr)-Total	0.00018		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cobalt (Co)-Total	0.00193		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Copper (Cu)-Total	0.00229		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Iron (Fe)-Total	0.072		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Lead (Pb)-Total	0.000117		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Lithium (Li)-Total	0.364		0.0010	mg/L	27-SEP-18	28-SEP-18	R4251953
Magnesium (Mg)-Total	275		0.0050	mg/L	27-SEP-18	28-SEP-18	R4251953
Manganese (Mn)-Total	0.567		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Molybdenum (Mo)-Total	0.00267		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Nickel (Ni)-Total	0.0116		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-1 MW-1							
Sampled By: CLIENT on 26-SEP-18 @ 12:00							
Matrix: H2O							
Total Metals in Water by CRC ICPMS							
Potassium (K)-Total	7.54		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Phosphorus (P)-Total	<0.050		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Rubidium (Rb)-Total	0.00042		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Selenium (Se)-Total	0.000194		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Silicon (Si)-Total	11.0		0.10	mg/L	27-SEP-18	28-SEP-18	R4251953
Silver (Ag)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Sodium (Na)-Total	104		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Strontium (Sr)-Total	1.86		0.020	mg/L	27-SEP-18	01-OCT-18	R4257702
Sulfur (S)-Total	546		50	mg/L	27-SEP-18	01-OCT-18	R4257702
Tellurium (Te)-Total	0.00022		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Tin (Sn)-Total	0.00023		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Titanium (Ti)-Total	0.00142		0.00030	mg/L	27-SEP-18	28-SEP-18	R4251953
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Uranium (U)-Total	0.177		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Vanadium (V)-Total	0.00078		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Zirconium (Zr)-Total	0.000864		0.000060	mg/L	27-SEP-18	28-SEP-18	R4251953
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		03-OCT-18	R4258480
Benzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromodichloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromoform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromomethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
n-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
sec-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
tert-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon disulfide	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon Tetrachloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloroethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
Chloroform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
2-Chlorotoluene	<0.020		0.020	mg/L		03-OCT-18	R4258480
4-Chlorotoluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromoethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromomethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,1-dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1-dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-1 MW-1							
Sampled By: CLIENT on 26-SEP-18 @ 12:00							
Matrix: H2O							
VOC plus F1 by GCMS							
Dichloromethane	<0.0020	DLM	0.0020	mg/L		03-OCT-18	R4258480
1,2-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
1,1-Dichloropropene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
Ethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
F1	<0.10		0.10	mg/L		03-OCT-18	R4258480
Hexachlorobutadiene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Hexane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		03-OCT-18	R4258480
Isopropylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
4-Isopropyltoluene	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
MEK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MIBK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MTBE	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Styrene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Tetrachloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Toluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichlorofluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Vinyl Chloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
M+P-Xylenes	<0.00040		0.00040	mg/L		03-OCT-18	R4258480
o-Xylene	<0.00030		0.00030	mg/L		03-OCT-18	R4258480
Surrogate: 4-Bromofluorobenzene (SS)	98.6		70-130	%		03-OCT-18	R4258480
Surrogate: 1,4-Difluorobenzene (SS)	100.3		70-130	%		03-OCT-18	R4258480
L2171249-2 MW-2							
Sampled By: CLIENT on 26-SEP-18 @ 12:20							
Matrix: H2O							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	745		1.2	mg/L		28-SEP-18	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	611		1.0	mg/L		27-SEP-18	R4250830
Miscellaneous Parameters							
Ammonia, Total (as N)	0.067		0.010	mg/L		28-SEP-18	R4251762
Chemical Oxygen Demand	32		20	mg/L		28-SEP-18	R4251873

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-2 MW-2							
Sampled By: CLIENT on 26-SEP-18 @ 12:20							
Matrix: H2O							
Chloride (Cl)	<10	DLM	10	mg/L		27-SEP-18	R4253767
Conductivity	3150		1.0	umhos/cm		27-SEP-18	R4250830
Hardness (as CaCO3)	2130	HTC	0.20	mg/L		03-OCT-18	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		27-SEP-18	R4253767
Nitrite (as N)	<0.20	DLM	0.20	mg/L		27-SEP-18	R4253767
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		02-OCT-18	R4258571
Silica, Reactive (as SiO2)	19.9		1.0	mg/L		28-SEP-18	R4251064
Special Request	See Attached					11-OCT-18	R4296507
Sulfate (SO4)	1650		6.0	mg/L		27-SEP-18	R4253767
Xylenes (Total)	<0.00050		0.00050	mg/L		03-OCT-18	
Total Dissolved Solids	2780		20	mg/L		27-SEP-18	R4251038
Total Kjeldahl Nitrogen	0.63		0.20	mg/L	28-SEP-18	01-OCT-18	R4254070
Total Organic Carbon	9.68		0.50	mg/L		28-SEP-18	R4253828
Total Solids	3120		10	mg/L		28-SEP-18	R4253554
Total Suspended Solids	23.5		2.0	mg/L		29-SEP-18	R4253451
Total THMs	<0.0010		0.0010	mg/L		03-OCT-18	
Turbidity	14.1		0.10	NTU		27-SEP-18	R4250589
pH	7.18		0.10	pH units		27-SEP-18	R4250830
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.122		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Antimony (Sb)-Total	0.00016		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Arsenic (As)-Total	0.00086		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Barium (Ba)-Total	0.0112		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Boron (B)-Total	0.206		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cadmium (Cd)-Total	0.0000125		0.0000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Calcium (Ca)-Total	340		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Cesium (Cs)-Total	0.000019		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Chromium (Cr)-Total	0.00037		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cobalt (Co)-Total	0.00252		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Copper (Cu)-Total	0.00313		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Iron (Fe)-Total	0.197		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Lead (Pb)-Total	0.000255		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Lithium (Li)-Total	0.375		0.0010	mg/L	27-SEP-18	28-SEP-18	R4251953
Magnesium (Mg)-Total	312		0.0050	mg/L	27-SEP-18	28-SEP-18	R4251953
Manganese (Mn)-Total	0.426		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Molybdenum (Mo)-Total	0.00258		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Nickel (Ni)-Total	0.0105		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Potassium (K)-Total	8.52		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Phosphorus (P)-Total	<0.050		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Rubidium (Rb)-Total	0.00063		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Selenium (Se)-Total	0.000186		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Silicon (Si)-Total	11.7		0.10	mg/L	27-SEP-18	28-SEP-18	R4251953
Silver (Ag)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Sodium (Na)-Total	138		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Strontium (Sr)-Total	2.07		0.020	mg/L	27-SEP-18	01-OCT-18	R4257702
Sulfur (S)-Total	610		50	mg/L	27-SEP-18	01-OCT-18	R4257702
Tellurium (Te)-Total	0.00021		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-2 MW-2							
Sampled By: CLIENT on 26-SEP-18 @ 12:20							
Matrix: H2O							
Total Metals in Water by CRC ICPMS							
Tin (Sn)-Total	0.00039		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Titanium (Ti)-Total	0.00552		0.00030	mg/L	27-SEP-18	28-SEP-18	R4251953
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Uranium (U)-Total	0.120		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Vanadium (V)-Total	0.00080		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Zirconium (Zr)-Total	0.000701		0.000060	mg/L	27-SEP-18	28-SEP-18	R4251953
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		03-OCT-18	R4258480
Benzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromodichloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromoform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromomethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
n-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
sec-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
tert-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon disulfide	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon Tetrachloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloroethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
Chloroform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
2-Chlorotoluene	<0.020		0.020	mg/L		03-OCT-18	R4258480
4-Chlorotoluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromoethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromomethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,1-dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1-dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichloromethane	<0.0030	DLM	0.0030	mg/L		03-OCT-18	R4258480
1,2-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
1,1-Dichloropropene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
Ethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
F1	<0.10		0.10	mg/L		03-OCT-18	R4258480
Hexachlorobutadiene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Hexane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-2 MW-2							
Sampled By: CLIENT on 26-SEP-18 @ 12:20							
Matrix: H2O							
VOC plus F1 by GCMS							
Isopropylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
4-Isopropyltoluene	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
MEK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MIBK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MTBE	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Styrene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Tetrachloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Toluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichlorofluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Vinyl Chloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
M+P-Xylenes	<0.00040		0.00040	mg/L		03-OCT-18	R4258480
o-Xylene	<0.00030		0.00030	mg/L		03-OCT-18	R4258480
Surrogate: 4-Bromofluorobenzene (SS)	88.5		70-130	%		03-OCT-18	R4258480
Surrogate: 1,4-Difluorobenzene (SS)	99.4		70-130	%		03-OCT-18	R4258480
L2171249-3 MW-3							
Sampled By: CLIENT on 26-SEP-18 @ 12:40							
Matrix: H2O							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	956		1.2	mg/L		28-SEP-18	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	784		1.0	mg/L		27-SEP-18	R4250830
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.010		0.010	mg/L		28-SEP-18	R4251762
Chemical Oxygen Demand	20		20	mg/L		28-SEP-18	R4251873
Chloride (Cl)	<2.5	DLM	2.5	mg/L		27-SEP-18	R4253767
Conductivity	1260		1.0	umhos/cm		27-SEP-18	R4250830
Hardness (as CaCO3)	771	HTC	0.20	mg/L		30-SEP-18	
Nitrate (as N)	<0.10	DLM	0.10	mg/L		27-SEP-18	R4253767
Nitrite (as N)	<0.050	DLM	0.050	mg/L		27-SEP-18	R4253767
Orthophosphate-Dissolved (as P)	0.0025		0.0010	mg/L		02-OCT-18	R4258571
Silica, Reactive (as SiO2)	20.3		1.0	mg/L		28-SEP-18	R4251064
Special Request	See Attached					11-OCT-18	R4296507
Sulfate (SO4)	38.4		1.5	mg/L		27-SEP-18	R4253767
Xylenes (Total)	<0.00050		0.00050	mg/L		03-OCT-18	
Total Dissolved Solids	724		20	mg/L		27-SEP-18	R4251038

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-3 MW-3							
Sampled By: CLIENT on 26-SEP-18 @ 12:40							
Matrix: H2O							
Total Kjeldahl Nitrogen	0.33		0.20	mg/L	28-SEP-18	01-OCT-18	R4254070
Total Organic Carbon	5.76		0.50	mg/L		28-SEP-18	R4253828
Total Solids	976		10	mg/L		28-SEP-18	R4253554
Total Suspended Solids	112		2.0	mg/L		29-SEP-18	R4253451
Total THMs	<0.0010		0.0010	mg/L		03-OCT-18	
Turbidity	50.4		0.10	NTU		27-SEP-18	R4250589
pH	7.66		0.10	pH units		27-SEP-18	R4250830
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	1.21		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Antimony (Sb)-Total	0.00034		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Arsenic (As)-Total	0.00088		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Barium (Ba)-Total	0.156		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Boron (B)-Total	0.123		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cadmium (Cd)-Total	0.0000327		0.0000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Calcium (Ca)-Total	85.2		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Cesium (Cs)-Total	0.000184		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Chromium (Cr)-Total	0.00244		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cobalt (Co)-Total	0.00076		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Copper (Cu)-Total	0.00651		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Iron (Fe)-Total	1.36		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Lead (Pb)-Total	0.000971		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Lithium (Li)-Total	0.160		0.0010	mg/L	27-SEP-18	28-SEP-18	R4251953
Magnesium (Mg)-Total	136		0.0050	mg/L	27-SEP-18	28-SEP-18	R4251953
Manganese (Mn)-Total	0.0605		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Molybdenum (Mo)-Total	0.00701		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Nickel (Ni)-Total	0.00634		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Potassium (K)-Total	4.02		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Phosphorus (P)-Total	0.089		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Rubidium (Rb)-Total	0.00338		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Selenium (Se)-Total	0.000444		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Silicon (Si)-Total	13.1		0.10	mg/L	27-SEP-18	28-SEP-18	R4251953
Silver (Ag)-Total	0.000012		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Sodium (Na)-Total	23.1		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Strontium (Sr)-Total	0.675		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Sulfur (S)-Total	15.0		0.50	mg/L	27-SEP-18	28-SEP-18	R4251953
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Thallium (Tl)-Total	0.000027		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Thorium (Th)-Total	0.00035		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Tin (Sn)-Total	0.00157		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Titanium (Ti)-Total	0.0483		0.00030	mg/L	27-SEP-18	28-SEP-18	R4251953
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Uranium (U)-Total	0.0312		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Vanadium (V)-Total	0.00450		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Zinc (Zn)-Total	0.0077		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Zirconium (Zr)-Total	0.00121		0.000060	mg/L	27-SEP-18	28-SEP-18	R4251953
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		03-OCT-18	R4258480
Benzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-3 MW-3							
Sampled By: CLIENT on 26-SEP-18 @ 12:40							
Matrix: H2O							
VOC plus F1 by GCMS							
Bromodichloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromoform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromomethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
n-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
sec-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
tert-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon disulfide	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon Tetrachloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloroethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
Chloroform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
2-Chlorotoluene	<0.020		0.020	mg/L		03-OCT-18	R4258480
4-Chlorotoluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromoethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromomethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,1-dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1-dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichloromethane	<0.0020	DLM	0.0020	mg/L		03-OCT-18	R4258480
1,2-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
1,1-Dichloropropene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
Ethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
F1	<0.10		0.10	mg/L		03-OCT-18	R4258480
Hexachlorobutadiene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Hexane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		03-OCT-18	R4258480
Isopropylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
4-Isopropyltoluene	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
MEK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MIBK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MTBE	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Styrene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Tetrachloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Toluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-3 MW-3							
Sampled By: CLIENT on 26-SEP-18 @ 12:40							
Matrix: H2O							
VOC plus F1 by GCMS							
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichlorofluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Vinyl Chloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
M+P-Xylenes	<0.00040		0.00040	mg/L		03-OCT-18	R4258480
o-Xylene	<0.00030		0.00030	mg/L		03-OCT-18	R4258480
Surrogate: 4-Bromofluorobenzene (SS)	101.5		70-130	%		03-OCT-18	R4258480
Surrogate: 1,4-Difluorobenzene (SS)	100.8		70-130	%		03-OCT-18	R4258480
L2171249-4 MW-5							
Sampled By: CLIENT on 26-SEP-18 @ 13:20							
Matrix: H2O							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	859		1.2	mg/L		28-SEP-18	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	704		1.0	mg/L		27-SEP-18	R4250830
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.010		0.010	mg/L		28-SEP-18	R4251762
Chemical Oxygen Demand	40		20	mg/L		28-SEP-18	R4251873
Chloride (Cl)	<10	DLM	10	mg/L		27-SEP-18	R4253767
Conductivity	4380		1.0	umhos/cm		27-SEP-18	R4250830
Hardness (as CaCO3)	3440	HTC	0.20	mg/L		03-OCT-18	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		27-SEP-18	R4253767
Nitrite (as N)	<0.20	DLM	0.20	mg/L		27-SEP-18	R4253767
Orthophosphate-Dissolved (as P)	0.0035		0.0010	mg/L		02-OCT-18	R4258571
Silica, Reactive (as SiO2)	19.8		1.0	mg/L		28-SEP-18	R4251064
Special Request	See Attached					11-OCT-18	R4296507
Sulfate (SO4)	2860		6.0	mg/L		27-SEP-18	R4253767
Xylenes (Total)	<0.00050		0.00050	mg/L		03-OCT-18	
Total Dissolved Solids	4640		20	mg/L		27-SEP-18	R4251038
Total Kjeldahl Nitrogen	1.05		0.20	mg/L	28-SEP-18	01-OCT-18	R4254070
Total Organic Carbon	13.7		0.50	mg/L		28-SEP-18	R4253828
Total Solids	4370	HTD	25	mg/L		01-OCT-18	R4258048
Total Suspended Solids	25.5		2.0	mg/L		29-SEP-18	R4253451
Total THMs	<0.0010		0.0010	mg/L		03-OCT-18	
Turbidity	9.55		0.10	NTU		27-SEP-18	R4250589
pH	7.30		0.10	pH units		27-SEP-18	R4250830
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.110		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Antimony (Sb)-Total	0.00016		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Arsenic (As)-Total	0.00102		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-4 MW-5							
Sampled By: CLIENT on 26-SEP-18 @ 13:20							
Matrix: H2O							
Total Metals in Water by CRC ICPMS							
Barium (Ba)-Total	0.0103		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Boron (B)-Total	0.154		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cadmium (Cd)-Total	0.0000174		0.0000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Calcium (Ca)-Total	508		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Cesium (Cs)-Total	0.000015		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Chromium (Cr)-Total	0.00035		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cobalt (Co)-Total	0.00020		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Copper (Cu)-Total	0.00488		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Iron (Fe)-Total	0.158		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Lead (Pb)-Total	0.000337		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Lithium (Li)-Total	0.431		0.0010	mg/L	27-SEP-18	28-SEP-18	R4251953
Magnesium (Mg)-Total	527		0.0050	mg/L	27-SEP-18	28-SEP-18	R4251953
Manganese (Mn)-Total	0.0399		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Molybdenum (Mo)-Total	0.00323		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Nickel (Ni)-Total	0.0124		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Potassium (K)-Total	10.8		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Phosphorus (P)-Total	0.056		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Rubidium (Rb)-Total	0.00077		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Selenium (Se)-Total	0.000426		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Silicon (Si)-Total	12.5		0.10	mg/L	27-SEP-18	28-SEP-18	R4251953
Silver (Ag)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Sodium (Na)-Total	198		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Strontium (Sr)-Total	2.54		0.020	mg/L	27-SEP-18	01-OCT-18	R4257702
Sulfur (S)-Total	1060		50	mg/L	27-SEP-18	01-OCT-18	R4257702
Tellurium (Te)-Total	0.00025		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Tin (Sn)-Total	0.00042		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Titanium (Ti)-Total	0.00386		0.00030	mg/L	27-SEP-18	28-SEP-18	R4251953
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Uranium (U)-Total	0.172		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Vanadium (V)-Total	0.00100		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Zinc (Zn)-Total	0.0035		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Zirconium (Zr)-Total	0.00127		0.000060	mg/L	27-SEP-18	28-SEP-18	R4251953
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		03-OCT-18	R4258480
Benzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromodichloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromoform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromomethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
n-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
sec-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
tert-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon disulfide	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon Tetrachloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloroethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-4 MW-5							
Sampled By: CLIENT on 26-SEP-18 @ 13:20							
Matrix: H2O							
VOC plus F1 by GCMS							
Chloroform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
2-Chlorotoluene	<0.020		0.020	mg/L		03-OCT-18	R4258480
4-Chlorotoluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromoethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromomethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,1-dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1-dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichloromethane	<0.0030	DLM	0.0030	mg/L		03-OCT-18	R4258480
1,2-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
1,1-Dichloropropene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
Ethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
F1	<0.10		0.10	mg/L		03-OCT-18	R4258480
Hexachlorobutadiene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Hexane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		03-OCT-18	R4258480
Isopropylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
4-Isopropyltoluene	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
MEK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MIBK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MTBE	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Styrene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Tetrachloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Toluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichlorofluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Vinyl Chloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
M+P-Xylenes	<0.00040		0.00040	mg/L		03-OCT-18	R4258480
o-Xylene	<0.00030		0.00030	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-4 MW-5							
Sampled By: CLIENT on 26-SEP-18 @ 13:20							
Matrix: H2O							
VOC plus F1 by GCMS							
Surrogate: 4-Bromofluorobenzene (SS)	97.8		70-130	%		03-OCT-18	R4258480
Surrogate: 1,4-Difluorobenzene (SS)	100.0		70-130	%		03-OCT-18	R4258480
L2171249-5 MW-6							
Sampled By: CLIENT on 26-SEP-18 @ 13:40							
Matrix: H2O							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	677		1.2	mg/L		28-SEP-18	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	555		1.0	mg/L		27-SEP-18	R4250830
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.010		0.010	mg/L		02-OCT-18	R4258679
Chemical Oxygen Demand	<20		20	mg/L		28-SEP-18	R4251873
Chloride (Cl)	12.3		1.0	mg/L		27-SEP-18	R4253767
Conductivity	1060		1.0	umhos/cm		27-SEP-18	R4250830
Hardness (as CaCO3)	727	HTC	0.20	mg/L		30-SEP-18	
Nitrate (as N)	0.341		0.040	mg/L		27-SEP-18	R4253767
Nitrite (as N)	<0.020	DLM	0.020	mg/L		27-SEP-18	R4253767
Orthophosphate-Dissolved (as P)	0.0016		0.0010	mg/L		02-OCT-18	R4258571
Silica, Reactive (as SiO2)	14.7		1.0	mg/L		28-SEP-18	R4251064
Special Request	See Attached					11-OCT-18	R4296507
Sulfate (SO4)	73.9		0.60	mg/L		27-SEP-18	R4253767
Xylenes (Total)	<0.00050		0.00050	mg/L		03-OCT-18	
Total Dissolved Solids	619		20	mg/L		27-SEP-18	R4251038
Total Kjeldahl Nitrogen	0.26		0.20	mg/L	28-SEP-18	01-OCT-18	R4254070
Total Organic Carbon	3.79		0.50	mg/L		28-SEP-18	R4253828
Total Solids	796		10	mg/L		28-SEP-18	R4253554
Total Suspended Solids	75.2		2.0	mg/L		29-SEP-18	R4253451
Total THMs	<0.0010		0.0010	mg/L		03-OCT-18	
Turbidity	60.7		0.10	NTU		27-SEP-18	R4250589
pH	7.67		0.10	pH units		27-SEP-18	R4250830
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.412		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Antimony (Sb)-Total	0.00011		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Arsenic (As)-Total	0.00061		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Barium (Ba)-Total	0.0982		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Boron (B)-Total	0.128		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cadmium (Cd)-Total	0.0000067		0.0000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Calcium (Ca)-Total	95.0		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Cesium (Cs)-Total	0.000043		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Chromium (Cr)-Total	0.00070		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cobalt (Co)-Total	0.00034		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Copper (Cu)-Total	0.00191		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-5 MW-6							
Sampled By: CLIENT on 26-SEP-18 @ 13:40							
Matrix: H2O							
Total Metals in Water by CRC ICPMS							
Iron (Fe)-Total	0.366		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Lead (Pb)-Total	0.000315		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Lithium (Li)-Total	0.125		0.0010	mg/L	27-SEP-18	28-SEP-18	R4251953
Magnesium (Mg)-Total	119		0.0050	mg/L	27-SEP-18	28-SEP-18	R4251953
Manganese (Mn)-Total	0.0336		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Molybdenum (Mo)-Total	0.00497		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Nickel (Ni)-Total	0.00273		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Potassium (K)-Total	4.40		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Phosphorus (P)-Total	<0.050		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Rubidium (Rb)-Total	0.00103		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Selenium (Se)-Total	0.000617		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Silicon (Si)-Total	10.7		0.10	mg/L	27-SEP-18	28-SEP-18	R4251953
Silver (Ag)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Sodium (Na)-Total	42.5		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Strontium (Sr)-Total	0.670		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Sulfur (S)-Total	34.1		0.50	mg/L	27-SEP-18	28-SEP-18	R4251953
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Thorium (Th)-Total	0.00022		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Tin (Sn)-Total	0.00020		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Titanium (Ti)-Total	0.0139		0.00030	mg/L	27-SEP-18	28-SEP-18	R4251953
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Uranium (U)-Total	0.0351		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Vanadium (V)-Total	0.00162		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Zinc (Zn)-Total	0.0032		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Zirconium (Zr)-Total	0.000600		0.000060	mg/L	27-SEP-18	28-SEP-18	R4251953
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		03-OCT-18	R4258480
Benzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromodichloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromoform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromomethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
n-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
sec-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
tert-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon disulfide	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon Tetrachloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloroethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
Chloroform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
2-Chlorotoluene	<0.020		0.020	mg/L		03-OCT-18	R4258480
4-Chlorotoluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromoethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromomethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-5 MW-6							
Sampled By: CLIENT on 26-SEP-18 @ 13:40							
Matrix: H2O							
VOC plus F1 by GCMS							
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,1-dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1-dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichloromethane	<0.0020	DLM	0.0020	mg/L		03-OCT-18	R4258480
1,2-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
1,1-Dichloropropene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
Ethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
F1	<0.10		0.10	mg/L		03-OCT-18	R4258480
Hexachlorobutadiene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Hexane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		03-OCT-18	R4258480
Isopropylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
4-Isopropyltoluene	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
MEK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MIBK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MTBE	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Styrene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Tetrachloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Toluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichlorofluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Vinyl Chloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
M+P-Xylenes	<0.00040		0.00040	mg/L		03-OCT-18	R4258480
o-Xylene	<0.00030		0.00030	mg/L		03-OCT-18	R4258480
Surrogate: 4-Bromofluorobenzene (SS)	94.9		70-130	%		03-OCT-18	R4258480
Surrogate: 1,4-Difluorobenzene (SS)	99.1		70-130	%		03-OCT-18	R4258480
L2171249-6 MW-7							
Sampled By: CLIENT on 26-SEP-18 @ 14:00							
Matrix: H2O							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	822		1.2	mg/L		28-SEP-18	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-6 MW-7							
Sampled By: CLIENT on 26-SEP-18 @ 14:00							
Matrix: H2O							
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	673		1.0	mg/L		27-SEP-18	R4250830
Miscellaneous Parameters							
Ammonia, Total (as N)	0.018		0.010	mg/L		02-OCT-18	R4258679
Chemical Oxygen Demand	25		20	mg/L		28-SEP-18	R4251873
Chloride (Cl)	<10	DLM	10	mg/L		27-SEP-18	R4253767
Conductivity	3640		1.0	umhos/cm		27-SEP-18	R4250830
Hardness (as CaCO3)	2680	HTC	0.20	mg/L		03-OCT-18	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		27-SEP-18	R4253767
Nitrite (as N)	<0.20	DLM	0.20	mg/L		27-SEP-18	R4253767
Orthophosphate-Dissolved (as P)	0.0015		0.0010	mg/L		02-OCT-18	R4258571
Silica, Reactive (as SiO2)	18.4		1.0	mg/L		28-SEP-18	R4251064
Special Request	See Attached					11-OCT-18	R4296507
Sulfate (SO4)	2020		6.0	mg/L		27-SEP-18	R4253767
Xylenes (Total)	<0.00050		0.00050	mg/L		03-OCT-18	
Total Dissolved Solids	3610		20	mg/L		27-SEP-18	R4251038
Total Kjeldahl Nitrogen	0.51		0.20	mg/L	28-SEP-18	01-OCT-18	R4254070
Total Organic Carbon	7.96		0.50	mg/L		28-SEP-18	R4253828
Total Solids	3750		10	mg/L		28-SEP-18	R4253554
Total Suspended Solids	31.1		2.0	mg/L		29-SEP-18	R4253451
Total THMs	<0.0010		0.0010	mg/L		03-OCT-18	
Turbidity	18.6		0.10	NTU		27-SEP-18	R4250589
pH	7.20		0.10	pH units		27-SEP-18	R4250830
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.616		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Arsenic (As)-Total	0.00085		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Barium (Ba)-Total	0.0155		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Boron (B)-Total	0.200		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cadmium (Cd)-Total	0.0000147		0.0000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Calcium (Ca)-Total	449		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Cesium (Cs)-Total	0.000081		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Chromium (Cr)-Total	0.00145		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cobalt (Co)-Total	0.00278		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Copper (Cu)-Total	0.00425		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Iron (Fe)-Total	0.741		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Lead (Pb)-Total	0.000529		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Lithium (Li)-Total	0.394		0.0010	mg/L	27-SEP-18	28-SEP-18	R4251953
Magnesium (Mg)-Total	379		0.0050	mg/L	27-SEP-18	28-SEP-18	R4251953
Manganese (Mn)-Total	0.429		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Molybdenum (Mo)-Total	0.00318		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Nickel (Ni)-Total	0.0161		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Potassium (K)-Total	9.48		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Phosphorus (P)-Total	0.066		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Rubidium (Rb)-Total	0.00183		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Selenium (Se)-Total	0.000273		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Silicon (Si)-Total	12.0		0.10	mg/L	27-SEP-18	28-SEP-18	R4251953

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-6 MW-7							
Sampled By: CLIENT on 26-SEP-18 @ 14:00							
Matrix: H2O							
Total Metals in Water by CRC ICPMS							
Silver (Ag)-Total	0.000013		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Sodium (Na)-Total	178		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Strontium (Sr)-Total	2.22		0.020	mg/L	27-SEP-18	01-OCT-18	R4257702
Sulfur (S)-Total	792		50	mg/L	27-SEP-18	01-OCT-18	R4257702
Tellurium (Te)-Total	0.00031		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Thallium (Tl)-Total	0.000012		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Thorium (Th)-Total	0.00030		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Tin (Sn)-Total	0.00041		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Titanium (Ti)-Total	0.0291		0.00030	mg/L	27-SEP-18	28-SEP-18	R4251953
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Uranium (U)-Total	0.185		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Vanadium (V)-Total	0.00195		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Zinc (Zn)-Total	0.0047		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Zirconium (Zr)-Total	0.00200		0.000060	mg/L	27-SEP-18	28-SEP-18	R4251953
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		03-OCT-18	R4258480
Benzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromodichloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromoform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromomethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
n-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
sec-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
tert-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon disulfide	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon Tetrachloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloroethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
Chloroform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
2-Chlorotoluene	<0.020		0.020	mg/L		03-OCT-18	R4258480
4-Chlorotoluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromoethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromomethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,1-dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1-dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichloromethane	<0.0020	DLM	0.0020	mg/L		03-OCT-18	R4258480
1,2-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
1,1-Dichloropropene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-6 MW-7							
Sampled By: CLIENT on 26-SEP-18 @ 14:00							
Matrix: H2O							
VOC plus F1 by GCMS							
cis-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
Ethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
F1	<0.10		0.10	mg/L		03-OCT-18	R4258480
Hexachlorobutadiene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Hexane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		03-OCT-18	R4258480
Isopropylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
4-Isopropyltoluene	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
MEK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MIBK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MTBE	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Styrene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Tetrachloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Toluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichlorofluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Vinyl Chloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
M+P-Xylenes	<0.00040		0.00040	mg/L		03-OCT-18	R4258480
o-Xylene	<0.00030		0.00030	mg/L		03-OCT-18	R4258480
Surrogate: 4-Bromofluorobenzene (SS)	84.2		70-130	%		03-OCT-18	R4258480
Surrogate: 1,4-Difluorobenzene (SS)	99.0		70-130	%		03-OCT-18	R4258480
L2171249-7 MW-4							
Sampled By: CLIENT on 26-SEP-18 @ 13:00							
Matrix: H2O							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	658		1.2	mg/L		28-SEP-18	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		28-SEP-18	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		28-SEP-18	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	540		1.0	mg/L		27-SEP-18	R4250830
Miscellaneous Parameters							
Ammonia, Total (as N)	0.021		0.010	mg/L		02-OCT-18	R4258679
Chemical Oxygen Demand	24		20	mg/L		28-SEP-18	R4251873
Chloride (Cl)	11.6		2.5	mg/L		27-SEP-18	R4253767
Conductivity	1390		1.0	umhos/cm		27-SEP-18	R4250830
Hardness (as CaCO3)	1600	HTC	0.20	mg/L		30-SEP-18	
Nitrate (as N)	0.26		0.10	mg/L		27-SEP-18	R4253767
Nitrite (as N)	<0.050	DLM	0.050	mg/L		27-SEP-18	R4253767

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-7 MW-4							
Sampled By: CLIENT on 26-SEP-18 @ 13:00							
Matrix: H2O							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		02-OCT-18	R4258571
Silica, Reactive (as SiO2)	17.9		1.0	mg/L		28-SEP-18	R4251064
Special Request	See Attached					11-OCT-18	R4296507
Sulfate (SO4)	322		1.5	mg/L		27-SEP-18	R4253767
Xylenes (Total)	<0.00050		0.00050	mg/L		03-OCT-18	
Total Dissolved Solids	985		20	mg/L		27-SEP-18	R4251038
Total Kjeldahl Nitrogen	0.55		0.20	mg/L	28-SEP-18	01-OCT-18	R4254070
Total Organic Carbon	4.52		0.50	mg/L		28-SEP-18	R4253828
Total Solids	1660		10	mg/L		28-SEP-18	R4253554
Total Suspended Solids	607		2.0	mg/L		29-SEP-18	R4253451
Total THMs	<0.0010		0.0010	mg/L		03-OCT-18	
Turbidity	158		0.10	NTU		27-SEP-18	R4250589
pH	7.53		0.10	pH units		27-SEP-18	R4250830
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	4.01		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Antimony (Sb)-Total	0.00016		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Arsenic (As)-Total	0.00370		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Barium (Ba)-Total	0.0782		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Beryllium (Be)-Total	0.00024		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Boron (B)-Total	0.152		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cadmium (Cd)-Total	0.0000684		0.0000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Calcium (Ca)-Total	327		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Cesium (Cs)-Total	0.000572		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Chromium (Cr)-Total	0.00756		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Cobalt (Co)-Total	0.00360		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Copper (Cu)-Total	0.0109		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Iron (Fe)-Total	7.25		0.010	mg/L	27-SEP-18	28-SEP-18	R4251953
Lead (Pb)-Total	0.00582		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Lithium (Li)-Total	0.166		0.0010	mg/L	27-SEP-18	28-SEP-18	R4251953
Magnesium (Mg)-Total	190		0.0050	mg/L	27-SEP-18	28-SEP-18	R4251953
Manganese (Mn)-Total	0.471		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Molybdenum (Mo)-Total	0.00490		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Nickel (Ni)-Total	0.0114		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953
Potassium (K)-Total	6.83		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Phosphorus (P)-Total	0.320		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Rubidium (Rb)-Total	0.0101		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Selenium (Se)-Total	0.000226		0.000050	mg/L	27-SEP-18	28-SEP-18	R4251953
Silicon (Si)-Total	18.0		0.10	mg/L	27-SEP-18	28-SEP-18	R4251953
Silver (Ag)-Total	0.000050		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Sodium (Na)-Total	46.5		0.050	mg/L	27-SEP-18	28-SEP-18	R4251953
Strontium (Sr)-Total	0.907		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Sulfur (S)-Total	130		0.50	mg/L	27-SEP-18	28-SEP-18	R4251953
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-SEP-18	28-SEP-18	R4251953
Thallium (Tl)-Total	0.000102		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Thorium (Th)-Total	0.00341		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Tin (Sn)-Total	0.00053		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Titanium (Ti)-Total	0.190		0.00030	mg/L	27-SEP-18	28-SEP-18	R4251953
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-SEP-18	28-SEP-18	R4251953
Uranium (U)-Total	0.0441		0.000010	mg/L	27-SEP-18	28-SEP-18	R4251953
Vanadium (V)-Total	0.00999		0.00050	mg/L	27-SEP-18	28-SEP-18	R4251953

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-7 MW-4							
Sampled By: CLIENT on 26-SEP-18 @ 13:00							
Matrix: H2O							
Total Metals in Water by CRC ICPMS							
Zinc (Zn)-Total	0.0173		0.0030	mg/L	27-SEP-18	28-SEP-18	R4251953
Zirconium (Zr)-Total	0.00254		0.000060	mg/L	27-SEP-18	28-SEP-18	R4251953
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		03-OCT-18	R4258480
Benzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromodichloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromoform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Bromomethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
n-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
sec-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
tert-Butylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon disulfide	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Carbon Tetrachloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloroethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
Chloroform	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Chloromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
2-Chlorotoluene	<0.020		0.020	mg/L		03-OCT-18	R4258480
4-Chlorotoluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromochloromethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dibromoethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dibromomethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,1-dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2-Dichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1-dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Dichloromethane	<0.0020	DLM	0.0020	mg/L		03-OCT-18	R4258480
1,2-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3-Dichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2,2-Dichloropropane	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
1,1-Dichloropropene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
cis-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		03-OCT-18	R4258480
Ethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
F1	<0.10		0.10	mg/L		03-OCT-18	R4258480
Hexachlorobutadiene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Hexane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		03-OCT-18	R4258480
Isopropylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
4-Isopropyltoluene	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
MEK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MIBK	<0.020		0.020	mg/L		03-OCT-18	R4258480
MTBE	<0.00050		0.00050	mg/L		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2171249-7 MW-4							
Sampled By: CLIENT on 26-SEP-18 @ 13:00							
Matrix: H2O							
VOC plus F1 by GCMS							
Styrene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Tetrachloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Toluene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichloroethene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Trichlorofluoromethane	<0.0010		0.0010	mg/L		03-OCT-18	R4258480
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
Vinyl Chloride	<0.00050		0.00050	mg/L		03-OCT-18	R4258480
M+P-Xylenes	<0.00040		0.00040	mg/L		03-OCT-18	R4258480
o-Xylene	<0.00030		0.00030	mg/L		03-OCT-18	R4258480
Surrogate: 4-Bromofluorobenzene (SS)	95.7		70-130	%		03-OCT-18	R4258480
Surrogate: 1,4-Difluorobenzene (SS)	99.6		70-130	%		03-OCT-18	R4258480

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
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**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)

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

COD-WP	Water	Chemical Oxygen Demand	APHA 5220 D

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colorimetric method.

EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

HARDNESS-CALC-WP	Water	Hardness Calculated	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.

MET-T-CCMS-WP	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.

N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	APHA 4500 NorgD (modified)

Aqueous samples are digested in a block digester with sulfuric acid and copper sulfate as a catalyst. Total Kjeldahl Nitrogen is then analyzed using a discrete analyzer with colorimetric detection.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.			
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PO4-DO-L-COL-WP	Water	Phosphate Ortho Dissolved in Water	APHA 4500 P PHOSPHORUS-L
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SIO2-COL-WP	Water	Reactive Silica by colour	APHA 4500 SIO2
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 "Silica". Molybdate Reactive Silica is determined by analysis of the sample using the heteropoly blue colourimetric method.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOT-WP	Water	Total Solids	APHA 2540 B (modified)
Total solids in aqueous matrices is determined gravimetrically after evaporation of the sample at 103 105°C.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
SPECIAL REQUEST 1-MP	Misc.	Special Request Middletown Pennsylvania	SEE SUBLET LAB RESULTS
TDS-WP	Water	Total Dissolved Solids (TDS)	APHA 2540 SOLIDS C,E
A well-mixed sample is filtered through a glass fiber filter paper. The filtrate is then evaportaed to dryness in a pre-weighed vial and dried at 180 – 2C. The increase in vial weight represents the total dissolved solids.			
THM-SUM-CALC-WP	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			
VOC+F1-HSMS-WP	Water	VOC plus F1 by GCMS	EPA 8260C / EPA 5021A
In this method samples are analyzed using a headspace autosampler interfaced to a dual column gas chromatograph with MS and Flame Ionization detectors.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** 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
MP	ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
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
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
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.

Quality Control Report

Client: WSP Canada Inc.
1600 Buffalo Place
Winnipeg MB R3T 6B8
Contact: Iain Pimlott

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R4250830								
WG2889737-28 LCS								
Alkalinity, Total (as CaCO3)			103.8		%		85-115	27-SEP-18
WG2889737-25 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	27-SEP-18
C-TOC-HTC-WP	**Water**							
Batch R4253828								
WG2891674-2 LCS								
Total Organic Carbon			96.9		%		80-120	28-SEP-18
WG2891674-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	28-SEP-18
CL-IC-N-WP	**Water**							
Batch R4253767								
WG2888496-2 LCS								
Chloride (Cl)			100.7		%		90-110	27-SEP-18
WG2888496-6 LCS								
Chloride (Cl)			100.6		%		90-110	27-SEP-18
WG2888496-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	27-SEP-18
WG2888496-5 MB								
Chloride (Cl)			<0.50		mg/L		0.5	27-SEP-18
COD-WP	**Water**							
Batch R4251873								
WG2890859-2 LCS								
Chemical Oxygen Demand			97.1		%		85-115	28-SEP-18
WG2890859-1 MB								
Chemical Oxygen Demand			<20		mg/L		20	28-SEP-18
EC-WP	**Water**							
Batch R4250830								
WG2889737-27 LCS								
Conductivity			100.4		%		90-110	27-SEP-18
WG2889737-25 MB								
Conductivity			<1.0		umhos/cm		1	27-SEP-18
MET-T-CCMS-WP	**Water**							
Batch R4251953								
WG2889519-2 LCS								
Aluminum (Al)-Total			98.9		%		80-120	28-SEP-18
Antimony (Sb)-Total			103.6		%		80-120	28-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4251953								
WG2889519-2 LCS								
Arsenic (As)-Total			98.0		%		80-120	28-SEP-18
Barium (Ba)-Total			95.1		%		80-120	28-SEP-18
Beryllium (Be)-Total			106.2		%		80-120	28-SEP-18
Bismuth (Bi)-Total			104.0		%		80-120	28-SEP-18
Boron (B)-Total			102.2		%		80-120	28-SEP-18
Cadmium (Cd)-Total			98.8		%		80-120	28-SEP-18
Calcium (Ca)-Total			101.2		%		80-120	28-SEP-18
Cesium (Cs)-Total			101.8		%		80-120	28-SEP-18
Chromium (Cr)-Total			95.3		%		80-120	28-SEP-18
Cobalt (Co)-Total			95.4		%		80-120	28-SEP-18
Copper (Cu)-Total			101.0		%		80-120	28-SEP-18
Iron (Fe)-Total			91.4		%		80-120	28-SEP-18
Lead (Pb)-Total			103.3		%		80-120	28-SEP-18
Lithium (Li)-Total			102.7		%		80-120	28-SEP-18
Magnesium (Mg)-Total			96.7		%		80-120	28-SEP-18
Manganese (Mn)-Total			97.3		%		80-120	28-SEP-18
Molybdenum (Mo)-Total			101.0		%		80-120	28-SEP-18
Nickel (Ni)-Total			97.0		%		80-120	28-SEP-18
Potassium (K)-Total			93.2		%		80-120	28-SEP-18
Phosphorus (P)-Total			107.7		%		80-120	28-SEP-18
Rubidium (Rb)-Total			102.7		%		80-120	28-SEP-18
Selenium (Se)-Total			95.9		%		80-120	28-SEP-18
Silicon (Si)-Total			98.3		%		80-120	28-SEP-18
Silver (Ag)-Total			103.0		%		80-120	28-SEP-18
Sodium (Na)-Total			97.3		%		80-120	28-SEP-18
Strontium (Sr)-Total			95.1		%		80-120	28-SEP-18
Sulfur (S)-Total			98.9		%		80-120	28-SEP-18
Tellurium (Te)-Total			96.4		%		80-120	28-SEP-18
Thallium (Tl)-Total			103.8		%		80-120	28-SEP-18
Thorium (Th)-Total			100.1		%		80-120	28-SEP-18
Tin (Sn)-Total			96.9		%		80-120	28-SEP-18
Titanium (Ti)-Total			94.6		%		80-120	28-SEP-18
Tungsten (W)-Total			103.5		%		80-120	28-SEP-18
Uranium (U)-Total			103.2		%		80-120	28-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4251953								
WG2889519-2 LCS								
Vanadium (V)-Total			98.0		%		80-120	28-SEP-18
Zinc (Zn)-Total			95.7		%		80-120	28-SEP-18
Zirconium (Zr)-Total			98.5		%		80-120	28-SEP-18
WG2889519-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	28-SEP-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	28-SEP-18
Boron (B)-Total			<0.010		mg/L		0.01	28-SEP-18
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	28-SEP-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	28-SEP-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	28-SEP-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	28-SEP-18
Iron (Fe)-Total			<0.010		mg/L		0.01	28-SEP-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	28-SEP-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	28-SEP-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	28-SEP-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	28-SEP-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	28-SEP-18
Potassium (K)-Total			<0.050		mg/L		0.05	28-SEP-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	28-SEP-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	28-SEP-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	28-SEP-18
Silicon (Si)-Total			<0.10		mg/L		0.1	28-SEP-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	28-SEP-18
Sodium (Na)-Total			<0.050		mg/L		0.05	28-SEP-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	28-SEP-18
Sulfur (S)-Total			<0.50		mg/L		0.5	28-SEP-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	28-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4251953								
WG2889519-1 MB								
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	28-SEP-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	28-SEP-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	28-SEP-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	28-SEP-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	28-SEP-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	28-SEP-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	28-SEP-18
N-TOTKJ-WP	**Water**							
Batch R4254070								
WG2888781-10 LCS								
Total Kjeldahl Nitrogen			103.4		%		75-125	01-OCT-18
WG2888781-6 LCS								
Total Kjeldahl Nitrogen			109.3		%		75-125	01-OCT-18
WG2888781-5 MB								
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	01-OCT-18
WG2888781-9 MB								
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	01-OCT-18
NH3-COL-WP	**Water**							
Batch R4251762								
WG2890746-10 LCS								
Ammonia, Total (as N)			92.2		%		85-115	28-SEP-18
WG2890746-9 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	28-SEP-18
Batch R4258679								
WG2894026-2 LCS								
Ammonia, Total (as N)			92.1		%		85-115	02-OCT-18
WG2894026-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	02-OCT-18
NO2-IC-N-WP	**Water**							
Batch R4253767								
WG2888496-2 LCS								
Nitrite (as N)			101.8		%		90-110	27-SEP-18
WG2888496-6 LCS								
Nitrite (as N)			100.9		%		90-110	27-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-WP	**Water**							
Batch R4253767								
WG2888496-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	27-SEP-18
WG2888496-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	27-SEP-18
NO3-IC-N-WP	**Water**							
Batch R4253767								
WG2888496-2 LCS								
Nitrate (as N)			101.0		%		90-110	27-SEP-18
WG2888496-6 LCS								
Nitrate (as N)			101.3		%		90-110	27-SEP-18
WG2888496-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	27-SEP-18
WG2888496-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	27-SEP-18
PH-WP	**Water**							
Batch R4250830								
WG2889737-26 LCS								
pH			7.40		pH units		7.3-7.5	27-SEP-18
PO4-DO-L-COL-WP	**Water**							
Batch R4258571								
WG2894150-2 LCS								
Orthophosphate-Dissolved (as P)			99.4		%		80-120	02-OCT-18
WG2894150-1 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	02-OCT-18
SIO2-COL-WP	**Water**							
Batch R4251064								
WG2889936-10 LCS								
Silica, Reactive (as SiO2)			101.9		%		85-115	28-SEP-18
WG2889936-9 MB								
Silica, Reactive (as SiO2)			<1.0		mg/L		1	28-SEP-18
SO4-IC-N-WP	**Water**							
Batch R4253767								
WG2888496-2 LCS								
Sulfate (SO4)			101.5		%		90-110	27-SEP-18
WG2888496-6 LCS								
Sulfate (SO4)			101.2		%		90-110	27-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WP	**Water**							
Batch R4253767								
WG2888496-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	27-SEP-18
WG2888496-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	27-SEP-18
SOLIDS-TOT-WP	**Water**							
Batch R4253554								
WG2889746-2 LCS								
Total Solids			100.4		%		85-115	28-SEP-18
WG2889746-1 MB								
Total Solids			<10		mg/L		10	28-SEP-18
Batch R4258048								
WG2891874-2 LCS								
Total Solids			99.8		%		85-115	01-OCT-18
WG2891874-1 MB								
Total Solids			<10		mg/L		10	01-OCT-18
SOLIDS-TOTSUS-WP	**Water**							
Batch R4253451								
WG2890596-22 LCS								
Total Suspended Solids			104.4		%		85-115	29-SEP-18
WG2890596-21 MB								
Total Suspended Solids			<2.0		mg/L		2	29-SEP-18
TDS-WP	**Water**							
Batch R4251038								
WG2888195-14 LCS								
Total Dissolved Solids			104.5		%		85-115	27-SEP-18
WG2888195-13 MB								
Total Dissolved Solids			<4.0		mg/L		4	27-SEP-18
TURBIDITY-WP	**Water**							
Batch R4250589								
WG2889822-2 LCS								
Turbidity			100.0		%		85-115	27-SEP-18
WG2889822-1 MB								
Turbidity			<0.10		NTU		0.1	27-SEP-18
VOC+F1-HSMS-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4258480								
WG2892662-2 LCS								
Acetone			103.6		%		70-130	02-OCT-18
Benzene			95.2		%		70-130	02-OCT-18
Bromobenzene			96.0		%		70-130	02-OCT-18
Bromochloromethane			95.6		%		70-130	02-OCT-18
Bromodichloromethane			90.6		%		70-130	02-OCT-18
Bromoform			75.3		%		70-130	02-OCT-18
Bromomethane			89.7		%		60-140	02-OCT-18
n-Butylbenzene			99.2		%		70-130	02-OCT-18
sec-Butylbenzene			106.9		%		70-130	02-OCT-18
tert-Butylbenzene			93.3		%		70-130	02-OCT-18
Carbon disulfide			74.5		%		70-130	02-OCT-18
Carbon Tetrachloride			86.8		%		70-130	02-OCT-18
Chlorobenzene			97.3		%		70-130	02-OCT-18
Chloroethane			102.1		%		60-140	02-OCT-18
Chloroform			100.0		%		70-130	02-OCT-18
Chloromethane			79.5		%		60-140	02-OCT-18
2-Chlorotoluene			92.5		%		70-130	02-OCT-18
4-Chlorotoluene			90.7		%		70-130	02-OCT-18
Dibromochloromethane			79.6		%		70-130	02-OCT-18
1,2-Dibromo-3-chloropropane			92.1		%		70-130	02-OCT-18
1,2-Dibromoethane			97.5		%		70-130	02-OCT-18
Dibromomethane			95.6		%		70-130	02-OCT-18
1,2-Dichlorobenzene			97.0		%		70-130	02-OCT-18
1,3-Dichlorobenzene			90.6		%		70-130	02-OCT-18
1,4-Dichlorobenzene			89.7		%		70-130	02-OCT-18
Dichlorodifluoromethane			77.1		%		60-140	02-OCT-18
1,1-dichloroethane			104.1		%		70-130	02-OCT-18
1,2-Dichloroethane			97.2		%		70-130	02-OCT-18
1,1-dichloroethene			94.9		%		70-130	02-OCT-18
cis-1,2-Dichloroethene			100.9		%		70-130	02-OCT-18
trans-1,2-Dichloroethene			93.6		%		70-130	02-OCT-18
Dichloromethane			95.0		%		70-130	02-OCT-18
1,2-Dichloropropane			98.0		%		70-130	02-OCT-18
1,3-Dichloropropane			97.3		%		70-130	02-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4258480								
WG2892662-2 LCS								
2,2-Dichloropropane			87.5		%		70-130	02-OCT-18
1,1-Dichloropropene			97.4		%		70-130	02-OCT-18
cis-1,3-Dichloropropene			83.4		%		70-130	02-OCT-18
trans-1,3-Dichloropropene			81.4		%		70-130	02-OCT-18
Ethylbenzene			102.2		%		70-130	02-OCT-18
Hexachlorobutadiene			99.9		%		70-130	02-OCT-18
Hexane			92.6		%		70-130	02-OCT-18
2-Hexanone (Methyl butyl ketone)			100.7		%		70-130	02-OCT-18
Isopropylbenzene			95.8		%		70-130	02-OCT-18
4-Isopropyltoluene			89.7		%		70-130	02-OCT-18
MEK			102.0		%		70-130	02-OCT-18
MIBK			95.2		%		70-130	02-OCT-18
MTBE			97.1		%		70-130	02-OCT-18
Styrene			89.7		%		70-130	02-OCT-18
1,1,1,2-Tetrachloroethane			83.6		%		70-130	02-OCT-18
1,1,2,2-Tetrachloroethane			87.0		%		70-130	02-OCT-18
Tetrachloroethene			100.7		%		70-130	02-OCT-18
Toluene			104.9		%		70-130	02-OCT-18
1,2,3-Trichlorobenzene			116.7		%		70-130	02-OCT-18
1,2,4-Trichlorobenzene			116.4		%		70-130	02-OCT-18
1,1,1-Trichloroethane			97.8		%		70-130	02-OCT-18
1,1,2-Trichloroethane			97.9		%		70-130	02-OCT-18
Trichloroethene			100.3		%		70-130	02-OCT-18
Trichlorofluoromethane			101.7		%		60-140	02-OCT-18
1,2,3-Trichloropropane			85.6		%		70-130	02-OCT-18
1,2,4-Trimethylbenzene			93.0		%		70-130	02-OCT-18
1,3,5-Trimethylbenzene			94.1		%		70-130	02-OCT-18
Vinyl Chloride			81.7		%		60-140	02-OCT-18
M+P-Xylenes			99.9		%		70-130	02-OCT-18
o-Xylene			97.8		%		70-130	02-OCT-18
WG2892662-3 LCS								
F1			114.9		%		70-130	02-OCT-18
WG2892662-1 MB								
Acetone			<0.020		mg/L		0.02	02-OCT-18
Benzene			<0.00050		mg/L		0.0005	02-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4258480								
WG2892662-1 MB								
Bromobenzene			<0.00050		mg/L		0.0005	02-OCT-18
Bromochloromethane			<0.00050		mg/L		0.0005	02-OCT-18
Bromodichloromethane			<0.00050		mg/L		0.0005	02-OCT-18
Bromoform			<0.00050		mg/L		0.0005	02-OCT-18
Bromomethane			<0.0010		mg/L		0.001	02-OCT-18
n-Butylbenzene			<0.00050		mg/L		0.0005	02-OCT-18
sec-Butylbenzene			<0.00050		mg/L		0.0005	02-OCT-18
tert-Butylbenzene			<0.00050		mg/L		0.0005	02-OCT-18
Carbon disulfide			<0.00050		mg/L		0.0005	02-OCT-18
Carbon Tetrachloride			<0.00050		mg/L		0.0005	02-OCT-18
Chlorobenzene			<0.00050		mg/L		0.0005	02-OCT-18
Chloroethane			<0.0010		mg/L		0.001	02-OCT-18
Chloroform			<0.00050		mg/L		0.0005	02-OCT-18
Chloromethane			<0.0010		mg/L		0.001	02-OCT-18
2-Chlorotoluene			<0.020		mg/L		0.02	02-OCT-18
4-Chlorotoluene			<0.00050		mg/L		0.0005	02-OCT-18
Dibromochloromethane			<0.00050		mg/L		0.0005	02-OCT-18
1,2-Dibromo-3-chloropropane			<0.00050		mg/L		0.0005	02-OCT-18
1,2-Dibromoethane			<0.00050		mg/L		0.0005	02-OCT-18
Dibromomethane			<0.00050		mg/L		0.0005	02-OCT-18
1,2-Dichlorobenzene			<0.00050		mg/L		0.0005	02-OCT-18
1,3-Dichlorobenzene			<0.00050		mg/L		0.0005	02-OCT-18
1,4-Dichlorobenzene			<0.00050		mg/L		0.0005	02-OCT-18
Dichlorodifluoromethane			<0.0010		mg/L		0.001	02-OCT-18
1,1-dichloroethane			<0.00050		mg/L		0.0005	02-OCT-18
1,2-Dichloroethane			<0.00050		mg/L		0.0005	02-OCT-18
1,1-dichloroethene			<0.00050		mg/L		0.0005	02-OCT-18
cis-1,2-Dichloroethene			<0.00050		mg/L		0.0005	02-OCT-18
trans-1,2-Dichloroethene			<0.00050		mg/L		0.0005	02-OCT-18
Dichloromethane			<0.00050		mg/L		0.0005	02-OCT-18
1,2-Dichloropropane			<0.00050		mg/L		0.0005	02-OCT-18
1,3-Dichloropropane			<0.00050		mg/L		0.0005	02-OCT-18
2,2-Dichloropropane			<0.00050		mg/L		0.0005	02-OCT-18
1,1-Dichloropropene			<0.00050		mg/L		0.0005	02-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4258480								
WG2892662-1 MB								
cis-1,3-Dichloropropene			<0.00050		mg/L		0.0005	02-OCT-18
trans-1,3-Dichloropropene			<0.00050		mg/L		0.0005	02-OCT-18
Ethylbenzene			<0.00050		mg/L		0.0005	02-OCT-18
F1			<0.10		mg/L		0.1	02-OCT-18
Hexachlorobutadiene			<0.00050		mg/L		0.0005	02-OCT-18
Hexane			<0.00050		mg/L		0.0005	02-OCT-18
2-Hexanone (Methyl butyl ketone)			<0.020		mg/L		0.02	02-OCT-18
Isopropylbenzene			<0.00050		mg/L		0.0005	02-OCT-18
4-Isopropyltoluene			<0.0010		mg/L		0.001	02-OCT-18
MEK			<0.020		mg/L		0.02	02-OCT-18
MIBK			<0.020		mg/L		0.02	02-OCT-18
MTBE			<0.00050		mg/L		0.0005	02-OCT-18
Styrene			<0.00050		mg/L		0.0005	02-OCT-18
1,1,1,2-Tetrachloroethane			<0.00050		mg/L		0.0005	02-OCT-18
1,1,2,2-Tetrachloroethane			<0.00050		mg/L		0.0005	02-OCT-18
Tetrachloroethene			<0.00050		mg/L		0.0005	02-OCT-18
Toluene			<0.00050		mg/L		0.0005	02-OCT-18
1,2,3-Trichlorobenzene			<0.00050		mg/L		0.0005	02-OCT-18
1,2,4-Trichlorobenzene			<0.00050		mg/L		0.0005	02-OCT-18
1,1,1-Trichloroethane			<0.00050		mg/L		0.0005	02-OCT-18
1,1,2-Trichloroethane			<0.00050		mg/L		0.0005	02-OCT-18
Trichloroethene			<0.00050		mg/L		0.0005	02-OCT-18
Trichlorofluoromethane			<0.0010		mg/L		0.001	02-OCT-18
1,2,3-Trichloropropane			<0.00050		mg/L		0.0005	02-OCT-18
1,2,4-Trimethylbenzene			<0.00050		mg/L		0.0005	02-OCT-18
1,3,5-Trimethylbenzene			<0.00050		mg/L		0.0005	02-OCT-18
Vinyl Chloride			<0.00050		mg/L		0.0005	02-OCT-18
M+P-Xylenes			<0.00040		mg/L		0.0004	02-OCT-18
o-Xylene			<0.00030		mg/L		0.0003	02-OCT-18
Surrogate: 4-Bromofluorobenzene (SS)			88.5		%		70-130	02-OCT-18
Surrogate: 1,4-Difluorobenzene (SS)			99.7		%		70-130	02-OCT-18

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	26-SEP-18 12:00	27-SEP-18 12:00	0.25	24	hours	EHTR-FM
	2	26-SEP-18 12:20	27-SEP-18 12:00	0.25	24	hours	EHTR-FM
	3	26-SEP-18 12:40	27-SEP-18 12:00	0.25	23	hours	EHTR-FM
	4	26-SEP-18 13:20	27-SEP-18 12:00	0.25	23	hours	EHTR-FM
	5	26-SEP-18 13:40	27-SEP-18 12:00	0.25	22	hours	EHTR-FM
	6	26-SEP-18 14:00	27-SEP-18 12:00	0.25	22	hours	EHTR-FM
	7	26-SEP-18 13:00	27-SEP-18 12:00	0.25	23	hours	EHTR-FM
Anions and Nutrients							
Phosphate Ortho Dissolved in Water							
	1	26-SEP-18 12:00	02-OCT-18 16:00	3	6	days	EHT
	2	26-SEP-18 12:20	02-OCT-18 16:00	3	6	days	EHT
	3	26-SEP-18 12:40	02-OCT-18 16:00	3	6	days	EHT
	4	26-SEP-18 13:20	02-OCT-18 16:00	3	6	days	EHT
	5	26-SEP-18 13:40	02-OCT-18 16:00	3	6	days	EHT
	6	26-SEP-18 14:00	02-OCT-18 16:00	3	6	days	EHT
	7	26-SEP-18 13:00	02-OCT-18 16:00	3	6	days	EHT

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2171249 were received on 26-SEP-18 14:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

October 24, 2018 Service Request No:K1809388

Judy Dalmaijer
ALS Environmental - Canada
Unit 12-1329 Niakwa Road East
Winnipeg, MB R2J 3T4

Laboratory Results for: L2171249

Dear Judy,

Enclosed are the results of the sample(s) submitted to our laboratory September 28, 2018
For your reference, these analyses have been assigned our service request number **K1809388.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3342. You may also contact me via email at Amanda.Juell@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

[redacted]

Amanda Juell
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: ALS Environmental - Canada
Project: L2171249
Sample Matrix: Water

Service Request: K1809388
Date Received: 09/28/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt:

Seven water samples were received for analysis at ALS Environmental on 09/28/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Organic LC:

No significant anomalies were noted with this analysis.

Approved by _____ Date 10/24/2018

SAMPLE DETECTION SUMMARY

CLIENT ID: L2171249-1			Lab ID: K1809388-001			
Analyte	**Results**	**Flag**	**MDL**	**MRL**	**Units**	**Method**
1,3-Dinitrobenzene	0.23	P		0.10	ug/L	8330B

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: ALS Environmental - Canada **Service Request:**K1809388
Project: L2171249

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1809388-001	L2171249-1	9/26/2018	
K1809388-002	L2171249-2	9/26/2018	
K1809388-003	L2171249-3	9/26/2018	
K1809388-004	L2171249-4	9/26/2018	
K1809388-005	L2171249-5	9/26/2018	
K1809388-006	L2171249-6	9/26/2018	
K1809388-007	L2171249-7	9/26/2018	

K1809388

L2171249

WINNIPEG

WP-SHIPTO-KE-THU

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA
1317 S. 13TH AVE
KELSO,WA 98626

NOTES: Please reference on final report and invoice: PO# *L2171249*
ALS requires QC data to be provided with your final results.

Special Request : EPA 8330B Explosives - Isomers of Dinitrotoluene.

Please see enclosed Z sample(s) in Z Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L2171249-1 MW-1		**9/26/2018**	
	Special Request - Kelso (SPECIAL REQUEST-KL 14)	10/3/2018	
L2171249-2 MW-2		**9/26/2018**	
	Special Request - Kelso (SPECIAL REQUEST-KL 14)	10/3/2018	
L2171249-3 MW-3		**9/26/2018**	
	Special Request - Kelso (SPECIAL REQUEST-KL 14)	10/3/2018	
L2171249-4 MW-5		**9/26/2018**	
	Special Request - Kelso (SPECIAL REQUEST-KL 14)	10/3/2018	
L2171249-5 MW-6		**9/26/2018**	
	Special Request - Kelso (SPECIAL REQUEST-KL 14)	10/3/2018	
L2171249-6 MW-7		**9/26/2018**	
	Special Request - Kelso (SPECIAL REQUEST-KL 14)	10/3/2018	
L2171249-7 MW-4		**9/26/2018**	
	Special Request - Kelso (SPECIAL REQUEST-KL 14)	10/3/2018	

ALS Environmental

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - KELSO, WASHINGTON, USA
1317 S. 13TH AVE
KELSO,WA 98626

Subcontract Info Contact: Judy Dalmaijer (204) 255-9749
Analysis and reporting info contact: Judy Dalmaijer
12-1329 NIAKWA ROAD E
WINNIPEG,MB R2J3T4
Phone: (204) 255-9749 Email: Judy.Dalmaijer@alsglobal.com

Please email confirmation of receipt to: Judy.Dalmaijer@alsglobal.com

Shipped By: [redacted] Date Shipped: 09/24/18

Received By: [redacted] Date Received: 9/28/18 1400

Verified By: [redacted] Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

PO [redacted]

Cooler Receipt and Preservation Form

Client ALS / Canada Service Request *K18* 99388

Received: 9/28/18 Opened: 9/28/18 By: [redacted] Unloaded: 9/28/18 By [redacted]

1. Samples were received via? *USPS* *Fed Ex* (*UPS*) *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y (N) If yes, how many and where? _____
   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number (NA)	Filed
15.3	15.2	—	—	-0.1	395		1Z 6e2 F45 66 6685 6290	

4. Packing material: (*Inserts*) *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time
* MZL		X								

Notes, Discrepancies, & Resolutions:

* No cooling agent

7/25/16 *Page* ____ *of* ____

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Client: ALS Environmental - Canada **Service Request:** K1809388
Project: L2171249

Sample Name: L2171249-1 **Date Collected:** 09/26/18
Lab Code: K1809388-001 **Date Received:** 09/28/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8330B	KLMILLER	KLMILLER
8330B	KLMILLER	DHADERLY

Sample Name: L2171249-2 **Date Collected:** 09/26/18
Lab Code: K1809388-002 **Date Received:** 09/28/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8330B	KLMILLER	KLMILLER
8330B	KLMILLER	DHADERLY

Sample Name: L2171249-3 **Date Collected:** 09/26/18
Lab Code: K1809388-003 **Date Received:** 09/28/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8330B	KLMILLER	KLMILLER

Sample Name: L2171249-4 **Date Collected:** 09/26/18
Lab Code: K1809388-004 **Date Received:** 09/28/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8330B	KLMILLER	KLMILLER

Client: ALS Environmental - Canada **Service Request:** K1809388
Project: L2171249

Sample Name: L2171249-5 **Date Collected:** 09/26/18
Lab Code: K1809388-005 **Date Received:** 09/28/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8330B	KLMILLER	KLMILLER

Sample Name: L2171249-6 **Date Collected:** 09/26/18
Lab Code: K1809388-006 **Date Received:** 09/28/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8330B	KLMILLER	KLMILLER
8330B	KLMILLER	DHADERLY

Sample Name: L2171249-7 **Date Collected:** 09/26/18
Lab Code: K1809388-007 **Date Received:** 09/28/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8330B	KLMILLER	KLMILLER

Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

High Performance Liquid Chromatography

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	L2171249-1	**Units:**	ug/L
Lab Code:	K1809388-001	**Basis:**	NA

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4-Amino-2,6-dinitrotoluene	ND U	0.10	1	10/11/18 02:52	10/3/18	
2-Amino-4,6-dinitrotoluene	ND U	0.10	1	10/11/18 02:52	10/3/18	
3,5-Dinitroaniline	ND U	0.20	1	10/11/18 02:52	10/3/18	
1,3-Dinitrobenzene	**0.23 P**	0.10	1	10/11/18 02:52	10/3/18	
2,4-Dinitrotoluene	ND U	0.20	1	10/11/18 02:52	10/3/18	
2,6-Dinitrotoluene	ND U	0.20	1	10/11/18 02:52	10/3/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1-Chloro-3-nitrobenzene	53	23 - 98	10/11/18 02:52	

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	L2171249-2	**Units:**	ug/L
Lab Code:	K1809388-002	**Basis:**	NA

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4-Amino-2,6-dinitrotoluene	ND U	0.10	1	10/11/18 03:42	10/3/18	
2-Amino-4,6-dinitrotoluene	ND U	0.10	1	10/11/18 03:42	10/3/18	
3,5-Dinitroaniline	ND U	0.20	1	10/11/18 03:42	10/3/18	
1,3-Dinitrobenzene	ND U	0.10	1	10/11/18 03:42	10/3/18	
2,4-Dinitrotoluene	ND U	0.20	1	10/11/18 03:42	10/3/18	
2,6-Dinitrotoluene	ND U	0.20	1	10/11/18 03:42	10/3/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1-Chloro-3-nitrobenzene	57	23 - 98	10/11/18 03:42	

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	L2171249-3	**Units:**	ug/L
Lab Code:	K1809388-003	**Basis:**	NA

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4-Amino-2,6-dinitrotoluene	ND U	0.10	1	10/11/18 04:32	10/3/18	
2-Amino-4,6-dinitrotoluene	ND U	0.10	1	10/11/18 04:32	10/3/18	
3,5-Dinitroaniline	ND U	0.20	1	10/11/18 04:32	10/3/18	
1,3-Dinitrobenzene	ND U	0.10	1	10/11/18 04:32	10/3/18	
2,4-Dinitrotoluene	ND U	0.20	1	10/11/18 04:32	10/3/18	
2,6-Dinitrotoluene	ND U	0.20	1	10/11/18 04:32	10/3/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1-Chloro-3-nitrobenzene	45	23 - 98	10/11/18 04:32	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	L2171249-4	**Units:**	ug/L
Lab Code:	K1809388-004	**Basis:**	NA

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4-Amino-2,6-dinitrotoluene	ND U	0.11	1	10/11/18 12:49	10/3/18	
2-Amino-4,6-dinitrotoluene	ND U	0.11	1	10/11/18 12:49	10/3/18	
3,5-Dinitroaniline	ND U	0.21	1	10/11/18 12:49	10/3/18	
1,3-Dinitrobenzene	ND U	0.11	1	10/11/18 12:49	10/3/18	
2,4-Dinitrotoluene	ND U	0.21	1	10/11/18 12:49	10/3/18	
2,6-Dinitrotoluene	ND U	0.21	1	10/11/18 12:49	10/3/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1-Chloro-3-nitrobenzene	61	23 - 98	10/11/18 12:49	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	L2171249-5	**Units:**	ug/L
Lab Code:	K1809388-005	**Basis:**	NA

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4-Amino-2,6-dinitrotoluene	ND U	0.11	1	10/11/18 06:11	10/3/18	
2-Amino-4,6-dinitrotoluene	ND U	0.11	1	10/11/18 06:11	10/3/18	
3,5-Dinitroaniline	ND U	0.21	1	10/11/18 06:11	10/3/18	
1,3-Dinitrobenzene	ND U	0.11	1	10/11/18 06:11	10/3/18	
2,4-Dinitrotoluene	ND U	0.21	1	10/11/18 06:11	10/3/18	
2,6-Dinitrotoluene	ND U	0.21	1	10/11/18 06:11	10/3/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1-Chloro-3-nitrobenzene	60	23 - 98	10/11/18 06:11	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	L2171249-6	**Units:**	ug/L
Lab Code:	K1809388-006	**Basis:**	NA

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4-Amino-2,6-dinitrotoluene	ND U	0.11	1	10/11/18 07:01	10/3/18	
2-Amino-4,6-dinitrotoluene	ND U	0.11	1	10/11/18 07:01	10/3/18	
3,5-Dinitroaniline	ND U	0.21	1	10/11/18 07:01	10/3/18	
1,3-Dinitrobenzene	ND U	0.11	1	10/11/18 07:01	10/3/18	
2,4-Dinitrotoluene	ND U	0.21	1	10/11/18 07:01	10/3/18	
2,6-Dinitrotoluene	ND U	0.21	1	10/11/18 07:01	10/3/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1-Chloro-3-nitrobenzene	50	23 - 98	10/11/18 07:01	

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Collected:**	09/26/18
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	L2171249-7	**Units:**	ug/L
Lab Code:	K1809388-007	**Basis:**	NA

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4-Amino-2,6-dinitrotoluene	ND U	0.10	1	10/11/18 07:51	10/3/18	
2-Amino-4,6-dinitrotoluene	ND U	0.10	1	10/11/18 07:51	10/3/18	
3,5-Dinitroaniline	ND U	0.20	1	10/11/18 07:51	10/3/18	
1,3-Dinitrobenzene	ND U	0.10	1	10/11/18 07:51	10/3/18	
2,4-Dinitrotoluene	ND U	0.20	1	10/11/18 07:51	10/3/18	
2,6-Dinitrotoluene	ND U	0.20	1	10/11/18 07:51	10/3/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1-Chloro-3-nitrobenzene	58	23 - 98	10/11/18 07:51	

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

High Performance Liquid Chromatography

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: ALS Environmental - Canada **Service Request:** K1809388
Project: L2171249
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Extraction Method: EPA 3535A

Sample Name	Lab Code	1-Chloro-3-nitrobenzene 23-98
L2171249-1	K1809388-001	53
L2171249-2	K1809388-002	57
L2171249-3	K1809388-003	45
L2171249-4	K1809388-004	61
L2171249-5	K1809388-005	60
L2171249-6	K1809388-006	50
L2171249-7	K1809388-007	58
Method Blank	KQ1813956-03	61
Lab Control Sample	KQ1813956-01	50
Duplicate Lab Control Sample	KQ1813956-02	50

Analytical Report

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ1813956-03	**Basis:**	NA

Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method: 8330B
Prep Method: EPA 3535A

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
4-Amino-2,6-dinitrotoluene	ND U	0.10	1	10/10/18 20:14	10/3/18	
2-Amino-4,6-dinitrotoluene	ND U	0.10	1	10/10/18 20:14	10/3/18	
3,5-Dinitroaniline	ND U	0.20	1	10/10/18 20:14	10/3/18	
1,3-Dinitrobenzene	ND U	0.10	1	10/10/18 20:14	10/3/18	
2,4-Dinitrotoluene	ND U	0.20	1	10/10/18 20:14	10/3/18	
2,6-Dinitrotoluene	ND U	0.20	1	10/10/18 20:14	10/3/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
1-Chloro-3-nitrobenzene	61	23 - 98	10/10/18 20:14	

Client:	ALS Environmental - Canada	**Service Request:**	K1809388
Project:	L2171249	**Date Analyzed:**	10/10/18
Sample Matrix:	Water	**Date Extracted:**	10/03/18

Duplicate Lab Control Sample Summary
Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (HPLC)

Analysis Method:	8330B	**Units:**	ug/L
Prep Method:	EPA 3535A	**Basis:**	NA
		Analysis Lot:	610346

	Lab Control Sample KQ1813956-01			Duplicate Lab Control Sample KQ1813956-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
1,3-Dinitrobenzene	7.60	8.00	95	7.49	8.00	94	26-125	2	30
2,4-Dinitrotoluene	7.12	8.00	89	7.11	8.00	89	50-111	<1	30
2,6-Dinitrotoluene	7.64	8.00	96	7.79	8.00	97	40-108	2	30
2-Amino-4,6-dinitrotoluene	7.50	8.00	94	7.43	8.00	93	54-116	<1	30
3,5-Dinitroaniline	7.83	8.00	98	7.69	8.00	96	30-133	2	30
4-Amino-2,6-dinitrotoluene	7.56	8.00	95	7.69	8.00	96	55-117	2	30

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2171249-COFC

COC Number: 15 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	WSP Canada Inc
Contact:	Iain Pimlott
Phone:	~~204-259-1514~~ 204-223-8018
	Company address below will appear on the final report
Street:	1600 Buffalo Place
City/Province:	Winnipeg, Manitoba
Postal Code:	R3T 6B8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Iain.Pimlott@wsp.com
Email 2:
Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax:
Email 2:

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☐ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4] ☐ | 3 day [P3] ☐ | 2 day [P2] ☐
EMERGENCY: 1 Business day [E1] ☐ | Same Day, Weekend or Statutory holiday [E0] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #: W2638/Q48095
Job #: 171-14563.00
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#
Major/Minor Code: | Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (lab use only):
ALS Contact: | Sampler:

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	ALK-SPEC-WP, PH-WP, EC-WP	C-TOT-HTC-WP	COD-WP, N-TOTKJ-WP, NH3-COL-WP	MET-T-CCMS-WP, HARDNESS-CALC-WP	MET-T-CCMS-1-WP, WP-AS-T	CL-IC-N-WP, SO4-IC-N-WP	NO2-IC-N-WP, NO3-IC-N-WP	PO4-DO-L-COL-WP	SIO2-COL-WP	SOLIDS-TOT-WP, SOLIDS-TOTSUS-WP	TDS-WP, TURBIDITY-WP	VOC+F1-HSMS-WP	XYLENES-SUM-CALC-WP, THM-SUM-CA	Number of Containers
	MW-1	26-09-18	13:00	H2O	✓	-	✓	-	✓	✓	✓	-	-	-	✓	✓	✓	
	MW-2	↓	13:20	↓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	MW-3		13:40		✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	MW-4		14:00		✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	MW-5		14:20		✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	MW-6		14:40		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	MW-7		15:00		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO
Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations Yes ☐ No ☐
Ice Packs ☐ Ice Cubes ☐ | Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
11.4					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: MH	Date: 26-4-19	Time: 2:00	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

L2171249-COFC

COC Number: 15 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	WSP Canada Inc
Contact:	Iain Pimlott
Phone:	~~204-259-1544~~ 204-223-8018
	Company address below will appear on the final report
Street:	1600 Buffalo Place
City/Province:	Winnipeg, Manitoba
Postal Code:	R3T 6B8
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: Iain.Pimlott@wsp.com
Email 2:
Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax:
Email 2:

Project Information

ALS Account # / Quote #:	W2638/Q48095
Job #:	171-14563.00
PO / AFE:	
LSD:	
ALS Lab Work Order # (lab use only)	L2171249

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	
ALS Contact:	Sampler:

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☐ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
4 day [P4]	☐	1 Business day [E1]	☐
3 day [P3]	☐	Same Day, Weekend or Statutory holiday [E0]	☐
2 day [P2]	☐		

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

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	SPECIAL REQUEST-KL	*SPECIAL REQUEST IS FOR EXPLOSIVE	Number of Containers
1	MW-1	26-09-18	13:00	H_2O	✓	✓	
2	MW-2		13:20		✓	✓	
3	MW-3		1340		✓	✓	
4	MW-5		14:00		✓	✓	
5	MW-6		14:20		✓	✓	
6	MW-7		14:40		✓	✓	
			15:00		✓	✓	

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	
11.3			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: [redacted]	Date: 26-9-18	Time: 2:00	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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**

WSP Canada Inc.
ATTN: IAIN PIMLOTT
1600 Buffalo Place
Winnipeg MB R3T 6B8

Date Received: 04-JUN-19
Report Date: 21-JUN-19 09:56 (MT)
Version: FINAL

Client Phone: 204-223-8018

Certificate of Analysis

Lab Work Order #: L2284492

Project P.O. #: NOT SUBMITTED
Job Reference: 171-14563-00
C of C Numbers:
Legal Site Desc:

[redacted]

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2284492-1 MW-1							
Sampled By: CLIENT on 04-JUN-19 @ 09:45							
Matrix: WATER							
Alkalinity species as HCO3, CO3, OH							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	804		1.2	mg/L		06-JUN-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		06-JUN-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		06-JUN-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	659		1.0	mg/L		05-JUN-19	R4659873
Miscellaneous Parameters							
Ammonia, Total (as N)	0.050		0.010	mg/L		05-JUN-19	R4660275
Chemical Oxygen Demand	45		20	mg/L		07-JUN-19	R4662319
Chloride (Cl)	<10	DLM	10	mg/L		04-JUN-19	R4659167
Conductivity	2970		1.0	umhos/cm		05-JUN-19	R4659873
Hardness (as CaCO3)	2120	HTC	0.20	mg/L		18-JUN-19	
Nitrate (as N)	<0.40	DLM	0.40	mg/L		04-JUN-19	R4659167
Nitrite (as N)	<0.20	DLM	0.20	mg/L		04-JUN-19	R4659167
Silica, Reactive (as SiO2)	20.4		1.0	mg/L		04-JUN-19	R4658067
Special Request	See Attached					19-JUN-19	R4680868
Sulfate (SO4)	1500		6.0	mg/L		04-JUN-19	R4659167
Xylenes (Total)	<0.00050		0.00050	mg/L		18-JUN-19	
Total Dissolved Solids	2730		20	mg/L		07-JUN-19	R4662564
Total Kjeldahl Nitrogen	0.45		0.20	mg/L	07-JUN-19	10-JUN-19	R4662846
Total Organic Carbon	12.3		0.50	mg/L		12-JUN-19	R4668350
Total Solids	2840		10	mg/L		11-JUN-19	R4664786
Total Suspended Solids	17.6		2.0	mg/L		11-JUN-19	R4665046
Total THMs	<0.0010		0.0010	mg/L		18-JUN-19	
Turbidity	6.74		0.10	NTU		04-JUN-19	R4654556
pH	7.62		0.10	pH units		05-JUN-19	R4659873
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.349		0.0030	mg/L	13-JUN-19	13-JUN-19	R4669779
Antimony (Sb)-Total	0.00021		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Arsenic (As)-Total	0.00096		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Barium (Ba)-Total	0.0134		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	13-JUN-19	13-JUN-19	R4669779
Boron (B)-Total	0.214		0.010	mg/L	13-JUN-19	13-JUN-19	R4669779
Cadmium (Cd)-Total	0.0000175		0.0000050	mg/L	13-JUN-19	13-JUN-19	R4669779
Calcium (Ca)-Total	350		0.050	mg/L	13-JUN-19	13-JUN-19	R4669779
Cesium (Cs)-Total	0.000054		0.000010	mg/L	13-JUN-19	13-JUN-19	R4669779
Chromium (Cr)-Total	0.00086		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Cobalt (Co)-Total	0.00168		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Copper (Cu)-Total	0.00450		0.00050	mg/L	13-JUN-19	13-JUN-19	R4669779
Iron (Fe)-Total	0.447		0.010	mg/L	13-JUN-19	13-JUN-19	R4669779
Lead (Pb)-Total	0.000284		0.000050	mg/L	13-JUN-19	13-JUN-19	R4669779
Lithium (Li)-Total	0.40		0.10	mg/L	13-JUN-19	17-JUN-19	R4672149
Magnesium (Mg)-Total	303		0.0050	mg/L	13-JUN-19	13-JUN-19	R4669779
Manganese (Mn)-Total	0.315		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Molybdenum (Mo)-Total	0.00306		0.000050	mg/L	13-JUN-19	13-JUN-19	R4669779
Nickel (Ni)-Total	0.0125		0.00050	mg/L	13-JUN-19	14-JUN-19	R4671275
Potassium (K)-Total	7.81		0.050	mg/L	13-JUN-19	13-JUN-19	R4669779

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2284492-1 MW-1							
Sampled By: CLIENT on 04-JUN-19 @ 09:45							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Phosphorus (P)-Total	0.038		0.030	mg/L	13-JUN-19	13-JUN-19	R4669779
Rubidium (Rb)-Total	0.00113		0.00020	mg/L	13-JUN-19	13-JUN-19	R4669779
Selenium (Se)-Total	0.000171		0.000050	mg/L	13-JUN-19	13-JUN-19	R4669779
Silicon (Si)-Total	11.9		0.10	mg/L	13-JUN-19	13-JUN-19	R4669779
Silver (Ag)-Total	0.000011		0.000010	mg/L	13-JUN-19	13-JUN-19	R4669779
Sodium (Na)-Total	107		0.050	mg/L	13-JUN-19	13-JUN-19	R4669779
Strontium (Sr)-Total	2.07		0.020	mg/L	13-JUN-19	17-JUN-19	R4672149
Sulfur (S)-Total	599		50	mg/L	13-JUN-19	17-JUN-19	R4672149
Tellurium (Te)-Total	0.00033		0.00020	mg/L	13-JUN-19	13-JUN-19	R4669779
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	13-JUN-19	13-JUN-19	R4669779
Thorium (Th)-Total	0.00018		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Tin (Sn)-Total	0.00015		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Titanium (Ti)-Total	0.0157		0.00030	mg/L	13-JUN-19	13-JUN-19	R4669779
Tungsten (W)-Total	<0.00010		0.00010	mg/L	13-JUN-19	13-JUN-19	R4669779
Uranium (U)-Total	0.196		0.000010	mg/L	13-JUN-19	13-JUN-19	R4669779
Vanadium (V)-Total	0.00201		0.00050	mg/L	13-JUN-19	13-JUN-19	R4669779
Zinc (Zn)-Total	0.0033		0.0030	mg/L	13-JUN-19	13-JUN-19	R4669779
Zirconium (Zr)-Total	0.00141		0.000060	mg/L	13-JUN-19	13-JUN-19	R4669779
VOC plus F1 by GCMS							
Acetone	<0.020		0.020	mg/L		11-JUN-19	R4671517
Benzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Bromobenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Bromochloromethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Bromodichloromethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Bromoform	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Bromomethane	<0.0020	DLM	0.0020	mg/L		11-JUN-19	R4671517
n-Butylbenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
sec-Butylbenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
tert-Butylbenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Carbon disulfide	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Carbon Tetrachloride	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Chlorobenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Chloroethane	<0.0010		0.0010	mg/L		11-JUN-19	R4671517
Chloroform	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Chloromethane	<0.0010		0.0010	mg/L		11-JUN-19	R4671517
2-Chlorotoluene	<0.020		0.020	mg/L		11-JUN-19	R4671517
4-Chlorotoluene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Dibromochloromethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,2-Dibromo-3-chloropropane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,2-Dibromoethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Dibromomethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,2-Dichlorobenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,3-Dichlorobenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,4-Dichlorobenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Dichlorodifluoromethane	<0.0010		0.0010	mg/L		11-JUN-19	R4671517
1,1-dichloroethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,2-Dichloroethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,1-dichloroethene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
cis-1,2-Dichloroethene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
trans-1,2-Dichloroethene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Dichloromethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2284492-1 MW-1							
Sampled By: CLIENT on 04-JUN-19 @ 09:45							
Matrix: WATER							
VOC plus F1 by GCMS							
1,2-Dichloropropane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,3-Dichloropropane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
2,2-Dichloropropane	<0.001	DLM	0.0010	mg/L		11-JUN-19	R4671517
1,1-Dichloropropene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
cis-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		11-JUN-19	R4671517
trans-1,3-Dichloropropene	<0.0010	DLM	0.0010	mg/L		11-JUN-19	R4671517
Ethylbenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
F1	<0.10		0.10	mg/L		11-JUN-19	R4671517
Hexachlorobutadiene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Hexane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
2-Hexanone (Methyl butyl ketone)	<0.020		0.020	mg/L		11-JUN-19	R4671517
Isopropylbenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
4-Isopropyltoluene	<0.0010		0.0010	mg/L		11-JUN-19	R4671517
MEK	<0.020		0.020	mg/L		11-JUN-19	R4671517
MIBK	<0.020		0.020	mg/L		11-JUN-19	R4671517
MTBE	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Styrene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,1,1,2-Tetrachloroethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,1,2,2-Tetrachloroethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Tetrachloroethene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Toluene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,2,3-Trichlorobenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,2,4-Trichlorobenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,1,1-Trichloroethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,1,2-Trichloroethane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Trichloroethene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Trichlorofluoromethane	<0.0010		0.0010	mg/L		11-JUN-19	R4671517
1,2,3-Trichloropropane	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,2,4-Trimethylbenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
1,3,5-Trimethylbenzene	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
Vinyl Chloride	<0.00050		0.00050	mg/L		11-JUN-19	R4671517
M+P-Xylenes	<0.00040		0.00040	mg/L		11-JUN-19	R4671517
o-Xylene	<0.00030		0.00030	mg/L		11-JUN-19	R4671517
Surrogate: 4-Bromofluorobenzene (SS)	95.2		70-130	%		11-JUN-19	R4671517
Surrogate: 1,4-Difluorobenzene (SS)	99.9		70-130	%		11-JUN-19	R4671517

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
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**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)

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

COD-WP	Water	Chemical Oxygen Demand	APHA 5220 D

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colorimetric method.

EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

HARDNESS-CALC-WP	Water	Hardness Calculated	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.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (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.

N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	APHA 4500 NorgD (modified)

Aqueous samples are digested in a block digester with sulfuric acid and copper sulfate as a catalyst. Total Kjeldahl Nitrogen is then analyzed using a discrete analyzer with colorimetric detection.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
SIO2-COL-WP	Water	Reactive Silica by colour	APHA 4500 SIO2
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 "Silica". Molybdate Reactive Silica is determined by analysis of the sample using the heteropoly blue colourimetric method.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOT-WP	Water	Total Solids	APHA 2540 B (modified)
Total solids in aqueous matrices is determined gravimetrically after evaporation of the sample at 103 105°C.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
SPECIAL REQUEST 1-MP	Misc.	Special Request Middletown Pennsylvania	SEE SUBLET LAB RESULTS
TDS-WP	Water	Total Dissolved Solids (TDS)	APHA 2540 SOLIDS C,E
A well-mixed sample is filtered through a glass fiber filter paper. The filtrate is then evaportaed to dryness in a pre-weighed vial and dried at 180 – 2C. The increase in vial weight represents the total dissolved solids.			
THM-SUM-CALC-WP	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
TURBIDITY-WP	Water	Turbidity	APHA 2130B (modified)
Turbidity in aqueous matrices is determined by the nephelometric method.			
VOC+F1-HSMS-WP	Water	VOC plus F1 by GCMS	EPA 8260C / EPA 5021A
In this method samples are analyzed using a headspace autosampler interfaced to a dual column gas chromatograph with MS and Flame Ionization detectors.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** 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
MP	ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
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
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
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.

Quality Control Report

Client: WSP Canada Inc.
1600 Buffalo Place
Winnipeg MB R3T 6B8
Contact: IAIN PIMLOTT

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R4659873								
WG3069192-15 DUP		**L2284492-1**						
Alkalinity, Total (as CaCO3)		659	654		mg/L	0.8	20	05-JUN-19
WG3069192-14 LCS								
Alkalinity, Total (as CaCO3)			103.6		%		85-115	05-JUN-19
WG3069192-11 MB								
Alkalinity, Total (as CaCO3)			1.0		mg/L		1	05-JUN-19
C-TOC-HTC-WP	**Water**							
Batch R4668350								
WG3076231-6 LCS								
Total Organic Carbon			100.7		%		80-120	12-JUN-19
WG3076231-5 MB								
Total Organic Carbon			<0.50		mg/L		0.5	12-JUN-19
CL-IC-N-WP	**Water**							
Batch R4659167								
WG3066823-2 LCS								
Chloride (Cl)			99.2		%		90-110	04-JUN-19
WG3066823-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	04-JUN-19
COD-WP	**Water**							
Batch R4662319								
WG3072310-6 LCS								
Chemical Oxygen Demand			97.7		%		85-115	07-JUN-19
WG3072310-5 MB								
Chemical Oxygen Demand			<20		mg/L		20	07-JUN-19
EC-WP	**Water**							
Batch R4659873								
WG3069192-15 DUP		**L2284492-1**						
Conductivity		2970	2960		umhos/cm	0.3	10	05-JUN-19
WG3069192-13 LCS								
Conductivity			100.7		%		90-110	05-JUN-19
WG3069192-11 MB								
Conductivity			<1.0		umhos/cm		1	05-JUN-19
MET-T-CCMS-WP	**Water**							
Batch R4669779								
WG3076102-2 LCS								
Aluminum (Al)-Total			98.4		%		80-120	13-JUN-19
Antimony (Sb)-Total			100.3		%		80-120	13-JUN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4669779								
WG3076102-2 LCS								
Arsenic (As)-Total			97.0		%		80-120	13-JUN-19
Barium (Ba)-Total			95.8		%		80-120	13-JUN-19
Beryllium (Be)-Total			100.7		%		80-120	13-JUN-19
Bismuth (Bi)-Total			97.0		%		80-120	13-JUN-19
Boron (B)-Total			99.3		%		80-120	13-JUN-19
Cadmium (Cd)-Total			96.6		%		80-120	13-JUN-19
Calcium (Ca)-Total			100.2		%		80-120	13-JUN-19
Cesium (Cs)-Total			104.8		%		80-120	13-JUN-19
Chromium (Cr)-Total			95.5		%		80-120	13-JUN-19
Cobalt (Co)-Total			98.0		%		80-120	13-JUN-19
Copper (Cu)-Total			96.3		%		80-120	13-JUN-19
Iron (Fe)-Total			96.0		%		80-120	13-JUN-19
Lead (Pb)-Total			100.1		%		80-120	13-JUN-19
Magnesium (Mg)-Total			106.3		%		80-120	13-JUN-19
Manganese (Mn)-Total			96.2		%		80-120	13-JUN-19
Molybdenum (Mo)-Total			101.6		%		80-120	13-JUN-19
Potassium (K)-Total			98.3		%		80-120	13-JUN-19
Phosphorus (P)-Total			98.3		%		80-120	13-JUN-19
Rubidium (Rb)-Total			98.8		%		80-120	13-JUN-19
Selenium (Se)-Total			101.3		%		80-120	13-JUN-19
Silicon (Si)-Total			98.6		%		80-120	13-JUN-19
Silver (Ag)-Total			102.0		%		80-120	13-JUN-19
Sodium (Na)-Total			98.2		%		80-120	13-JUN-19
Tellurium (Te)-Total			98.3		%		80-120	13-JUN-19
Thallium (Tl)-Total			98.5		%		80-120	13-JUN-19
Thorium (Th)-Total			99.8		%		80-120	13-JUN-19
Tin (Sn)-Total			96.7		%		80-120	13-JUN-19
Titanium (Ti)-Total			95.2		%		80-120	13-JUN-19
Tungsten (W)-Total			98.1		%		80-120	13-JUN-19
Uranium (U)-Total			98.3		%		80-120	13-JUN-19
Vanadium (V)-Total			96.8		%		80-120	13-JUN-19
Zinc (Zn)-Total			97.5		%		80-120	13-JUN-19
Zirconium (Zr)-Total			103.0		%		80-120	13-JUN-19
WG3076102-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4669779								
WG3076102-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	13-JUN-19
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Arsenic (As)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Barium (Ba)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	13-JUN-19
Boron (B)-Total			<0.010		mg/L		0.01	13-JUN-19
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	13-JUN-19
Calcium (Ca)-Total			<0.050		mg/L		0.05	13-JUN-19
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	13-JUN-19
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Copper (Cu)-Total			<0.00050		mg/L		0.0005	13-JUN-19
Iron (Fe)-Total			<0.010		mg/L		0.01	13-JUN-19
Lead (Pb)-Total			<0.000050		mg/L		0.00005	13-JUN-19
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	13-JUN-19
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	13-JUN-19
Potassium (K)-Total			<0.050		mg/L		0.05	13-JUN-19
Phosphorus (P)-Total			<0.030		mg/L		0.03	13-JUN-19
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	13-JUN-19
Selenium (Se)-Total			<0.000050		mg/L		0.00005	13-JUN-19
Silicon (Si)-Total			<0.10		mg/L		0.1	13-JUN-19
Silver (Ag)-Total			<0.000010		mg/L		0.00001	13-JUN-19
Sodium (Na)-Total			<0.050		mg/L		0.05	13-JUN-19
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	13-JUN-19
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	13-JUN-19
Thorium (Th)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Tin (Sn)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	13-JUN-19
Tungsten (W)-Total			<0.00010		mg/L		0.0001	13-JUN-19
Uranium (U)-Total			<0.000010		mg/L		0.00001	13-JUN-19
Vanadium (V)-Total			<0.00050		mg/L		0.0005	13-JUN-19
Zinc (Zn)-Total			<0.0030		mg/L		0.003	13-JUN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R4669779								
WG3076102-1 MB								
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	13-JUN-19
N-TOTKJ-WP	**Water**							
Batch R4662846								
WG3070499-2 LCS								
Total Kjeldahl Nitrogen			95.6		%		75-125	10-JUN-19
WG3070499-1 MB								
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	10-JUN-19
NH3-COL-WP	**Water**							
Batch R4660275								
WG3069698-14 LCS								
Ammonia, Total (as N)			101.4		%		85-115	05-JUN-19
WG3069698-13 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	05-JUN-19
NO2-IC-N-WP	**Water**							
Batch R4659167								
WG3066823-2 LCS								
Nitrite (as N)			101.9		%		90-110	04-JUN-19
WG3066823-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	04-JUN-19
NO3-IC-N-WP	**Water**							
Batch R4659167								
WG3066823-2 LCS								
Nitrate (as N)			99.6		%		90-110	04-JUN-19
WG3066823-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	04-JUN-19
PH-WP	**Water**							
Batch R4659873								
WG3069192-15 DUP		**L2284492-1**						
pH		7.62	7.63	J	pH units	0.01	0.2	05-JUN-19
WG3069192-12 LCS								
pH			7.38		pH units		7.3-7.5	05-JUN-19
SIO2-COL-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SIO2-COL-WP	**Water**							
Batch R4658067								
WG3067568-3 DUP		**L2284492-1**						
Silica, Reactive (as SiO2)		20.4	21.0		mg/L	2.6	20	04-JUN-19
WG3067568-2 LCS								
Silica, Reactive (as SiO2)			103.3		%		85-115	04-JUN-19
WG3067568-1 MB								
Silica, Reactive (as SiO2)			<1.0		mg/L		1	04-JUN-19
SO4-IC-N-WP	**Water**							
Batch R4659167								
WG3066823-2 LCS								
Sulfate (SO4)			99.6		%		90-110	04-JUN-19
WG3066823-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	04-JUN-19
SOLIDS-TOT-WP	**Water**							
Batch R4664786								
WG3073890-3 DUP		**L2284492-1**						
Total Solids		2840	2860		mg/L	0.8	20	11-JUN-19
WG3073890-2 LCS								
Total Solids			96.6		%		85-115	11-JUN-19
WG3073890-1 MB								
Total Solids			<10		mg/L		10	11-JUN-19
SOLIDS-TOTSUS-WP	**Water**							
Batch R4665046								
WG3072270-2 LCS								
Total Suspended Solids			108.0		%		85-115	11-JUN-19
WG3072270-1 MB								
Total Suspended Solids			<2.0		mg/L		2	11-JUN-19
TDS-WP	**Water**							
Batch R4662564								
WG3069877-2 LCS								
Total Dissolved Solids			100.8		%		85-115	07-JUN-19
WG3069877-1 MB								
Total Dissolved Solids			<4.0		mg/L		4	07-JUN-19
TURBIDITY-WP	**Water**							
Batch R4654556								
WG3066321-2 LCS								
Turbidity			105.0		%		85-115	04-JUN-19
WG3066321-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-WP	**Water**							
Batch R4654556								
WG3066321-1 MB								
Turbidity			<0.10		NTU		0.1	04-JUN-19
VOC+F1-HSMS-WP	**Water**							
Batch R4671517								
WG3072712-2 LCS								
Acetone			94.8		%		70-130	10-JUN-19
Benzene			96.3		%		70-130	10-JUN-19
Bromobenzene			102.5		%		70-130	10-JUN-19
Bromochloromethane			96.6		%		70-130	10-JUN-19
Bromodichloromethane			100.3		%		70-130	10-JUN-19
Bromoform			97.8		%		70-130	10-JUN-19
Bromomethane			103.7		%		60-140	10-JUN-19
n-Butylbenzene			109.3		%		70-130	10-JUN-19
sec-Butylbenzene			111.5		%		70-130	10-JUN-19
tert-Butylbenzene			110.5		%		70-130	10-JUN-19
Carbon disulfide			94.3		%		70-130	10-JUN-19
Carbon Tetrachloride			100.2		%		70-130	10-JUN-19
Chlorobenzene			101.5		%		70-130	10-JUN-19
Chloroethane			109.2		%		60-140	10-JUN-19
Chloroform			101.1		%		70-130	10-JUN-19
Chloromethane			105.8		%		60-140	10-JUN-19
2-Chlorotoluene			112.2		%		70-130	10-JUN-19
4-Chlorotoluene			96.8		%		70-130	10-JUN-19
Dibromochloromethane			102.4		%		70-130	10-JUN-19
1,2-Dibromo-3-chloropropane			94.4		%		70-130	10-JUN-19
1,2-Dibromoethane			99.8		%		70-130	10-JUN-19
Dibromomethane			99.3		%		70-130	10-JUN-19
1,2-Dichlorobenzene			101.1		%		70-130	10-JUN-19
1,3-Dichlorobenzene			100.6		%		70-130	10-JUN-19
1,4-Dichlorobenzene			102.8		%		70-130	10-JUN-19
Dichlorodifluoromethane			123.3		%		60-140	10-JUN-19
1,1-dichloroethane			100.2		%		70-130	10-JUN-19
1,2-Dichloroethane			99.1		%		70-130	10-JUN-19
1,1-dichloroethene			99.1		%		70-130	10-JUN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4671517								
WG3072712-2 LCS								
cis-1,2-Dichloroethene			98.5		%		70-130	10-JUN-19
trans-1,2-Dichloroethene			98.2		%		70-130	10-JUN-19
Dichloromethane			100.2		%		70-130	10-JUN-19
1,2-Dichloropropane			96.9		%		70-130	10-JUN-19
1,3-Dichloropropane			99.5		%		70-130	10-JUN-19
2,2-Dichloropropane			95.5		%		70-130	10-JUN-19
1,1-Dichloropropene			98.4		%		70-130	10-JUN-19
cis-1,3-Dichloropropene			101.4		%		70-130	10-JUN-19
trans-1,3-Dichloropropene			100.6		%		70-130	10-JUN-19
Ethylbenzene			113.4		%		70-130	10-JUN-19
Hexachlorobutadiene			100.4		%		70-130	10-JUN-19
Hexane			98.1		%		70-130	10-JUN-19
2-Hexanone (Methyl butyl ketone)			104.1		%		70-130	10-JUN-19
Isopropylbenzene			104.4		%		70-130	10-JUN-19
4-Isopropyltoluene			109.5		%		70-130	10-JUN-19
MEK			96.4		%		70-130	10-JUN-19
MIBK			104.6		%		70-130	10-JUN-19
MTBE			104.1		%		70-130	10-JUN-19
Styrene			103.8		%		70-130	10-JUN-19
1,1,1,2-Tetrachloroethane			106.3		%		70-130	10-JUN-19
1,1,2,2-Tetrachloroethane			98.0		%		70-130	10-JUN-19
Tetrachloroethene			100.9		%		70-130	10-JUN-19
Toluene			106.8		%		70-130	10-JUN-19
1,2,3-Trichlorobenzene			96.3		%		70-130	10-JUN-19
1,2,4-Trichlorobenzene			94.5		%		70-130	10-JUN-19
1,1,1-Trichloroethane			102.6		%		70-130	10-JUN-19
1,1,2-Trichloroethane			101.8		%		70-130	10-JUN-19
Trichloroethene			101.1		%		70-130	10-JUN-19
Trichlorofluoromethane			106.4		%		60-140	10-JUN-19
1,2,3-Trichloropropane			97.3		%		70-130	10-JUN-19
1,2,4-Trimethylbenzene			109.8		%		70-130	10-JUN-19
1,3,5-Trimethylbenzene			109.9		%		70-130	10-JUN-19
Vinyl Chloride			99.6		%		60-140	10-JUN-19
M+P-Xylenes			112.5		%		70-130	10-JUN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4671517								
WG3072712-2 LCS								
o-Xylene			110.6		%		70-130	10-JUN-19
WG3072712-3 LCS								
F1			108.0		%		70-130	10-JUN-19
WG3072712-1 MB								
Acetone			<0.020		mg/L		0.02	11-JUN-19
Benzene			<0.00050		mg/L		0.0005	11-JUN-19
Bromobenzene			<0.00050		mg/L		0.0005	11-JUN-19
Bromochloromethane			<0.00050		mg/L		0.0005	11-JUN-19
Bromodichloromethane			<0.00050		mg/L		0.0005	11-JUN-19
Bromoform			<0.00050		mg/L		0.0005	11-JUN-19
Bromomethane			<0.0010		mg/L		0.001	11-JUN-19
n-Butylbenzene			<0.00050		mg/L		0.0005	11-JUN-19
sec-Butylbenzene			<0.00050		mg/L		0.0005	11-JUN-19
tert-Butylbenzene			<0.00050		mg/L		0.0005	11-JUN-19
Carbon disulfide			<0.00050		mg/L		0.0005	11-JUN-19
Carbon Tetrachloride			<0.00050		mg/L		0.0005	11-JUN-19
Chlorobenzene			<0.00050		mg/L		0.0005	11-JUN-19
Chloroethane			<0.0010		mg/L		0.001	11-JUN-19
Chloroform			<0.00050		mg/L		0.0005	11-JUN-19
Chloromethane			<0.0010		mg/L		0.001	11-JUN-19
2-Chlorotoluene			<0.020		mg/L		0.02	11-JUN-19
4-Chlorotoluene			<0.00050		mg/L		0.0005	11-JUN-19
Dibromochloromethane			<0.00050		mg/L		0.0005	11-JUN-19
1,2-Dibromo-3-chloropropane			<0.00050		mg/L		0.0005	11-JUN-19
1,2-Dibromoethane			<0.00050		mg/L		0.0005	11-JUN-19
Dibromomethane			<0.00050		mg/L		0.0005	11-JUN-19
1,2-Dichlorobenzene			<0.00050		mg/L		0.0005	11-JUN-19
1,3-Dichlorobenzene			<0.00050		mg/L		0.0005	11-JUN-19
1,4-Dichlorobenzene			<0.00050		mg/L		0.0005	11-JUN-19
Dichlorodifluoromethane			<0.0010		mg/L		0.001	11-JUN-19
1,1-dichloroethane			<0.00050		mg/L		0.0005	11-JUN-19
1,2-Dichloroethane			<0.00050		mg/L		0.0005	11-JUN-19
1,1-dichloroethene			<0.00050		mg/L		0.0005	11-JUN-19
cis-1,2-Dichloroethene			<0.00050		mg/L		0.0005	11-JUN-19
trans-1,2-Dichloroethene			<0.00050		mg/L		0.0005	11-JUN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4671517								
WG3072712-1 MB								
Dichloromethane			<0.00050		mg/L		0.0005	11-JUN-19
1,2-Dichloropropane			<0.00050		mg/L		0.0005	11-JUN-19
1,3-Dichloropropane			<0.00050		mg/L		0.0005	11-JUN-19
2,2-Dichloropropane			<0.00050		mg/L		0.0005	11-JUN-19
1,1-Dichloropropene			<0.00050		mg/L		0.0005	11-JUN-19
cis-1,3-Dichloropropene			<0.00050		mg/L		0.0005	11-JUN-19
trans-1,3-Dichloropropene			<0.00050		mg/L		0.0005	11-JUN-19
Ethylbenzene			<0.00050		mg/L		0.0005	11-JUN-19
F1			<0.10		mg/L		0.1	11-JUN-19
Hexachlorobutadiene			<0.00050		mg/L		0.0005	11-JUN-19
Hexane			<0.00050		mg/L		0.0005	11-JUN-19
2-Hexanone (Methyl butyl ketone)			<0.020		mg/L		0.02	11-JUN-19
Isopropylbenzene			<0.00050		mg/L		0.0005	11-JUN-19
4-Isopropyltoluene			<0.0010		mg/L		0.001	11-JUN-19
MEK			<0.020		mg/L		0.02	11-JUN-19
MIBK			<0.020		mg/L		0.02	11-JUN-19
MTBE			<0.00050		mg/L		0.0005	11-JUN-19
Styrene			<0.00050		mg/L		0.0005	11-JUN-19
1,1,1,2-Tetrachloroethane			<0.00050		mg/L		0.0005	11-JUN-19
1,1,2,2-Tetrachloroethane			<0.00050		mg/L		0.0005	11-JUN-19
Tetrachloroethene			<0.00050		mg/L		0.0005	11-JUN-19
Toluene			<0.00050		mg/L		0.0005	11-JUN-19
1,2,3-Trichlorobenzene			<0.00050		mg/L		0.0005	11-JUN-19
1,2,4-Trichlorobenzene			<0.00050		mg/L		0.0005	11-JUN-19
1,1,1-Trichloroethane			<0.00050		mg/L		0.0005	11-JUN-19
1,1,2-Trichloroethane			<0.00050		mg/L		0.0005	11-JUN-19
Trichloroethene			<0.00050		mg/L		0.0005	11-JUN-19
Trichlorofluoromethane			<0.0010		mg/L		0.001	11-JUN-19
1,2,3-Trichloropropane			<0.00050		mg/L		0.0005	11-JUN-19
1,2,4-Trimethylbenzene			<0.00050		mg/L		0.0005	11-JUN-19
1,3,5-Trimethylbenzene			<0.00050		mg/L		0.0005	11-JUN-19
Vinyl Chloride			<0.00050		mg/L		0.0005	11-JUN-19
M+P-Xylenes			<0.00040		mg/L		0.0004	11-JUN-19
o-Xylene			<0.00030		mg/L		0.0003	11-JUN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC+F1-HSMS-WP	**Water**							
Batch R4671517								
WG3072712-1 MB								
Surrogate: 4-Bromofluorobenzene (SS)			92.8		%		70-130	11-JUN-19
Surrogate: 1,4-Difluorobenzene (SS)			98.6		%		70-130	11-JUN-19

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	04-JUN-19 09:45	05-JUN-19 12:00	0.25	26	hours	EHTR-FM

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2284492 were received on 04-JUN-19 10:45.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

June 21, 2019

Ms. Bea Ryback
ALS Environmental-Winnipeg MB
Unit 12–1329 Niakwa Road East
Winnipeg, MB, R2J 3T4

Certificate of Analysis

Project Name:	**SOIL**	Workorder:	**3037960**
Purchase Order:		Workorder ID:	**L2284492**

Dear Ms. Ryback:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, June 5, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Sarah S Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Craig Riddell

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

[redacted]

Ms. Sarah S Leung
Project Coordinator

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SAMPLE SUMMARY

Workorder: 3037960 L2284492

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3037960001	L2284492-1 MW-1	Water	6/4/2019 09:45	6/5/2019 10:32	Collected by Client

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SAMPLE SUMMARY

Workorder: 3037960 L2284492

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 3037960 L2284492

Lab ID: **3037960001** Date Collected: 6/4/2019 09:45 Matrix: Water

Sample ID: **L2284492-1 MW-1** Date Received: 6/5/2019 10:32

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
EXPLOSIVES										
2-Amino-4,6-Dinitrotoluene	ND		ug/L	0.20	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A
4-Amino-2,6-dinitrotoluene	ND		ug/L	0.20	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A
2,4-Dinitrotoluene	ND		ug/L	0.20	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A
2,6-Dinitrotoluene	ND		ug/L	0.20	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A
4-Nitrotoluene	ND		ug/L	0.20	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A
2-Nitrotoluene	ND		ug/L	0.20	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A
3-Nitrotoluene	ND		ug/L	0.20	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A
2,4,6-Trinitrotoluene	ND		ug/L	0.20	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,4-Dinitrobenzene (S)	106		%	50 - 150	SW846 8330B	6/11/19 19:30	JEK	6/19/19 22:55	CGS	A

[redacted]

Ms. Sarah S Leung
Project Coordinator

ALS Environmental

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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3037960 L2284492

Lab ID	Sample ID	Analysis Method	Prep Method
3037960001	L2284492-1 MW-1	SW846 8330B	SW846 8330B

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QUALITY CONTROL DATA

Workorder: 3037960 L2284492

QC Batch: DWPR/3038 **Analysis Method:** SW846 8330B

QC Batch Method: SW846 8330B

Associated Lab Samples: 3037960001

METHOD BLANK: 2961999

Parameter	Blank Result	Units	Reporting Limit
2-Amino-4,6-Dinitrotoluene	ND	ug/L	0.20
4-Amino-2,6-dinitrotoluene	ND	ug/L	0.20
2,4-Dinitrotoluene	ND	ug/L	0.20
2,6-Dinitrotoluene	ND	ug/L	0.20
4-Nitrotoluene	ND	ug/L	0.20
2-Nitrotoluene	ND	ug/L	0.20
3-Nitrotoluene	ND	ug/L	0.20
2,4,6-Trinitrotoluene	ND	ug/L	0.20
1,4-Dinitrobenzene (S)	107	%	50 - 150

LABORATORY CONTROL SAMPLE: 2962000

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
2-Amino-4,6-Dinitrotoluene	105	ug/L	1	1.0	79 - 120
4-Amino-2,6-dinitrotoluene	103	ug/L	1	1.0	76 - 125
2,4-Dinitrotoluene	97.4	ug/L	1	0.97	78 - 120
2,6-Dinitrotoluene	95.2	ug/L	1	0.95	77 - 127
4-Nitrotoluene	94.1	ug/L	1	0.94	71 - 127
2-Nitrotoluene	88.4	ug/L	1	0.88	70 - 127
3-Nitrotoluene	93.7	ug/L	1	0.94	73 - 125
2,4,6-Trinitrotoluene	102	ug/L	1	1.0	71 - 123
1,4-Dinitrobenzene (S)	112	%			50 - 150

MATRIX SPIKE SAMPLE: 2962001 ORIGINAL: 3037960001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MS % Rec	% Rec Limit
2-Amino-4,6-Dinitrotoluene	0	ug/L	1	.87387	86.9	79 - 120
4-Amino-2,6-dinitrotoluene	0	ug/L	1	.93148	92.7	76 - 125
2,4-Dinitrotoluene	0	ug/L	1	.94876	94.4	78 - 120
2,6-Dinitrotoluene	0	ug/L	1	.9024	89.8	77 - 127
4-Nitrotoluene	0	ug/L	1	.81991	81.6	71 - 127

QUALITY CONTROL DATA

Workorder: 3037960 L2284492

2-Nitrotoluene	0	ug/L	1	.92781	92.3	70 - 127
3-Nitrotoluene	0	ug/L	1	.89341	88.9	73 - 125
2,4,6-Trinitrotoluene	0	ug/L	1	.94082	93.6	71 - 123
1,4-Dinitrobenzene (S)	102	%				50 - 150

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3037960 L2284492

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3037960001	L2284492-1 MW-1	SW846 8330B	DWPR/3038	SW846 8330B	HPLC/4766

ALS Environmental

3037960

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - MIDDLETOWN, PENNSYLVANIA, USA
34 DOGWOOD LANE
MIDDLETOWN,PENNSYLVANIA 17057

NOTES: Please reference on final report and invoice: PO# L2284492
ALS requires QC data to be provided with your final results.

EPA-8330B Explosives – Isomers of Dinitrotoluene.

Please see enclosed 1 **sample(s) in** 1 **Container(s)**

2

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
		6/4/19 09:45	CLS 6/5
L2284492-1 MW-1	Special Request Middletown Pennsylvania (SPECIAL REQUEST 1-MP 14)	6/18/2019	

Subcontract Info Contact: Judy Dalmaijer (204) 255-9749

Analysis and reporting info contact: Judy Dalmaijer
12-1329 NIAKWA ROAD E
WINNIPEG,MB R2J3T4
Phone: (204) 255-9749 Email: Judy.Dalmaijer@alsglobal.com

Please email confirmation of receipt to: Judy.Dalmaijer@alsglobal.com

Shipped By: [redacted] Date Shipped: ~~JUNE~~ JUNE 4

Received By: COMMON COURIER/ALS COURIER Date Received:

Verified By: Date Verified:

Cathy Simms ALS 6/5/19 1032 Temperature: 9°

Sample Integrity Issues:

7.4°C 401

WP-SHIPTO-SU-TUE

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
ALS Winnipeg	30379460	CLS	6/5

1. Were airbills / tracking numbers present and recorded?	NONE	(YES)	NO
Tracking number: 17 6d2 F45 66 6708 8475			
2. Are Custody Seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody Seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present?		(YES)	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	(NO)
5a. Does the COC contain sample locations?		(YES)	(NO)
5b. Does the COC contain date and time of sample collection for all samples?		YES	(NO)
5c. Does the COC contain sample collectors name?		YES	(NO)
5d. Does the COC note the type(s) of preservation for all bottles?		YES	(NO)
5e. Does the COC note the number of bottles submitted for each sample?		(YES)	NO
5f. Does the COC note the type of sample, composite or grab?		YES	(NO)
5g. Does the COC note the matrix of the sample(s)?		YES	(NO)
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	(YES)	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		(YES)	NO
8. Are all samples within holding times for the requested analyses?		(YES)	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		(YES)	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	(N/A)	YES	NO
11. Were the samples received on ice?		(YES)	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	(NO)
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	(NO)
13a. Are the samples required for SDWA compliance reporting?	(N/A)	YES	NO
13b. Did the client provide a SDWA PWS ID#?	(N/A)	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	(N/A)	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	(N/A)	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	(N/A)	YES	NO

Cooler #:								
Temperature (°C):	7.4							
Thermometer ID:	401							
Radiological (µCi):								

COMMENTS (Required for all NO responses above and any sample non-conformance):
COC doesn't note Sample (date or time) bottle Preservation, c/g. + matrix. [Filled in by CLS per email 6/5]
Sampled by client
Rec'd out of temp (rec'd on two small ice packs w/ styrofoam protectant around bottles)

~~Dedt~~

Rev. 4/29/2019

ALS Environmental
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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2284492-COFC

COC Number: 17 - 743656

Page of

Report To	Contact and company name below will appear on the final report
Company:	WSP
Contact:	Iain Pimlott
Phone:	204-223-8018
	Company address below will appear on the final report
Street:	1600 Buffalo Pl.
City/Province:	WPG MB
Postal Code:	R3T 6B8
Invoice To	Same as Report To: YES [X] NO [ ]
	Copy of Invoice with Report: YES [ ] NO [ ]
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	PDF [X] EXCEL [ ] EDD (DIGITAL) [ ]
Quality Control (QC) Report with Report	YES [ ] NO [ ]
Compare Results to Criteria on Report - provide details below if box checked	[ ]
Select Distribution:	EMAIL [X] MAIL [ ] FAX [ ]
Email 1 or Fax	iain.pimlott@wsp.com
Email 2	
Email 3	

Invoice Distribution	
Select Invoice Distribution:	EMAIL [X] MAIL [ ] FAX [ ]
Email 1 or Fax	
Email 2	

Project Information	
ALS Account # / Quote #:	Q48095
Job #:	171-14563-00
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only):

ALS Contact:

Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] [ ] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] [ ] 3 day [P3-25%] [ ] 2 day [P2-50%] [ ]

EMERGENCY: 1 Business day [E - 100%] [ ] Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] [ ]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

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	NUMBER OF CONTAINERS	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	MW-1			Water	Q48095 ✓		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? YES [ ] NO [ ]

Are samples for human consumption/ use? YES [ ] NO [ ]

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen [ ] SIF Observations Yes [ ] No [ ]

Ice Packs [ ] Ice Cubes [ ] Custody seal intact Yes [ ] No [ ]

Cooling Initiated [ ]

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
13.4							

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by: [redacted]	Date: 04/06/19	Time: 16:45

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

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