Northeast Capital Industrial Association

2017 Groundwater Quality Monitoring

Beverly Channel Monitoring Wells

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1. Introduction

1.1 General

The Northeast Capital Industrial Association (NCIA) Beverly Channel Study Area is located within Sturgeon and Strathcona Counties and is comprised of Townships 54, 55, and 56, Ranges 21 and 22, W4M (Figure 1). Groundwater monitoring of the Beverly Channel within the Study Area has been conducted since 2005. The objective of the groundwater monitoring program is to monitor for changes in groundwater flow and quality from the established baseline in the study area. The monitoring well network in the NCIA Study Area consists of 13 wells completed in the Beverly Channel and one well completed within the bedrock (Figure 2).

1.2 Previous Work

Previous work conducted within the Study Area was described by Stantec Consulting Ltd. (Stantec; 2006a, 2006b, 2007, 2008, and 2009), WorleyParsons Canada Services Ltd. (WorleyParsons; 2010, 2011, 2012, 2013, 2014, and 2015) and Advisian (2016) and is summarized as follows.

- Depth to the groundwater surface in the Beverly Channel has historically ranged from approximately 15 to 35 metres below ground surface (mbgs). Annual groundwater level fluctuations have generally been 1 m or less.
- The lateral groundwater flow gradient within the Beverly Channel has historically ranged from approximately 0.0005 to 0.005 m/m. Groundwater flow velocity has been estimated to vary from approximately 16 to 160 m/year in different areas of the Beverly Channel.
- Historically, sulphate concentrations have exceeded the applied guideline at MW-07, while total dissolved solids (TDS), iron, and manganese have exceeded the applied guidelines at several locations within the Study Area.
- Sodium concentrations have historically exceeded the applied guideline at MW-07 and MW-09.
- Chloride concentrations at MW-04 are higher than at other locations in the Beverly Channel. These chloride concentrations, nevertheless, are considered to be natural, reflecting the water quality in the underlying bedrock.

1.3 Scope of Work

The scope of the 2017 program was to conduct and report on annual groundwater level and quality at the existing monitoring network in the NCIA Study Area, conduct a supplemental monitoring event at MW-02 and MW-02B, and conduct a follow-up hydraulic conductivity test at MW-02B. The annual monitoring event occurred on July 13, 14 and August 2, 2017, while the supplemental monitoring event and hydraulic conductivity test occurred on September 25 and 29, 2017. The 2017 program included the following tasks:

- field measurements of depth to groundwater at all monitoring wells;

- field measurements of electrical conductivity (EC), pH, and temperature of groundwater;
- sampling of groundwater and submission for laboratory analysis;
- testing for hydraulic conductivity at MW-02B; and
- preparation of a report summarizing the program methodology and results, and providing an analysis of the groundwater data.

A list of the chemical parameters analyzed for the 2017 monitoring program is provided in Section 3.3. Stable isotope analysis for hydrogen (^{2}H; deuterium) and oxygen (^{18}O) began in 2015 and has continued during the 2016 and 2017 monitoring events.

2. Physical Setting

2.1 Topography and Drainage

The Study Area encompasses residential, agricultural, and industrial areas. While local topography varies at each well location, the ground generally slopes toward the North Saskatchewan River, which crosses the Study Area from southwest to northeast. Surface drainage is expected to be generally toward the North Saskatchewan River or Astotin Creek, which ultimately discharges to the North Saskatchewan River (Figure 1).

2.2 Regional Geology and Hydrogeology

A detailed description of the geology and hydrogeology of the region was provided by Stantec (2006a). A brief summary is provided below.

Regional bedrock geology comprises Late Cretaceous-aged, marginal marine to non-marine, grey thick-bedded sandstone; grey and green mudstone; grey, clayey siltstone; coal beds; and rare intermittent ironstone beds of the Belly River Group or marine, dark grey blocky shale and silty shale; greenish glauconitic and grey clayey sandstone; thin concretionary ironstone and bentonitic beds of the Bearpaw Formation (Stein 1976; Prior et al. 2013). The Bearpaw Formation has been eroded over most of the Study Area, but seems to be present in the southwest of the Study Area. The Bearpaw Formation is generally considered an aquitard. The Horseshoe Canyon Formation is present outside of the Study Area toward the southwest.

Quaternary deposits consisting of pre-glacial, glacial, lacustrine and aeolian deposited sediments overlie the bedrock. The Beverly Channel is a major pre-glacial valley in the area that consists of buried sand and gravel deposits. The channel is roughly coincident with the present-day North Saskatchewan River Valley. Deposited in fast-flowing braided streams, the sand and gravels of the Beverly Channel form an important regional aquifer in the area.

Clay till is present above the Beverly Channel sand and gravels and clay overlies the clay till. The clay and clay till units provide an effective protective barrier for the Beverly Channel over much of the region. A saturated surficial sand unit may overlie the clay unit in some areas.

Aquifers can be found in the Belly River Group, the Beverly Channel, sand lenses in the till, and surficial sand and gravel deposits (Stein 1976). Aquifers within the Belly River Group exhibit TDS concentrations ranging from 1,000 to more than 6,000 mg/L (Stein 1976). Areas of high TDS concentrations are typically associated with high chloride and/or high sulphate content (Stein 1976).

The Beverly Channel is hydraulically connected to the North Saskatchewan River (Stein 1976). Mineralization in the Beverly Channel generally ranges from less than 500 to 3,000 mg/L TDS. Iron concentrations within the Channel can exceed 15 mg/L and iron staining and iron bacteria are common (Stein 1976).

2.3 Regional Groundwater Use and Quality

A water well search of the Study Area was conducted in October 2016. The Alberta Water Well Information Database indicated that there were 1,212 water well records within the Study Area (Appendix 1). The majority of the wells were listed for domestic use, but included also stock and municipal use (e.g. Village of Bruderheim). About 93% of the water well records had a depth between 1 and 80 m, with a median depth of 27.4 m. The existence and location of these water wells has not been field-verified. With the industrial development in the Heartland Area, many of the wells associated with the water well records are no longer in use and have been abandoned. There were 120 well records indicated as abandoned.

Groundwater quality in the Beverly Channel aquifer is variable, with reported mineralization as TDS ranging from less than 500 to over 1,000 mg/L. The groundwater is also chemically hard and has elevated iron concentrations.

Based on the results of the water well search, groundwater analytical data are available for 439 of the 1,212 water well records. A subset of the available chemistry data summarizing the ranges and mean concentrations of select parameters compiled from available water well record chemistry data is provided in Table A. The summary does not include groundwater chemistry statistics from any new water wells that have been identified since analysis of the data presented in Table A was conducted.

Several water wells were identified as being completed within the Beverly Channel in the Study Area in Shell Canada Limited's (Shell) Environmental Impact Assessment for the Scotford Upgrader Expansion (Shell 2005). Water well chemistry data were unavailable for most of these water wells.

Table A Select Parameter Concentrations from Available Water Well Records

Parameter	Beverly Channel		Upper Bedrock	
	Range	Mean	Range	Mean
pH	7.3-8.5	8.1	7.8-8.7	8.0
Chloride (mg/L)	1-38	13.5	2-901	197
Sulphate (mg/L)	40-726	316	5-741	193
Iron (mg/L)	0.02-4.84	1.24	0.08-1.48	0.36
TDS (mg/L)	362-1732	975	331-2021	1059
Sodium (mg/L)	54-417	200	8-825	274

Notable differences between the Beverly Channel and upper bedrock include chloride, sulphate, and iron concentrations. Within the Beverly Channel, mean chloride concentrations are lower while mean sulphate and iron concentrations are typically higher than in the upper bedrock.

3. Field Program

3.1 Hydraulic Conductivity Testing

The hydraulic conductivity testing at monitoring well MW-02B consisted of measuring the rate at which water levels in the monitoring well recovered from displaced to pre-displacement levels (static groundwater levels). The water was displaced by purging water from the well to near dryness.

The following outlines the general field procedure for the hydraulic conductivity test.

- The static depth to water was measured prior to purging with the use of an electric water level meter. A transducer level logger was also lowered into the monitoring well to electronically record static condition and then removed prior to purging.
- Purging was completed with the use of a Waterra power pump.
- The transducer was set to electronically record water level recovery every 60 seconds.
- Manual measurements were limited to two measurements on September 25, 2017 and one measurement on September 29, 2017.

3.2 Monitoring Network

The monitoring network consists of 14 monitoring wells at 13 different locations within the Study Area, with one nested pair of monitoring wells (MW-02 and MW-02B) at one location in the Beverly Channel Aquifer and the bedrock below. Borehole logs are provided in Appendix 2.

3.3 Groundwater Sampling

Groundwater sampling was conducted according to Advisian's groundwater sampling protocols. The following procedures were followed during sampling of all monitoring wells.

- Prior to sampling, the static groundwater level was measured with an electric water level tape. The tape was cleaned by rinsing with distilled water after each reading.
- Wells were purged of standing water using a Waterra pump, a Geosub submersible pump, or manually via the use of a bailer. The temperature, pH, and EC of the water were monitored during purging. The wells were purged until these field-measured parameters stabilized.
- After purging and field measurements, groundwater samples were collected. Samples were collected in pre-cleaned bottles and vials provided by ALS Laboratory in Edmonton, Alberta. Samples for dissolved metals, dissolved ammonia, and dissolved organic carbon (DOC) analyses were field-filtered using a 45 µm inline filter. Preservatives were added to DOC, dissolved metals, and phenols sample bottles as directed by ALS. Hydrocarbon parameter samples bottles were provided pre-charged with preservatives by ALS. Groundwater samples were also collected for the analysis of stable isotopes deuterium (^{2}H) and oxygen-18 (^{18}O).
- Groundwater samples were placed in coolers with ice for transport to ALS.
- Quality assurance/quality control (QA/QC) for the field sampling program consisted of collecting one duplicate sample and one field blank.
- Standard chain-of-custody (COC) protocols were followed.

Measurements of water quality indicator parameters were conducted during the field sampling program including temperature, pH, and EC. The pH meter was calibrated using pH 4, 7, and 10 buffer solutions while the EC meter was calibrated with a standard KCL solution of 1,413 µS/cm at 25°C prior to analysing for field parameters.

3.3.1 Quality Assurance/Quality Control Procedures

The QA/QC procedures for the monitoring program were as follows.

- Thoroughly rinsing all equipment with distilled water prior to entering a well (e.g. water level tape and Geosub pump).

- A blind field blank was prepared in the field and submitted for analysis of major ions/routine potability; benzene, toluene, ethylbenzene, and xylenes (BTEX); petroleum hydrocarbon (PHC) fractions (F)1 and F2; dissolved metals and trace elements; volatile organic compounds (VOCs); deuterium and oxygen stable isotopes.
- Storing samples in coolers maintained at approximately 4°C.
- Documentation of sample handling, transport, and delivery to the laboratory using appropriate COC procedures and documentation.

Groundwater samples were collected on July 13 and 14, August 2, and September 29, 2017. All groundwater samples were analyzed by ALS, with the exception of the stable isotopes, which ALS subcontracted to Isobrine Solutions Inc.

3.3.2 Analytical Schedule

The analytical schedule for each monitoring well is summarized in Table B. Groundwater samples from all monitoring wells were analyzed for the following:

- major ions/routine potability parameters, including EC, pH, total alkalinity, chloride, sulphate, iron, manganese, TDS, calcium, magnesium, potassium, sodium, bicarbonate, carbonate, hydroxide, fluoride, ion balance, dissolved organic carbon (DOC), nitrate-as-nitrogen, nitrite-as-nitrogen, and total ammonia;
- dissolved metal and trace element parameters, including aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, titanium, uranium, vanadium, and zinc;
- PHC parameters including BTEX, PHC F1 and F2;
- VOCs, styrene and phenols; and
- deuterium and oxygen (^{2}H and ^{18}O) stable isotopes.

Table B 2017 Analytical Schedule

Monitoring Well	Major Ions/Routine Potability (see Table 3)	Dissolved metals & Trace Elements (see Table 4)	Petroleum Hydrocarbons (see Table 5)	Volatile Organic Compounds (see Table 6)	Isotopes (^{2}H and ^{18}O) (see Table 7)
MW-01	✓	✓	✓	✓	✓
MW-02	✓	✓	✓	✓	✓
MW-02B	✓	✓	✓	✓	✓
MW-03	✓	✓	✓	✓	✓
MW-04	✓	✓	✓	✓	✓
MW-05	✓	✓	✓	✓	✓
MW-06	✓	✓	✓	✓	✓
MW-07	✓	✓	✓	✓	✓
MW-08	✓	✓	✓	✓	✓
MW-09	✓	✓	✓	✓	✓
MW-10	✓	✓	✓	✓	✓
MW-11	✓	✓	✓	✓	✓
MW-12	✓	✓	✓	✓	✓
MW-13	✓	✓	✓	✓	✓

3.4 Assessment Criteria

Historically, groundwater from the Beverly Channel aquifer has been used for domestic, stock and municipal uses (e.g. Village of Bruderheim). As such, the Health Canada (2017) Guidelines for Canadian Drinking Water Quality (GCDWQ) have been included in the summary tables for the analytical results. Their purpose is to provide a general reference for the groundwater quality in the Beverly Channel Aquifer in light of the historical use, while considering that the groundwater quality represents background conditions.

3.5 Data Analysis

3.5.1 MW-02B Hydraulic Conductivity Test

Analysis and interpretation of the hydraulic conductivity test at MW-02B was conducted as follows.

- Pressure transducer data were used to calculate the displacement values required for analyzing the test. The transducer data were processed by downloading the pressure readings recorded as equivalent water column height (m H2O) above the transducer.
- The duration of the test was 5,630 minutes beginning at 1:46 pm September 25, 2017 and ending at 11:35 am September 29, 2017.
- Analysis of the recovery data was accomplished with the use of commercial software (AQTESOLV). Time and displacement values were then imported into AQTESOLV.
- The Hvorslev method (Hvorslev 1951) was used to evaluate the data and estimate hydraulic conductivity. The Hvorslev method was developed for the analysis of slug tests on non-leaky confined aquifers with a partially or fully penetrating well.

3.5.2 Groundwater Monitoring Data

Upon completion of the field program, groundwater field measurements and analytical data were tabulated. Tables include a summary of historical parameters and minimum, maximum, and mean concentrations for each well. Select indicator parameters were then graphed and utilized for statistical and graphical analysis as described below.

3.5.2.1 Statistical and Graphical Analysis

A Mann-Kendall test is a non-parametric test of a trend in a data set (Helsel and Hirsch 1992). The test evaluates whether parameter concentrations are rising or falling. Mann-Kendall analysis can be performed only on a monotonic time series data set with more than four sampling points. Sen's Method is used to assess the rate of change (increase or decrease) in a trending data set (Gilbert 1987). Mann-Kendall and Sen's Method analyses were applied to chloride, fluoride, sulphate, iron, manganese, sodium, total dissolved solids, and dissolved organic carbon. pH was visually analyzed for potential trends.

Following completion of the statistical calculations, the data were evaluated and trends were considered potentially significant if:

- the data set contained six or more data points;
- the data were visually monotonic;
- the Mann-Kendall probability was greater than 95% or the inferred confidence level was greater than 95% (P-value of two-tailed test was less than or equal to 0.05) and 50% of the sample was greater than the detection limit;

- Sen's normalized slope (in absolute % change per year) was 10% or greater; and
- Absolute slope (in mg/L/yr) was greater than:
  - 2 mg/L/yr for chloride, TDS, sulphate, and sodium;
  - 0.1 mg/L/yr for fluoride, iron, and manganese; and
  - 0.5 mg/L/yr for DOC.

Trends apparent from visual inspection of the graphical control charts, but not indicated statistically, were also noted.

3.5.2.2 High, Low, and Average Charts

The historical data for key indicator parameters at each monitoring well were summarized through charts that show the historical range (i.e. highest and lowest values) and the average value.

4. Results

4.1 Hydraulic Conductivity Test

The estimated hydraulic conductivity of the tested bedrock interval at MW-02B was 1.1 x 10^{-9} m/s (Appendix 3). This value is about the same as the previously reported hydraulic conductivity value for this same interval of 1.2 x 10^{-9} m/s (Advisian, 2016) and is representative of shale (10^{-9} to 10^{-13} m/s; Freeze and Cherry 1979).

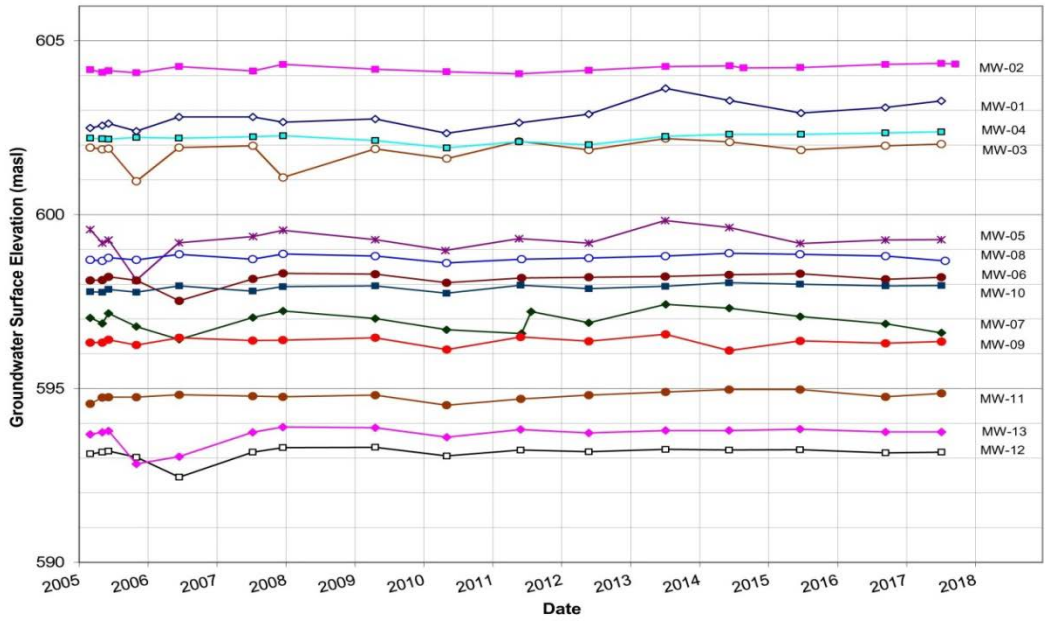
4.2 Groundwater Flow

4.2.1 Groundwater Surface Elevations

Groundwater level hydrographs are provided in Appendix 4 and summarized in Figure A. Groundwater surface elevations within the Beverly Channel ranged from 593.2 to 604.4 metres above sea level (masl) at MW-12 and MW-02, respectively. Groundwater surface elevations were consistent with historical values in the Beverly Channel.

The groundwater surface elevation at the monitoring well completed in the bedrock at MW-02B ranged from 607.22 to 607.51 masl during the 2017 monitoring events (Table 1), which was about 4.3 to 4.6 m higher than in September 2016. This indicates that the groundwater surface elevation measured at MW-02B had not yet equilibrated after installation in 2016.

Figure A Historical Groundwater Surface Elevations in Beverly Channel Monitoring Wells



4.2.2 Lateral Groundwater Flow

Lateral groundwater flow in the Beverly Channel was consistent with previous analyses and was generally to the northwest towards the North Saskatchewan River (Figure 3). The lateral hydraulic gradient ranged from approximately 0.001 m/m in the north to 0.003 m/m in the south near MW-04. Based on the geometric mean hydraulic conductivity of 3.9×10^{-4} m/s, the hydraulic gradient of 0.001 and the assumed effective porosity of 0.25, the linear groundwater flow velocity in the north is approximately 50 m/year. Based on the geometric mean hydraulic conductivity of 2.0×10^{-4} m/s the hydraulic gradient of 0.003 and the assumed effective porosity of 0.25, the linear groundwater flow velocity in the south is approximately 75 m/year.

4.2.3 Vertical Groundwater Flow

The vertical hydraulic gradient between the Beverly Channel and the underlying bedrock was approximately 0.9 m/m (downward) in July 2017 and 0.8 m/m (downward) in September 2017 at MW-02/MW02B. This indicated the potential for upward flow (discharge) from the bedrock to the Beverly Channel, as the groundwater level in the bedrock (MW2B; 607.22 masl) was higher than that in the Beverly Channel (MW2; 604.33 masl).

4.3 Field-Measured Parameters

Field-measured parameters are presented in Table 2. Groundwater temperatures at the Beverly Channel monitoring wells ranged from 6.6 to 12.4°C; EC values ranged from 824 to 3,520 µS/cm; and pH ranged from 6.92 to 7.6 in 2017, and were largely consistent with historical results, with the exception of higher EC at MW-07.

Field parameters measured in the bedrock at MW-02B during the July sampling event were: temperature of 8.8°C, EC of 4,230 µS/cm, and pH of 7.93. The EC measured at MW-02B was higher than initially recorded at this location in 2016. The field parameters measured during the supplementary sampling of MW-02B were: temperature of 7.9 °C, EC of 3,740 µS/cm, and pH of 8.27.

4.4 Groundwater Quality

Groundwater analytical results are presented in Tables 3, 4, 5, 6, and 7. Original laboratory analytical reports are included in Appendix 5. Hydrochemical control charts are provided in Appendix 6. A statistical table with basic statistical and Mann-Kendall analyses for indicator parameters is included in Appendix 7.

4.4.1 Select Inorganic Data

Select inorganic parameter data are presented in Tables 3 and 4. Results from the 2017 sampling event are summarized as follows.

- Dissolved iron concentrations were within the historical ranges at all wells except MW-05 which showed an increase of 0.02 mg/L compared to the historical range. Iron and manganese concentrations are typically higher than the drinking water standards of 0.3 and 0.05 mg/L, respectively.

- TDS concentrations were largely consistent with the historical ranges observed in the NCIA Study Area. At the majority of the monitoring wells, TDS ranged from 400 to 1,200 mg/L. Total dissolved solids continued to be less than 500 mg/L at monitoring wells MW-01 and MW-13. TDS concentrations in the Beverly Channel Aquifer continued to be highest at MW-07 (1,820 mg/L).

- Dissolved sulphate concentrations continued to be within the historical ranges for all monitoring wells except MW-04 which continued to show an increasing trend. At the majority of the monitoring wells, sulphate concentrations are less than 500 mg/L. At monitoring well MW-06, sulphate concentrations have ranged from 420 to 560 mg/L and at MW-07 from 622 to 1,270 mg/L.

- Sodium concentrations continued to be within historical ranges at all wells completed in the Beverly Channel Aquifer. Sodium concentrations are typically below 200 mg/L; however, at monitoring wells MW-07 and MW-09, sodium concentrations have ranged from 189 to 320 mg/L.

- Chloride concentrations continue to be within historical ranges at all but MW-01 and MW-03. Chloride concentrations at MW-01 have increased from 3.02 mg/L in 2011 to 6.27 mg/L in 2017; from 44.2 mg/L in 2011 to 57.9 mg/L in 2017 at MW-03. Typically, chloride concentrations have been less than 50 mg/L at all monitoring wells except MW-04, where they have ranged from 125 to 200 mg/L.

A comparison of the chemical composition of the waters at MW-02 and MW-02B during the 2017 sampling events is summarized as follows:

- Dissolved iron concentrations ranged from approximately 8 to 11 mg/L at MW-02 and from approximately 0.4 to 0.7 mg/L at MW-02B. Dissolved manganese concentrations at MW-02 and MW-02B averaged 0.2 and 0.4 mg/L (respectively) and both iron and manganese concentrations exceed the Health Canada (2017) Canadian drinking water guidelines.

- Sodium concentrations at MW-02 were less than the Health Canada (2017) drinking water guidelines (200 mg/L) ranging from approximately 100 to 125 mg/L. Sodium concentrations at MW-02B exceeded the Health Canada drinking water guideline, ranging from 590 to 675 mg/L.

- Chloride concentrations at MW-02 decreased to less than 50 mg/L for 2017 while chloride concentrations at MW-02B increased, exceeding 800 mg/L.

- Sulphate concentrations were greater than 220 mg/L at MW-02 and were less than 15 mg/L at MW-02B. Sulphate concentrations decreased at both MW-02 and MW-02B between the July and September sampling events.

- TDS concentrations reported at MW-02 are approximately half of those observed at MW-02B (averaging 873 and 1,780 mg/L, respectively). TDS concentrations at MW-02 decreased from 884 to 862 mg/L between sampling events and have increased at MW-02B from 1,660 to 1,900 mg/L.

The fluctuating ion concentrations observed at MW-02 may be associated with interactions with groundwater with elevated ion concentrations from bedrock as characterized at monitoring well MW-02B. The downward vertical hydraulic gradient between MW-02 and MW-02B, indicative of the potential for upward groundwater flow from bedrock to the Beverly Channel, supports this hypothesis.

4.4.2 Dissolved Metals and Trace Elements

Dissolved metals and trace element parameters are presented in Table 4 .Dissolved metals and trace element concentrations were generally within the historical ranges and were below the Health Canada (2017) drinking water guidelines at all monitoring wells (where guidelines exist), except for dissolved iron, manganese, and sodium. In 2017, minor deviations from historical ranges were noted in select parameters at some monitoring wells.

4.4.3 Petroleum Hydrocarbons (PHCs)

Petroleum hydrocarbon results are presented in Table 5. PHC concentrations were below their corresponding reporting detection limits (RDLs) at all monitoring wells in 2017. Therefore, below-guideline detections of toluene and xylenes at MW-01, MW-02 and MW-03 in 2016 were confirmed as anomalous and unreliable.

4.4.4 Volatile Organic Compounds

Volatile organic compound results are presented in Table 6. Styrene and phenols were the VOCs analyzed in 2017. There were no styrene or phenols detected at the Beverly Channel Monitoring wells in 2017. The dissolved phenols concentration in upper bedrock at MW-02B decreased from the previous year from 0.0101 to 0.0014 mg/L.

4.4.5 Trends and Statistical Analysis

Mann-Kendall/Sen's slope analysis and hydrochemical control charts are presented in Appendix 5. Results are summarized in Table C below.

Table C Summarized Results from Mann-Kendall/Sen's Slope Analysis and Visual Inspections

Monitoring Station	Parameter	Mann-Kendall (Statistically Significant) Trend	Visual Trend Only
MW-01	Chloride	---	↑
MW-02	Chloride	↑	N/A
MW-03	Chloride	---	↑
MW-04	Iron	↑	N/A
MW-04	Sulphate	---	↑

Note: ↑ indicates an increasing trend, ↓ indicates a decreasing trend, - - - indicates no statistically significant trend. N/A = not applicable

4.5 Stable Isotopes

4.5.1 Background

Isotopes have become a common tool used in hydrological studies in the past half-century. For groundwater studies in particular, they are useful to quantify recharge and discharge processes, assess inter-aquifer flow processes, and determine possible sources and mechanisms of industrial pollution. The basic principle is that the stable isotopes of hydrogen and oxygen remain constant in infiltrated groundwater, as long as there are no phase changes or fractionation (changes in relative abundance of isotopes) along the flow path. In this way, these stable isotopes become conservative tracers in the groundwater system (Clark and Fritz 1997).

The main purpose of the analysis of hydrogen and oxygen stable isotopes, which was initiated in 2015, is to generate a baseline data set for the Beverly Channel monitoring network. Over time, once sufficient baseline data are accumulated, the stable isotopes will be used to help determine the origin(s) of groundwater at each of the monitoring locations in the Beverly Channel, the relative contribution of groundwater from bedrock, and whether sources associated with industrial activities could have contributed to changes in groundwater quality in the Beverly Channel.

The main processes that affect the oxygen and hydrogen isotopic composition of groundwater include evaporation and simple mixing at or below the surface (Sidle 1998). Relationships known as local meteoric water lines (LMWLs) have been defined to characterize isotope ratios for precipitation in certain geographical areas. Historical International Atomic Energy Agency (IAEA) data of isotope ratios have thus been used to define the Edmonton LMWL, which is mathematically expressed as follows (Lemay 2002):

$$\delta^{2}\mathrm{H} = 7.66\,\delta^{18}\mathrm{O} - 1.00$$

The local meteoric water line provides a reference for the relative abundance of the stable isotopes and, thus, the possible origin of the water. For example, waters in ponds that experience evaporation would be expected to have an enrichment of the stable isotopes (as they are heavier) and plot below and to the right of the LMWL. Moreover, evaporated water will plot below the LMWL along a local evaporation line (LEL) which intersects the LMWL at the point representative of the isotopic composition of the original, un-evaporated water. For lakes in central Alberta, the LEL from regression of data sets from 2008 and 2009 were as follows (Gibson et al. 2016):

$$2008\text{: } \delta^{2}\mathrm{H} = 5.42\,\delta^{18}\mathrm{O} - 46.16$$

$$2009\text{: } \delta^{2}\mathrm{H} = 5.22\,\delta^{18}\mathrm{O} - 47.63$$

4.5.2 Results

Laboratory analytical results for stable isotopes oxygen-18 (^{18}O) and deuterium (^{2}H) from sampling in 2017 are presented in

Table D. The isotope ratios of oxygen in water ($\delta^{18}O_{water}$) for the Beverly Channel monitoring wells ranged from -18.55 to -16 ‰ at MW-03 and MW-05, respectively. The isotope ratios of deuterium in water ($\delta^{2}H_{water}$) ranged from -147.8 to -131.8 ‰ also at MW-03 and MW-05 respectively.

The delta (δ) values are reported as per mill (‰) differences relative to Vienna Standard Mean Ocean Water (VSMOW), the IAEA standard defining the isotopic composition of fresh water. The δ values were reported by the laboratory according to the following relationship:

$$\delta_{sample} = \left(\frac{R_x}{R_{VSMOW}} - 1\right) * 1000$$

where R_x and R_{VSMOW} are the ratios of the heavier to the lighter isotope in the sample and standard, respectively (Kendall and McDonnell 1998).

Figure B shows a plot that includes the Edmonton LMWL, the IAEA data used to generate the Edmonton LMWL, the central Alberta lake LELs, and the isotope data from the Beverly Channel monitoring wells and the bedrock monitoring well. On Figure B, the 2015 through 2017 analytical data for the Beverly Channel monitoring wells, and the 2016 and 2017 analytical data for the bedrock monitoring well generally plot below and to the right of the Edmonton LMWL. Moreover, the data plots along the lake LELs.

These results would appear to suggest that groundwater in the Beverly Channel has a varying influence from different sources. On the light-end of the ^{18}O-^{2}H ranges, the groundwater appears to be mostly influenced from direct surface infiltration (e.g. MW-03). On the heavier-end of the ^{18}O-^{2}H ranges, there may be a higher relative contribution of bedrock groundwater or a higher relative contribution of evaporated surface water, or both.

Chloride concentrations may be used as the distinguishing parameter to determine which source may be of greater influence, as is shown in Figure C. For example, the isotope-chloride relationship may be indicating a higher relative contribution of bedrock groundwater at MW-04 and a higher relative contribution of surface water at MW-05.

Table D Isotope Results

Monitoring Station	Sampling Date	$\delta^{18}O_{Water}$ (‰)	$\delta^{2}H_{Water}$ (‰)
MW-01	13-Jul-2017	-17.72	-141.80
MW-02	13-Jul-2017	-17.82	-142.80
MW-02	29-Sep-2017	-18.02	-144.8
MW-03	13-Jul-2017	-18.54	-147.80
MW-03 Dup	14-Jul-2017	-18.55	-147.50
MW-04	13-Jul-2017	-16.37	-133.80
MW-05	13-Jul-2017	-16.00	-131.80
MW-06	13-Jul-2017	-17.48	-143.20
MW-07	14-Jul-2017	-17.91	-145.70
MW-08	02-Aug-2017	-17.39	-141.40
MW-09	14-Jul-2017	-18.21	-147.30
MW-10	14-Jul-2017	-18.23	-146.50
MW-11	14-Jul-2017	-16.86	-139.30
MW-12	14-Jul-2017	-16.95	-138.60
MW-13	14-Jul-2017	-18.22	-145.10
MW-02B	14-Jul-2017	-16.40	-133.80
MW-02B	29-Sep-2017	-16.56	-135.5
FIELD BLANK	14-Jul-2017	-19.35	-148.80

Figure B Comparison of Stable Isotope Results with the Edmonton LMWL

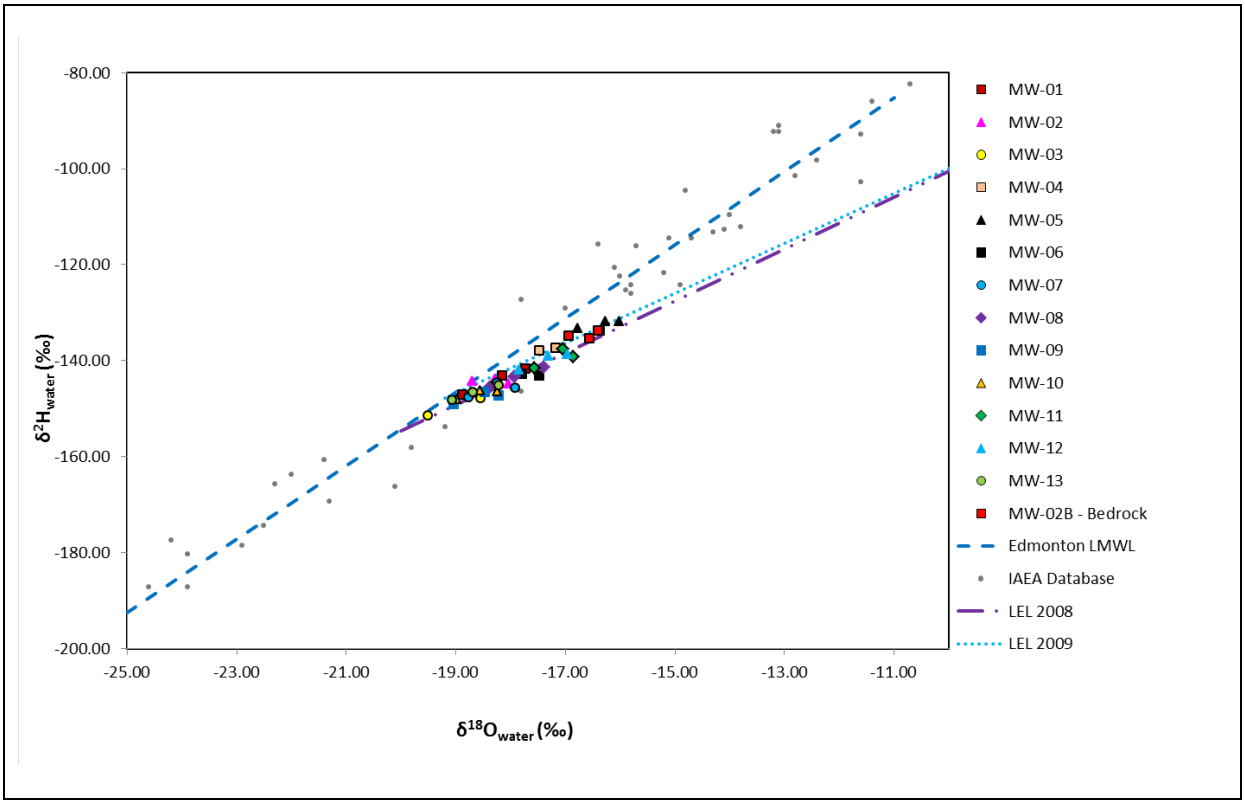
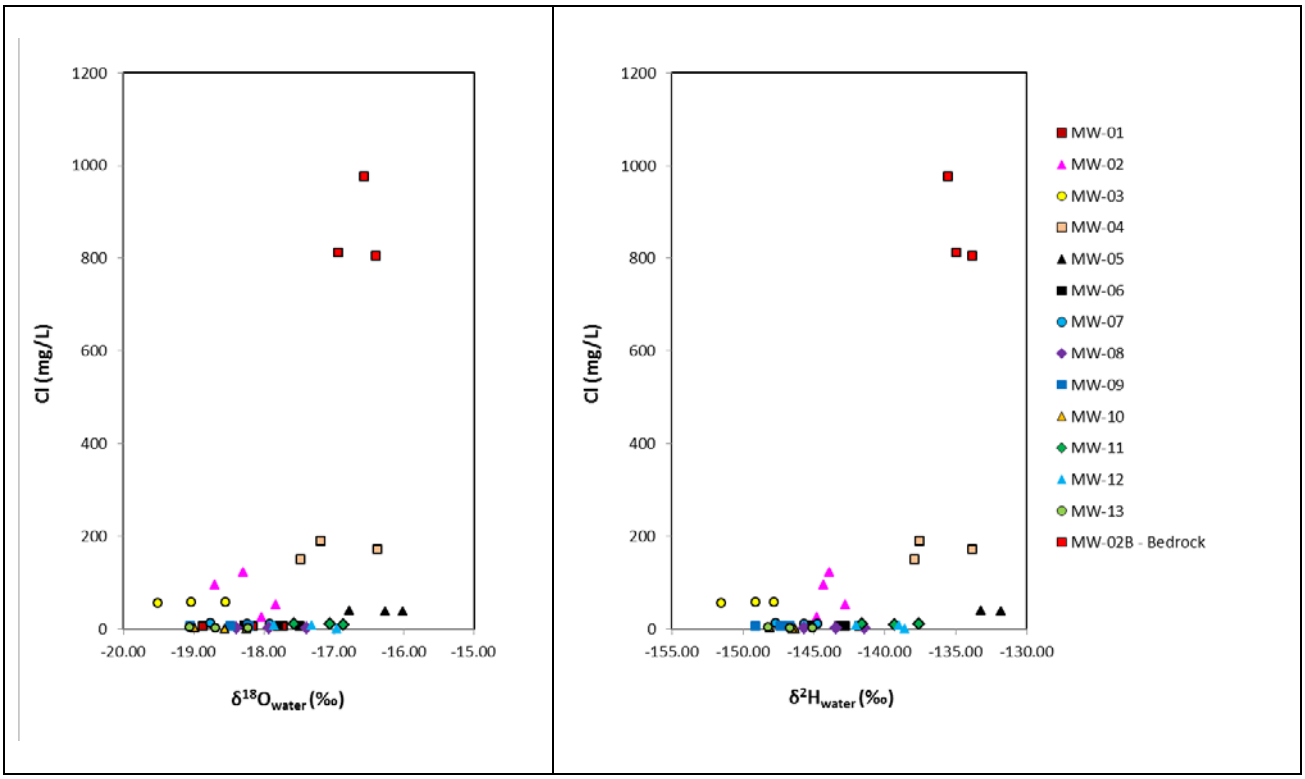


Figure C Comparison of Stable Isotope Results with Chloride Concentrations



4.6 QA/QC Results and Summary

After reviewing U.S. Environmental Protection Agency (EPA) data validation guidelines for field duplicate criteria, Zeiner (1994) indicated that the relative precent difference (RPD) between sample and duplicate results should be less than 20 percent for aqueous samples. When the sample, or sample duplicate values are less than five times the RDL, the absolute value of the difference of the results should be less than or equal to the RDL for aqueous samples (Zeiner 1994). A comparison of duplicate samples collected from MW-03 (Appendix 7) indicated that all results met the above criteria.

American Public Health Association (APHA) et al. (2005) indicate an ion balance of ± 10% is typically acceptable. Values outside the commonly acceptable limits may arise for a number of reasons (e.g. analytical interference, unknown constituents, or reporting errors). Ion balance results were within this criterion (Table 3).

A field blank was collected and analysed for main ions/potability, dissolved metals and trace elements, PHCs, VOCs, and isotopes. Dissolved calcium, magnesium, sodium and copper were detected in the field blank. Dissolved calcium was detected at a concentration of 0.110 mg/L; dissolved magnesium was detected at a concentration of 0.0108 mg/L; dissolved copper was detected at a concentration of 0.00027 mg/L. These detections are within five times the RDL (0.050, 0.0050, and 0.0002 mg/L respectively) and are therefore considered an unreliable detection. Dissolved sodium however was detected at a concentration of 0.085 mg/L, 17 times the RDL and is considered to be a reliable detection.

The remaining parameters were below their respective RDLs, indicating that cross-contamination did not occur during sampling.

5. Discussion of Key Groundwater Quality Indicators

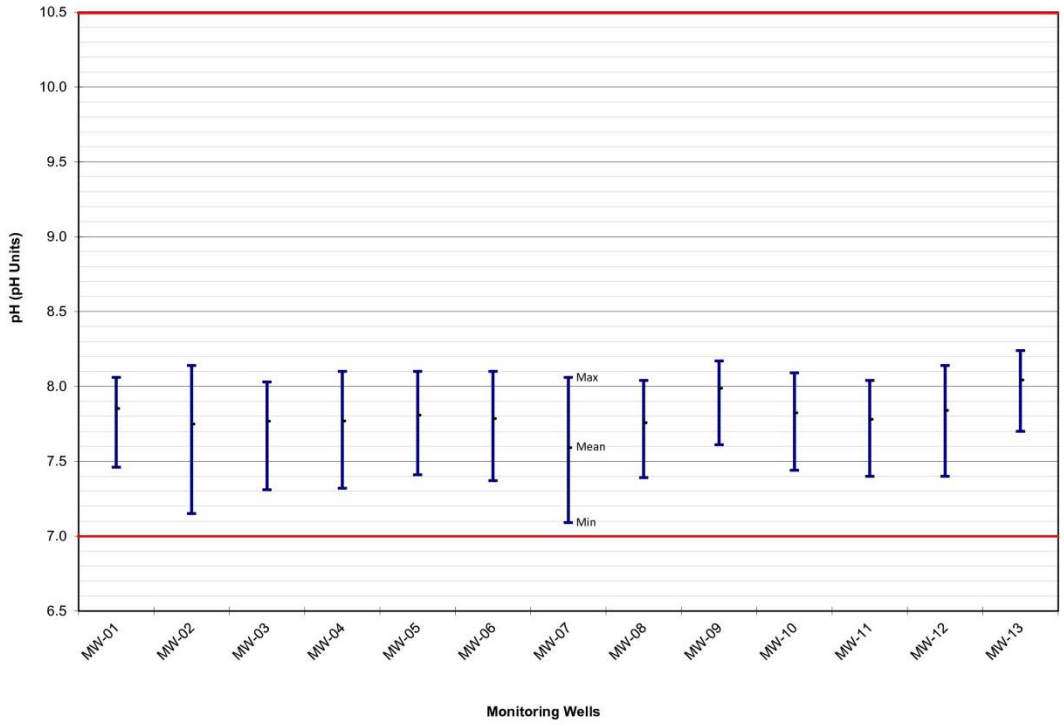
5.1 pH

Hem (1992) indicated that most groundwater has pH values ranging from approximately 6.0 to 8.5, while river water in areas not influenced by pollution reportedly have a pH range of 6.5 to 8.5.

The GCDWQ guideline suggests an acceptable pH range of 7.0 to 10.5 (Health Canada 2017), indicated by the red lines on Figure D. As there are no specific health effects noted on which to base the limits for the pH of drinking water, this guideline is an aesthetic objective (AO) rather than a maximum acceptable concentration (MAC). At a pH below 6.5, corrosion effects may become significant in the drinking water supply and distribution system, and at a pH above 8.5, encrustations and scaling may become an issue (Health Canada 1979a).

In the Beverly Channel, since the groundwater monitoring began in 2005, laboratory-measured groundwater pH values ranged from 7.09 to 8.24 (Figure D) and were within the range of natural waters as defined by Hem (1992) and within AO guideline range established by Health Canada (2017). Field-measured pH, which is generally more indicative of in-situ conditions, has historically ranged from 6.88 to 7.77 in the Beverly Channel monitoring wells.

Figure D High, Low, and Average Values of pH in Beverly Channel Monitoring Wells

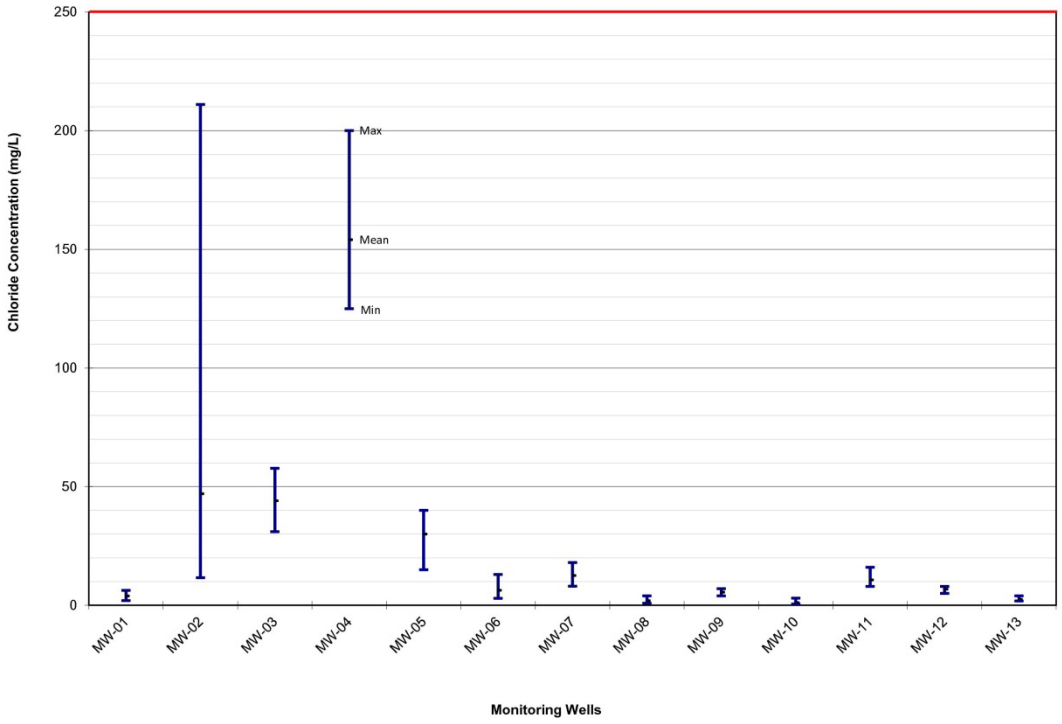


5.2 Chloride

Chloride is an inorganic, non-reactive ion that occurs widely in nature. When introduced into groundwater, chloride is highly mobile and difficult to remove due to its high solubility (Health Canada 1979b) and is generally utilized as an indicator of groundwater contamination. Typical anthropogenic uses of chloride include control of ice and snow, effluents from chemical industries, oil well operations, sewage, irrigation drainage, and refuse leachates. Chloride concentrations in Quaternary and bedrock groundwater are typically less than 50 mg/L in Sturgeon and Strathcona Counties (Hydrogeological Consultants Ltd. [HCL] 2001a and 2001b) but can be naturally elevated in regional discharge areas.

Health Canada (2017) suggests an AO guideline of less than or equal to 250 mg/L for chloride (indicated by the red line on Figure E) to minimize undesirable taste. At higher concentrations, chloride may also cause corrosion in distribution systems (Health Canada 1979b).

Figure E High, Low, and Average Values of Chloride Concentrations in Beverly Channel Monitoring Wells



Chloride concentrations in the Beverly Channel Aquifer are typically less than 50 mg/L and in several monitoring wells less than 10 mg/L. Elevated chloride concentrations between 125 and 200 mg/L have been observed at MW-04 and are considered natural, reflecting mixing of water quality with underlying bedrock (WorleyParsons 2010). A statistically increasing (MW-02) and visually increasing trends in chloride concentrations (MW-01 and MW-03) were observed in 2017. The increasing trend determined at MW-02 reflects that the entire dataset were used in the Mann-Kendall analysis. The most recent (2017) results indicate decreasing concentrations.

Prior to 2014, chloride concentrations at MW-02 (Figure A6-2) were relatively stable below 40 mg/L. Between 2014 and 2016 there were fluctuations in the chloride concentration, increasing to a maximum of 211 mg/L in 2014. In July 2017, the chloride concentration at MW-02 decreased to 52 mg/L. Supplementary sampling of MW-02 in September 2017 indicated that the chloride concentrations at MW-02 continued decreasing to 25 mg/L, consistent with the pre-2014 historical range.

It appears that the fluctuations at MW-02 may be indicating mixing of Beverly Channel and bedrock groundwater (804 to 975 mg/L at MW-02B). The upward vertical hydraulic gradient between the bedrock and overlying Beverly Channel Aquifer at MW-02 and MW-02B provides evidence that such mixing could be occurring.

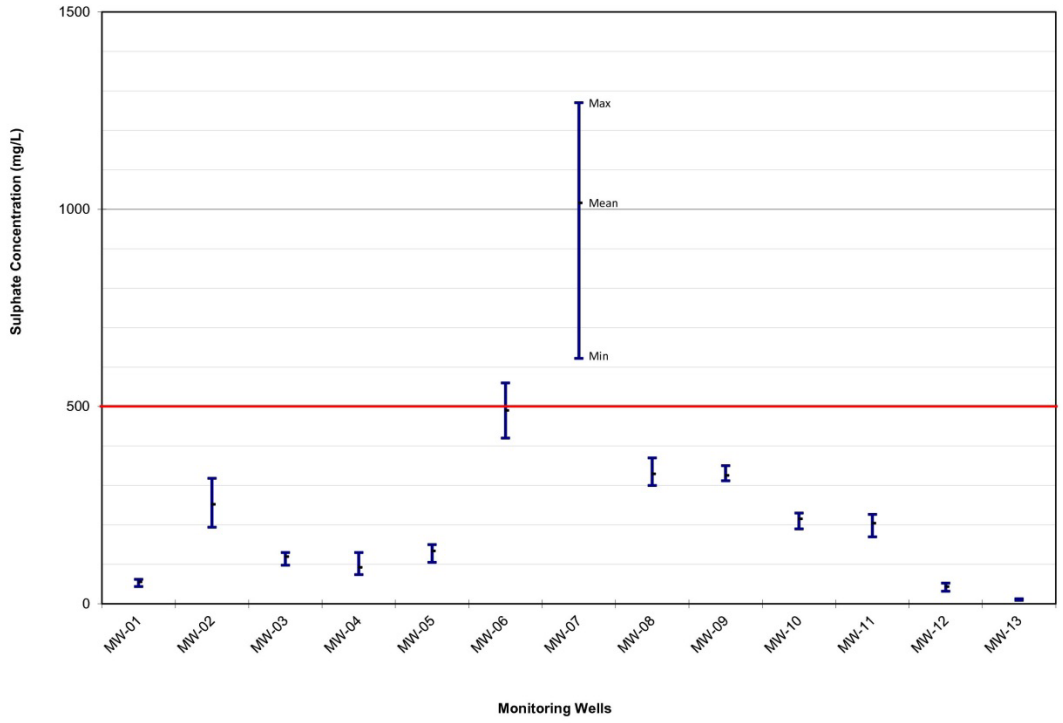
5.3 Sulphate

Sources of sulphur that can be found in the natural environment include certain igneous rock minerals, evaporite sediment (e.g., gypsum), and geothermal water (Hem 1992). Anthropogenic sources of sulphate are mainly introduced by the combustion of fuels and the smelting of ores (Hem 1992). Industrial uses of sulphur, usually in the form of sulphuric acid, include production of fertilizer, manufacturing of chemicals, dyes, glass, paper, soaps, textiles, fungicides, insecticides, astringents and emetics (review by Health Canada 1987).

The Health Canada (2017) AO guideline for sulphate is less than or equal to 500 mg/L (indicated by the red line on Figure F). This value is based on taste considerations, although there is the possibility of adverse physiological effects at higher concentrations.

In the NCIA Study area, background sulphate concentration are generally less than 100 mg/L in the surficial sand deposits, range from 100 to over 1,000 mg/L in shallow bedrock, and range from less than 1,000 to over 4,000 mg/L in till and clay deposits (BA Energy Inc. 2004; Komex International Ltd. [Komex] 2006; Petro-Canada Oil Sands Inc. [PCOSI] 2006; Shell 2005, 2007; TOTAL E&P Canada Inc. [TOTAL] 2007). Monitoring well MW-07 has sulphate concentrations in the range of about 600 to 1,300 mg/L, which is similar to concentrations observed in the shallow bedrock.

Figure F High, Low, and Average Values of Sulphate Concentrations in Beverly Channel Monitoring Wells



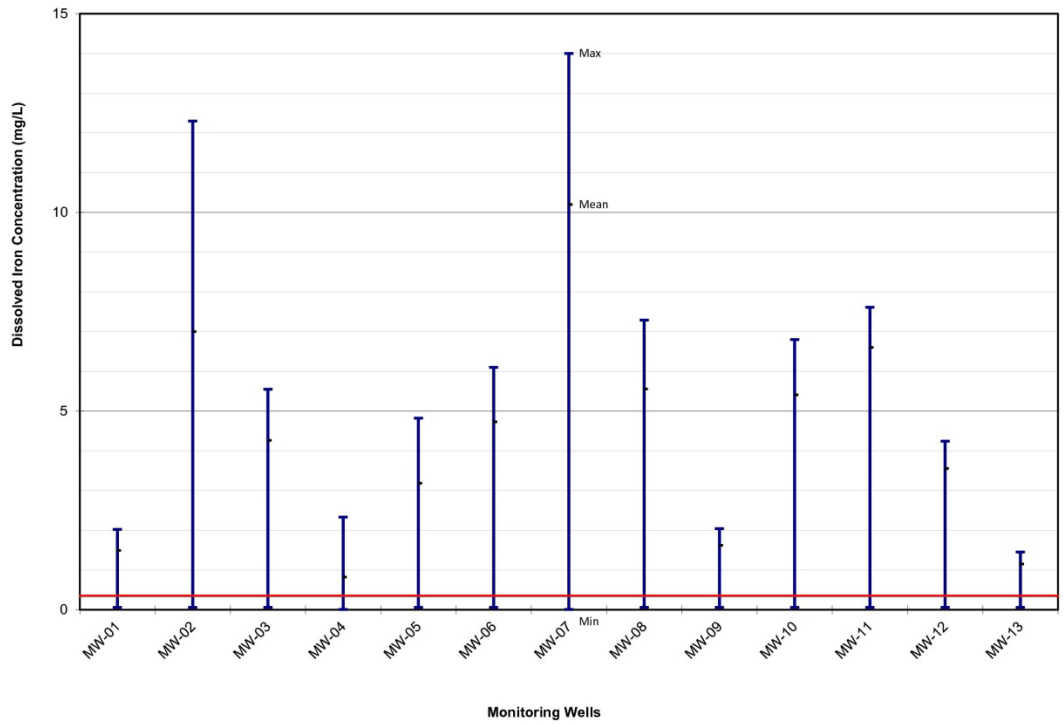
5.4 Dissolved Iron

When iron is released into water, it is generally re-precipitated nearby as sedimentary species involving sulphide, carbonate, oxide or oxyhydroxide (Hem 1992). The availability of iron to aqueous solutions is strongly affected by environmental conditions, particularly the oxidation/reduction capacity and pH. Iron is also present in organic wastes, and in plant debris in soils (Hem 1992), which can then be released into groundwater via biodegradation processes. In aerated waters, the concentration of iron is seldom high (Health Canada 1978a).

The Health Canada (2017) AO guideline for iron in drinking water is less than or equal to 0.3 mg/L (indicated by the red line on Figure G). This objective is aimed to minimize objectionable taste and appearance, as well as inefficiency in distribution systems that can result from the precipitation of insoluble hydroxides and the development of slime produced by iron oxidizing bacteria.

Within the Beverly Channel, elevated dissolved iron concentrations are generally expected. Stein (1976) indicated that dissolved iron concentrations in excess of 15 mg/L were not uncommon. HCL (2001a) reported dissolved iron concentrations in excess of 7 mg/L for a Beverly Channel water supply well for the Village of Bruderheim. Dissolved iron concentrations in the Beverly Channel monitoring wells ranges from non-detectable values to about 14 mg/L (Figure G).

Figure G High, Low, and Average Values of Iron Concentrations in Beverly Channel Monitoring Wells



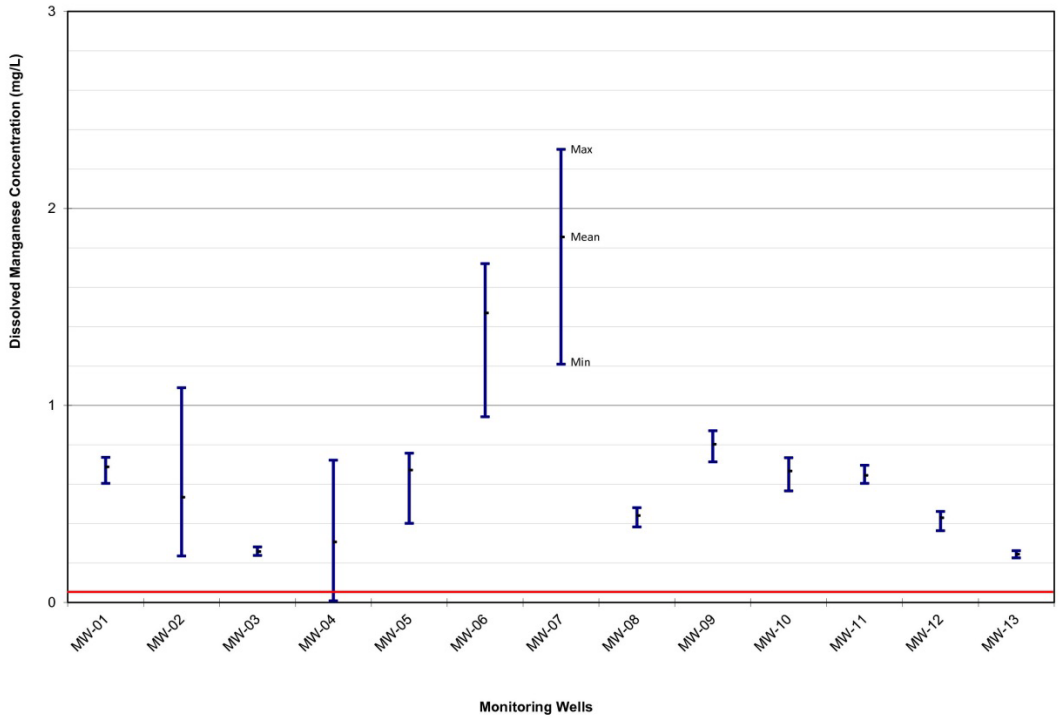
5.5 Dissolved Manganese

Manganese is most often present as a component of dioxide, carbonate or silicate minerals (Health Canada 1979c), and many igneous and metamorphic minerals contain manganese as a minor constituent (Hem 1992). Similar to iron, the presence of dissolved manganese in water is dependent on both redox and pH conditions, although it is somewhat more stable toward oxidation than ferrous iron (Hem 1992).

Health Canada (2017) suggests an AO guideline of less than or equal to 0.05 mg/L (indicated by the red line on Figure H) to minimize staining, undesirable tastes in beverages, and minimize the accumulation of microbial growths in distribution systems (black precipitates; Health Canada 1979c). Higher concentrations of manganese are expected to be more prevalent in groundwater than surface water due to the higher likelihood of reducing conditions in the subsurface (Health Canada 1979c).

The manganese concentrations in the Beverly Channel are within the combined range of surface water/groundwater manganese concentrations from data compiled by Hem (1992). Generally, manganese concentrations may be expected to be higher in the Beverly Channel than in shallower geological units as there is a higher likelihood of reducing conditions with depth. On average, the lowest concentrations of manganese were measured at monitoring wells MW-03, MW-04, and MW-13; the highest concentrations occurred at MW-06 and MW-07.

Figure H High, Low, and Average Values of Manganese Concentrations in Beverly Channel Monitoring Wells



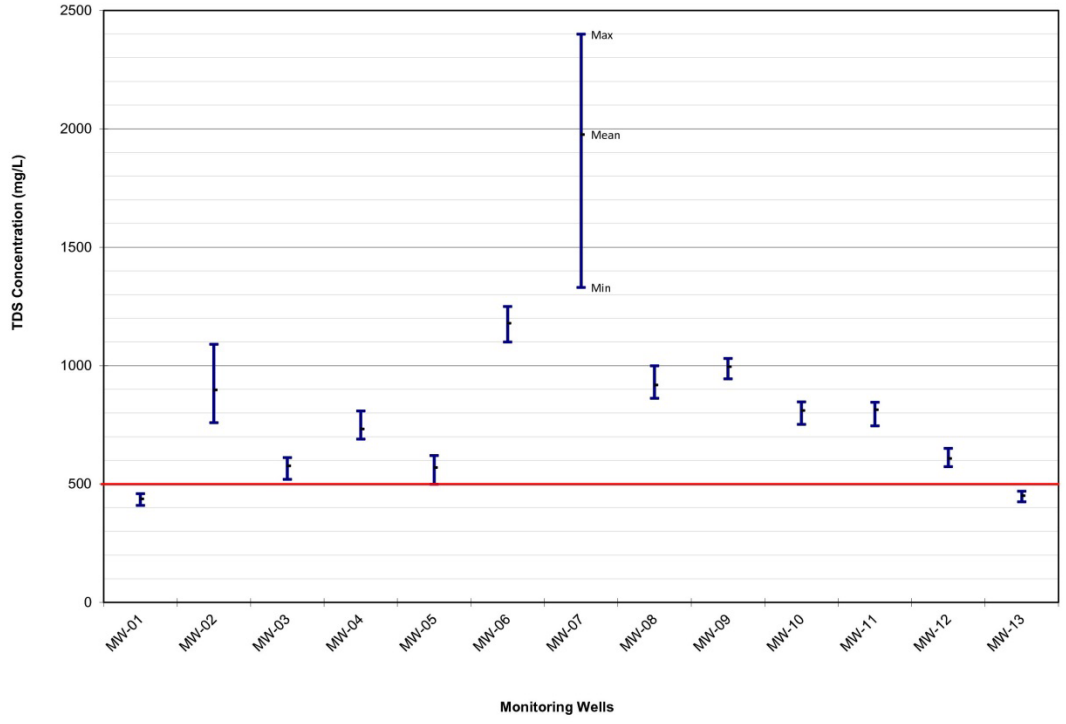
5.6 Total Dissolved Solids

TDS are dissolved constituents which comprise inorganic salts, primarily the major cations and anions used for groundwater characterization, nitrate (when introduced by agricultural use), and small amounts of organic matter (Health Canada 1978b). Sources of TDS include natural mineral sources, sewage, urban and agricultural runoff and industrial water (Health Canada 1978b). Concentrations of TDS resulting from mineral dissolution vary with the solubility of the minerals present.

Health Canada (2017) suggests an AO of less than or equal to 500 mg/L for TDS (indicated by the red line on Figure I) to minimize hardness, unpalatability, mineral deposition and corrosion (Health Canada 1978b). Recent data on health effects associated with the ingestion of TDS in drinking water is limited and the data that are available are unclear; however, some individual components of TDS (e.g. chloride, sodium, and nitrate) can affect human health (Health Canada 1978b; as updated 1991).

TDS concentrations within the Beverly Channel monitoring well network range from 410 to 2,400 mg/L, with only two monitoring wells with a TDS of less than 500 mg/L (MW-01 and MW-13). This is generally consistent with TDS values in excess of 1,000 mg/L reported by HCL (2001a and 2001b) for the Beverly Channel. The higher TDS concentration at MW-07 may be related to local groundwater discharge from bedrock. The TDS concentration in the bedrock at MW-02B was 1,900 mg/L in 2017, consistent with the generally reported range of 1,000 to 2,000 mg/L (Stein 1976) in the area. TDS concentrations in groundwater may exceed 3,000 mg/L in some areas (HCL 2001a and 2001b).

Figure I High, Low, and Average Values of TDS Concentrations in Beverly Channel Monitoring Wells



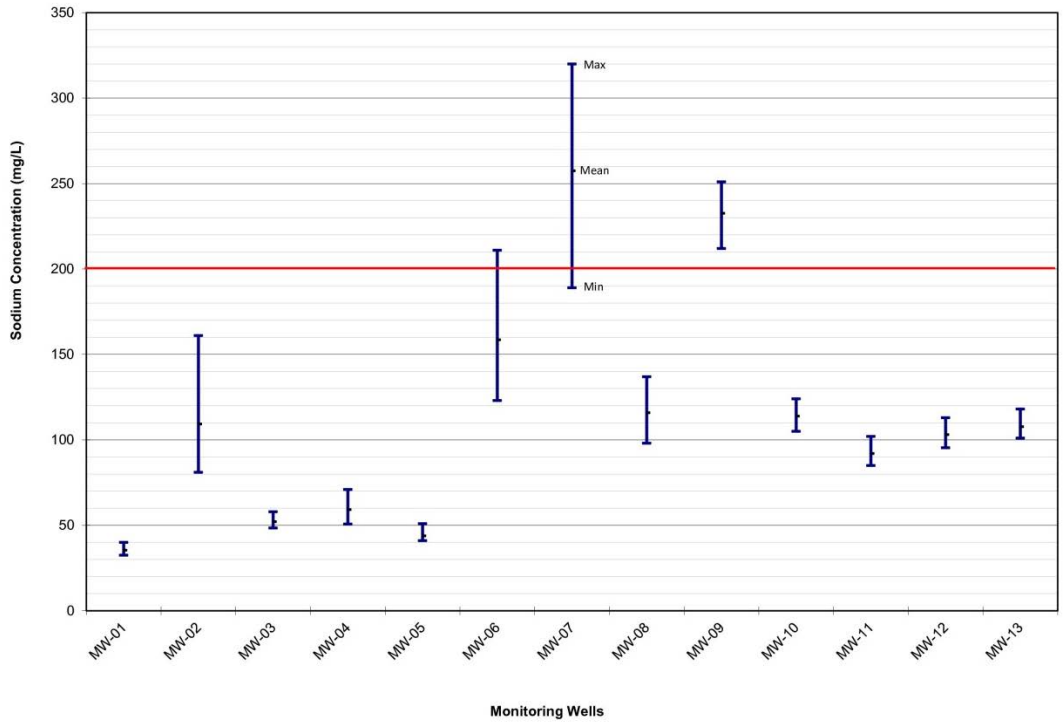
5.7 Sodium

Sodium may be present in feldspar minerals, which can release sodium into water through weathering. Sodium may be present as readily soluble salts, such as those left behind in the uplift of land surface or decline of sea level (Hem 1992). Anthropogenic sources of sodium include the use of salt for de-icing, brine disposal or leakage from oil wells, and water reuse for irrigation purposes (Hem 1992). Other potential anthropogenic sources include sewage and industrial effluents, and the use of sodium compounds for corrosion control and water-softening processes (Health Canada 1979d).

Health Canada (2017) suggests an AO of less than or equal to 200 mg/L for sodium (indicated by the red line in Figure J). The human body has effective mechanisms to control sodium levels therefore; sodium is not acutely toxic in the normal range of environmental or dietary concentrations (Health Canada 1979d). However, there is a relation in the human body between fluid volume and sodium retention, and changes in sodium intake may result in disturbances such as changes in hypertension, congestive cardiac failure, renal disease, cirrhosis, toxaemia of pregnancy, and Meniere's disease (Health Canada 1979d).

Sodium concentrations within the Beverly Channel have ranged from approximately 33 to 320 mg/L (Figure J). Monitoring wells MW-06, MW-07, and MW-09 have elevated sodium concentrations compared to other monitoring wells. The elevated concentrations could be due to the proximity of the monitoring well in relation to the bedrock, where sodium concentrations are generally higher.

Figure J High, Low, and Average Values of Sodium Concentrations in Beverly Channel Monitoring Wells



6. Summary and Recommendations

Annual groundwater quality monitoring of the Beverly Channel Aquifer was completed for the NCIA in July and August 2017 with a supplementary sampling of MW-02 and MW-02B in September 2017. Results are summarized as follows.

- A hydraulic conductivity test was conducted on the monitoring well MW-02B. The estimated hydraulic conductivity was $1.1x10^{-9}$ m/s, consistent with the historically reported value of 1.2×10^{-9} m/s.
- Lateral groundwater flow was generally to the northwest. The hydraulic gradient ranged from 0.001 to 0.003 m/m and the linear groundwater flow velocity ranged from 50 to 75m/year in 2017.
- Groundwater met the Health Canada (2017) AO guideline of 7 to 10.5 for pH at all monitoring wells. Reported field- and laboratory-measured pH values for 2017 were generally within historical ranges.
- Chloride concentrations were generally below 50 mg/L and within historical ranges. Elevated chloride concentrations reported at MW-04 are considered natural and potentially illustrate the influence of well screen proximity to bedrock (WorleyParsons 2010). This interpretation is supported by isotopic values at this location. A statistically increasing trend at MW-02 and visually increasing trends in chloride concentrations were observed at MW-01 and MW-03 in 2017. The most recent (2017) results indicate decreasing chloride concentrations at MW-02 and a reversal of the increasing trend.
- A visually increasing trend in sulphate and a statistically increasing trend in iron were also noted at MW-04. This will continue to be assessed by further monitoring.
- Dissolved iron, manganese, TDS, and sodium appear to be naturally elevated in the Beverly Channel within the NCIA Study Area. While elevated, their concentrations remain well within naturally occurring ranges for groundwater within Sturgeon and Strathcona County (Stein 1976; HCL 2001a, 2001b).
- The elevated sulphate concentration at MW-07 is considered to be naturally occurring due to the absence of industry in the immediate area. Other parameters, including dissolved iron, manganese, TDS, and sodium, are also generally higher at MW-07. These elevated concentrations are likely natural and could be caused by interactions with bedrock material.
- There were no PHCs detected during the 2017 sampling events. Below-guideline detections of toluene and xylenes at MW-01, MW-02, and MW-03 in 2016 were confirmed as anomalous and unreliable.
- There were no VOCs detected in the Beverly Channel monitoring wells; however, dissolved phenols were detected at MW-02B (completed in bedrock). The concentration decreased from the previous year from 0.0101 to 0.0014 mg/L.
- Analysis of oxygen (^{18}O) and deuterium (^{2}H) stable isotope results suggest that groundwater in the Beverly Channel has a varying influence from different sources. On the light-end of the ^{18}O-^{2}H ranges, the groundwater appears to be mostly influenced from direct surface infiltration (e.g. MW-03). On the heavier-end of the ^{18}O-^{2}H ranges, there may be a higher relative contribution of bedrock groundwater or a higher relative contribution of evaporated surface water, or both.

- The vertical hydraulic gradient between the bedrock and Beverly Channel Aquifer was calculated at the nested pair (MW-02 and MW-02B). Results from the July and September sampling events both indicated a downward vertical gradient (0.9 and 0.8 m/m, respectively), indicating the potential for flow from the bedrock toward the overlying Beverly Channel Aquifer. Fluctuating and increasing (i.e., chloride) concentrations at MW-02 are indicative of mixed bedrock and Beverly Channel groundwater quality.

Recommendations are as follows:

- Complete annual groundwater monitoring in 2018. The analytical schedule should be the same as completed in 2017 (Table B), including stable isotopes.

7. Closure

We trust that this report satisfies your current requirements and provides suitable documentation for your records. If you have any questions or require further details, please contact the undersigned at any time.

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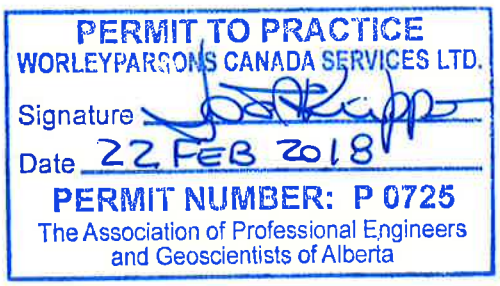

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Advisian, Americas

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Tables

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WorleyParsons Group

Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 307075-01608-300

Monitoring Station	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Stickup (m)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Depth to Groundwater (mbtoc)	Depth to Groundwater (mbgs)	Groundwater Surface Elevation (masl)	Depth to Bottom of Well (mbgs)	Hydraulic Conductivity (m/s)	Lithology
Groundwater Monitoring															
MW-01	350335.04	5951040.45	617.52	618.04	0.52	19.80	15.50 - 19.80	14.30 - 19.80	07-Mar-2005	15.55	15.03	602.49		6.80E-05	Sand and Gravel
									04-May-2005	15.48	14.96	602.56			
									06-Jun-2005	15.42	14.90	602.62			
									17-Nov-2005	15.64	15.12	602.40			
									15-Jun-2006	15.23	14.71	602.81			
									12-Jul-2007	15.23	14.71	602.81			
									19-Dec-2007	15.38	14.86	602.66			
									21-Apr-2009	15.29	14.77	602.75			
									05-May-2010	15.70	15.18	602.34			
									25-May-2011	15.40	14.88	602.64			
									29-May-2012	15.15	14.63	602.89	19.62		
									10-Jul-2013	14.41	13.89	603.63	19.04		
									16-Jun-2014	14.76	14.24	603.28	18.78		
									29-Jun-2015	15.12	14.60	602.92	18.75		
									19-Sep-2016	14.96	14.44	603.08	19.62		
									13-Jul-2017	14.77	14.25	603.27	19.91		
MW-02	352457.80	5950583.37	630.71	631.31	0.60	33.80	27.60 - 33.80	26.20 - 33.80	07-Mar-2005	27.14	26.54	604.17		1.80E-04	Sand and Gravel
									04-May-2005	27.22	26.62	604.09			
									06-Jun-2005	27.17	26.57	604.14			
									17-Nov-2005	27.23	26.63	604.08			
									15-Jun-2006	27.05	26.45	604.26			
									13-Jul-2007	27.18	26.58	604.13			
									19-Dec-2007	26.99	26.39	604.32			
									21-Apr-2009	27.13	26.53	604.18			
									05-May-2010	27.20	26.60	604.11			
									25-May-2011	27.26	26.66	604.05			
									29-May-2012	27.16	26.56	604.15	26.56		
									10-Jul-2013	27.05	26.45	604.26	33.70		
									16-Jun-2014	27.03	26.43	604.28	33.57		
									28-Aug-2014	27.09	26.49	604.22	33.58		
									25-Jun-2015	27.08	26.48	604.23	33.57		
									19-Sep-2016	26.99	26.39	604.32	33.61		
									13-Jul-2017	26.96	26.36	604.35	33.90		
									25-Sep-17	26.94	26.34	604.33			
MW-03	353030.21	5952940.90	623.79	624.43	0.64	29.60	25.00 - 29.60	23.50 - 29.60	08-Mar-2005	22.50	21.86	601.93		2.20E-04	Sand and Gravel
									04-May-2005	22.55	21.91	601.88			
									06-Jun-2005	22.53	21.89	601.90			
									17-Nov-2005	23.47	22.83	600.96			
									15-Jun-2006	22.50	21.86	601.93			
									12-Jul-2007	22.45	21.81	601.98			
									19-Dec-2007	23.36	22.72	601.07			
									21-Apr-2009	22.54	21.90	601.89			
									06-May-2010	22.82	22.18	601.61			
									25-May-2011	22.32	21.68	602.11			
									29-May-2012	22.57	21.93	601.86	29.48		
									10-Jul-2013	22.24	21.60	602.19	29.57		
									16-Jun-2014	22.34	21.70	602.09	29.44		
									29-Jun-2015	22.57	21.93	601.86	29.44		
									19-Sep-2016	22.45	21.81	601.98	29.48		
									13-Jul-2017	22.40	21.76	602.03	29.47		
MW-04	354823.41	5953959.76	620.25	620.79	0.54	26.20	21.60 - 26.20	19.50 - 26.20	08-Mar-2005	18.59	18.05	602.20		1.80E-04	Sand and Gravel
									04-May-2005	18.61	18.07	602.18			
									06-Jun-2005	18.62	18.08	602.17			
									17-Nov-2005	18.57	18.03	602.22			
									14-Jun-2006	18.59	18.05	602.20			
									13-Jul-2007	18.55	18.01	602.24			

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Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 307075-01608-300

Monitoring Station	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Stickup (m)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Depth to Groundwater (mbtoc)	Depth to Groundwater (mbgs)	Groundwater Surface Elevation (masl)	Depth to Bottom of Well (mbgs)	Hydraulic Conductivity (m/s)	Lithology
MW-04 (cont'd)									19-Dec-2007	18.52	17.98	602.27			
									21-Apr-2009	18.66	18.12	602.13			
									06-May-2010	18.87	18.33	601.92			
									07-Jun-2011	18.70	18.16	602.09			
									30-May-2012	18.78	18.24	602.01	26.39		
									09-Jul-2013	18.54	18.00	602.25	27.26		
									13-Jun-2014	18.48	17.94	602.31	26.21		
									29-Jun-2015	18.48	17.94	602.31	26.18		
									19-Sep-2016	18.44	17.90	602.35	26.36		
									13-Jul-2017	18.41	17.87	602.38	26.94		
MW-05	354293.74	5954889.46	624.28	624.89	0.61	31.40	26.80 - 31.40	28.40 - 31.40	08-Mar-2005	25.32	24.71	599.57			Gravel
									04-May-2005	25.71	25.10	599.18			
									06-Jun-2005	25.62	25.01	599.27			
									17-Nov-2005	26.77	26.16	598.12			
									14-Jun-2006	25.70	25.09	599.19			
									13-Jul-2007	25.52	24.91	599.37			
									19-Dec-2007	25.34	24.73	599.55			
									21-Apr-2009	25.61	25.00	599.28			
									29-Apr-2010	25.92	25.31	598.97			
									25-May-2011	25.58	24.97	599.31			
									29-May-2012	25.71	25.10	599.18	30.22		
									08-Jul-2013	25.06	24.45	599.83	30.27		
									13-Jun-2014	25.26	24.65	599.63	30.05		
									25-Jun-2015	25.72	25.11	599.17	30.06		
									19-Sep-2016	25.62	25.01	599.27	30.25		
									13-Jul-2017	25.61	25.00	599.28	30.05		
MW-06	361559.34	5958812.22	629.61	630.28	0.67	39.00	34.40 - 39.00	32.90 - 39.00	08-Mar-2005	32.17	31.50	598.11		1.50E-04	Sand and Gravel
									04-May-2005	32.16	31.49	598.12			
									06-Jun-2005	32.07	31.40	598.21			
									17-Nov-2005	32.17	31.50	598.11			
									16-Jun-2006	32.76	32.09	597.52			
									12-Jul-2007	32.13	31.46	598.15			
									19-Dec-2007	31.97	31.30	598.31			
									22-Apr-2009	31.99	31.32	598.29			
									05-May-2010	32.24	31.57	598.04			
									07-Jun-2011	32.10	31.43	598.18			
									29-May-2012	32.08	31.41	598.20	38.57		
									08-Jul-2013	32.06	31.39	598.22	39.03		
									12-Jun-2014	32.01	31.34	598.27	38.50		
									25-Jun-2015	31.98	31.31	598.30	38.53		
									20-Sep-2016	32.14	31.47	598.14	38.41		
									13-Jul-2017	32.08	31.41	598.20	38.39		
MW-07	359089.70	5959604.24	630.41	631.01	0.60	43.90	37.80 - 43.90	36.30 - 43.90	09-Mar-2005	33.98	33.38	597.03			Sand and Gravel
									04-May-2005	34.14	33.54	596.87			
									06-Jun-2005	33.85	33.25	597.16			
									17-Nov-2005	34.23	33.63	596.78			
									16-Jun-2006	34.60	34.00	596.41			
									12-Jul-2007	33.97	33.37	597.04			
									19-Dec-2007	33.78	33.18	597.23			
									22-Apr-2009	34.00	33.40	597.01			
									05-May-2010	34.32	33.72	596.69			
									08-Jun-2011	34.43	33.83	596.58			
									28-Jul-2011	33.80	33.20	597.21			
									30-May-2012	34.12	33.52	596.89	44.06		
									11-Jul-2013	33.59	32.99	597.42	41.40		
									13-Jun-2014	33.70	33.10	597.31	41.40		
									25-Jun-2015	33.94	33.34	597.07	41.40		
									20-Sep-2016	34.15	33.55	596.86	41.40		
									14-Jul-2017	34.41	33.81	596.60	41.26		
MW-08	363133.77	5961204.95	625.87	626.44	0.57	33.50	30.50 - 33.50	28.70 - 33.50	09-Mar-2005	27.74	27.17	598.70		9.50E-04	Gravel
									04-May-2005	27.77	27.20	598.67			

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Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 307075-01608-300

Monitoring Station	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Stickup (m)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Depth to Groundwater (mbtoc)	Depth to Groundwater (mbgs)	Groundwater Surface Elevation (masl)	Depth to Bottom of Well (mbgs)	Hydraulic Conductivity (m/s)	Lithology
MW-08 (cont'd)									06-Jun-2005	27.68	27.11	598.76			
									15-Nov-2005	27.74	27.17	598.70			
									16-Jun-2006	27.58	27.01	598.86			
									11-Jul-2007	27.72	27.15	598.72			
									19-Dec-2007	27.57	27.00	598.87			
									22-Apr-2009	27.63	27.06	598.81			
									05-May-2010	27.83	27.26	598.61			
									07-Jun-2011	27.72	27.15	598.72			
									30-May-2012	27.69	27.12	598.75	33.50		
									09-Jul-2013	27.63	27.06	598.81	30.60		
									12-Jun-2014	27.55	26.98	598.89	33.43		
									24-Jun-2015	27.58	27.01	598.86	33.67		
									20-Sep-2016	27.63	27.06	598.81	33.45		
									02-Aug-2017	27.77	27.20	598.67	33.43		
MW-09	361003.46	5962032.28	624.06	624.73	0.67	36.60	32.00 - 36.60	30.50 - 36.60	09-Mar-2005	28.41	27.74	596.32		4.10E-04	Gravel, Sand and Gravel
									04-May-2005	28.41	27.74	596.32			
									06-Jun-2005	28.33	27.66	596.40			
									17-Nov-2005	28.48	27.81	596.25			
									16-Jun-2006	28.27	27.60	596.46			
									11-Jul-2007	28.35	27.68	596.38			
									18-Dec-2007	28.34	27.67	596.39			
									22-Apr-2009	28.27	27.60	596.46			
									06-May-2010	28.61	27.94	596.12			
									02-Jun-2011	28.25	27.58	596.48			
									29-May-2012	28.37	27.70	596.36	36.39		
									10-Jul-2013	28.17	27.50	596.56	36.58		
									13-Jun-2014	28.64	27.97	596.09	36.03		
									25-Jun-2015	28.36	27.69	596.37	36.40		
									20-Sep-2016	28.43	27.76	596.30	36.10		
									14-Jul-2017	28.38	27.71	596.35	36.41		
MW-10	364954.62	5963505.11	624.06	624.67	0.61	41.80	35.70 - 41.80	N/A	09-Mar-2005	26.89	26.28	597.78			Gravel, Sand and Gravel
									04-May-2005	26.90	26.29	597.77			
									06-Jun-2005	26.82	26.21	597.85			
									16-Nov-2005	26.90	26.29	597.77			
									16-Jun-2006	26.72	26.11	597.95			
									11-Jul-2007	26.87	26.26	597.80			
									18-Dec-2007	26.74	26.13	597.93			
									22-Apr-2009	26.72	26.11	597.95			
									05-May-2010	26.93	26.32	597.74			
									02-Jun-2011	26.70	26.09	597.97			
									30-May-2012	26.80	26.19	597.87	41.17		
									09-Jul-2013	26.73	26.12	597.94	42.26		
									12-Jun-2014	26.63	26.02	598.04	41.18		
									24-Jun-2015	26.67	26.06	598.00	41.18		
									20-Sep-2016	26.72	26.11	597.95	41.25		
									14-Jul-2017	26.71	26.10	597.96	41.10		
MW-11	362564.36	5965300.71	624.49	625.16	0.67	44.20	38.10 - 44.20	35.10 - 47.20	10-Mar-2005	30.60	29.93	594.56		1.50E-04	Sand and Gravel
									04-May-2005	30.42	29.75	594.74			
									06-Jun-2005	30.41	29.74	594.75			
									16-Nov-2005	30.41	29.74	594.75			
									16-Jun-2006	30.34	29.67	594.82			
									11-Jul-2007	30.38	29.71	594.78			
									18-Dec-2007	30.40	29.73	594.76			
									22-Apr-2009	30.35	29.68	594.81			
									05-May-2010	30.64	29.97	594.52			
									02-Jun-2011	30.46	29.79	594.70			
									30-May-2012	30.35	29.68	594.81	44.11		
									10-Jul-2013	30.26	29.59	594.90	44.21		
									12-Jun-2014	30.19	29.52	594.97	44.64		
									24-Jun-2015	30.19	29.52	594.97	44.67		

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Table 1

Monitoring Well Installation Details: Datum/Groundwater Surface Elevations and Hydraulic Conductivities

PROJECT No.: 307075-01608-300

Monitoring Station	Easting (m)	Northing (m)	Ground Elevation (masl)	Datum Elevation (masl)	Stickup (m)	Total Depth of Piezometer (mbgs)	Depth Interval of Screen (mbgs)	Depth Interval of Sand (mbgs)	Date (dd-mmm-yyyy)	Depth to Groundwater (mbtoc)	Depth to Groundwater (mbgs)	Groundwater Surface Elevation (masl)	Depth to Bottom of Well (mbgs)	Hydraulic Conductivity (m/s)	Lithology
MW-11 (cont'd)									20-Sep-2016	30.40	29.73	594.76	44.40		
									14-Jul-2017	30.30	29.63	594.86	43.56		
MW-12	366805.93	5968379.85	625.46	626.07	0.61	38.10	35.10 - 38.10	33.50 - 38.10	10-Mar-2005	32.95	32.34	593.12		1.40E-04	Sand, Sand and Gravel
									04-May-2005	32.90	32.29	593.17			
									06-Jun-2005	32.87	32.26	593.20			
									16-Nov-2005	33.05	32.44	593.02			
									16-Jun-2006	33.62	33.01	592.45			
									11-Jul-2007	32.90	32.29	593.17			
									18-Dec-2007	32.77	32.16	593.30			
									22-Apr-2009	32.76	32.15	593.31			
									06-May-2010	33.01	32.40	593.06			
									02-Jun-2011	32.84	32.23	593.23			
									29-May-2012	32.89	32.28	593.18	38.11		
									10-Jul-2013	32.82	32.21	593.25	38.84		
									12-Jun-2014	32.84	32.23	593.23	38.09		
									24-Jun-2015	32.83	32.22	593.24	38.10		
									20-Sep-2016	32.92	32.31	593.15	38.09		
									14-Jul-2017	32.90	32.29	593.17	37.94		
MW-13	365292.72	5968147.12	625.65	626.28	0.63	40.50	37.50 - 40.50	36.00 - 40.50	10-Mar-2005	32.60	31.97	593.68			Gravel
									04-May-2005	32.54	31.91	593.74			
									06-Jun-2005	32.50	31.87	593.78			
									16-Nov-2005	33.45	32.82	592.83			
									16-Jun-2006	33.24	32.61	593.04			
									11-Jul-2007	32.54	31.91	593.74			
									18-Dec-2007	32.39	31.76	593.89			
									22-Apr-2009	32.41	31.78	593.87			
									06-May-2010	32.68	32.05	593.60			
									02-Jun-2011	32.46	31.83	593.82			
									30-May-2012	32.56	31.93	593.72	40.44		
									10-Jul-2013	32.49	31.86	593.79	40.51		
									12-Jun-2014	32.49	31.86	593.79	40.37		
									24-Jun-2015	32.45	31.82	593.83	40.60		
									20-Sep-2016	32.53	31.90	593.75	40.35		
									14-Jul-2017	32.53	31.90	593.75	40.90		
MW-02B	50604.05	5950323.21	630.67	631.38	0.71	N/A	N/A	N/A	20-Sep-2016	28.50	27.79	602.88	39.64		
									13-Jul-2017	23.87	23.16	607.51	41.19		
									25-Sep-17	24.16	23.45	607.22			

NOTES: 1. Data may be entered to the nearest mm, but are reported above to the nearest cm.
Apparent rounding errors may occasionally occur in calculated fields (e.g. Groundwater Surface Elevation).
2. All coordinates are provided in the coordinate system.
3. N/M - Denotes not measured.
4. N/A - Denotes not available.
5. masl - Denotes metres above sea level.
6. mbgs - Denotes metres below ground surface.
7. mbtoc - Denotes metres below top of PVC casing.

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Table 2

Groundwater Analytical Results: Field Measurements

PROJECT No.: 307075-01608-300

Monitoring Station	Sample Type	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
Groundwater Monitoring						
MW-01		05-May-2010	749	6.95	5.6	
		25-May-2011	741	7.11	7.7	
		29-May-2012	749	6.88	7.6	
		10-Jul-2013	720	7.21	6.8	Clear
		16-Jun-2014	765	7.38	7.0	Clear
		29-Jun-2015	708	7.37	7.8	Colourless
		19-Sep-2016	716	7.17	8.6	Clear
		13-Jul-2017	824	7.21	7.9	Brown/Silty
MW-02		05-May-2010	1306	7.04	4.8	
		25-May-2011	1397	7.02	8.3	
		29-May-2012	1023	7.49	7.3	
		29-Jul-2013	1161	7.10	10.9	Cloudy brown
		16-Jun-2014	1298	7.19	6.7	Clear, orange
		28-Aug-2014	1355	7.12	7.0	Clear
		25-Jun-2015	1238	7.05	7.6	Light brown
		19-Sep-2016	1217	6.96	8.7	Clear
		13-Jul-2017	1412	6.92	7.6	Clear
		29-Sep-17	1403	7.26	12.4	
MW-03		06-May-2010	974	7.14	6.6	
		25-May-2011	976	7.08	8.9	Clear
		29-May-2012	958	7.72	8.3	
		10-Jul-2013	966	7.14	8.4	Cloudy brown
		16-Jun-2014	1003	7.35	8.2	Clear
		29-Jun-2015	947	7.25	8.5	Colourless (clear)
		19-Sep-2016	935	7.04	9.7	Clear
		13-Jul-2017	1071	7.16	8.6	Cloudy
MW-04		06-May-2010	1213	7.14	8.2	
		07-Jun-2011	1230	7.12	8.1	Clear
		30-May-2012	1420	7.14	7.8	
		09-Jul-2013	1216	7.10	8.3	Clear
		13-Jun-2014	1289	7.27	8.0	Clear, yellow
		29-Jun-2015	1186	7.20	9.3	Clear
		19-Sep-2016	1331	7.09	8.7	Clear
		13-Jul-2017	1412	7.04	7.7	Clear
MW-05		29-Apr-2010	985	7.08	7.6	
		25-May-2011	1070	7.06	8.3	
		29-May-2012	982	7.28	9.7	
		08-Jul-2013	987	7.34	7.1	Silty
		13-Jun-2014	1004	7.41	7.6	Light grey
		25-Jun-2015	935	7.35	8.0	Light brown
		19-Sep-2016	958	7.16	8.1	Clear
		13-Jul-2017	1103	7.04	7.7	Brown/Silty
MW-06		06-May-2010	1773	7.21	5.7	
		07-Jun-2011	1762	7.215	11.1	
		29-May-2012	1699	7.29	7.6	
		08-Jul-2013	1683	7.23	8.6	Clear
		12-Jun-2014	1755	7.33	8.6	Clear
		25-Jun-2015	1637	7.36	10.8	Clear
		20-Sep-2016	1562	7.12	7.9	Brown and silty
		13-Jul-2017	1564	7.19	7.4	Brown/Silty
MW-07		05-May-2010	2640	6.91	7.2	
		08-Jun-2011	1750	7.73	6.6	
		28-Jul-2011	2680	7.11	7.2	
		30-May-2012	2540	7.04	8.1	

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Table 2

Groundwater Analytical Results: Field Measurements

PROJECT No.: 307075-01608-300

Monitoring Station	Sample Type	Date (dd-mmm-yyyy)	Electrical Conductivity (uS/cm)	pH (pH Units)	Temperature (°C)	Sample Comment
MW-07 (cont'd)		11-Jul-2013	2610	6.98	7.5	Clear
		13-Jun-2014	2910	7.12	9.1	Clear. F14-01
		25-Jun-2015	2570	7.06	8.8	Clear
		20-Sep-2016	2370	6.95	10.0	Clear
		14-Jul-2017	3520	6.92	7.5	Clear
MW-08		05-May-2010	1359	7.09	5.4	
		07-Jun-2011	1378	7.408	9	Slight silt
		30-May-2012	1363	7.31	7.3	
		09-Jul-2013	1198	7.34	6.9	Clear / Silty
		12-Jun-2014	1387	7.41	7.3	Murky brown
		24-Jun-2015	1327	7.30	7.6	Colourless
		20-Sep-2016	1268	7.31	7.5	Clear
		02-Aug-2017	1525	7.26	6.7	Minor Silt
MW-09		06-May-2010	1538	7.35	6.8	
		02-Jun-2011	1548	7.49	9.1	Very silty
		29-May-2012	1507	7.43	7.7	
		10-Jul-2013	1463	7.43	8.9	Cloudy brown
		13-Jun-2014	1537	7.67	7.1	Light brown
		25-Jun-2015	1427	7.59	7.7	Light grey
		20-Sep-2016	1396	7.46	7.9	Cloudy
		14-Jul-2017	1647	7.52	7.2	Cloudy
MW-10		05-May-2010	1287	7.11	6.6	
		25-May-2011	1192	7.36	9.1	Clear
		30-May-2012	1267	7.29	7.4	
		09-Jul-2013	1247	7.24	7.0	Clear
		12-Jun-2014	1292	7.42	7.8	Clear. D14-01
		24-Jun-2015	1242	7.36	7.9	Colourless
		20-Sep-2016	1162	7.21	8.1	Clear
		14-Jul-2017	1355	7.20	7.1	Clear
MW-11		05-May-2010	1303	7.06	7.2	
		03-Jun-2011	1341	7.42	6.9	
		30-May-2012	1282	7.19	9.8	
		10-Jul-2013	1258	7.18	7.4	Silty grey
		12-Jun-2014	1322	7.38	7.3	Cloudy brown
		24-Jun-2015	1241	7.26	7.3	light grey
		20-Sep-2016	1156	7.04	8.2	Clear
		14-Jul-2017	1448	7.11	7.2	Clear
MW-12		06-May-2010	1032	7.32	5.1	
		02-Jun-2011	983	6.95	8.7	Clear
		29-May-2012	1024	7.37	7.3	
		10-Jul-2013	998	7.34	6.1	Murky brown
		12-Jun-2014	1020	7.42	7.6	Cloudy brown
		24-Jun-2015	992	7.3	6.6	Colourless
		20-Sep-2016	941	7.18	7.6	Brown and silty
		14-Jul-2017	1135	7.19	6.6	Cloudy, Minor Silt
MW-13		06-May-2010	776	7.53	7	
		02-Jun-2011	841	7.06	8.5	Clear
		30-May-2012	733	7.69	6.9	
		10-Jul-2013	759	7.60	10.1	Cloudy brown
		12-Jun-2014	775	7.77	7.2	Cloudy brown
		24-Jun-2015	734	7.69	7.0	Colourless
		20-Sep-2016	741	7.45	7.4	Brown and silty
		14-Jul-2017	934	7.60	7.0	Brown/Silty
MW-02B		20-Sep-2016	2770	7.84	8.0	Brown and silty
		13-Jul-2017	4230	7.93	8.8	Brown Silty
		29-Sep-17	3740	8.27	7.9	

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Table 3

Groundwater Analytical Results: Indicator Analysis Parameters

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Anions: Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Cations: Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Fluoride (mg/L)	General: Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Total Dissolved Solids (Calculated) (mg/L)	Inorganic Nitrogen Compounds: Ammonia (Total; as N) (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Ion Balance: Cation Sum (meq/L)	Anion Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Miscellaneous: Dissolved Organic Carbon (mg/L)
Canadian Drinking Water AO Guidelines 2017		---	---	**250**	**500**	---	---	**0.3**	---	**0.05**	---	**200**	---	---	---	---	---	---	**(7 - 10.5)**	**500**	**500**	---	---	---	---	---	---	---	---	---	---	---
Canadian Drinking Water MAC Guidelines 2017		---	---	---	---	---	---	---	---	---	---	---	**1.5**	---	---	---	---	---	---	---	---	**45**	**10**	**3.2**	**1**	**10**	---	---	---	---	---	---
Groundwater Monitoring																															
MW-01	07-Mar-2005	444	< 5	4	57.4	< 5	94.6	**1.02**	24.8	**0.605**	3.1	40	0.19	364	---	762	338	7.7	---	442	0.39	---	< 0.1	---	< 0.05	< 0.1	---	---	100	---	3
	17-Nov-2005	451	< 5	4	61.1	< 5	94.8	**1.67**	26.9	**0.662**	2.3	36	0.13	370	---	760	347	7.9	---	447	0.212	---	< 0.1	---	< 0.05	< 0.1	---	---	97.6	---	3
	15-Jun-2006	448	< 5	4	56.8	< 5	99.7	**1.81**	27.3	**0.7**	2.9	37	0.14	367	---	748	361	8	---	448	0.274	---	< 0.1	---	< 0.05	< 0.1	---	---	103	---	3
	12-Jul-2007	445	< 5	3	54.6	< 5	95.1	**1.84**	26.1	**0.664**	2.3	33	0.13	365	---	718	345	7.8	---	433	0.185	---	< 0.1	---	< 0.05	< 0.1	---	---	98.6	---	3
	19-Dec-2007	470	< 1	2	60	< 1	87	< 0.06	23	**0.67**	2.2	34	0.2	390	---	770	310	7.8	---	442	0.26	---	< 0.2	---	< 0.06	< 0.2	---	---	0.87	---	2
	21-Apr-2009	450	< 0.5	5	44	< 0.5	84	< 0.06	24	**0.66**	2.4	36	0.14	370	---	770	310	7.67	---	410	0.22	---	0.003	---	< 0.003	0.003	---	---	93	---	2.3
	05-May-2010	453	< 5.0	3.46	62.0	< 5.0	98.6	**2.02**	28.4	**0.730**	---	38.1	0.150	371	---	762	363	8.06	---	456	0.221	---	< 0.050	---	< 0.050	< 0.071	---	---	102	---	3.0
	25-May-2011	446	< 5.0	3.02	57.1	< 5.0	91.1	**1.53**	25.4	**0.675**	2.68	33.3	0.109	366	---	768	332	8.04	---	432	0.271	---	< 0.050	---	< 0.050	< 0.071	---	---	94.9	---	3.4
	29-May-2012	450	< 5.0	3.13	56.2	< 5.0	93.0	**1.57**	23.7	**0.694**	2.70	35.0	0.106	369	---	769	330	8.00	---	435	0.228	---	< 0.050	---	< 0.050	< 0.071	---	---	94.7	---	3.1
	10-Jul-2013	438	< 5.0	3.49	52.3	< 5.0	96.5	**1.82**	26.2	**0.729**	2.71	36.0	0.124	359	---	727	349	7.94	445	433	---	---	< 0.050	---	< 0.050	< 0.071	---	---	103	---	3.5
	16-Jun-2014	408	< 5.0	4.58	59.8	< 5.0	87.2	**1.92**	26.4	**0.737**	2.80	32.7	0.119	334	---	677	326	7.94	470	414	---	---	< 0.050	---	< 0.020	< 0.054	---	---	99.4	---	4.5
	29-Jun-2015	450	< 0.50	4.7	57	< 0.50	97	**1.9**	27	**0.71**	2.6	37	0.15	370	< 0.50	760	350	7.46	460	450	---	0.069	0.016	< 0.033	< 0.010	< 0.020	8.9	8.8	---	1.0	2.5
	19-Sep-2016	434	< 5.0	5.46	54.6	< 5.0	92.8	**1.76**	26.0	**0.699**	2.63	32.5	0.114	356	---	744	339	7.87	449	428	---	---	< 0.020	---	< 0.010	< 0.022	---	---	98.1	---	4.3
	13-Jul-2017	453	< 5.0	6.27	52.2	< 5.0	91.5	**1.93**	27.0	**0.714**	2.66	36.2	0.121	372	---	709	340	7.76	489	459	---	---	< 0.020	---	< 0.010	< 0.022	---	---	91.6	---	2.4
MW-02	07-Mar-2005	514	< 5	13	227	< 5	113	0.275	34.5	**0.236**	6.8	111	0.21	422	---	1210	424	7.7	---	**759**	1.75	---	0.1	---	< 0.05	0.1	---	---	101	---	8
	17-Nov-2005	575	< 5	38	270	< 5	125	0.085	51.3	**0.671**	7.2	120	0.11	471	---	1400	523	7.9	---	**894**	1.34	---	< 0.1	---	< 0.05	< 0.1	---	---	98.4	---	6
	15-Jun-2006	629	< 5	23	274	< 5	162	**3.19**	55.4	**1.09**	5.5	95	0.09	516	---	1420	633	7.9	---	**925**	1.17	---	< 0.1	---	< 0.05	< 0.1	---	---	102	---	5
	13-Jul-2007	630	< 5	12	263	< 5	154	**8.72**	54.4	**0.841**	4.3	83	0.09	516	---	1360	609	7.9	---	**880**	0.756	---	< 0.1	---	< 0.05	< 0.1	---	---	98.7	---	6
	19-Dec-2007	660	< 1	13	290	< 1	140	< 0.06	46	**0.7**	4.5	83	0.1	540	---	1400	530	7.4	---	**895**	0.1	---	< 0.2	---	< 0.06	< 0.2	---	---	0.84	---	5
	21-Apr-2009	610	< 0.5	18	230	< 0.5	130	**1.5**	44	**0.53**	4.4	81	0.08	500	---	1400	500	7.36	---	**810**	0.56	---	0.005	---	< 0.003	0.005	---	---	89	---	4.1
	05-May-2010	597	< 5.0	11.6	268	< 5.0	147	**9.35**	54.0	**0.505**	---	87.2	0.094	489	---	1290	589	7.97	---	**866**	0.539	---	< 0.050	---	< 0.050	< 0.071	---	---	100	---	5.4
	25-May-2011	628	< 5.0	22.3	318	< 5.0	141	**9.25**	51.3	**0.434**	4.25	97.9	< 0.050	515	---	1500	563	7.90	---	**944**	0.728	---	< 0.050	---	< 0.050	< 0.071	---	---	89.1	---	11.3
	30-May-2012	605	< 5.0	29.6	231	< 5.0	135	**8.07**	44.8	**0.431**	5.18	82.9	0.061	496	---	1350	522	7.80	---	**826**	0.538	---	< 0.050	---	< 0.050	< 0.071	---	---	91.0	---	4.9
	10-Jul-2013	588	< 5.0	24.2	194	< 5.0	172	**12.3**	56.4	**0.554**	5.25	161	0.080	482	---	1220	662	7.69	**805**	**902**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	142	---	5.4
	16-Jun-2014	563	< 5.0	211	282	< 5.0	144	**10.8**	52.0	**0.446**	4.75	122	0.080	461	---	1850	574	8.02	**1180**	**1090**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	80.2	---	4.5
	28-Aug-2014	590	< 5.0	41.9	211	< 5.0	139	**8.49**	48.5	**0.488**	4.66	90.8	0.067	484	---	1340	547	7.85	**861**	**826**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	98.4	---	5.3
	25-Jun-2015	610	< 0.50	96	270	< 0.50	150	**11**	55	**0.41**	4.7	160	0.078	500	< 0.50	1600	610	7.15	**930**	**1000**	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	20	18	---	1.1	4.7
	19-Sep-2016	575	< 5.0	123	241	< 5.0	157	**9.74**	53.9	**0.384**	4.73	150	< 0.040	471	---	1650	614	7.69	**1070**	**1010**	---	---	< 0.040	---	< 0.020	< 0.045	---	---	106	---	5.9
	13-Jul-2017	585	< 5.0	51.7	224	< 5.0	140	**7.99**	52.2	**0.372**	4.92	99.6	0.056	480	---	1310	565	7.63	**900**	**884**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	96.4	---	6.2
	29-Sep-2017	498	< 5.0	25.0	250	< 5.0	157	**11.2**	54.8	**0.467**	5.08	125	< 0.10	408	---	1220	618	8.14	---	**862**	---	---	< 0.10	---	< 0.050	< 0.11	---	---	127	---	5.4
MW-03	07-Mar-2005	442	< 5	31	113	< 5	106	**3.19**	36.1	**0.264**	3.5	56	0.14	362	---	937	413	7.4	---	**563**	0.38	---	< 0.1	---	< 0.05	< 0.1	---	---	103	---	5
	17-Nov-2005	445	< 5	35	122	< 5	104	**4.47**	36.4	**0.239**	3	54	0.1	365	---	949	410	7.8	---	**573**	0.306	---	< 0.1	---	< 0.05	< 0.1	---	---	98.1	---	4
	15-Jun-2006	439	< 5	35	116	< 5	109	**4.85**	36.6	**0.258**	3	52	0.1	360	---	943	423	8	---	**568**	0.359	---	< 0.1	---	< 0.05	< 0.1	---	---	102	---	3
	12-Jul-2007	440	< 5	36	122	< 5	108	**4.89**	37.7	**0.249**	3	55	0.11	361	---	930	425	8	---	**578**	0.291	---	< 0.1	---	< 0.05	< 0.1	---	---	102	---	3
	19-Dec-2007	460	< 1	35	130	< 1	98	< 0.06	32	**0.25**	2.7	49	0.1	380	---	960	370	7.7	---	**571**	0.06	---	< 0.2	---	< 0.06	< 0.2	---	---	0.87	---	3
	21-Apr-2009	430	< 0.5	35	98	< 0.5	92	< 0.06	32	**0.24**	2.8	51	0.11	350	---	950	360	7.57	---	**520**	0.33	---	0.009	---	< 0.003	0.009	---	---	95	---	2.5
	06-May-2010	435	< 5.0	44.3	124	< 5.0	104	**5.23**	36.8	**0.253**	---	52.3	0.117	357	---	967	411	8.03	---	**579**	0.339	---	< 0.050	---	< 0.050	< 0.071	---	---	96.4	---	5.3
	02-Jun-2011	433	< 5.0	44.2	120	< 5.0	115	**5.55**	40.1	**0.277**	3.20	52.7	0.105	355	---	1000	452	7.98	---	**588**	0.302	---	< 0.050	---	< 0.050	< 0.071	---	---	105	---	3.3
	29-May-2012	434	< 5.0	45.9	115	< 5.0	102	**4.83**	31.8	**0.246**	3.05	48.8	0.080	355	---	988	386	7.83	---	**560**	0.327	---	< 0.050	---	< 0.050	< 0.071	---	---	91.7	---	3.4
	10-Jul-2013	427	< 5.0	48.3	119	< 5.0	109	**5.36**	38.3	**0.274**	3.20	57.9	0.105	350	---	963	430	7.81	**608**	**586**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	103	---	3.0
	16-Jun-2014	395	< 5.0	55.9	129	< 5.0	100	**5.13**	36.9	**0.263**	3.23	48.4	0.073	324	---	933	402	7.96	**612**	**568**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	95.1	---	5.9
	29-Jun-2015	430	< 0.50	56	130	< 0.50	110	**5.4**	39	**0.27**	3.1	51	0.13	350	< 0.50	1000	440	7.31	**610**	**610**	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	11	11	---	1.0	3.5
	19-Sep-2016	423	< 5.0	57.7	123	< 5.0	121	**5.22**	38.5	**0.269**	3.14	50.1	0.079	347	---	1000	461	7.71	**630**	**602**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	103	---	5.1
	13-Jul-2017	419	< 5.0	57.6	121	< 5.0	108	**5.50**	40.1	**0.282**	3.12	52.6	0.088	344	---	958	435	7.65	**629**	**612**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	95.1	---	3.8
(Duplicate)	13-Jul-2017	418	< 5.0	57.9	122	< 5.0	111	**5.20**	37.2	**0.260**	2.91	49.8	0.082	343	---	958	430	7.78	**631**	**609**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	93.3	---	3.5
MW-04	08-Mar-2005	458	< 5	137	81.4	< 5	142	0.173	37.7	**0.152**	9.9	57	0.15	375	---	1200	510	7.5	---	**694**	< 0.05	---	0.8	---	< 0.05	0.8	---	---	98.5	---	1
	17-Nov-2005	449	< 5	157	87	< 5	147	0.104	40	**0.053**	9.5	59	0.12	368	---	1280	532	7.8	---	**726**	0.013	---	1.2	---	< 0.05	1.2	---	---	98.2	---	5
(Duplicate)	17-Nov-2005	452	< 5	157	89	< 5	147	0.105	40.4	**0.053**	9.7	60	0.12	371	---	1290	533	7.9	---	**731**	0.01	---	1.2	---	< 0.05	1.2	---	---	98.1	---	4
	14-Jun-2006	455	< 5	155	86.2	< 5	147	0.005	42.7	**0.13**	10.2	57	0.13	373	---	1280	543	7.7	---	**724**	0.007	---	0.5	---	< 0.05	0.5	---	---	99.4	---	4

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Table 3

Groundwater Analytical Results: Indicator Analysis Parameters

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Anions					Cations							General							Inorganic Nitrogen Compounds						Ion Balance				Miscellaneous
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Fluoride (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Total Dissolved Solids (Calculated) (mg/L)	Ammonia (Total; as N) (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Cation Sum (meq/L)	Anion Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Dissolved Organic Carbon (mg/L)
Canadian Drinking Water AO Guidelines 2017		---	---	250	500	---	---	0.3	---	0.05	---	200	---	---	---	---	---	---	(7 - 10.5)	500	500	---	---	---	---	---	---	---	---	---	---	---
Canadian Drinking Water MAC Guidelines 2017		---	---	---	---	---	---	---	---	---	---	---	1.5	---	---	---	---	---	---	---	---	45	10	3.2	1	10	---	---	---	---	---	---
MW-04 (cont'd)	13-Jul-2007	449	< 5	190	84.5	< 5	154	< 0.005	43.6	0.009	10.4	68	0.14	368	---	1360	564	7.9	---	**774**	0.008	---	0.5	---	< 0.05	0.5	---	---	99.9	---	3
	19-Dec-2007	460	< 1	200	82	< 1	140	< 0.06	35	0.016	10	71	0.1	380	---	1400	500	7.7	---	**763**	0.01	---	0.6	---	< 0.06	0.6	---	---	0.9	---	3
	21-Apr-2009	450	< 0.5	150	74	< 0.5	140	< 0.06	37	0.03	9.4	63	0.14	370	---	1200	500	7.62	---	**690**	< 0.05	---	0.4	---	< 0.003	0.4	---	---	99	---	2.8
	06-May-2010	470	< 5.0	131	92.1	< 5.0	152	0.078	44.0	**0.258**	---	63.4	0.129	385	---	1220	561	8.01	---	**724**	< 0.050	---	0.090	---	< 0.050	0.090	---	---	107	---	3.0
	07-Jun-2011	482	< 5.0	125	88.9	< 5.0	140	0.028	41.3	**0.114**	8.78	50.7	0.119	395	---	1280	520	7.95	---	**693**	< 0.050	---	0.264	---	< 0.050	0.264	---	---	96.3	---	3.0
	30-May-2012	500	< 5.0	126	88.2	< 5.0	141	**1.47**	38.1	**0.722**	8.93	50.9	0.089	409	---	1280	509	7.88	---	**699**	< 0.050	---	< 0.050	---	< 0.050	< 0.071	---	---	92.8	---	3.2
(Duplicate)	30-May-2012	499	< 5.0	126	88.6	< 5.0	161	**1.73**	44.8	**0.861**	11.4	58.9	0.094	409	---	1280	587	7.94	---	**736**	< 0.050	---	< 0.050	---	< 0.050	< 0.071	---	---	107	---	3.3
	09-Jul-2013	493	< 5.0	129	87.8	< 5.0	154	**1.70**	44.0	**0.561**	10.8	55.8	0.082	404	---	1230	566	7.76	**761**	**724**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	103	---	3.3
	13-Jun-2014	426	< 5.0	146	92.8	< 5.0	143	**1.39**	40.8	**0.494**	9.68	52.9	0.093	350	---	1190	525	8.10	**808**	**695**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	100	---	3.0
	29-Jun-2015	480	< 0.50	150	100	< 0.50	150	**1.9**	44	**0.54**	9.5	59	0.13	390	< 0.50	1300	550	7.32	**780**	**750**	---	0.13	0.030	< 0.033	< 0.010	0.030	14	14	---	0.98	3.5
	19-Sep-2016	430	< 5.0	190	125	< 5.0	165	**2.33**	47.9	**0.621**	9.96	59.5	0.090	353	---	1410	609	7.76	**833**	**809**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	100	---	3.6
	13-Jul-2017	425	< 5.0	171	130	< 5.0	154	**2.24**	47.7	**0.616**	9.52	62.6	0.102	348	---	1290	581	7.78	**877**	**797**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	98.1	---	3.7
MW-05	08-Mar-2005	403	< 5	15	105	< 5	96.2	**1.14**	27.5	**0.402**	6.1	51	0.18	330	---	831	353	7.6	---	499	0.63	---	< 0.1	---	< 0.05	< 0.1	---	---	103	---	5
	17-Nov-2005	422	< 5	21	115	< 5	98.6	**3.31**	30.1	**0.531**	6.9	43	0.11	346	---	881	370	7.9	---	**522**	0.331	---	< 0.1	---	< 0.05	< 0.1	---	---	95.4	---	4
	14-Jun-2006	421	< 5	22	124	< 5	107	**3.48**	33.5	**0.583**	7.6	44	0.11	345	---	902	405	7.7	---	**545**	0.338	---	< 0.1	---	< 0.05	< 0.1	---	---	101	---	4
	13-Jul-2007	426	< 5	25	135	< 5	110	**4**	34.3	**0.682**	7.3	42	0.11	349	---	931	416	8.1	---	**563**	0.216	---	< 0.1	---	< 0.05	< 0.1	---	---	98.5	---	4
	19-Dec-2007	440	< 1	22	150	< 1	100	< 0.06	30	**0.66**	7.4	41	0.1	360	---	930	380	7.6	---	**566**	0.05	---	< 0.2	---	< 0.06	< 0.2	---	---	0.88	---	3
	21-Apr-2009	420	< 0.5	30	130	< 0.5	120	< 0.06	34	**0.72**	7.6	43	0.12	350	---	960	430	7.58	---	**570**	0.22	---	0.007	---	< 0.003	0.007	---	---	100	---	2.5
	29-Apr-2010	428	< 5.0	30.6	144	< 5.0	120	**3.39**	36.7	**0.758**	---	46.1	0.107	351	---	969	451	7.95	---	**596**	0.234	---	< 0.050	---	< 0.050	< 0.071	---	---	103	---	3.3
	25-May-2011	433	< 5.0	30.9	141	< 5.0	105	**3.82**	32.7	**0.657**	7.29	41.7	0.075	355	---	990	397	8.05	---	**572**	0.261	---	< 0.050	---	< 0.050	< 0.071	---	---	91.1	---	4.4
	29-May-2012	442	< 5.0	33.7	138	< 5.0	112	**3.83**	31.3	**0.707**	8.00	42.6	0.061	362	---	1000	409	7.93	---	**583**	0.233	---	< 0.050	---	< 0.050	< 0.071	---	---	92.3	---	6.9
	08-Jul-2013	448	< 5.0	36.3	139	< 5.0	118	**3.17**	33.5	**0.754**	8.61	42.9	0.092	367	---	998	433	7.83	**614**	**599**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	95.3	---	4.1
	13-Jun-2014	341	< 5.0	37.8	143	< 5.0	117	**4.37**	34.8	**0.758**	8.31	42.0	0.073	279	---	853	435	8.00	**635**	**550**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	111	---	6.6
	25-Jun-2015	450	< 0.50	40	150	< 0.50	120	**4.8**	38	**0.71**	8.4	47	0.10	370	< 0.50	980	450	7.41	**630**	**620**	---	0.065	0.015	< 0.033	< 0.010	< 0.020	12	11	---	1.0	3.2
	19-Sep-2016	406	< 5.0	38.4	137	< 5.0	121	**4.39**	36.3	**0.757**	7.99	43.3	0.076	333	---	987	452	7.85	**620**	**584**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	105	---	4.8
	13-Jul-2017	440	< 5.0	38.1	131	< 5.0	115	**4.82**	38.1	**0.742**	7.95	44.6	0.081	360	---	934	444	7.83	**644**	**610**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	95.7	---	4.1
MW-06	08-Mar-2005	560	< 5	4	451	< 5	171	**2.92**	58.9	**1.32**	6.1	138	0.18	459	---	1580	670	7.5	---	**1100**	1.46	---	< 0.1	---	< 0.05	< 0.1	---	---	105	---	5
	17-Nov-2005	641	< 5	13	471	< 5	148	**2.96**	52	**0.943**	5	**211**	0.15	526	---	1780	584	8	---	**1220**	1.95	---	< 0.1	---	< 0.05	< 0.1	---	---	101	---	8
	16-Jun-2006	633	< 5	10	482	< 5	168	**3.58**	57.7	**1.01**	5.5	190	0.14	519	---	1700	657	7.7	---	**1220**	2.38	---	< 0.1	---	< 0.05	< 0.1	---	---	104	---	7
	12-Jul-2007	637	< 5	10	478	< 5	157	**4.5**	55.3	**1.28**	4.8	182	0.17	522	---	1760	620	7.9	---	**1200**	1.92	---	< 0.1	---	< 0.05	< 0.1	---	---	99.4	---	7
	19-Dec-2007	630	< 1	3	**560**	< 1	160	< 0.06	54	**1.5**	5	140	0.2	510	---	1700	620	7.7	---	**1230**	1.9	---	< 0.2	---	< 0.06	< 0.2	---	---	0.85	---	6
	22-Apr-2009	590	< 0.5	6	420	< 0.5	180	**5.7**	62	**1.7**	5.5	150	0.14	490	---	1700	710	7.47	---	**1100**	1.7	---	0.004	---	< 0.003	0.004	---	---	110	---	5.1
	06-May-2010	626	< 5.0	8.45	**520**	< 5.0	156	**5.38**	57.1	**1.39**	---	194	0.173	513	---	1770	625	8.06	---	**1250**	1.88	---	< 0.050	---	< 0.050	< 0.071	---	---	98.8	---	6.7
	07-Jun-2011	603	< 5.0	3.45	**501**	< 5.0	164	**5.55**	60.4	**1.64**	5.02	123	0.129	494	---	1760	658	7.96	---	**1150**	1.57	---	< 0.050	---	< 0.050	< 0.071	---	---	91.3	---	8.0
	29-May-2012	602	< 5.0	2.95	494	< 5.0	167	**6.02**	56.5	**1.70**	5.80	139	0.128	493	---	1730	650	7.81	---	**1160**	1.55	---	< 0.050	---	< 0.050	< 0.071	---	---	94.7	---	6.8
	08-Jul-2013	611	< 5.0	4.57	499	< 5.0	168	**5.84**	55.2	**1.72**	5.17	135	0.128	501	---	1720	647	7.81	**1240**	**1170**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	92.2	---	6.4
	12-Jun-2014	528	< 5.0	6.67	**519**	< 5.0	163	**5.93**	57.6	**1.62**	5.56	152	0.119	433	---	1630	644	8.10	**1260**	**1160**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	99.9	---	5.8
	25-Jun-2015	620	< 0.50	6.4	490	< 0.50	160	**6.1**	60	**1.5**	5.8	180	0.15	510	< 0.50	1700	650	7.37	**1200**	**1200**	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	21	20	---	1.0	6.5
	20-Sep-2016	599	< 5.0	5.6	490	< 5.0	167	**5.88**	61.0	**1.63**	5.53	143	0.086	491	---	1720	668	7.84	**1180**	**1170**	---	---	< 0.040	---	< 0.020	< 0.045	---	---	97.7	---	9.0
	13-Jul-2017	598	< 5.0	4.81	494	< 5.0	157	**5.83**	58.9	**1.63**	5.12	143	0.136	490	---	1620	635	7.79	**1240**	**1180**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	91.7	---	7.7
MW-07	09-Mar-2005	664	< 5	13	**1130**	< 5	287	**10.4**	100	**1.88**	6.6	**287**	0.11	544	---	2680	1130	7.5	---	**2150**	2.24	---	0.1	---	< 0.05	0.1	---	---	102	---	5
	17-Nov-2005	666	< 5	16	**1010**	< 5	270	**10.9**	94.8	**1.83**	5.5	**268**	0.08	546	---	2670	1060	7.7	---	**1990**	2.03	---	< 0.1	---	< 0.05	< 0.1	---	---	102	---	6
	16-Jun-2006	661	< 5	15	**1010**	< 5	284	< 0.005	96.4	**1.86**	6.2	**269**	0.07	542	---	2530	1110	7.5	---	**2010**	2.28	---	0.1	---	< 0.05	0.1	---	---	105	---	6
	12-Jul-2007	641	< 5	12	**940**	< 5	257	**10.9**	89.8	**1.78**	4.6	**248**	0.09	526	---	2290	1010	7.6	---	**1870**	2.03	---	< 0.1	---	< 0.05	< 0.1	---	---	103	---	6
	19-Dec-2007	660	< 1	9	**1000**	< 1	220	< 0.06	72	**1.6**	5.1	**230**	0.1	540	---	2500	850	7.5	---	**1890**	0.26	---	< 0.2	---	< 0.06	< 0.2	---	---	0.84	---	6
	22-Apr-2009	730	< 0.5	18	**1200**	< 0.5	330	**14**	110	**2.3**	6.6	**320**	0.08	600	---	3000	1300	7.19	---	**2400**	2.5	---	0.004	---	< 0.003	0.004	---	---	110	---	6.6
	05-May-2010	657	< 5.0	13.2	**1040**	< 5.0	262	**12.5**	93.5	**1.90**	---	**274**	0.135	538	---	2600	1040	7.90	---	**2010**	2.33	---	< 0.050	---	< 0.050	< 0.071	---	---	100	---	5.8
	08-Jun-2011	537	< 5.0	8.07	**622**	< 5.0	178	**8.26**	68.8	**1.21**	4.38	189	0.116	440	---	1900	728	7.69	---	**1330**	1.83	---	< 0.050	---	< 0.050	< 0.071	---	---	104	---	11.5
	28-Jul-2011	659	< 5.0	11.8	**1020**	< 5.0	256	**11.7**	87.9	**1.84**	5.55	**245**	0.128	540	---	2670	1000	7.98	---	**1950**	2.39	---	< 0.050	---	< 0.050	< 0.071	---	---	95.2	---	6.3
	30-May-2012	648	< 5.0	12.6	**949**	< 5.0	247	**11.3**	80.4	**1.79**	6.96	**245**	0.093	531	---	2570	948	7.71	---	**1860**	2.22	---	< 0.050	---	< 0.050	< 0.071	---	---	96.9	---	6.0
	11-Jul-2013	716	< 5.0	11.5	**1020**	< 5.0	269	**12.1**	82.4	**1.87**	5.37	**241**	0.110	586	---	2680	1010	7.30	**2180**	**1980**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	92.6	---	6.2
	13-Jun-2014	636	< 5.0	13.2	**1270**	< 5.0	289	**13.8**	97.9	**2.26**	6.09	**270**	0.047	521	---	2800	1120	8.06	**2320**	**2260**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	92.3	---	5.8
	25-Jun-2015	690	< 0.50	13	**1100**	< 0.50	270	**13**	97	**1.9**	6.0	**280**	0.086	570	< 0.50	2700	1100	7.09	**2200**	**2100**	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	34	35	---	0.99	6.0
	20-Sep-2016	656	< 5.0	11.3	**1040**	< 5.0	283	**12.9**	97.8	**2.01**	6.02	**259**	0.042	537	---	2680	1110	7.64	**2200**	**2020**	---	---	< 0.040	---	< 0.020	< 0.045	---	---	103	---	7.2

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Table 3

Groundwater Analytical Results: Indicator Analysis Parameters

PROJECT No.: 307075-01608-300

		Anions					Cations							General							Inorganic Nitrogen Compounds						Ion Balance				Miscellaneous
Monitoring Station	Date (dd-mmm-yyyy)	Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Fluoride (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Total Dissolved Solids (Calculated) (mg/L)	Ammonia (Total; as N) (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Cation Sum (meq/L)	Anion Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Dissolved Organic Carbon (mg/L)
Canadian Drinking Water AO Guidelines 2017		---	---	250	500	---	---	0.3	---	0.05	---	200	---	---	---	---	---	(7 - 10.5)	500	500	---	---	---	---	---	---	---	---	---	---	---	---
Canadian Drinking Water MAC Guidelines 2017		---	---	---	---	---	---	---	---	---	---	---	1.5	---	---	---	---	---	---	---	---	45	10	3.2	1	10	---	---	---	---	---	---
MW-07 (cont'd)	14-Jul-2017	639	< 5.0	11.6	**895**	< 5.0	249	**11.2**	83.7	**1.80**	5.45	**238**	0.058	524	---	2360	966	7.51	**2050**	**1820**	---	---	< 0.040	---	< 0.020	< 0.045	---	---	99.3	---	7.3
MW-08	09-Mar-2005	593	< 5	3	369	< 5	147	**5.66**	45	**0.474**	6	137	0.13	486	---	1470	552	7.7	---	**999**	1.83	---	0.1	---	< 0.05	0.1	---	---	98.8	---	5
	15-Nov-2005	549	< 5	4	300	< 5	133	**5.16**	37.4	**0.384**	5.2	112	0.11	450	---	1310	486	7.5	---	**862**	1.5	---	< 0.1	---	< 0.05	< 0.1	---	---	95.9	---	6
	16-Jun-2006	594	< 5	3	341	< 5	161	**6.97**	44.2	**0.481**	6.1	132	0.09	487	---	1240	584	7.7	---	**980**	1.89	---	< 0.1	---	< 0.05	< 0.1	---	---	104	---	6
	11-Jul-2007	583	< 5	2	316	< 5	150	**7.29**	42.9	**0.454**	5	115	0.08	478	---	1390	551	7.9	---	**918**	1.61	---	< 0.1	---	< 0.05	< 0.1	---	---	100	---	7
	19-Dec-2007	630	< 1	2	370	< 1	130	< 0.06	36	**0.44**	5.4	120	0.1	520	---	1400	480	7.7	---	**977**	0.25	---	< 0.2	---	< 0.06	< 0.2	---	---	0.84	---	5
	21-Apr-2009	560	< 0.5	3	300	< 0.5	150	< 0.06	40	**0.45**	5.6	110	0.11	450	---	1400	530	7.62	---	**880**	1.7	---	0.007	---	< 0.003	0.007	---	---	100	---	5.3
	05-May-2010	558	< 5.0	1.43	333	< 5.0	146	**7.22**	43.2	**0.470**	---	122	0.130	458	---	1360	542	8.04	---	**927**	1.74	---	< 0.050	---	< 0.050	< 0.071	---	---	101	---	5.3
	07-Jun-2011	565	< 5.0	0.97	320	< 5.0	136	**5.41**	38.3	**0.411**	5.12	98.0	0.082	463	---	1400	497	7.95	---	**876**	1.71	---	< 0.050	---	< 0.050	< 0.071	---	---	89.8	---	10.3
	30-May-2012	560	< 5.0	0.86	308	< 5.0	135	**6.69**	35.0	**0.409**	5.69	107	0.084	459	---	1360	481	7.93	---	**867**	1.76	---	< 0.050	---	< 0.050	< 0.071	---	---	92.3	---	5.7
	09-Jul-2013	535	< 5.0	1.37	304	< 5.0	149	**6.47**	40.4	**0.415**	6.47	112	0.093	439	---	1290	538	7.96	**876**	**877**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	104	---	5.5
	12-Jun-2014	474	< 5.0	1.23	345	< 5.0	144	**7.19**	38.5	**0.476**	5.95	110	0.083	388	---	1260	518	7.94	**938**	**878**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	102	---	5.1
	24-Jun-2015	570	< 0.50	1.6	320	< 0.50	150	**7.1**	42	**0.44**	5.7	120	0.10	470	< 0.50	1400	540	7.43	**950**	**930**	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	16	16	---	1.0	5.4
	20-Sep-2016	515	< 5.0	1.37	331	< 5.0	152	**6.96**	41.4	**0.441**	5.86	113	0.082	422	---	1370	550	7.86	**928**	**898**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	104	---	7.5
	02-Aug-2017	583	< 5.0	2.4	357	< 5.0	---	---	---	---	---	---	0.103	478	---	1460	540	7.39	**1010**	**987**	---	---	< 0.040	---	< 0.020	< 0.045	---	---	92.6	---	4.8
MW-09	09-Mar-2005	626	< 5	5	313	< 5	71.6	**1.11**	26	**0.714**	4.2	**226**	0.29	513	---	1520	286	7.9	---	**954**	1.81	---	0.1	---	< 0.05	0.1	---	---	93.2	---	5
(Duplicate)	09-Mar-2005	628	< 5	5	340	< 5	79.1	**1.07**	27.9	**0.705**	4.7	**243**	0.29	515	---	1520	312	7.9	---	**1010**	1.79	---	0.1	---	< 0.05	0.1	---	---	97.4	---	5
	17-Nov-2005	640	< 5	7	312	< 5	92.6	**1.4**	27.3	**0.752**	3.9	**227**	0.22	524	---	1550	344	8.1	---	**984**	1.85	---	< 0.1	---	< 0.05	< 0.1	---	---	98	---	6
	16-Jun-2006	644	< 5	7	316	< 5	98.1	**1.44**	27.7	**0.797**	3.9	**231**	0.23	528	---	1520	359	7.9	---	**1000**	2.09	---	< 0.1	---	< 0.05	< 0.1	---	---	99.9	---	8
	11-Jul-2007	656	< 5	6	322	< 5	94.9	**1.74**	27.6	**0.785**	3.3	**231**	0.21	538	---	1530	351	8.1	---	**1010**	1.8	---	< 0.1	---	< 0.05	< 0.1	---	---	97.9	---	7
	18-Dec-2007	670	< 1	4	350	< 1	83	< 0.06	22	**0.77**	3.5	**230**	0.2	550	---	1500	300	8	---	**1020**	0.23	---	< 0.2	---	< 0.06	< 0.2	---	---	0.86	---	9
	22-Apr-2009	630	< 0.5	6	330	< 0.5	97	**1.9**	27	**0.86**	4.1	**240**	0.22	520	---	1500	350	7.73	---	**1000**	1.9	---	0.005	---	< 0.003	0.005	---	---	100	---	5.5
	06-May-2010	639	< 5.0	5.57	342	< 5.0	93.1	**2.04**	27.8	**0.828**	---	**240**	0.251	524	---	1540	347	8.17	---	**1030**	2.02	---	< 0.050	---	< 0.050	< 0.071	---	---	98.4	---	5.6
(Duplicate)	06-May-2010	641	< 5.0	5.63	345	< 5.0	93.1	**2.03**	27.6	**0.832**	---	**246**	0.243	526	---	1540	346	8.17	---	**1040**	2.00	---	< 0.050	---	< 0.050	< 0.071	---	---	99.2	---	5.5
	02-Jun-2011	646	< 5.0	5.84	325	< 5.0	87.4	**1.46**	25.2	**0.754**	4.09	**212**	< 0.050	530	---	1580	322	8.17	---	**978**	2.05	---	< 0.050	---	< 0.050	< 0.071	---	---	90.0	---	8.0
(Duplicate)	02-Jun-2011	646	< 5.0	5.64	325	< 5.0	89.5	**1.29**	26.0	**0.773**	4.16	**220**	< 0.050	530	---	1570	331	8.22	---	**988**	2.09	---	< 0.050	---	< 0.050	< 0.071	---	---	93.0	---	7.1
	29-May-2012	643	< 5.0	4.82	319	< 5.0	88.3	**1.89**	23.7	**0.784**	4.22	**226**	0.184	527	---	1550	318	8.04	---	**982**	2.02	---	< 0.050	---	< 0.050	< 0.071	---	---	94.1	---	6.0
	10-Jul-2013	644	< 5.0	5.29	327	< 5.0	96.2	**1.94**	26.8	**0.842**	4.06	**251**	0.203	527	---	1530	351	7.89	**1030**	**1030**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	103	---	5.9
	13-Jun-2014	525	< 5.0	5.39	341	< 5.0	87.8	**1.85**	25.6	**0.868**	4.23	**222**	0.199	430	---	1390	325	8.12	**1030**	**944**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	102	---	5.8
	25-Jun-2015	620	< 0.50	5.6	320	< 0.50	93	**2.0**	28	**0.80**	4.2	**250**	0.24	500	< 0.50	1500	350	7.61	**1000**	**1000**	---	0.14	0.031	< 0.033	< 0.010	0.031	18	17	---	1.1	5.4
(Duplicate)	19-Sep-2016	626	< 5.0	4.9	319	< 5.0	97.4	**1.88**	27.3	**0.795**	4.04	**223**	0.158	513	---	1530	356	8.10	**1040**	**984**	---	---	< 0.040	---	< 0.020	< 0.045	---	---	99.2	---	7.1
	20-Sep-2016	598	< 5.0	5.0	318	< 5.0	97.0	**1.93**	27.5	**0.822**	4.08	**231**	0.157	490	---	1530	355	8.07	**1030**	**977**	---	---	< 0.040	---	< 0.020	< 0.045	---	---	104	---	7.2
	14-Jul-2017	650	< 5.0	5.18	325	< 5.0	90.0	**1.96**	27.1	**0.872**	3.92	**240**	0.216	533	---	1440	336	8.04	**1030**	**1030**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	95.6	---	6.9
MW-10	09-Mar-2005	628	< 5	< 1	221	< 5	131	**5.29**	36.1	**0.639**	5.3	117	0.18	514	---	1270	476	7.7	---	**819**	1.68	---	0.1	---	< 0.05	0.1	---	---	99.7	---	5
	16-Nov-2005	634	< 5	3	222	< 5	129	**5.49**	35.2	**0.642**	5	108	0.12	520	---	1260	467	7.5	---	**814**	1.36	---	< 0.1	---	< 0.05	< 0.1	---	---	93.8	---	6
	16-Jun-2006	641	< 5	2	212	< 5	139	**5.89**	37.8	**0.67**	5.6	119	0.13	525	---	1120	503	7.7	---	**831**	1.76	---	< 0.1	---	< 0.05	< 0.1	---	---	103	---	6
	11-Jul-2007	651	< 5	2	208	< 5	132	**5.93**	36.9	**0.656**	4.7	110	0.12	533	---	1270	482	8	---	**814**	1.65	---	< 0.1	---	< 0.05	< 0.1	---	---	97.2	---	5
	18-Dec-2007	660	< 1	< 1	230	< 1	120	< 0.06	29	**0.64**	4.8	110	0.2	540	---	1300	410	7.8	---	**822**	1.8	---	< 0.2	---	< 0.06	< 0.2	---	---	0.84	---	5
	22-Apr-2009	620	< 0.5	2	190	< 0.5	140	**5.9**	36	**0.71**	5.6	120	0.14	510	---	1300	490	7.51	---	**800**	1.8	---	0.005	---	< 0.003	0.005	---	---	110	---	4.7
	05-May-2010	633	< 5.0	0.73	227	< 5.0	139	**6.80**	39.1	**0.735**	---	124	0.169	519	---	1270	508	8.07	---	**847**	1.71	---	< 0.050	---	< 0.050	< 0.071	---	---	104	---	5.1
	02-Jun-2011	607	< 5.0	1.19	206	< 5.0	113	**3.89**	30.2	**0.566**	5.58	105	< 0.050	497	---	1260	407	8.04	---	**759**	1.60	---	< 0.050	---	< 0.050	< 0.071	---	---	89.9	---	6.7
	30-May-2012	639	< 5.0	0.53	211	< 5.0	127	**5.98**	31.6	**0.655**	5.79	111	0.113	524	---	1290	447	7.89	---	**801**	1.79	---	< 0.050	---	< 0.050	< 0.071	---	---	93.5	---	5.9
	09-Jul-2013	638	< 5.0	0.68	215	< 5.0	141	**6.11**	37.3	**0.729**	6.22	118	0.107	523	---	1250	506	8.09	**833**	**832**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	103	---	5.4
(Duplicate)	09-Jul-2013	643	< 5.0	0.85	216	< 5.0	142	**6.03**	36.7	**0.710**	5.96	115	0.115	527	---	1250	506	8.04	**837**	**833**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	101	---	5.4
	12-Jun-2014	507	< 5.0	0.67	229	< 5.0	125	**6.10**	34.2	**0.689**	5.79	108	0.110	416	---	1110	453	8.05	**845**	**752**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	106	---	6.9
(Duplicate)	12-Jun-2014	543	< 5.0	0.82	229	< 5.0	124	**6.08**	34.5	**0.740**	5.84	110	0.104	445	---	1140	452	8.04	**834**	**771**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	102	---	5.0
	24-Jun-2015	640	< 0.50	1.1	210	< 0.50	130	**6.3**	36	**0.67**	5.8	120	0.16	520	< 0.50	1300	480	7.44	**850**	**820**	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	15	15	---	1.0	5.1
(Duplicate)	24-Jun-2015	630	< 0.50	1.2	200	< 0.50	130	**6.4**	36	**0.67**	5.6	120	0.14	520	< 0.50	1300	480	7.41	**840**	**820**	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	15	15	---	1.0	5.2
	20-Sep-2016	619	< 5.0	0.66	222	< 5.0	131	**6.01**	35.9	**0.676**	5.74	111	0.114	508	---	1270	475	7.90	**825**	**811**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	97.8	---	6.6
	14-Jul-2017	640	< 5.0	0.62	218	< 5.0	117	**5.98**	36.1	**0.674**	5.49	115	0.139	525	---	1200	441	7.85	**834**	**828**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	89.5	---	6.4

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Table 3

Groundwater Analytical Results: Indicator Analysis Parameters

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Anions					Cations							General							Inorganic Nitrogen Compounds						Ion Balance				Miscellaneous
		Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Fluoride (mg/L)	Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Total Dissolved Solids (Calculated) (mg/L)	Ammonia (Total; as N) (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Cation Sum (meq/L)	Anion Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Dissolved Organic Carbon (mg/L)
Canadian Drinking Water AO Guidelines 2017		---	---	250	500	---	---	0.3	---	0.05	---	200	---	---	---	---	---	---	(7 - 10.5)	500	500	---	---	---	---	---	---	---	---	---	---	---
Canadian Drinking Water MAC Guidelines 2017		---	---	---	---	---	---	---	---	---	---	---	1.5	---	---	---	---	---	---	---	---	45	10	3.2	1	10	---	---	---	---	---
MW-11	10-Mar-2005	642	< 5	8	196	< 5	150	**6.89**	45.8	**0.668**	4.9	92	0.14	526	---	1270	563	7.7	---	**813**	1.5	---	0.1	---	< 0.05	0.1	---	---	104	---	15
	16-Nov-2005	654	< 5	16	199	< 5	140	**6.95**	42.5	**0.628**	4.5	85	0.09	536	---	1270	525	7.4	---	**809**	1.41	---	< 0.1	---	< 0.05	< 0.1	---	---	93.4	---	7
	16-Jun-2006	672	< 5	11	194	< 5	153	**7.23**	45.7	**0.659**	4.8	92	0.09	551	---	1100	570	7.7	---	**831**	1.56	---	< 0.1	---	< 0.05	< 0.1	---	---	101	---	7
	11-Jul-2007	662	< 5	8	193	< 5	143	**7.15**	45.3	**0.632**	3.9	88	0.09	542	---	1280	544	8	---	**806**	1.43	---	< 0.1	---	< 0.05	< 0.1	---	---	98.6	---	8
	18-Dec-2007	680	< 1	10	210	< 1	130	< 0.06	38	**0.61**	4.3	87	0.1	560	---	1300	480	7.7	---	**810**	0.2	---	< 0.2	---	< 0.06	< 0.2	---	---	0.87	---	6
	22-Apr-2009	640	< 0.5	10	170	< 0.5	150	**7**	45	**0.67**	4.9	91	0.11	530	---	1300	560	7.51	---	**800**	1.5	---	0.003	---	< 0.003	0.003	---	---	110	---	5.5
	05-May-2010	650	< 5.0	15.2	212	< 5.0	144	**7.61**	45.9	**0.663**	---	98.1	0.132	533	---	1290	549	8.04	---	**840**	1.48	---	< 0.050	---	< 0.050	< 0.071	---	---	99.1	---	6.0
	02-Jun-2011	653	< 5.0	9.69	203	< 5.0	148	**6.99**	46.4	**0.687**	5.36	96.0	< 0.050	536	---	1320	561	8.00	---	**830**	1.55	---	< 0.050	---	< 0.050	< 0.071	---	---	102	---	6.8
	30-May-2012	648	< 5.0	8.71	202	< 5.0	134	**6.82**	38.7	**0.605**	5.34	87.9	0.067	531	---	1300	494	7.90	---	**795**	1.51	---	< 0.050	---	< 0.050	< 0.071	---	---	91.8	---	6.6
	10-Jul-2013	640	< 5.0	8.92	213	< 5.0	147	**7.52**	44.7	**0.697**	5.09	102	0.105	525	---	1270	551	7.93	**828**	**836**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	103	---	6.2
	12-Jun-2014	473	< 5.0	14.1	227	< 5.0	136	**7.07**	41.5	**0.672**	5.32	89.0	0.074	388	---	1090	510	7.99	**856**	**746**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	110	---	5.6
	24-Jun-2015	640	< 0.50	11	210	< 0.50	140	**7.4**	45	**0.62**	5.0	97	0.11	520	< 0.50	1300	540	7.42	**850**	**830**	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	16	15	---	1.0	6.3
	20-Sep-2016	595	< 5.0	11.4	221	< 5.0	148	**6.91**	44.3	**0.609**	4.97	90.7	0.087	488	---	1270	552	7.87	**845**	**813**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	103	---	7.5
	14-Jul-2017	650	< 5.0	8.40	215	< 5.0	138	**6.84**	43.7	**0.618**	4.59	92.8	0.087	533	---	1220	525	7.77	**839**	**845**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	91.6	---	7.3
MW-12	10-Mar-2005	636	< 5	6	45.9	< 5	95.7	**2.78**	27.9	**0.365**	5	106	0.13	521	---	1000	354	7.9	---	**600**	1.39	---	0.1	---	< 0.05	0.1	---	---	102	---	6
	16-Nov-2005	712	< 5	8	52.5	< 5	94.9	**3.37**	28.5	**0.402**	5.2	111	0.07	584	---	1020	354	7.4	---	**651**	1.2	---	< 0.1	---	< 0.05	< 0.1	---	---	92.7	---	7
	16-Jun-2006	669	< 5	7	44.2	< 5	100	**3.76**	29.1	**0.436**	5.1	106	0.07	549	---	904	370	7.8	---	**621**	1.34	---	< 0.1	---	< 0.05	< 0.1	---	---	100	---	7
	11-Jul-2007	670	< 5	7	42.4	< 5	95.4	**3.77**	29.2	**0.422**	4.2	101	0.08	550	---	1020	358	8	---	**609**	1.16	---	< 0.1	---	< 0.05	< 0.1	---	---	97.4	---	7
	18-Dec-2007	700	< 1	5	43	< 1	82	< 0.06	23	**0.4**	4.3	99	< 0.1	570	---	1000	300	7.8	---	**601**	0.29	---	< 0.2	---	< 0.06	< 0.2	---	---	0.84	---	7
	22-Apr-2009	650	< 0.5	8	32	< 0.5	98	**4.1**	29	**0.45**	4.9	110	0.09	540	---	1000	360	7.66	---	**610**	1.3	---	0.005	---	< 0.003	0.005	---	---	110	---	6.4
	06-May-2010	667	< 5.0	7.05	46.8	< 5.0	96.4	**4.24**	30.2	**0.456**	---	109	0.114	547	---	1030	365	8.13	---	**623**	1.32	---	< 0.050	---	< 0.050	< 0.071	---	---	100	---	10.5
	02-Jun-2011	662	< 5.0	6.40	44.6	< 5.0	98.1	**3.34**	30.9	**0.450**	4.86	95.4	0.071	543	---	1050	372	8.14	---	**606**	1.31	---	0.054	---	< 0.050	< 0.071	---	---	97.9	---	13.5
	30-May-2012	660	< 5.0	6.25	43.3	< 5.0	89.8	**4.14**	25.6	**0.435**	5.23	95.7	0.076	541	---	1030	330	8.03	---	**591**	1.32	---	< 0.050	---	< 0.050	< 0.071	---	---	91.5	---	6.6
	10-Jul-2013	649	< 5.0	6.89	44.4	< 5.0	101	**3.99**	28.9	**0.457**	5.00	113	0.083	532	---	1000	371	7.89	**628**	**618**	---	---	< 0.050	---	< 0.050	< 0.071	---	---	106	---	6.9
	12-Jun-2014	598	< 5.0	7.20	47.4	< 5.0	93.8	**3.88**	27.7	**0.462**	5.14	97.6	0.064	490	---	915	348	8.02	**619**	**573**	---	---	< 0.050	---	< 0.020	< 0.054	---	---	103	---	8.3
	24-Jun-2015	660	< 0.50	7.7	45	< 0.50	93	**4.0**	29	**0.42**	5.0	110	0.084	540	< 0.50	1000	350	7.63	**620**	**620**	---	0.047	0.011	< 0.033	< 0.010	< 0.020	12	12	---	1.0	6.8
	20-Sep-2016	646	< 5.0	6.53	43.5	< 5.0	94.9	**4.21**	28.4	**0.442**	4.76	98.2	0.063	530	---	1000	354	7.93	**615**	**594**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	98.2	---	7.4
	14-Jul-2017	---	---	---	---	---	94.1	**4.18**	27.9	**0.437**	4.53	98.9	---	---	---	---	---	---	**614**	---	---	---	---	---	---	---	---	---	---	---	6.1
	02-Aug-2017	639	< 5.0	6.42	43.4	< 5.0	86.0	---	26.9	---	4.61	95.7	0.114	524	---	1010	326	7.43	---	**597**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	89.4	---	---
MW-13	10-Mar-2005	531	< 5	2	10.6	< 5	53.7	**0.818**	16.5	**0.263**	4.2	112	0.2	435	---	784	202	8.1	---	460	1.4	---	0.1	---	< 0.05	0.1	---	---	100	---	4
	16-Nov-2005	537	< 5	4	12.5	< 5	51.2	**1.08**	16.2	**0.243**	3.4	103	0.14	440	---	782	195	7.8	---	454	1.29	---	< 0.1	---	< 0.05	< 0.1	---	---	92.2	---	5
	16-Jun-2006	715	541	4	10.1	< 5	55.6	**1.19**	17.1	**0.256**	3.9	112	0.14	443	---	715	209	8	---	470	1.31	---	0.2	---	< 0.05	0.2	---	---	99.4	---	5
	11-Jul-2007	541	< 5	2	9.1	< 5	53	**1.26**	16.9	**0.252**	3.5	105	0.13	444	---	782	202	8.2	---	456	1.22	---	< 0.1	---	< 0.05	< 0.1	---	---	96.3	---	5
	18-Dec-2007	560	< 1	2	9	< 1	45	< 0.06	14	**0.25**	3.5	110	0.2	460	---	790	170	8	---	457	0.23	---	< 0.2	---	< 0.06	< 0.2	---	---	0.87	---	5
	22-Apr-2009	520	< 0.5	3	9	< 0.5	54	**1.3**	17	**0.26**	3.9	110	0.15	430	---	770	200	7.81	---	460	1.3	---	0.005	---	< 0.003	0.005	---	---	100	---	4.5
	06-May-2010	530	< 5.0	2.15	9.54	< 5.0	50.0	**1.45**	16.4	**0.249**	---	110	0.160	435	---	776	192	8.22	---	453	1.30	---	< 0.050	---	< 0.050	< 0.071	---	---	97.5	---	4.1
	02-Jun-2011	530	< 5.0	1.92	9.12	< 5.0	48.1	**1.25**	15.3	**0.231**	3.74	103	0.162	434	---	796	183	8.24	---	442	1.36	---	< 0.050	---	< 0.050	< 0.071	---	---	92.1	---	5.2
	30-May-2012	529	< 5.0	1.81	9.24	< 5.0	48.0	**1.33**	14.4	**0.238**	4.00	101	0.119	433	---	786	179	8.18	---	438	1.31	---	< 0.050	---	< 0.050	< 0.071	---	---	90.5	---	4.6
	10-Jul-2013	525	< 5.0	2.28	10.0	< 5.0	49.7	**1.17**	16.2	**0.252**	3.98	118	0.147	430	---	769	191	7.92	464	458	---	---	< 0.050	---	< 0.050	< 0.071	---	---	102	---	4.4
	12-Jun-2014	485	< 5.0	2.63	11.0	< 5.0	48.8	**1.30**	15.4	**0.245**	4.07	104	0.129	398	---	698	185	8.16	457	425	---	---	< 0.050	---	< 0.020	< 0.054	---	---	101	---	6.3
	24-Jun-2015	530	< 0.50	2.9	13	< 0.50	49	**1.3**	16	**0.24**	3.9	110	0.16	430	< 0.50	780	190	7.70	460	460	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	9.0	9.0	---	1.0	4.9
	20-Sep-2016	508	< 5.0	2.09	11.3	< 5.0	50.9	**1.33**	15.4	**0.235**	3.77	105	0.124	417	---	762	191	8.14	459	439	---	---	< 0.020	---	< 0.010	< 0.022	---	---	98.2	---	7.6
	14-Jul-2017	503	< 5.0	2.43	10.8	< 5.0	42.3	**1.29**	15.5	**0.227**	3.52	106	0.125	412	---	724	169	8.15	493	445	---	---	< 0.020	---	< 0.010	< 0.022	---	---	89.8	---	5.1
MW-02B	20-Sep-2016	357	< 5.0	**812**	41.7	< 5.0	40.4	< 0.050	8.75	**0.109**	4.85	**571**	0.41	293	---	3180	137	8.28	**1760**	**1650**	---	---	< 0.10	---	< 0.050	< 0.11	---	---	93.4	---	9.8
	14-Jul-2017	403	< 5.0	**804**	13.3	< 5.0	35.8	**0.687**	7.18	**0.200**	3.60	**589**	0.475	330	---	3210	119	8.29	**1850**	**1660**	---	---	< 0.040	---	< 0.020	< 0.045	---	---	93.8	---	7.9
	29-Sep-2017	372	10.4	**975**	5.8	< 5.0	37.2	**0.44**	7.34	**0.114**	4.0	**673**	0.42	322	---	3370	123	8.55	---	**1900**	---	---	< 0.10	---	< 0.050	< 0.11	---	---	93.4	---	10.2

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Table 3

Groundwater Analytical Results: Indicator Analysis Parameters

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Anions: Bicarbonate (mg/L)	Carbonate (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Hydroxide (mg/L)	Cations: Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Fluoride (mg/L)	General: Alkalinity (Total; as $CaCO_3$) (mg/L)	Alkalinity (PP; as $CaCO_3$) (mg/L)	Electrical Conductivity (uS/cm)	Hardness (Total; as $CaCO_3$) (mg/L)	pH (pH Units)	Total Dissolved Solids (mg/L)	Total Dissolved Solids (Calculated) (mg/L)	Inorganic Nitrogen Compounds: Ammonia (Total; as N) (mg/L)	Nitrate (mg/L)	Nitrate (as N) (mg/L)	Nitrite (mg/L)	Nitrite (as N) (mg/L)	Nitrite-plus-Nitrate (as N) (mg/L)	Ion Balance: Cation Sum (meq/L)	Anion Sum (meq/L)	Ion Balance (%)	Ion Balance (Balance)	Miscellaneous: Dissolved Organic Carbon (mg/L)
Canadian Drinking Water AO Guidelines 2017		---	---	250	500	---	---	0.3	---	0.05	---	200	---	---	---	---	---	(7 - 10.5)	500	500	---	---	---	---	---	---	---	---	---	---	---
Canadian Drinking Water MAC Guidelines 2017		---	---	---	---	---	---	---	---	---	---	---	1.5	---	---	---	---	---	---	---	---	45	10	3.2	1	10	---	---	---	---	---
QA/QC																															
FIELD BLANK	05-May-2010	< 5.0	< 5.0	< 0.50	< 0.50	< 5.0	< 0.50	< 0.020	< 0.10	< 0.0050	---	< 0.50	< 0.050	< 5.0	---	1.07	< 1.0	**6.06**	---	< 1.0	< 0.050	---	< 0.050	---	< 0.050	< 0.071	---	---	LowTDS	---	< 1.0
	25-May-2011	< 5.0	< 5.0	< 0.50	< 0.50	< 5.0	< 0.50	< 0.020	< 0.10	< 0.0050	< 0.10	< 0.50	< 0.050	< 5.0	---	1.06	< 1.0	**6.02**	---	< 1.0	< 0.050	---	< 0.050	---	< 0.050	< 0.071	---	---	LowTDS	---	< 1.0
	09-Jul-2013	< 5.0	< 5.0	< 0.50	< 0.50	< 5.0	< 0.50	< 0.010	< 0.10	< 0.0020	< 0.10	< 1.0	< 0.020	< 2.0	---	1.90	< 1	**6.19**	< 10	< 1	---	---	< 0.050	---	< 0.050	< 0.071	---	---	Low TDS	---	3.5
	13-Jun-2014	< 5.0	< 5.0	< 0.50	< 0.50	< 5.0	< 0.50	< 0.010	< 0.10	< 0.0020	< 0.10	< 1.0	< 0.020	< 2.0	---	1.80	< 1	**5.52**	< 10	< 1	---	---	< 0.050	---	< 0.020	< 0.054	---	---	Low TDS	---	< 1.0
	25-Jun-2015	< 0.50	< 0.50	< 1.0	< 1.0	< 0.50	< 0.30	< 0.060	< 0.20	< 0.0040	< 0.30	< 0.50	< 0.050	< 0.50	< 0.50	< 1.0	< 0.50	**4.73**	< 10	< 10	---	< 0.044	< 0.010	< 0.033	< 0.010	< 0.020	0.018	0	---	< 0.010	0.56
	19-Sep-2016	< 5.0	< 5.0	< 0.50	< 0.30	< 5.0	< 0.050	< 0.010	< 0.0050	< 0.00010	< 0.050	< 0.050	< 0.020	< 2.0	---	< 2.0	< 1	**5.41**	< 10	< 1	---	---	< 0.020	---	< 0.010	< 0.022	---	---	Low TDS	---	< 1.0
	14-Jul-2017	---	---	---	---	---	< 0.050	< 0.010	< 0.0050	< 0.00010	< 0.050	0.102	---	---	---	---	---	---	< 10	---	---	---	---	---	---	---	---	---	---	---	< 1.0
	02-Aug-2017	< 5.0	< 5.0	< 0.50	< 0.30	< 5.0	0.110	---	0.0108	---	< 0.050	0.085	< 0.020	< 2.0	---	< 2.0	< 1	**6.17**	---	< 1	---	---	< 0.020	---	< 0.010	< 0.022	---	---	Low TDS	---	---
Relative Percent Difference (RPD) Report																															
MW-03	13-Jul-2017	419	< 5.0	57.6	121	< 5.0	108	**5.50**	40.1	**0.282**	3.12	52.6	0.088	344	---	958	435	7.65	**629**	**612**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	95.1	---	3.8
(Duplicate)	13-Jul-2017	418	< 5.0	57.9	122	< 5.0	111	**5.20**	37.2	**0.260**	2.91	49.8	0.082	343	---	958	430	7.78	**631**	**609**	---	---	< 0.020	---	< 0.010	< 0.022	---	---	93.3	---	3.5
RPD(%)		**0.2%**	**---**	**0.5%**	**0.8%**	**---**	**2.7%**	**5.6%**	**7.5%**	**8.1%**	**7.0%**	**5.5%**	**7.1%**	**0.3%**	**---**	**0.0%**	**1.2%**	**1.7%**	**0.3%**	**0.5%**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**---**	**1.9%**	**---**	**8.2%**

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Denotes values exceeding

(Health Canada, February 2017. Guidelines for Canadian Drinking Water Quality. Aesthetic Objective. Summary Table. Prepared by the Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment)

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Table 4

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Strontium (mg/L)	Thallium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
Canadian Drinking Water AO Guidelines 2017		**0.1**	---	---	---	---	---	---	---	---	---	**1**	**0.3**	---	---	**0.05**	---	---	---	---	---	---	---	---	---	---	---	---	---	**5**
Canadian Drinking Water MAC Guidelines 2017		---	**0.006**	**0.01**	**1**	---	---	**5**	**0.005**	**0.05**	---	---	---	**0.01**	---	---	**0.001**	---	---	---	**0.05**	---	---	---	---	---	---	**0.02**	---	---
Groundwater Monitoring																														
MW-01	07-Mar-2005	0.02	0.0008	0.0008	0.199	< 0.0005	< 0.00005	0.053	< 0.0001	0.0009	0.0017	< 0.0006	**1.02**	0.0004	---	**0.605**	< 0.0001	0.0007	0.0004	---	< 0.0004	---	< 0.0002	0.579	< 0.0005	< 0.0002	0.0013	0.0026	0.0003	0.004
	17-Nov-2005	0.01	0.0005	0.0009	0.143	< 0.0005	< 0.0001	0.046	< 0.0001	< 0.0004	0.0015	0.0007	**1.67**	< 0.0001	---	**0.662**	< 0.0001	0.0013	0.0012	---	< 0.0004	---	< 0.0002	0.551	< 0.0001	< 0.0002	0.0012	0.0023	0.0001	< 0.002
	15-Jun-2006	< 0.01	0.0006	0.0009	0.134	< 0.0005	< 0.00005	0.045	< 0.0001	0.0027	0.0008	< 0.0006	**1.81**	< 0.0001	---	**0.7**	< 0.0001	0.0004	< 0.0001	---	< 0.0004	---	< 0.0002	0.554	< 0.00005	< 0.0002	0.001	0.0022	< 0.0001	0.005
	12-Jul-2007	< 0.01	0.0004	0.0009	0.127	< 0.0005	< 0.00005	0.054	< 0.0001	0.0011	0.0009	< 0.0006	**1.84**	< 0.0001	---	**0.664**	< 0.0001	0.0009	0.003	---	0.0005	---	< 0.0002	0.558	< 0.00005	< 0.0002	0.0008	0.0022	< 0.0001	< 0.002
	19-Dec-2007	< 0.001	< 0.0002	< 0.001	0.11	< 0.001	---	0.05	< 0.0002	< 0.001	0.0009	< 0.0002	< 0.06	< 0.0002	---	**0.67**	< 0.00005	0.0008	0.0027	---	< 0.001	---	< 0.0001	0.53	< 0.0002	< 0.001	0.001	0.0024	< 0.001	< 0.003
	21-Apr-2009	< 0.001	< 0.0002	0.0008	---	< 0.001	---	---	< 0.000005	< 0.001	0.0008	0.0005	< 0.06	< 0.0002	---	**0.66**	0.000001	0.0004	0.0009	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0021	< 0.001	< 0.003
	05-May-2010	< 0.0050	< 0.00040	0.00095	0.132	< 0.00050	---	0.053	< 0.00010	< 0.0050	0.00088	< 0.0010	**2.02**	< 0.00010	---	**0.730**	< 0.00010	0.00046	0.0025	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00081	0.00209	< 0.00010	< 0.0020
	25-May-2011	0.0051	< 0.00040	0.00093	0.147	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	0.00084	0.0017	**1.53**	< 0.00010	---	**0.675**	< 0.000020	0.00039	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00205	0.00016	0.0074
	29-May-2012	< 0.0050	< 0.00040	0.00088	0.120	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	0.00068	< 0.0010	**1.57**	< 0.00010	---	**0.694**	< 0.000020	0.000423	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00194	< 0.00010	0.0034
	10-Jul-2013	< 0.0050	< 0.00040	0.00098	0.147	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	0.00075	< 0.0010	**1.82**	< 0.00010	---	**0.729**	< 0.000020	0.000360	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00223	< 0.00010	< 0.0030
	16-Jun-2014	< 0.0050	< 0.00040	0.00092	0.144	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	0.00072	< 0.0010	**1.92**	< 0.00010	---	**0.737**	< 0.0000050	0.000281	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00212	< 0.00010	< 0.0030
	29-Jun-2015	0.0038	< 0.00060	0.00079	0.13	< 0.0010	---	0.051	< 0.000020	< 0.0010	0.00076	0.00046	**1.9**	< 0.00020	0.027	**0.71**	---	0.00038	0.00091	< 0.10	< 0.00020	7.1	< 0.00010	0.55	< 0.00020	< 0.0010	< 0.0010	0.0021	< 0.0010	< 0.0030
	19-Sep-2016	< 0.0010	< 0.00010	0.00095	0.137	< 0.00010	---	0.054	< 0.0000050	< 0.00010	0.00073	< 0.00020	**1.76**	< 0.000050	---	**0.699**	< 0.0000050	0.000264	0.00100	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00199	< 0.00050	0.0013
	13-Jul-2017	< 0.0010	< 0.00010	0.00088	0.131	< 0.00010	---	0.050	< 0.0000050	< 0.00010	0.00069	< 0.00020	**1.93**	< 0.000050	---	**0.714**	< 0.0000050	0.000177	0.00084	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00209	< 0.00050	< 0.0010
MW-02	07-Mar-2005	0.02	0.001	0.0025	0.204	< 0.0005	< 0.00005	0.12	< 0.0001	0.0013	0.0008	0.0015	0.275	0.0004	---	**0.236**	0.0001	0.0046	< 0.0001	---	0.0008	---	< 0.0002	1.03	< 0.0005	< 0.0002	0.0012	0.0032	0.0017	0.004
	17-Nov-2005	0.03	0.0006	0.0014	0.152	< 0.0005	< 0.0001	0.189	< 0.0001	< 0.0004	0.0031	0.0021	0.085	< 0.0001	---	**0.671**	< 0.0001	0.0148	0.0644	---	0.0006	---	< 0.0002	1.54	0.00006	< 0.0002	0.0015	0.0053	0.0005	< 0.002
	15-Jun-2006	< 0.01	0.0007	0.0024	0.107	< 0.0005	0.00005	0.152	< 0.0001	0.004	0.0031	0.0011	**3.19**	< 0.0001	---	**1.09**	< 0.0001	0.0009	0.0012	---	0.0005	---	< 0.0002	1.46	< 0.00005	< 0.0002	0.0012	0.0023	< 0.0001	0.1012
	13-Jul-2007	< 0.01	0.0005	0.0036	0.0749	< 0.0005	< 0.00005	0.136	< 0.0001	< 0.0004	0.0032	0.0007	**8.72**	< 0.0001	---	**0.841**	< 0.0001	0.0008	0.0055	---	< 0.0004	---	< 0.0002	1.46	< 0.00005	< 0.0002	0.0011	0.0019	< 0.0001	< 0.002
	19-Dec-2007	< 0.001	< 0.0002	0.003	0.04	< 0.001	---	0.13	< 0.0002	0.004	0.0026	0.0005	< 0.06	0.0003	---	**0.7**	< 0.00005	0.0006	0.0046	---	< 0.001	---	< 0.0001	1.3	< 0.0002	< 0.001	0.002	0.0014	0.002	< 0.003
	21-Apr-2009	< 0.001	< 0.0002	0.0038	---	< 0.001	---	---	< 0.000005	< 0.001	0.0017	0.0002	**1.5**	< 0.0002	---	**0.53**	0.000001	0.0005	0.0019	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0014	< 0.001	< 0.003
	05-May-2010	< 0.0050	< 0.00040	0.00369	0.0544	< 0.00050	---	0.144	< 0.00010	< 0.0050	0.00157	< 0.0010	**9.35**	< 0.00010	---	**0.505**	< 0.00010	0.00041	0.0043	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00104	0.00139	< 0.00010	0.0044
	25-May-2011	< 0.0050	< 0.00040	0.00327	0.0420	< 0.00050	---	0.135	< 0.00010	< 0.0050	0.00100	< 0.0010	**9.25**	< 0.00010	---	**0.434**	< 0.000020	0.00040	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00114	< 0.00010	0.0025
	30-May-2012	0.0106	< 0.00040	0.00312	0.0586	< 0.00050	---	0.133	< 0.00010	< 0.0050	0.00103	< 0.0010	**8.07**	< 0.00010	---	**0.431**	< 0.000020	0.000615	0.0027	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00123	< 0.00010	0.0031
	10-Jul-2013	< 0.0050	< 0.00040	0.00340	0.0850	< 0.00050	---	0.200	< 0.00010	< 0.0050	0.00072	< 0.0010	**12.3**	< 0.00010	---	**0.554**	< 0.000020	0.000324	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00102	< 0.00010	< 0.0030
	16-Jun-2014	< 0.0050	< 0.00040	0.00319	0.0659	< 0.00050	---	0.163	< 0.00010	< 0.0050	0.00059	< 0.0010	**10.8**	< 0.00010	---	**0.446**	< 0.0000050	0.00037	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00060	0.00097	< 0.00020	< 0.0030
	28-Aug-2014	< 0.0050	< 0.00040	0.00302	0.0686	---	---	0.144	< 0.00010	< 0.0050	---	< 0.0010	**8.49**	< 0.00010	---	**0.488**	0.0000059	---	< 0.0020	---	< 0.00040	---	< 0.00010	---	---	---	---	0.00132	---	< 0.0030
	25-Jun-2015	0.0035	< 0.00060	0.0028	0.092	< 0.0010	---	0.21	< 0.000020	< 0.0010	0.00043	< 0.00020	**11**	< 0.00020	0.078	**0.41**	---	0.00036	0.00072	< 0.10	< 0.00020	8.5	< 0.00010	1.5	< 0.00020	< 0.0010	< 0.0010	0.00086	< 0.0010	< 0.0030
	19-Sep-2016	< 0.0020	< 0.00020	0.00322	0.114	< 0.00020	---	0.235	< 0.000010	< 0.00020	0.00035	< 0.00040	**9.74**	< 0.00010	---	**0.384**	< 0.0000050	0.00048	< 0.0010	---	< 0.00010	---	< 0.000020	---	< 0.000020	---	< 0.00060	0.000897	< 0.0010	0.0042
	13-Jul-2017	< 0.0010	< 0.00010	0.00345	0.124	< 0.00010	---	0.150	< 0.0000050	< 0.00010	0.00057	< 0.00020	**7.99**	0.000078	---	**0.372**	< 0.0000050	0.000337	0.00105	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00127	< 0.00050	< 0.0010
	29-Sep-2017	< 0.0010	< 0.00010	0.00336	0.191	< 0.00010	---	0.183	< 0.0000050	< 0.00010	0.00038	< 0.00020	**11.2**	< 0.000050	---	**0.467**	< 0.0000050	0.000496	0.00091	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000912	< 0.00050	< 0.0010
MW-03	07-Mar-2005	< 0.01	0.0007	0.0012	0.0744	< 0.0005	< 0.00005	0.128	< 0.0001	0.0009	0.0012	< 0.0006	**3.19**	< 0.0001	---	**0.264**	< 0.0001	0.0008	< 0.0001	---	< 0.0004	---	< 0.0002	0.811	< 0.0005	< 0.0002	0.001	0.0007	< 0.0001	0.003
	17-Nov-2005	0.01	0.0006	0.0014	0.0418	< 0.0005	0.00009	0.119	< 0.0001	< 0.0004	0.0008	0.0008	**4.47**	< 0.0001	---	**0.239**	< 0.0001	0.0015	0.0003	---	0.0005	---	< 0.0002	0.828	< 0.0001	< 0.0002	0.0019	0.0007	< 0.0001	< 0.002
	15-Jun-2006	< 0.01	0.0006	0.0013	0.0411	< 0.00045	< 0.00005	0.109	< 0.0001	0.0029	0.0008	0.0007	**4.85**	< 0.0001	---	**0.258**	< 0.0001	0.0007	< 0.0001	---	0.0005	---	< 0.0002	0.845	< 0.00005	< 0.0002	0.001	0.0007	< 0.0001	0.01
	12-Jul-2007	< 0.01	0.0004	0.0014	0.0379	< 0.0005	< 0.00005	0.115	< 0.0001	0.0012	0.0008	< 0.0006	**4.89**	0.0005	---	**0.249**	0.00009	0.0029	< 0.00001	---	< 0.0002	---	< 0.0002	0.001	0.0007	0.882	< 0.00005	0.0002	< 0.001	< 0.002
	19-Dec-2007	< 0.001	< 0.0002	< 0.001	0.03	< 0.001	---	0.11	< 0.0002	0.002	0.0008	0.0002	< 0.06	0.0002	---	**0.25**	< 0.00005	0.0012	0.0042	---	< 0.001	---	< 0.0001	0.82	< 0.0002	< 0.001	0.002	0.0006	0.001	< 0.003
	21-Apr-2009	< 0.001	< 0.0002	0.0013	---	< 0.001	---	---	< 0.000005	< 0.001	0.0006	0.0007	< 0.06	0.0002	---	**0.24**	0.000001	0.0007	0.001	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0006	< 0.001	< 0.003
	06-May-2010	< 0.0050	< 0.00040	0.00154	0.0380	< 0.00050	---	0.116	< 0.00010	< 0.0050	0.00076	< 0.0010	**5.23**	< 0.00010	---	**0.253**	< 0.00010	0.00079	0.0027	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00079	0.00056	0.00036	< 0.0020
	02-Jun-2011	< 0.0050	< 0.00040	0.00141	0.0389	< 0.00050	---	0.103	< 0.00010	< 0.0050	0.00061	< 0.0010	**5.55**	< 0.00010	---	**0.277**	< 0.000020	0.00056	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00058	< 0.00010	< 0.0020
	29-May-2012	< 0.0050	< 0.00040	0.00132	0.0350	< 0.00050	---	0.088	< 0.00010	< 0.0050	0.00062	< 0.0010	**4.83**	< 0.00010	---	**0.246**	< 0.000020	0.000535	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00051	< 0.00010	< 0.0030
	10-Jul-2013	< 0.0050	< 0.00040	0.00147	0.0431	< 0.00050	---	0.098	< 0.00010	< 0.0050	0.00073	< 0.0010	**5.36**	< 0.00010	---	**0.274**	< 0.000020	0.000682	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00064	< 0.00010	< 0.0030
	16-Jun-2014	< 0.0050	< 0.00040	0.00143	0.0428	< 0.00050	---	0.097	< 0.00010	< 0.0050	0.00070	< 0.0010	**5.13**	< 0.00010	---	**0.263**	< 0.0000050	0.000496	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00058	< 0.00010	< 0.0030
	29-Jun-2015	0.0031	< 0.00060	0.0014	0.043	< 0.0010	---	0.12	< 0.000020	< 0.0010	0.00074	0.00036	**5.4**	< 0.00020	0.042	**0.27**	---	0.00073	0.00083	< 0.10	< 0.00020	8.4	< 0.00010	0.88	< 0.00020	< 0.0010	< 0.0010	0.00059	< 0.0010	0.0097
	19-Sep-2016	< 0.0010	< 0.00010	0.00154	0.0426	< 0.00010	---	0.122	< 0.0000050	< 0.00010	0.00069	< 0.00020	**5.22**	< 0.0000050	---	**0.269**	< 0.0000050	0.000443	0.00098	---	< 0.0000050	---	< 0.0000010	---	< 0.0000010	---	< 0.0000030	0.000561	< 0.0000050	< 0.0010
	13-Jul-2017	< 0.0010	< 0.00010	0.00148	0.0431	< 0.00010	---	0.105	< 0.0000050	< 0.00010	0.00071	< 0.00020	**5.50**	0.000094	---	**0.282**	< 0.0000050	0.000371	0.00096	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000619	< 0.00050	< 0.0010
(Duplicate)	13-Jul-2017	< 0.0010	< 0.00010	0.00138	0.0437	< 0.00010	---	0.111	< 0.0000050	< 0.00010	0.00066	< 0.00020	**5.20**	0.000090	---	**0.260**	< 0.0000050	0.000407	0.00088	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000597	< 0.00050	< 0.0010
MW-04	08-Mar-2005	< 0.01	0.0009	0.0011	0.0737	< 0.0005	< 0.00005	0.101	< 0.0001	0.0018	0.0007	0.0008	0.173	0.0002	---	**0.152**	< 0.0001	0.0005	< 0.0001	---	0.0006	---	< 0.0002	0.561	< 0.0005	< 0.0002	0.0007	0.0029	< 0.0001	0.004
	17-Nov-2005	< 0.01	0.0007	0.0006	0.0809	< 0.0005	0.00007	0.093	< 0.0001	0.0007	0.0049	0.0012	0.104	< 0.0001	---	**0.053**	0.0002	0.003	0.014	---	0.0009	---	< 0.0002	0.616	< 0.0001	< 0.0002	0.0004	0.0025	< 0.0001	0.029
(Duplicate)	17-Nov-2005	0.01	0.0006	0.0007	0.0817	< 0.0005	0.00005	0.097	< 0.0001	0.0009	0.0051	0.0012	0.105	< 0.0001	---	**0.053**	0.0001	0.0028	0.0132	---	0.0009	---	< 0.0002	0.609	< 0.0001	< 0.0002	0.0004	0.0026	< 0.0001	0.032
	14-Jun-2006	< 0.01	0.0008	0.0006	0.764	< 0.0005	< 0.00005	0.092	< 0.0001	0.0017	< 0.0001	0.0009	0.005	< 0.0001	---	**0.13**	< 0.0001	0.0005	0.0007	---	0.001	---	< 0.0002	0.585	< 0.00005	< 0.0002	0.0003	0.0028	0.0022	0.005
	13-Jul-2007	< 0.01	< 0.0004	0.0008	0.085	< 0.0005	< 0.00005	0.1	< 0.0001	0.0047	0.0001	< 0.0006	< 0.005	< 0.0001	---	0.009	0.0002	0.0005	0.0042	---	0.0006	---	< 0.0002	0.59	0.00024	< 0.0002	0.0004	0.0027	0.0009	0.005
	19-Dec-2007	< 0.001	< 0.0002	< 0.001	0.08	< 0.001	---	0.09	< 0.0002	0.001	< 0.0003	0.0006	< 0.06	0.0002	---	0.016	< 0.00005	0.0006	0.0052	---	< 0.001	---	< 0.0001	0.61	< 0.0002	< 0.001	0.002	0.0023	< 0.001	< 0.003
	21-Apr-2009	< 0.001	< 0.0002	< 0.0002	---	< 0.001	---	---	0.000024	< 0.001	< 0.0003	0.0009	< 0.06	< 0.0002	---	0.03	0.000003	0.0004	0.0021	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0029	< 0.001	< 0.003
	06-May-2010	< 0.0050	< 0.00040	0.00117	0.0843	< 0.00050	---	0.098	< 0.00010	< 0.0050	0.00054	< 0.0010	0.078	< 0.00010	---	**0.258**	< 0.00010	0.00038	0.0047	---	0.00106	---	< 0.00010	---	< 0.000050	---	0.00046	0.00284	0.00072	< 0.0020

Advisian
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Table 4

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Strontium (mg/L)	Thallium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
Canadian Drinking Water AO Guidelines 2017		**0.1**	---	---	---	---	---	---	---	---	---	**1**	**0.3**	---	---	**0.05**	---	---	---	---	---	---	---	---	---	---	---	---	---	**5**
Canadian Drinking Water MAC Guidelines 2017		---	**0.006**	**0.01**	**1**	---	---	**5**	**0.005**	**0.05**	---	---	---	**0.01**	---	---	**0.001**	---	---	---	**0.05**	---	---	---	---	---	---	**0.02**	---	---
MW-04 (cont'd)	07-Jun-2011	< 0.0050	< 0.00040	< 0.00040	0.0832	< 0.00050	---	0.090	< 0.00010	< 0.0050	0.00015	< 0.0010	0.028	< 0.00010	---	**0.114**	< 0.000020	0.00038	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00333	< 0.00010	< 0.0020
	30-May-2012	0.0135	< 0.00040	0.00054	0.0954	< 0.00050	---	0.086	< 0.00010	< 0.0050	0.00088	< 0.0010	**1.47**	< 0.00010	---	**0.722**	< 0.000020	0.000398	0.0024	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00396	< 0.00010	< 0.0030
(Duplicate)	30-May-2012	0.0112	< 0.00040	0.00059	0.0967	< 0.00050	---	0.087	< 0.00010	< 0.0050	0.00088	< 0.0010	**1.73**	< 0.00010	---	**0.861**	< 0.000020	0.000326	0.0022	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00041	0.00404	< 0.00010	< 0.0030
	09-Jul-2013	< 0.0050	< 0.00040	0.00065	0.103	< 0.00050	---	0.091	< 0.00010	< 0.0050	0.00058	< 0.0010	**1.70**	< 0.00010	---	**0.561**	< 0.000020	0.000359	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00392	< 0.00010	< 0.0030
	13-Jun-2014	< 0.0050	< 0.00040	0.00053	0.109	< 0.00050	---	0.069	< 0.00010	< 0.0050	0.00035	< 0.0010	**1.39**	< 0.00010	---	**0.494**	< 0.0000050	0.000297	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00390	< 0.00010	< 0.0030
	29-Jun-2015	0.0035	< 0.00060	0.00057	0.11	< 0.0010	---	0.094	< 0.000020	< 0.0010	0.00042	< 0.00020	**1.9**	< 0.00020	0.041	**0.54**	---	0.00039	0.0018	< 0.10	< 0.00020	4.9	< 0.00010	0.63	< 0.00020	< 0.0010	< 0.0010	0.0038	< 0.0010	< 0.0030
	19-Sep-2016	< 0.0010	< 0.00010	0.00062	0.123	< 0.00010	---	0.094	< 0.0000050	< 0.00010	0.00044	< 0.00020	**2.33**	< 0.000050	---	**0.621**	< 0.0000050	0.000220	0.00221	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00348	< 0.00050	< 0.0010
	13-Jul-2017	< 0.0010	< 0.00010	0.00077	0.118	< 0.00010	---	0.087	< 0.0000050	< 0.00010	0.00043	< 0.00020	**2.24**	0.000073	---	**0.616**	< 0.0000050	0.000189	0.00210	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00357	< 0.00050	< 0.0010
MW-05	08-Mar-2005	< 0.01	0.0008	0.0035	0.0618	< 0.0005	< 0.00005	0.14	< 0.0001	0.0009	0.0008	< 0.0006	**1.14**	0.0002	---	**0.402**	< 0.0001	0.0022	< 0.0001	---	0.0004	---	< 0.0002	0.71	< 0.0005	< 0.0002	0.0008	0.0014	0.0002	0.003
	17-Nov-2005	< 0.01	0.0005	0.0081	0.0564	< 0.0005	0.00006	0.116	< 0.0001	< 0.0004	0.001	0.0007	**3.31**	< 0.0001	---	**0.531**	< 0.0001	0.0029	0.0022	---	0.0004	---	< 0.0002	0.667	< 0.0001	< 0.0002	0.0009	0.0008	0.0001	< 0.002
	14-Jun-2006	< 0.01	0.0007	0.0051	0.454	< 0.0005	< 0.00005	0.081	< 0.0001	0.0016	0.0007	0.0006	**3.48**	< 0.0001	---	**0.583**	< 0.0001	0.0013	0.0002	---	< 0.0004	---	< 0.0002	0.659	< 0.00005	< 0.0002	0.0005	0.0007	0.0008	0.004
	13-Jul-2007	< 0.01	0.0005	0.0018	0.0455	< 0.0005	< 0.00005	0.052	< 0.0001	0.0005	0.0008	0.0009	**4**	< 0.0001	---	**0.682**	< 0.0001	0.0006	0.0034	---	0.0005	---	< 0.0002	0.684	< 0.00005	< 0.0002	0.0006	0.0007	< 0.0001	0.005
	19-Dec-2007	< 0.001	< 0.0002	0.001	0.04	< 0.001	---	0.06	< 0.0002	0.003	0.0007	< 0.0002	< 0.06	0.0002	---	**0.66**	< 0.00005	0.0005	0.0029	---	< 0.001	---	< 0.0001	0.63	< 0.0002	< 0.001	0.002	0.0007	0.001	< 0.003
	21-Apr-2009	< 0.001	< 0.0002	0.0014	---	< 0.001	---	---	< 0.000005	< 0.001	0.0007	0.0008	< 0.06	< 0.0002	---	**0.72**	0.000001	0.0006	0.0014	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0007	< 0.001	< 0.003
	29-Apr-2010	< 0.0050	0.00052	0.00170	0.0478	< 0.00050	---	0.064	< 0.00010	< 0.0050	0.00082	< 0.0010	**3.39**	< 0.00010	---	**0.758**	< 0.00010	0.00063	0.0039	---	0.00086	---	< 0.00010	---	< 0.000050	---	0.00088	0.00070	0.00017	0.0025
	25-May-2011	< 0.0050	< 0.00040	0.00159	0.0552	< 0.00050	---	0.052	< 0.00010	< 0.0050	0.00075	< 0.0010	**3.82**	< 0.00010	---	**0.657**	< 0.000020	0.00042	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00066	< 0.00010	< 0.0020
	29-May-2012	< 0.0050	< 0.00040	0.00107	0.0455	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	0.00067	< 0.0010	**3.83**	< 0.00010	---	**0.707**	< 0.000020	0.000321	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00063	< 0.00010	< 0.0030
	08-Jul-2013	< 0.0050	< 0.00040	0.00136	0.0547	< 0.00050	---	0.050	< 0.00010	< 0.0050	0.00082	< 0.0010	**3.17**	< 0.00010	---	**0.754**	< 0.000020	0.000414	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00060	< 0.00010	0.0049
	13-Jun-2014	< 0.0050	< 0.00040	0.00173	0.0486	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	0.00081	< 0.0010	**4.37**	< 0.00010	---	**0.758**	< 0.0000050	0.000415	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00071	< 0.00010	< 0.0030
	25-Jun-2015	< 0.0030	< 0.00060	0.0018	0.051	< 0.0010	---	0.059	< 0.000020	< 0.0010	0.00084	0.00056	**4.8**	< 0.00020	0.041	**0.71**	---	0.00054	0.00091	< 0.10	< 0.00020	6.6	< 0.00010	0.69	< 0.00020	< 0.0010	< 0.0010	0.00072	< 0.0010	0.0034
	19-Sep-2016	< 0.0010	< 0.00010	0.00122	0.0504	< 0.00010	---	0.057	< 0.0000050	< 0.00010	0.00076	< 0.00020	**4.39**	< 0.000050	---	**0.757**	< 0.0000050	0.000272	0.00130	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000706	< 0.00050	0.0013
	13-Jul-2017	0.0022	< 0.00010	0.00200	0.0515	< 0.00010	---	0.055	< 0.0000050	< 0.00010	0.00084	< 0.00020	**4.82**	< 0.000050	---	**0.742**	< 0.0000050	0.000296	0.00127	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000755	< 0.00050	< 0.0010
MW-06	08-Mar-2005	< 0.01	0.0009	0.0042	0.071	< 0.0005	< 0.00005	0.148	< 0.0001	0.0035	0.0012	0.0011	**2.92**	0.0004	---	**1.32**	< 0.0001	0.0014	< 0.0001	---	0.0005	---	< 0.0002	1.2	< 0.0005	< 0.0002	0.0008	0.0023	0.0002	0.004
	17-Nov-2005	0.01	0.0005	0.0038	0.0557	< 0.0005	0.00006	0.16	< 0.0001	< 0.0004	0.0012	0.0012	**2.96**	< 0.0001	---	**0.943**	< 0.0001	0.0015	0.0004	---	0.0005	---	< 0.0002	1.26	< 0.0001	< 0.0002	0.0015	0.0015	0.0001	< 0.002
	16-Jun-2006	< 0.01	0.0009	0.0034	0.0666	< 0.0005	< 0.00005	0.149	< 0.0001	0.0015	0.0007	0.0014	**3.58**	< 0.0001	---	**1.01**	< 0.0001	0.0014	< 0.0001	---	0.0007	---	< 0.0002	1.28	< 0.0005	< 0.0002	0.001	0.0016	< 0.001	0.008
	12-Jul-2007	< 0.01	0.0005	0.0042	0.043	< 0.0005	< 0.00005	0.159	< 0.0001	0.0014	0.0009	0.0014	**4.5**	< 0.0001	---	**1.28**	< 0.0001	0.0016	0.006	---	< 0.0004	---	< 0.00021	1.42	< 0.0005	< 0.0002	0.0014	0.0016	< 0.0001	0.003
	19-Dec-2007	< 0.001	< 0.0002	0.003	0.03	< 0.001	---	0.13	< 0.0002	0.002	0.0008	0.0011	< 0.06	0.0002	---	**1.5**	< 0.00005	0.0012	0.0052	---	< 0.001	---	< 0.0001	1.4	< 0.0002	< 0.001	0.002	0.0018	0.001	< 0.003
	22-Apr-2009	< 0.001	< 0.0002	0.005	---	< 0.001	---	---	0.000009	< 0.001	0.0004	< 0.0002	**5.7**	< 0.0002	---	**1.7**	< 0.000001	0.001	0.0015	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0017	< 0.001	< 0.003
	06-May-2010	< 0.0050	< 0.00040	0.00507	0.0353	< 0.00050	---	0.150	< 0.00010	< 0.0050	0.00052	0.0012	**5.38**	< 0.00010	---	**1.39**	< 0.00010	0.00094	0.0039	---	0.00041	---	< 0.00010	---	< 0.000050	---	0.00125	0.00146	0.00016	0.0063
	07-Jun-2011	0.0288	< 0.00040	0.00570	0.0309	< 0.00050	---	0.138	< 0.00010	< 0.0050	0.00036	< 0.0010	**5.55**	< 0.00010	---	**1.64**	< 0.000020	0.00080	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00063	0.00180	0.00016	< 0.0020
	29-May-2012	0.0104	< 0.00040	0.00525	0.0265	< 0.00050	---	0.122	< 0.00010	< 0.0050	0.00030	< 0.0010	**6.02**	< 0.00010	---	**1.70**	< 0.000020	0.000878	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00173	< 0.00010	0.0036
	08-Jul-2013	< 0.0050	< 0.00040	0.00544	0.0315	< 0.0010	---	0.123	< 0.00010	< 0.0050	0.00036	< 0.0010	**5.84**	< 0.00010	---	**1.72**	< 0.000020	0.00097	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.00010	---	< 0.00060	0.00158	< 0.00020	< 0.0030
	12-Jun-2014	< 0.0050	< 0.00040	0.00505	0.0315	< 0.00050	---	0.112	< 0.00010	< 0.0050	0.00030	< 0.0010	**5.93**	< 0.00010	---	**1.62**	< 0.0000050	0.00084	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00060	0.00169	< 0.00020	< 0.0030
	25-Jun-2015	< 0.0030	< 0.00060	0.0045	0.033	< 0.0010	---	0.15	< 0.000020	< 0.0010	< 0.00030	< 0.00020	**6.1**	< 0.00020	0.11	**1.5**	---	0.0010	< 0.00050	0.18	< 0.00020	7.6	< 0.00010	1.4	< 0.00020	< 0.0010	< 0.0010	0.0016	< 0.0010	< 0.0030
	20-Sep-2016	< 0.0020	< 0.00020	0.00556	0.0303	< 0.00020	---	0.147	< 0.000010	< 0.00020	0.00025	< 0.00040	**5.88**	< 0.00010	---	**1.63**	< 0.0000050	0.00089	< 0.0010	---	< 0.00010	---	< 0.000020	---	< 0.000020	---	< 0.00060	0.00179	< 0.0010	< 0.0020
	13-Jul-2017	0.0124	< 0.00020	0.00532	0.0276	< 0.00020	---	0.132	< 0.000010	< 0.00020	0.00027	< 0.00040	**5.83**	< 0.00010	---	**1.63**	< 0.0000050	0.00090	< 0.0010	---	< 0.00010	---	< 0.000020	---	< 0.000020	---	< 0.00060	0.00174	< 0.0010	< 0.0020
MW-07	09-Mar-2005	< 0.01	0.0008	0.0017	0.0733	< 0.0005	< 0.00005	0.366	< 0.0001	0.0017	0.0026	0.0024	**10.4**	0.0004	---	**1.88**	< 0.0001	0.001	< 0.0001	---	0.0008	---	< 0.0002	2.49	< 0.0005	< 0.0002	0.0012	0.0018	< 0.0001	0.006
	17-Nov-2005	< 0.01	0.0007	0.0019	0.053	< 0.0005	0.00005	0.311	< 0.0001	< 0.0004	0.002	0.0018	**10.9**	< 0.0001	---	**1.83**	< 0.0001	0.001	< 0.0001	---	< 0.0004	---	< 0.0002	2.45	< 0.0001	< 0.0002	0.0009	0.0017	< 0.0001	< 0.002
	16-Jun-2006	< 0.01	0.0007	0.0022	0.0543	< 0.0005	< 0.00005	0.312	< 0.0001	0.0018	0.0012	0.0023	< 0.005	< 0.0001	---	**1.86**	< 0.0001	0.0008	< 0.0001	---	0.0007	---	< 0.0002	2.58	< 0.00005	< 0.0002	0.001	0.0017	< 0.0001	0.006
	12-Jul-2007	< 0.01	0.0005	0.0027	0.0596	< 0.0005	< 0.00005	0.289	< 0.0001	0.0011	0.0014	0.0015	**10.9**	< 0.0001	---	**1.78**	< 0.0001	0.0012	0.0056	---	0.0008	---	< 0.0002	2.49	< 0.00005	< 0.0002	0.0011	0.0016	< 0.0001	0.002
	19-Dec-2007	< 0.001	< 0.0002	0.001	0.04	< 0.001	---	0.26	< 0.0002	0.004	0.0013	0.0016	< 0.06	0.0003	---	**1.6**	< 0.00005	0.0011	0.0059	---	< 0.001	---	< 0.0001	2.2	< 0.0002	< 0.001	0.002	0.0014	0.002	0.003
	22-Apr-2009	< 0.001	< 0.0002	0.0021	---	< 0.001	---	---	0.000016	< 0.001	0.0013	0.0007	**14**	< 0.0002	---	**2.3**	< 0.000001	0.0004	0.0024	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0016	< 0.001	< 0.003
	05-May-2010	< 0.0050	< 0.00040	0.00361	0.0490	< 0.00050	---	0.279	< 0.00010	< 0.0050	0.00128	0.0014	**12.5**	< 0.00010	---	**1.90**	< 0.00010	0.00097	0.0056	---	0.00127	---	< 0.00010	---	< 0.000050	---	0.00109	0.00156	< 0.00010	0.0057
	08-Jun-2011	< 0.0050	< 0.00040	0.00570	0.0954	< 0.00050	---	0.215	< 0.00010	< 0.0050	0.00116	< 0.0010	**8.26**	< 0.00010	---	**1.21**	< 0.000020	0.00151	0.0021	---	< 0.00040	---	< 0.00010	---	0.000071	---	0.00030	0.00138	< 0.00010	0.0050
	28-Jul-2011	< 0.0050	< 0.00040	0.00333	0.0483	---	---	0.262	< 0.00010	< 0.0050	---	< 0.0010	**11.7**	< 0.00010	---	**1.84**	< 0.000020	---	< 0.0020	---	< 0.00040	---	< 0.00010	---	---	---	---	0.00152	---	< 0.0030
	30-May-2012	0.0116	< 0.00040	0.00376	0.0544	< 0.00050	---	0.240	< 0.00010	< 0.0050	0.00104	< 0.0010	**11.3**	< 0.00010	---	**1.79**	< 0.000020	0.000974	0.0026	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00143	< 0.00010	< 0.0030
	11-Jul-2013	< 0.0050	< 0.00050	0.00382	0.0466	< 0.0025	---	0.276	< 0.00010	< 0.0050	0.00097	< 0.0010	**12.1**	< 0.00025	---	**1.87**	< 0.000020	0.00088	< 0.0020	---	< 0.00050	---	< 0.00010	---	< 0.00025	---	< 0.0015	0.00140	< 0.00050	< 0.0050
	13-Jun-2014	< 0.0050	< 0.00050	0.00319	0.0298	< 0.00050	---	0.226	< 0.00010	< 0.0050	0.00105	< 0.0010	**13.8**	< 0.00025	---	**2.26**	< 0.0000050	0.00067	< 0.0020	---	< 0.00050	---	< 0.00010	---	< 0.000050	---	< 0.0015	0.00170	< 0.00050	< 0.0050
	25-Jun-2015	< 0.0030	< 0.00060	0.0038	0.047	< 0.0010	---	0.29	< 0.000020	< 0.0010	0.0010	< 0.00020	**13**	< 0.00020	0.16	**1.9**	---	0.0010	0.0011	< 0.10	< 0.00020	8.0	< 0.00010	2.6	< 0.00020	< 0.0010	< 0.0010	0.0016	< 0.0010	< 0.0030
	20-Sep-2016	< 0.0050	< 0.00050	0.00383	0.0416	< 0.00050	---	0.300	< 0.000025	< 0.00050	0.00088	< 0.0010	**12.9**	< 0.00025	---	**2.01**	< 0.0000050	0.00078	< 0.0025	---	< 0.00025	---	< 0.000050	---	< 0.000050	---	< 0.0015	0.00159	< 0.0025	< 0.0050
	14-Jul-2017	< 0.0020	< 0.00020	0.00442	0.0503	< 0.00020	---	0.264	< 0.000010	< 0.00020	0.00086	< 0.00040	**11.2**	< 0.00010	---	**1.80**	< 0.0000050	0.00109	< 0.0010	---	< 0.00010	---	< 0.000020	---	< 0.000020	---	< 0.00060	0.00147	< 0.0010	< 0.0020
MW-08	09-Mar-2005	< 0.01	0.0006	0.0042	0.084	< 0.0005	< 0.00005	0.244	< 0.0001	0.0011	0.0008	0.001	**5.66**	0.0004	---	**0.474**	< 0.0001	0.0012	< 0.0001	---	0.0004	---	< 0.0002	1.4	< 0.0005	< 0.0002	0.0008	0.0011	< 0.0001	0.003
	15-Nov-2005	< 0.01	0.0005	0.0046	0.115	< 0.0005	0.00009	0.184	< 0.0001	0.0005	0.0009	0.001	**5.16**	< 0.0001	---	**0.384**	< 0.0001	0.0025	< 0.0001	---	0.0005	---	< 0.0002	1.27	< 0.0001	< 0.0002	0.001	0.0015	< 0.0001	< 0.002
	16-Jun-2006	< 0.01	0.0006	0.0044	0.0629	< 0.0005	< 0.00005	0.206	< 0.0001	0.0012	0.0004	0.0011	**6.97**	< 0.0001	---	**0.481**	< 0.0001	0.0011	< 0.0001	---	< 0.0004	---	< 0.0002	1.45	< 0.00005	< 0.0002	0.0008	0.0009	< 0.0001	0.006
	11-Jul-2007	< 0.01	0.0005	0.0052	0.0519	< 0.0005	< 0.00005	0.176	< 0.0001	0.0016	0.0005	0.0012	**7.29**	< 0.0001	---	**0.454**	< 0.0001	0.0016	0.0031	---	< 0.0004	---	< 0.0002	1.59	< 0.00005	< 0.0002	0.0012	0.0008	0.0004	0.004
	19-Dec-2007	< 0.001	< 0.0002	0.002	0.03	< 0.001	---	0.17	< 0.0002	0.003	0.0004	0.0006	< 0.06	0.0002	---	**0.44**	< 0.00005	0.0014	0.0036	---	< 0.001	---	< 0.0001	1.4	< 0.0002	< 0.001	0.002	0.0008	0.001	< 0.003
	21-Apr-2009	< 0.001	< 0.0002	0.0062	---	< 0.001	---	---	< 0.000005	< 0.001	< 0.0003	0.0016	< 0.06	< 0.0002	---	**0.45**	< 0.000001	0.002	0.0017	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0007	< 0.001	< 0.003

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Table 4

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Strontium (mg/L)	Thallium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
Canadian Drinking Water AO Guidelines 2017		**0.1**	---	---	---	---	---	---	---	---	---	**1**	**0.3**	---	---	**0.05**	---	---	---	---	---	---	---	---	---	---	---	---	---	**5**
Canadian Drinking Water MAC Guidelines 2017		---	**0.006**	**0.01**	**1**	---	---	**5**	**0.005**	**0.05**	---	---	---	**0.01**	---	---	**0.001**	---	---	---	**0.05**	---	---	---	---	---	---	**0.02**	---	---
MW-08 (cont'd)	05-May-2010	< 0.0050	< 0.00040	0.00672	0.0675	< 0.00050	---	0.179	< 0.00010	< 0.0050	0.00035	< 0.0010	**7.22**	< 0.00010	---	**0.470**	< 0.00010	0.00168	0.0027	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00094	0.00072	0.00017	0.0163
	07-Jun-2011	< 0.0050	< 0.00040	0.00667	0.0614	< 0.00050	---	0.180	< 0.00010	< 0.0050	0.00036	< 0.0010	**5.41**	< 0.00010	---	**0.411**	< 0.000020	0.00154	0.0025	---	0.00159	---	< 0.00010	---	< 0.000050	---	0.00144	0.00080	0.00018	0.0116
	30-May-2012	0.0104	< 0.00040	0.00600	0.0499	< 0.00050	---	0.154	< 0.00010	< 0.0050	0.00018	< 0.0010	**6.69**	< 0.00010	---	**0.409**	< 0.000020	0.00137	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00069	< 0.00010	0.0042
	09-Jul-2013	< 0.0050	< 0.00040	0.00767	0.0639	< 0.00050	---	0.163	< 0.00010	< 0.0050	0.00018	< 0.0010	**6.47**	< 0.00010	---	**0.415**	< 0.000020	0.00175	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00067	< 0.00010	< 0.0030
	12-Jun-2014	< 0.0050	< 0.00040	0.00675	0.0551	< 0.00050	---	0.130	< 0.00010	< 0.0050	0.00017	< 0.0010	**7.19**	< 0.00010	---	**0.476**	< 0.0000050	0.00129	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00071	< 0.00010	< 0.0030
	24-Jun-2015	< 0.0030	< 0.00060	0.0054	0.055	< 0.0010	---	0.18	< 0.000020	< 0.0010	< 0.00030	< 0.00020	**7.1**	< 0.00020	0.092	**0.44**	---	0.0014	< 0.00050	< 0.10	< 0.00020	7.7	< 0.00010	1.4	< 0.00020	< 0.0010	< 0.0010	0.00067	< 0.0010	< 0.0030
	20-Sep-2016	< 0.0010	< 0.00010	0.00700	0.0658	< 0.00010	---	0.183	0.0000056	< 0.00010	0.00016	< 0.00020	**6.96**	< 0.000050	---	**0.441**	< 0.0000050	0.00108	0.00053	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000699	< 0.00050	0.0015
	02-Aug-2017	0.0053	< 0.00010	0.00530	0.0318	< 0.00010	---	0.204	< 0.0000050	< 0.00010	0.00018	< 0.00020	---	< 0.000050	---	---	< 0.0000050	0.00103	< 0.00050	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000683	< 0.00050	< 0.0010
MW-09	09-Mar-2005	**0.14**	0.0007	0.0019	0.0608	< 0.0005	< 0.00005	0.339	< 0.0001	0.0016	0.0011	0.001	**1.11**	0.0001	---	**0.714**	< 0.0001	0.0019	0.0002	---	< 0.0004	---	< 0.0002	0.843	< 0.0005	< 0.0002	0.0058	0.0019	0.0005	0.003
(Duplicate)	09-Mar-2005	**0.12**	0.0007	0.0019	0.0616	< 0.0005	< 0.00005	0.332	< 0.0001	0.0012	0.0012	0.001	**1.07**	0.0003	---	**0.705**	< 0.0001	0.0019	0.0002	---	< 0.0004	---	< 0.0002	0.841	< 0.0005	< 0.0002	0.0059	0.0018	0.0004	0.004
	17-Nov-2005	0.02	0.0006	0.0018	0.052	< 0.0005	< 0.0001	0.294	< 0.0001	0.0006	0.0023	0.0011	**1.4**	< 0.0001	---	**0.752**	< 0.0001	0.0038	0.0087	---	0.0005	---	< 0.0002	0.869	< 0.0001	< 0.0002	0.0038	0.0015	0.0002	< 0.002
	16-Jun-2006	< 0.01	0.0006	0.0018	0.0389	< 0.0005	< 0.00005	0.289	< 0.0001	0.0013	0.0011	0.0012	**1.44**	< 0.0001	---	**0.797**	< 0.0001	0.0015	< 0.0001	---	< 0.0004	---	< 0.0002	0.861	< 0.00005	< 0.0002	0.0008	0.0014	< 0.0001	0.005
	11-Jul-2007	< 0.01	0.0004	0.002	0.0302	< 0.0005	< 0.00005	0.26	< 0.0001	0.0016	0.0009	0.0008	**1.74**	< 0.0001	---	**0.785**	< 0.0001	0.0017	0.003	---	< 0.0004	---	< 0.0002	0.961	< 0.00005	< 0.0002	0.0009	0.0014	0.0005	< 0.002
	18-Dec-2007	< 0.001	< 0.0002	0.002	0.02	< 0.001	---	0.26	< 0.0002	< 0.001	0.0009	0.0008	< 0.06	< 0.0002	---	**0.77**	< 0.00005	0.0018	0.0023	---	< 0.001	---	< 0.0001	0.81	< 0.0002	< 0.001	0.002	0.0014	< 0.001	0.003
	22-Apr-2009	**0.1**	< 0.0002	0.0023	---	< 0.001	---	---	0.000008	< 0.001	0.0008	0.0003	**1.9**	< 0.0002	---	**0.86**	< 0.000001	0.0016	0.0017	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	0.005	0.0012	< 0.001	< 0.003
	06-May-2010	< 0.0050	< 0.00040	0.00255	0.0250	< 0.00050	---	0.267	< 0.00010	< 0.0050	0.00085	< 0.0010	**2.04**	< 0.00010	---	**0.828**	< 0.00010	0.00158	0.0027	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00078	0.00121	< 0.00010	< 0.0020
(Duplicate)	06-May-2010	< 0.0050	< 0.00040	0.00257	0.0247	< 0.00050	---	0.261	< 0.00010	< 0.0050	0.00086	< 0.0010	**2.03**	< 0.00010	---	**0.832**	< 0.00010	0.00154	0.0027	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00077	0.00120	< 0.00010	0.0020
	02-Jun-2011	< 0.0050	< 0.00040	0.00280	0.0294	< 0.00050	---	0.255	< 0.00010	< 0.0050	0.00128	< 0.0010	**1.46**	< 0.00010	---	**0.754**	< 0.000020	0.00156	< 0.0020	---	< 0.00040	---	0.00013	---	< 0.000050	---	< 0.00030	0.00132	0.00012	0.0020
(Duplicate)	02-Jun-2011	< 0.0050	< 0.00040	0.00272	0.0296	< 0.00050	---	0.237	< 0.00010	< 0.0050	0.00126	< 0.0010	**1.29**	< 0.00010	---	**0.773**	< 0.000020	0.00152	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00128	0.00015	< 0.0020
	29-May-2012	0.0112	< 0.00040	0.00234	0.0209	< 0.00050	---	0.226	< 0.00010	< 0.0050	0.00080	< 0.0010	**1.89**	< 0.00010	---	**0.784**	< 0.000020	0.00143	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00121	< 0.00010	0.0030
	10-Jul-2013	< 0.0050	< 0.00040	0.00237	0.0243	< 0.0010	---	0.249	< 0.00010	< 0.0050	0.00138	< 0.0010	**1.94**	< 0.00010	---	**0.842**	< 0.000020	0.00154	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.00010	---	< 0.00060	0.00138	< 0.00020	< 0.0030
	13-Jun-2014	< 0.0050	< 0.00040	0.00232	0.0224	< 0.00050	---	0.196	< 0.00010	< 0.0050	0.00120	< 0.0010	**1.85**	< 0.00010	---	**0.868**	< 0.0000050	0.00131	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00132	< 0.00010	< 0.0030
	25-Jun-2015	< 0.0030	< 0.00060	0.0020	0.023	< 0.0010	---	0.27	< 0.000020	< 0.0010	0.0011	< 0.00020	**2.0**	< 0.00020	0.081	**0.80**	---	0.0016	0.00051	< 0.10	< 0.00020	6.4	< 0.00010	0.88	< 0.00020	< 0.0010	< 0.0010	0.0013	< 0.0010	< 0.0030
(Duplicate)	19-Sep-2016	< 0.0020	< 0.00020	0.00240	0.0227	< 0.00020	---	0.281	< 0.000010	< 0.00020	0.00117	< 0.00040	**1.88**	< 0.00010	---	**0.795**	< 0.0000050	0.00155	< 0.0010	---	< 0.00010	---	< 0.000020	---	< 0.000020	---	< 0.00060	0.00129	< 0.0010	< 0.0020
	20-Sep-2016	< 0.0020	< 0.00020	0.00249	0.0227	< 0.00020	---	0.285	< 0.000010	< 0.00020	0.00118	< 0.00040	**1.93**	< 0.00010	---	**0.822**	< 0.0000050	0.00161	< 0.0010	---	< 0.00010	---	< 0.000020	---	< 0.000020	---	< 0.00060	0.00131	< 0.0010	< 0.0020
	14-Jul-2017	< 0.0010	< 0.00010	0.00260	0.0223	< 0.00010	---	0.258	< 0.0000050	< 0.00010	0.00157	< 0.00020	**1.96**	< 0.000050	---	**0.872**	< 0.0000050	0.000861	0.00096	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00130	< 0.00050	< 0.0010
MW-10	09-Mar-2005	< 0.01	0.0007	0.003	0.0296	< 0.0005	< 0.00005	0.209	< 0.0001	0.0012	0.0003	0.0007	**5.29**	0.0004	---	**0.639**	< 0.0001	0.0009	< 0.0001	---	< 0.0004	---	< 0.0002	1.29	< 0.0005	< 0.0002	0.0008	0.0019	< 0.0001	0.003
	16-Nov-2005	< 0.01	0.0006	0.0037	0.0331	< 0.0005	< 0.0001	0.202	< 0.0001	< 0.0004	0.0005	0.0009	**5.49**	< 0.0001	---	**0.642**	< 0.0001	0.001	< 0.0001	---	0.0006	---	< 0.0002	1.43	< 0.0001	< 0.0002	0.0008	0.0015	< 0.0001	< 0.002
	16-Jun-2006	< 0.01	0.0006	0.0036	0.0319	< 0.0005	< 0.00005	0.187	< 0.0001	0.0011	0.0003	0.0009	**5.89**	< 0.0001	---	**0.67**	< 0.0001	0.0009	< 0.0001	---	< 0.0004	---	< 0.0002	1.41	< 0.00005	< 0.0002	0.0007	0.0014	< 0.0001	0.009
	11-Jul-2007	< 0.01	0.0005	0.0039	0.0291	< 0.0005	< 0.00005	0.168	< 0.0001	0.0015	0.0004	0.0008	**5.93**	< 0.0001	---	**0.656**	< 0.0001	0.0009	0.003	---	< 0.0004	---	< 0.0002	1.55	< 0.00005	< 0.0002	0.0007	0.0013	0.0004	0.015
	18-Dec-2007	< 0.001	< 0.0002	0.002	0.02	< 0.001	---	0.16	< 0.0002	< 0.001	0.0005	0.0006	< 0.06	< 0.0002	---	**0.64**	< 0.00005	0.0011	0.0029	---	< 0.001	---	< 0.0001	1.3	< 0.0002	< 0.001	0.002	0.0014	< 0.001	< 0.003
	22-Apr-2009	< 0.001	< 0.0002	0.0044	---	< 0.001	---	---	0.000007	< 0.001	< 0.0003	0.0006	**5.9**	< 0.0002	---	**0.71**	< 0.0000001	0.0009	0.001	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0011	< 0.001	< 0.003
	05-May-2010	< 0.0050	< 0.00040	0.00459	0.0290	< 0.00050	---	0.177	< 0.00010	< 0.0050	0.00044	0.0015	**6.80**	< 0.00010	---	**0.735**	< 0.00010	0.00097	0.0029	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00083	0.00115	< 0.00010	0.0023
	02-Jun-2011	< 0.0050	< 0.00040	0.00287	0.0321	< 0.00050	---	0.170	< 0.00010	< 0.0050	0.00031	< 0.0010	**3.89**	< 0.00010	---	**0.566**	< 0.000020	0.00481	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00133	0.00021	0.0030
	30-May-2012	0.0139	< 0.00040	0.00420	0.0273	< 0.00050	---	0.150	< 0.00010	< 0.0050	0.00032	< 0.0010	**5.98**	< 0.00010	---	**0.655**	< 0.000020	0.000884	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00113	< 0.00010	< 0.0030
	09-Jul-2013	< 0.0050	< 0.00040	0.00485	0.0295	< 0.00050	---	0.162	< 0.00010	< 0.0050	0.00032	< 0.0010	**6.11**	< 0.00010	---	**0.729**	< 0.000020	0.000870	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00116	< 0.00010	< 0.0030
(Duplicate)	09-Jul-2013	< 0.0050	< 0.00040	0.00479	0.0293	< 0.00050	---	0.159	< 0.00010	< 0.0050	0.00031	< 0.0010	**6.03**	< 0.00010	---	**0.710**	< 0.000020	0.000863	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00115	< 0.00010	< 0.0030
	12-Jun-2014	< 0.0050	< 0.00040	0.00463	0.0282	< 0.00050	---	0.127	< 0.00010	< 0.0050	0.00031	< 0.0010	**6.10**	< 0.00010	---	**0.689**	< 0.0000050	0.000770	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00117	< 0.00010	< 0.0030
(Duplicate)	12-Jun-2014	< 0.0050	< 0.00040	0.00450	0.0293	< 0.00050	---	0.129	< 0.00010	< 0.0050	0.00032	< 0.0010	**6.08**	< 0.00010	---	**0.740**	< 0.0000050	0.000782	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00112	< 0.00010	< 0.0030
	24-Jun-2015	< 0.0030	< 0.00060	0.0039	0.030	< 0.0010	---	0.18	< 0.000020	< 0.0010	0.00030	< 0.00020	**6.3**	< 0.00020	0.10	**0.67**	---	0.00088	0.00085	< 0.10	< 0.00020	7.1	< 0.00010	1.4	< 0.00020	< 0.0010	< 0.0010	0.0012	< 0.0010	< 0.0030
(Duplicate)	24-Jun-2015	< 0.0030	< 0.00060	0.0040	0.030	< 0.0010	---	0.17	< 0.000020	< 0.0010	0.00031	< 0.00020	**6.4**	< 0.00020	0.10	**0.67**	---	0.00087	0.00083	< 0.10	< 0.00020	7.1	< 0.00010	1.4	< 0.00020	< 0.0010	< 0.0010	0.0011	< 0.0010	< 0.0030
	20-Sep-2016	< 0.0010	< 0.00010	0.00468	0.0300	< 0.00010	---	0.180	< 0.0000050	< 0.00010	0.00031	< 0.00020	**6.01**	< 0.000050	---	**0.676**	< 0.0000050	0.000633	0.00092	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00113	< 0.00050	< 0.0010
	14-Jul-2017	< 0.0010	< 0.00010	0.00457	0.0311	< 0.00010	---	0.154	< 0.0000050	< 0.00010	0.00032	< 0.00020	**5.98**	0.000056	---	**0.674**	< 0.0000050	0.000458	0.00087	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00112	< 0.00050	< 0.0010
MW-11	10-Mar-2005	< 0.01	0.0008	0.0022	0.0494	< 0.0005	< 0.00005	0.189	< 0.0001	0.0011	0.0006	< 0.0006	**6.89**	< 0.0001	---	**0.668**	< 0.0001	0.001	< 0.0001	---	< 0.0004	---	< 0.0002	1.27	< 0.0005	< 0.0002	0.0008	0.0012	0.0001	0.004
	16-Nov-2005	0.02	0.0006	0.0025	0.0466	< 0.0005	0.00008	0.227	< 0.0001	0.0006	0.0007	0.0009	**6.95**	< 0.0001	---	**0.628**	< 0.0001	0.0009	< 0.0001	---	< 0.0004	---	< 0.0002	1.24	< 0.0001	< 0.0002	0.001	0.0012	< 0.0001	< 0.002
	16-Jun-2006	< 0.01	0.0006	0.0022	0.044	< 0.0005	< 0.00005	0.205	< 0.0001	0.0013	0.0003	0.0009	**7.23**	< 0.0001	---	**0.659**	< 0.0001	0.0006	< 0.0001	---	0.0004	---	< 0.0002	1.22	< 0.00005	< 0.0002	0.001	0.0011	< 0.0001	0.009
	11-Jul-2007	< 0.01	0.0004	0.0023	0.0377	< 0.0005	< 0.00005	0.186	< 0.0001	0.0016	0.0004	< 0.0006	**7.15**	< 0.0001	---	**0.632**	< 0.0001	0.0007	0.0027	---	< 0.0004	---	< 0.0002	1.35	< 0.00005	< 0.0002	0.0024	0.0011	0.0004	< 0.002
	18-Dec-2007	< 0.001	< 0.0002	< 0.001	0.03	< 0.001	---	0.18	< 0.0002	< 0.001	0.0006	0.0008	< 0.06	< 0.0002	---	**0.61**	< 0.00005	0.001	0.0027	---	< 0.001	---	< 0.0001	1.1	< 0.0002	< 0.001	0.003	0.0013	< 0.001	< 0.003
	22-Apr-2009	< 0.001	< 0.0002	0.0024	---	< 0.001	---	---	0.000009	< 0.001	0.0004	0.0007	**7**	< 0.0002	---	**0.67**	0.000001	0.0007	0.0008	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.001	< 0.001	< 0.003
	05-May-2010	< 0.0050	< 0.00040	0.00259	0.0396	< 0.00050	---	0.189	< 0.00010	< 0.0050	0.00047	< 0.0010	**7.61**	< 0.00010	---	**0.663**	< 0.00010	0.00072	0.0027	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00102	0.00100	< 0.00010	0.0023
	02-Jun-2011	< 0.0050	< 0.00040	0.00239	0.0423	< 0.00050	---	0.199	< 0.00010	< 0.0050	0.00047	0.0017	**6.99**	< 0.00010	---	**0.687**	< 0.000020	0.00061	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00109	0.00010	0.0105
	30-May-2012	0.0106	< 0.00040	0.00232	0.0386	< 0.00050	---	0.161	< 0.00010	< 0.0050	0.00038	< 0.0010	**6.82**	< 0.00010	---	**0.605**	< 0.000020	0.000669	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00100	< 0.00010	< 0.0030
	10-Jul-2013	< 0.0050	< 0.00040	0.00260	0.0424	< 0.00050	---	0.173	< 0.00010	< 0.0050	0.00036	< 0.0010	**7.52**	< 0.00010	---	**0.697**	< 0.000020	0.000700	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00116	< 0.00010	< 0.0030
	12-Jun-2014	< 0.0050	< 0.00040	0.00255	0.0421	< 0.00050	---	0.135	< 0.00010	< 0.0050	0.00030	< 0.0010	**7.07**	< 0.00010	---	**0.672**	< 0.0000050	0.000539	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00119	0.00099	< 0.00010	< 0.0030
	24-Jun-2015	< 0.0030	< 0.00060	0.0022	0.043	< 0.0010	---	0.19	< 0.000020	< 0.0010	< 0.00030	< 0.00020	**7.4**	< 0.00020	0.079	**0.62**	---	0.00065	< 0.00050	< 0.10	< 0.00020	8.0	< 0.00010	1.2	< 0.00020	< 0.0010	< 0.0010	0.0010	< 0.0010	< 0.0030
	20-Sep-2016	< 0.0010	< 0.00010	0.00262	0.0415	< 0.00010	---	0.206	< 0.0000050	< 0.00010	0.00028	< 0.00020	**6.91**	< 0.000050	---	**0.609**	< 0.0000050	0.000471	< 0.00050	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000977	< 0.00050	< 0.0010
	14-Jul-2017	< 0.0010	< 0.00010	0.00246	0.0405	< 0.00010	---	0.187	< 0.0000050	< 0.00010	0.00027	< 0.00020	**6.84**	0.000051	---	**0.618**	< 0.0000050	0.000359	< 0.00050	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.00104	< 0.00050	< 0.0010

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Table 4

Groundwater Analytical Results: Dissolved Metals and Trace Elements

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Chromium (Total) (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Strontium (mg/L)	Thallium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
Canadian Drinking Water AO Guidelines 2017		**0.1**	---	---	---	---	---	---	---	---	---	**1**	**0.3**	---	---	**0.05**	---	---	---	---	---	---	---	---	---	---	---	---	---	**5**
Canadian Drinking Water MAC Guidelines 2017		---	**0.006**	**0.01**	**1**	---	---	**5**	**0.005**	**0.05**	---	---	---	**0.01**	---	---	**0.001**	---	---	---	**0.05**	---	---	---	---	---	---	**0.02**	---	---
MW-12	10-Mar-2005	< 0.01	0.0008	0.0022	0.153	< 0.0005	< 0.00005	0.234	< 0.0001	0.0038	0.0008	< 0.0006	**2.78**	0.0004	---	**0.365**	< 0.0001	0.0015	< 0.0001	---	< 0.0004	---	< 0.0002	0.915	< 0.0005	< 0.0002	0.0011	0.001	< 0.0001	0.01
	16-Nov-2005	< 0.01	0.0005	0.0026	0.182	< 0.0005	0.00006	0.282	< 0.0001	< 0.0004	0.001	0.0008	**3.37**	< 0.0001	---	**0.402**	< 0.0001	0.0013	< 0.0001	---	< 0.0004	---	< 0.0002	0.903	< 0.0001	< 0.0002	0.0008	0.0011	< 0.0001	< 0.002
	16-Jun-2006	< 0.01	0.0006	0.0023	0.178	< 0.0005	< 0.00005	0.251	< 0.00012	0.0016	0.0007	< 0.0006	**3.76**	< 0.0001	---	**0.436**	< 0.0001	0.0012	< 0.0001	---	< 0.0004	---	< 0.0002	0.925	< 0.00005	< 0.0002	0.0008	0.001	< 0.0001	0.007
	11-Jul-2007	< 0.01	0.0005	0.0025	0.146	< 0.0005	< 0.00005	0.233	< 0.001	0.0015	0.0012	< 0.0006	**3.77**	< 0.0001	---	**0.422**	< 0.0001	0.0017	0.0033	---	< 0.0004	---	< 0.0002	0.972	< 0.00005	< 0.0002	0.0007	0.0009	0.0004	0.004
	18-Dec-2007	< 0.001	< 0.0002	0.002	0.1	< 0.001	---	0.22	< 0.0002	< 0.001	0.0007	< 0.0002	< 0.06	< 0.0002	---	**0.4**	0.00007	0.0014	0.0021	---	< 0.001	---	< 0.0001	0.84	< 0.0002	< 0.001	0.002	0.0011	< 0.001	< 0.003
	22-Apr-2009	< 0.001	< 0.0002	0.0026	---	< 0.001	---	---	0.000006	< 0.001	0.0006	0.0008	**4.1**	< 0.0002	---	**0.45**	0.000001	0.0012	0.0012	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0008	< 0.001	< 0.003
	06-May-2010	< 0.0050	< 0.00040	0.00285	0.143	< 0.00050	---	0.242	< 0.00010	< 0.0050	0.00065	< 0.0010	**4.24**	< 0.00010	---	**0.456**	< 0.00010	0.00115	0.0022	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00081	0.00083	< 0.00010	< 0.0020
	02-Jun-2011	< 0.0050	< 0.00040	0.00199	0.130	< 0.00050	---	0.244	< 0.00010	< 0.0050	0.00043	< 0.0010	**3.34**	< 0.00010	---	**0.450**	< 0.000020	0.00102	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00087	< 0.00010	0.0021
	30-May-2012	0.0146	< 0.00040	0.00267	0.112	< 0.00050	---	0.219	< 0.00010	< 0.0050	0.00046	< 0.0010	**4.14**	< 0.00010	---	**0.435**	< 0.000020	0.00121	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00085	< 0.00010	< 0.0030
	10-Jul-2013	< 0.0050	< 0.00040	0.00285	0.143	< 0.00050	---	0.227	< 0.00010	< 0.0050	0.00045	< 0.0010	**3.99**	< 0.00010	---	**0.457**	< 0.000020	0.00115	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00094	< 0.00010	< 0.0030
	12-Jun-2014	< 0.0050	< 0.00040	0.00266	0.125	< 0.00050	---	0.178	< 0.00010	< 0.0050	0.00044	< 0.0010	**3.88**	< 0.00010	---	**0.462**	< 0.0000050	0.000921	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00080	< 0.00010	0.0044
	24-Jun-2015	< 0.0030	< 0.00060	0.0022	0.12	< 0.0010	---	0.24	0.000020	< 0.0010	0.00039	< 0.00020	**4.0**	< 0.00020	0.068	**0.42**	---	0.0010	0.0015	< 0.10	< 0.00020	7.3	< 0.00010	0.90	< 0.00020	< 0.0010	< 0.0010	0.00075	< 0.0010	< 0.0030
	20-Sep-2016	0.0024	< 0.00010	0.00280	0.125	< 0.00010	---	0.245	< 0.0000050	< 0.00010	0.00041	< 0.00020	**4.21**	< 0.000050	---	**0.442**	< 0.0000050	0.000685	0.00062	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000810	< 0.00050	< 0.0010
	14-Jul-2017	< 0.0010	< 0.00010	0.00268	0.122	< 0.00010	---	0.237	< 0.0000050	< 0.00010	0.00037	< 0.00020	**4.18**	< 0.000050	---	**0.437**	< 0.0000050	0.000594	0.00052	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000867	< 0.00050	< 0.0010
MW-13	10-Mar-2005	< 0.01	0.0008	0.0012	0.389	< 0.0005	< 0.00005	0.258	< 0.0001	0.0048	0.0008	< 0.0006	**0.818**	0.0002	---	**0.263**	< 0.0001	0.0023	0.0009	---	< 0.0004	---	< 0.0002	0.57	< 0.0005	< 0.0002	0.0006	0.0008	< 0.0001	0.005
	16-Nov-2005	0.07	0.0006	0.0016	0.413	< 0.0005	< 0.0001	0.301	< 0.0001	0.0007	0.0033	0.0007	**1.08**	0.0002	---	**0.243**	0.0001	0.0027	0.0015	---	0.0005	---	< 0.0002	0.542	< 0.0001	< 0.0002	0.0006	0.0009	< 0.0001	< 0.002
	16-Jun-2006	< 0.01	0.0006	0.0014	0.424	< 0.0005	< 0.00005	0.273	< 0.0001	0.0011	0.0007	< 0.0006	**1.19**	< 0.0001	---	**0.256**	< 0.0001	0.0021	< 0.0001	---	< 0.0004	---	< 0.0002	0.553	< 0.00005	< 0.0002	0.0006	0.0008	< 0.0001	0.009
	11-Jul-2007	< 0.01	0.0004	0.0014	0.428	< 0.0005	< 0.00005	0.246	< 0.0001	0.0016	0.0009	< 0.0006	**1.26**	< 0.0001	---	**0.252**	< 0.0001	0.0023	0.0022	---	< 0.0004	---	< 0.0002	0.58	< 0.00005	< 0.0002	0.0006	0.0008	0.0004	< 0.002
	18-Dec-2007	< 0.001	< 0.0002	0.001	0.29	< 0.001	---	0.25	< 0.0002	< 0.001	0.0009	< 0.0002	< 0.06	< 0.0002	---	**0.25**	0.00007	0.0028	0.0016	---	< 0.001	---	< 0.0001	0.5	< 0.0002	< 0.001	0.002	0.0009	< 0.001	< 0.003
	22-Apr-2009	< 0.001	< 0.0002	0.0015	---	< 0.001	---	---	0.000005	< 0.001	0.0007	0.0003	**1.3**	< 0.0002	---	**0.26**	< 0.000001	0.0022	0.0012	---	< 0.0002	---	< 0.0001	---	< 0.0002	< 0.001	< 0.001	0.0007	< 0.001	< 0.003
	06-May-2010	< 0.0050	< 0.00040	0.00162	0.407	< 0.00050	---	0.254	< 0.00010	< 0.0050	0.00092	< 0.0010	**1.45**	< 0.00010	---	**0.249**	< 0.00010	0.00219	0.0021	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00070	0.00069	< 0.00010	< 0.0020
	02-Jun-2011	< 0.0050	< 0.00040	0.00157	0.411	< 0.00050	---	0.265	< 0.00010	< 0.0050	0.00062	< 0.0010	**1.25**	< 0.00010	---	**0.231**	< 0.000020	0.00194	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00073	< 0.00010	< 0.0020
	30-May-2012	< 0.0050	< 0.00040	0.00140	0.354	< 0.00050	---	0.197	< 0.00010	< 0.0050	0.00065	< 0.0010	**1.33**	< 0.00010	---	**0.238**	< 0.000020	0.00180	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00063	< 0.00010	< 0.0030
	10-Jul-2013	< 0.0050	< 0.00040	0.00176	0.462	< 0.00050	---	0.221	< 0.00010	< 0.0050	0.00128	< 0.0010	**1.17**	< 0.00010	---	**0.252**	< 0.000020	0.00484	0.0112	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	0.00075	< 0.00010	< 0.0030
	12-Jun-2014	0.0371	< 0.00040	0.00179	0.420	< 0.00050	---	0.196	< 0.00010	< 0.0050	0.00074	< 0.0010	**1.30**	< 0.00010	---	**0.245**	< 0.0000050	0.00183	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	0.00148	0.00069	0.00013	< 0.0030
	24-Jun-2015	< 0.0030	< 0.00060	0.0014	0.40	< 0.0010	---	0.26	< 0.000020	< 0.0010	0.00062	< 0.00020	**1.3**	< 0.00020	0.048	**0.24**	---	0.0022	0.00086	< 0.10	< 0.00020	6.0	< 0.00010	0.52	< 0.00020	< 0.0010	< 0.0010	0.00065	< 0.0010	< 0.0030
	20-Sep-2016	0.0023	< 0.00010	0.00167	0.394	< 0.00010	---	0.266	< 0.0000050	< 0.00010	0.00064	< 0.00020	**1.33**	< 0.000050	---	**0.235**	0.000212	0.00157	0.00090	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000664	< 0.00050	< 0.0010
	14-Jul-2017	< 0.0010	< 0.00010	0.00152	0.393	< 0.00010	---	0.217	< 0.0000050	< 0.00010	0.00062	< 0.00020	**1.29**	< 0.000050	---	**0.227**	< 0.0000050	0.00113	0.00081	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000615	< 0.00050	< 0.0010
MW-02B	20-Sep-2016	0.0076	< 0.00050	0.00141	0.497	< 0.00050	---	0.651	< 0.000025	< 0.00050	< 0.00050	< 0.0010	< 0.050	< 0.00025	---	**0.109**	< 0.0000050	0.0157	< 0.0025	---	< 0.00025	---	< 0.000050	---	< 0.000050	---	< 0.0015	0.00449	< 0.0025	0.0065
	14-Jul-2017	0.0160	< 0.00050	0.00707	0.646	0.00325	---	0.705	0.00297	0.00321	0.00328	0.0032	**0.687**	0.00317	---	**0.200**	< 0.0000050	0.0112	0.0035	---	0.00332	---	< 0.000050	---	0.00580	---	< 0.0015	0.00601	0.0034	0.0088
	29-Sep-2017	< 0.0050	< 0.00050	0.00379	0.719	< 0.00050	---	0.765	< 0.000025	< 0.00050	< 0.00050	< 0.0010	**0.44**	< 0.00025	---	**0.114**	< 0.0000050	0.00900	< 0.0025	---	< 0.00025	---	< 0.000050	---	< 0.000050	---	< 0.0015	0.00225	< 0.0025	< 0.0050
QA/QC																														
FIELD BLANK	05-May-2010	< 0.0050	< 0.00040	< 0.00040	< 0.0050	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	< 0.00010	< 0.0010	< 0.020	< 0.00010	---	< 0.0050	< 0.00010	< 0.00010	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	< 0.00010	< 0.00010	< 0.0020
	25-May-2011	< 0.0050	< 0.00040	< 0.00040	< 0.0050	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	< 0.00010	< 0.0010	< 0.020	< 0.00010	---	< 0.0050	< 0.000020	< 0.00010	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	< 0.00010	< 0.00010	< 0.0020
	09-Jul-2013	< 0.0050	< 0.00040	< 0.00040	< 0.0050	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	< 0.00010	< 0.0010	< 0.010	< 0.00010	---	< 0.0020	< 0.000020	< 0.000050	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	< 0.00010	< 0.00010	< 0.0030
	13-Jun-2014	< 0.0050	< 0.00040	< 0.00040	< 0.0050	< 0.00050	---	< 0.050	< 0.00010	< 0.0050	< 0.00010	< 0.0010	< 0.010	< 0.00010	---	< 0.0020	< 0.0000050	< 0.000050	< 0.0020	---	< 0.00040	---	< 0.00010	---	< 0.000050	---	< 0.00030	< 0.00010	< 0.00010	< 0.0030
	25-Jun-2015	< 0.0030	< 0.00060	< 0.00020	< 0.010	< 0.0010	---	< 0.020	< 0.000020	< 0.0010	< 0.00030	< 0.00020	< 0.060	< 0.00020	< 0.020	< 0.0040	---	< 0.00020	< 0.00050	< 0.10	< 0.00020	< 0.10	< 0.00010	< 0.020	< 0.00020	< 0.0010	< 0.0010	< 0.00010	< 0.0010	< 0.0030
	19-Sep-2016	< 0.0010	< 0.00010	< 0.00010	< 0.00005	< 0.00010	---	0.012	< 0.0000050	< 0.00010	< 0.00010	< 0.00020	< 0.010	< 0.000050	---	< 0.00010	< 0.0000050	< 0.000050	< 0.00050	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	< 0.000010	< 0.00050	< 0.0010
	14-Jul-2017	< 0.0010	< 0.00010	< 0.00010	< 0.00005	< 0.00010	---	< 0.010	< 0.0000050	< 0.00010	< 0.00010	0.00027	< 0.010	< 0.000050	---	< 0.00010	< 0.0000050	< 0.000050	< 0.00050	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	< 0.000010	< 0.00050	< 0.0010
Relative Percent Difference (RPD) Report																														
MW-03	13-Jul-2017	< 0.0010	< 0.00010	0.00148	0.0431	< 0.00010	---	0.105	< 0.0000050	< 0.00010	0.00071	< 0.00020	**5.50**	0.000094	---	**0.282**	< 0.0000050	0.000371	0.00096	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000619	< 0.00050	< 0.0010
(Duplicate)	13-Jul-2017	< 0.0010	< 0.00010	0.00138	0.0437	< 0.00010	---	0.111	< 0.0000050	< 0.00010	0.00066	< 0.00020	**5.20**	0.000090	---	**0.260**	< 0.0000050	0.000407	0.00088	---	< 0.000050	---	< 0.000010	---	< 0.000010	---	< 0.00030	0.000597	< 0.00050	< 0.0010
RPD(%)		---	---	**7.0%**	**1.4%**	---	---	**5.6%**	---	---	**7.3%**	---	**5.6%**	**4.3%**	---	**8.1%**	---	**9.3%**	**8.7%**	---	---	---	---	---	---	---	---	---	**3.6%**	---	---

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.
3. Highlighting indicates parameters at applied guideline/criteria.
4. Denotes values exceeding

(Health Canada, February 2017. Guidelines for Canadian Drinking Water Quality. Aesthetic Objective. Summary Table. Prepared by the Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment)

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Table 5

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	Styrene (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
Canadian Drinking Water AO Guidelines 2017		---	0.024	0.0016	0.02	---	---	---
Canadian Drinking Water MAC Guidelines 2017		0.005	0.06	0.14	0.09	---	---	---
Groundwater Monitoring								
MW-01	07-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	15-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	12-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	19-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	21-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	05-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	25-May-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	29-May-2012	---	---	---	---	---	---	< 0.25
	10-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	16-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	29-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	19-Sep-2016	< 0.00050	0.00112	< 0.00050	0.00253	< 0.0010	< 0.10	< 0.10
	13-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-02	07-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	15-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	13-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	19-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	21-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	05-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	25-May-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
	10-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	0.31
	16-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	28-Aug-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	25-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	0.10
	19-Sep-2016	< 0.00050	0.00099	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	13-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	29-Sep-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.00050	< 0.10	< 0.10
MW-03	07-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	15-Jun-2006	< 0.0005	0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	12-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	19-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	21-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	06-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	02-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	29-May-2012	---	---	---	---	---	---	< 0.25
	10-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	16-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	29-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	19-Sep-2016	< 0.00050	0.00309	< 0.00050	0.00234	< 0.0010	< 0.10	< 0.10
	13-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
(Duplicate)	13-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-04	08-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
(Duplicate)	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	14-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	13-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	19-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	21-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	06-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	07-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
(Duplicate)	30-May-2012	---	---	---	---	---	---	< 0.25
	09-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	13-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	29-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	19-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	13-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-05	08-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	14-Jun-2006	< 0.0005	0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	13-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	19-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	21-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	29-Apr-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	25-May-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	29-May-2012	---	---	---	---	---	---	< 0.25
	08-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	13-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	25-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	19-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	13-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-06	08-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	12-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	19-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	22-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	06-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	07-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	29-May-2012	---	---	---	---	---	---	< 0.25
	08-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	12-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	25-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	13-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-07	09-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	12-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	19-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	22-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	05-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	08-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	28-Jul-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
	11-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25

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Table 5

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	Styrene (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
Canadian Drinking Water AO Guidelines 2017		---	0.024	0.0016	0.02	---	---	---
Canadian Drinking Water MAC Guidelines 2017		0.005	0.06	0.14	0.09	---	---	---
MW-07 (cont'd)	13-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	25-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	14-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-08	09-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	15-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	11-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	19-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	21-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	05-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	07-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
	09-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	12-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	24-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	02-Aug-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-09	09-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
(Duplicate)	09-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	17-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	11-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	18-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	22-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	0.3
	06-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
(Duplicate)	06-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	02-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
(Duplicate)	02-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	29-May-2012	---	---	---	---	---	---	< 0.25
	10-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	13-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	25-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
(Duplicate)	19-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	14-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-10	09-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	11-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	18-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	22-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	05-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	02-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
	09-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
(Duplicate)	09-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	12-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
(Duplicate)	12-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	24-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
(Duplicate)	24-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	14-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-11	10-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	11-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	18-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	22-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	05-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	02-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
	10-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	12-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	24-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	14-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-12	10-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	11-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	18-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	22-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	06-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	02-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
	10-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	12-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	24-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	02-Aug-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-13	10-Mar-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Nov-2005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	16-Jun-2006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	11-Jul-2007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	---	< 0.1	< 0.05
	18-Dec-2007	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	22-Apr-2009	< 0.0004	< 0.0004	< 0.0004	< 0.0008	---	< 0.1	< 0.1
	06-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	02-Jun-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
	10-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	12-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	24-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	14-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
MW-02B	20-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	14-Jul-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	29-Sep-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.00050	< 0.10	< 0.10

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Table 5

Groundwater Analytical Results: Petroleum Hydrocarbons (PHCs)

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (Total) (mg/L)	Styrene (mg/L)	PHC F1 (C_6-C_{10}) - BTEX (mg/L)	PHC F2 (C_{10}-C_{16}) (mg/L)
Canadian Drinking Water AO Guidelines 2017		**---**	**0.024**	**0.0016**	**0.02**	**---**	**---**	**---**
Canadian Drinking Water MAC Guidelines 2017		**0.005**	**0.06**	**0.14**	**0.09**	**---**	**---**	**---**
QA/QC								
FIELD BLANK	05-May-2010	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	25-May-2011	< 0.00050	< 0.00075	< 0.00050	< 0.001	---	< 0.10	< 0.25
	30-May-2012	---	---	---	---	---	---	< 0.25
	09-Jul-2013	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	13-Jun-2014	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.25
	25-Jun-2015	< 0.00040	< 0.00040	< 0.00040	< 0.00080	---	< 0.10	< 0.10
	19-Sep-2016	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10
	02-Aug-2017	< 0.00050	< 0.00050	< 0.00050	< 0.00071	< 0.0010	< 0.10	< 0.10

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.

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Table 6

Groundwater Analytical Results: Volatile Organic Compounds (VOCs)

PROJECT No.: 307075-01608-300		Hydrocarbons	Phenols
Monitoring Station	Date (dd-mmm-yyyy)	Styrene (mg/L)	Phenols (mg/L)
Groundwater Monitoring			
MW-01	07-Mar-2005	---	< 0.001
	17-Nov-2005	---	< 0.001
	15-Jun-2006	---	< 0.001
	12-Jul-2007	---	< 0.001
	19-Dec-2007	---	0.002
	21-Apr-2009	---	0.003
	05-May-2010	< 0.0010	< 0.0010
	25-May-2011	< 0.0010	< 0.0010
	29-May-2012	---	< 0.0010
	10-Jul-2013	< 0.0010	< 0.0010
	16-Jun-2014	< 0.0010	< 0.0010
	29-Jun-2015	---	< 0.0020
	19-Sep-2016	< 0.0010	< 0.0010
	13-Jul-2017	< 0.0010	< 0.0010
MW-02	07-Mar-2005	---	< 0.001
	17-Nov-2005	---	< 0.001
	15-Jun-2006	---	< 0.001
	13-Jul-2007	---	0.002
	19-Dec-2007	---	0.002
	21-Apr-2009	---	0.002
	05-May-2010	< 0.0010	< 0.0010
	25-May-2011	< 0.0010	< 0.0010
	30-May-2012	---	< 0.0010
	10-Jul-2013	< 0.0010	< 0.0010
	16-Jun-2014	< 0.0010	< 0.0010
	28-Aug-2014	< 0.0010	< 0.0010
	25-Jun-2015	---	< 0.0020
	19-Sep-2016	< 0.0010	< 0.0010
	13-Jul-2017	< 0.0010	< 0.0010
	29-Sep-2017	< 0.00050	< 0.0010
MW-03	07-Mar-2005	---	< 0.001
	17-Nov-2005	---	< 0.001
	15-Jun-2006	---	< 0.001
	12-Jul-2007	---	< 0.001
	19-Dec-2007	---	0.002
	21-Apr-2009	---	0.003
	06-May-2010	< 0.0010	< 0.0010
	02-Jun-2011	< 0.0010	< 0.0010
	29-May-2012	---	< 0.0010
	10-Jul-2013	< 0.0010	< 0.0010
	16-Jun-2014	< 0.0010	< 0.0010
	29-Jun-2015	---	< 0.0020
	19-Sep-2016	< 0.0010	< 0.0010
	13-Jul-2017	< 0.0010	< 0.0010
(Duplicate)	13-Jul-2017	< 0.0010	< 0.0010
MW-04	08-Mar-2005	---	< 0.001
	17-Nov-2005	---	< 0.001
(Duplicate)	17-Nov-2005	---	< 0.001
	14-Jun-2006	---	< 0.001
	13-Jul-2007	---	< 0.001
	19-Dec-2007	---	0.002
	21-Apr-2009	---	< 0.002
	06-May-2010	< 0.0010	< 0.0010
	07-Jun-2011	< 0.0010	< 0.0010

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Table 6

Groundwater Analytical Results: Volatile Organic Compounds (VOCs)

PROJECT No.: 307075-01608-300		Hydrocarbons	Phenols
Monitoring Station	Date (dd-mmm-yyyy)	Styrene (mg/L)	Phenols (mg/L)
MW-04 (cont'd)	30-May-2012	---	< 0.0010
(Duplicate)	30-May-2012	---	< 0.0010
	09-Jul-2013	< 0.0010	< 0.0010
	13-Jun-2014	< 0.0010	< 0.0010
	29-Jun-2015	---	< 0.0020
	19-Sep-2016	< 0.0010	< 0.0010
	13-Jul-2017	< 0.0010	< 0.0010
MW-05	08-Mar-2005	---	< 0.001
	17-Nov-2005	---	< 0.001
	14-Jun-2006	---	< 0.001
	13-Jul-2007	---	0.002
	19-Dec-2007	---	< 0.001
	21-Apr-2009	---	0.003
	29-Apr-2010	< 0.0010	< 0.0010
	25-May-2011	< 0.0010	< 0.0010
	29-May-2012	---	< 0.0010
	08-Jul-2013	< 0.0010	< 0.0010
	13-Jun-2014	< 0.0010	< 0.0010
	25-Jun-2015	---	< 0.0020
	19-Sep-2016	< 0.0010	< 0.0010
	13-Jul-2017	< 0.0010	< 0.0010
MW-06	08-Mar-2005	---	< 0.001
	17-Nov-2005	---	< 0.001
	16-Jun-2006	---	< 0.001
	12-Jul-2007	---	< 0.001
	19-Dec-2007	---	0.002
	22-Apr-2009	---	0.003
	06-May-2010	< 0.0010	< 0.0010
	07-Jun-2011	< 0.0010	< 0.0010
	29-May-2012	---	< 0.0010
	08-Jul-2013	< 0.0010	< 0.0010
	12-Jun-2014	< 0.0010	< 0.0010
	25-Jun-2015	---	< 0.0020
	20-Sep-2016	< 0.0010	< 0.0010
	13-Jul-2017	< 0.0010	< 0.0010
MW-07	09-Mar-2005	---	< 0.001
	17-Nov-2005	---	< 0.001
	16-Jun-2006	---	< 0.001
	12-Jul-2007	---	< 0.001
	19-Dec-2007	---	0.002
	22-Apr-2009	---	0.003
	05-May-2010	< 0.0010	< 0.0010
	08-Jun-2011	< 0.0010	0.0020
	28-Jul-2011	< 0.0010	< 0.0010
	30-May-2012	---	< 0.0010
	11-Jul-2013	< 0.0010	0.0017
	13-Jun-2014	< 0.0010	< 0.0010
	25-Jun-2015	---	< 0.0020
	20-Sep-2016	< 0.0010	< 0.0010
	14-Jul-2017	< 0.0010	< 0.0010
MW-08	09-Mar-2005	---	< 0.001
	15-Nov-2005	---	< 0.001
	16-Jun-2006	---	< 0.001
	11-Jul-2007	---	< 0.001
	19-Dec-2007	---	0.001
	21-Apr-2009	---	0.002
	05-May-2010	< 0.0010	< 0.0010
	07-Jun-2011	< 0.0010	0.0016

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Table 6

Groundwater Analytical Results: Volatile Organic Compounds (VOCs)

PROJECT No.: 307075-01608-300		Hydrocarbons	Phenols
Monitoring Station	Date (dd-mmm-yyyy)	Styrene (mg/L)	Phenols (mg/L)
MW-08 (cont'd)	30-May-2012	---	< 0.0010
	09-Jul-2013	< 0.0010	< 0.0010
	12-Jun-2014	< 0.0010	< 0.0010
	24-Jun-2015	---	< 0.0020
	20-Sep-2016	< 0.0010	< 0.0010
	02-Aug-2017	< 0.0010	< 0.0010
MW-09	09-Mar-2005	---	< 0.001
(Duplicate)	09-Mar-2005	---	< 0.001
	17-Nov-2005	---	< 0.001
	16-Jun-2006	---	< 0.001
	11-Jul-2007	---	< 0.001
	18-Dec-2007	---	0.002
	22-Apr-2009	---	0.003
	06-May-2010	< 0.0010	< 0.0010
(Duplicate)	06-May-2010	< 0.0010	< 0.0010
	02-Jun-2011	< 0.0010	< 0.0010
(Duplicate)	02-Jun-2011	< 0.0010	< 0.0010
	29-May-2012	---	< 0.0010
	10-Jul-2013	< 0.0010	< 0.0010
	13-Jun-2014	< 0.0010	< 0.0010
	25-Jun-2015	---	< 0.0020
(Duplicate)	19-Sep-2016	< 0.0010	< 0.0010
	20-Sep-2016	< 0.0010	< 0.0010
	14-Jul-2017	< 0.0010	< 0.0010
MW-10	09-Mar-2005	---	< 0.001
	16-Nov-2005	---	< 0.001
	16-Jun-2006	---	< 0.001
	11-Jul-2007	---	< 0.001
	18-Dec-2007	---	0.002
	22-Apr-2009	---	0.002
	nk+A1	< 0.0010	< 0.0010
	02-Jun-2011	< 0.0010	0.0018
	30-May-2012	---	< 0.0010
	09-Jul-2013	< 0.0010	< 0.0010
(Duplicate)	09-Jul-2013	< 0.0010	< 0.0010
	12-Jun-2014	< 0.0010	< 0.0010
(Duplicate)	12-Jun-2014	< 0.0010	< 0.0010
	24-Jun-2015	---	< 0.0020
(Duplicate)	24-Jun-2015	---	< 0.0020
	20-Sep-2016	< 0.0010	< 0.0010
	14-Jul-2017	< 0.0010	< 0.0010
MW-11	10-Mar-2005	---	< 0.001
	16-Nov-2005	---	< 0.001
	16-Jun-2006	---	< 0.001
	11-Jul-2007	---	< 0.001
	18-Dec-2007	---	0.002
	22-Apr-2009	---	0.004
	05-May-2010	< 0.0010	< 0.0010
	02-Jun-2011	< 0.0010	< 0.0010
	30-May-2012	---	< 0.0010
	10-Jul-2013	< 0.0010	< 0.0010
	12-Jun-2014	< 0.0010	< 0.0010
	24-Jun-2015	---	< 0.0020
	20-Sep-2016	< 0.0010	< 0.0010
	14-Jul-2017	< 0.0010	< 0.0010
MW-12	10-Mar-2005	---	< 0.001
	16-Nov-2005	---	< 0.001
	16-Jun-2006	---	< 0.001

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Table 6

Groundwater Analytical Results: Volatile Organic Compounds (VOCs)

PROJECT No.: 307075-01608-300		Hydrocarbons	Phenols
Monitoring Station	Date (dd-mmm-yyyy)	Styrene (mg/L)	Phenols (mg/L)
MW-12 (cont'd)	11-Jul-2007	---	< 0.001
	18-Dec-2007	---	0.002
	22-Apr-2009	---	0.003
	06-May-2010	< 0.0010	< 0.0010
	02-Jun-2011	< 0.0010	< 0.0010
	30-May-2012	---	< 0.0010
	10-Jul-2013	< 0.0010	< 0.0010
	12-Jun-2014	< 0.0010	< 0.0010
	24-Jun-2015	---	< 0.0020
	20-Sep-2016	< 0.0010	< 0.0010
	14-Jul-2017	---	< 0.0010
	02-Aug-2017	< 0.0010	---
MW-13	10-Mar-2005	---	< 0.001
	16-Nov-2005	---	< 0.001
	16-Jun-2006	---	< 0.001
	11-Jul-2007	---	0.001
	18-Dec-2007	---	< 0.001
	22-Apr-2009	---	0.003
	06-May-2010	< 0.0010	< 0.0010
	02-Jun-2011	< 0.0010	< 0.0010
	30-May-2012	---	< 0.0010
	10-Jul-2013	< 0.0010	< 0.0010
	12-Jun-2014	< 0.0010	< 0.0010
	24-Jun-2015	---	< 0.0020
	20-Sep-2016	< 0.0010	< 0.0010
	14-Jul-2017	< 0.0010	< 0.0010
MW-02B	20-Sep-2016	< 0.0010	0.0101
	14-Jul-2017	< 0.0010	< 0.0010
	29-Sep-2017	< 0.00050	0.0014
QA/QC			
FIELD BLANK	05-May-2010	< 0.0010	< 0.0010
	25-May-2011	< 0.0010	< 0.0010
	09-Jul-2013	< 0.0010	< 0.0010
	13-Jun-2014	< 0.0010	< 0.0010
	25-Jun-2015	---	< 0.0020
	19-Sep-2016	< 0.0010	< 0.0010
	14-Jul-2017	---	< 0.0010
	02-Aug-2017	< 0.0010	---
Relative Percent Difference (RPD) Report			
MW-03	13-Jul-2017	< 0.0010	< 0.0010
(Duplicate)	13-Jul-2017	< 0.0010	< 0.0010
RPD(%)		**---**	**---**

NOTES:

1. --- in guideline row(s) denotes no criteria for that parameter.
2. --- in detail data row(s) denotes parameter not analyzed.

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Table 7

Groundwater Analytical Results: Isotopes

PROJECT No.: 307075-01608-300

Monitoring Station	Date (dd-mmm-yyyy)	delta ^{18}O (H_2O) (‰)	delta ^{2}H (H_2O) (‰)
Groundwater Monitoring			
MW-01	29-Jun-2015	-18.87	-147.2
	19-Sep-2016	-18.15	-143.1
	13-Jul-2017	-17.72	-141.8
MW-02	25-Jun-2015	-18.69	-144.3
	19-Sep-2016	-18.28	-143.9
	13-Jul-2017	-17.82	-142.8
	29-Sep-2017	-18.02	-144.8
MW-03	29-Jun-2015	-19.51	-151.5
	19-Sep-2016	-19.03	-149.1
	13-Jul-2017	-18.54	-147.8
(Duplicate)	14-Jul-2017	-18.55	-147.5
MW-04	29-Jun-2015	-17.47	-137.9
	19-Sep-2016	-17.18	-137.5
	13-Jul-2017	-16.37	-133.8
MW-05	25-Jun-2015	-16.77	-133.2
	19-Sep-2016	-16.26	-131.8
	13-Jul-2017	-16.00	-131.8
MW-06	25-Jun-2015	-18.27	-145.3
	20-Sep-2016	-17.79	-142.8
	13-Jul-2017	-17.48	-143.2
MW-07	25-Jun-2015	-18.76	-147.7
	20-Sep-2016	-18.24	-144.7
	14-Jul-2017	-17.91	-145.7
MW-08	24-Jun-2015	-18.39	-145.7
	20-Sep-2016	-17.93	-143.4
	02-Aug-2017	-17.39	-141.4
MW-09	25-Jun-2015	-19.04	-149.1
(Duplicate)	19-Sep-2016	-18.48	-146.6
	20-Sep-2016	-18.47	-146.7
	14-Jul-2017	-18.21	-147.3
MW-10	24-Jun-2015	-18.97	-148.1
(Duplicate)	24-Jun-2015	-18.86	-148.0
	20-Sep-2016	-18.54	-146.3
	14-Jul-2017	-18.23	-146.5
MW-11	24-Jun-2015	-17.57	-141.6
	20-Sep-2016	-17.05	-137.6
	14-Jul-2017	-16.86	-139.3
MW-12	24-Jun-2015	-17.84	-142.0
	20-Sep-2016	-17.30	-139.0
	14-Jul-2017	-16.95	-138.6
MW-13	24-Jun-2015	-19.06	-148.2
	20-Sep-2016	-18.69	-146.7
	14-Jul-2017	-18.22	-145.1
MW-02B	20-Sep-2016	-16.93	-134.9
	14-Jul-2017	-16.40	-133.8
	29-Sep-2017	-16.56	-135.5
QA/QC			
FIELD BLANK	25-Jun-2015	-20.20	-153.2
	19-Sep-2016	-18.73	-143.5
	14-Jul-2017	-19.35	-148.8

Figures

340000 360000 380000

5960000

Twp. 57 Twp. 56 Twp. 55 Twp. 54

Bon Accord
Gibbons
STURGEON COUNTY
Goose Hummock Golf Resort
Range Road 215
Range Road 210
Astotin Creek
Bruederheim
Star
LAMONT COUNTY
Lamont
743 m
Dow Chemical Industrial Complex
EDMONTON ASHESBURG AIRPORT
STRATHCONA COUNTY
Namao
Fort Saskatchewan
Lancaster Park
Manning Dr.
Range Road 222
Range Road 213A
I. D. NO. 13 (ELK ISLAND)

Rge. 25 Rge. 24 Rge. 23 Rge. 22 Rge. 21 Rge. 20 Rge. 19

Study Area
County Boundaries

0 2.5 5
Kilometers
1:150,000
NAD 1983 UTM Zone 12N

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

SITE LOCATION

OneWay to zero harm

Date: 15-NOV-17	Drawn by: T.G.	Edited by: T.G.	App'd by: .

Advision WorleyParsons Group

WorleyParsons Project No. 307075-01608-300

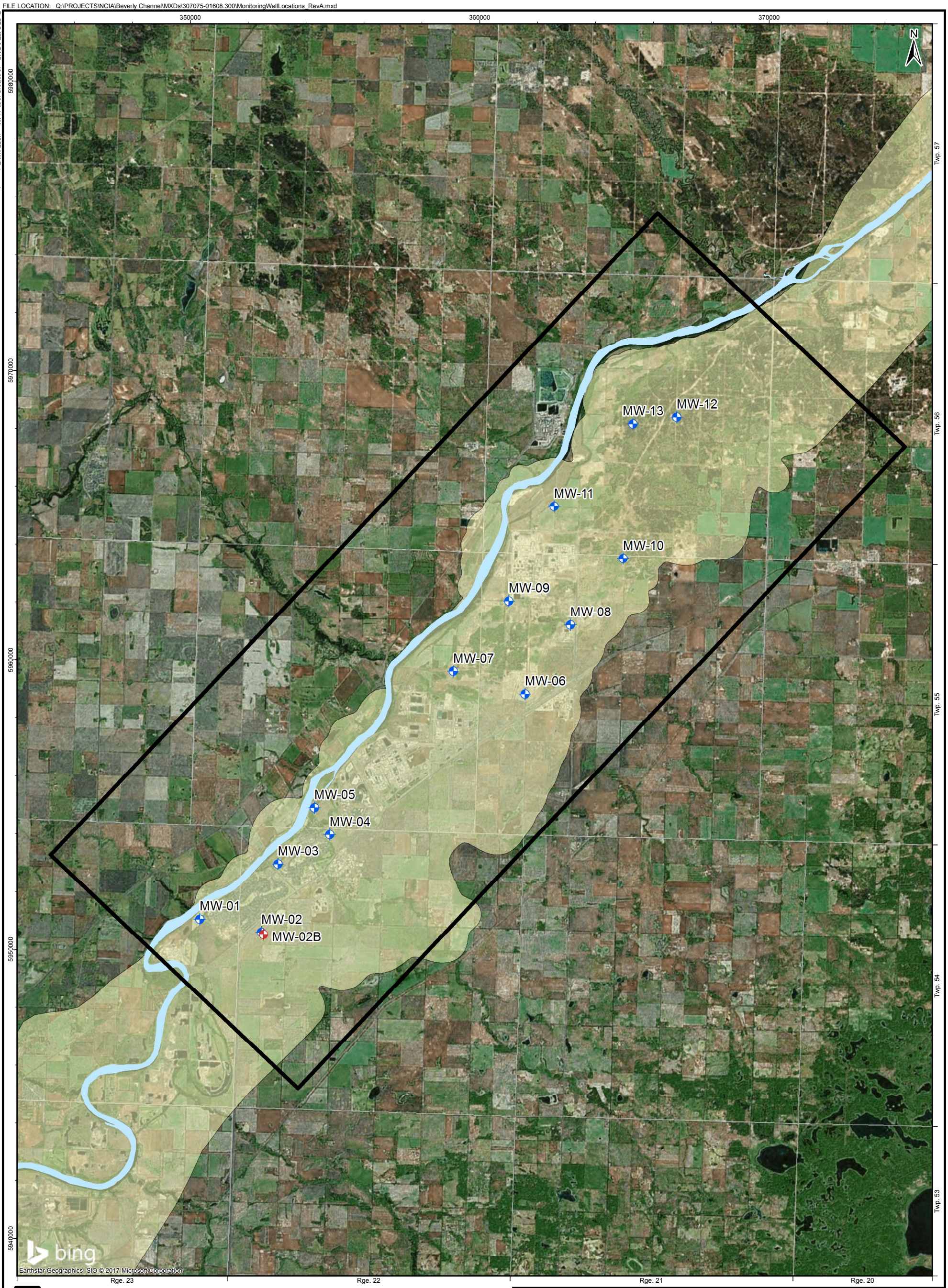
FIG No 1 REV A

PLOT DATE & TIME: 21/09/2015 1:54:41 PM USER NAME: tom.graham
SAVE DATE & TIME: 15/11/2017 11:03:21 AM ISSUING OFFICE: EDMONTON GIS

FILE LOCATION: Q:\PROJECTS\NCIA\Beverly Channel\MXDs\307075-01608.300\Site_Location_RevA.mxd

FILE LOCATION: Q:\PROJECTS\NCIA\Beverly Channel\MXDs\307075-01608.300\MonitoringWellLocations_RevA.mxd

PLOT DATE & TIME: 16/09/2015 10:52:41 AM USER NAME: tom.graham
SAVE DATE & TIME: 15/11/2017 11:20:49 AM ISSUING OFFICE: EDMONTON GIS



Study Area

Beverly Channel

Beverly Channel Monitoring Well

Bedrock Monitoring Well

0 2.5 5

Kilometres

1:125,000

NAD 1983 UTM Zone 12N

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

MONITORING WELL LOCATIONS

Date:	Drawn by:	Edited by:	App'd by:
15-NOV-17	T.G.	T.G.	.

OneWay™ to zero harm

Advisian WorleyParsons Group

WorleyParsons Project No. 307075-01608-300

FIG No 2

REV A

FILE LOCATION: Q:\PROJECTS\NCIA\Beverly Channel\MXDs\307075-01608.300\GW_Elevations_2017_September_RevC.mxd

PLOT DATE & TIME: 16/09/2015 10:56:06 AM
SAVE DATE & TIME: 20/11/2017 10:47:54 AM
USER NAME: tom.graham
ISSUING OFFICE: EDMONTON GIS

350000 360000 370000

5980000 5970000 5960000 5950000 5940000

Twp. 57 Twp. 56 Twp. 55 Twp. 54 Twp. 53

N

MW-13 (593.75)
MW-12 (593.17)
MW-11 (594.86)
MW-10 (597.96)
MW-09 (596.35)
MW-08 (598.68)
MW-07 (596.60)
MW-06 (598.20)
MW-05 (599.28)
MW-04 (602.38)
MW-03 (602.03)
MW-01 (603.28)
MW-02 (604.35)
MW-02B

594 595 596 597 598 599 600 601 602 603 604

Earthstar Geographics SIO © 2017 Microsoft Corporation

Rge. 23 Rge. 22 Rge. 21 Rge. 20

Study Area
Beverly Channel
Beverly Channel Monitoring Well
Bedrock Monitoring Well
Groundwater Surface Elevation Contour (masl)
Inferred Groundwater Flow Direction
(602.35) Groundwater Surface Elevation (masl)

0 2.5 5
Kilometres
1:125,000
NAD 1983 UTM Zone 12N

NOTE: MW-02B NOT INCLUDED FOR GROUNDWATER FLOW INTERPRETATION

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

GROUNDWATER SURFACE ELEVATIONS, SEPTEMBER 2017

OneWay to zero harm

Date:	Drawn by:	Edited by:	App'd by:
20-NOV-17	T.G.	T.G.	.

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WorleyParsons Project No.
307075-01608-300

FIG No 3
REV C

Appendices

Appendix 1 Water Well Records

FILE LOCATION: Q:\PROJECTS\NCIA\Beverly Channel\MXDs\307075-01608.200\307075_01608_200-WR-A1-1_ww_search-REVA.mxd

PLOT DATE & TIME: 30/06/2011 10:18:34 AM USER NAME: linda.flury
SAVE DATE & TIME: 24/10/2016 12:11:52 PM ISSUING OFFICE: EDMONTON GIS

360000

6980000

5960000

5940000

Rge. 23 Rge. 22 Rge. 21 Rge. 20

Twp. 57 Twp. 56 Twp. 55 Twp. 54 Twp. 53

N

MW-01
MW-02
MW-02B
MW-03
MW-04
MW-05
MW-06
MW-07
MW-08
MW-09
MW-10
MW-11
MW-12
MW-13

Redwater
Gibbons
Bruderheim
Josephburg

Township Road 574
Township Road 572
Township Road 570
Township Road 564
Township Road 562
Township Road 554
Township Road 550
Township Road 544
Township Road 542
Township Road 540

Range Road 233
Range Road 230
Range Road 224
Range Road 223
Range Road 220
Range Road 215A
Range Road 214
Range Road 213
Range Road 212
Range Road 211
Range Road 210
Range Road 204
Range Road 203

44 St
125 St
17 St NE
759 Ave NE
195 Ave NE
Manning Dr NE
Manning Dr NW
89 Ave
Boyd Lake Rd

Victoria Trail
North Saskatchewan River
Trappers Lake
Elk Island National
FORT SASKATCHEWAN INDUSTRIAL PARK
EASTGATE BUSINESS PARK
PINEVIEW
CLOVER BAR

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- Chemistry Exists - Bedrock
- Chemistry Exists - Beverly Channel
- Chemistry Exists
- No Chemistry
- NCIA Monitoring Well
- Study Area
- Townships
- Beverly Channel

0 1 2 3 4 5
Kilometres
1:125,000
NAD 1983 UTM Zone 12N

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2016 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

WATER WELL RECORDS WITHIN THE STUDY AREA

Date:	Drawn by:	Edited by:	App'd by:
24-OCT-16	P.K.	L.F.	.

OneWay to zero harm

Advision WorleyParsons Group

WorleyParsons Project No. 307076-1608-200

FIG No A1 - 1

REV A

Appendix A1-1

Water Well Records Within the Study Area

WELL ID	LOCATION: LSD	SECTION	TOWNSHIP	RANGE	MERIDIAN	WELL DEPTH (m)	PERFORATIONS 1 (m) FROM	PERFORATIONS 1 (m) TO	PERFORATIONS 2 (m) FROM	PERFORATIONS 2 (m) TO	PERFORATIONS 3 (m) FROM	PERFORATIONS 3 (m) TO	SCREENINGS 1 (m) FROM	SCREENINGS 1 (m) TO	SCREENINGS 2 (m) FROM	SCREENINGS 2 (m) TO	DATE COMPLETED	DATE ABANDONED	WELL OWNER	PROPOSED USE	TYPE OF WORK	DRILL METHOD	CHEMISTRY
42021	13	24	56	21	4														ALTA ENV		Unknown	Unknown	No Chemistry
0042022	4	14	56	21	4																Unknown	Unknown	No Chemistry
0261198	SE	07	055	22	4	1.8													HERDER, H		Chemistry	Hand Dug	Chemistry Exists
0261609	10	18	055	22	4	792.5											11/08/1953		MID-WESTERN #10-18		Oil Exploratory	Unknown	No Chemistry
0261734	04	27	55	22	4	256.3											22/05/1953		IMPERIAL OIL LTD #AO282-6		Oil Exploratory	Unknown	No Chemistry
0261824	04	34	55	22	4	295.7											22/05/1953		IMPERIAL OIL LTD #AO282 4		Oil Exploratory	Unknown	No Chemistry
0261829	01	3	56	22	4	268.2											13/05/1953		IMPERIAL OIL LTD #AO190-173		Oil Exploratory	Unknown	No Chemistry
0261847	04	36	55	22	4	299.0											21/05/1953		IMPERIAL OIL LTD		Oil Exploratory	Unknown	No Chemistry
0263716	16	12	056	21	4	42.7							34.1	35.7			17/11/1975		BRUDERHEIM, TOWN OF #15-75		Unknown	Unknown	No Chemistry
1421800	8	14	55	22	4														KEYERA				No Chemistry
1716347	2	27	55	21	4														LEDCOR				No Chemistry
1716349	2	27	55	21	4														LEDCOR				No Chemistry
1716350	2	27	55	21	4														LEDCOR				No Chemistry
1716352	2	27	55	21	4														LEDCOR				No Chemistry
1690170	SE	12	55	22	4	38.7							35.4	38.4			23/10/2014		CORMODE-DICKSON	Commercial	New Well	Rotary - Mud	No Chemistry
0261191	SE	07	055	22	4	6.1													HERDER, H	Contamination Invest.	Chemistry	Hand Dug	Chemistry Exists
1270077	07	10	055	22	4	21.6							17.1	20.1			25/05/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Drilled	No Chemistry
1270078	07	10	055	22	4	24.7							19.2	22.3			25/05/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Drilled	No Chemistry
1270079	07	10	055	22	4	27.1							20.7	23.8			26/05/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Rotary	No Chemistry
1270080	07	10	055	22	4	24.4							18.9	21.9			27/05/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Rotary	No Chemistry
1270081	07	10	055	22	4	29.6							22.3	25.3			27/05/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Rotary	No Chemistry
1270082	07	10	055	22	4	28.3							22.6	25.6			28/05/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Rotary	No Chemistry
1270083	07	10	055	22	4	28.0							22.6	25.6			23/06/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Rotary	No Chemistry
1270084	07	10	055	22	4	30.5							24.1	27.4			25/06/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Rotary	No Chemistry
1270085	07	10	055	22	4	24.7							20.7	23.8			24/06/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Rotary	No Chemistry
1270086	07	10	055	22	4	13.4							10.1	11.6			29/09/1998		DOW CHEMICAL CANADA LTD	Contamination Invest.	New Well	Rotary	No Chemistry
1320051	1	35	56	21	4	11.9							8.5	10.1			04/11/2008		AMEC EARTH & ENVIRONMENTAL	Dewatering	New Well	Bored	No Chemistry
2088626	15	8	56	21	4	11.9							2.7	8.8			20/01/2014		CITY OF EDMONTON	Dewatering	New Well	Rotary - Air	No Chemistry
2088627	15	8	56	21	4	11.6											21/01/2014		CITY OF EDMONTON	Dewatering	New Well	Rotary - Air	No Chemistry
0040488	SE	19	055	21	4	13.4											02/02/1970		HEARTLAND PROPERTIES	Domestic	Old Well-Abandoned	Not Applicable	No Chemistry
0040835	NW	03	057	21	4	18.3	12.2	18.3									22/08/2001		LANE, COLLEEN	Domestic	New Well	Rotary	No Chemistry
0083363	06	05	055	21	4	35.1													WESTMAN, F.W.	Domestic	Chemistry	Drilled	Chemistry Exists
0083364	12	05	055	21	4	24.4											01/01/1920		COATTA, E.J.	Domestic	Federal Well Survey	Bored	No Chemistry
0083365	09	05	055	21	4	4.3													PICKETT, JACK	Domestic	Chemistry	Unknown	Chemistry Exists
0083367	NW	06	055	21	4	64.0											03/08/1979		GAUF, ROD	Domestic	New Well	Rotary	No Chemistry
0083368	NE	06	055	21	4	18.3													SCHNEIDER, EARL A.	Domestic	Chemistry	Bored	Chemistry Exists
0083372	SW	07	055	21	4	39.6													NEWMAN, WILBERT	Domestic	Chemistry	Drilled	Chemistry Exists
0083373	09	07	055	21	4	30.5													MELTON, OTIS	Domestic	Chemistry	Drilled	Chemistry Exists
0083374	12	07	055	21	4	24.4											01/01/1920		THORNE, A.	Domestic	Federal Well Survey	Drilled	No Chemistry
0083375	NW	07	055	21	4	54.9	48.8	54.9									12/09/1987		FINCH, E.	Domestic	New Well	Cable Tool	No Chemistry
0083376	NW	07	055	21	4	9.1													FINCH, EDWARD	Domestic	Chemistry	Drilled	Chemistry Exists
0083377	NE	07	055	21	4	9.1													ENGLISH, LESLIE	Domestic	Chemistry	Unknown	Chemistry Exists
0083379	15	07	055	21	4	81.1													GEISLINGER, W.	Domestic	Chemistry	Unknown	Chemistry Exists
0083383	NE	09	055	21	4	0.0													EDE, W.	Domestic	Chemistry	Unknown	No Chemistry
0083417	SW	15	055	21	4	54.9	48.8	54.9									08/06/1989		WHELAN, JAMES	Domestic	New Well	Rotary	No Chemistry
0083418	NE	15	055	21	4	91.4													ANWEILER, SAL	Domestic	Chemistry	Unknown	Chemistry Exists
0083419	NW	16	055	21	4	56.4													KREBS, BERNARD	Domestic	Chemistry	Unknown	Chemistry Exists
0083423	11	17	055	21	4	21.3							20.1	21.3			09/04/1985		CNR	Domestic	New Well	Rotary	No Chemistry
0083425	NE	17	055	21	4	82.3	70.1	82.3									17/08/1983		SCOTFORD COLONY	Domestic	New Well	Rotary	No Chemistry
0083426	NE	17	055	21	4	79.2													SCOTFORD HUTTERITE BRETHREN	Domestic	Chemistry	Unknown	Chemistry Exists
0083428	NE	17	055	21	4	36.6													SCOTFORD COLONY	Domestic	Chemistry	Unknown	Chemistry Exists
0083439	SW	18	055	21	4	45.7													DUECK, MICHAEL	Domestic	Chemistry	Unknown	No Chemistry
0083440	NW	18	055	21	4	5.5													MAGEE, GARY	Domestic	Chemistry	Unknown	Chemistry Exists
0083447	05	19	055	21	4	46.9													DZURNY, EMIL	Domestic	Chemistry	Unknown	Chemistry Exists
0083448	NW	19	055	21	4	6.1												01/01/2001	BACHLEITNER, CATHY	Domestic	Chemistry	Hand Dug	Chemistry Exists
0083449	NE	19	055	21	4	39.6							36.6	38.1			23/07/1975	01/01/2001	EDE, WILLIAM	Domestic	New Well	Rotary	Chemistry Exists
0083450	NE	19	055	21	4	61.0													OLSON, FRED	Domestic	Chemistry	Unknown	Chemistry Exists
0083451	NE	19	055	21	4	40.2							34.7	40.2			10/10/1981		EDE, W.J.	Domestic	New Well	Rotary	No Chemistry
0083452	NE	19	055	21	4	48.8													ENOS, AL	Domestic	Chemistry	Drilled	Chemistry Exists
0083453	NE	19	055	21	4	39.0													NEBEL, ROBERT	Domestic	Chemistry	Drilled	Chemistry Exists
0083455	15	19	055	21	4	11.6							10.1	11.3			11/05/1978		NEBEL, ROBERT	Domestic	New Well	Rotary	No Chemistry
0083458	NE	19	055	21	4	18.3													NYHUIS, ALBERT	Domestic	Chemistry	Hand Dug	Chemistry Exists
0083460	NE	19	055	21	4	9.1													DOIGE, J.F.	Domestic	Chemistry	Unknown	Chemistry Exists
0083461	NE	19	055	21	4	50.3													CAMERON, ED	Domestic	Chemistry	Unknown	Chemistry Exists
0083462	SE	20	055	21	4	99.4													CNR#BEAMER SPUR	Domestic	Chemistry	Unknown	Chemistry Exists
0083463	SE	20	055	21	4	0.0													CNR#SCOTFORD YARD	Domestic	Chemistry	Unknown	No Chemistry
0083467	NE	21	055	21	4	76.2													SCOTFORD HUTTERITE COLONY	Domestic	Chemistry	Unknown	Chemistry Exists
0083470	NW	22	055	21	4	64.0													LARSEN, SVEND	Domestic	Chemistry	Drilled	Chemistry Exists
0083471	NW	22	055	21	4	54.9													LARSEN, HELEN	Domestic	Chemistry	Unknown	Chemistry Exists
0083473	NE	22	055	21	4	18.3													CHERNICHAN, JOHN	Domestic	Chemistry	Bored	Chemistry Exists
0083500	SW	27	055	21	4	0.0													CHOLOWSKI, ALBERT	Domestic	Chemistry	Unknown	No Chemistry
0083501	SW	27	055	21	4	67.1													CHIPCHASE, G.	Domestic	Chemistry	Unknown	Chemistry Exists
0083502	NW	27	055	21	4	42.7													MILLWARD, DONALD	Domestic	Chemistry	Unknown	Chemistry Exists
0083503	NW	27	055	21	4	42.7													MILLWARD, DONALD	Domestic	Chemistry	Unknown	Chemistry Exists
0083505	SE	28	055	21	4	38.7													ROYCE, SIDNEY	Domestic	Chemistry	Drilled	Chemistry Exists
0083506	SE	28	055	21	4	24.4													ROYCE, SIDNEY	Domestic	Chemistry	Unknown	No Chemistry
0083510	SE	30	055	21	4	9.8													WATERS, DEAN	Domestic	Chemistry	Unknown	Chemistry Exists
0083511	SE	30	055	21	4	7.6												01/01/2001	DOCKSTEADER, ILEF	Domestic	Chemistry	Hand Dug	Chemistry Exists
0083512	SE	30	055	21	4	9.1													HARBOWAY, M.	Domestic	Chemistry	Hand Dug	Chemistry Exists
0083513	SE	30	055	21	4	14.3											15/02/1970		BALIMORE, WESLY	Domestic	New Well	Bored	No Chemistry
0083514	SE	30	055	21	4	6.1													ORDELL, RICHARD	Domestic	Chemistry	Unknown	Chemistry Exists
0083516	SE	30	055	21	4	12.2													WATERS, DEAN	Domestic	Chemistry	Drilled	Chemistry Exists
0083517	SE	30	055	21	4	45.7													WOUDENBURG, MARY	Domestic	Chemistry	Unknown	Chemistry Exists
0083518	SW	30	055	21	4	6.1											12/12/1968		DAYTON, GEORGE	Domestic	Chemistry	Bored	Chemistry Exists
0083519	SW	30	055	21	4	6.7													DEMEULE, LORETTA	Domestic	Chemistry	Hand Dug	Chemistry Exists
0083520	06	30	055	21	4	41.1							39.6	41.1			08/08/1984		MOSER, GEORGETTE	Domestic	New Well	Rotary	No Chemistry
0083521	03	30	055	21	4	13.4											02/02/1970		YARSHUK, PETE	Domestic	New Well	Bored	No Chemistry
0083522	SW	30	055	21	4	10.7													WIEBE, G.	Domestic	Chemistry	Unknown	Chemistry Exists
0083523	SW	30	055	21	4	9.1													DEMEULE, N.E.	Domestic	Chemistry	Drilled	Chemistry Exists
0083524	NW	30	055	21	4	6.7													BAKER, I.H.	Domestic	Chemistry	Drilled	Chemistry Exists
0083525	NW	30	055	21	4	7.3													LINING, DALE	Domestic	Chemistry	Bored	Chemistry Exists
0083526	NW	30	055	21	4	7.3													FRANCOUER, LARRY	Domestic	Chemistry	Unknown	Chemistry Exists
0083527	NW	30	055	21	4	9.1													BECK, LINDA	Domestic	Chemistry	Unknown	Chemistry Exists
0083528	NW	30	055	21	4	12.2													FRANCOUER, LARRY	Domestic	Chemistry	Drilled	Chemistry Exists
0083529	NW	30	055	21	4	9.8											30/11/1965		YANCHUK, PETE	Domestic	New Well	Bored	No Chemistry
0083531	NW	30	055	21	4	12.2											06/02/1970		YARSHUK, PETER	Domestic	New Well	Bored	No Chemistry
0083532	13	30	055	21	4	8.5											12/02/1970	01/01/2001	YARSHUK, PETER	Domestic	New Well	Bored	No Chemistry
0083533	SE	31	055	21	4	41.1													PCL BRAUN SIMONS LTD	Domestic	Chemistry	Unknown	Chemistry Exists
0083534	NE	31	055	21	4	39.6													PCL BRAUN SIMONS LTD	Domestic	Chemistry	Unknown	Chemistry Exists
0083536	NW	32	055	21	4	39.6													PCL BRAUN SIMONS LTD	Domestic	Chemistry	Unknown	Chemistry Exists
0083537	NW	32	055	21	4	39.6													PCL BRAUN SIMONS LTD	Domestic	Chemistry	Unknown	Chemistry Exists
0083538	NW	32	055	21	4	45.7													PCL BRAUN SIMONS LTD	Domestic	Chemistry	Unknown	Chemistry Exists
0083544	NE	32	055	21	4	46.3													VISSCHER, D.	Domestic	Chemistry	Unknown	Chemistry Exists
0083548	SW	34	055	21	4	15.2													RADKE, JAMES	Domestic	Chemistry	Drilled	Chemistry Exists
0083549	04	34	055	21	4	12.2											26/08/1975		RADKE, BEN	Domestic	New Well	Bored	No Chemistry
0083551	SW	34	055	21	4	0.0													RADKE	Domestic	Chemistry	Unknown	No Chemistry
0083552	05	34	055	21	4	35.1							32.0	35.1			09/02/1986		RADKE, J./ R.	Domestic	New Well	Rotary	No Chemistry
0083554	NW	34	055	21	4	18.3													PICKARD, WAYNE	Domestic	Chemistry	Drilled	Chemistry Exists
0083556	NW	34	055	21	4	39.6							34.4	36.0			01/10/1970		FISHER, GEORGE P.	Domestic	New Well	Rotary	No Chemistry
0083560	NW	34	055	21	4	42.7							36.6	42.7			14/08/1989		DAOUST, C.	Domestic	New Well	Rotary	No Chemistry
0083561	NE	34	055	21	4	30.5							28.3	29.9			05/06/1968		BERG, ALFRED	Domestic	New Well	Rotary	No Chemistry
0083564	NE	35	55	21	4	12.8													CHARBONNEAU, MARCEL	Domestic	Chemistry	Drilled	Chemistry Exists
0083570	SE	36	055	21	4	18.3													NAVRATIL, JOHN	Domestic	Chemistry	Bored	Chemistry Exists
0083571	SE	36	055	21	4	15.2													WIENS, LORI	Domestic	Chemistry	Unknown	Chemistry Exists
0083572	SW	36	055	21	4	39.6	37.8	39.6									07/04/1988		UNITED GRAIN GROWERS LTD	Domestic	New Well	Cable Tool	No Chemistry
0083573	NW	36	055	21	4	12.2													PROKOPCZAK, DAVID	Domestic	Chemistry	Unknown	Chemistry Exists
0083656	SE	16	055	21	4	48.2													RIETVELD, LEENDERT	Domestic	Chemistry	Drilled	Chemistry Exists
0090354	SE	27	055	21	4	54.9	39.0	42.7									01/08/1972		CHOLOWSKI, ALBERT	Domestic	New Well	Rotary	No Chemistry
0091494	04	06	056	20	4	6.1													SAMPERT, T.	Domestic	Federal Well Survey	Hand Dug	No Chemistry
0091496	SW	06	056	20	4	3.0													THORNE, KEITH	Domestic	Chemistry	Unknown	No Chemistry
0091498	NE	06	056	20	4	91.4													SCHRAM, GEORGE	Domestic	Chemistry	Unknown	Chemistry Exists
0091502	09	07	056	20	4	9.1													DRIESNER, D.	Domestic	Federal Well Survey	Bored	No Chemistry
0091504	SW	08	056	20	4	23.8													SCHRAM, ED	Domestic	Chemistry	Unknown	Chemistry Exists
0091506	16	08	056	20	4	75.0											15/11/1961		FREY, BERT W.	Domestic	New Well	Rotary	Chemistry Exists
0091507	NE	08	056	20	4	5.5													FREY, B.	Domestic	Chemistry	Unknown	No Chemistry
0091508	09	08	056	20	4	12.2											01/01/1920		FREY, J.	Domestic	Federal Well Survey	Bored	No Chemistry
0091550	SW	16	056	20	4	6.1													ROSNAU, N.	Domestic	Chemistry	Unknown	Chemistry Exists
0091553	12	16	056	20	4	19.5											20/03/1985		NEAVE, JOHN	Domestic	New Well	Bored	Chemistry Exists
0091554	02	17	56	20	4	34.1											06/05/1981		SAMPERT, RAY	Domestic	New Well	Bored	No Chemistry
0091558	SE	18	056	20	4	5.8													MCLELLAN, ARTHUR	Domestic	Chemistry	Unknown	Chemistry Exists
0091559	SE	18	056	20	4	6.7													MCLELLAN, ARTHUR	Domestic	Chemistry	Hand Dug	Chemistry Exists
0091561	SE	18	056	20	4	33.5											17/12/1981		MCLELLAN, ARTHUR L.	Domestic	New Well	Cable Tool	No Chemistry
0091562	SE	18	56	20	4	67.1											07/10/2000		HELMER, MURIEL/ABNER	Domestic	Old Well-Test	Not Applicable	Chemistry Exists
0091562	SE	18	56	20	4	67.1	61.0	67.1									31/12/1981		MCLELLAN, ARTHUR	Domestic	New Well	Rotary	Chemistry Exists
0091564	04	18	056	20	4	0.0													STELTER, A.	Domestic	Federal Well Survey	Hand Dug	No Chemistry
0091565	NW	18	056	20	4	12.2													SERINK, W.	Domestic	Chemistry	Bored	Chemistry Exists
0091566	11	18	056	20	4	14.9											17/06/1979		SERINK, W.	Domestic	New Well	Bored	No Chemistry
0091572	04	19	056	20	4	44.2											23/09/1978		SERINK, BILL	Domestic	New Well	Rotary	No Chemistry
0091573	12	19	056	20	4	10.4											01/07/1974		MATTHEWS, BILL	Domestic	New Well	Bored	Chemistry Exists
0100929	SW	08	056	20	4	7.9													SCHRAM, ED	Domestic	Chemistry	Hand Dug	Chemistry Exists
0100930	SE	08	056	20	4	9.1													KRAUSE, F.	Domestic	Chemistry	Unknown	Chemistry Exists
0100931	00	08	056	20	4	17.1													INKSTER, COLIN	Domestic	Chemistry	Unknown	Chemistry Exists
0100932	NE	08	056	20	4	19.5											14/07/1973		INKSTER, COLIN	Domestic	New Well	Bored	No Chemistry
0100943	SW	16	056	20	4	62.5	56.4	62.5									01/11/1973		ROSNAU, NEIL	Domestic	New Well	Cable Tool	Chemistry Exists
0100944	SW	16	056	20	4	93.0													ROSNAU, NEIL	Domestic	Chemistry	Unknown	Chemistry Exists
0100945	SW	16	056	20	4	24.7													BOWES, GEORGE	Domestic	Chemistry	Unknown	Chemistry Exists
0100946	SW	16	056	20	4	28.7											18/10/1977		ROSNAU, WESLEY	Domestic	New Well	Bored	Chemistry Exists
0100947	SW	20	056	20	4	45.7													BETTAC, E.	Domestic	Chemistry	Unknown	Chemistry Exists
0100948	SW	20	056	20	4	45.7													WATSON, D.	Domestic	Chemistry	Unknown	No Chemistry
0150309	SE	29	055	22	4	91.4											25/01/1990		GROOT, DON	Domestic	New Well	Combination	No Chemistry
0152373	WH	08	056	21	4	25.0											26/06/1990		MASCHMEYER, RAY	Domestic	New Well	Rotary	No Chemistry
0153167	SE	22	055	21	4	48.8							41.1	42.7			20/07/1990		POULIN, RODGER	Domestic	New Well	Rotary	No Chemistry
0154895	NW	16	055	21	4	48.8	42.7	48.8									13/10/1990		KREBS, BERNARD L.	Domestic	New Well	Rotary	No Chemistry
0156817	NW	07	054	22	4	67.1													ALLEN, GERALD	Domestic	Chemistry	Unknown	No Chemistry
0156870	NW	16	055	21	4	74.7													KREBS, BERNARD L.	Domestic	Chemistry	Rotary	Chemistry Exists
0156871	SE	30	055	21	4	9.8													HONISCH, VERNON	Domestic	Chemistry	Not Applicable	No Chemistry
0156872	SW	01	055	22	4	0.0													THEROUX, CHRIS	Domestic	Chemistry	Not Applicable	No Chemistry
0156874	00	20	055	22	4	8.5													LAMOUREUX, JOHN C./CRAIG, RAY	Domestic	Chemistry	Not Applicable	No Chemistry
0157040	NW	01	056	21	4	11.0													CHOLOWSKI, TOM	Domestic	Chemistry	Hand Dug	No Chemistry
0157041	NE	27	056	21	4	54.9													EASTWOOD, J.W.	Domestic	Chemistry	Not Applicable	No Chemistry
0158532	NE	08	054	22	4	14.0											07/07/1979		MAKUCH, PETER J.	Domestic	New Well	Bored	No Chemistry
0158533	NE	08	054	22	4	23.2											01/07/1972		OGDEN, WAYNE	Domestic	New Well	Bored	No Chemistry
0158577	NE	03	056	22	4	64.0	30.5	64.0									06/04/1968		KUGLER, ERIKA	Domestic	New Well	Rotary	No Chemistry
0159287	SE	05	055	22	4	14.6	8.2	14.6									10/07/1991		GODBOUT, ROMEO	Domestic	New Well	Bored	No Chemistry
0160456	NE	34	056	21	4	12.2													GORGICHUK, DIANA	Domestic	Chemistry	Not Applicable	No Chemistry
0160666	SE	30	055	21	4	8.5													SOWDEN, HELEN	Domestic	Chemistry	Not Applicable	No Chemistry
0160801	SE	16	054	22	4	5.5													BONOWICZ, KEN	Domestic	Chemistry	Not Applicable	No Chemistry
0161740	NE	08	054	22	4	30.5													OSTERLAND, JOYCE	Domestic	Chemistry	Not Applicable	No Chemistry
0161789	NE	19	056	21	4	7.6													MELTON, JAMES	Domestic	Chemistry	Not Applicable	No Chemistry
0161790	NW	27	056	21	4	3.7													JOHNSTON, DAVID	Domestic	Chemistry	Not Applicable	No Chemistry
0162337	09	4	57	21	4	22.9											26/05/2001		LANE, C.	Domestic	Old Well-Test	Not Applicable	No Chemistry
0162337	09	4	57	21	4	21.3							17.7	21.3			31/12/1991		LANE, C/EST OF M PICH	Domestic	Reconstructed	Not Applicable	No Chemistry
0162337	09	4	57	21	4	22.9							16.2	22.3			16/11/1991		LANE, C./EST OF M. PICH	Domestic	New Well	Cable Tool	No Chemistry
0165347	SE	34	054	23	4	24.4													MOAK, CARL A.	Domestic	Chemistry	Unknown	No Chemistry
0166298	NE	08	054	22	4	73.2	42.7	72.2									01/06/1992		TAPLEY, CAM	Domestic	New Well	Rotary	No Chemistry
0167085	NE	08	054	22	4	11.6													AMBLER, TERRY D.	Domestic	Chemistry	Unknown	No Chemistry
0167584	NW	25	055	21	4	61.0													PROKOPCZAK, WM	Domestic	Chemistry	Unknown	No Chemistry
0168098	16	08	054	22	4	14.6	4.3	9.8									25/06/1992		COOL, NORMAND	Domestic	New Well	Bored	No Chemistry
0168181	09	18	054	22	4	9.8	4.9	9.8									21/07/1992		DAKIN, DEXTER	Domestic	New Well	Bored	No Chemistry
0168267	NE	08	054	22	4	11.3	6.1	11.3									16/07/1992		DORLICH, HELGA	Domestic	New Well	Bored	No Chemistry
0169284	08	14	055	22	4	40.5							37.8	39.3			02/10/1992		FEDERATED PIPELINE LTD	Domestic	New Well	Rotary	No Chemistry
0169305	NE	08	054	22	4	9.4													DAKIN, DOREEN	Domestic	Chemistry	Unknown	No Chemistry
0169519	SW	02	057	21	4	3.0													SUDAYKO, MIKE	Domestic	Chemistry	Unknown	No Chemistry
0169601	SW	02	057	21	4	48.8													SUDAYKO, MIKE	Domestic	Chemistry	Unknown	No Chemistry
0193975	SW	30	055	21	4	42.7												01/01/2001	G&J TRAILER ENT	Domestic	Chemistry	Unknown	No Chemistry
0195146	NW	33	056	21	4	15.2											01/08/1973		PICH, PETER	Domestic	New Well	Bored	No Chemistry
0196672	SE	08	056	20	4	6.1													ALEXANDER, BOB	Domestic	Chemistry	Unknown	No Chemistry
0208911	SE	16	056	21	4	11.9	4.6	11.3									25/09/1992		HENKELMAN, PERCY	Domestic	New Well	Bored	No Chemistry
0224564	SE	18	056	20	4	42.7							35.4	41.5			09/10/1993		MCLELLAN, ART	Domestic	New Well	Rotary	No Chemistry
0225468	10	08	054	22	4	14.9	7.3	8.5	10.1	14.6							26/08/1993		HESKE, GERRY	Domestic	New Well	Bored	No Chemistry
0225474	09	08	054	22	4	14.9	6.1	12.2									27/08/1993		CLARK, DARCY	Domestic	New Well	Bored	No Chemistry
0231919	NW	13	054	23	4	31.7							29.3	31.7			20/12/1977		ESQUIRE HOMES LTD/FUNG, DR. G.	Domestic	New Well	Rotary	No Chemistry
0238531	NW	30	055	21	4	42.1	36.0	42.1									26/01/1994	01/01/2001	LEUENG, DALE	Domestic	New Well	Rotary	No Chemistry
0240644	NE	08	054	22	4	64.0	57.9	64.0									16/03/1994		GETSON, DON	Domestic	New Well	Cable Tool	No Chemistry
0240722	09	08	054	22	4	14.9	4.6	10.7									22/10/1993		MRASEK, DAVID	Domestic	New Well	Bored	No Chemistry
0240723	09	08	054	22	4	14.9	5.5	11.6									01/10/1993		BALANKO, RON	Domestic	New Well	Bored	No Chemistry
0241116	10	08	054	22	4	14.9	4.9	12.2									13/05/1994		BOWES, MURRAY	Domestic	New Well	Bored	No Chemistry
0260033	NE	07	054	22	4	59.7											01/01/1958		GALLOWAY, K.	Domestic	New Well	Cable Tool	Chemistry Exists
0260035	NW	08	054	22	4	61.0	48.8	57.9									22/09/1983		CHIMERA, WALTER	Domestic	New Well	Cable Tool	Chemistry Exists
0260037	NE	08	054	22	4	73.5											01/10/1973		GYDISH, ROBERT	Domestic	New Well	Cable Tool	Chemistry Exists
0260038	NE	08	054	22	4	73.2	47.5	73.2									08/03/1974		RAFUSE, A.J.	Domestic	New Well	Cable Tool	No Chemistry
0260039	NE	08	054	22	4	8.5											01/04/1971		SWANSON, K.	Domestic	New Well	Bored	No Chemistry
0260045	NE	08	054	22	4	73.2	45.7	73.2									16/06/1972		KALISTA, M.J.	Domestic	New Well	Cable Tool	Chemistry Exists
0260046	NE	08	054	22	4	9.1											28/08/1978		TOMPLINS, D.	Domestic	New Well	Bored	Chemistry Exists
0260048	NE	08	054	22	4	8.8											06/09/1979		THOME, MIKE	Domestic	New Well	Bored	No Chemistry
0260052	NE	08	054	22	4	9.1											27/10/1980		KROENTING, GREG	Domestic	New Well	Bored	Chemistry Exists
0260054	NE	08	054	22	4	10.1											30/04/1984		KENSON HLDG	Domestic	New Well	Bored	No Chemistry
0260058	NE	08	054	22	4	11.9											28/05/1986		HESKE, GERRY	Domestic	New Well	Bored	Chemistry Exists
0260171	SE	16	054	22	4	61.0	54.9	61.0									03/11/1988		BONOWICZ, JOE	Domestic	New Well	Cable Tool	Chemistry Exists

Appendix A1-1

Water Well Records Within the Study Area

WELL ID	LOCATION					WELL DEPTH (m)	PERFORATIONS 1 (m)		PERFORATIONS 2 (m)		PERFORATIONS 3 (m)		SCREENINGS 1 (m)		SCREENINGS 2 (m)		DATE		WELL OWNER	PROPOSED USE	TYPE OF WORK	DRILL METHOD	CHEMISTRY
	LSD	SECTION	TOWNSHIP	RANGE	MERIDIAN		FROM	TO	FROM	TO	FROM	TO	FROM	TO	FROM	TO	COMPLETED	ABANDONED					
0260194	NW	21	054	22	4	70.1	61.0	68.6									03/04/1985		GRAYMAN, LYLE	Domestic	New Well	Cable Tool	No Chemistry
0260203	NW	23	054	22	4	46.9	22.6	46.0									17/04/1984		MCEACHERN, MEL	Domestic	New Well	Rotary	Chemistry Exists
0260225	SW	27	54	22	4	50.3	33.5	47.2									20/12/1969		SHAREK, TONY	Domestic	New Well	Rotary	No Chemistry
0260227	NE	27	054	22	4	61.9	24.4	61.0									11/04/1967		SIMMONS, HECTOR	Domestic	New Well	Rotary	Chemistry Exists
0260229	NW	28	054	22	4	47.5											29/02/1960		DAVIS, DON	Domestic	New Well	Rotary	No Chemistry
0260230	NW	28	054	22	4	73.2	67.1	71.9									12/08/1976		ROBERT, VICTOR	Domestic	New Well	Rotary	Chemistry Exists
0260232	NW	28	054	22	4	27.4											20/08/1960		SNEDSTEAD	Domestic	New Well	Drilled	No Chemistry
0260233	NW	28	054	22	4	30.5											25/09/1960		STARK, R.	Domestic	New Well	Drilled	No Chemistry
0260234	NW	28	054	22	4	60.0											06/05/1970		PIERCE, E.	Domestic	New Well	Rotary	Chemistry Exists
0260235	NW	28	054	22	4	30.5											17/09/1959		BOHNET, HANS	Domestic	New Well	Rotary	Chemistry Exists
0260236	NW	28	054	22	4	30.5											07/10/1960		PETROSKI CONTRACTING	Domestic	New Well	Drilled	No Chemistry
0260237	NW	28	054	22	4	30.5											19/01/1961		WETZTREN, M.	Domestic	New Well	Cable Tool	Chemistry Exists
0260366	NW	28	054	22	4	76.8											26/10/1977		SHEPPARD, JOHN	Domestic	New Well	Rotary	No Chemistry
0260369	12	28	054	22	4	32.3							28.3	29.3			02/07/1959		HAMILTON, CALVIN	Domestic	New Well	Rotary	Chemistry Exists
0260375	NW	29	054	22	4	13.7													VLA	Domestic	Chemistry	Hand Dug	Chemistry Exists
0260383	SE	30	054	22	4	76.2													KREBS, D.	Domestic	Chemistry	Unknown	Chemistry Exists
0260386	SE	30	054	22	4	76.2											30/05/1968		KREBS, DON	Domestic	New Well	Rotary	No Chemistry
0260397	SE	32	054	22	4	24.4													CHOLOWSKI, GERALD	Domestic	Chemistry	Unknown	Chemistry Exists
0260425	SW	34	054	22	4	45.7													FLEMING, ERNEST	Domestic	Chemistry	Drilled	Chemistry Exists
0260441	NE	34	054	22	4	57.9													BARTELL, RICHARD	Domestic	Chemistry	Unknown	Chemistry Exists
0260447	NW	35	054	22	4	48.2											01/01/1912		SIMMONS, F.	Domestic	New Well	Drilled	No Chemistry
0260903	WH	13	054	23	4	3.7													MITHELL, DOUG	Domestic	Chemistry	Unknown	Chemistry Exists
0260906	NW	13	054	23	4	31.7							28.3	31.7			01/10/1977		OBRADOVICH, VUKSAN	Domestic	New Well	Rotary	Chemistry Exists
0260914	NW	13	054	23	4	82.3													ELLEFSON, NORM	Domestic	Chemistry	Cable Tool	Chemistry Exists
0260922	NW	13	054	23	4	82.3													GAVINCHUK, GEORGE	Domestic	Chemistry	Drilled	Chemistry Exists
0260948	NW	13	054	23	4	31.7							29.0	31.4			23/03/1978		PESKLEVIS, ALBERT	Domestic	New Well	Rotary	Chemistry Exists
0260972	NW	13	054	23	4	32.0							29.3	32.0			29/05/1979		KIEL, RUDY	Domestic	New Well	Rotary	Chemistry Exists
0260980	NW	13	054	23	4	31.7											04/07/1979		SIGURDSON, HOWARD	Domestic	New Well	Rotary	Chemistry Exists
0260987	NW	13	054	23	4	42.7							29.9	31.4			04/11/1980		MITCHELL, DOUGLAS B.	Domestic	New Well	Rotary	No Chemistry
0260996	NW	13	054	23	4	36.6													BERG, AARON	Domestic	Chemistry	Unknown	Chemistry Exists
0261001	NW	13	054	23	4	32.0							29.0	32.0			24/04/1980		BERG, AARON	Domestic	New Well	Rotary	No Chemistry
0261009	NE	13	054	23	4	12.2											01/01/1935		DAWSON, MAJ.	Domestic	Federal Well Survey	Hand Dug	No Chemistry
0261032	SE	01	055	22	4	45.7													SCHWANDT, E A	Domestic	Chemistry	Unknown	Chemistry Exists
0261039	SE	01	055	22	4	54.9													HANSEN, P E	Domestic	New Well	Unknown	No Chemistry
0261073	SE	01	055	22	4	0.0													WALLACE, J	Domestic	Chemistry	Unknown	Chemistry Exists
0261075	SE	01	055	22	4	0.0													BARR, F	Domestic	Chemistry	Unknown	Chemistry Exists
0261078	SE	01	055	22	4	121.9													BEST, S.	Domestic	Chemistry	Unknown	Chemistry Exists
0261082	SE	01	055	22	4	0.0													SCHLOSSER, D	Domestic	Chemistry	Unknown	Chemistry Exists
0261107	16	31	054	22	4	2.7													CAMERON, D.	Domestic	Chemistry	Unknown	Chemistry Exists
0261129	00	04	055	22	4	0.0													LAMOUREUX CHILDRENS HOME	Domestic	Chemistry	Hand Dug	Chemistry Exists
0261133	SE	05	055	22	4	11.3											14/09/1982		LAMOUREUX, J	Domestic	New Well	Bored	Chemistry Exists
0261139	SE	05	055	22	4	11.3											11/05/1959		LAMOUREUX, R	Domestic	New Well	Bored	Chemistry Exists
0261147	SW	06	055	22	4	39.6											01/07/1973		GABERT, B	Domestic	New Well	Cable Tool	No Chemistry
0261149	SE	06	055	22	4	73.2	43.3	49.4									15/07/1980		BOYCHUK, N	Domestic	New Well	Rotary	No Chemistry
0261151	03	06	055	22	4	8.2											01/01/1906		LAMOUREUX, A.L.	Domestic	Federal Well Survey	Hand Dug	No Chemistry
0261154	04	06	055	22	4	51.8													ZIMA, M	Domestic	Chemistry	Unknown	Chemistry Exists
0261182	NE	06	055	22	4	79.2													ELLIOTT, F	Domestic	Chemistry	Unknown	Chemistry Exists
0261187	09	06	055	22	4	18.3											01/01/1927		ADAMS, B.S.	Domestic	Federal Well Survey	Drilled	No Chemistry
0261202	SE	07	055	22	4	9.1													HERDER, H	Domestic	Chemistry	Drilled	Chemistry Exists
0261203	SE	07	055	22	4	82.3											26/08/1974	26/08/1974	JUKASZ, A.	Domestic	Dry Hole-Abandoned	Rotary	No Chemistry
0261213	NW	07	055	22	4	18.3											23/05/1969		CHRISTIANSEN, J.M.	Domestic	New Well	Bored	Chemistry Exists
0261220	NE	07	055	22	4	10.7													PRINS, W	Domestic	Chemistry	Unknown	Chemistry Exists
0261225	NE	07	055	22	4	11.6											21/10/1978		PRINS, W	Domestic	New Well	Bored	No Chemistry
0261250	10	09	055	22	4	19.8													KEITH, D	Domestic	Chemistry	Unknown	Chemistry Exists
0261348	SE	11	055	22	4	36.9							34.4	36.9			27/04/1978		WOUDENBERG, M.	Domestic	New Well	Rotary	No Chemistry
0261357	SE	11	055	22	4	79.2											01/08/1965		TIMNALL, C./V.	Domestic	New Well	Rotary	No Chemistry
0261368	SE	11	055	22	4	73.2													SHEWCHUK, S	Domestic	Chemistry	Unknown	Chemistry Exists
0261376	SE	11	055	22	4	61.0													HAREL, C.	Domestic	Chemistry	Unknown	Chemistry Exists
0261383	SE	11	055	22	4	121.9	103.6	121.9									20/10/1977		WOUDENBERG, M.	Domestic	New Well	Rotary	No Chemistry
0261396	SE	11	055	22	4	64.0													TINDALL, V	Domestic	Chemistry	Unknown	Chemistry Exists
0261398	SE	11	055	22	4	27.4													DENNIS, D.	Domestic	Chemistry	Unknown	Chemistry Exists
0261403	SW	11	055	22	4	54.9													SHEWCHUK, T	Domestic	Chemistry	Unknown	Chemistry Exists
0261446	NW	13	055	22	4	24.4													WOUDENBERG, M.	Domestic	Chemistry	Unknown	Chemistry Exists
0261447	NW	13	055	22	4	12.2													WOUDENBERG, M.	Domestic	Chemistry	Drilled	Chemistry Exists
0261449	NE	13	055	22	4	7.3											01/04/1971		BARON, F.	Domestic	New Well	Bored	No Chemistry
0261450	NE	13	055	22	4	7.3													MCARTHUR, DOUGLAS	Domestic	Chemistry	Unknown	Chemistry Exists
0261453	NE	13	055	22	4	7.3													DAWSON, J B	Domestic	Chemistry	Bored	Chemistry Exists
0261468	SW	14	055	22	4	64.0											01/04/1959			Domestic	New Well	Unknown	No Chemistry
0261493	NW	14	055	22	4	18.3													TAILLEFER, G	Domestic	Chemistry	Drilled	Chemistry Exists
0261513	SW	17	055	22	4	0.0													GRANT, G.	Domestic	Chemistry	Unknown	Chemistry Exists
0261521	NW	17	055	22	4	18.3													READNER, H	Domestic	Chemistry	Bored	Chemistry Exists
0261530	NE	17	055	22	4	115.8													RUSSEL, L	Domestic	Chemistry	Unknown	Chemistry Exists
0261542	SW	18	055	22	4	9.1													CURTIS, L	Domestic	Chemistry	Bored	Chemistry Exists
0261556	NW	18	055	22	4	8.2													CURTIS, R.	Domestic	Chemistry	Unknown	Chemistry Exists
0261563	NW	24	054	23	4	9.1														Domestic	Chemistry	Unknown	Chemistry Exists
0261564	NE	24	054	23	4	53.3											16/07/1980		MOLINEUX, RALPH/TABLER, PAUL	Domestic	New Well	Cable Tool	No Chemistry
0261567	SE	25	054	23	4	6.4													FT SASK LANDFILL #OBS WELL	Domestic	Chemistry	Unknown	Chemistry Exists
0261575	SE	25	054	23	4	36.0													BARRY, M	Domestic	Chemistry	Drilled	Chemistry Exists
0261578	NW	18	055	22	4	9.1													CURTIS, R.	Domestic	Chemistry	Unknown	Chemistry Exists
0261586	NW	18	055	22	4	0.0													CURTIS, R.L.	Domestic	Chemistry	Unknown	Chemistry Exists
0261587	NW	25	054	23	4	28.3													ORAM, JAMES M	Domestic	Chemistry	Unknown	Chemistry Exists
0261588	NW	25	054	23	4	12.8													VILLENEUVE, L	Domestic	Chemistry	Hand Dug	Chemistry Exists
0261589	NW	18	055	22	4	22.9													CURTIS, R.	Domestic	Chemistry	Unknown	Chemistry Exists
0261590	NW	25	054	23	4	0.0													MURPHY, H	Domestic	Chemistry	Drilled	Chemistry Exists
0261591	NW	18	055	22	4	15.2													CURTIS, R.	Domestic	Chemistry	Unknown	Chemistry Exists
0261593	NE	25	054	23	4	10.1													BYERS, D.H.	Domestic	Chemistry	Unknown	No Chemistry
0261598	NW	26	054	23	4	29.0	21.3	27.4									01/06/1969		MCGEACHY, JIM	Domestic	New Well	Rotary	No Chemistry
0261605	NE	26	054	23	4	73.2											07/06/1978		SIMPSON, TOM	Domestic	New Well	Rotary	No Chemistry
0261606	NE	18	055	22	4	0.0													ANWEILER, S.	Domestic	Chemistry	Unknown	Chemistry Exists
0261610	00	26	054	23	4	9.8													KIEL, RUDOLF	Domestic	Chemistry	Unknown	Chemistry Exists
0261614	SW	20	055	22	4	30.5											01/01/1960		CRAIG, R.S.	Domestic	Chemistry	Unknown	Chemistry Exists
0261615	SW	27	054	23	4	24.4													PENNY, STEPHEN	Domestic	Chemistry	Unknown	Chemistry Exists
0261618	01	21	055	22	4	10.4													DEMERS,	Domestic	Chemistry	Unknown	Chemistry Exists
0261619	SW	27	054	23	4	61.0	24.4	61.0									31/05/1978		FYITH, JAMES	Domestic	New Well	Rotary	Chemistry Exists
0261629	SW	27	054	23	4	29.9													FEDORAK, NESTOR	Domestic	Chemistry	Unknown	Chemistry Exists
0261635	SW	21	55	22	4	11.6											30/06/1975		COURCHESNE, L	Domestic	Chemistry	Bored	Chemistry Exists
0261639	SW	21	055	22	4	7.6													COURCHESNE, L	Domestic	Chemistry	Hand Dug	Chemistry Exists
0261640	03	21	055	22	4	91.4	79.2	91.4									08/04/1986		COURCHESNE, L E	Domestic	New Well	Rotary	Chemistry Exists
0261646	16	21	055	22	4	61.0											18/12/1962		DAMCHUK, J	Domestic	New Well	Rotary	No Chemistry
0261652	NE	21	055	22	4	0.0													GAUMONT, J R	Domestic	Chemistry	Unknown	No Chemistry
0261653	NW	22	055	22	4	0.0													RIVARD, K	Domestic	Chemistry	Unknown	Chemistry Exists
0261654	NE	22	055	22	4	97.5	85.3	97.5									26/11/1981		CNR	Domestic	New Well	Rotary	No Chemistry
0261657	NE	23	055	22	4	20.4													JOHNSTON, GARY	Domestic	Chemistry	Drilled	Chemistry Exists
0261660	SE	24	055	22	4	6.1													ESLER, J	Domestic	Chemistry	Hand Dug	Chemistry Exists
0261662	SW	24	055	22	4	12.2							5.8	7.3			23/07/1966		MCGEE, K.	Domestic	New Well	Rotary	Chemistry Exists
0261669	SW	24	055	22	4	4.6													MAGEE, K	Domestic	Chemistry	Bored	Chemistry Exists
0261670	04	24	055	22	4	4.3													SELTHGATE, G A	Domestic	Federal Well Survey	Hand Dug	No Chemistry
0261672	NW	24	055	22	4	30.5													MAGEE,, K	Domestic	Chemistry	Drilled	Chemistry Exists
0261675	NE	24	055	22	4	0.0													FISH & GAME ASSOC	Domestic	Chemistry	Unknown	Chemistry Exists
0261678	NE	28	054	23	4	13.1													PARENTEAU, L	Domestic	Chemistry	Bored	Chemistry Exists
0261681	NW	25	055	22	4	7.6													GAUMONT, M	Domestic	Chemistry	Unknown	Chemistry Exists
0261710	NE	25	055	22	4	76.2													GAUMONT, M	Domestic	New Well	Unknown	Chemistry Exists
0261716	NE	25	055	22	4	61.0													GAUMONT, M	Domestic	Chemistry	Unknown	Chemistry Exists
0261726	NW	26	055	22	4	54.9											01/01/1963		JIGOLYK, L.	Domestic	Chemistry	Unknown	Chemistry Exists
0261729	SE	27	055	22	4	6.1													BELAIR, R	Domestic	Chemistry	Unknown	Chemistry Exists
0261731	SE	27	055	22	4	96.0	50.3	96.0									14/10/1986		BELAIR, R	Domestic	New Well	Rotary	No Chemistry
0261737	SE	28	055	22	4	0.0													SAWCHUK, J	Domestic	Chemistry	Unknown	Chemistry Exists
0261738	NW	28	055	22	4	50.9											30/04/1965		GOUTBECK, P.	Domestic	New Well	Rotary	Chemistry Exists
0261742	SE	01	055	23	4	0.0													SERNA, VICTOR	Domestic	Chemistry	Unknown	Chemistry Exists
0261744	SE	01	055	23	4	0.0													SERNA, VICTOR	Domestic	Chemistry	Unknown	Chemistry Exists
0261745	SE	01	055	23	4	15.2													SERNA, VICTOR	Domestic	Chemistry	Unknown	Chemistry Exists
0261746	NW	28	055	22	4	30.5													BOHNET, H	Domestic	Chemistry	Drilled	Chemistry Exists
0261748	SE	01	055	23	4	15.2													SERNA, VICTOR	Domestic	Chemistry	Unknown	Chemistry Exists
0261750	NW	28	055	22	4	0.0													VAN BOOM, H.	Domestic	Chemistry	Unknown	Chemistry Exists
0261752	SE	01	055	23	4	94.5	61.0	94.5									01/09/1984		SERNA, VICTOR	Domestic	New Well	Rotary	Chemistry Exists
0261757	SE	01	055	23	4	48.8											21/08/1984		SERNA, VICTOR	Domestic	Dry Hole	Rotary	No Chemistry
0261759	SE	01	055	23	4	80.5											20/08/1984		SERNA, VICTOR	Domestic	Dry Hole	Rotary	No Chemistry
0261764	SW	01	055	23	4	24.4													PARADIS, F.	Domestic	Chemistry	Drilled	Chemistry Exists
0261769	SE	02	055	23	4	24.4													PARADIS, NORMAN	Domestic	Chemistry	Unknown	Chemistry Exists
0261771	SE	02	055	23	4	22.9													PARADIS, NORMAN	Domestic	Chemistry	Drilled	Chemistry Exists
0261813	SE	33	055	22	4	42.7													ALLISON, G	Domestic	Chemistry	Unknown	Chemistry Exists
0261820	SE	34	055	22	4	9.4													JIGOLYK, H.	Domestic	Chemistry	Unknown	Chemistry Exists
0261823	SH	34	055	22	4	9.8													CARROLL, T	Domestic	Chemistry	Unknown	Chemistry Exists
0261827	NE	34	055	22	4	45.7													HOLMES, S	Domestic	Chemistry	Drilled	Chemistry Exists
0261828	NE	34	055	22	4	39.6	27.4	39.6											HOLMES, R	Domestic	New Well	Cable Tool	No Chemistry
0261830	NW	35	055	22	4	49.7													DOSHEWNEK, G	Domestic	Chemistry	Drilled	Chemistry Exists
0261845	NW	35	055	22	4	51.8							24.4	42.7			12/05/1983		SYVENKY, P.	Domestic	New Well	Rotary	No Chemistry
0262011	02	33	054	23	4	37.5													STRAUSS, HOWARD	Domestic	Chemistry	Unknown	Chemistry Exists
0262057	SE	34	054	23	4	29.6													BLOWER, JERRY	Domestic	Chemistry	Bored	Chemistry Exists
0262061	SE	34	054	23	4	22.6											20/06/1975		NEWMAN, NELSON	Domestic	New Well	Bored	Chemistry Exists
0262070	SE	34	054	23	4	0.0													THIMER, ERIC	Domestic	Chemistry	Unknown	Chemistry Exists
0262074	SE	34	054	23	4	61.0													MARSH, JEROME L	Domestic	Chemistry	Rotary	Chemistry Exists
0262083	NW	34	054	23	4	76.2													MELNYCHUK, GEORGE G	Domestic	Chemistry	Drilled	Chemistry Exists
0262104	NW	34	054	23	4	24.4													PARADIS, GILBERT	Domestic	Chemistry	Unknown	Chemistry Exists
0262109	NE	34	054	23	4	61.0													MELNYCHUK, GEORGE G	Domestic	Chemistry	Unknown	Chemistry Exists
0262113	SE	35	054	23	4	76.2													DEVEREUX, J.R.	Domestic	Chemistry	Unknown	Chemistry Exists
0262141	SW	01	055	23	4	19.8											10/07/1920		PARDIS, W.	Domestic	Federal Well Survey	Backhoe	No Chemistry
0262261	SW	35	054	23	4	30.5													GAUMONT, P	Domestic	Chemistry	Unknown	Chemistry Exists
0262265	SW	35	054	23	4	28.3													KJENNER, GEORGE	Domestic	Chemistry	Drilled	Chemistry Exists
0262271	SW	35	054	23	4	16.8													L. PETERSON DEV LTD	Domestic	Chemistry	Hand Dug	Chemistry Exists
0262278	SW	35	054	23	4	21.3													L. PETERSON DEV LTD	Domestic	Chemistry	Hand Dug	Chemistry Exists
0262285	SW	35	054	23	4	36.6													HANES, ALBERT	Domestic	Chemistry	Unknown	Chemistry Exists
0262292	SW	35	054	23	4	42.7													HOFFSTETER, B.	Domestic	Chemistry	Unknown	Chemistry Exists
0262296	SW	35	054	23	4	25.9													HOFFSTETER, BEN	Domestic	Chemistry	Bored	Chemistry Exists
0262305	SW	35	054	23	4	31.1													FEDORAK, J	Domestic	Chemistry	Unknown	Chemistry Exists
0262314	SW	35	054	23	4	30.5													PALTZAT, MARVIN	Domestic	Chemistry	Bored	Chemistry Exists
0262324	SW	35	054	23	4	25.0											09/09/1980		BURAK, FRED	Domestic	New Well	Bored	Chemistry Exists
0262332	SW	35	054	23	4	54.9	42.7	54.9									07/06/1978		HORNES, ALBERT	Domestic	New Well	Rotary	No Chemistry
0262356	NW	35	054	23	4	19.8											01/08/1976		L. PETERSON DEV LTD	Domestic	Chemistry	Bored	Chemistry Exists
0262366	00	35	054	23	4	16.8													PALZAT, M.	Domestic	Chemistry	Drilled	No Chemistry
0262369	SE	36	054	23	4	80.5	73.2	79.2									03/11/1977		MAYRHUT, JAMES	Domestic	New Well	Rotary	No Chemistry
0262385	NW	36	054	23	4	20.1													NYHUIS, ALBERT	Domestic	Chemistry	Unknown	Chemistry Exists
0262393	NE	36	054	23	4	13.1											15/08/1986		GAUMONT, EMIL	Domestic	New Well	Bored	No Chemistry
0262397	NE	36	054	23	4	12.2													SEVNE, GEORGE	Domestic	Chemistry	Unknown	No Chemistry
0262468	SW	12	055	23	4	21.3											01/05/1968		STRAUSS, L.	Domestic	New Well	Rotary	Chemistry Exists
0262511	SE	13	055	23	4	13.4													COURCHESNE, RAY	Domestic	Chemistry	Drilled	Chemistry Exists
0263303	SE	01	056	21	4	12.2													GUENETTE, D	Domestic	Chemistry	Bored	Chemistry Exists
0263308	SW	01	056	21	4	14.0													TARON, D.E.	Domestic	Chemistry	Drilled	Chemistry Exists
0263315	SW	01	056	21	4	36.6													OLD, R/C	Domestic	Chemistry	Unknown	Chemistry Exists
0263327	SW	02	056	21	4	10.7													HALABEY, A	Domestic	Chemistry	Bored	Chemistry Exists
0263334	03	02	056	21	4	118.9											09/07/1965		HALABEY, ALEX	Domestic	New Well	Drilled	Chemistry Exists
0263375	SW	03	056	21	4	6.4											01/01/1973		HANNERMAN, R	Domestic	Chemistry	Unknown	Chemistry Exists
0263380	NE	03	056	21	4	39.6													VELTMAN, H	Domestic	Chemistry	Unknown	Chemistry Exists
0263474	SW	05	056	21	4	16.8													REED, D	Domestic	Chemistry	Drilled	Chemistry Exists
0263484	04	05	056	21	4	8.5											28/01/1970		YARSHUK, P	Domestic	New Well	Bored	No Chemistry
0263489	NW	13	054	23	4	33.5							30.8	32.3			05/02/1987		DOREJKO, GERRY	Domestic	New Well	Rotary	No Chemistry
0263492	NW	05	056	21	4	42.7											12/01/1961	28/02/1974	CHOLOWSKI, R.	Domestic	Old Well-Abandoned	Drilled	No Chemistry
0263502	NW	13	054	23	4	34.1							32.3	33.8			05/05/1981		NISBET, BOB	Domestic	New Well	Rotary	No Chemistry
0263525	NE	05	056	21	4	6.1													CHOLOWSKI, R.	Domestic	Chemistry	Bored	Chemistry Exists
0263543	NE	05	056	21	4	4.9													CHOLOWSKI, R.	Domestic	Chemistry	Unknown	Chemistry Exists
0263560	SW	08	056	21	4	48.8											01/04/1973		KOFLUK, D	Domestic	New Well	Rotary	Chemistry Exists
0263579	SW	08	056	21	4	25.0							22.9	24.4			11/11/1966		MASCHMEYER, R	Domestic	New Well	Rotary	No Chemistry
0263583	15	08	056	21	4	11.6													BRODIE, H.L.	Domestic	Chemistry	Unknown	Chemistry Exists
0263592	SW	09	056	21	4	0.0													LECHENKO #3 DRINKING WELL	Domestic	Chemistry	Unknown	Chemistry Exists
0263595	NE	11	056	21	4	64.6													NAURATIL, J	Domestic	Chemistry	Drilled	Chemistry Exists
0263633	09	11	056	21	4	10.7													NAVRATIL, J	Domestic	Chemistry	Bored	Chemistry Exists
0263640	NE	11	056	21	4	43.3							41.1	42.4			17/08/1984		ANDRUCHOW, E	Domestic	New Well	Rotary	Chemistry Exists
0263645	NE	11	056	21	4	36.6													O'BRIEN, N	Domestic	Chemistry	Unknown	Chemistry Exists
0263651	NE	11	056	21	4	18.0											20/06/1986		BREIT, E	Domestic	New Well	Backhoe	Chemistry Exists
0263676	SE	12	056	21	4	7.9													ESCH, G	Domestic	Chemistry	Hand Dug	Chemistry Exists
0263683	SE	12	056	21	4	91.4	79.2	91.4									05/11/1981		ESCH, G	Domestic	New Well	Rotary	No Chemistry
0263697	SE	12	056	21	4	0.0													MIZERA, T.	Domestic	Chemistry	Unknown	Chemistry Exists
0263707	SW	12	056	21	4	61.0													GABERT, M.	Domestic	Chemistry	Unknown	Chemistry Exists
0263714	NW	12	056	21	4	33.5													GABERT, M.	Domestic	Chemistry	Unknown	Chemistry Exists
0263736	SE	13	056	21	4	7.9													YOUNG, C.S.	Domestic	Chemistry	Unknown	Chemistry Exists
0263842	SE	14	056	21	4	3.7													SMART, D	Domestic	Chemistry	Hand Dug	Chemistry Exists
0263852	SW	2	56	22	4	61.0													NOEL, MAURICE	Domestic	Chemistry	Unknown	Chemistry Exists
0263854	NW	02	056	22	4	36.6													SANK, LLOYD	Domestic	Chemistry	Unknown	Chemistry Exists
0263867	SW	3	56	22	4	54.9													MELENKA, ALEX	Domestic	Chemistry	Unknown	Chemistry Exists
0263870	NE	14	056	21	4	10.7													HODGSON, G A	Domestic	Chemistry	Unknown	Chemistry Exists
0263877	NE	14	056	21	4	13.4											01/08/1972		HODGSON, G	Domestic	New Well	Bored	No Chemistry
0263883	NE	14	056	21	4	11.3													PERCY, G.	Domestic	Chemistry	Bored	Chemistry Exists
0263887	NE	14	056	21	4	48.8											17/05/1985		PERCY, G.	Domestic	New Well	Rotary	No Chemistry
0263910	NE	14	056	21	4	0.0													SMIBERT, R	Domestic	Chemistry	Unknown	No Chemistry
0263924	SW	16	056	21	4	0.0													KROPP, L.	Domestic	Spring	Not Applicable	Chemistry Exists
0263933	SW	16	056	21	4	0.0													BOLTON SCHOOL	Domestic	Chemistry	Unknown	Chemistry Exists
0263959	SW	16	056	21	4	9.1													MARQUARDT, E	Domestic	Chemistry	Drilled	Chemistry Exists
0263963	NW	16	056	21	4	6.7													BLENN	Domestic	Chemistry	Unknown	Chemistry Exists
0263969	NW	18	056	21	4	22.9													VISSCHER, H	Domestic	Chemistry	Unknown	Chemistry Exists

Advisian
WorleyParsons Group

Appendix A1-1

Water Well Records Within the Study Area

WELL ID	LOCATION					WELL DEPTH (m)	PERFORATIONS 1 (m)		PERFORATIONS 2 (m)		PERFORATIONS 3 (m)		SCREENINGS 1 (m)		SCREENINGS 2 (m)		DATE		WELL OWNER	PROPOSED USE	TYPE OF WORK	DRILL METHOD	CHEMISTRY
	LSD	SECTION	TOWNSHIP	RANGE	MERIDIAN		FROM	TO	FROM	TO	FROM	TO	FROM	TO	FROM	TO	COMPLETED	ABANDONED					
0263970	NW	18	056	21	4	12.2													VISSCHER, H	Domestic	Chemistry	Unknown	Chemistry Exists
0263974	SE	19	056	21	4	9.1													CAMPBELL, R	Domestic	Chemistry	Hand Dug	Chemistry Exists
0263991	SW	19	056	21	4	22.9													SMULSKI, J.	Domestic	Chemistry	Unknown	Chemistry Exists
0263992	SW	19	56	21	4	18.9											20/06/1984		S V HALF DIAMOND RANCHES	Domestic	New Well	Bored	No Chemistry
0263993	NE	19	056	21	4	12.2													ROBINSON, J	Domestic	Chemistry	Unknown	Chemistry Exists
0263996	NE	19	056	21	4	8.5													ROBINSON, J	Domestic	Chemistry	Hand Dug	Chemistry Exists
0264112	SW	11	056	22	4	106.7	14.0	64.0									06/03/1980		BRIGGS, EARL	Domestic	Deepened	Cable Tool	No Chemistry
0264146	SW	12	056	22	4	0.0													SERINK, MIKE	Domestic	Chemistry	Unknown	No Chemistry
0264148	SE	20	056	21	4	54.9											01/08/1977		SAWYER, D	Domestic	Chemistry	Drilled	Chemistry Exists
0264150	SW	12	056	22	4	0.0													SERINK, MIKE	Domestic	Chemistry	Unknown	No Chemistry
0264151	NW	12	056	22	4	22.9											01/05/1968		MINCHOU, CLARENCE	Domestic	New Well	Unknown	Chemistry Exists
0264156	15	20	056	21	4	19.8											24/10/1958		FEDORAK, M	Domestic	New Well	Bored	No Chemistry
0264163	NE	12	056	22	4	76.2													PUCHALIK, NICK	Domestic	Chemistry	Drilled	Chemistry Exists
0264167	NE	20	056	21	4	24.4													FEDORAK, M	Domestic	Chemistry	Unknown	Chemistry Exists
0264173	SE	13	056	22	4	35.1							32.0	35.1			03/11/1989		DUPONT CAN	Domestic	New Well	Rotary	No Chemistry
0264176	16	20	056	21	4	0.0											01/01/1921		MYRON, S.	Domestic	Federal Well Survey	Drilled	No Chemistry
0264184	SW	13	056	22	4	76.2													BLOM, BERNARD	Domestic	Chemistry	Drilled	Chemistry Exists
0264187	SW	13	056	22	4	65.5													BLOM, KLAAS	Domestic	Chemistry	Unknown	Chemistry Exists
0264190	SE	21	056	21	4	16.5											12/05/1978		DEBAAN, J	Domestic	New Well-Abandoned	Rotary	No Chemistry
0264203	SE	21	056	21	4	57.9							12.8	14.3			12/09/1978		DEBAAN, J	Domestic	New Well	Rotary	No Chemistry
0264255	07	25	056	21	4	14.6											20/08/1984		ESSO RES	Domestic	New Well	Bored	Chemistry Exists
0264258	SE	26	056	21	4	39.0											12/05/1987		VAN INVEN, F.	Domestic	Unknown	Unknown	No Chemistry
0264263	SW	26	056	21	4	4.3													SAWATZKY, H	Domestic	Chemistry	Unknown	Chemistry Exists
0264268	SW	26	056	21	4	17.4	4.6	12.2									31/03/1988		SAWATZKI, W	Domestic	New Well	Bored	No Chemistry
0264277	09	27	056	21	4	61.0	50.3	56.4									24/07/1979		RYKMANS, H.	Domestic	New Well	Rotary	No Chemistry
0264286	SE	28	056	21	4	21.3													BELLAND, R.	Domestic	Chemistry	Drilled	Chemistry Exists
0264289	NW	28	056	21	4	4.6													RESEARCH COUNCIL #6-DRINKING	Domestic	Chemistry	Unknown	Chemistry Exists
0264290	SE	05	055	22	4	4.3													GODBOUT, VIVIAN	Domestic	Chemistry	Unknown	No Chemistry
0264293	SE	05	055	22	4	0.0													GAUMONT, GILBERTE	Domestic	Chemistry	Unknown	Chemistry Exists
0264297	NE	28	056	21	4	18.3													SHIPLEY, J.	Domestic	Chemistry	Auger	Chemistry Exists
0264298	NW	06	055	22	4	18.3													JESKE, O.	Domestic	Chemistry	Unknown	Chemistry Exists
0264304	NE	25	055	22	4	61.0													GAUMONT, MICHAEL #2	Domestic	Chemistry	Unknown	Chemistry Exists
0264305	SE	29	056	21	4	54.9													PACHALUCK, P.	Domestic	Chemistry	Unknown	Chemistry Exists
0264343	SE	29	056	21	4	7.6											15/08/1963		SMULSKI, J.	Domestic	New Well	Backhoe	No Chemistry
0264347	SE	29	056	21	4	76.2													KALISVAART, J/T	Domestic	Chemistry	Drilled	Chemistry Exists
0264357	SE	29	056	21	4	74.7											02/09/1961		PUCHALIK, P.	Domestic	Deepened	Drilled	Chemistry Exists
0264368	SE	29	056	21	4	14.0													PUCHALIK, P.	Domestic	Chemistry	Unknown	Chemistry Exists
0264384	SW	29	056	21	4	9.8													PUCHALIK, S.	Domestic	Chemistry	Unknown	Chemistry Exists
0264385	SW	29	056	21	4	0.0													PUCHALIK, S.	Domestic	Chemistry	Unknown	Chemistry Exists
0264386	SW	29	056	21	4	7.3											24/09/1958		PUCHALIK, S.	Domestic	New Well	Bored	Chemistry Exists
0264392	SW	29	056	21	4	0.0													PUCHALIK, S.#PUMPHOUSE WELL	Domestic	Chemistry	Unknown	Chemistry Exists
0264393	SW	29	056	21	4	13.7													PUCHALIK, S.	Domestic	Chemistry	Unknown	Chemistry Exists
0264396	NE	29	056	21	4	0.0													SAUNDERS, P	Domestic	Chemistry	Unknown	No Chemistry
0264424	SE	32	056	21	4	27.4													YAKIMETS, O	Domestic	Chemistry	Unknown	Chemistry Exists
0264437	SE	32	056	21	4	42.7	36.6	39.6									16/04/1980		YAKIMETES, O J	Domestic	New Well	Rotary	No Chemistry
0264466	01	33	056	21	4	19.5							17.7	18.9			01/05/1977		KUIPER, A/D	Domestic	New Well	Rotary	Chemistry Exists
0264491	NE	33	056	21	4	0.0													LUBEMSKI, K.	Domestic	Chemistry	Unknown	No Chemistry
0264507	04	34	056	21	4	15.2	3.7	4.6									12/06/1985		WOLANSKY, W	Domestic	New Well	Backhoe	Chemistry Exists
0264531	SW	34	056	21	4	61.0	15.2	24.4									30/03/1974		WOLANSKI, W.	Domestic	New Well	Rotary	Chemistry Exists
0264630	NW	34	056	21	4	24.4													MAHONEY, R.	Domestic	Chemistry	Unknown	Chemistry Exists
0264637	NE	34	056	21	4	32.0	26.5	32.0									10/03/1974		ANDERSON, K	Domestic	New Well	Rotary	Chemistry Exists
0264659	8	35	56	21	4	4.9													SCHILLER, J.	Domestic	Chemistry	Auger	Chemistry Exists
0264666	NW	35	056	21	4	4.3													HESS, R	Domestic	Chemistry	Jet	Chemistry Exists
0264680	SE	36	056	21	4	5.2													RUDKO, W.	Domestic	Chemistry	Unknown	Chemistry Exists
0264699	SW	36	56	21	4	7.3													DRABBLE, R.	Domestic	Chemistry	Unknown	Chemistry Exists
0264707	NW	36	056	21	4	9.1													MAKOWECKI, A	Domestic	Chemistry	Drilled	Chemistry Exists
0264712	NW	36	056	21	4	6.4													MAKOWECKI, A	Domestic	Chemistry	Hand Dug	Chemistry Exists
0264902	NE	08	054	22	4	79.9											24/06/1970		KENNEDY, CLIFF	Domestic	New Well	Rotary	Chemistry Exists
0264908	NE	08	054	22	4	54.9													KALISTA, JOE	Domestic	Chemistry	Drilled	Chemistry Exists
0264911	NE	08	054	22	4	9.1													ATTEW, ELAINE	Domestic	Chemistry	Bored	Chemistry Exists
0264913	NE	08	054	22	4	11.6													SPALLIN, K./L.	Domestic	Chemistry	Drilled	Chemistry Exists
0264915	NE	08	054	22	4	13.1											08/06/1979		LEVERSEDGE, DAN	Domestic	New Well	Bored	Chemistry Exists
0264921	NE	08	054	22	4	10.4													KENNEDY, C.A.	Domestic	Chemistry	Unknown	Chemistry Exists
0264923	NE	08	054	22	4	14.9											11/06/1979		KENNEDY, KEN	Domestic	New Well	Bored	Chemistry Exists
0265801	SW	02	057	21	4	27.4													MCCULLOUGH, DAVID	Domestic	Chemistry	Hand Dug	Chemistry Exists
0265802	SW	02	057	21	4	74.7											05/10/1981		ROMANIUK, ELI	Domestic	New Well	Rotary	No Chemistry
0265804	SW	02	057	21	4	3.0													MCCULLOUGH, DAVE	Domestic	Chemistry	Unknown	Chemistry Exists
0265805	SW	03	057	21	4	10.4											01/01/1940		LIBBEY, KATHERINE	Domestic	Chemistry	Drilled	Chemistry Exists
0265811	SE	04	057	21	4	30.5							25.0	27.4			03/08/1979		SCHWING, ROMAN	Domestic	New Well	Rotary	Chemistry Exists
0266031	SE	13	056	22	4	12.2													SCHROTER, RON	Domestic	Chemistry	Unknown	Chemistry Exists
0267205	SW	01	055	23	4	64.0	57.9	64.0									06/09/1976		ROLF, RON	Domestic	New Well	Rotary	No Chemistry
0271650	SE	05	055	22	4	59.4							57.0	58.5			13/07/1978		GODBOUT, ROMEO	Domestic	New Well	Rotary	No Chemistry
0271736	SW	36	054	23	4	39.3													SMITH, B.B.	Domestic	Chemistry	Drilled	Chemistry Exists
0273997	NW	36	054	23	4	24.4													BISSON, R	Domestic	Chemistry	Unknown	Chemistry Exists
0274006	EH	36	054	23	4	0.0													GAUMONT, E	Domestic	Chemistry	Unknown	Chemistry Exists
0274171	SE	05	055	22	4	14.9	8.2	12.8									19/08/1991		GILLARD, R	Domestic	New Well	Bored	No Chemistry
0274184	16	31	054	22	4	14.6											08/05/1989		BANDURA, E	Domestic	New Well	Bored	No Chemistry
0274248	SE	05	055	22	4	12.2											20/06/1985		LAMOUREUX, C	Domestic	New Well	Bored	Chemistry Exists
0274249	SE	05	055	22	4	14.6	9.1	12.8									24/03/1988		LAMOUREAX, R.	Domestic	New Well	Bored	No Chemistry
0274956	NE	05	055	21	4	41.1											05/09/1978		PICKETT, J	Domestic	New Well	Rotary	Chemistry Exists
0280645	NW	31	054	22	4	10.7											18/09/1980		LAMOUREUX HALL	Domestic	New Well	Bored	No Chemistry
0280650	SW	28	055	21	4	9.1													VISSCHER, D.	Domestic	Chemistry	Unknown	Chemistry Exists
0280651	00	04	055	22	4	15.2													FLEMING, E.B.	Domestic	Chemistry	Unknown	Chemistry Exists
0280653	SE	16	055	22	4	6.1													RANDON, J.R.	Domestic	Chemistry	Unknown	Chemistry Exists
0280654	SE	16	055	22	4	39.6													RANDON, J.R.	Domestic	Chemistry	Unknown	Chemistry Exists
0280657	SE	16	055	22	4	7.6													GEM SOD FARMS	Domestic	Chemistry	Hand Dug	Chemistry Exists
0280703	SE	09	055	22	4	17.4	7.6	15.2									26/04/1994		LAMOUREUX, ROBERT	Domestic	New Well	Bored	No Chemistry
0282099	NW	18	055	21	4	24.4													MAGEE, KEN	Domestic	Chemistry	Hand Dug	Chemistry Exists
0285787	NE	17	055	21	4	18.6							12.2	18.3			04/06/1996		HUTTERIAN BRETHREN	Domestic	New Well	Rotary	No Chemistry
0285789	NW	30	055	21	4	51.8							46.3	47.9			30/05/1995	01/01/2001	BENFELD, BILL	Domestic	New Well	Rotary	No Chemistry
0285792	SE	12	055	23	4	21.9	9.8	11.9	18.6	19.5							24/10/1996		PICKUNYK, NICK	Domestic	New Well	Bored	No Chemistry
0286113	WH	17	055	22	4	22.9											30/04/1968		READNER, HENRY #400-H	Domestic	New Well	Auger	No Chemistry
0286990	NE	08	054	22	4	85.3	43.9	85.3									07/01/1997		MARSHALL, RANDY	Domestic	New Well	Rotary	No Chemistry
0286991	SE	31	054	22	4	16.2	9.8	14.9									27/07/1996		GAUMONT, LARRAINE	Domestic	New Well	Bored	No Chemistry
0287800	NE	08	054	22	4	82.3	70.1	82.3									11/09/1996		RICE, LYALL	Domestic	New Well	Rotary	No Chemistry
0287802	NE	28	054	23	4	61.0											10/07/1997	10/07/1997	NORTH COUNTRY CATTLE CO	Domestic	Test Hole-Abandoned	Rotary	No Chemistry
0289102	NE	28	054	23	4	48.8	36.6	45.7									11/07/1997		NORTH COUNTRY CATTLE CO	Domestic	New Well	Rotary	No Chemistry
0289381	SE	09	055	22	4	73.2	61.0	73.2									19/05/1998		NANAKSAR, GURDWARA	Domestic	New Well	Rotary	No Chemistry
0290926	SE	12	055	23	4	23.8	6.7	9.1	16.2	17.1							20/05/1998		PICHUNYH, JACK	Domestic	New Well	Bored	No Chemistry
0290974	SE	28	054	22	4	39.6	33.5	39.6									07/10/1998		ROBERTSON, DALE	Domestic	New Well	Rotary	No Chemistry
0290979	SE	21	056	21	4	18.3	3.7	4.3	13.1	14.3	16.2	16.8					14/07/1998		MARQUARDT, BRENT	Domestic	New Well	Bored	No Chemistry
0292191	SE	33	055	22	4	47.2	39.6	45.7									26/04/1999		WESTRA, MARTIN/WESTRALIA FARMS	Domestic	New Well	Rotary	No Chemistry
0293392	NW	31	055	21	4	24.4							19.8	21.3			13/09/1999		MCKAY, BRIAN	Domestic	New Well	Rotary	No Chemistry
0293774	SW	17	056	20	4	85.3	72.2	74.7	77.7	80.8							17/10/1999		SCHRAM, BARRY	Domestic	New Well	Rotary	No Chemistry
0293775	SW	17	056	20	4	123.4											12/10/1999	12/10/1999	SCHRAM, BARRY	Domestic	Dry Hole-Abandoned	Rotary	No Chemistry
0294342	SE	21	056	21	4	24.4	10.1	12.5	15.5	20.1	23.2	23.5					08/08/1998		SOOREE, DICK	Domestic	New Well	Bored	No Chemistry
0295164	SW	30	056	20	4	37.2	31.1	37.2									18/05/2000		SHILOH REBMAN YOUTH CAMP	Domestic	New Well	Rotary	No Chemistry
0297082	SE	33	054	23	4	36.6											21/06/2001	21/06/2001	STRAUSS, HOWARD #1	Domestic	Test Hole-Abandoned	Rotary	No Chemistry
0297083	SE	33	054	23	4	36.6	25.9	32.0									22/06/2001		STRAUSS, HOWARD	Domestic	New Well	Rotary	No Chemistry
0297115	NE	18	056	20	4	18.3											07/10/2000		MARTIN, BONNIE	Domestic	Old Well-Test	Unknown	No Chemistry
0297409	SW	30	056	20	4	82.3											18/05/2000	18/05/2001	SHILOH REBMAN YOUTH CAMP	Domestic	Dry Hole-Abandoned	Rotary	No Chemistry
0297410	SW	30	56	20	4	85.3	36.6	42.7	48.8	54.9	61.0	67.1					15/05/2000	16/05/2000	SHILOH REBMAN YOUTH CAMP #2	Domestic	New Well	Rotary	No Chemistry
0297411	SW	30	56	20	4	36.6	26.8	32.9									17/05/2000		SHILOH REBMAN YOUTH CAMP #3	Domestic	New Well	Rotary	No Chemistry
0297579	07	21	56	21	4	21.0	13.7	16.8									18/09/2001		MARQUARDT, B.	Domestic	New Well	Bored	No Chemistry
0297579	07	21	56	21	4	18.3												26/07/2007	MARQUARDT, BRENT & CINDY	Domestic	Old Well-Abandoned	Bored	No Chemistry
0297580	NE	21	056	21	4	21.0	13.7	16.8									19/09/2001		LEICHNER, WALTER	Domestic	New Well	Bored	No Chemistry
0299631	NW	07	055	21	4	71.0	63.1	69.2									17/05/2001		CHARTRAND, LOUIE/MARY	Domestic	New Well	Rotary	No Chemistry
1130470	NW	34	055	21	4	35.4	29.3	35.4									19/07/2007		HALLS AUTO PARTS	Domestic	New Well	Rotary	No Chemistry
1130875	11	13	54	23	4	41.1							27.4	33.5			08/11/2010		OYAMA, ROSE-ANN & SONNIE	Domestic	New Well	Combination	No Chemistry
1131346	SE	3	57	21	4	37.5							27.4	33.5			10/03/2016		FINNEGAN, LORNE & SHIRLEY	Domestic	New Well	Cable Tool	No Chemistry
1165834	NE	34	54	23	4	30.5	12.8	15.5	18.6	20.4	21.9	22.9					11/09/2014		PARADIS, GILBERT	Domestic	New Well	Combination	No Chemistry
1300079	NW	23	054	22	4	42.7	25.0	42.7									24/02/2005		MCEACHERN, MEL	Domestic	New Well	Rotary	No Chemistry
1370431	1	36	55	22	4	43.9							39.6	42.7			06/10/2010		YOUNG, CARL	Domestic	New Well	Combination	No Chemistry
1370496	5	22	55	21	4	37.2	30.5	37.2									25/10/2012		ROCQUE, SHANE	Domestic	New Well	Combination	No Chemistry
1370549	SW	30	56	20	4	36.6	29.0	35.1									30/06/2014		SHILOH YOUTH RANCH	Domestic	New Well	Combination	No Chemistry
1640316	16	14	54	23	4	15.2							12.2	15.2			05/11/2010		MOIZARD, ANDRE	Domestic	New Well	Rotary - Mud	No Chemistry
1690074	SE	01	055	22	4	59.4	51.8	57.9									13/05/1999		RASMUSSEN, RON	Domestic	New Well	Rotary	No Chemistry
1690085	NE	36	054	23	4	17.7	12.2	17.4									28/09/1999		NYHUIS, DAVE	Domestic	New Well	Rotary	No Chemistry
1690122	NE	24	55	22	4	18.0	4.6	12.2									17/10/2008		AUX-SABLE CANADA LTD	Domestic	New Well	Bored	No Chemistry
1690124	16	31	54	22	4	17.4	8.5	14.9									05/06/2008		LAMOUREUX, ART	Domestic	New Well	Bored	No Chemistry
1690166	1	1	55	22	4	52.4	45.7	51.8									11/08/2011		SCHOENLEBER, TIM	Domestic	New Well	Rotary - Mud	No Chemistry
1755005	SW	02	057	21	4	18.3	4.0	5.8									22/10/2002		SUDAYKO, MIKE	Domestic	New Well	Bored	No Chemistry
1755094	11	25	54	23	4	25.0	15.8	18.6									08/09/2009		KAM, IAN	Domestic	New Well	Bored	No Chemistry
1755120	SE	35	56	21	4	36.6	29.3	33.2									08/07/2011		BADRY, RICK	Domestic	New Well	Bored	No Chemistry
1795056	NE	08	054	22	4	93.0	67.1	93.0									18/07/2003		SUPINA, NICK	Domestic	New Well	Rotary	No Chemistry
1795213	NE	25	54	23	4	74.7											21/04/2009		KAM, IAN	Domestic	New Well	Rotary	No Chemistry
1795249	NW	25	54	23	4	74.7	48.8	73.2									21/04/2009		KAM, IAN	Domestic	New Well	Combination	No Chemistry
1888906	11	28	54	22	4	31.4							28.3	29.9			21/07/2009		KROHMAN, KURT	Domestic	New Well	Rotary	No Chemistry
1888958	1	36	54	23	4	73.2	61.0	73.2									24/06/2010		FIVE STAR POULTRY	Domestic	New Well	Rotary - Mud	No Chemistry
0264494	09	33	056	21	4	23.5											16/08/1961		SCURRY RAINBOW OIL LTD	Domestic & Industrial	New Well	Rotary	Chemistry Exists
0083010	13	25	055	21	4	27.4													HOFFMAN	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0083265	14	31	055	20	4	24.1											01/01/1915		FISHER, J.	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0083366	02	06	055	21	4	16.5													BRICK, A.W.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0083378	09	07	055	21	4	12.2													MAGEE, H.	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0083420	NE	16	055	21	4	51.8											23/04/1965		MOHR, GUS	Domestic & Stock	New Well	Jet	No Chemistry
0083433	NE	17	055	21	4	109.7	91.4	109.7									19/03/1986		SCOTFORD COLONY	Domestic & Stock	Deepened	Rotary	No Chemistry
0083435	NE	17	055	21	4	97.5	85.3	97.5									18/06/1985		SCOTFORD COLONY	Domestic & Stock	New Well	Rotary	No Chemistry
0083436	NE	17	055	21	4	79.9													SCOTFORD HUTTERITE BRETHREN	Domestic & Stock	Chemistry	Unknown	Chemistry Exists
0083437	NE	17	055	21	4	0.0													SCOTFORD COLONY	Domestic & Stock	Chemistry	Unknown	No Chemistry
0083438	03	18	055	21	4	12.2											01/01/1938		MOORE, T.	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0083459	NE	19	055	21	4	0.0													SPRUCE HILL HOG RANCH	Domestic & Stock	Chemistry	Unknown	No Chemistry
0083465	SE	21	055	21	4	64.0											12/09/1982		THOMAS, WARREN	Domestic & Stock	New Well	Rotary	No Chemistry
0083468	05	22	55	21	4	39.0											01/01/1915		LANGHAUSEN, J.	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0083469	NW	22	055	21	4	51.8											01/04/1965		LARSEN, S.A.	Domestic & Stock	New Well	Cable Tool	No Chemistry
0083477	NW	23	055	21	4	36.6							35.4	36.6			02/07/1968		ARNDT, ERDMAN	Domestic & Stock	New Well	Rotary	No Chemistry
0083497	09	26	055	21	4	13.7											01/01/1933		FLUKER, R.	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0083499	05	27	055	21	4	30.5											01/01/1924		UNDERSCHULTZ, A.	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0083535	01	32	055	21	4	0.0													MOHR, G.P.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0083555	NW	34	055	21	4	42.7							38.1	39.9			01/09/1970		DAUST, CHARLIE	Domestic & Stock	New Well	Rotary	No Chemistry
0083563	04	35	055	21	4	30.5											01/01/1926		BERG, R.	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0091495	04	06	056	20	4	17.1											16/04/1986		YAWORSKI, MIKE	Domestic & Stock	New Well	Bored	No Chemistry
0091499	16	06	056	20	4	68.0	48.8	68.0									12/04/1985		SCHRAM, GEORGE	Domestic & Stock	New Well	Rotary	Chemistry Exists
0091500	08	07	056	20	4	14.6											24/07/1981		SCHRAM, ELMER	Domestic & Stock	New Well	Bored	No Chemistry
0091503	04	08	056	20	4	7.6											01/01/1919		RISKE, E.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0091505	13	08	056	20	4	17.7											18/07/1984		SAMPERT, ROGER	Domestic & Stock	New Well	Bored	Chemistry Exists
0091551	05	16	056	20	4	4.9											01/01/1930		KALAS	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0091552	04	16	056	20	4	6.7											01/01/1930		HENKLEMAN	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0091555	SE	17	056	20	4	19.2	4.3	17.4									19/08/1986		SAMPERT, RAY	Domestic & Stock	New Well	Bored	No Chemistry
0091560	SE	18	056	20	4	15.8											09/08/1978		MCLELLAN, ARTHUR	Domestic & Stock	New Well	Bored	No Chemistry
0091563	08	18	056	20	4	4.6											01/01/1925		KAUS, A.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0091570	02	19	056	20	4	12.8													SCHUMAK, A.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0091574	12	19	056	20	4	14.6											20/09/1985		MATTHEWS, B.	Domestic & Stock	New Well	Bored	No Chemistry
0091575	04	20	056	20	4	3.7											01/01/1917		WIKEHLERK	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0153068	NE	08	054	22	4	73.2	61.0	73.2									26/09/1988		BORYS, BILLIE	Domestic & Stock	New Well	Cable Tool	No Chemistry
0153696	13	36	56	21	4	45.7	36.6	45.7									14/04/1989		BOWERIN, CATHERINE	Domestic & Stock	New Well	Cable Tool	No Chemistry
0153768	NW	23	055	21	4	42.7							35.4	36.6			31/08/1990		ARNDT, R.E.	Domestic & Stock	New Well	Rotary	No Chemistry
0154442	SE	36	55	22	4	30.5							29.3	30.5			21/03/1990		STEFFLER, BEN/GERALD	Domestic & Stock	New Well	Rotary	No Chemistry
0158576	SW	08	056	20	4	21.0											25/09/1979		SCHRAM, EDWARD	Domestic & Stock	New Well	Bored	No Chemistry
0160258	SW	16	054	22	4	15.2	7.6	13.7									09/11/1991		BIZUK, MORRIS	Domestic & Stock	New Well	Bored	No Chemistry
0164457	NE	11	056	22	4	59.4	30.2	58.5									10/03/1992		BRIGGS, ALAN	Domestic & Stock	New Well	Rotary	No Chemistry
0166391	SE	17	054	22	4	12.2	6.1	10.7									28/06/1989		TWIGGE, MRS E.	Domestic & Stock	New Well	Bored	No Chemistry
0206702	NE	03	056	21	4	44.2							40.5	42.1			26/03/1993		VELTMAN, HERB	Domestic & Stock	New Well	Rotary	No Chemistry
0208867	SW	06	056	20	4	16.5	4.6	13.7									12/03/1993		YAWORSKI, MICHEAL	Domestic & Stock	New Well	Bored	No Chemistry
0220716	NE	17	055	21	4	105.2											20/09/1991		SCOTFORD COLONY	Domestic & Stock	Reconstructed	Cable Tool	No Chemistry
0231536	SW	02	055	23	4	67.1	57.9	64.0									09/08/1993		ARNDT, PETER	Domestic & Stock	New Well	Rotary	No Chemistry
0260034	NW	08	054	22	4	47.2											01/01/1925		ARBS, E.	Domestic & Stock	New Well	Drilled	No Chemistry
0260068	NW	09	054	22	4	30.5													MCEACHERN, J.	Domestic & Stock	Chemistry	Drilled	No Chemistry
0260172	04	16	054	22	4	6.7													FLEMING, J.	Domestic & Stock	New Well	Hand Dug	No Chemistry
0260174	13	16	054	22	4	24.4											01/01/1910		SPALAN, G.	Domestic & Stock	New Well	Drilled	No Chemistry
0260179	SW	17	054	22	4	61.0											01/01/1935		GALLOWY, P.	Domestic & Stock	New Well	Drilled	No Chemistry
0260181	13	17	054	22	4	25.9													PETERS, H.B.	Domestic & Stock	New Well	Bored	No Chemistry
0260192	NW	20	54	22	4	36.6							27.4	29.0			10/05/1966		STETSON, H.A.	Domestic & Stock	New Well	Rotary	Chemistry Exists
0260193	05	21	054	22	4	42.7											01/01/1920		ARMSTRONG, J.	Domestic & Stock	New Well	Drilled	No Chemistry
0260195	13	21	054	22	4	61.0											01/01/1928		ARMSTRONG, G.	Domestic & Stock	New Well	Drilled	No Chemistry
0260196	SE	22	054	22	4	37.2											29/11/1988		LA TRACE, DARLENE	Domestic & Stock	New Well	Rotary	Chemistry Exists
0260198	13	22	054	22	4	61.0											01/01/1916		ROTH, H.G.	Domestic & Stock	New Well	Drilled	No Chemistry
0260217	02	26	054	22	4	70.1	50.3	61.3									12/12/1966		SLATER, GRACE	Domestic & Stock	New Well	Rotary	Chemistry Exists
0260219	04	26	054	22	4	59.4	49.1	55.2									24/03/1969		KLAUTT, A.R.	Domestic & Stock	New Well	Drilled	No Chemistry
0260223	SW	26	054	22	4	61.0	47.9	61.0									04/10/1984		GALLOWAY, ED	Domestic & Stock	New Well	Cable Tool	No Chemistry
0260224	10	26	054	22	4	30.2											01/01/1930		BETHIEL, A.	Domestic & Stock	New Well	Drilled	No Chemistry
0260226	12	27	054	22	4	21.3													ROBERTSON, F.A.	Domestic & Stock	New Well	Bored	No Chemistry
0260228	05	28	054	22	4	30.5											01/01/1928		CRANSON, G.A.	Domestic & Stock	New Well	Drilled	No Chemistry
0260378	11	29	054	22	4	61.0											01/01/1911		ADAMSON, R.F.	Domestic & Stock	New Well	Drilled	No Chemistry
0260424	SE	32	054	22	4	6.1														Domestic & Stock	New Well	Hand Dug	No Chemistry
0260427	04	34	054	22	4	48.8											01/01/1930		LAWRENCE, F.B.	Domestic & Stock	New Well	Drilled	No Chemistry
0260438	13	34	054	22	4	54.9											01/01/1926		WALL, T.	Domestic & Stock	New Well	Drilled	No Chemistry
0260442	NE	34	054	22	4	42.7											21/11/1988		BARTEL, RICHARD	Domestic & Stock	New Well	Rotary	Chemistry Exists
0260928	NW	13	054	23	4	4.9													TURNBULL, R.J.	Domestic & Stock	Chemistry	Hand Dug	Chemistry Exists
0261215	12	07	055	22	4	5.5											01/01/1908		LAMOUREUX, A.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry

Appendix A1-1

Water Well Records Within the Study Area

WELL ID	LOCATION					WELL DEPTH (m)	PERFORATIONS 1 (m)		PERFORATIONS 2 (m)		PERFORATIONS 3 (m)		SCREENINGS 1 (m)		SCREENINGS 2 (m)		DATE		WELL OWNER	PROPOSED USE	TYPE OF WORK	DRILL METHOD	CHEMISTRY
	LSD	SECTION	TOWNSHIP	RANGE	MERIDIAN		FROM	TO	FROM	TO	FROM	TO	FROM	TO	FROM	TO	COMPLETED	ABANDONED					
0261229	07	08	055	22	4	9.1													ADDERHORD, A.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0261231	SE	08	055	22	4	14.9	7.0	9.1	12.2	14.9							28/07/1988		COURCHESNE, R	Domestic & Stock	New Well	Bored	No Chemistry
0261392	08	11	055	22	4	61.0											01/01/1921		MAGEE, K	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0261429	01	12	055	22	4	32.3											01/01/1922		BRICKRIDGE, A	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0261433	04	13	055	22	4	111.3											01/01/1922		KELLY, G	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0261595	03	26	054	23	4	4.9													PODHANIUK, W.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0261602	12	18	055	22	4	6.4											01/01/1930		MCIASSIC, S	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0261651	09	21	055	22	4	11.0											01/01/1922		GAUMONT, A	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0261679	09	24	055	22	4	4.9											01/01/1932		THORNE, R E	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0261728	01	27	055	22	4	4.6													BELAIR, E C	Domestic & Stock	Chemistry	Hand Dug	Chemistry Exists
0261778	09	29	055	22	4	22.9											01/01/1931		LANGLOIS, G R	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0261821	08	34	055	22	4	60.0											01/01/1926		LA CHAPPELLE	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0261822	SE	34	055	22	4	54.9	42.7	53.3									19/03/1984		JIGOLYK, H.	Domestic & Stock	New Well	Cable Tool	No Chemistry
0261844	13	35	055	22	4	22.9											01/01/1935		LECLAIRE, L	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0261886	09	01	056	21	4	4.6													SCHULTZ, E	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0262005	SE	33	054	23	4	42.7											03/11/1988	03/11/1988	STRAUSS, HOWARD #TEST HOLE	Domestic & Stock	Test Hole	Rotary	No Chemistry
0262018	SW	33	054	23	4	45.7											02/11/1988	02/11/1988	STRAUSS, HOWARD #TEST HOLE 2	Domestic & Stock	Test Hole	Rotary	No Chemistry
0262076	08	34	054	23	4	18.3											01/01/1928		PARRIDY, C.	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0262102	12	34	054	23	4	35.1											01/01/1921		SPEER, C.R.	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0262130	SE	35	054	23	4	79.2	67.1	79.2									22/11/1988		DEVEREUX, W	Domestic & Stock	New Well	Rotary	No Chemistry
0262341	SW	35	054	23	4	48.8	36.6	48.8									13/10/1981		HANES, ALBERT R	Domestic & Stock	New Well	Rotary	No Chemistry
0262348	SW	35	054	23	4	42.7	30.5	42.7									26/09/1988		HANES, ALBERT	Domestic & Stock	New Well	Rotary	No Chemistry
0262432	04	02	055	23	4	0.0													SPEER, C.R.	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0262523	SE	13	055	23	4	103.6	82.3	103.6									19/03/1983		KOZAK, NICK	Domestic & Stock	New Well	Rotary	Chemistry Exists
0263732	SE	13	056	21	4	42.1													WAGNER, J	Domestic & Stock	New Well	Cable Tool	No Chemistry
0263735	08	13	056	21	4	4.9											01/01/1927		WAGNER, J	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0263820	SW	13	056	21	4	47.2	35.1	47.2									09/05/1988		PROCHNAU, E.	Domestic & Stock	New Well	Rotary	No Chemistry
0263834	04	01	056	22	4	64.0											01/01/1929		MORROW, E.	Domestic & Stock	New Well	Drilled	No Chemistry
0263841	NW	01	056	22	4	34.4											10/12/1987		LAMOUREUX, RENALD	Domestic & Stock	New Well	Bored	Chemistry Exists
0263856	14	02	056	22	4	54.9											01/01/1924		TROTTER, J.	Domestic & Stock	New Well	Drilled	No Chemistry
0263863	10	02	056	22	4	10.7											01/01/1900		MCPIKE, T.	Domestic & Stock	New Well	Hand Dug	No Chemistry
0263896	NE	14	056	21	4	48.8							42.4	43.9			04/11/1988		HODGSON, G	Domestic & Stock	New Well	Rotary	No Chemistry
0263966	06	18	056	21	4	42.7											01/01/1922		MATHIEU, A	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0263979	04	19	056	21	4	15.2											01/01/1921		TAYLOR, J	Domestic & Stock	Federal Well Survey	Drilled	No Chemistry
0264014	16	19	056	21	4	7.3											01/01/1930		SMOLSKI, D.	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0264143	SW	12	056	22	4	26.8											22/08/1985		SERINK, MIKE	Domestic & Stock	New Well	Bored	Chemistry Exists
0264170	02	13	056	22	4	10.7											01/01/1916		BERWICK, C.D.	Domestic & Stock	New Well	Hand Dug	No Chemistry
0264301	SE	22	055	22	4	14.3											25/06/1985		GODBOUT, N.	Domestic & Stock	New Well	Bored	No Chemistry
0264335	SE	29	056	21	4	70.1											02/06/1976		PUCHALIK, P.	Domestic & Stock	New Well	Cable Tool	Chemistry Exists
0264354	01	29	056	21	4	30.5													PUCHLUK, J.	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0264375	08	35	056	21	4	3.7													CONSARTO	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0264387	03	29	056	21	4	5.5													PUCHALACH	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0264395	09	29	056	21	4	12.2													KACHUK	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0264486	12	33	056	21	4	24.4													PSYCH	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0264503	04	34	056	21	4	3.7													MALOWNY	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0264662	04	35	056	21	4	19.2													ROMANIUK, E.	Domestic & Stock	Federal Well Survey	Bored	No Chemistry
0264672	SE	36	056	21	4	42.7	27.4	42.7									12/05/1976		CORNELIUS	Domestic & Stock	New Well	Cable Tool	No Chemistry
0264716	12	36	056	21	4	4.0													TKACHUK	Domestic & Stock	Federal Well Survey	Hand Dug	No Chemistry
0264931	NE	17	54	22	4													25/06/2012	ARMSTRONG, JIM	Domestic & Stock	Old Well - Abandoned	Unknown	Chemistry Exists
0265807	SE	04	057	21	4	30.5											02/12/1976		SAWKA, WALTER	Domestic & Stock	New Well	Cable Tool	Chemistry Exists
0266021	13	01	056	22	4	18.3											01/01/1934		YANCH, J.	Domestic & Stock	New Well	Bored	Chemistry Exists
0271540	NE	05	055	22	4	13.4											21/06/1985		GODBOUT, ROMEO	Domestic & Stock	New Well	Bored	No Chemistry
0274016	EH	36	054	23	4	17.7											25/04/1983		GAUMONT, C	Domestic & Stock	New Well	Bored	Chemistry Exists
0274028	EH	36	054	23	4	15.5	9.8	13.7									20/04/1989		GAUMONT, L	Domestic & Stock	New Well	Bored	No Chemistry
0280646	NE	36	054	23	4	14.3											19/10/1987		LAMOUREUX, JIM	Domestic & Stock	New Well	Bored	No Chemistry
0299620	SW	33	054	23	4	54.9	29.9	32.6	35.7	51.8							23/03/2002		HAZELAAR, HARVEY	Domestic & Stock	New Well	Rotary	No Chemistry
1911765	SW	02	057	21	4	79.2	71.0	77.1									27/02/2006	27/02/2006	SUNDAY KO, MIKE	Domestic & Stock	New Well	Rotary	No Chemistry
0083509	SE	29	055	21	4	45.7	41.8	44.8									24/06/1977		CF BRAUN CO	Industrial	New Well	Rotary	No Chemistry
0083539	NE	32	055	21	4	41.1							35.1	41.1			09/10/1981		PCL BRAUN SIMONS LTD #WELL4	Industrial	New Well	Rotary	Chemistry Exists
0083540	NE	32	055	21	4	41.1							35.7	41.1			06/10/1981		PCL BRAUN SIMONS LTD #HOLE5	Industrial	New Well	Rotary	No Chemistry
0083541	NE	32	055	21	4	42.7	40.2	42.7									20/08/1981		PCL BRAUN SIMONS LTD #HOLE1	Industrial	New Well	Rotary	No Chemistry
0083542	NE	32	055	21	4	42.7	40.2	42.7									02/09/1981		PCL BRAUN SIMONS LTD #HOLE2	Industrial	New Well	Rotary	No Chemistry
0083543	NE	32	055	21	4	42.7	40.5	42.7									25/08/1981		PCL BRAUN SIMONS LTD #HOLE3	Industrial	New Well	Rotary	No Chemistry
0083545	SE	34	055	21	4	54.9	0.3	54.9									19/10/1982		NORTHWESTERN UTILITIES	Industrial	New Well	Rotary	No Chemistry
0083546	SH	34	055	21	4	36.6													NORTHWESTERN UTILITIES	Industrial	Chemistry	Unknown	No Chemistry
0083565	01	36	055	21	4	24.4							18.0	22.6			15/11/1980		SHELL OIL	Industrial	New Well	Rotary	No Chemistry
0083566	01	36	055	21	4	24.4	20.4	21.9									16/11/1980		SHELL OIL	Industrial	New Well	Rotary	No Chemistry
0083567	01	36	055	21	4	45.7	40.2	41.5									17/11/1980		SHELL OIL	Industrial	New Well	Rotary	No Chemistry
0083568	02	36	055	21	4	15.2	11.9	13.1									18/11/1980		SHELL OIL	Industrial	New Well	Rotary	No Chemistry
0083569	01	36	055	21	4	30.5							13.1	18.9			06/11/1980		SHELL OIL	Industrial	New Well	Rotary	No Chemistry
0091601	03	30	056	20	4	954.0											21/12/1950		IMPERIAL OIL LTD	Industrial	Oil Exploratory	Rotary	No Chemistry
0152045	NW	10	055	22	4	37.8							34.7	37.8			08/12/1989		DOW CHEMICAL#MONITORING WELL	Industrial	New Well	Rotary	No Chemistry
0152046	NW	10	055	22	4	36.0							32.9	36.0			12/12/1989		DOW CHEMICAL#MONITORING WELL	Industrial	New Well	Rotary	No Chemistry
0152047	NW	10	055	22	4	41.1							38.1	41.1			10/12/1989		DOW CHEMICAL#MONITORING WELL	Industrial	New Well	Rotary	No Chemistry
0152048	NW	10	055	22	4	37.8							34.7	37.8			13/12/1989		DOW CHEMICAL#MONITORING WELL	Industrial	New Well	Rotary	No Chemistry
0260182	10	17	054	22	4	780.3											10/05/1954		TRIZONE OIL DEV CO LTD	Industrial	Oil Exploratory	Drilled	No Chemistry
0260380	10	29	054	22	4	751.3											02/10/1953		MID-WESTERN IND GAS LTD	Industrial	Oil Exploratory	Drilled	No Chemistry
0260402	NW	32	054	22	4	64.0											29/11/1956		PEACE RIVER GLASS	Industrial	New Well	Drilled	No Chemistry
0260408	NW	32	054	22	4	35.7	31.4	35.1									01/01/1955		PEACE RIVER GLASS	Industrial	New Well	Unknown	No Chemistry
0261083	00	02	055	22	4	44.2	33.5	39.6									24/02/1978		DOW CHEMICAL	Industrial	New Well	Unknown	No Chemistry
0261087	00	02	055	22	4	25.9	21.3	25.9									02/03/1978		DOW CHEMICALS	Industrial	New Well	Unknown	No Chemistry
0261092	00	02	055	22	4	42.7	39.6	42.7									08/03/1978		DOW CHEMICALS	Industrial	New Well	Unknown	No Chemistry
0261097	SE	03	055	22	4	64.0													CAN COMSTOCK LTD	Industrial	Chemistry	Unknown	Chemistry Exists
0261104	08	04	055	22	4	762.0											03/09/1962		MIDWESTERN IND GAS LTD #8-4	Industrial	New Well	Unknown	No Chemistry
0261247	06	09	055	22	4	765.0											03/12/1959		DOME PETRO LTD	Industrial	Oil Exploratory	Unknown	No Chemistry
0261344	10	10	055	22	4	1881.5											30/08/1966		DOW CHEMICAL #NACL	Industrial	Cathodic Protection	Unknown	No Chemistry
0261436	SW	13	055	22	4	4.9													DOW CHEMICAL	Industrial	Chemistry	Unknown	No Chemistry
0261496	11	14	055	22	4	39.6							33.2	35.1			14/09/1974		DOME PETRO	Industrial	New Well	Rotary	No Chemistry
0261535	10	17	055	22	4	967.7											12/06/1953		NORTHWESTERN UTILITIES LTD#5	Industrial	Unknown	Unknown	No Chemistry
0261682	04	36	55	22	4	299.0											21/05/1953		IMPERIAL OIL LTD #AO282-2	Industrial	Oil Exploratory	Unknown	No Chemistry
0261723	04	26	55	22	4	317.9											17/05/1953		IMPERIAL OIL LTD #AO282-1	Industrial	Oil Exploratory	Unknown	No Chemistry
0261736	16	27	055	22	4	304.5											21/05/1953		IMPERIAL OIL LTD #AO282-3	Industrial	Oil Exploratory	Unknown	No Chemistry
0261761	01	01	055	23	4	9.1													#SP. 1914497	Industrial	Flowing Shot Hole	Unknown	No Chemistry
0261825	12	34	055	22	4	304.5											13/05/1953		IMPERIAL OIL LTD #AO282 5	Industrial	Oil Exploratory	Unknown	No Chemistry
0261848	16	36	055	22	4	365.8											11/05/1946		IMPERIAL OIL LTD #615	Industrial	Oil Exploratory	Unknown	No Chemistry
0263838	03	1	56	22	4	1321.3											28/02/1951		LINGNORA GOLD MINES LTD	Industrial	Unknown	Drilled	No Chemistry
0263849	01	2	56	22	4	304.5											17/05/1953		IMPERIAL OIL LTD	Industrial	Oil Exploratory	Drilled	No Chemistry
0263860	13	02	056	22	4	286.5											18/05/1953		IMPERIAL OIL LTD	Industrial	Oil Exploratory	Drilled	No Chemistry
0263918	04	15	56	21	4	996.1											15/11/1950		SEABOARD OIL CO #4-15	Industrial	Oil Exploratory	Unknown	No Chemistry
0264108	01	11	56	22	4	286.5											14/05/1953		IMPERIAL OIL LTD	Industrial	Test Hole	Drilled	No Chemistry
0264153	04	13	056	22	4	0.0											11/08/1953		IMPERIAL OIL LTD	Industrial	Flowing Shot Hole	Unknown	No Chemistry
0264161	13	12	056	22	4	292.6											14/05/1953		IMPERIAL OIL LTD	Industrial	Test Hole	Drilled	No Chemistry
0264189	03	13	056	22	4	246.3														Industrial	Flowing Shot Hole	Drilled	No Chemistry
0280652	WH	11	055	22	4	29.0											19/07/1984		DOW CHEMICAL	Industrial	Cathodic Protection	Rotary	No Chemistry
0282100	NW	02	055	22	4	70.7											09/05/1984		DOW CHEMICAL#R-240-1	Industrial	New Well	Rotary	No Chemistry
0282101	SE	10	055	22	4	71.9											08/05/1984		DOW CHEMICAL#R-90-3	Industrial	New Well	Rotary	No Chemistry
0282102	SW	11	055	22	4	27.4											03/05/1984		DOW CHEMICAL #R-240-2	Industrial	New Well	Rotary	No Chemistry
0282103	NW	11	055	22	4	98.8											01/05/1984		DOW CHEMICAL #370-5	Industrial	New Well	Rotary	No Chemistry
0282104	NW	11	055	22	4	100.6											03/05/1984		DOW CHEMICAL #370-4	Industrial	New Well	Rotary	No Chemistry
0282105	NW	11	055	22	4	100.0											26/04/1984		DOW CHEMICAL #370-3	Industrial	New Well	Rotary	No Chemistry
0282106	NW	11	055	22	4	94.8											25/04/1984		DOW CHEMICAL #370-2	Industrial	New Well	Rotary	No Chemistry
0282117	SE	10	055	22	4	25.9											04/05/1984		DOW CHEMICAL #150-2	Industrial	New Well	Rotary	No Chemistry
0289172	EH	07	056	21	4	30.5											06/09/1997	06/09/1997	I.O.L. #1	Industrial	Test Hole-Abandoned	Rotary	No Chemistry
0289173	EH	17	056	21	4	15.2	11.9	13.4									09/09/1997	09/09/1997	I.O.L. #6	Industrial	Test Hole-Abandoned	Rotary	No Chemistry
0289174	EH	17	056	21	4	13.4											08/09/1997	08/09/1997	I.O.L. #5	Industrial	Test Hole-Abandoned	Rotary	No Chemistry
0289175	EH	17	056	21	4	14.9	11.9	14.9									06/09/1997	06/09/1997	I.O.L. #2	Industrial	Test Hole-Abandoned	Rotary	No Chemistry
0289176	EH	17	056	21	4	18.3	15.8	17.4									07/09/1997	07/09/1997	I.O.L. #3	Industrial	Test Hole-Abandoned	Rotary	No Chemistry
0289177	EH	17	056	21	4	15.2											08/09/1997	08/09/1997	I.O.L. #4	Industrial	Test Hole-Abandoned	Rotary	No Chemistry
0298284	SW	19	055	21	4	41.1														Industrial	Old Well-Abandoned	Not Applicable	No Chemistry
1270376	1	27	55	21	4	46.9	32.0	46.9									13/06/2016		INTERCHEM CANADA	Industrial	New Well	Combination	No Chemistry
1270378	1	27	55	21	4	30.5							22.3	24.4			07/06/2016		INTERCHEM CANADA	Industrial	New Well	Combination	No Chemistry
1270379	8	29	55	21	4	48.8							33.5	35.1			29/06/2016		PEMBINA MIDSTREAM LTD.	Industrial	New Well	Rotary - Mud	No Chemistry
1300178	12	5	56	21	4	39.6							31.4	34.4			18/04/2007		SHELL CANADA/THURBER ENG.	Industrial	New Well	Rotary	No Chemistry
1421784	2	14	55	22	4														KEYERA CORP	Industrial	New Well	Rotary - Mud	No Chemistry
1421795	7	14	55	22	4	48.8							37.1	42.1			30/10/2015		KEYERA CORP	Industrial	New Well	Rotary - Mud	No Chemistry
1421796	SE	14	55	22	4	48.8							37.2	42.2			24/10/2015		KEYERA CORP	Industrial	New Well	Rotary - Mud	No Chemistry
1421797	3	14	55	22	4	46.6							34.7	39.7			02/11/2015		KEYERA CORP	Industrial	New Well	Rotary - Mud	No Chemistry
1421798	4	14	55	22	4	45.7							34.0	39.1			06/11/2015		KEYERA CORP	Industrial	New Well	Rotary - Mud	No Chemistry
1421799	5	14	55	22	4	46.6							34.6	39.6			08/11/2015		KEYERA	Industrial	New Well	Rotary - Mud	No Chemistry
1421801	8	14	55	22	4	48.8							36.6	41.6			27/11/2015		KEYERA	Industrial	New Well	Rotary - Mud	No Chemistry
1575400	SE	18	56	21	4	47.2							16.8	47.2			25/10/2006		ACCESS PIPELINES	Industrial	New Well	Rotary	No Chemistry
1889277	5	18	55	21	4	49.4							36.9	43.0			02/03/2015		KEYERA CORP.	Industrial	New Well	Rotary - Mud	No Chemistry
0242397	SE	10	055	22	4	12.2											14/11/1978		DOW CHEMICAL	Investigation	Test Hole	Cable Tool	No Chemistry
0242398	NW	11	055	22	4	7.3	0.9	7.3									22/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0242399	NW	11	055	22	4	7.6	0.9	7.6									22/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0242400	NW	11	055	22	4	7.9	0.9	7.9									22/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0242401	NW	11	055	22	4	8.5	0.9	8.5									22/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0242402	NW	11	055	22	4	9.4	0.9	9.4									22/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0242403	NW	11	055	22	4	9.8	0.9	9.8									22/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0242404	NW	11	055	22	4	10.7	0.9	10.7									22/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0242405	NW	11	055	22	4	11.6	0.9	11.6									22/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0242406	SE	11	055	22	4	13.1											29/11/1978		DOW CHEMICAL	Investigation	New Well	Cable Tool	No Chemistry
0261846	NE	35	054	22	4	30.5											05/08/1976		ALTA ENV	Investigation	Test Hole	Unknown	No Chemistry
0281168	SH	06	056	21	4	36.6											11/05/1969		ALTA ENV #0294E	Investigation	Test Hole	Drilled	No Chemistry
0281169	09	33	056	21	4	19.8											18/04/1972		ALTA ENV #0792E	Investigation	Test Hole	Drilled	No Chemistry
0281170	09	32	055	21	4	47.2							40.5	42.1	45.1	46.3	09/05/1970		ALTA ENV #0499E	Investigation	Test Hole	Drilled	Chemistry Exists
0281173	SE	01	056	22	4	29.0											11/05/1969		ALTA ENV #0292E	Investigation	Test Hole	Drilled	No Chemistry
0042021	13	24	56	21	4	4.6							3.0	4.6			25/09/1991		ALTA ENV	Monitoring	New Well	Rotary	No Chemistry
0261254	SE	10	055	22	4	8.5											08/11/1978		DOW CHEMICAL #MONCTOUNGWELL	Monitoring	New Well	Cable Tool	No Chemistry
0261261	08	10	055	22	4	7.9											14/11/1978		DOW CHEMICAL LTD #8	Monitoring	Test Hole	Cable Tool	No Chemistry
0261265	07	10	055	22	4	33.5											08/11/1978		DOW CHEMICAL #6 MONITORING	Monitoring	Test Hole	Cable Tool	No Chemistry
0261271	NW	10	055	22	4	16.8							13.4	16.5			24/10/1989		DOW CHEMICAL	Monitoring	Test Hole	Rotary	No Chemistry
0261281	NW	10	055	22	4	18.0							13.7	16.8			21/10/1989		DOW CHEMICAL #1 MONITOR	Monitoring	Test Hole	Rotary	No Chemistry
0261285	NW	10	055	22	4	16.2							13.1	16.2			26/10/1989		DOW CHEMICAL	Monitoring	Test Hole	Rotary	No Chemistry
0261294	NW	10	055	22	4	16.5							13.4	16.5			26/10/1989		DOW CHEMICAL	Monitoring	Test Hole	Rotary	No Chemistry
0261297	NW	10	055	22	4	18.0							14.9	18.0			26/10/1989		DOW CHEMICAL	Monitoring	Test Hole	Rotary	No Chemistry
0261302	10	10	055	22	4	5.2											09/04/1979		DOW CHEMICAL #21	Monitoring	Test Hole	Cable Tool	No Chemistry
0261321	10	10	055	22	4	4.9											09/04/1979		DOW CHEMICAL #22 MONITORING W	Monitoring	Test Hole	Cable Tool	No Chemistry
0261340	09	10	055	22	4	5.8											09/04/1979		DOW CHEMICAL	Monitoring	Test Hole	Cable Tool	No Chemistry
0261414	NW	11	055	22	4	36.6							34.1	35.7			27/08/1980		DOW CHEMICAL	Monitoring	Test Hole	Rotary	No Chemistry
0261420	NW	11	055	22	4	39.6							36.0	37.5			25/08/1980		DOW CHEMICAL	Monitoring	Test Hole	Rotary	No Chemistry
0261423	NE	11	055	22	4	39.6											27/11/1978		DOW CHEMICAL #10 MONITORING W	Monitoring	Test Hole	Cable Tool	No Chemistry
0261427	NE	11	055	22	4	7.3	0.9	7.3									22/11/1978		DOW CHEMICAL #12 MONITORING W	Monitoring	Test Hole	Cable Tool	No Chemistry
0261428	10	11	055	22	4	7.3	0.9	7.3									22/11/1978		DOW CHEMICAL #13 MONITORING W	Monitoring	Test Hole	Cable Tool	No Chemistry
0261460	SW	14	055	22	4	6.1							4.6	6.1					DOME PETRO#BRINE UGS PITSITE 1	Monitoring	Chemistry	Unknown	Chemistry Exists
0261475	SW	14	055	22	4	6.1							4.6	6.1					DOME PETRO#BRINE UGS PITSITE 2	Monitoring	Chemistry	Unknown	Chemistry Exists
0261485	SW	14	055	22	4	6.1							4.6	6.1					DOME PETRO#UGS@BRINEPITSITE 3	Monitoring	Chemistry	Unknown	Chemistry Exists
0261489	SW	14	055	22	4	6.1							4.6	6.1					DOME PETRO#UGS@BRINEPITSITE 4	Monitoring	Chemistry	Unknown	Chemistry Exists
0263387	01	05	056	21	4	42.1	39.3	42.1									27/04/1982		CAN BADGER CO LTD #7	Monitoring	New Well	Rotary	No Chemistry
0263397	01	05	056	21	4	45.7	38.1	39.6									30/03/1982	30/03/1982	CAN BADGER CO LTD	Monitoring	New Well-Abandoned	Rotary	No Chemistry
0263410	01	05	056	21	4	47.2	38.1	41.1									06/04/1982		CAN BADGER CO LTD #2	Monitoring	New Well	Rotary	No Chemistry
0263417	01	05	056	21	4	61.0	45.7	61.0									08/04/1982		CAN BADGER CO LTD #3	Monitoring	New Well	Rotary	No Chemistry
0263423	01	05	056	21	4	61.0	45.7	61.0									13/04/1982		CAN BADGER CO LTD #4	Monitoring	New Well	Rotary	No Chemistry
0263439	01	05	056	21	4	91.4	76.5	82.3									16/04/1982	16/04/1982	CAN BADGER CO LTD	Monitoring	New Well-Abandoned	Rotary	No Chemistry
0263447	01	05	056	21	4	76.2	64.0	73.2									22/04/1982	22/04/1982	CAN BADGER CO LTD	Monitoring	New Well-Abandoned	Rotary	No Chemistry
0263459	01	05	056	21	4	42.7							39.0	40.5			03/05/1982		CAN BADGER CO LTD #8	Monitoring	New Well	Rotary	No Chemistry
0263465	01	05	056	21	4	42.7											05/05/1982		CAN BADGER CO LTD #9	Monitoring	New Well	Rotary	No Chemistry
0264021	SE	20	056	21	4	5.2													IMPERIAL OIL #6A	Monitoring	Chemistry	Unknown	Chemistry Exists
0264030	SE	20	056	21	4	7.9													IMPERIAL OIL #6D	Monitoring	Chemistry	Unknown	Chemistry Exists
0264036	SE	20	056	21	4	21.9													IMPERIAL OIL #5B	Monitoring	Chemistry	Unknown	Chemistry Exists
0264045	SE	20	056	21	4	33.5													IMPERIAL OIL #6B	Monitoring	Chemistry	Unknown	Chemistry Exists
0264050	SE	20	056	21	4	43.0													IMPERIAL OIL #3B	Monitoring	Chemistry	Unknown	Chemistry Exists
0264054	SE	20	056	21	4	2.1													IMPERIAL OIL #5F	Monitoring	Chemistry	Unknown	Chemistry Exists
0264056	SE	20	056	21	4	43.3													IMPERIAL OIL #5A	Monitoring	Chemistry	Unknown	Chemistry Exists
0264061	SE	20	056	21	4	15.2													IMPERIAL OIL #6C	Monitoring	Chemistry	Unknown	Chemistry Exists
0264075	SE	20	056	21	4	7.3													IMPERIAL OIL #5D	Monitoring	Chemistry	Unknown	Chemistry Exists
0264078	SE	20	056	21	4	5.5													IMPERIAL OIL #7	Monitoring	Chemistry	Unknown	Chemistry Exists
0264081	SE	20	056	21	4	5.5													IMPERIAL OIL #10	Monitoring	Chemistry	Unknown	Chemistry Exists
0264086	SE	20	056	21	4	4.3													IMPERIAL OIL #8	Monitoring	Chemistry	Unknown	Chemistry Exists
0264089	SE	20	056	21	4	4.3													IMPERIAL OIL #5H	Monitoring	Chemistry	Unknown	Chemistry Exists
0264094	SE	20	056	21	4	4.3													IMPERIAL OIL #5E	Monitoring	Chemistry	Unknown	Chemistry Exists
0264096	SE	20	056	21	4	4.0													IMPERIAL OIL #4A	Monitoring	Chemistry	Unknown	Chemistry Exists
0264098	SE	20	056	21	4	4.0													IMPERIAL OIL #5G	Monitoring	Chemistry	Unknown	Chemistry Exists
0264103	SE	20	056	21	4	3.0													IMPERIAL OIL #9	Monitoring	Chemistry	Unknown	Chemistry Exists
1270257	5	14	55	22	4	37.6							35.2	36.7			20/12/2013		KEYERA ENERGY LTD.	Monitoring	New Well	Rotary - Mud	No Chemistry
1270258	6	14	55	22	4	36.4							34.9	36.4			18/12/2013		KEYERA ENERGY LTD.	Monitoring	New Well	Rotary - Mud	No Chemistry
1270271	1	14	55	22	4	41.8	39.0	40.5					39.0	40.5			30/09/2014		KEYERA ENERGY LTD.	Monitoring	Piezometer	Rotary - Mud	No Chemistry
1270272	2	14	55	22	4	39.2	36.6	38.1					36.6	38.1			02/10/2014		KEYERA ENERGY LTD.	Monitoring	Piezometer	Rotary - Mud	No Chemistry
1270273	2	14	55	22	4	38.7	36.0	37.7					36.0	37.6			03/10/2014		KEYERA ENERGY LTD.	Monitoring	Piezometer	Rotary - Mud	No Chemistry
1420288	NW	14	056	21	4	42.7							35.1	38.1			02/02/2005		NCIA	Monitoring	New Well	Rotary	No Chemistry
1420299	SW	31	054	22	4	32.0							25.0	29.6			25/01/2005		NCIA	Monitoring	New Well	Rotary	No Chemistry
1420305	NW	31	055	21	4	42.7							31.1	37.2			28/01/2005		NCIA	Monitoring	Test Hole	Rotary	No Chemistry
1420309	NE	33	055	21	4	44.8							35.7	41.8			27/01/2005		NCIA	Monitoring	New Well	Rotary	No Chemistry
1420313	SE	04	055	22	4	36.6							26.5	31.1			03/02/2005		NCIA	Monitoring	New Well	Rotary	No Chemistry
1420564	NW	19	054	22	4	38.1							27.7	34.4			24/01/2005		N C I A	Monitoring	New Well	Rotary	No Chemistry
2093187	1	35	56	21	4	8.4							4.6	7.6			10/11/2008		AMEC EARTH & ENVIRONMENT	Monitoring	New Well	Auger	No Chemistry
2093188	1	35	56	21	4	13.0							9.8	12.8			10/11/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093213	1	35	56	21	4	8.4							4.8	7.8			11/11/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093222	1	35	56	21	4	10.0							7.0	10.0			18/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry

Appendix A1-1

Water Well Records Within the Study Area

WELL ID	LOCATION LSD	SECTION	TOWNSHIP	RANGE	MERIDIAN	WELL DEPTH (m)	PERFORATIONS 1 (m) FROM	TO	PERFORATIONS 2 (m) FROM	TO	PERFORATIONS 3 (m) FROM	TO	SCREENINGS 1 (m) FROM	TO	SCREENINGS 2 (m) FROM	TO	DATE COMPLETED	ABANDONED	WELL OWNER	PROPOSED USE	TYPE OF WORK	DRILL METHOD	CHEMISTRY
2093223	1	35	56	21	4	9.8							6.8	9.8			19/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093224	1	35	56	21	4	12.0							9.0	12.0			19/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093225	1	35	56	21	4	12.0							7.0	10.0			19/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093226	1	35	56	21	4	13.1							7.7	10.7			22/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093227	1	35	56	21	4	9.9							5.2	8.2			13/12/2007		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093228	1	35	56	21	4	13.1							8.5	11.5			22/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093229	1	35	56	21	4	13.0							7.1	10.1			10/11/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093230	1	35	56	21	4	12.0							7.0	10.0			19/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093232	1	35	56	21	4	8.4							5.0	8.0			18/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093233	1	35	56	21	4	8.4							5.2	8.2			13/12/2007		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093235	1	35	56	21	4	12.5							9.0	12.0			18/09/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093241	1	35	56	21	4	8.4							4.6	7.6			11/11/2008		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093243	1	35	56	21	4	11.5							7.1	10.1			13/12/2007		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093244	1	35	56	21	4	9.9							6.8	9.9			13/12/2007		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093249	1	35	56	21	4	8.4							5.2	8.2			14/12/2007		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
2093250	1	35	56	21	4	8.4							5.2	8.2			14/12/2007		AMEC EARTH & ENVIRONMENTAL	Monitoring	New Well	Auger	No Chemistry
0101384	NW	32	054	22	4	0.0													FT SASK, TOWN OF #WELL 1	Municipal	Unknown	Unknown	No Chemistry
0156873	NW	09	055	22	4	0.0													U.M.O.L.-C.R.N.E.W.S.	Municipal	Chemistry	Not Applicable	No Chemistry
0260180	04	17	54	22	4	29.0											22/04/1972		ALTA ENV/WATER RES	Municipal	Unknown	Drilled	No Chemistry
0260416	NH	32	054	22	4	18.6														Municipal	New Well	Drilled	No Chemistry
0263723	16	12	056	21	4	42.7							29.3	30.8			06/11/1975		BRUDERHEIM, TOWN OF#11-75	Municipal	New Well	Unknown	Chemistry Exists
0263728	16	12	056	21	4	42.7							35.7	37.2			03/10/1975		BRUDERHEIM, TOWN OF #9-75	Municipal	New Well	Unknown	Chemistry Exists
0263729	16	12	056	21	4	42.7							33.8	37.2			04/11/1975		BRUDERHEIM, TOWN OF#10-75	Municipal	New Well	Unknown	Chemistry Exists
0263738	01	13	56	21	4	43.6	30.8	38.4									16/07/1975		BRUDERHEIM, TOWN OF#6-75 PUMP	Municipal	New Well	Unknown	Chemistry Exists
0263821	05	13	056	21	4	48.8							41.8	43.0			11/11/1975		BRUDERHEIM, TOWN OF#14-75	Municipal	New Well	Unknown	Chemistry Exists
0263828	16	13	056	21	4	36.6							31.1	32.3			10/11/1975		BRUDERHEIM, TOWN OF#13-75	Municipal	New Well-Abandoned	Unknown	Chemistry Exists
0263912	09	14	056	21	4	49.4											16/07/1975		BRUDERHEIM, TOWN OF	Municipal	New Well	Unknown	No Chemistry
0264233	15	21	056	21	4	42.7							34.1	35.4			07/11/1975		BRUDERHEIM, TOWN OF#12-75	Municipal	New Well	Unknown	Chemistry Exists
1495323	NE	12	56	21	4	38.1							33.2	36.3			22/08/2007		STRATHCONA COUNTY / UMA	Municipal	New Well	Rotary	No Chemistry
0263789	01	13	56	21	4	35.7	34.4	35.7									16/07/1975		BRUDERHEIM, TOWN OF	Municipal & Observation	New Well	Unknown	No Chemistry
0042022	4	14	56	21	4	6.1							3.1	4.6			25/09/1991		ALTA ENV/CHMILIAR, W.	Observation	New Well	Rotary	No Chemistry
0083369	NE	06	055	21	4	15.2											08/04/1988		ALTA ENV	Observation	Test Hole	Auger	No Chemistry
0083370	SW	07	055	21	4	42.7											06/08/1976		ALTA ENV #1619BE	Observation	Test Hole	Rotary	No Chemistry
0083472	12	22	055	21	4	30.8											24/06/1969		ALTA AGRICULTURE	Observation	Test Hole	Rotary	No Chemistry
0215410	08	30	054	22	4	42.7	29.0	34.1									06/08/1976		ALTA ENV #1619E	Observation	Test Hole	Unknown	No Chemistry
0224185	SE	18	056	20	4	73.2											08/10/1993	08/10/1993	MCLELLAN, ART	Observation	Test Hole-Abandoned	Rotary	No Chemistry
0234510	NW	30	056	20	4	51.8											12/05/1969		ALTA ENV #0298E	Observation	Test Hole	Unknown	No Chemistry
0234526	SE	30	056	20	4	37.5											13/05/1969		ALTA ENV #0299E	Observation	Test Hole	Unknown	No Chemistry
0234530	13	30	56	20	4	10.1													ALBERTA ENVIRONMENT	Observation	Old Well - Test	Unknown	Chemistry Exists
0234530	13	30	56	20	4	10.1							8.5	10.1			27/03/1985		ALTA ENV #2342E	Observation	Test Hole	Rotary	Chemistry Exists
0234532	13	30	56	20	4	36.9							35.4	36.9			26/03/1985		ALTA ENV #2341E	Observation	Test Hole	Rotary	No Chemistry
0234538	13	30	56	20	4	10.1							8.5	10.1			27/03/1985		ALTA ENV #2343E	Observation	Test Hole	Rotary	Chemistry Exists
0234538	13	30	56	20	4	10.1													ALBERTA ENVIRONMENT	Observation	Old Well - Test	Unknown	Chemistry Exists
0234545	13	30	56	20	4	48.2							46.3	47.9			22/03/1985		ALTA ENV	Observation	Test Hole	Rotary	No Chemistry
0234548	13	30	56	20	4	78.9													ALBERTA ENVIRONMENT	Observation	Old Well - Test	Unknown	Chemistry Exists
0234548	13	30	56	20	4	78.9											19/03/1985		ALTA ENV #2339E	Observation	Test Hole	Rotary	Chemistry Exists
0234549	13	30	056	20	4	72.5											11/03/1985	11/03/1985	ALTA ENV #2334E	Observation	Test Hole-Abandoned	Rotary	No Chemistry
0260051	NE	08	054	22	4	38.1							6.4	12.8			14/04/1977		KENNEDY	Observation	New Well	Rotary	No Chemistry
0260458	SW	36	054	22	4	13.7											07/04/1988			Observation	Test Hole	Bored	No Chemistry
0262034	09	33	054	23	4	56.4											06/10/1972		ALTA ENV #0886E	Observation	Test Hole	Unknown	No Chemistry
0263831	SW	01	056	22	4	19.8													ALTA ENV/WATER RES #0293E	Observation	Test Hole	Rotary	No Chemistry
0286110	01	28	055	21	4	21.3											24/06/1969		#HOLE 670-H	Observation	Test Hole	Auger	No Chemistry
0286112	13	22	055	21	4	30.8											24/06/1969		#HOLE 671-H	Observation	Test Hole	Auger	No Chemistry
0286117	13	28	055	21	4	29.3											25/06/1969		#HOLE 669-H	Observation	Test Hole	Auger	No Chemistry
1270377	1	27	55	21	4	61.0							36.0	42.1			10/06/2016		INTERCHEM CANADA	Observation	New Well	Combination	No Chemistry
1300177	12	5	56	21	4	43.0							30.5	39.9			16/04/2007		SHELL CANADA/THURBER ENG.	Observation	Piezometer	Rotary	No Chemistry
1420001	NE	10	055	22	4	19.2							16.2	19.2			10/02/2005		AGRIUM PLANT-FORT SASKATCHEWA	Observation	New Well	Rotary	No Chemistry
1420003	NW	05	056	21	4	44.2							38.1	44.2			24/09/2004		SHELL CANADA	Observation	New Well	Rotary	No Chemistry
1420007	SW	24	055	22	4	43.9							37.8	43.9			15/05/2005		NCIA	Observation	New Well	Rotary	No Chemistry
1420016	NE	10	055	22	4	17.4							14.3	17.4			10/02/2005		AGRIUM PLANT-FORT SASKATCHEWA	Observation	New Well	Rotary	No Chemistry
1420018	NE	03	056	21	4	48.8											20/01/2005	20/01/2005	NCIA	Observation	Test Hole-Abandoned	Rotary	No Chemistry
1420020	SE	29	055	21	4	33.5							30.5	33.5			03/02/2005		NICA	Observation	New Well	Rotary	No Chemistry
1420023	NE	18	055	21	4	38.7							34.1	38.7			31/01/2005		NCIA	Observation	New Well	Rotary	No Chemistry
1420030	NE	32	054	22	4	30.5							21.6	26.2			26/01/2005		NCIA	Observation	New Well	Rotary	No Chemistry
1420050	NW	24	054	23	4	19.8							15.5	19.8			24/01/2005		NCIA	Observation	New Well	Rotary	No Chemistry
1420097	09	10	056	21	4	36.6											24/03/2004	24/03/2004	STANTEC CONSULTING LTD	Observation	Test Hole-Abandoned	Unknown	No Chemistry
1420104	SW	10	055	22	4	15.8							12.8	15.8			10/11/2005		AGRIUM	Observation	New Well	Rotary	No Chemistry
1420115	NE	10	55	22	4	24.7							18.6	24.7			09/02/2005		AGRIUM PLANT -FT SASKATCHEWAN	Observation	New Well	Rotary	No Chemistry
1420135	NE	10	055	22	4	18.3							15.2	18.3			10/02/2005		AGRIUM PLANT	Observation	New Well	Rotary	No Chemistry
1420143	NE	10	055	22	4	19.2							15.2	18.3			11/02/2005		AGRIUM PLANT-FT SASKATCHEWAN	Observation	New Well	Rotary	No Chemistry
1420152	SW	25	055	22	4	48.8											21/01/2005	21/02/2005	NCIA	Observation	Test Hole-Abandoned	Rotary	No Chemistry
1420161	SW	15	055	22	4	36.6											18/01/2005	18/01/2005	NCIA	Observation	Dry Hole-Abandoned	Rotary	No Chemistry
1420165	NW	04	055	22	4	12.2											18/01/2005	18/01/2005	NCIA	Observation	Dry Hole-Abandoned	Rotary	No Chemistry
1420173	SW	26	055	22	4	30.5											18/01/2005	18/01/2005	NCIA	Observation	Dry Hole-Abandoned	Rotary	No Chemistry
1420174	SE	30	055	21	4	47.2											19/01/2005	19/01/2005	NCIA	Observation	Dry Hole-Abandoned	Rotary	No Chemistry
1420181	SE	36	055	22	4	12.2											19/01/2005	19/01/2005	NCIA	Observation	Dry Hole-Abandoned	Rotary	No Chemistry
1420197	SW	34	055	21	4	54.9											20/01/2005	20/01/2005	NCIA	Observation	Test Hole-Abandoned	Rotary	No Chemistry
1420210	15	09	056	21	4	48.8							32.0	53.3			22/03/2004		STANTEC CONSULTING LTD	Observation	New Well	Rotary	No Chemistry
1420217	13	10	056	21	4	48.8							38.7	44.8			23/03/2004		STANTEC CONSULTING LTD	Observation	New Well	Rotary	No Chemistry
1420224	16	10	056	21	4	48.8							40.2	43.3			24/03/2004		STANTEC CONSULTING LTD	Observation	New Well	Rotary	No Chemistry
1420228	04	10	056	21	4	36.6							33.5	36.6			23/03/2004		STANTEC CONSULTING LTD	Observation	New Well	Rotary	No Chemistry
1420242	NW	15	056	21	4	42.7							36.0	40.5			02/02/2005		NCIA	Observation	New Well	Rotary	No Chemistry
1420259	SE	29	054	22	4	36.6											17/01/2005	17/01/2005	NCIA	Observation	Test Hole-Abandoned	Rotary	No Chemistry
1420418	NE	10	055	22	4	25.0							21.9	25.0			09/02/2005		AGRIUM PLANT, FT SASKATCHEWAN	Observation	New Well	Rotary	No Chemistry
1420419	NE	10	055	22	4	30.5							21.9	25.0			09/02/2005		AGRIUM PLANT, FT SASKATCHEWAN	Observation	New Well	Rotary	No Chemistry
1420432	SW	32	055	21	4	17.1							14.0	17.1			08/09/2006		SHELL SCOTTFORD REFINERY	Observation	Piezometer	Rotary	No Chemistry
1420433	SW	32	055	21	4	45.7							38.7	41.8			08/09/2006		SHELL SCOTTFORD REFINERY	Observation	Piezometer	Rotary	No Chemistry
1420565	SW	34	055	21	4	42.7											21/01/2005	21/01/2005	N C I A	Observation	New Well-Abandoned	Rotary	No Chemistry
1420578	SE	16	056	21	4	48.8							39.6	45.7			23/06/2006		SHELL SCOTFORD	Observation	New Well	Rotary	No Chemistry
1420579	NE	04	056	21	4	44.2							36.9	39.9			21/06/2006		SHELL SCOTFORD	Observation	New Well	Rotary	No Chemistry
1421030	SW	36	54	22	4	24.4							14.3	15.8	15.8	18.9	03/07/2010		REPERIO RESOURCES	Observation	New Well	Rotary - Mud	No Chemistry
1421033	NE	26	54	22	4	10.7							6.4	9.4			24/06/2010		REPERIO RESOURCES	Observation	New Well	Rotary - Mud	No Chemistry
1421034	NE	26	54	22	4	12.2							7.6	10.7			25/06/2010		REPERIO RESOURCES	Observation	New Well	Rotary - Mud	No Chemistry
1421035	SW	26	54	22	4	11.3							8.2	9.8			01/07/2010		REPERIO RESOURCES	Observation	New Well	Rotary - Mud	No Chemistry
1421038	SW	26	54	22	4	16.5							9.1	15.2			01/07/2010		REPERIO RESOURCES	Observation	New Well	Rotary - Mud	No Chemistry
1421039	NE	26	54	22	4	10.7							6.1	9.1			29/06/2010		REPERIO RESOURCES	Observation	New Well	Rotary - Mud	No Chemistry
1421785	3	14	55	22	4	41.1							35.2	39.9			03/11/2015		KERYERA CORP	Observation	New Well	Rotary - Mud	No Chemistry
1421793	SE	14	55	22	4	42.7							37.1	41.8			27/10/2015		KEYERA CORP	Observation	New Well	Rotary - Mud	No Chemistry
1421794	SE	14	55	22	4	43.2							37.4	42.1			30/10/2015		KEYERA CORP	Observation	New Well	Rotary - Mud	No Chemistry
1495324	NE	12	056	21	4	34.4							31.1	34.1			22/08/2007		STRATHCONA COUNTY / UMA	Observation	New Well	Rotary	No Chemistry
2058433	04	17	54	22	4	29.0											22/04/1972		ALTA ENV - #791E	Observation	Other	Unknown	No Chemistry
0196962	08	22	054	22	4	150.9											29/05/1975		ARC# TH 3-75	Other	Coal Test Hole	Unknown	No Chemistry
0261523	12	17	055	22	4	10.7											01/01/1935		NORMANDEAU, J	Other	Federal Well Survey	Hand Dug	No Chemistry
1421047	SW	36	54	22	4	10.1							7.6	9.1			25/06/2010		REPERIO RESOURCES	Other	New Well	Rotary - Mud	No Chemistry
1421611	SW	14	55	22	4	45.7							33.8	38.4	38.4	44.5	24/07/2014		KEYERA ENERGY	Other	New Well	Rotary - Mud	No Chemistry
1421680	SW	14	55	22	4	46.6							33.9	39.3			04/12/2014		KEYERA ENERGY	Other	New Well	Rotary - Mud	No Chemistry
1476845	6	34	55	21	4	119.8											04/11/2015		SKYSTONE ENGINEERING	Other	Other	Unknown	No Chemistry
1476846	6	34	55	21	4	119.8											07/11/2015		SKYSTONE ENGINEERING	Other	Other	Rotary - Mud	No Chemistry
1476847	5	34	55	21	4	94.5											08/11/2015		SKYSTONE ENGINEERING	Other	Other	Rotary - Mud	No Chemistry
1795266	SE	32	56	21	4	3.6												29/09/2010	TOTAL E & P CANADA LTD.	Other	Old Well - Abandoned	Other	No Chemistry
1795267	SE	32	56	21	4	12.5												28/09/2010	TOTAL E & P CANADA	Other	Old Well - Abandoned	Unknown	No Chemistry
1795268	SE	32	56	21	4	23.7												30/09/2010	TOTAL E & P CANADA LTD	Other	Old Well - Abandoned	Bored	No Chemistry
1795269	SE	32	56	21	4	14.5												30/09/2010	TOTAL E & P CANADA LTD	Other	Old Well - Abandoned	Unknown	No Chemistry
1795270	NW	33	56	21	4	13.7												01/10/2010	TOTAL E & P CANADA LTD.	Other	Old Well - Abandoned	Unknown	No Chemistry
1795271	NW	33	56	21	4	14.3												01/10/2010	TOTAL E & P CANADA LTD	Other	Old Well - Abandoned	Unknown	No Chemistry
1795277	NW	33	56	21	4	14.3												04/10/2010	TOTAL E & P CANADA LTD	Other	Old Well - Abandoned	Unknown	No Chemistry
1795278	SW	33	56	21	4	8.8												05/10/2010	TOTAL E & P CANADA LTD.	Other	Old Well - Abandoned	Bored	No Chemistry
1795279	SE	33	56	21	4	33.5							32.0	33.5				07/10/2010	TOTAL E & P CANADA LTD.	Other	Old Well - Abandoned	Unknown	No Chemistry
1795280	NE	33	56	21	4	28.0												12/10/2010	TOTAL E & P CANADA LTD.	Other	Old Well - Abandoned	Unknown	No Chemistry
1795281	NE	34	56	21	4	30.7												06/10/2010	TOTAL E & P CANADA LTD	Other	Old Well - Abandoned	Unknown	No Chemistry
1795282	SE	4	57	21	4	27.7												06/10/2010	TOTAL E & P CANADA LTD	Other	Old Well - Abandoned	Unknown	No Chemistry
1795283	NE	33	56	21	4	16.8												05/10/2010	TOTAL E& P CANADA LTD	Other	Old Well - Abandoned	Unknown	No Chemistry
1795285	SE	28	56	21	4	10.3												04/10/2010	TOTAL E & P CANADA LTD	Other	Old Well - Abandoned	Unknown	No Chemistry
1795286	15	34	56	21	4	13.3												07/10/2010	TOTAL E & P CANADA LTD.	Other	Old Well - Abandoned	Unknown	No Chemistry
1888893	4	18	56	21	4	48.8							30.5	33.5	33.5	36.6	29/06/2009		ACCESS PIPELINES	Other	New Well	Rotary	No Chemistry
0083371	03	07	055	21	4	50.3	39.6	50.3									11/09/1981		MOYSEY, FRANK	Stock	New Well	Rotary	No Chemistry
0083421	16	16	055	21	4	14.0											01/01/1934		MANZ, A.	Stock	Federal Well Survey	Bored	No Chemistry
0083422	NW	17	055	21	4	39.6											01/11/1973		SCOTFORD COLONY	Stock	New Well	Cable Tool	No Chemistry
0083424	NE	17	055	21	4	85.3	73.2	85.3									07/12/1983		SCOTFORD COLONY	Stock	New Well	Rotary	Chemistry Exists
0083427	16	17	055	21	4	82.3											02/07/1974		SCOTFORD COLONY	Stock	New Well	Cable Tool	No Chemistry
0083429	09	17	055	21	4	45.7											01/08/1973		SCOTFORD COLONY	Stock	New Well	Cable Tool	No Chemistry
0083430	16	17	055	21	4	73.2	71.6	73.2									23/06/1978		SCOTFORD COLONY	Stock	New Well	Rotary	No Chemistry
0083431	16	17	055	21	4	85.3													MANN, A.A.	Stock	Federal Well Survey	Drilled	No Chemistry
0083432	16	17	055	21	4	134.1											02/12/1983		SCOTFORD COLONY	Stock	New Well	Rotary	No Chemistry
0083434	NE	17	055	21	4	21.3							17.7	19.2			27/08/1986		SCOTFORD COLONY	Stock	New Well	Rotary	No Chemistry
0083441	16	18	055	21	4	12.2											01/01/1928		BARCLEY, E.H.	Stock	Federal Well Survey	Bored	No Chemistry
0083442	SW	19	55	21	4	2.4													WING, H.S.	Stock	Chemistry	Hand Dug	Chemistry Exists
0083443	SW	19	055	21	4	3.0													WING, GERRY	Stock	Chemistry	Hand Dug	Chemistry Exists
0083444	SW	19	055	21	4	4.3													BLACKLOCK, BRIAN	Stock	Chemistry	Hand Dug	Chemistry Exists
0083454	15	19	055	21	4	7.3											10/05/1968	01/01/2001	NEBEL, ROBERT	Stock	New Well	Bored	Chemistry Exists
0083456	15	19	055	21	4	8.5	1.8	7.9									07/01/1980		HENDERSON, GARTH	Stock	New Well	Bored	No Chemistry
0083457	15	19	055	21	4	12.2	5.5	7.6									02/01/1980	01/01/2001	HENDERSON, GARTH	Stock	New Well	Bored	No Chemistry
0083464	01	21	055	21	4	38.1	31.7	36.6									03/04/1980		KRIBS, ROBERT	Stock	New Well	Rotary	Chemistry Exists
0083466	04	21	055	21	4	18.3											14/09/1983		WAKARYK, ANDREW	Stock	New Well	Bored	No Chemistry
0083475	05	23	055	21	4	54.9											01/01/1926		PENELTON, J.	Stock	Federal Well Survey	Drilled	No Chemistry
0083478	14	23	055	21	4	13.4											01/01/1926		ARNDT, G.	Stock	Federal Well Survey	Bored	No Chemistry
0083498	SE	27	055	21	4	56.4	40.2	51.2									30/11/1962		CHOLOWSKI, ALBERT	Stock	New Well	Rotary	No Chemistry
0083504	16	27	55	21	4	26.8											05/07/1974		HEINRICHS, ED	Stock	New Well	Cable Tool	Chemistry Exists
0083515	SE	30	055	21	4	9.8	3.7	9.8									20/08/1975	01/01/2001	GODBOUT, STAN	Stock	New Well	Bored	No Chemistry
0083530	13	30	055	21	4	42.7											01/05/1974		LIVING, DALE	Stock	New Well	Cable Tool	Chemistry Exists
0083547	04	34	55	21	4	32.0											13/04/1982		RADKE, BEN	Stock	New Well	Cable Tool	No Chemistry
0083547	04	34	55	21	4	32.0											18/04/1982		RADKE, JAMES & RANDY	Stock	Well Inventory	Unknown	No Chemistry
0083550	SW	34	55	21	4	94.5	85.3	94.5									28/09/1977		RADKE, BEN	Stock	New Well	Rotary	Chemistry Exists
0083553	04	34	055	21	4	14.6											06/11/1981		RADKE, BEN	Stock	New Well	Bored	No Chemistry
0083557	13	34	055	21	4	36.6											09/09/1981		HALL'S AUTO	Stock	New Well	Cable Tool	No Chemistry
0083558	13	34	055	21	4	40.5											19/10/1978		DAOUST, CHARLES	Stock	New Well	Cable Tool	No Chemistry
0083559	13	34	055	21	4	42.7							36.6	42.7			14/07/1987		DAOUST, C.	Stock	New Well	Rotary	No Chemistry
0083562	16	34	055	21	4	53.3											01/05/1982		BERG, RON	Stock	New Well	Cable Tool	No Chemistry
0083574	12	36	55	21	4	12.2											01/01/1936		PROKOPCZAK, J.	Stock	Federal Well Survey	Bored	No Chemistry
0091556	04	17	056	20	4	42.7	27.4	42.7									16/08/1982		SCHRAM, BARRY	Stock	New Well	Cable Tool	No Chemistry
0091557	12	17	056	20	4	48.8							39.6	41.5			04/06/1984		HODGSON, L.	Stock	New Well	Rotary	No Chemistry
0091567	13	18	056	20	4	6.7											01/01/1918		SERANT, M.	Stock	Federal Well Survey	Unknown	No Chemistry
0091568	NW	18	056	20	4	47.2											24/08/1987		SERINK, WILLIAM	Stock	New Well	Rotary	No Chemistry
0091569	01	19	056	20	4	50.3											31/07/1975		RADKE, SIEGFRIED	Stock	New Well	Cable Tool	No Chemistry
0091571	04	19	056	20	4	45.7											08/07/1977		SERINK, WILLIAM	Stock	New Well	Rotary	Chemistry Exists
0154375	NE	03	056	22	4	59.4	45.7	57.9									17/04/1985		KUGLER, IRWIN	Stock	New Well	Rotary	No Chemistry
0159190	NE	17	055	21	4	82.3											28/05/1976		SCOTFORD COLONY#PUMP HOUSE	Stock	New Well	Rotary	Chemistry Exists
0159197	NE	34	055	21	4	54.9	46.6	52.7									29/09/1991		BERG, RON	Stock	New Well	Rotary	No Chemistry
0159288	SE	05	055	22	4	13.4	8.2	12.2									10/07/1991		GODBOUT, ROMEO	Stock	Reconstructed	Bored	No Chemistry
0167849	NE	17	055	21	4	14.9											10/07/1992		SCOTFORD COLONY	Stock	New Well-Abandoned	Bored	No Chemistry
0167850	NE	17	055	21	4	20.4	12.2	13.1	19.5	20.4							12/07/1992		SCOTFORD COLONY	Stock	New Well	Bored	No Chemistry
0185985	SW	17	056	20	4	67.1	48.8	61.0									28/10/1992		SCHRAM, BARRY	Stock	New Well	Rotary	No Chemistry
0260183	NW	18	054	22	4	36.6											01/02/1974		SMITH, HARRY	Stock	New Well	Cable Tool	No Chemistry
0260184	SE	19	054	22	4	28.3							26.5	28.0			27/04/1968		GALLOWAY, R.	Stock	New Well	Drilled	No Chemistry
0260190	SE	19	054	22	4	28.7											01/01/1925		LOREN, J.	Stock	New Well	Combination	No Chemistry
0260222	SW	26	054	22	4	54.9											08/06/1978		GALLOWAY, ED	Stock	New Well	Rotary	No Chemistry
0261227	09	07	055	22	4	7.9											01/01/1930		VILLENEUVE, E.	Stock	Federal Well Survey	Hand Dug	No Chemistry
0261236	03	08	055	22	4	105.5											01/01/1924		HOULE, O.	Stock	Federal Well Survey	Drilled	No Chemistry
0261456	16	13	55	22	4	103.6											01/01/1924		KREPS, J.	Stock	Federal Well Survey	Drilled	No Chemistry
0261550	04	18	055	22	4	118.9											01/01/1930		VILLENEUVE, M	Stock	Federal Well Survey	Drilled	No Chemistry
0261611	08	19	055	22	4	5.5											01/01/1931		ROCK, L.C.	Stock	Federal Well Survey	Hand Dug	No Chemistry
0261753	08	29	055	22	4	22.9											01/01/1933		LANGLOIS, L	Stock	Federal Well Survey	Bored	No Chemistry
0261833	NE	14	056	21	4	11.3											19/04/1989		HODGSON, GEORGE	Stock	Deepened	Bored	No Chemistry
0262001	02	33	054	23	4	152.4											01/01/1931		DORLAND	Stock	Federal Well Survey	Drilled	No Chemistry
0262022	16	33	054	23	4	15.2											01/01/1916		WILSON	Stock	Federal Well Survey	Bored	No Chemistry
0262123	SE	35	054	23	4	36.6	24.4	25.0	27.4	30.5	32.0	32.6					01/06/1975		DEVEREUX, JOHN	Stock	New Well	Drilled	No Chemistry
0262361	EH	35	054	23	4	35.1	26.5	31.1									01/09/1973		DEVEREUX, J	Stock	New Well	Rotary	No Chemistry
0262430	SE	01	055	23	4	12.2											14/07/1922		VAN ACKER, L.	Stock	Federal Well Survey	Hand Dug	No Chemistry
0262520	SE	13	055	23	4	120.1											13/07/1925		VILLENEUVE, O.	Stock	Federal Well Survey	Drilled	No Chemistry
0263351	SE	03	056	21	4	10.7	6.1	10.7									17/09/1974		PROKOPCZAK, J.	Stock	New Well	Backhoe	No Chemistry
0263599	NE	11	056	21	4	36.6													TAYLOR, G J	Stock	New Well	Cable Tool	Chemistry Exists
0263607	NE	11	056	21	4	37.2											01/08/1973		FAIRWEATHER, B.	Stock	New Well	Cable Tool	Chemistry Exists
0263699	SW	12	056	21	4	31.1													OLSON, R	Stock	New Well	Cable Tool	No Chemistry
0263703	SW	12	056	21	4	13.7											03/09/1977		OLSEN, R	Stock	New Well	Rotary	No Chemistry
0263710	NW	12	056	21	4	44.2											12/08/1983		GABERT, M.	Stock	New Well	Rotary	No Chemistry
0263818	03	13	056	21	4	4.9													PROCNAIM, R.	Stock	Federal Well Survey	Hand Dug	No Chemistry
0263941	04	16	056	21	4	42.7													KROPP, L.	Stock	New Well	Cable Tool	Chemistry Exists
0264180	SE	21	056	21	4	54.9							47.5	48.2			03/07/1978		DEBAAN, J	Stock	New Well	Rotary	No Chemistry
0264218	SW	21	056	21	4	53.6											01/03/1974		SMITH, E.	Stock	New Well	Cable Tool	Chemistry Exists
0264254	08	25	056	21	4	14.9											17/06/1978		SERINK, W	Stock	New Well	Bored	No Chemistry
0264272	SW	26	056	21	4	39.6	31.7	37.8									12/04/1988		SAWATZKI, W	Stock	New Well	Rotary	No Chemistry
0264282	09	27	056	21	4	67.1							30.5	36.6	42.7	48.8	20/05/1986		MEDAK, W	Stock	New Well	Rotary	No Chemistry
0264315	SE	29	056	21	4	7.3													PUCHALUK, P.	Stock	Chemistry	Unknown	Chemistry Exists
0264931	NE	17	54	22	4	67.1											18/04/1955		ARMSTRONG	Stock	New Well	Drilled	Chemistry Exists
0264947	NE	35	054	22	4	51.8											01/09/1973		SIMMONS, HECTOR	Stock	New Well	Cable Tool	Chemistry Exists
0267241	SE	03	056	21	4	10.7	4.6	10.7									10/10/1974		PROKOPCZAK, L.J.	Stock	New Well	Bored	No Chemistry
0270766	04	21	056	20	4	68.6													GRONER, LARRY	Stock	New Well	Cable Tool	No Chemistry
0290971	SW	34	056	21	4	16.8	12.8	15.8									18/10/1998		WOHNSKY, WALT	Stock	New Well	Bored	No Chemistry
0297412	5	36	56	21	4	48.8	36.6	48.8									23/05/2000		DRABBLE, R.	Stock	New Well	Rotary	No Chemistry

Appendix A1-1

Water Well Records Within the Study Area

WELL ID	LOCATION					WELL DEPTH	PERFORATIONS 1 (m)		PERFORATIONS 2 (m)		PERFORATIONS 3 (m)		SCREENINGS 1 (m)		SCREENINGS 2 (m)		DATE		WELL OWNER	PROPOSED USE	TYPE OF WORK	DRILL METHOD	CHEMISTRY
	LSD	SECTION	TOWNSHIP	RANGE	MERIDIAN	(m)	FROM	TO	FROM	TO	FROM	TO	FROM	TO	FROM	TO	COMPLETED	ABANDONED					
1325000	NE	35	054	22	4	51.8											01/09/1973		SIMMONS, HECTOR	Stock	New Well	Cable Tool	No Chemistry
1690056	NW	9	56	21	4	11.6	3.0	9.1									09/07/2002		GAUMONT, CONARD	Stock	New Well	Bored	No Chemistry
1912209	SW	8	56	20	4	85.3											09/10/2013	09/10/2013	SHRAM, BARRY	Stock	Dry Hole - Abandoned	Rotary - Mud	No Chemistry
1912211	SW	8	56	20	4	97.5	91.4	97.5									13/10/2013		SHRAM, BARRY	Stock	New Well	Rotary - Mud	No Chemistry
1912296	SW	17	56	20	4	91.4	79.2	85.3									05/11/2014		SCHRAM, BARRY	Stock	New Well	Rotary - Mud	No Chemistry
0042021	13	24	56	21	4	4.6											04/03/1994		ALBERTA ENVIRONMENT	Unknown	Old Well - Test	Unknown	No Chemistry
0042022	4	14	56	21	4	5.5													ALBERTA ENVIRONMENT	Unknown	Other	Unknown	No Chemistry
0083442	SW	19	55	21	4	5.2												03/11/2008	WING, H.S.	Unknown	Old Well-Abandoned	Unknown	Chemistry Exists
0083445	SW	19	055	21	4	0.0													BLACKLOCK, OLGA	Unknown	Chemistry	Unknown	No Chemistry
0083446	SW	19	055	21	4	3.7												20/12/2002	DZURNY, E.	Unknown	Chemistry	Unknown	No Chemistry
0083468	05	22	55	21	4													30/10/2012	ROCQUE, SHANE	Unknown	Old Well - Abandoned	Unknown	No Chemistry
0083504	16	27	55	21	4	27.4												02/07/2009	HEINRICHS, E & D	Unknown	Old Well-Abandoned	Unknown	Chemistry Exists
0083507	01	28	055	21	4	21.3											24/06/1969		ALTA AGRICULTURE #670H	Unknown	Test Hole	Rotary	No Chemistry
0083508	13	28	055	21	4	29.3											25/06/1969		ALTA AGRICULTURE #669H	Unknown	Test Hole	Rotary	No Chemistry
0083529	NW	30	055	21	4													02/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
0083564	NE	35	55	21	4	11.0												10/07/2009	CHICHAK, L.	Unknown	Old Well-Abandoned	Unknown	Chemistry Exists
0083574	12	36	55	21	4	12.2												01/07/2009	PROKOPCZAK, B.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
0091497	04	06	056	20	4	7.0											17/07/1975		HYDROGEOLOGICAL CONSULT LTD	Unknown	Test Hole	Auger	No Chemistry
0091501	01	7	56	20	4	27.4											17/07/1975		HYDROGEOLOGICAL CONSULT LTD	Unknown	Test Hole	Auger	No Chemistry
0152372	WH	08	056	21	4	30.5											26/06/1990		MASCHMEYER, RAY	Unknown	Dry Hole	Rotary	No Chemistry
0160230	NE	08	054	22	4	17.7	6.1	13.7									24/10/1991		KROENING, GREG	Unknown	New Well	Bored	No Chemistry
0164457	NE	11	056	22	4													08/12/2008	PETRO CANADA	Unknown	Old Well-Abandoned	Unknown	No Chemistry
0169121	SE	16	056	21	4	34.7											23/09/1992	23/09/1992	HENKELMAN, P.R.	Unknown	New Well-Abandoned	Rotary	No Chemistry
0208911	SE	16	056	21	4													01/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
0240750	NE	30	055	21	4	42.7											11/05/1969		ALTA ENV/WATER RES #0295E	Unknown	Test Hole	Rotary	No Chemistry
0240751	EH	20	055	21	4	45.1											12/05/1969		ALTA ENV/WATER RES #0296E	Unknown	Test Hole	Rotary	No Chemistry
0240752	NE	15	055	21	4	24.4											12/05/1969		ALTA ENV #0297E	Unknown	Test Hole	Rotary	No Chemistry
0240761	02	33	54	23	4	42.7											20/09/1973		ALTA ENV #1072E	Unknown	Test Hole	Rotary	Chemistry Exists
0240767	NE	36	054	22	4	12.2											08/08/1976		ALTA ENV #1621E	Unknown	Test Hole	Rotary	No Chemistry
0240768	NE	35	054	22	4	30.5											05/08/1976		ALTA ENV #1618E	Unknown	Test Hole	Auger	No Chemistry
0240769	NE	34	054	22	4	36.6											07/08/1976		ALTA ENV #1620E	Unknown	Test Hole	Rotary	No Chemistry
0240770	NW	29	054	22	4	42.7											08/08/1976		ALTA ENV #1622E	Unknown	Test Hole	Rotary	No Chemistry
0260032	NW	07	054	22	4	45.7													HOPKIN, JIM	Unknown	Chemistry	Drilled	Chemistry Exists
0260036	NE	08	054	22	4	21.3													TUCKER, CHARLES	Unknown	Chemistry	Bored	Chemistry Exists
0260040	NE	08	054	22	4	20.7											28/10/1974		KREBS, CLIFF	Unknown	Chemistry	Drilled	Chemistry Exists
0260041	NE	08	054	22	4	23.8													WILKINSON, J.P.	Unknown	Chemistry	Bored	Chemistry Exists
0260042	NE	08	054	22	4	0.0													GIDYCH, R.T.	Unknown	Chemistry	Unknown	Chemistry Exists
0260043	NE	08	054	22	4	8.2													STEVENSON, R.C.	Unknown	Chemistry	Hand Dug	Chemistry Exists
0260044	NE	08	054	22	4	7.9													LIVINGSTON, BRIAN	Unknown	Chemistry	Bored	Chemistry Exists
0260047	NE	08	054	22	4	67.1													MCKINLAY, R.L.	Unknown	Chemistry	Drilled	Chemistry Exists
0260049	NE	08	054	22	4	12.2													KENSON HLDG	Unknown	Chemistry	Bored	Chemistry Exists
0260050	NE	08	054	22	4	12.2													KENSON HLDG	Unknown	Chemistry	Bored	Chemistry Exists
0260053	NE	08	054	22	4	0.0													SUPINA, NICK	Unknown	Chemistry	Unknown	Chemistry Exists
0260055	NE	08	054	22	4	7.9													BECKER, MARK	Unknown	Chemistry	Unknown	Chemistry Exists
0260056	NE	08	054	22	4	24.4													HENDRICKSON, CONNIE	Unknown	Chemistry	Unknown	Chemistry Exists
0260057	NE	08	054	22	4	3.0													SPALLIN, LYNNE	Unknown	Chemistry	Unknown	Chemistry Exists
0260059	NE	08	054	22	4	16.8													KENNEDY, KENNETH	Unknown	Chemistry	Unknown	Chemistry Exists
0260060	NE	08	054	22	4	9.1													GROTEN, HELEN	Unknown	Chemistry	Unknown	Chemistry Exists
0260061	00	08	054	22	4	10.7													DIRKS, G.A.	Unknown	Chemistry	Unknown	Chemistry Exists
0260067	NW	09	054	22	4	61.0													VAN CAMP, ERIC	Unknown	Chemistry	Drilled	Chemistry Exists
0260173	NW	16	054	22	4	27.4													THOMAS, ALFRED	Unknown	Chemistry	Unknown	Chemistry Exists
0260175	NW	16	054	22	4	29.6													MCKAY, A.A.	Unknown	Chemistry	Unknown	Chemistry Exists
0260176	NE	16	054	22	4	24.1													GUY, F.E.	Unknown	Chemistry	Unknown	Chemistry Exists
0260177	SE	17	054	22	4	6.1													TWIGGE, E.R.	Unknown	Chemistry	Drilled	Chemistry Exists
0260178	SW	17	054	22	4	80.8													GALLOWAY, LLOYD	Unknown	Chemistry	Unknown	Chemistry Exists
0260185	SE	19	054	22	4	54.9													RIVER BRAE FARM	Unknown	Chemistry	Unknown	Chemistry Exists
0260186	SE	19	054	22	4	56.4													GALLOWAY, ROY	Unknown	Chemistry	Unknown	Chemistry Exists
0260187	NW	19	054	22	4	57.9													LAMPRECHT, HENRY	Unknown	Chemistry	Unknown	Chemistry Exists
0260188	NW	19	054	22	4	70.1													GABERT, DOUG	Unknown	Chemistry	Drilled	Chemistry Exists
0260189	10	19	054	22	4	32.9														Unknown	Chemistry	Unknown	Chemistry Exists
0260191	04	20	054	22	4	28.3											01/01/1915		PETERS, R.J.	Unknown	New Well	Drilled	No Chemistry
0260192	NW	20	54	22	4													05/12/2014	SUREWAY CONSTRUCTION	Unknown	Old Well - Abandoned	Unknown	Chemistry Exists
0260197	SW	22	054	22	4	9.1													SHACKLETON, STV	Unknown	Chemistry	Unknown	Chemistry Exists
0260218	02	26	54	22	4	22.9							12.2	13.4			18/09/1964		MID WESTERN INDUSTRIAL GAS LTD	Unknown	New Well	Unknown	No Chemistry
0260220	SW	26	054	22	4	61.0													IRELAND, KEN	Unknown	Chemistry	Bored	Chemistry Exists
0260221	SW	26	054	22	4	51.8													GALLOWAY, EDWARD	Unknown	Chemistry	Drilled	Chemistry Exists
0260231	NW	28	054	22	4	61.0													RUDOLPH, MARJORIE	Unknown	Chemistry	Drilled	Chemistry Exists
0260359	NW	28	054	22	4	32.0													KOVAC, JOE	Unknown	Chemistry	Unknown	Chemistry Exists
0260361	NW	28	054	22	4	30.5													MCNIRNE, ROBERT	Unknown	Chemistry	Unknown	Chemistry Exists
0260363	NW	28	054	22	4	29.9													HAMER, LYLE	Unknown	Chemistry	Unknown	Chemistry Exists
0260364	NW	28	054	22	4	25.9													LEONHARDT, C.J.	Unknown	Chemistry	Drilled	Chemistry Exists
0260371	00	28	054	22	4	24.4													FINDLAY, W.	Unknown	Chemistry	Unknown	No Chemistry
0260372	NW	29	054	22	4	10.4													VAN DEN BERG	Unknown	Chemistry	Unknown	Chemistry Exists
0260374	NW	29	054	22	4	35.1													VAN DEN BERG	Unknown	Chemistry	Unknown	Chemistry Exists
0260381	00	29	054	22	4	15.5											01/05/1965		HANFORD, R.M.	Unknown	New Well	Bored	No Chemistry
0260385	SE	30	054	22	4	67.1													LAINPRECHT, H.	Unknown	Chemistry	Unknown	Chemistry Exists
0260389	NW	31	054	22	4	18.9													#TH 1	Unknown	Test Hole	Unknown	No Chemistry
0260391	NW	31	054	22	4	16.2													#TH 2	Unknown	Test Hole	Unknown	No Chemistry
0260392	NW	31	054	22	4	16.8													#TH 3	Unknown	Test Hole	Unknown	No Chemistry
0260394	NW	31	054	22	4	15.8													#TH 4	Unknown	Test Hole	Unknown	No Chemistry
0260395	NW	31	054	22	4	23.2													#TH 5	Unknown	Test Hole	Unknown	No Chemistry
0260398	SW	32	054	22	4	71.6													SEWCHUK, S.	Unknown	Chemistry	Unknown	Chemistry Exists
0260399	SW	32	054	22	4	0.0													SCOTFORD COLONY	Unknown	Chemistry	Unknown	No Chemistry
0260400	SW	32	054	22	4	9.1													KOHUT, WM	Unknown	Chemistry	Drilled	Chemistry Exists
0260401	SW	32	054	22	4	12.8													DONALDSON, ARTHUR	Unknown	Chemistry	Unknown	Chemistry Exists
0260405	NW	32	054	22	4	15.8											01/01/1927		HOPPER#N SASK RIVER	Unknown	New Well	Drilled	No Chemistry
0260413	NW	32	054	22	4	0.0													WALKER, L.	Unknown	Chemistry	Unknown	No Chemistry
0260415	NW	32	054	22	4	0.0													SHERRITT GORDON MINES	Unknown	Chemistry	Unknown	No Chemistry
0260431	SW	34	054	22	4	49.4											02/05/1955			Unknown	New Well	Drilled	No Chemistry
0260436	SW	34	054	22	4	0.0													EMONTS, GERALD	Unknown	Chemistry	Unknown	No Chemistry
0260462	EH	36	054	22	4	12.2													LAMOUREUX, JIM	Unknown	Chemistry	Unknown	No Chemistry
0260942	NW	13	54	23	4	69.5											02/09/1930		ARMSTRONG, E.	Unknown	Other	Drilled	No Chemistry
0261035	SE	01	055	22	4	69.5											01/09/1930		ATKINSON, H	Unknown	Well Inventory	Unknown	No Chemistry
0261038	SE	01	055	22	4	54.9											19/07/1959		HANSEN, P E	Unknown	New Well	Unknown	No Chemistry
0261055	NW	28	054	22	4	36.0														Unknown	New Well	Drilled	No Chemistry
0261166	NW	06	055	22	4	57.9													JESKE, O	Unknown	Test Hole	Rotary	No Chemistry
0261432	SE	13	055	22	4	56.4											01/09/1930		TATHAM, J	Unknown	New Well	Unknown	No Chemistry
0261583	SW	25	054	23	4	39.6											12/10/1963		HANES, A	Unknown	New Well	Rotary	No Chemistry
0261596	16	18	055	22	4	12.5											23/10/1964		LAMOUREUX, J A	Unknown	New Well	Bored	No Chemistry
0261749	SE	01	055	23	4	4.6														Unknown	Unknown	Unknown	No Chemistry
0261751	SE	01	055	23	4	29.6											28/08/1984	28/08/1984	SERNA, VICTOR	Unknown	New Well-Abandoned	Bored	No Chemistry
0262042	SE	34	054	23	4	91.4	24.4	42.7									28/10/1974		BELYEA, A.F.	Unknown	New Well	Unknown	Chemistry Exists
0262078	NW	34	054	23	4	67.1											01/07/1954		SPEER, A.	Unknown	New Well	Drilled	No Chemistry
0262257	SW	35	054	23	4	21.0											12/11/1977	12/11/1977	YUSKIW, N	Unknown	Old Well-Abandoned	Bored	No Chemistry
0262433	01	03	055	23	4	15.2													WILSON	Unknown	Federal Well Survey	Bored	No Chemistry
0263525	NE	05	056	21	4													19/10/2007	SHELL CANAD LIMITED	Unknown	Old Well-Abandoned	Unknown	Chemistry Exists
0263554	NW	07	056	21	4	56.7													VISSCHER, P.	Unknown	Unknown	Unknown	No Chemistry
0263560	SW	08	056	21	4													01/11/2007	SHELL CANADA - OIL SANDS	Unknown	Old Well-Abandoned	Unknown	Chemistry Exists
0263661	09	11	056	21	4	66.4	32.9	36.0	36.9	37.8							31/08/1973		ANURATIL, J.	Unknown	Unknown	Unknown	No Chemistry
0263852	SW	2	56	22	4													07/12/2010	NOEL, MAURICE	Unknown	Old Well - Abandoned	Unknown	Chemistry Exists
0263867	SW	3	56	22	4	54.9												24/07/2008	MELENKA, ALEX	Unknown	Old Well-Abandoned	Unknown	Chemistry Exists
0263992	SW	19	56	21	4	18.1												08/06/2016	NORTH WEST REDWATER PTR	Unknown	Old Well - Abandoned	Not Applicable	No Chemistry
0264091	SE	11	056	22	4	64.0	51.8	64.0									10/10/1973		SERINK, MIKE	Unknown	New Well	Rotary	Chemistry Exists
0264141	SE	12	056	22	4	61.0													SERINK, MIKE	Unknown	Chemistry	Unknown	Chemistry Exists
0264168	SE	13	056	22	4	61.0													BLOOM, B.	Unknown	Chemistry	Unknown	Chemistry Exists
0264193	NE	13	056	22	4	50.3													OOSTERHUIS, H.T.	Unknown	Chemistry	Unknown	Chemistry Exists
0264390	SW	29	056	21	4	0.0													ESSO RES	Unknown	Chemistry	Unknown	Chemistry Exists
0268135	SE	01	055	23	4	4.6														Unknown	Unknown	Unknown	No Chemistry
0268141	SE	01	055	23	4	4.6														Unknown	Unknown	Unknown	No Chemistry
0297410	SW	30	56	20	4													28/07/2015	SHILOH YOUTH RANCH	Unknown	Old Well - Abandoned	Unknown	No Chemistry
0297411	SW	30	56	20	4													28/07/2015	SHILOH YOUTH RANCH	Unknown	Old Well - Abandoned	Unknown	No Chemistry
0298285	NE	19	055	21	4	0.0														Unknown	Old Well-Abandoned	Not Applicable	No Chemistry
1125042	9	1	56	22	4	15.2												26/09/2011	OVIDENT ENERGY / WILLIAMS ENER	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1165818	SW	34	55	21	4	33.2											13/05/2014	13/05/2014	RADKE, BEN	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1165819	SW	34	55	21	4	7.6											13/05/2014	13/05/2014	RADKE, BEN	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1165820	SW	34	55	21	4												13/05/2014	13/05/2014	RADKE, BEN	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1165821	SW	34	55	21	4												13/05/2014	13/05/2014	RADKE, BEN	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1165822	SW	35	55	21	4	89.0											13/05/2014	13/05/2014	RADKE, BEN	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1270253	15	8	56	21	4	12.2	2.4	11.6									18/10/2013		CITY OF EDMONTON	Unknown	Other	Rotary - Mud	No Chemistry
1270254	15	8	56	21	4	12.2	2.4	11.6									19/10/2013		CITY OF EDMONTON	Unknown	Other	Rotary - Mud	No Chemistry
1270255	15	8	56	21	4	21.3	8.5	20.7									19/10/2013		CITY OF EDMONTON	Unknown	Other	Rotary - Mud	No Chemistry
1270256	15	8	56	21	4	21.3	8.5	20.7									21/10/2013		CITY OF EDMONTON	Unknown	Other	Rotary - Mud	No Chemistry
1370431	1	36	55	22	4														YOUNG, CARL	Unknown	Old Well - Test	Not Applicable	No Chemistry
1420003	NW	05	056	21	4													01/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1420578	SE	16	056	21	4													01/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575400	SE	18	56	21	4													08/07/2009	ACCESS PIPELINES	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575427	SW	09	056	21	4													19/10/2007	SHELL CANADA LIMITED OIL SANDS	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575428	SW	09	056	21	4													19/10/2007	SHELL CANADA LIMITED OIL SANDS	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575581	NW	09	056	21	4													20/10/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575582	SW	16	056	21	4													20/10/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575583	SW	16	056	21	4													20/10/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575584	SE	16	056	21	4													01/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575585	SE	30	055	21	4													02/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575586	SE	30	055	21	4													02/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575587	SE	30	055	21	4													02/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575588	SE	30	055	21	4													02/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575589	NW	30	055	21	4													02/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575666	SW	12	056	22	4													08/12/2008	PETRO CANADA	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575667	SW	13	056	22	4													09/12/2008	PETRO CANADA	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575668	SW	13	056	22	4													09/12/2008	PETRO CANADA	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575669	SW	16	056	21	4													11/06/2008	SHELL CANADA LTD.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575670	SW	16	056	21	4													11/06/2008	SHELL CANADA LTD.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575671	SE	16	056	21	4													11/06/2008	SHELL CANADA LTD.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575697	NE	35	55	21	4	18.3												02/07/2009	CHICHAK, L.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575698	NE	35	55	21	4	4.9												01/07/2009	CHICHAK, L.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575699	NW	26	55	21	4	30.5												02/07/2009	PROKOPCZAK, L.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575700	NW	26	55	21	4	18.3												10/07/2009	PROKOPCZAK, L.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575701	NW	26	55	21	4	27.4												10/07/2009	PROKOPCZAK, L.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575702	SW	35	55	21	4	42.7												02/07/2009	HALLABEY, S.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575703	NW	30	55	21	4	5.5												01/07/2009	PROKOPCZAK, B.	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1575880	SE	11	56	22	4													09/12/2008	PETRO CANADA	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1575882	NW	12	56	22	4													09/12/2008	PETRO CANADA	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1575883	SW	12	56	22	4													09/12/2008	PETRO CANADA	Unknown	Old Well - Abandoned	Unknown	No Chemistry
1690056	NW	9	56	21	4													01/11/2007	SHELL CANADA LIMITED	Unknown	Old Well-Abandoned	Unknown	No Chemistry
1716348	2	27	55	21	4													05/07/2016	LEDCOR	Unknown	Old Well - Abandoned	Not Applicable	No Chemistry
1716351	2	27	55	21	4													05/07/2016	LEDCOR	Unknown	Old Well - Abandoned	Not Applicable	No Chemistry
1795275	15	34	56	21	4	3.7											14/06/2011	14/06/2011	TOTAL E & P CANADA LTD.	Unknown	Old Well - Abandoned	Unknown	No Chemistry

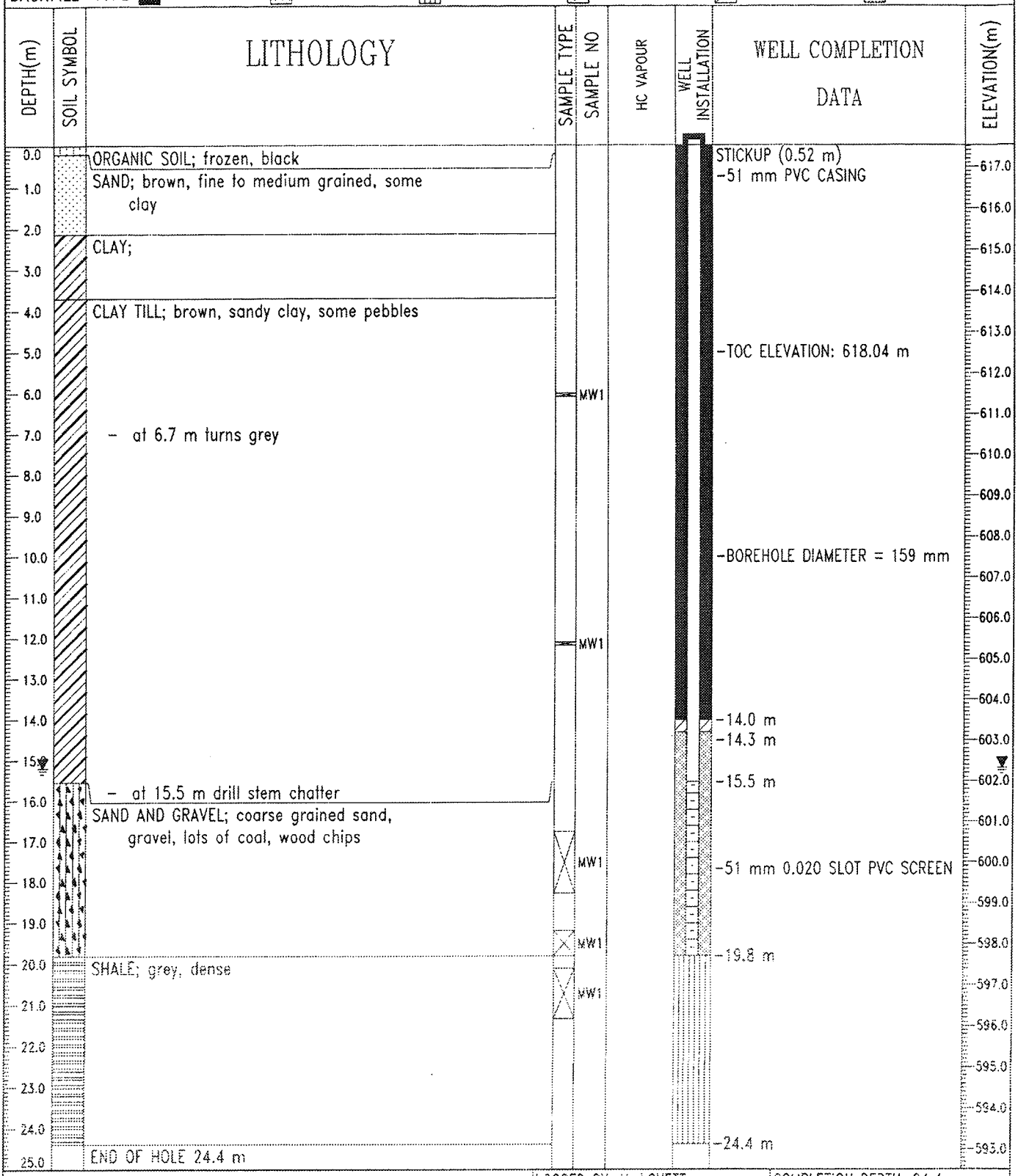
* Data Source: Alberta Environment and Parks, Alberta Water Well Information Database. Retrieved October 4, 2016, via Alberta Environment and Parks FTP site.
* Date of Search: October 20, 2016

Appendix 2 Borehole Logs

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-01
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:350335.04 N:5951040.45	ELEVATION: 617.52 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND



Stantec Consulting Ltd.	LOGGED BY: H. LOVETT	COMPLETION DEPTH: 24.4 m
Edmonton, Alberta	REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/24/05
	Fig. No: 17094	Page 1 of 1

05/11/04 07:28PM (PETION-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-02
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:352457.80 N:5950583.37	ELEVATION: 630.71 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0		ORGANIC SOIL; frozen, black					STICKUP (0.60 m)	630.0
1.0		SAND; brown, medium grained					-51 mm PVC CASING	
2.0							-TOC ELEVATION: 631.31 m	629.0
3.0							-BOREHOLE DIAMETER = 159 mm	628.0
4.0								627.0
5.0								626.0
6.0								625.0
7.0		CLAY TILL; brown, sandy clay, silty, some pebbles, coal chips						624.0
8.0								623.0
9.0								622.0
10.0								621.0
11.0								620.0
12.0								619.0
13.0								618.0
14.0		SAND; brown, grey, speckled medium grained sand						617.0
15.0								616.0
16.0								615.0
17.0		CLAY; brown, sandy						614.0
18.0		SAND; grey, medium speckled sand		MW2				613.0
19.0								612.0
20.0								611.0
21.0								610.0
22.0								609.0
23.0								608.0
24.0				MW2				607.0
25.0								606.0

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 38.1 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/24/05
Fig. No: 17094	Page 1 of 2

05/11/04 02:28PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-02
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:352457.80 N:5950583.37	ELEVATION: 630.71 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
25.0								605.0
26.0							-25.9 m	
27.0		SAND AND GRAVEL; coarse grained sand and gravel, coal chips, wood					-26.2 m	604.0
28.0								603.0
29.0		- at 29.0 m lots of chatter on drill stem						602.0
30.0				MW2			-51 mm 0.020 SLOT PVC SCREEN	601.0
31.0								600.0
32.0								599.0
33.0								598.0
34.0		SHALE; grey, dense					-33.8 m	597.0
35.0								596.0
36.0				MW2				595.0
37.0								594.0
38.0		END OF HOLE 38.1 m					-38.1 m	593.0
39.0								592.0
40.0								591.0
41.0								590.0
42.0								589.0
43.0								588.0
44.0								587.0
45.0								586.0
46.0								585.0
47.0								584.0
48.0								583.0
49.0								582.0
50.0								581.0

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 38.1 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/24/05
Fig. No: 17094	Page 2 of 2

05/11/04 02:28PM (PELTON-1)

Advisian
WorleyParsons Group

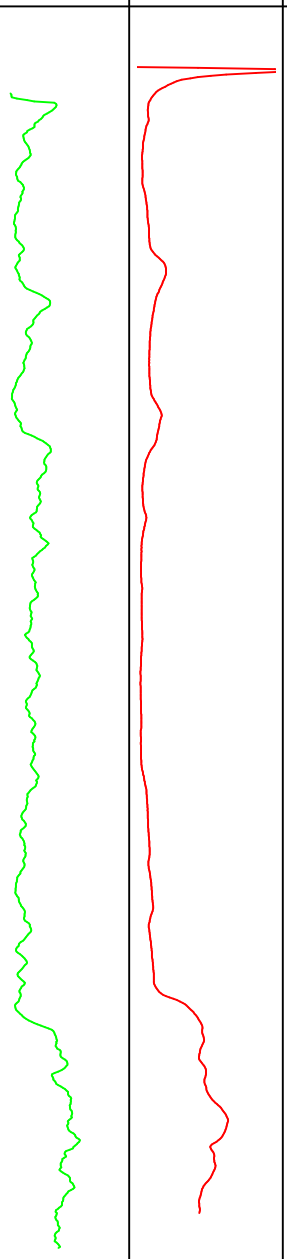
Borehole # MW-02B

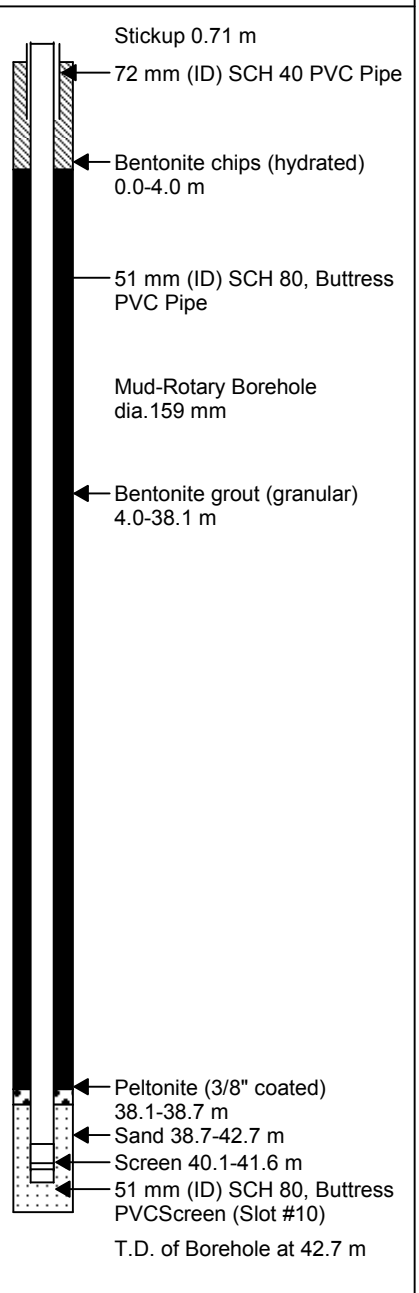
PROJECT # 307075-01608-200

Project Name: 2016 Beverly Channel Groundwater Monitoring
Client: Northwest Capital Industry Association
Drilled by: Lakeland Drilling
Drilling Method: Mud-Rotary
Drill Date: 02-Sep-2016
Logged by: Josh Malkin

Location: 14-19-054-22 W4M
Northing: 5950323.21 m
Easting: 50604.05 m
Elevation: 630.67 masl

Depth (m)	Description
0	Ground Surface
0–2	***CLAY (0.0-1.8 m)*** Silt; grey; moderately firm; medium plasticity; cohesive.
2–8	***SAND (1.8-7.6 m)*** Medium grained; well sorted; rounded; brownish grey; coal inclusions.
8–13	***SILTY CLAY (7.6-12.2 m)*** Some sand; trace clay; brown; moderately soft; trace coal fragements.
13–14	***SITY CLAY TILL (12.2-13.4 m)*** Greyish black; moderately soft; low plasticity; trace coal fragments; trace sand stringer.
14–32	***SAND (13.4-31.4 m)*** Well sorted; rounded; brown; loose; trace potassium feldspar.
32–34	***SAND AND GRAVEL (31.4-34.0 m)*** Poorly sorted; sub-rounded to sub-angular; brown; loose; some coal fragments.
34–42.7	***SHALE (34.0-42.7 m)*** Bluish grey; consistant sorting; firm.
42.7 m	End of Borehole

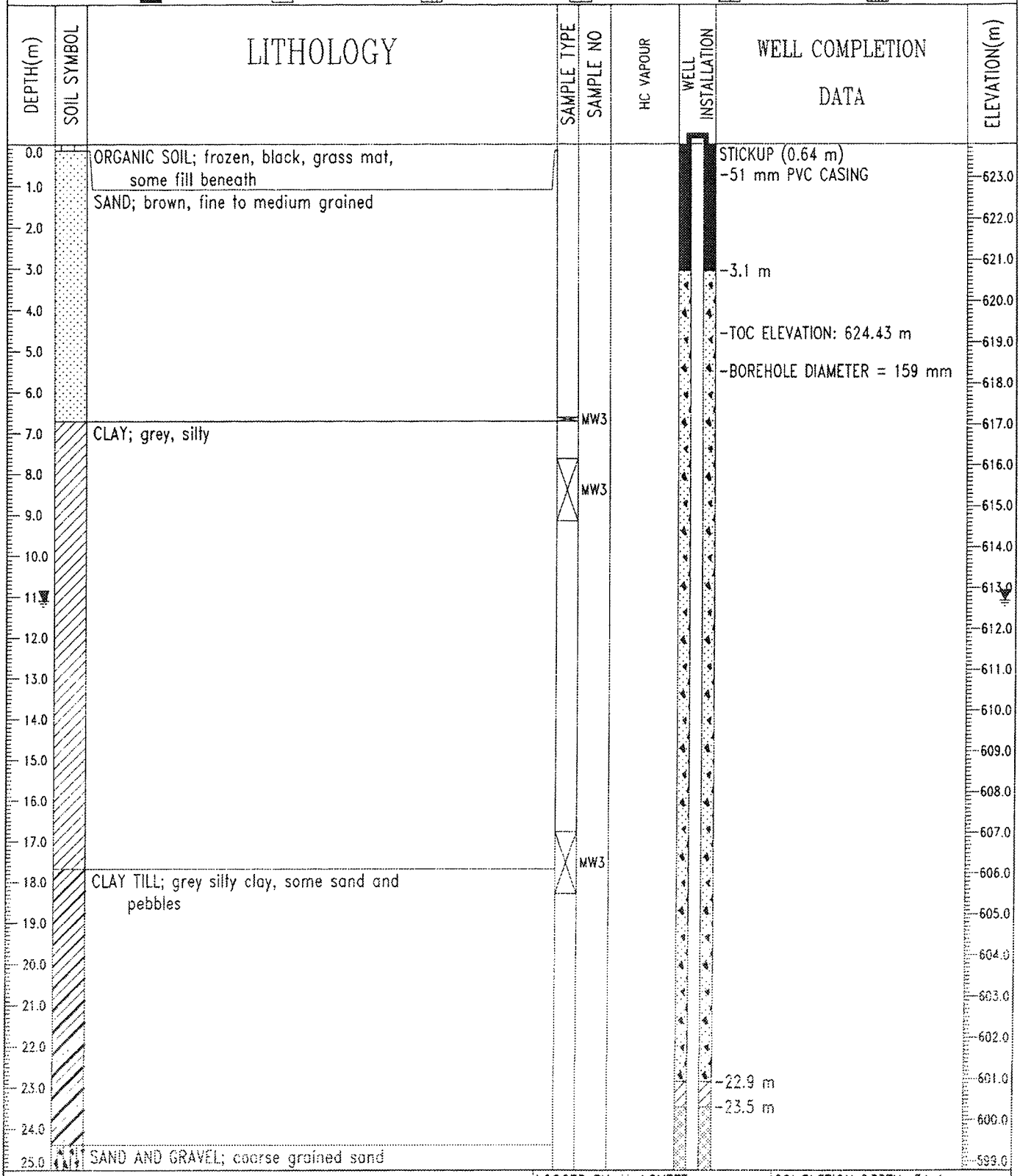




CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-03
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:353030.21 N:5952940.90	ELEVATION: 623.79 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND



Stantec Consulting Ltd.	LOGGED BY: H. LOVETT	COMPLETION DEPTH: 31.4 m
Edmonton, Alberta	REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/25/05
	Fig. No: 17094	Page 1 of 2

05/11/04 02:28PM (PETCH-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-03
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:353030.21 N:5952940.90	ELEVATION: 623.79 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
25.0	with coal and gravel					-25.0 m	598.0
26.0			MW3				
27.0			MW3			-51 mm 0.020 SLOT PVC SCREEN	597.0
28.0							596.0
29.0							595.0
30.0	SHALE; grey, dense		MW3			-29.6 m	594.0
31.0						-31.4 m	593.0
32.0	END OF HOLE 31.4 m						592.0
33.0							591.0
34.0							590.0
35.0							589.0
36.0							588.0
37.0							587.0
38.0							586.0
39.0							585.0
40.0							584.0
41.0							583.0
42.0							582.0
43.0							581.0
44.0							580.0
45.0							579.0
46.0							578.0
47.0							577.0
48.0							576.0
49.0							575.0
50.0							574.0

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 31.4 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/25/05
Fig. No: 17094	Page 2 of 2

05/11/04 02:26PM (PETION-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-04
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:354823.41 N:5953959.76	ELEVATION: 620.25 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	LITHOLOGY	SAMPLE TYPE / SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0	ORGANIC SOIL; black, frozen				STICKUP (0.54 m)	620.0
1.0	CLAY; grey, sandy				-152 mm PVC CASING	619.0
2.0					-1.5 m	618.0
3.0					-TOC ELEVATION: 620.79 m	617.0
4.0					-BOREHOLE DIAMETER = 222 mm	616.0
5.0						615.0
6.0						614.0
7.0	SAND; brown, fine to coarse grained, pebbles, black speckles	MW4				613.0
8.0						612.0
9.0						611.0
10.0						610.0
11.0						609.0
12.0						608.0
13.0						607.0
14.0						606.0
15.0						605.0
16.0						604.0
17.0	- at 16.8 m finer grained brown sand					603.0
18.0 ▼					-18.3 m	602.0 ▼
19.0	- at 18.3 m back to medium to coarse grained grey/brown sand				-19.5 m	601.0
20.0	SHALE; grey, clay					600.0
21.0		MW4				599.0
22.0	SAND; grey, medium to coarse grained	MW4			-21.6 m	598.0
23.0	SAND AND GRAVEL; grey, coarse grained sand and gravel, wood fibers	MW4				597.0
24.0						596.0
25.0					-155 mm 0.020 SLOT PVC SCREEN	

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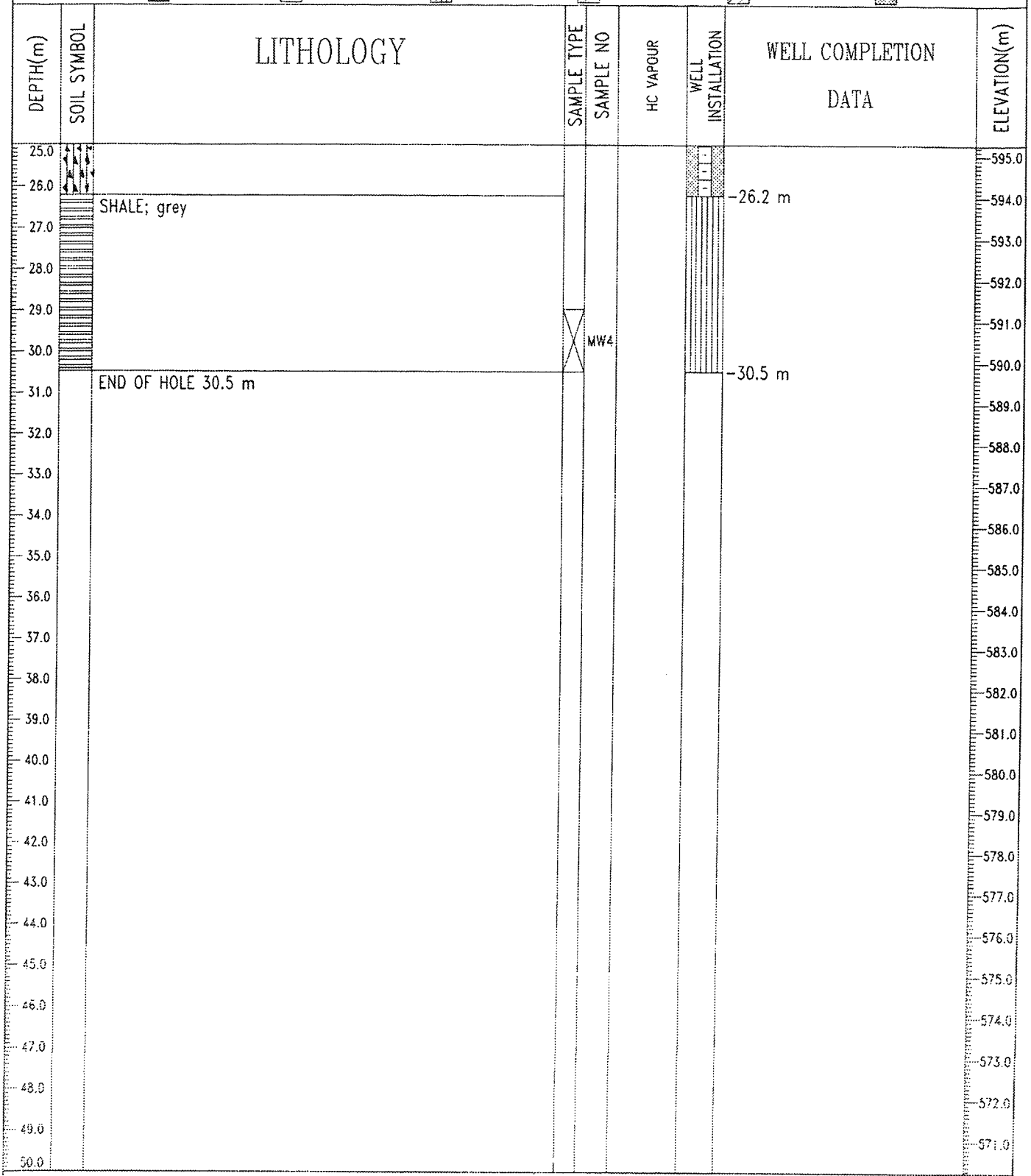
LOGGED BY: H. LOVETT	COMPLETION DEPTH: 30.5 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/25/05
Fig. No: 17094	Page 1 of 2

05/11/04 02:32PM (PETIOR-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-04
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:354823.41 N:5953959.76	ELEVATION: 620.25 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND



Stantec Consulting Ltd.	LOGGED BY: H. LOVETT	COMPLETION DEPTH: 30.5 m
Edmonton, Alberta	REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/25/05
	Fig. No: 17094	Page 2 of 2

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-05
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:354293.74 N:5954889.46	ELEVATION: 624.28 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0		TOPSOIL; frozen, black, some organics					STICKUP (0.61 m)	624.0
1.0		SAND; brown, fine to medium grained					-51 mm PVC CASING	623.0
2.0								622.0
3.0							-3.1 m	621.0
4.0		CLAY; brown, soft, silty					-TOC ELEVATION: 624.89 m	620.0
5.0							-BOREHOLE DIAMTER = 159 mm	619.0
6.0								618.0
7.0		- from 7.3 to 10.7 m blue, silty clay						617.0
8.0								616.0
9.0								615.0
10.0								614.0
11.0		TILL; blue, silty clay, small gravel, multi colored						613.0
12.0								612.0
13.0								611.0
14.0								610.0
15.0								609.0
16.0		GRAVEL; large gravel, multi colored, tower shakes						608.0
17.0		TILL; sandy, sandy clay, fine grained, small gravel, grey						607.0
18.0		SAND AND GRAVEL; grey, medium to coarse grained sand, small gravel						606.0
19.0		CLAY TILL; sandy, grey, fine grained sandy clay till		MW5				605.0
20.0								604.0
21.0								603.0
22.0							-22.6 m	602.0
23.0		- well cemented from 23.2 to 25.0 m					-23.2 m	601.0
24.0								600.0
25.0				MW5				

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 37.5 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 02/03/05
Fig. No: 17094	Page 1 of 2

05/11/04 01:29PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-05
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:354293.74 N:5954889.46	ELEVATION: 624.28 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	LITHOLOGY	SAMPLE NO	WELL COMPLETION DATA	ELEVATION(m)
25.0		MW5		599.0
26.0	SAND; grey, salt and pepper color, fine to medium grained sand			598.0
27.0			-26.8 m	597.0
28.0	GRAVEL; small to large gravel, multi colored, sand and gravel mixed alot	MW	-28.4 m	596.0
29.0				595.0
30.0			-51 mm 0.020 SLOT PVC SCREEN	594.0
31.0			-31.4 m	593.0
32.0	SHALE; grey, dense			592.0
33.0				591.0
34.0				590.0
35.0				589.0
36.0				588.0
37.0			-37.5 m	587.0
38.0	END OF HOLE 37.5 m			586.0
39.0				585.0
40.0				584.0
41.0				583.0
42.0				582.0
43.0				581.0
44.0				580.0
45.0				579.0
46.0				578.0
47.0				577.0
48.0				576.0
49.0				575.0
50.0				

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 37.5 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 02/03/05
Fig. No: 17094	Page 2 of 2

05/11/04 02:29PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-06
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:361559.34 N:5958812.22	ELEVATION: 629.61 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0		TOPSOIL; black/brown, frozen, organics					STICKUP (0.67 m)	629.0
1.0		CLAY; sandy, light brown, fine grained					-51 mm PVC CASING	
2.0								628.0
3.0		- at 3.1 m turns grey, silty					-3.1 m	627.0
4.0				MW6			-TOC ELEVATION: 630.28 m	626.0
5.0							-BOREHOLE DIAMETER = 159 mm	
6.0								625.0
7.0				MW6				624.0
8.0		CLAY TILL; grey, silty, clay, some rocks and pebbles						623.0
9.0								622.0
10.0								621.0
11.0								620.0
12.0								619.0
13.0								618.0
14.0		- at 13.7 m becomes more sandy, firm						617.0
15.0								616.0
16.0								615.0
17.0								614.0
18.0								613.0
19.0								612.0
20.0								611.0
21.0								610.0
22.0								609.0
23.0		SAND; grey, black speckled, medium grained, some silt		MW6				608.0
24.0		CLAY; grey, sandy, silty						607.0
25.0		SAND;						606.0
								605.0

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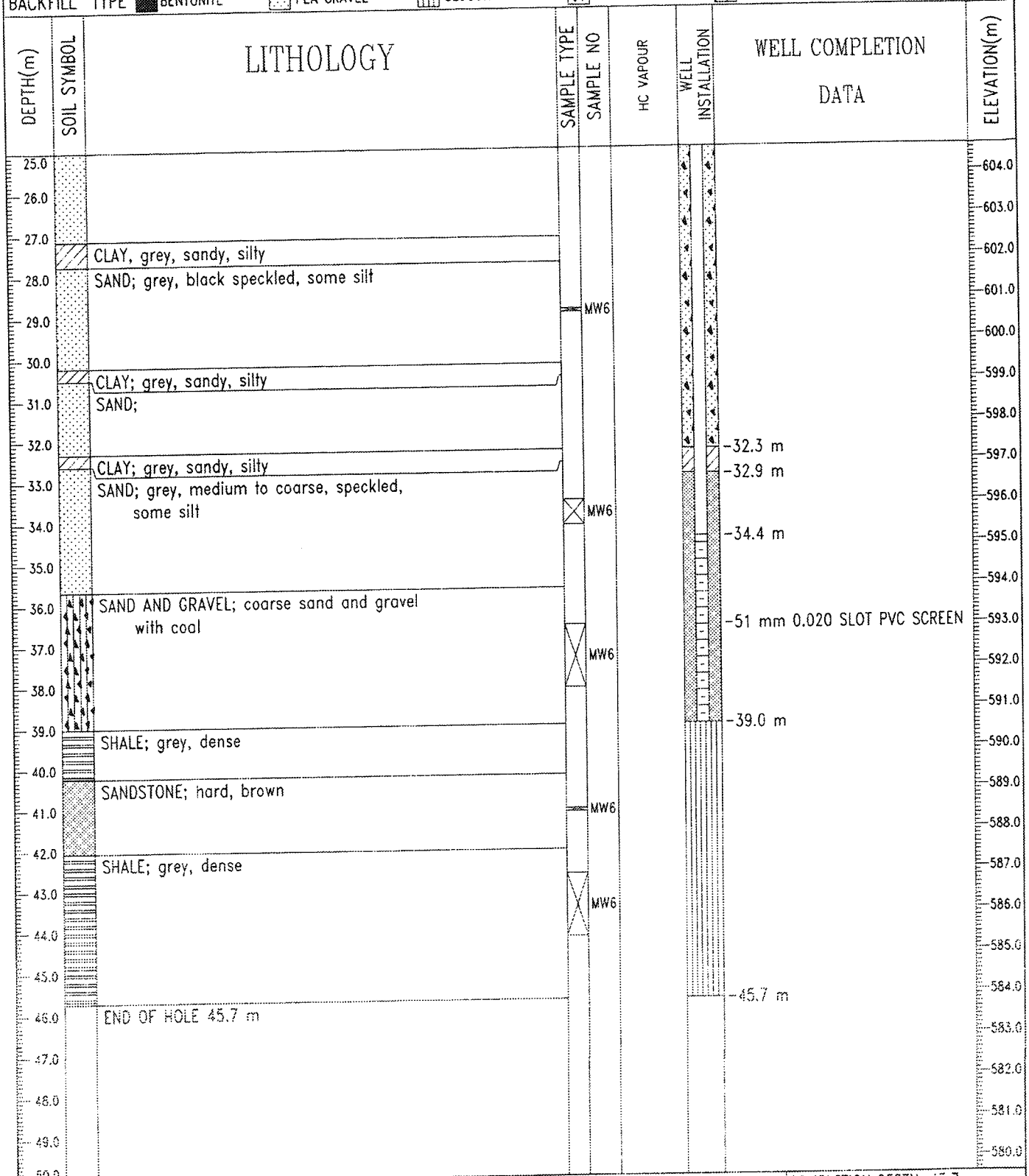
LOGGED BY: H. LOVETT | COMPLETION DEPTH: 45.7 m
REVIEWED BY: D. YOSHISAKA | COMPLETE: 01/31/05
Fig. No: 17094 |

05/11/04 02:42PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-06
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:361559.34 N:5958812.22	ELEVATION: 629.61 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND



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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 45.7 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/31/05
Fig. No: 17094	Page 2 of 2

05/11/04 02:42PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-07
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:359089.70 N:5959604.24	ELEVATION: 630.41 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0		SAND; brown, medium to coarse grained sand and gravel					STICKUP (0.60 m)	630.0
1.0							-152 mm PVC CASING	629.0
2.0								628.0
3.0		CLAY; grey, sandy					-TOC ELEVATION: 631.01 m	627.0
4.0		SAND; grey, fine grained					-BOREHOLE DIAMETER = 222 mm	626.0
5.0								625.0
6.0								624.0
7.0								623.0
8.0								622.0
9.0								621.0
10.0		CLAY; grey, sandy						620.0
11.0								619.0
12.0								618.0
13.0		SAND; grey, fine grained						617.0
14.0								616.0
15.0								615.0
16.0								614.0
17.0		CLAY TILL; grey, sandy clay with pebbles						613.0
18.0								612.0
19.0								611.0
20.0								610.0
21.0								609.0
22.0								608.0
23.0								607.0
24.0								606.0
25.0								

Stantec Consulting Ltd.
Edmonton, Alberta

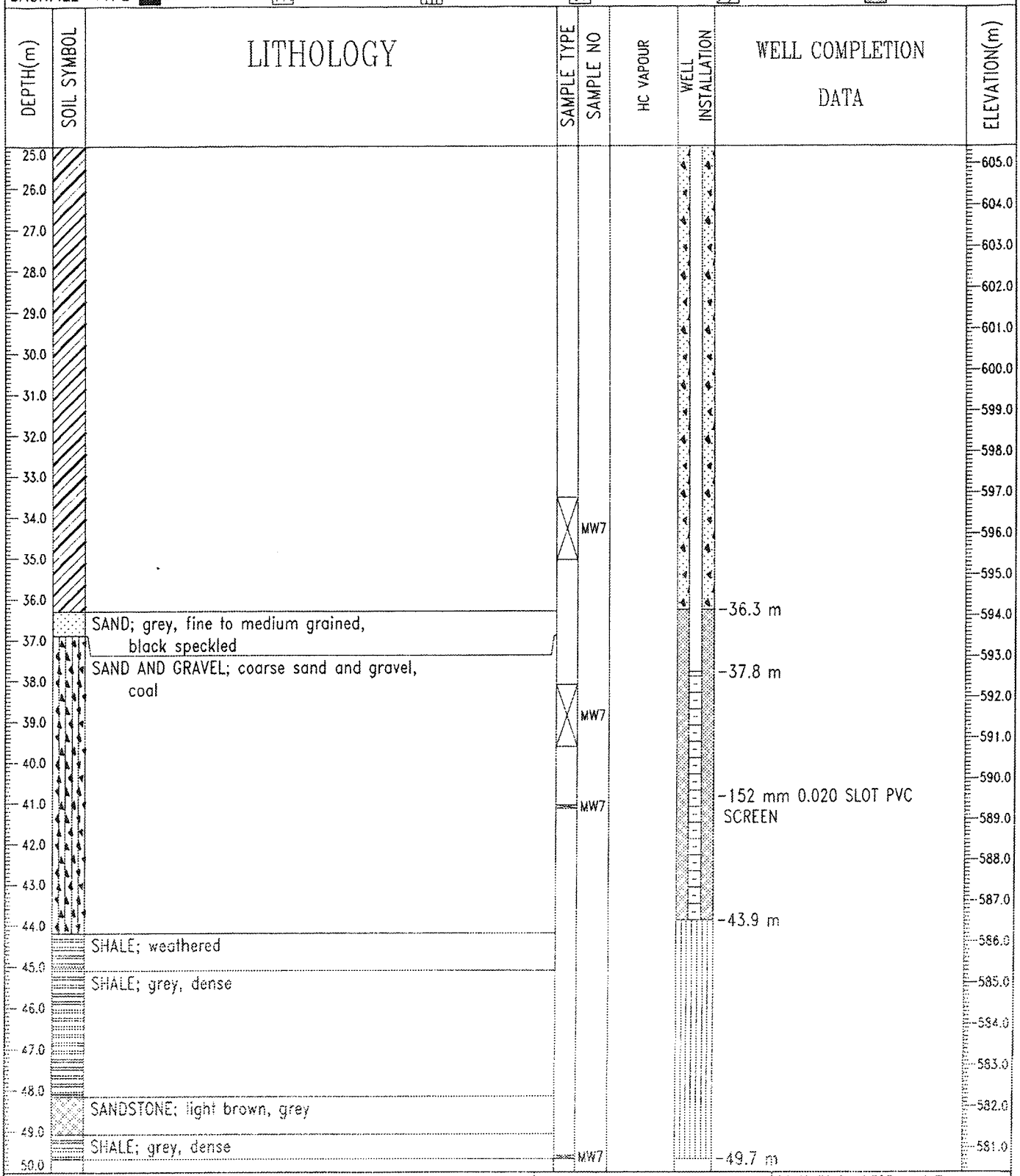
LOGGED BY: H. LOVETT | COMPLETION DEPTH: 49.7 m
REVIEWED BY: D. YOSHISAKA | COMPLETE: 02/14/05
Fig. No: 17094 |

05/11/04 02:47PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-07
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:359089.70 N:5959604.24	ELEVATION: 630.41 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND



Stantec Consulting Ltd. Edmonton, Alberta	LOGGED BY: H. LOVETT	COMPLETION DEPTH: 49.7 m
	REVIEWED BY: D. YOSHISAKA	COMPLETE: 02/14/05
	Fig. No: 17094	Page 2 of 2

05/11/04 02:47PM (PETION-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-08
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:363133.77 N:5961204.95	ELEVATION: 625.87 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0	TOPSOIL; black, roots, grasses					STICKUP (0.57 m)	625.0
1.0	SAND; brown/black grains, fine to medium grained					-51 mm PVC CASING	
2.0	CLAY; brown/grey, silty						624.0
3.0							623.0
4.0						-3.1 m -TOC ELEVATION: 626.44 m -BOREHOLE DIAMETER = 159 mm	622.0
5.0	SAND; silty, brown, very fine grained						621.0
6.0							620.0
7.0							619.0
8.0							618.0
9.0							617.0
10.0	CLAY; blue/grey, silty						616.0
11.0							615.0
12.0							614.0
13.0							613.0
14.0	CLAY TILL; blue clay, sandy						612.0
15.0							611.0
16.0							610.0
17.0							609.0
18.0							608.0
19.0	SAND; coarse grained, grey/brown						607.0
20.0	CLAY TILL; blue clay, small gravel, sandy						606.0
21.0							605.0
22.0			MW8				604.0
23.0							603.0
24.0	SHALE; rafted						602.0
25.0							601.0

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 37.8 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 02/03/05
Fig. No: 17094	Page 1 of 2

05/11/04 02:28PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-08
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:363133.77 N:5961204.95	ELEVATION: 625.87 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
25.0								600.0
26.0		SAND; fine to medium grained, grey, black specks						599.0
27.0								598.0
28.0				MW8			-28.0 m	597.0
29.0							-28.7 m	596.0
30.0				MW8			-30.5 m	595.0
31.0		GRAVEL; brown/black, small gravel, coal chunks					-51 mm 0.020 SLOT PVC SCREEN	594.0
32.0								593.0
33.0				MW8			-33.5 m	592.0
34.0		SHALE; grey, dense						591.0
35.0								590.0
36.0				MW8				589.0
37.0								588.0
38.0		END OF HOLE 37.8 m					-37.8 m	587.0
39.0								586.0
40.0								585.0
41.0								584.0
42.0								583.0
43.0								582.0
44.0								581.0
45.0								580.0
46.0								579.0
47.0								578.0
48.0								577.0
49.0								576.0
50.0								

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 37.8 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 02/03/05
Fig. No: 17094	Page 2 of 2

05/11/24 02:29PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-09
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:361003.46 N:5962032.28	ELEVATION: 624.06 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0		ORGANIC SOIL; frozen, black					STICKUP (0.67 m)	624.0
1.0		CLAY; silty, light brown, some sand, some pebbles					-51 mm PVC CASING	623.0
2.0								622.0
3.0		- at 3.1 m turns darker brown					-TOC ELEVATION: 624.73 m	621.0
4.0							-BOREHOLE DIAMETER = 159 mm	620.0
5.0								619.0
6.0								618.0
7.0								617.0
8.0								616.0
9.0								615.0
10.0								614.0
11.0		CLAY TILL; grey, silty, some pebbles						613.0
12.0								612.0
13.0								611.0
14.0								610.0
15.0		- at 14.6 m becomes sandy						609.0
16.0								608.0
17.0								607.0
18.0		SAND; grey, fine to medium grained, some clay and coal						606.0
19.0		CLAY TILL; grey, fine to medium grained sand and pebbles						605.0
20.0								604.0
21.0								603.0
22.0								602.0
23.0								601.0
24.0								600.0
25.0								

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 43.6 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/28/05
Fig. No: 17094	Page 1 of 2

05/11/04 02:30PM (PETION-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-09
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:361003.46 N:5962032.28	ELEVATION: 624.06 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
25.0							599.0
26.0	SAND; grey, medium grained, some clay, black coal speckles						598.0
27.0							597.0
28.0							596.0
29.0	CLAY; grey, sandy						595.0
30.0	GRAVEL; gravel with coarse sand and gravel					-29.9 m -30.5 m	594.0
31.0			MW9				593.0
32.0	SAND AND GRAVEL; coarse sand and coal with gravel					-32.0 m	592.0
33.0						-51 mm 0.020 SLOT PVC SCREEN	591.0
34.0	GRAVEL; gravel with coarse sand and coal						590.0
35.0							589.0
36.0			MW9			-36.6 m	588.0
37.0							587.0
38.0							586.0
39.0	SHALE; grey, dense						585.0
40.0			MW9				584.0
41.0							583.0
42.0							582.0
43.0						-43.6 m	581.0
44.0	END OF HOLE 43.6 m						580.0
45.0							579.0
46.0							578.0
47.0							577.0
48.0							576.0
49.0							575.0
50.0							

Stantec Consulting Ltd Edmonton, Alberta	LOGGED BY: H. LOVETT	COMPLETION DEPTH: 43.6 m
	REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/28/05
	Fig. No: 17094	Page 2 of 2

05/11/04 02:50PM (PEL GN-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-10
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:364,954.62 N:5,963,505.11	ELEVATION: 624.06 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0		TOPSOIL; brown, frozen, sandy					STICKUP (0.61 m)	624.0
1.0		SAND; brown, fine to medium grained					-152 mm PVC CASING	623.0
2.0								622.0
3.0		- at 3.1 m turns grey, some silt					-3.0 m	621.0
4.0							-TOC ELEVATION: 624.67 m	620.0
5.0							-BOREHOLE DIAMETER = 200 mm	619.0
6.0								618.0
7.0								617.0
8.0		CLAY; grey, silty						616.0
9.0								615.0
10.0								614.0
11.0								613.0
12.0		SAND; grey, fine grained						612.0
13.0								611.0
14.0								610.0
15.0								609.0
16.0		CLAY TILL; grey, silty						608.0
17.0		SILT; sandy, grey, fine grained sand and silt						607.0
18.0		CLAY TILL; grey, silty						606.0
19.0								605.0
20.0								604.0
21.0								603.0
22.0								602.0
23.0		SAND; grey, fine grained, some silt						601.0
24.0								600.0
25.0		CLAY; grey, silty, harder						

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LOGGED BY: H. LOVETT | COMPLETION DEPTH: 44.8 m
REVIEWED BY: D. YOSHISAKA | COMPLETE: 01/26/05
Fig. No: 17094

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-10
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:364,954.62 N:5,963,505.11	ELEVATION: 624.06 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
25.0								599.0
26.0		SAND; cemented, grey, black speckled						598.0
27.0								597.0
28.0				MW10				596.0
29.0								595.0
30.0							-30.2 m	594.0
31.0							-31.4 m	593.0
32.0								592.0
33.0								591.0
34.0		SAND AND GRAVEL; coarse grained sand and gravel, coal		MW10			-SHALE BASKET	590.0
35.0								589.0
36.0							-35.7 m	588.0
37.0				MW10			-152 mm 0.020 SLOT PVC SCREEN	587.0
38.0								586.0
39.0		GRAVEL; mostly gravel, lots of drill stem chatter, some sand						585.0
40.0								584.0
41.0								583.0
42.0		SHALE; grey, dense					-41.8 m	582.0
43.0				MW10				581.0
44.0								580.0
45.0		END OF HOLE 44.8 m					-44.8 m	579.0
46.0								578.0
47.0								577.0
48.0								576.0
49.0								575.0
50.0								

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LOGGED BY: H. LOVETT | COMPLETION DEPTH: 44.8 m
REVIEWED BY: D. YOSHISAKA | COMPLETE: 01/26/05
Fig. No: 17094 |

CLIENT: NCIA	DRILLING COMPANY: SPT DRILLING LTD.	BOREHOLE NO: MW-11
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: N:5,965,300.71 E:362,564.36	ELEVATION: 624.491 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	SLOTTED PIEZOMETER	WELL COMPLETION DATA	ELEVATION(m)
0.0		TOPSOIL; soft, black, organic silty soil					-STICKUP (0.67 m)	624.0
		SAND; loose, brown, fine to medium grained					-51 mm PVC CASING	
1.0		CLAY; firm, brown, orange, grey, silty, no pebbles						623.0
2.0		CLAY TILL; firm, brown, sandy clay, grey, silt strands, some orange oxidation, some coal, pebbles						622.0
3.0							-3.0 m	621.0
4.0								
5.0							-BOREHOLE DIAMETER 160 mm	620.0
		- at 5.5 m turns grey						619.0
6.0		- at 6.4 m damp to moist						618.0
7.0								617.0
8.0								616.0
9.0								615.0
10.0								614.0
11.0								613.0
12.0								612.0
13.0								611.0
14.0								610.0
15.0		- from 15.2 to 17.7 m lots of sand, coarse grained, speckled, larger rocks mixed with clay, wet						609.0
16.0								608.0
17.0								607.0
18.0		- at 17.7 m returns to firm, grey clay till						606.0
19.0		- at 18.9 m small band of coarse grained sand then returns to grey						605.0
20.0								

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 44.2 m
REVIEWED BY: H. LOVETT	COMPLETE: 09/24/04
Fig. No: 17094	Page 1 of 3

CLIENT: NCIA	DRILLING COMPANY: SPT DRILLING LTD.	BOREHOLE NO: MW-11
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: N:5,965,300.71 E:362,564.36	ELEVATION: 624.491 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	SLOTTED PIEZOMETER	WELL COMPLETION DATA	ELEVATION(m)
20.0		clay till						604.0
21.0								603.0
22.0								602.0
23.0								601.0
24.0								600.0
25.0								599.0
26.0								598.0
27.0		SAND; loose, fine to medium grained, wet						597.0
28.0								596.0
29.0								595.0
30.0								594.0
31.0								593.0
32.0								592.0
33.0								591.0
34.0								590.0
35.0							-35.1 m	589.0
36.0								588.0
37.0		SAND AND GRAVEL; loose, grey, wet, large gravel						587.0
38.0							-38.1 m	586.0
39.0								585.0
40.0								

Stantec Consulting Ltd. Edmonton, Alberta	LOGGED BY: H. LOVETT	COMPLETION DEPTH: 44.2 m
	REVIEWED BY: H. LOVETT	COMPLETE: 09/24/04
	Fig. No: 17094	Page 2 of 3

CLIENT: NCIA	DRILLING COMPANY: SPT DRILLING LTD.	BOREHOLE NO: MW-11
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: N:5,965,300.71 E:362,564.36	ELEVATION: 624.491 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	SLOTTED PIEZOMETER	WELL COMPLETION DATA	ELEVATION(m)
40.0								584.0
41.0							-51 mm 0.010 SLOT PVC SCREEN	583.0
42.0								582.0
43.0								581.0
44.0							-44.2 m	580.0
45.0		SHALE; dark grey, dry						579.0
46.0								578.0
47.0							-47.2 m	577.0
48.0		END OF HOLE 47.2 m NOTE: ON COMPLETION -backfill borehole with 10/20 grade sand to 44.2 mBGL MONITOR WELL INSTALLED -blue steel casing protector with lock added -above ground PVC stickup (0.67 mAGL) ON SEPTEMBER 24, 2004 -water level at 29.84 mBGL ON SEPTEMBER 28, 2004 -water level at 29.83 mBGL LOCAL COORDINATES: N:5242.77 E:2786.27 NOTE: -Originally installed for Shell Scotford Upgrader 04-10-44						576.0
49.0								575.0
50.0								574.0
51.0								573.0
52.0								572.0
53.0								571.0
54.0								570.0
55.0								569.0
56.0								568.0
57.0								567.0
58.0								566.0
59.0								565.0
60.0								

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LOGGED BY: H. LOVETT | COMPLETION DEPTH: 44.2 m
REVIEWED BY: H. LOVETT | COMPLETE: 09/24/04
Fig. No: 17094 |

08/08/29 11:10AM (PETTOH-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-12
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:366805.93 N:5968379.85	ELEVATION: 625.46 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0		MOSS; frozen, green, some organics					STICKUP (0.61 m)	625.0
1.0		SAND; brown, fine to medium grained					-51 mm PVC CASING	624.0
2.0								623.0
3.0							-3.1 m	622.0
4.0							-TOC ELEVATION: 626.07 m	621.0
5.0							-BOREHOLE DIAMETER = 159 mm	620.0
6.0								619.0
7.0								618.0
8.0		CLAY; grey, silty SILT; grey						617.0
9.0								616.0
10.0								615.0
11.0		CLAY; grey, silty						614.0
12.0								613.0
13.0		SILT; grey						612.0
14.0								611.0
15.0		CLAY; grey, silty						610.0
16.0								609.0
17.0								608.0
18.0								607.0
19.0		CLAY TILL; grey, sandy, clay, some silt,						606.0
20.0		some pebbles						605.0
21.0								604.0
22.0								603.0
23.0								602.0
24.0								601.0
25.0								

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 42.7 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/02/05
Fig. No: 17094	Page 1 of 2

05/11/04 02:30PM (PELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-12
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:366805.93 N:5968379.85	ELEVATION: 625.46 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
25.0								600.0
26.0								599.0
27.0				MW12				598.0
28.0		SAND; grey, medium grained, black speckled		MW12				597.0
29.0								596.0
30.0								595.0
31.0								594.0
32.0								593.0
33.0							-32.9 m	592.0
34.0							-33.5 m	591.0
35.0								590.0
36.0								589.0
37.0		SAND AND GRAVEL; coarse sand and gravel, coal					-51 mm 0.020 SLOT PVC SCREEN	588.0
38.0				MW12			-38.1 m	587.0
39.0		SHALE; grey, dense						586.0
40.0								585.0
41.0		- brown, soft shale						584.0
42.0		- grey, dense		MW12			-42.7 m	583.0
43.0		END OF HOLE 42.7 m						582.0
44.0								581.0
45.0								580.0
46.0								579.0
47.0								578.0
48.0								577.0
49.0								576.0
50.0								

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LOGGED BY: H. LOVETT	COMPLETION DEPTH: 42.7 m
REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/02/05
Fig. No: 17094	Page 2 of 2

05/11/04 02:30PM (PETTEN-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-13
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:365292.72 N:5968147.12	ELEVATION: 625.65 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND

DEPTH(m)	SOIL SYMBOL	LITHOLOGY	SAMPLE TYPE	SAMPLE NO	HC VAPOUR	WELL INSTALLATION	WELL COMPLETION DATA	ELEVATION(m)
0.0		PEAT MOSS;					STICKUP (0.63 m)	625.0
1.0		SAND; brown, fine to medium grained					-51 mm PVC CASING	624.0
2.0								623.0
3.0							-3.1 m	622.0
4.0							-TOC ELEVATION: 626.28 m	621.0
5.0							-BOREHOLE DIAMETER = 159 mm	620.0
6.0								619.0
7.0								618.0
8.0		CLAY; brown grey, silty						617.0
9.0		SAND; brown, grey, fine to medium grained, some clay						616.0
10.0		CLAY; grey, silty						615.0
11.0								614.0
12.0								613.0
13.0								612.0
14.0								611.0
15.0								610.0
16.0								609.0
17.0								608.0
18.0								607.0
19.0								606.0
20.0		CLAY TILL; grey, sandy (fine to medium grained), clay with pebbles - at 19.8 m rock						605.0
21.0								604.0
22.0								603.0
23.0				MW13				602.0
24.0								601.0
25.0								

Stantec Consulting Ltd.
Edmonton, Alberta

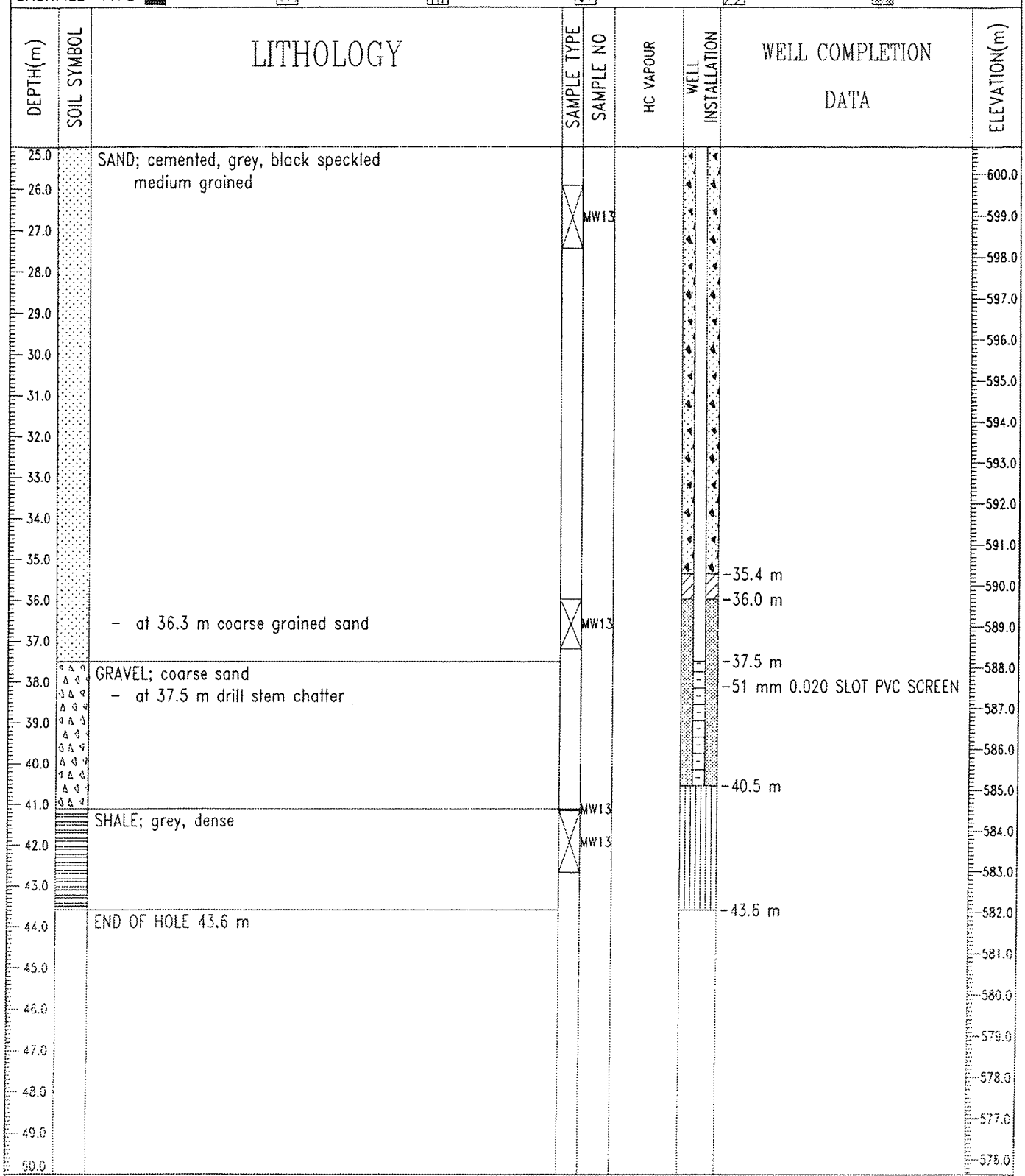
LOGGED BY: H. LOVETT | COMPLETION DEPTH: 43.6 m
REVIEWED BY: D. YOSHISAKA | COMPLETE: 01/02/05
Fig. No: 17094 | Page 1 of 2

05/11/04 02:48PM (FELTON-1)

CLIENT: NCIA	FIELD PERSONNEL: H. LOVETT	BOREHOLE NO: MW-13
PROJECT: BEVERLY CHANNEL INVESTIGATION	DRILLING METHOD: MUD ROTARY	PROJECT NO: 1102-17094/400
LOCATION: FORT SASKATCHEWAN, AB	COORDINATES: E:365292.72 N:5968147.12	ELEVATION: 625.65 (m)

SAMPLE TYPE: SHELBY TUBE | NO RECOVERY | GRAB | SPT | A-CASING | CORE

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | PELTONITE | SAND



Stantec Consulting Ltd.	LOGGED BY: H. LOVETT	COMPLETION DEPTH: 43.6 m
Edmonton, Alberta	REVIEWED BY: D. YOSHISAKA	COMPLETE: 01/02/05
	Fig. No: 17094	Page 2 of 2

05/11/04 02:48PM (PELTON-1)

Advisian
WorleyParsons Group

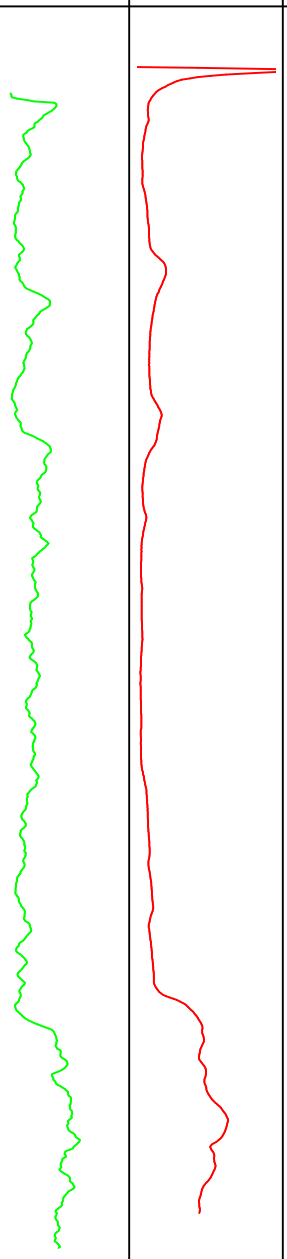
Borehole # MW-02B

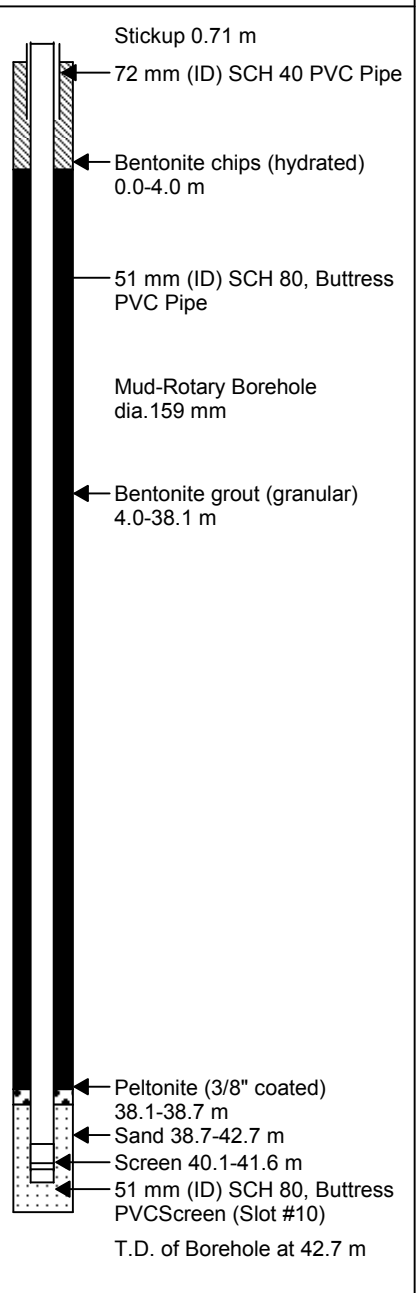
PROJECT # 307075-01608-200

Project Name: 2016 Beverly Channel Groundwater Monitoring
Client: Northwest Capital Industry Association
Drilled by: Lakeland Drilling
Drilling Method: Mud-Rotary
Drill Date: 02-Sep-2016
Logged by: Josh Malkin

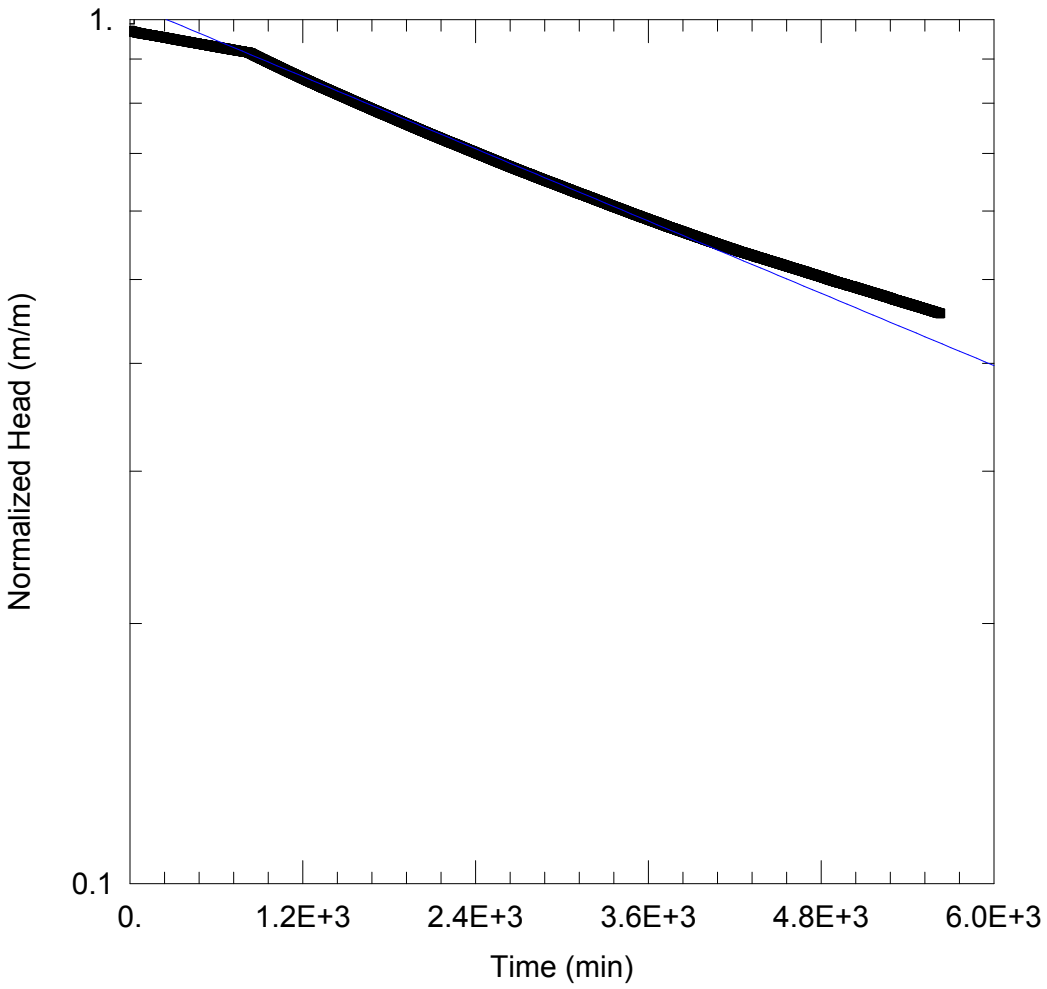
Location: 14-19-054-22 W4M
Northing: 5950323.21 m
Easting: 50604.05 m
Elevation: 630.67 masl

Depth (m)	Description
0	Ground Surface
0–2	***CLAY (0.0-1.8 m)*** Silt; grey; moderately firm; medium plasticity; cohesive.
2–8	***SAND (1.8-7.6 m)*** Medium grained; well sorted; rounded; brownish grey; coal inclusions.
8–13	***SILTY CLAY (7.6-12.2 m)*** Some sand; trace clay; brown; moderately soft; trace coal fragements.
13–14	***SITY CLAY TILL (12.2-13.4 m)*** Greyish black; moderately soft; low plasticity; trace coal fragments; trace sand stringer.
14–32	***SAND (13.4-31.4 m)*** Well sorted; rounded; brown; loose; trace potassium feldspar.
32–34	***SAND AND GRAVEL (31.4-34.0 m)*** Poorly sorted; sub-rounded to sub-angular; brown; loose; some coal fragments.
34–42.7	***SHALE (34.0-42.7 m)*** Bluish grey; consistant sorting; firm.
42.7 m	End of Borehole





Appendix 3 Hydraulic Conductivity Test



NCIZ GROUNDWATER MONITORING PROGRAM

Data Set: U:\...\MW-02B.aqt
Date: 01/03/18 Time: 15:39:42

PROJECT INFORMATION

Company: Advisian
Client: NCIA
Project: 307075-01608-300
Location: Fort Saskatchewan
Test Well: MW-02B
Test Date: 25/09/2017

AQUIFER DATA

Saturated Thickness: 4. m
Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (MW-02B)

Initial Displacement: 17.77 m
Total Well Penetration Depth: 4. m
Casing Radius: 0.025 m
Static Water Column Height: 17.77 m
Screen Length: 4. m
Well Radius: 0.0795 m
Gravel Pack Porosity: 0.2

SOLUTION

Aquifer Model: Confined
Solution Method: Hvorslev
K = 1.108E-9 m/sec
y0 = 18.51 m

Data Set: U:\EDM\GBS\307075-01608\300-2017_GW_Mon\12.0_Reports\12.3_Backend\Apdx 3 K-Test\MW-02B.a
Title: NCIZ Groundwater Monitoring Program
Date: 01/03/18
Time: 15:42:26

PROJECT INFORMATION

Company: Advisian
Client: NCIA
Project: 307075-01608-300
Location: Fort Saskatchewan
Test Date: 25/09/2017
Test Well: MW-02B

AQUIFER DATA

Saturated Thickness: 4. m
Anisotropy Ratio (Kz/Kr): 1.

SLUG TEST WELL DATA

Test Well: MW-02B

X Location: 0. m
Y Location: 0. m

Initial Displacement: 17.77 m
Static Water Column Height: 17.77 m
Casing Radius: 0.025 m
Well Radius: 0.0795 m
Well Skin Radius: 1. m
Screen Length: 4. m
Total Well Penetration Depth: 4. m
Corrected Casing Radius (Bouwer-Rice Method): 0.025 m
Gravel Pack Porosity: 0.2

No. of Observations: 5630

Observation Data

Time (min)	Displacement (m)	Time (min)	Displacement (m)
0.	17.77	2815.	11.7
1.	17.24	2816.	11.69
2.	17.25	2817.	11.69
3.	17.25	2818.	11.69
4.	17.25	2819.	11.69
5.	17.25	2820.	11.68
6.	17.25	2821.	11.68
7.	17.24	2822.	11.68
8.	17.24	2823.	11.68
9.	17.24	2824.	11.68
10.	17.23	2825.	11.68
11.	17.23	2826.	11.68
12.	17.23	2827.	11.67
13.	17.23	2828.	11.67
14.	17.22	2829.	11.67
15.	17.22	2830.	11.67
16.	17.22	2831.	11.67
17.	17.22	2832.	11.67
18.	17.21	2833.	11.66
19.	17.21	2834.	11.66
20.	17.21	2835.	11.66
21.	17.21	2836.	11.66
22.	17.21	2837.	11.66
23.	17.21	2838.	11.66
24.	17.21	2839.	11.66
25.	17.2	2840.	11.65
26.	17.2	2841.	11.65
27.	17.2	2842.	11.65

Time (min)	Displacement (m)	Time (min)	Displacement (m)
28.	17.2	2843.	11.65
29.	17.2	2844.	11.64
30.	17.19	2845.	11.64
31.	17.19	2846.	11.64
32.	17.19	2847.	11.64
33.	17.19	2848.	11.64
34.	17.19	2849.	11.64
35.	17.19	2850.	11.64
36.	17.19	2851.	11.63
37.	17.19	2852.	11.63
38.	17.18	2853.	11.63
39.	17.18	2854.	11.63
40.	17.18	2855.	11.63
41.	17.18	2856.	11.63
42.	17.18	2857.	11.62
43.	17.17	2858.	11.62
44.	17.17	2859.	11.62
45.	17.17	2860.	11.62
46.	17.17	2861.	11.62
47.	17.17	2862.	11.61
48.	17.17	2863.	11.61
49.	17.17	2864.	11.61
50.	17.16	2865.	11.61
51.	17.16	2866.	11.61
52.	17.16	2867.	11.61
53.	17.16	2868.	11.6
54.	17.16	2869.	11.6
55.	17.16	2870.	11.6
56.	17.16	2871.	11.6
57.	17.16	2872.	11.6
58.	17.15	2873.	11.6
59.	17.15	2874.	11.59
60.	17.15	2875.	11.59
61.	17.15	2876.	11.59
62.	17.15	2877.	11.59
63.	17.15	2878.	11.59
64.	17.15	2879.	11.59
65.	17.14	2880.	11.58
66.	17.14	2881.	11.58
67.	17.14	2882.	11.58
68.	17.14	2883.	11.58
69.	17.14	2884.	11.58
70.	17.14	2885.	11.57
71.	17.13	2886.	11.57
72.	17.13	2887.	11.57
73.	17.13	2888.	11.57
74.	17.13	2889.	11.57
75.	17.13	2890.	11.57
76.	17.13	2891.	11.57
77.	17.13	2892.	11.56
78.	17.13	2893.	11.56
79.	17.13	2894.	11.56
80.	17.12	2895.	11.56
81.	17.12	2896.	11.56
82.	17.12	2897.	11.55
83.	17.12	2898.	11.55
84.	17.12	2899.	11.55
85.	17.12	2900.	11.55
86.	17.12	2901.	11.55
87.	17.12	2902.	11.55
88.	17.12	2903.	11.55
89.	17.11	2904.	11.54
90.	17.11	2905.	11.54
91.	17.11	2906.	11.54
92.	17.11	2907.	11.54
93.	17.11	2908.	11.54
94.	17.11	2909.	11.54

Time (min)	Displacement (m)	Time (min)	Displacement (m)
95.	17.11	2910.	11.54
96.	17.11	2911.	11.53
97.	17.1	2912.	11.53
98.	17.1	2913.	11.53
99.	17.1	2914.	11.53
100.	17.1	2915.	11.53
101.	17.1	2916.	11.53
102.	17.1	2917.	11.52
103.	17.1	2918.	11.52
104.	17.1	2919.	11.52
105.	17.1	2920.	11.52
106.	17.09	2921.	11.52
107.	17.09	2922.	11.51
108.	17.09	2923.	11.51
109.	17.09	2924.	11.51
110.	17.09	2925.	11.51
111.	17.09	2926.	11.51
112.	17.09	2927.	11.51
113.	17.09	2928.	11.51
114.	17.09	2929.	11.5
115.	17.08	2930.	11.5
116.	17.08	2931.	11.5
117.	17.08	2932.	11.5
118.	17.08	2933.	11.49
119.	17.08	2934.	11.49
120.	17.08	2935.	11.49
121.	17.08	2936.	11.49
122.	17.08	2937.	11.49
123.	17.07	2938.	11.49
124.	17.07	2939.	11.49
125.	17.07	2940.	11.49
126.	17.07	2941.	11.48
127.	17.07	2942.	11.48
128.	17.07	2943.	11.48
129.	17.07	2944.	11.48
130.	17.07	2945.	11.48
131.	17.07	2946.	11.47
132.	17.07	2947.	11.47
133.	17.06	2948.	11.47
134.	17.06	2949.	11.47
135.	17.06	2950.	11.47
136.	17.06	2951.	11.47
137.	17.06	2952.	11.46
138.	17.06	2953.	11.46
139.	17.06	2954.	11.46
140.	17.06	2955.	11.46
141.	17.06	2956.	11.46
142.	17.05	2957.	11.46
143.	17.05	2958.	11.45
144.	17.05	2959.	11.45
145.	17.05	2960.	11.45
146.	17.05	2961.	11.45
147.	17.05	2962.	11.45
148.	17.05	2963.	11.44
149.	17.05	2964.	11.44
150.	17.05	2965.	11.44
151.	17.04	2966.	11.44
152.	17.04	2967.	11.44
153.	17.04	2968.	11.44
154.	17.04	2969.	11.43
155.	17.04	2970.	11.44
156.	17.04	2971.	11.43
157.	17.04	2972.	11.43
158.	17.04	2973.	11.43
159.	17.04	2974.	11.43
160.	17.03	2975.	11.43
161.	17.03	2976.	11.43

Time (min)	Displacement (m)	Time (min)	Displacement (m)
162.	17.03	2977.	11.42
163.	17.03	2978.	11.42
164.	17.03	2979.	11.42
165.	17.03	2980.	11.42
166.	17.03	2981.	11.41
167.	17.03	2982.	11.42
168.	17.03	2983.	11.42
169.	17.02	2984.	11.41
170.	17.02	2985.	11.41
171.	17.02	2986.	11.41
172.	17.02	2987.	11.41
173.	17.02	2988.	11.41
174.	17.02	2989.	11.4
175.	17.02	2990.	11.4
176.	17.02	2991.	11.4
177.	17.02	2992.	11.4
178.	17.01	2993.	11.4
179.	17.01	2994.	11.39
180.	17.01	2995.	11.39
181.	17.01	2996.	11.39
182.	17.01	2997.	11.39
183.	17.01	2998.	11.39
184.	17.01	2999.	11.38
185.	17.01	3000.	11.38
186.	17.01	3001.	11.38
187.	17.	3002.	11.38
188.	17.	3003.	11.38
189.	17.	3004.	11.37
190.	17.	3005.	11.37
191.	17.	3006.	11.37
192.	17.	3007.	11.37
193.	17.	3008.	11.37
194.	17.	3009.	11.37
195.	16.99	3010.	11.36
196.	16.99	3011.	11.36
197.	16.99	3012.	11.36
198.	16.99	3013.	11.36
199.	16.99	3014.	11.36
200.	16.99	3015.	11.36
201.	16.99	3016.	11.36
202.	16.99	3017.	11.36
203.	16.98	3018.	11.35
204.	16.99	3019.	11.35
205.	16.98	3020.	11.35
206.	16.98	3021.	11.35
207.	16.98	3022.	11.35
208.	16.98	3023.	11.34
209.	16.98	3024.	11.34
210.	16.98	3025.	11.34
211.	16.98	3026.	11.34
212.	16.97	3027.	11.34
213.	16.97	3028.	11.34
214.	16.97	3029.	11.34
215.	16.97	3030.	11.33
216.	16.97	3031.	11.33
217.	16.97	3032.	11.33
218.	16.97	3033.	11.33
219.	16.97	3034.	11.33
220.	16.97	3035.	11.32
221.	16.97	3036.	11.32
222.	16.96	3037.	11.32
223.	16.96	3038.	11.32
224.	16.96	3039.	11.32
225.	16.96	3040.	11.32
226.	16.96	3041.	11.31
227.	16.96	3042.	11.31
228.	16.96	3043.	11.31

Time (min)	Displacement (m)	Time (min)	Displacement (m)
229.	16.96	3044.	11.31
230.	16.96	3045.	11.31
231.	16.95	3046.	11.31
232.	16.95	3047.	11.3
233.	16.95	3048.	11.3
234.	16.95	3049.	11.3
235.	16.95	3050.	11.3
236.	16.95	3051.	11.3
237.	16.95	3052.	11.3
238.	16.95	3053.	11.3
239.	16.94	3054.	11.29
240.	16.94	3055.	11.29
241.	16.94	3056.	11.29
242.	16.94	3057.	11.29
243.	16.94	3058.	11.28
244.	16.94	3059.	11.28
245.	16.94	3060.	11.28
246.	16.94	3061.	11.28
247.	16.94	3062.	11.28
248.	16.93	3063.	11.28
249.	16.93	3064.	11.27
250.	16.93	3065.	11.27
251.	16.93	3066.	11.27
252.	16.93	3067.	11.27
253.	16.93	3068.	11.27
254.	16.93	3069.	11.27
255.	16.93	3070.	11.27
256.	16.93	3071.	11.26
257.	16.92	3072.	11.26
258.	16.92	3073.	11.26
259.	16.92	3074.	11.26
260.	16.92	3075.	11.26
261.	16.92	3076.	11.25
262.	16.92	3077.	11.25
263.	16.92	3078.	11.25
264.	16.92	3079.	11.25
265.	16.91	3080.	11.25
266.	16.91	3081.	11.25
267.	16.91	3082.	11.25
268.	16.91	3083.	11.24
269.	16.91	3084.	11.24
270.	16.91	3085.	11.24
271.	16.91	3086.	11.24
272.	16.91	3087.	11.24
273.	16.9	3088.	11.24
274.	16.91	3089.	11.24
275.	16.9	3090.	11.23
276.	16.9	3091.	11.23
277.	16.9	3092.	11.23
278.	16.9	3093.	11.23
279.	16.9	3094.	11.22
280.	16.9	3095.	11.22
281.	16.9	3096.	11.22
282.	16.89	3097.	11.22
283.	16.89	3098.	11.22
284.	16.89	3099.	11.22
285.	16.89	3100.	11.21
286.	16.89	3101.	11.21
287.	16.89	3102.	11.21
288.	16.89	3103.	11.21
289.	16.88	3104.	11.21
290.	16.88	3105.	11.21
291.	16.88	3106.	11.2
292.	16.88	3107.	11.2
293.	16.88	3108.	11.2
294.	16.88	3109.	11.2
295.	16.88	3110.	11.2

Time (min)	Displacement (m)	Time (min)	Displacement (m)
296.	16.87	3111.	11.2
297.	16.87	3112.	11.2
298.	16.87	3113.	11.19
299.	16.87	3114.	11.19
300.	16.87	3115.	11.19
301.	16.87	3116.	11.19
302.	16.87	3117.	11.19
303.	16.87	3118.	11.18
304.	16.87	3119.	11.18
305.	16.86	3120.	11.18
306.	16.86	3121.	11.18
307.	16.86	3122.	11.18
308.	16.86	3123.	11.18
309.	16.86	3124.	11.18
310.	16.86	3125.	11.17
311.	16.86	3126.	11.17
312.	16.86	3127.	11.17
313.	16.85	3128.	11.17
314.	16.85	3129.	11.17
315.	16.85	3130.	11.17
316.	16.85	3131.	11.16
317.	16.85	3132.	11.16
318.	16.85	3133.	11.16
319.	16.85	3134.	11.16
320.	16.85	3135.	11.16
321.	16.85	3136.	11.16
322.	16.84	3137.	11.16
323.	16.84	3138.	11.15
324.	16.84	3139.	11.15
325.	16.84	3140.	11.15
326.	16.84	3141.	11.15
327.	16.84	3142.	11.15
328.	16.84	3143.	11.15
329.	16.83	3144.	11.15
330.	16.83	3145.	11.14
331.	16.83	3146.	11.14
332.	16.83	3147.	11.14
333.	16.83	3148.	11.14
334.	16.83	3149.	11.14
335.	16.83	3150.	11.13
336.	16.83	3151.	11.13
337.	16.83	3152.	11.13
338.	16.82	3153.	11.13
339.	16.82	3154.	11.13
340.	16.82	3155.	11.13
341.	16.82	3156.	11.13
342.	16.82	3157.	11.12
343.	16.82	3158.	11.12
344.	16.82	3159.	11.12
345.	16.82	3160.	11.12
346.	16.82	3161.	11.12
347.	16.81	3162.	11.12
348.	16.81	3163.	11.12
349.	16.81	3164.	11.12
350.	16.81	3165.	11.12
351.	16.81	3166.	11.11
352.	16.81	3167.	11.11
353.	16.81	3168.	11.11
354.	16.81	3169.	11.11
355.	16.8	3170.	11.11
356.	16.8	3171.	11.11
357.	16.8	3172.	11.1
358.	16.8	3173.	11.1
359.	16.8	3174.	11.1
360.	16.8	3175.	11.1
361.	16.8	3176.	11.1
362.	16.8	3177.	11.09

Time (min)	Displacement (m)	Time (min)	Displacement (m)
363.	16.8	3178.	11.09
364.	16.79	3179.	11.09
365.	16.79	3180.	11.09
366.	16.79	3181.	11.09
367.	16.79	3182.	11.09
368.	16.79	3183.	11.08
369.	16.79	3184.	11.08
370.	16.79	3185.	11.08
371.	16.79	3186.	11.08
372.	16.78	3187.	11.08
373.	16.78	3188.	11.08
374.	16.78	3189.	11.07
375.	16.78	3190.	11.07
376.	16.78	3191.	11.07
377.	16.78	3192.	11.07
378.	16.78	3193.	11.07
379.	16.78	3194.	11.07
380.	16.78	3195.	11.06
381.	16.77	3196.	11.06
382.	16.77	3197.	11.06
383.	16.77	3198.	11.06
384.	16.77	3199.	11.06
385.	16.77	3200.	11.06
386.	16.77	3201.	11.05
387.	16.77	3202.	11.05
388.	16.77	3203.	11.05
389.	16.77	3204.	11.05
390.	16.76	3205.	11.05
391.	16.76	3206.	11.05
392.	16.76	3207.	11.05
393.	16.76	3208.	11.05
394.	16.76	3209.	11.04
395.	16.76	3210.	11.04
396.	16.76	3211.	11.04
397.	16.76	3212.	11.04
398.	16.76	3213.	11.04
399.	16.75	3214.	11.04
400.	16.75	3215.	11.03
401.	16.75	3216.	11.03
402.	16.75	3217.	11.03
403.	16.75	3218.	11.03
404.	16.75	3219.	11.03
405.	16.75	3220.	11.02
406.	16.75	3221.	11.02
407.	16.74	3222.	11.02
408.	16.74	3223.	11.02
409.	16.74	3224.	11.02
410.	16.74	3225.	11.02
411.	16.74	3226.	11.01
412.	16.74	3227.	11.01
413.	16.74	3228.	11.01
414.	16.74	3229.	11.01
415.	16.73	3230.	11.01
416.	16.73	3231.	11.01
417.	16.73	3232.	11.
418.	16.73	3233.	11.
419.	16.73	3234.	11.
420.	16.73	3235.	11.
421.	16.73	3236.	11.
422.	16.73	3237.	11.
423.	16.72	3238.	10.99
424.	16.72	3239.	10.99
425.	16.72	3240.	10.99
426.	16.72	3241.	10.99
427.	16.72	3242.	10.99
428.	16.72	3243.	10.99
429.	16.72	3244.	10.99

Time (min)	Displacement (m)	Time (min)	Displacement (m)
430.	16.72	3245.	10.98
431.	16.72	3246.	10.98
432.	16.72	3247.	10.98
433.	16.71	3248.	10.98
434.	16.71	3249.	10.98
435.	16.71	3250.	10.98
436.	16.71	3251.	10.97
437.	16.71	3252.	10.97
438.	16.71	3253.	10.97
439.	16.71	3254.	10.97
440.	16.71	3255.	10.97
441.	16.7	3256.	10.97
442.	16.7	3257.	10.97
443.	16.7	3258.	10.96
444.	16.7	3259.	10.96
445.	16.7	3260.	10.96
446.	16.7	3261.	10.96
447.	16.7	3262.	10.96
448.	16.7	3263.	10.96
449.	16.7	3264.	10.95
450.	16.69	3265.	10.95
451.	16.69	3266.	10.95
452.	16.69	3267.	10.95
453.	16.69	3268.	10.95
454.	16.69	3269.	10.94
455.	16.69	3270.	10.94
456.	16.69	3271.	10.94
457.	16.69	3272.	10.94
458.	16.69	3273.	10.94
459.	16.68	3274.	10.94
460.	16.68	3275.	10.94
461.	16.68	3276.	10.94
462.	16.68	3277.	10.93
463.	16.68	3278.	10.93
464.	16.68	3279.	10.93
465.	16.68	3280.	10.93
466.	16.68	3281.	10.93
467.	16.68	3282.	10.92
468.	16.67	3283.	10.92
469.	16.67	3284.	10.92
470.	16.67	3285.	10.92
471.	16.67	3286.	10.92
472.	16.67	3287.	10.92
473.	16.67	3288.	10.91
474.	16.67	3289.	10.91
475.	16.67	3290.	10.91
476.	16.66	3291.	10.91
477.	16.66	3292.	10.91
478.	16.66	3293.	10.91
479.	16.66	3294.	10.91
480.	16.66	3295.	10.91
481.	16.66	3296.	10.9
482.	16.66	3297.	10.9
483.	16.66	3298.	10.9
484.	16.66	3299.	10.9
485.	16.65	3300.	10.89
486.	16.65	3301.	10.89
487.	16.65	3302.	10.89
488.	16.65	3303.	10.89
489.	16.65	3304.	10.89
490.	16.65	3305.	10.89
491.	16.65	3306.	10.89
492.	16.65	3307.	10.89
493.	16.65	3308.	10.88
494.	16.64	3309.	10.88
495.	16.64	3310.	10.88
496.	16.64	3311.	10.88

Time (min)	Displacement (m)	Time (min)	Displacement (m)
497.	16.64	3312.	10.88
498.	16.64	3313.	10.87
499.	16.64	3314.	10.87
500.	16.64	3315.	10.87
501.	16.64	3316.	10.87
502.	16.64	3317.	10.87
503.	16.63	3318.	10.87
504.	16.63	3319.	10.86
505.	16.63	3320.	10.86
506.	16.63	3321.	10.86
507.	16.63	3322.	10.86
508.	16.63	3323.	10.86
509.	16.63	3324.	10.86
510.	16.63	3325.	10.85
511.	16.62	3326.	10.85
512.	16.62	3327.	10.85
513.	16.62	3328.	10.85
514.	16.62	3329.	10.85
515.	16.62	3330.	10.85
516.	16.62	3331.	10.84
517.	16.62	3332.	10.84
518.	16.62	3333.	10.84
519.	16.62	3334.	10.84
520.	16.62	3335.	10.84
521.	16.61	3336.	10.83
522.	16.61	3337.	10.83
523.	16.61	3338.	10.83
524.	16.61	3339.	10.83
525.	16.61	3340.	10.83
526.	16.61	3341.	10.83
527.	16.61	3342.	10.83
528.	16.61	3343.	10.83
529.	16.6	3344.	10.82
530.	16.6	3345.	10.82
531.	16.6	3346.	10.82
532.	16.6	3347.	10.82
533.	16.6	3348.	10.82
534.	16.6	3349.	10.81
535.	16.6	3350.	10.81
536.	16.6	3351.	10.81
537.	16.6	3352.	10.81
538.	16.59	3353.	10.81
539.	16.59	3354.	10.81
540.	16.59	3355.	10.81
541.	16.59	3356.	10.8
542.	16.59	3357.	10.8
543.	16.59	3358.	10.8
544.	16.59	3359.	10.8
545.	16.59	3360.	10.8
546.	16.59	3361.	10.8
547.	16.59	3362.	10.79
548.	16.58	3363.	10.8
549.	16.58	3364.	10.79
550.	16.58	3365.	10.79
551.	16.58	3366.	10.79
552.	16.58	3367.	10.79
553.	16.58	3368.	10.78
554.	16.58	3369.	10.78
555.	16.58	3370.	10.78
556.	16.58	3371.	10.78
557.	16.57	3372.	10.78
558.	16.57	3373.	10.78
559.	16.57	3374.	10.78
560.	16.57	3375.	10.78
561.	16.57	3376.	10.77
562.	16.57	3377.	10.77
563.	16.57	3378.	10.77

Time (min)	Displacement (m)	Time (min)	Displacement (m)
564.	16.57	3379.	10.77
565.	16.56	3380.	10.77
566.	16.56	3381.	10.77
567.	16.56	3382.	10.77
568.	16.56	3383.	10.77
569.	16.56	3384.	10.76
570.	16.56	3385.	10.76
571.	16.56	3386.	10.76
572.	16.56	3387.	10.76
573.	16.55	3388.	10.76
574.	16.55	3389.	10.75
575.	16.55	3390.	10.75
576.	16.55	3391.	10.75
577.	16.55	3392.	10.75
578.	16.55	3393.	10.75
579.	16.55	3394.	10.75
580.	16.55	3395.	10.75
581.	16.55	3396.	10.75
582.	16.55	3397.	10.74
583.	16.54	3398.	10.74
584.	16.54	3399.	10.74
585.	16.54	3400.	10.74
586.	16.54	3401.	10.73
587.	16.54	3402.	10.74
588.	16.54	3403.	10.73
589.	16.54	3404.	10.73
590.	16.53	3405.	10.73
591.	16.53	3406.	10.73
592.	16.53	3407.	10.73
593.	16.53	3408.	10.73
594.	16.53	3409.	10.73
595.	16.53	3410.	10.72
596.	16.53	3411.	10.72
597.	16.53	3412.	10.72
598.	16.53	3413.	10.72
599.	16.53	3414.	10.72
600.	16.52	3415.	10.71
601.	16.52	3416.	10.71
602.	16.52	3417.	10.71
603.	16.52	3418.	10.71
604.	16.52	3419.	10.71
605.	16.52	3420.	10.71
606.	16.52	3421.	10.7
607.	16.52	3422.	10.71
608.	16.52	3423.	10.7
609.	16.51	3424.	10.7
610.	16.51	3425.	10.7
611.	16.51	3426.	10.7
612.	16.51	3427.	10.69
613.	16.51	3428.	10.7
614.	16.51	3429.	10.69
615.	16.51	3430.	10.69
616.	16.51	3431.	10.69
617.	16.51	3432.	10.69
618.	16.5	3433.	10.69
619.	16.5	3434.	10.69
620.	16.5	3435.	10.68
621.	16.5	3436.	10.68
622.	16.5	3437.	10.68
623.	16.5	3438.	10.68
624.	16.5	3439.	10.68
625.	16.5	3440.	10.68
626.	16.5	3441.	10.68
627.	16.5	3442.	10.67
628.	16.49	3443.	10.67
629.	16.49	3444.	10.67
630.	16.49	3445.	10.67

Time (min)	Displacement (m)	Time (min)	Displacement (m)
631.	16.49	3446.	10.67
632.	16.49	3447.	10.66
633.	16.49	3448.	10.66
634.	16.49	3449.	10.66
635.	16.48	3450.	10.66
636.	16.48	3451.	10.66
637.	16.48	3452.	10.66
638.	16.48	3453.	10.66
639.	16.48	3454.	10.65
640.	16.48	3455.	10.65
641.	16.48	3456.	10.65
642.	16.48	3457.	10.65
643.	16.48	3458.	10.65
644.	16.47	3459.	10.64
645.	16.47	3460.	10.64
646.	16.47	3461.	10.64
647.	16.47	3462.	10.64
648.	16.47	3463.	10.64
649.	16.47	3464.	10.64
650.	16.47	3465.	10.64
651.	16.47	3466.	10.64
652.	16.46	3467.	10.63
653.	16.47	3468.	10.63
654.	16.46	3469.	10.63
655.	16.46	3470.	10.63
656.	16.46	3471.	10.63
657.	16.46	3472.	10.63
658.	16.46	3473.	10.63
659.	16.46	3474.	10.62
660.	16.46	3475.	10.62
661.	16.46	3476.	10.62
662.	16.46	3477.	10.62
663.	16.45	3478.	10.62
664.	16.45	3479.	10.61
665.	16.45	3480.	10.61
666.	16.45	3481.	10.61
667.	16.45	3482.	10.61
668.	16.45	3483.	10.61
669.	16.45	3484.	10.61
670.	16.45	3485.	10.6
671.	16.45	3486.	10.6
672.	16.44	3487.	10.6
673.	16.44	3488.	10.6
674.	16.44	3489.	10.6
675.	16.44	3490.	10.6
676.	16.44	3491.	10.6
677.	16.44	3492.	10.6
678.	16.44	3493.	10.59
679.	16.44	3494.	10.59
680.	16.43	3495.	10.59
681.	16.43	3496.	10.59
682.	16.43	3497.	10.59
683.	16.43	3498.	10.58
684.	16.43	3499.	10.58
685.	16.43	3500.	10.58
686.	16.43	3501.	10.58
687.	16.43	3502.	10.58
688.	16.43	3503.	10.58
689.	16.42	3504.	10.57
690.	16.42	3505.	10.57
691.	16.42	3506.	10.57
692.	16.42	3507.	10.57
693.	16.42	3508.	10.57
694.	16.42	3509.	10.57
695.	16.42	3510.	10.57
696.	16.42	3511.	10.57
697.	16.41	3512.	10.57

Time (min)	Displacement (m)	Time (min)	Displacement (m)
698.	16.41	3513.	10.56
699.	16.41	3514.	10.56
700.	16.41	3515.	10.56
701.	16.41	3516.	10.56
702.	16.41	3517.	10.56
703.	16.41	3518.	10.56
704.	16.41	3519.	10.55
705.	16.41	3520.	10.55
706.	16.4	3521.	10.55
707.	16.4	3522.	10.55
708.	16.4	3523.	10.55
709.	16.4	3524.	10.55
710.	16.4	3525.	10.55
711.	16.4	3526.	10.54
712.	16.4	3527.	10.54
713.	16.4	3528.	10.54
714.	16.4	3529.	10.54
715.	16.4	3530.	10.54
716.	16.39	3531.	10.54
717.	16.39	3532.	10.54
718.	16.39	3533.	10.54
719.	16.39	3534.	10.53
720.	16.39	3535.	10.53
721.	16.39	3536.	10.53
722.	16.39	3537.	10.53
723.	16.39	3538.	10.53
724.	16.39	3539.	10.53
725.	16.38	3540.	10.53
726.	16.38	3541.	10.52
727.	16.38	3542.	10.52
728.	16.38	3543.	10.52
729.	16.38	3544.	10.52
730.	16.38	3545.	10.52
731.	16.38	3546.	10.52
732.	16.38	3547.	10.52
733.	16.38	3548.	10.51
734.	16.37	3549.	10.51
735.	16.37	3550.	10.51
736.	16.37	3551.	10.51
737.	16.37	3552.	10.51
738.	16.37	3553.	10.51
739.	16.37	3554.	10.5
740.	16.37	3555.	10.5
741.	16.37	3556.	10.5
742.	16.36	3557.	10.5
743.	16.36	3558.	10.5
744.	16.36	3559.	10.49
745.	16.36	3560.	10.49
746.	16.36	3561.	10.49
747.	16.36	3562.	10.49
748.	16.36	3563.	10.49
749.	16.36	3564.	10.49
750.	16.36	3565.	10.49
751.	16.36	3566.	10.49
752.	16.35	3567.	10.48
753.	16.35	3568.	10.48
754.	16.35	3569.	10.48
755.	16.35	3570.	10.48
756.	16.35	3571.	10.48
757.	16.35	3572.	10.48
758.	16.35	3573.	10.48
759.	16.35	3574.	10.47
760.	16.35	3575.	10.47
761.	16.34	3576.	10.47
762.	16.34	3577.	10.47
763.	16.34	3578.	10.47
764.	16.34	3579.	10.47

Time (min)	Displacement (m)	Time (min)	Displacement (m)
765.	16.34	3580.	10.47
766.	16.34	3581.	10.46
767.	16.34	3582.	10.46
768.	16.34	3583.	10.46
769.	16.34	3584.	10.46
770.	16.34	3585.	10.46
771.	16.33	3586.	10.46
772.	16.34	3587.	10.45
773.	16.33	3588.	10.45
774.	16.33	3589.	10.45
775.	16.33	3590.	10.45
776.	16.33	3591.	10.45
777.	16.33	3592.	10.45
778.	16.33	3593.	10.45
779.	16.33	3594.	10.44
780.	16.32	3595.	10.44
781.	16.32	3596.	10.44
782.	16.32	3597.	10.44
783.	16.32	3598.	10.44
784.	16.32	3599.	10.44
785.	16.32	3600.	10.43
786.	16.32	3601.	10.43
787.	16.32	3602.	10.43
788.	16.32	3603.	10.43
789.	16.32	3604.	10.43
790.	16.31	3605.	10.43
791.	16.31	3606.	10.43
792.	16.31	3607.	10.43
793.	16.31	3608.	10.42
794.	16.31	3609.	10.42
795.	16.31	3610.	10.42
796.	16.31	3611.	10.42
797.	16.3	3612.	10.42
798.	16.3	3613.	10.42
799.	16.3	3614.	10.42
800.	16.3	3615.	10.41
801.	16.3	3616.	10.41
802.	16.3	3617.	10.41
803.	16.3	3618.	10.41
804.	16.3	3619.	10.41
805.	16.3	3620.	10.41
806.	16.29	3621.	10.41
807.	16.29	3622.	10.4
808.	16.29	3623.	10.4
809.	16.29	3624.	10.4
810.	16.29	3625.	10.4
811.	16.29	3626.	10.4
812.	16.29	3627.	10.4
813.	16.29	3628.	10.39
814.	16.29	3629.	10.39
815.	16.29	3630.	10.39
816.	16.28	3631.	10.39
817.	16.28	3632.	10.39
818.	16.28	3633.	10.39
819.	16.28	3634.	10.39
820.	16.28	3635.	10.39
821.	16.28	3636.	10.39
822.	16.28	3637.	10.38
823.	16.28	3638.	10.38
824.	16.28	3639.	10.38
825.	16.27	3640.	10.38
826.	16.27	3641.	10.38
827.	16.27	3642.	10.37
828.	16.27	3643.	10.37
829.	16.27	3644.	10.37
830.	16.27	3645.	10.37
831.	16.27	3646.	10.37

Time (min)	Displacement (m)	Time (min)	Displacement (m)
832.	16.26	3647.	10.37
833.	16.26	3648.	10.37
834.	16.26	3649.	10.36
835.	16.26	3650.	10.36
836.	16.26	3651.	10.36
837.	16.26	3652.	10.36
838.	16.26	3653.	10.36
839.	16.26	3654.	10.36
840.	16.25	3655.	10.36
841.	16.24	3656.	10.36
842.	16.23	3657.	10.36
843.	16.23	3658.	10.36
844.	16.23	3659.	10.35
845.	16.22	3660.	10.35
846.	16.22	3661.	10.35
847.	16.21	3662.	10.35
848.	16.21	3663.	10.35
849.	16.21	3664.	10.35
850.	16.21	3665.	10.34
851.	16.2	3666.	10.34
852.	16.2	3667.	10.34
853.	16.2	3668.	10.34
854.	16.2	3669.	10.34
855.	16.19	3670.	10.33
856.	16.19	3671.	10.33
857.	16.18	3672.	10.33
858.	16.18	3673.	10.33
859.	16.18	3674.	10.33
860.	16.17	3675.	10.33
861.	16.17	3676.	10.32
862.	16.17	3677.	10.32
863.	16.17	3678.	10.32
864.	16.16	3679.	10.32
865.	16.16	3680.	10.32
866.	16.16	3681.	10.32
867.	16.15	3682.	10.32
868.	16.15	3683.	10.31
869.	16.15	3684.	10.31
870.	16.14	3685.	10.31
871.	16.14	3686.	10.31
872.	16.14	3687.	10.31
873.	16.13	3688.	10.31
874.	16.13	3689.	10.31
875.	16.13	3690.	10.31
876.	16.13	3691.	10.3
877.	16.12	3692.	10.3
878.	16.12	3693.	10.3
879.	16.11	3694.	10.3
880.	16.11	3695.	10.3
881.	16.11	3696.	10.3
882.	16.11	3697.	10.29
883.	16.1	3698.	10.29
884.	16.1	3699.	10.29
885.	16.1	3700.	10.29
886.	16.09	3701.	10.29
887.	16.09	3702.	10.29
888.	16.09	3703.	10.28
889.	16.09	3704.	10.28
890.	16.08	3705.	10.28
891.	16.08	3706.	10.28
892.	16.08	3707.	10.28
893.	16.08	3708.	10.28
894.	16.07	3709.	10.28
895.	16.07	3710.	10.27
896.	16.07	3711.	10.27
897.	16.06	3712.	10.27
898.	16.06	3713.	10.27

Time (min)	Displacement (m)	Time (min)	Displacement (m)
899.	16.06	3714.	10.27
900.	16.05	3715.	10.27
901.	16.05	3716.	10.27
902.	16.05	3717.	10.27
903.	16.04	3718.	10.26
904.	16.04	3719.	10.26
905.	16.04	3720.	10.26
906.	16.03	3721.	10.26
907.	16.03	3722.	10.26
908.	16.03	3723.	10.26
909.	16.02	3724.	10.25
910.	16.02	3725.	10.25
911.	16.02	3726.	10.25
912.	16.02	3727.	10.25
913.	16.01	3728.	10.25
914.	16.01	3729.	10.25
915.	16.01	3730.	10.24
916.	16.01	3731.	10.24
917.	16.	3732.	10.24
918.	16.	3733.	10.24
919.	16.	3734.	10.24
920.	15.99	3735.	10.24
921.	15.99	3736.	10.23
922.	15.99	3737.	10.23
923.	15.98	3738.	10.23
924.	15.98	3739.	10.23
925.	15.98	3740.	10.23
926.	15.98	3741.	10.23
927.	15.97	3742.	10.23
928.	15.97	3743.	10.23
929.	15.97	3744.	10.23
930.	15.96	3745.	10.22
931.	15.96	3746.	10.22
932.	15.96	3747.	10.22
933.	15.95	3748.	10.22
934.	15.95	3749.	10.22
935.	15.95	3750.	10.22
936.	15.95	3751.	10.22
937.	15.94	3752.	10.21
938.	15.94	3753.	10.21
939.	15.94	3754.	10.21
940.	15.93	3755.	10.21
941.	15.93	3756.	10.21
942.	15.93	3757.	10.21
943.	15.92	3758.	10.21
944.	15.92	3759.	10.21
945.	15.92	3760.	10.2
946.	15.91	3761.	10.2
947.	15.91	3762.	10.2
948.	15.91	3763.	10.2
949.	15.91	3764.	10.2
950.	15.9	3765.	10.2
951.	15.9	3766.	10.2
952.	15.9	3767.	10.2
953.	15.89	3768.	10.19
954.	15.89	3769.	10.19
955.	15.89	3770.	10.19
956.	15.89	3771.	10.19
957.	15.88	3772.	10.19
958.	15.88	3773.	10.19
959.	15.88	3774.	10.19
960.	15.87	3775.	10.18
961.	15.87	3776.	10.18
962.	15.87	3777.	10.18
963.	15.87	3778.	10.18
964.	15.86	3779.	10.18
965.	15.86	3780.	10.18

Time (min)	Displacement (m)	Time (min)	Displacement (m)
966.	15.86	3781.	10.18
967.	15.86	3782.	10.17
968.	15.85	3783.	10.17
969.	15.85	3784.	10.17
970.	15.85	3785.	10.17
971.	15.84	3786.	10.17
972.	15.84	3787.	10.16
973.	15.84	3788.	10.16
974.	15.83	3789.	10.16
975.	15.83	3790.	10.16
976.	15.83	3791.	10.16
977.	15.83	3792.	10.16
978.	15.82	3793.	10.16
979.	15.82	3794.	10.16
980.	15.82	3795.	10.16
981.	15.81	3796.	10.15
982.	15.81	3797.	10.15
983.	15.81	3798.	10.15
984.	15.81	3799.	10.15
985.	15.8	3800.	10.15
986.	15.8	3801.	10.15
987.	15.8	3802.	10.14
988.	15.79	3803.	10.15
989.	15.79	3804.	10.14
990.	15.79	3805.	10.14
991.	15.78	3806.	10.14
992.	15.78	3807.	10.14
993.	15.78	3808.	10.14
994.	15.78	3809.	10.14
995.	15.77	3810.	10.14
996.	15.77	3811.	10.13
997.	15.77	3812.	10.13
998.	15.77	3813.	10.13
999.	15.76	3814.	10.13
1000.	15.76	3815.	10.13
1001.	15.75	3816.	10.13
1002.	15.75	3817.	10.13
1003.	15.75	3818.	10.12
1004.	15.75	3819.	10.12
1005.	15.74	3820.	10.12
1006.	15.74	3821.	10.12
1007.	15.74	3822.	10.12
1008.	15.73	3823.	10.12
1009.	15.73	3824.	10.12
1010.	15.73	3825.	10.11
1011.	15.73	3826.	10.11
1012.	15.72	3827.	10.11
1013.	15.72	3828.	10.11
1014.	15.72	3829.	10.11
1015.	15.71	3830.	10.11
1016.	15.71	3831.	10.11
1017.	15.71	3832.	10.11
1018.	15.71	3833.	10.1
1019.	15.7	3834.	10.1
1020.	15.7	3835.	10.1
1021.	15.7	3836.	10.1
1022.	15.69	3837.	10.1
1023.	15.69	3838.	10.1
1024.	15.69	3839.	10.1
1025.	15.68	3840.	10.1
1026.	15.68	3841.	10.1
1027.	15.68	3842.	10.09
1028.	15.68	3843.	10.09
1029.	15.67	3844.	10.09
1030.	15.67	3845.	10.09
1031.	15.67	3846.	10.09
1032.	15.67	3847.	10.09

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1033.	15.66	3848.	10.09
1034.	15.66	3849.	10.09
1035.	15.66	3850.	10.08
1036.	15.65	3851.	10.08
1037.	15.65	3852.	10.08
1038.	15.65	3853.	10.08
1039.	15.65	3854.	10.08
1040.	15.64	3855.	10.07
1041.	15.64	3856.	10.07
1042.	15.64	3857.	10.07
1043.	15.63	3858.	10.07
1044.	15.63	3859.	10.07
1045.	15.63	3860.	10.07
1046.	15.62	3861.	10.07
1047.	15.62	3862.	10.06
1048.	15.62	3863.	10.06
1049.	15.62	3864.	10.06
1050.	15.61	3865.	10.06
1051.	15.61	3866.	10.06
1052.	15.61	3867.	10.06
1053.	15.61	3868.	10.06
1054.	15.6	3869.	10.05
1055.	15.6	3870.	10.05
1056.	15.6	3871.	10.05
1057.	15.6	3872.	10.05
1058.	15.59	3873.	10.05
1059.	15.59	3874.	10.05
1060.	15.59	3875.	10.05
1061.	15.58	3876.	10.05
1062.	15.58	3877.	10.04
1063.	15.58	3878.	10.04
1064.	15.57	3879.	10.04
1065.	15.57	3880.	10.04
1066.	15.57	3881.	10.04
1067.	15.57	3882.	10.04
1068.	15.56	3883.	10.04
1069.	15.56	3884.	10.04
1070.	15.56	3885.	10.03
1071.	15.55	3886.	10.03
1072.	15.55	3887.	10.03
1073.	15.55	3888.	10.03
1074.	15.55	3889.	10.03
1075.	15.54	3890.	10.03
1076.	15.54	3891.	10.02
1077.	15.54	3892.	10.02
1078.	15.53	3893.	10.02
1079.	15.53	3894.	10.02
1080.	15.53	3895.	10.02
1081.	15.52	3896.	10.02
1082.	15.52	3897.	10.01
1083.	15.52	3898.	10.01
1084.	15.52	3899.	10.01
1085.	15.51	3900.	10.01
1086.	15.51	3901.	10.01
1087.	15.51	3902.	10.01
1088.	15.5	3903.	10.01
1089.	15.5	3904.	10.01
1090.	15.5	3905.	10.01
1091.	15.5	3906.	10.01
1092.	15.49	3907.	10.
1093.	15.49	3908.	10.
1094.	15.49	3909.	10.
1095.	15.48	3910.	10.
1096.	15.48	3911.	10.
1097.	15.48	3912.	9.998
1098.	15.48	3913.	9.997
1099.	15.47	3914.	9.995

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1100.	15.47	3915.	9.992
1101.	15.47	3916.	9.991
1102.	15.47	3917.	9.988
1103.	15.46	3918.	9.988
1104.	15.46	3919.	9.987
1105.	15.46	3920.	9.986
1106.	15.45	3921.	9.985
1107.	15.45	3922.	9.987
1108.	15.45	3923.	9.984
1109.	15.45	3924.	9.983
1110.	15.44	3925.	9.981
1111.	15.44	3926.	9.979
1112.	15.44	3927.	9.978
1113.	15.43	3928.	9.977
1114.	15.43	3929.	9.975
1115.	15.43	3930.	9.973
1116.	15.43	3931.	9.972
1117.	15.43	3932.	9.971
1118.	15.42	3933.	9.969
1119.	15.42	3934.	9.966
1120.	15.42	3935.	9.965
1121.	15.41	3936.	9.965
1122.	15.41	3937.	9.964
1123.	15.41	3938.	9.962
1124.	15.4	3939.	9.96
1125.	15.4	3940.	9.959
1126.	15.4	3941.	9.959
1127.	15.4	3942.	9.956
1128.	15.39	3943.	9.956
1129.	15.39	3944.	9.954
1130.	15.39	3945.	9.951
1131.	15.39	3946.	9.949
1132.	15.38	3947.	9.949
1133.	15.38	3948.	9.948
1134.	15.38	3949.	9.945
1135.	15.37	3950.	9.946
1136.	15.37	3951.	9.944
1137.	15.37	3952.	9.943
1138.	15.37	3953.	9.942
1139.	15.36	3954.	9.942
1140.	15.36	3955.	9.94
1141.	15.36	3956.	9.938
1142.	15.35	3957.	9.939
1143.	15.35	3958.	9.935
1144.	15.35	3959.	9.934
1145.	15.35	3960.	9.932
1146.	15.35	3961.	9.931
1147.	15.34	3962.	9.932
1148.	15.34	3963.	9.931
1149.	15.34	3964.	9.93
1150.	15.33	3965.	9.927
1151.	15.33	3966.	9.928
1152.	15.33	3967.	9.928
1153.	15.33	3968.	9.925
1154.	15.32	3969.	9.923
1155.	15.32	3970.	9.921
1156.	15.32	3971.	9.92
1157.	15.31	3972.	9.918
1158.	15.31	3973.	9.919
1159.	15.31	3974.	9.916
1160.	15.31	3975.	9.913
1161.	15.3	3976.	9.912
1162.	15.3	3977.	9.91
1163.	15.3	3978.	9.91
1164.	15.29	3979.	9.909
1165.	15.29	3980.	9.907
1166.	15.29	3981.	9.906

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1167.	15.29	3982.	9.903
1168.	15.28	3983.	9.902
1169.	15.28	3984.	9.899
1170.	15.28	3985.	9.898
1171.	15.27	3986.	9.898
1172.	15.27	3987.	9.897
1173.	15.27	3988.	9.895
1174.	15.27	3989.	9.892
1175.	15.26	3990.	9.892
1176.	15.26	3991.	9.89
1177.	15.26	3992.	9.89
1178.	15.25	3993.	9.888
1179.	15.25	3994.	9.886
1180.	15.25	3995.	9.885
1181.	15.25	3996.	9.885
1182.	15.24	3997.	9.883
1183.	15.24	3998.	9.883
1184.	15.24	3999.	9.88
1185.	15.24	4000.	9.88
1186.	15.23	4001.	9.878
1187.	15.23	4002.	9.876
1188.	15.23	4003.	9.874
1189.	15.23	4004.	9.874
1190.	15.22	4005.	9.873
1191.	15.22	4006.	9.872
1192.	15.22	4007.	9.869
1193.	15.21	4008.	9.868
1194.	15.21	4009.	9.867
1195.	15.21	4010.	9.867
1196.	15.21	4011.	9.866
1197.	15.2	4012.	9.865
1198.	15.2	4013.	9.863
1199.	15.2	4014.	9.862
1200.	15.19	4015.	9.86
1201.	15.19	4016.	9.857
1202.	15.19	4017.	9.856
1203.	15.19	4018.	9.855
1204.	15.18	4019.	9.855
1205.	15.18	4020.	9.854
1206.	15.18	4021.	9.852
1207.	15.18	4022.	9.85
1208.	15.17	4023.	9.847
1209.	15.17	4024.	9.848
1210.	15.17	4025.	9.846
1211.	15.17	4026.	9.844
1212.	15.16	4027.	9.844
1213.	15.16	4028.	9.841
1214.	15.16	4029.	9.841
1215.	15.15	4030.	9.841
1216.	15.15	4031.	9.84
1217.	15.15	4032.	9.836
1218.	15.15	4033.	9.836
1219.	15.14	4034.	9.833
1220.	15.14	4035.	9.832
1221.	15.14	4036.	9.831
1222.	15.14	4037.	9.83
1223.	15.13	4038.	9.83
1224.	15.13	4039.	9.829
1225.	15.13	4040.	9.829
1226.	15.13	4041.	9.828
1227.	15.12	4042.	9.825
1228.	15.12	4043.	9.824
1229.	15.12	4044.	9.824
1230.	15.11	4045.	9.821
1231.	15.11	4046.	9.819
1232.	15.11	4047.	9.819
1233.	15.11	4048.	9.82

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1234.	15.1	4049.	9.818
1235.	15.1	4050.	9.816
1236.	15.1	4051.	9.813
1237.	15.09	4052.	9.814
1238.	15.09	4053.	9.811
1239.	15.09	4054.	9.809
1240.	15.09	4055.	9.807
1241.	15.08	4056.	9.806
1242.	15.08	4057.	9.804
1243.	15.08	4058.	9.805
1244.	15.08	4059.	9.805
1245.	15.08	4060.	9.802
1246.	15.07	4061.	9.802
1247.	15.07	4062.	9.799
1248.	15.07	4063.	9.797
1249.	15.07	4064.	9.796
1250.	15.06	4065.	9.796
1251.	15.06	4066.	9.794
1252.	15.06	4067.	9.793
1253.	15.05	4068.	9.791
1254.	15.05	4069.	9.788
1255.	15.05	4070.	9.788
1256.	15.05	4071.	9.788
1257.	15.04	4072.	9.785
1258.	15.04	4073.	9.784
1259.	15.04	4074.	9.782
1260.	15.03	4075.	9.78
1261.	15.03	4076.	9.779
1262.	15.03	4077.	9.777
1263.	15.03	4078.	9.779
1264.	15.02	4079.	9.775
1265.	15.02	4080.	9.774
1266.	15.02	4081.	9.774
1267.	15.01	4082.	9.772
1268.	15.01	4083.	9.77
1269.	15.01	4084.	9.77
1270.	15.01	4085.	9.769
1271.	15.01	4086.	9.768
1272.	15.	4087.	9.767
1273.	15.	4088.	9.764
1274.	15.	4089.	9.763
1275.	15.	4090.	9.762
1276.	14.99	4091.	9.759
1277.	14.99	4092.	9.759
1278.	14.99	4093.	9.756
1279.	14.99	4094.	9.755
1280.	14.98	4095.	9.753
1281.	14.98	4096.	9.753
1282.	14.98	4097.	9.753
1283.	14.97	4098.	9.751
1284.	14.97	4099.	9.748
1285.	14.97	4100.	9.747
1286.	14.97	4101.	9.747
1287.	14.97	4102.	9.748
1288.	14.96	4103.	9.747
1289.	14.96	4104.	9.746
1290.	14.96	4105.	9.744
1291.	14.96	4106.	9.743
1292.	14.95	4107.	9.742
1293.	14.95	4108.	9.739
1294.	14.95	4109.	9.737
1295.	14.94	4110.	9.736
1296.	14.94	4111.	9.736
1297.	14.94	4112.	9.734
1298.	14.94	4113.	9.733
1299.	14.93	4114.	9.733
1300.	14.93	4115.	9.731

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1301.	14.93	4116.	9.729
1302.	14.93	4117.	9.728
1303.	14.92	4118.	9.728
1304.	14.92	4119.	9.727
1305.	14.92	4120.	9.725
1306.	14.91	4121.	9.724
1307.	14.91	4122.	9.723
1308.	14.91	4123.	9.722
1309.	14.91	4124.	9.72
1310.	14.9	4125.	9.719
1311.	14.9	4126.	9.717
1312.	14.9	4127.	9.715
1313.	14.9	4128.	9.714
1314.	14.89	4129.	9.714
1315.	14.89	4130.	9.71
1316.	14.89	4131.	9.71
1317.	14.89	4132.	9.709
1318.	14.88	4133.	9.708
1319.	14.88	4134.	9.706
1320.	14.88	4135.	9.706
1321.	14.88	4136.	9.705
1322.	14.87	4137.	9.705
1323.	14.87	4138.	9.702
1324.	14.87	4139.	9.702
1325.	14.87	4140.	9.7
1326.	14.86	4141.	9.697
1327.	14.86	4142.	9.698
1328.	14.86	4143.	9.695
1329.	14.86	4144.	9.695
1330.	14.85	4145.	9.692
1331.	14.85	4146.	9.69
1332.	14.85	4147.	9.688
1333.	14.84	4148.	9.688
1334.	14.84	4149.	9.688
1335.	14.84	4150.	9.687
1336.	14.84	4151.	9.684
1337.	14.83	4152.	9.684
1338.	14.83	4153.	9.682
1339.	14.83	4154.	9.68
1340.	14.83	4155.	9.68
1341.	14.82	4156.	9.679
1342.	14.82	4157.	9.676
1343.	14.82	4158.	9.675
1344.	14.82	4159.	9.673
1345.	14.81	4160.	9.674
1346.	14.81	4161.	9.671
1347.	14.81	4162.	9.67
1348.	14.81	4163.	9.67
1349.	14.8	4164.	9.667
1350.	14.8	4165.	9.667
1351.	14.8	4166.	9.667
1352.	14.8	4167.	9.665
1353.	14.79	4168.	9.664
1354.	14.79	4169.	9.663
1355.	14.79	4170.	9.662
1356.	14.79	4171.	9.66
1357.	14.78	4172.	9.658
1358.	14.78	4173.	9.655
1359.	14.78	4174.	9.657
1360.	14.78	4175.	9.655
1361.	14.77	4176.	9.653
1362.	14.77	4177.	9.651
1363.	14.77	4178.	9.652
1364.	14.77	4179.	9.652
1365.	14.77	4180.	9.649
1366.	14.76	4181.	9.647
1367.	14.76	4182.	9.647

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1368.	14.76	4183.	9.646
1369.	14.75	4184.	9.643
1370.	14.75	4185.	9.644
1371.	14.75	4186.	9.643
1372.	14.75	4187.	9.642
1373.	14.75	4188.	9.641
1374.	14.74	4189.	9.639
1375.	14.74	4190.	9.637
1376.	14.74	4191.	9.635
1377.	14.73	4192.	9.634
1378.	14.73	4193.	9.633
1379.	14.73	4194.	9.633
1380.	14.73	4195.	9.631
1381.	14.73	4196.	9.631
1382.	14.72	4197.	9.629
1383.	14.72	4198.	9.627
1384.	14.72	4199.	9.624
1385.	14.71	4200.	9.622
1386.	14.71	4201.	9.622
1387.	14.71	4202.	9.621
1388.	14.71	4203.	9.619
1389.	14.7	4204.	9.617
1390.	14.7	4205.	9.618
1391.	14.7	4206.	9.617
1392.	14.7	4207.	9.615
1393.	14.69	4208.	9.615
1394.	14.69	4209.	9.613
1395.	14.69	4210.	9.613
1396.	14.69	4211.	9.611
1397.	14.68	4212.	9.61
1398.	14.68	4213.	9.608
1399.	14.68	4214.	9.608
1400.	14.68	4215.	9.606
1401.	14.67	4216.	9.605
1402.	14.67	4217.	9.603
1403.	14.67	4218.	9.601
1404.	14.67	4219.	9.6
1405.	14.67	4220.	9.598
1406.	14.66	4221.	9.597
1407.	14.66	4222.	9.595
1408.	14.66	4223.	9.593
1409.	14.65	4224.	9.593
1410.	14.65	4225.	9.593
1411.	14.65	4226.	9.59
1412.	14.65	4227.	9.588
1413.	14.65	4228.	9.589
1414.	14.64	4229.	9.588
1415.	14.64	4230.	9.587
1416.	14.64	4231.	9.586
1417.	14.63	4232.	9.585
1418.	14.63	4233.	9.585
1419.	14.63	4234.	9.583
1420.	14.63	4235.	9.58
1421.	14.63	4236.	9.578
1422.	14.62	4237.	9.576
1423.	14.62	4238.	9.577
1424.	14.62	4239.	9.575
1425.	14.61	4240.	9.575
1426.	14.61	4241.	9.573
1427.	14.61	4242.	9.573
1428.	14.61	4243.	9.571
1429.	14.6	4244.	9.571
1430.	14.6	4245.	9.568
1431.	14.6	4246.	9.566
1432.	14.6	4247.	9.566
1433.	14.6	4248.	9.567
1434.	14.59	4249.	9.567

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1435.	14.59	4250.	9.565
1436.	14.59	4251.	9.565
1437.	14.58	4252.	9.563
1438.	14.58	4253.	9.559
1439.	14.58	4254.	9.56
1440.	14.58	4255.	9.559
1441.	14.58	4256.	9.557
1442.	14.57	4257.	9.556
1443.	14.57	4258.	9.555
1444.	14.57	4259.	9.553
1445.	14.56	4260.	9.55
1446.	14.56	4261.	9.55
1447.	14.56	4262.	9.549
1448.	14.56	4263.	9.546
1449.	14.56	4264.	9.545
1450.	14.55	4265.	9.544
1451.	14.55	4266.	9.542
1452.	14.55	4267.	9.541
1453.	14.55	4268.	9.54
1454.	14.54	4269.	9.541
1455.	14.54	4270.	9.539
1456.	14.54	4271.	9.537
1457.	14.54	4272.	9.536
1458.	14.53	4273.	9.533
1459.	14.53	4274.	9.533
1460.	14.53	4275.	9.533
1461.	14.53	4276.	9.534
1462.	14.52	4277.	9.532
1463.	14.52	4278.	9.531
1464.	14.52	4279.	9.529
1465.	14.51	4280.	9.529
1466.	14.51	4281.	9.526
1467.	14.51	4282.	9.524
1468.	14.51	4283.	9.525
1469.	14.51	4284.	9.524
1470.	14.51	4285.	9.521
1471.	14.5	4286.	9.522
1472.	14.5	4287.	9.521
1473.	14.5	4288.	9.521
1474.	14.49	4289.	9.519
1475.	14.49	4290.	9.518
1476.	14.49	4291.	9.517
1477.	14.49	4292.	9.515
1478.	14.49	4293.	9.516
1479.	14.48	4294.	9.514
1480.	14.48	4295.	9.513
1481.	14.48	4296.	9.511
1482.	14.47	4297.	9.508
1483.	14.47	4298.	9.508
1484.	14.47	4299.	9.506
1485.	14.47	4300.	9.507
1486.	14.47	4301.	9.504
1487.	14.46	4302.	9.504
1488.	14.46	4303.	9.502
1489.	14.46	4304.	9.5
1490.	14.46	4305.	9.501
1491.	14.45	4306.	9.501
1492.	14.45	4307.	9.5
1493.	14.45	4308.	9.498
1494.	14.45	4309.	9.497
1495.	14.44	4310.	9.493
1496.	14.44	4311.	9.493
1497.	14.44	4312.	9.492
1498.	14.44	4313.	9.491
1499.	14.44	4314.	9.49
1500.	14.43	4315.	9.489
1501.	14.43	4316.	9.486

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1502.	14.43	4317.	9.486
1503.	14.43	4318.	9.484
1504.	14.42	4319.	9.482
1505.	14.42	4320.	9.482
1506.	14.42	4321.	9.483
1507.	14.42	4322.	9.482
1508.	14.41	4323.	9.481
1509.	14.41	4324.	9.48
1510.	14.41	4325.	9.476
1511.	14.4	4326.	9.476
1512.	14.4	4327.	9.476
1513.	14.4	4328.	9.473
1514.	14.4	4329.	9.473
1515.	14.4	4330.	9.471
1516.	14.39	4331.	9.472
1517.	14.39	4332.	9.472
1518.	14.39	4333.	9.469
1519.	14.39	4334.	9.468
1520.	14.38	4335.	9.467
1521.	14.38	4336.	9.467
1522.	14.38	4337.	9.464
1523.	14.38	4338.	9.464
1524.	14.37	4339.	9.463
1525.	14.37	4340.	9.46
1526.	14.37	4341.	9.459
1527.	14.37	4342.	9.458
1528.	14.36	4343.	9.457
1529.	14.36	4344.	9.454
1530.	14.36	4345.	9.454
1531.	14.36	4346.	9.452
1532.	14.35	4347.	9.452
1533.	14.35	4348.	9.451
1534.	14.35	4349.	9.45
1535.	14.34	4350.	9.446
1536.	14.34	4351.	9.445
1537.	14.34	4352.	9.445
1538.	14.34	4353.	9.443
1539.	14.34	4354.	9.442
1540.	14.34	4355.	9.441
1541.	14.33	4356.	9.442
1542.	14.33	4357.	9.442
1543.	14.33	4358.	9.441
1544.	14.32	4359.	9.438
1545.	14.32	4360.	9.437
1546.	14.32	4361.	9.432
1547.	14.31	4362.	9.435
1548.	14.31	4363.	9.434
1549.	14.31	4364.	9.431
1550.	14.31	4365.	9.429
1551.	14.31	4366.	9.43
1552.	14.31	4367.	9.431
1553.	14.3	4368.	9.429
1554.	14.3	4369.	9.428
1555.	14.3	4370.	9.426
1556.	14.29	4371.	9.426
1557.	14.29	4372.	9.424
1558.	14.29	4373.	9.422
1559.	14.29	4374.	9.421
1560.	14.28	4375.	9.421
1561.	14.28	4376.	9.419
1562.	14.28	4377.	9.419
1563.	14.28	4378.	9.417
1564.	14.27	4379.	9.419
1565.	14.27	4380.	9.416
1566.	14.27	4381.	9.415
1567.	14.27	4382.	9.415
1568.	14.27	4383.	9.414

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1569.	14.26	4384.	9.413
1570.	14.26	4385.	9.412
1571.	14.26	4386.	9.412
1572.	14.26	4387.	9.411
1573.	14.25	4388.	9.409
1574.	14.25	4389.	9.408
1575.	14.25	4390.	9.405
1576.	14.25	4391.	9.407
1577.	14.24	4392.	9.404
1578.	14.24	4393.	9.402
1579.	14.24	4394.	9.401
1580.	14.24	4395.	9.401
1581.	14.23	4396.	9.399
1582.	14.23	4397.	9.398
1583.	14.23	4398.	9.396
1584.	14.23	4399.	9.396
1585.	14.22	4400.	9.394
1586.	14.22	4401.	9.394
1587.	14.22	4402.	9.394
1588.	14.22	4403.	9.391
1589.	14.22	4404.	9.39
1590.	14.21	4405.	9.39
1591.	14.21	4406.	9.388
1592.	14.21	4407.	9.388
1593.	14.21	4408.	9.386
1594.	14.2	4409.	9.385
1595.	14.2	4410.	9.383
1596.	14.2	4411.	9.381
1597.	14.19	4412.	9.38
1598.	14.19	4413.	9.378
1599.	14.19	4414.	9.376
1600.	14.19	4415.	9.376
1601.	14.19	4416.	9.373
1602.	14.18	4417.	9.372
1603.	14.18	4418.	9.373
1604.	14.18	4419.	9.373
1605.	14.17	4420.	9.372
1606.	14.17	4421.	9.37
1607.	14.17	4422.	9.369
1608.	14.17	4423.	9.369
1609.	14.17	4424.	9.366
1610.	14.16	4425.	9.365
1611.	14.16	4426.	9.365
1612.	14.16	4427.	9.362
1613.	14.16	4428.	9.364
1614.	14.15	4429.	9.363
1615.	14.15	4430.	9.36
1616.	14.15	4431.	9.359
1617.	14.15	4432.	9.358
1618.	14.15	4433.	9.357
1619.	14.14	4434.	9.356
1620.	14.14	4435.	9.355
1621.	14.14	4436.	9.352
1622.	14.13	4437.	9.352
1623.	14.13	4438.	9.35
1624.	14.13	4439.	9.349
1625.	14.13	4440.	9.348
1626.	14.13	4441.	9.349
1627.	14.12	4442.	9.348
1628.	14.12	4443.	9.346
1629.	14.12	4444.	9.346
1630.	14.12	4445.	9.344
1631.	14.12	4446.	9.344
1632.	14.11	4447.	9.343
1633.	14.11	4448.	9.341
1634.	14.11	4449.	9.342
1635.	14.11	4450.	9.34

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1636.	14.1	4451.	9.339
1637.	14.1	4452.	9.338
1638.	14.1	4453.	9.337
1639.	14.1	4454.	9.333
1640.	14.09	4455.	9.333
1641.	14.09	4456.	9.331
1642.	14.09	4457.	9.331
1643.	14.09	4458.	9.331
1644.	14.09	4459.	9.329
1645.	14.08	4460.	9.327
1646.	14.08	4461.	9.323
1647.	14.08	4462.	9.322
1648.	14.08	4463.	9.321
1649.	14.07	4464.	9.318
1650.	14.07	4465.	9.32
1651.	14.07	4466.	9.318
1652.	14.07	4467.	9.318
1653.	14.07	4468.	9.315
1654.	14.06	4469.	9.314
1655.	14.06	4470.	9.314
1656.	14.06	4471.	9.315
1657.	14.06	4472.	9.312
1658.	14.05	4473.	9.312
1659.	14.05	4474.	9.309
1660.	14.05	4475.	9.308
1661.	14.05	4476.	9.309
1662.	14.04	4477.	9.306
1663.	14.04	4478.	9.306
1664.	14.04	4479.	9.306
1665.	14.03	4480.	9.304
1666.	14.03	4481.	9.303
1667.	14.03	4482.	9.304
1668.	14.03	4483.	9.3
1669.	14.03	4484.	9.301
1670.	14.02	4485.	9.301
1671.	14.02	4486.	9.299
1672.	14.02	4487.	9.298
1673.	14.02	4488.	9.296
1674.	14.01	4489.	9.294
1675.	14.01	4490.	9.295
1676.	14.01	4491.	9.293
1677.	14.01	4492.	9.29
1678.	14.	4493.	9.29
1679.	14.	4494.	9.29
1680.	14.	4495.	9.289
1681.	14.	4496.	9.288
1682.	13.99	4497.	9.284
1683.	13.99	4498.	9.286
1684.	13.99	4499.	9.285
1685.	13.99	4500.	9.283
1686.	13.98	4501.	9.283
1687.	13.98	4502.	9.282
1688.	13.98	4503.	9.279
1689.	13.98	4504.	9.277
1690.	13.98	4505.	9.278
1691.	13.97	4506.	9.275
1692.	13.97	4507.	9.275
1693.	13.97	4508.	9.274
1694.	13.97	4509.	9.272
1695.	13.96	4510.	9.27
1696.	13.96	4511.	9.27
1697.	13.96	4512.	9.268
1698.	13.96	4513.	9.266
1699.	13.96	4514.	9.266
1700.	13.95	4515.	9.266
1701.	13.95	4516.	9.265
1702.	13.95	4517.	9.266

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1703.	13.95	4518.	9.262
1704.	13.95	4519.	9.262
1705.	13.94	4520.	9.26
1706.	13.94	4521.	9.261
1707.	13.93	4522.	9.258
1708.	13.93	4523.	9.258
1709.	13.93	4524.	9.256
1710.	13.93	4525.	9.255
1711.	13.92	4526.	9.254
1712.	13.92	4527.	9.253
1713.	13.92	4528.	9.25
1714.	13.92	4529.	9.252
1715.	13.92	4530.	9.25
1716.	13.92	4531.	9.25
1717.	13.91	4532.	9.248
1718.	13.91	4533.	9.246
1719.	13.91	4534.	9.244
1720.	13.91	4535.	9.245
1721.	13.9	4536.	9.241
1722.	13.9	4537.	9.241
1723.	13.9	4538.	9.24
1724.	13.89	4539.	9.239
1725.	13.89	4540.	9.236
1726.	13.89	4541.	9.236
1727.	13.89	4542.	9.238
1728.	13.89	4543.	9.236
1729.	13.89	4544.	9.234
1730.	13.88	4545.	9.233
1731.	13.88	4546.	9.232
1732.	13.88	4547.	9.23
1733.	13.88	4548.	9.229
1734.	13.87	4549.	9.228
1735.	13.87	4550.	9.226
1736.	13.87	4551.	9.226
1737.	13.87	4552.	9.223
1738.	13.86	4553.	9.223
1739.	13.86	4554.	9.223
1740.	13.86	4555.	9.222
1741.	13.86	4556.	9.22
1742.	13.85	4557.	9.22
1743.	13.85	4558.	9.219
1744.	13.85	4559.	9.218
1745.	13.85	4560.	9.216
1746.	13.85	4561.	9.214
1747.	13.85	4562.	9.213
1748.	13.84	4563.	9.212
1749.	13.84	4564.	9.212
1750.	13.84	4565.	9.21
1751.	13.83	4566.	9.21
1752.	13.83	4567.	9.208
1753.	13.83	4568.	9.205
1754.	13.83	4569.	9.204
1755.	13.82	4570.	9.204
1756.	13.82	4571.	9.201
1757.	13.82	4572.	9.202
1758.	13.82	4573.	9.2
1759.	13.82	4574.	9.2
1760.	13.81	4575.	9.199
1761.	13.81	4576.	9.199
1762.	13.81	4577.	9.198
1763.	13.8	4578.	9.197
1764.	13.8	4579.	9.195
1765.	13.8	4580.	9.195
1766.	13.8	4581.	9.192
1767.	13.79	4582.	9.192
1768.	13.8	4583.	9.192
1769.	13.8	4584.	9.19

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1770.	13.79	4585.	9.189
1771.	13.79	4586.	9.186
1772.	13.79	4587.	9.186
1773.	13.79	4588.	9.184
1774.	13.78	4589.	9.184
1775.	13.78	4590.	9.184
1776.	13.78	4591.	9.18
1777.	13.78	4592.	9.181
1778.	13.78	4593.	9.18
1779.	13.77	4594.	9.177
1780.	13.77	4595.	9.176
1781.	13.77	4596.	9.175
1782.	13.77	4597.	9.175
1783.	13.76	4598.	9.174
1784.	13.76	4599.	9.171
1785.	13.76	4600.	9.172
1786.	13.76	4601.	9.17
1787.	13.75	4602.	9.171
1788.	13.75	4603.	9.17
1789.	13.75	4604.	9.169
1790.	13.75	4605.	9.167
1791.	13.75	4606.	9.166
1792.	13.74	4607.	9.165
1793.	13.74	4608.	9.164
1794.	13.74	4609.	9.162
1795.	13.74	4610.	9.164
1796.	13.74	4611.	9.162
1797.	13.73	4612.	9.161
1798.	13.73	4613.	9.159
1799.	13.73	4614.	9.156
1800.	13.73	4615.	9.156
1801.	13.72	4616.	9.153
1802.	13.72	4617.	9.155
1803.	13.72	4618.	9.152
1804.	13.72	4619.	9.151
1805.	13.71	4620.	9.151
1806.	13.71	4621.	9.149
1807.	13.71	4622.	9.148
1808.	13.71	4623.	9.148
1809.	13.7	4624.	9.146
1810.	13.7	4625.	9.145
1811.	13.7	4626.	9.144
1812.	13.7	4627.	9.142
1813.	13.7	4628.	9.142
1814.	13.7	4629.	9.142
1815.	13.69	4630.	9.141
1816.	13.69	4631.	9.139
1817.	13.69	4632.	9.138
1818.	13.68	4633.	9.136
1819.	13.68	4634.	9.135
1820.	13.68	4635.	9.133
1821.	13.68	4636.	9.131
1822.	13.68	4637.	9.132
1823.	13.67	4638.	9.131
1824.	13.67	4639.	9.129
1825.	13.67	4640.	9.128
1826.	13.67	4641.	9.128
1827.	13.66	4642.	9.127
1828.	13.66	4643.	9.127
1829.	13.66	4644.	9.124
1830.	13.66	4645.	9.124
1831.	13.66	4646.	9.123
1832.	13.65	4647.	9.121
1833.	13.65	4648.	9.12
1834.	13.65	4649.	9.117
1835.	13.65	4650.	9.116
1836.	13.64	4651.	9.117

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1837.	13.64	4652.	9.115
1838.	13.64	4653.	9.116
1839.	13.64	4654.	9.113
1840.	13.63	4655.	9.112
1841.	13.63	4656.	9.113
1842.	13.63	4657.	9.111
1843.	13.63	4658.	9.109
1844.	13.63	4659.	9.109
1845.	13.62	4660.	9.106
1846.	13.62	4661.	9.108
1847.	13.62	4662.	9.106
1848.	13.62	4663.	9.106
1849.	13.62	4664.	9.104
1850.	13.61	4665.	9.101
1851.	13.61	4666.	9.1
1852.	13.61	4667.	9.097
1853.	13.61	4668.	9.099
1854.	13.61	4669.	9.098
1855.	13.6	4670.	9.099
1856.	13.6	4671.	9.096
1857.	13.6	4672.	9.096
1858.	13.59	4673.	9.094
1859.	13.59	4674.	9.093
1860.	13.59	4675.	9.09
1861.	13.59	4676.	9.088
1862.	13.58	4677.	9.087
1863.	13.58	4678.	9.089
1864.	13.58	4679.	9.086
1865.	13.58	4680.	9.087
1866.	13.57	4681.	9.085
1867.	13.57	4682.	9.084
1868.	13.57	4683.	9.082
1869.	13.57	4684.	9.082
1870.	13.57	4685.	9.08
1871.	13.57	4686.	9.077
1872.	13.56	4687.	9.078
1873.	13.56	4688.	9.076
1874.	13.56	4689.	9.076
1875.	13.56	4690.	9.077
1876.	13.55	4691.	9.075
1877.	13.55	4692.	9.073
1878.	13.55	4693.	9.072
1879.	13.55	4694.	9.071
1880.	13.54	4695.	9.068
1881.	13.54	4696.	9.066
1882.	13.54	4697.	9.067
1883.	13.54	4698.	9.066
1884.	13.53	4699.	9.065
1885.	13.53	4700.	9.065
1886.	13.53	4701.	9.064
1887.	13.53	4702.	9.061
1888.	13.53	4703.	9.06
1889.	13.52	4704.	9.059
1890.	13.52	4705.	9.057
1891.	13.52	4706.	9.056
1892.	13.52	4707.	9.056
1893.	13.52	4708.	9.052
1894.	13.51	4709.	9.052
1895.	13.51	4710.	9.05
1896.	13.51	4711.	9.052
1897.	13.51	4712.	9.05
1898.	13.5	4713.	9.047
1899.	13.5	4714.	9.046
1900.	13.5	4715.	9.046
1901.	13.5	4716.	9.047
1902.	13.5	4717.	9.046
1903.	13.49	4718.	9.045

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1904.	13.49	4719.	9.044
1905.	13.49	4720.	9.042
1906.	13.49	4721.	9.04
1907.	13.49	4722.	9.038
1908.	13.48	4723.	9.037
1909.	13.48	4724.	9.035
1910.	13.48	4725.	9.035
1911.	13.47	4726.	9.031
1912.	13.47	4727.	9.032
1913.	13.47	4728.	9.032
1914.	13.47	4729.	9.029
1915.	13.47	4730.	9.03
1916.	13.47	4731.	9.028
1917.	13.46	4732.	9.027
1918.	13.46	4733.	9.025
1919.	13.46	4734.	9.024
1920.	13.46	4735.	9.023
1921.	13.45	4736.	9.022
1922.	13.45	4737.	9.021
1923.	13.45	4738.	9.024
1924.	13.45	4739.	9.02
1925.	13.44	4740.	9.019
1926.	13.44	4741.	9.018
1927.	13.44	4742.	9.017
1928.	13.44	4743.	9.015
1929.	13.44	4744.	9.013
1930.	13.43	4745.	9.014
1931.	13.43	4746.	9.013
1932.	13.43	4747.	9.012
1933.	13.43	4748.	9.01
1934.	13.43	4749.	9.01
1935.	13.42	4750.	9.009
1936.	13.42	4751.	9.009
1937.	13.42	4752.	9.008
1938.	13.42	4753.	9.006
1939.	13.41	4754.	9.006
1940.	13.41	4755.	9.003
1941.	13.41	4756.	9.001
1942.	13.41	4757.	8.998
1943.	13.4	4758.	9.001
1944.	13.4	4759.	8.998
1945.	13.4	4760.	8.998
1946.	13.4	4761.	8.996
1947.	13.4	4762.	8.995
1948.	13.39	4763.	8.996
1949.	13.39	4764.	8.994
1950.	13.39	4765.	8.994
1951.	13.39	4766.	8.991
1952.	13.39	4767.	8.991
1953.	13.38	4768.	8.989
1954.	13.38	4769.	8.987
1955.	13.38	4770.	8.988
1956.	13.38	4771.	8.987
1957.	13.37	4772.	8.985
1958.	13.37	4773.	8.983
1959.	13.37	4774.	8.983
1960.	13.37	4775.	8.98
1961.	13.37	4776.	8.981
1962.	13.36	4777.	8.979
1963.	13.36	4778.	8.978
1964.	13.36	4779.	8.977
1965.	13.36	4780.	8.974
1966.	13.36	4781.	8.975
1967.	13.35	4782.	8.972
1968.	13.35	4783.	8.97
1969.	13.35	4784.	8.97
1970.	13.35	4785.	8.968

Time (min)	Displacement (m)	Time (min)	Displacement (m)
1971.	13.34	4786.	8.968
1972.	13.34	4787.	8.968
1973.	13.34	4788.	8.967
1974.	13.33	4789.	8.965
1975.	13.33	4790.	8.965
1976.	13.33	4791.	8.964
1977.	13.33	4792.	8.964
1978.	13.33	4793.	8.963
1979.	13.32	4794.	8.962
1980.	13.32	4795.	8.959
1981.	13.32	4796.	8.958
1982.	13.32	4797.	8.958
1983.	13.32	4798.	8.956
1984.	13.31	4799.	8.954
1985.	13.31	4800.	8.953
1986.	13.31	4801.	8.952
1987.	13.31	4802.	8.949
1988.	13.31	4803.	8.948
1989.	13.31	4804.	8.948
1990.	13.3	4805.	8.946
1991.	13.3	4806.	8.949
1992.	13.3	4807.	8.947
1993.	13.3	4808.	8.946
1994.	13.29	4809.	8.945
1995.	13.29	4810.	8.943
1996.	13.29	4811.	8.941
1997.	13.29	4812.	8.94
1998.	13.28	4813.	8.938
1999.	13.28	4814.	8.938
2000.	13.28	4815.	8.935
2001.	13.28	4816.	8.935
2002.	13.28	4817.	8.934
2003.	13.27	4818.	8.934
2004.	13.27	4819.	8.933
2005.	13.27	4820.	8.93
2006.	13.27	4821.	8.931
2007.	13.26	4822.	8.928
2008.	13.26	4823.	8.928
2009.	13.26	4824.	8.926
2010.	13.26	4825.	8.926
2011.	13.26	4826.	8.924
2012.	13.25	4827.	8.925
2013.	13.25	4828.	8.923
2014.	13.25	4829.	8.921
2015.	13.24	4830.	8.919
2016.	13.24	4831.	8.919
2017.	13.24	4832.	8.918
2018.	13.24	4833.	8.916
2019.	13.24	4834.	8.918
2020.	13.24	4835.	8.915
2021.	13.23	4836.	8.916
2022.	13.23	4837.	8.914
2023.	13.23	4838.	8.913
2024.	13.23	4839.	8.91
2025.	13.23	4840.	8.908
2026.	13.22	4841.	8.907
2027.	13.22	4842.	8.907
2028.	13.22	4843.	8.904
2029.	13.22	4844.	8.902
2030.	13.21	4845.	8.902
2031.	13.21	4846.	8.899
2032.	13.21	4847.	8.897
2033.	13.21	4848.	8.897
2034.	13.21	4849.	8.895
2035.	13.2	4850.	8.893
2036.	13.2	4851.	8.896
2037.	13.2	4852.	8.894

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2038.	13.2	4853.	8.892
2039.	13.2	4854.	8.89
2040.	13.19	4855.	8.892
2041.	13.19	4856.	8.89
2042.	13.19	4857.	8.887
2043.	13.19	4858.	8.886
2044.	13.18	4859.	8.887
2045.	13.18	4860.	8.885
2046.	13.18	4861.	8.883
2047.	13.18	4862.	8.881
2048.	13.18	4863.	8.881
2049.	13.17	4864.	8.879
2050.	13.17	4865.	8.878
2051.	13.17	4866.	8.878
2052.	13.17	4867.	8.877
2053.	13.17	4868.	8.877
2054.	13.16	4869.	8.875
2055.	13.16	4870.	8.875
2056.	13.16	4871.	8.872
2057.	13.16	4872.	8.873
2058.	13.16	4873.	8.871
2059.	13.15	4874.	8.869
2060.	13.15	4875.	8.867
2061.	13.15	4876.	8.868
2062.	13.15	4877.	8.865
2063.	13.14	4878.	8.866
2064.	13.14	4879.	8.866
2065.	13.14	4880.	8.864
2066.	13.14	4881.	8.863
2067.	13.14	4882.	8.862
2068.	13.14	4883.	8.859
2069.	13.13	4884.	8.859
2070.	13.13	4885.	8.859
2071.	13.13	4886.	8.856
2072.	13.12	4887.	8.854
2073.	13.12	4888.	8.854
2074.	13.12	4889.	8.852
2075.	13.12	4890.	8.851
2076.	13.12	4891.	8.85
2077.	13.12	4892.	8.849
2078.	13.11	4893.	8.85
2079.	13.11	4894.	8.847
2080.	13.11	4895.	8.845
2081.	13.1	4896.	8.846
2082.	13.1	4897.	8.844
2083.	13.1	4898.	8.842
2084.	13.1	4899.	8.842
2085.	13.1	4900.	8.84
2086.	13.1	4901.	8.839
2087.	13.09	4902.	8.838
2088.	13.09	4903.	8.837
2089.	13.09	4904.	8.836
2090.	13.09	4905.	8.838
2091.	13.09	4906.	8.835
2092.	13.08	4907.	8.836
2093.	13.08	4908.	8.832
2094.	13.08	4909.	8.831
2095.	13.08	4910.	8.829
2096.	13.07	4911.	8.829
2097.	13.07	4912.	8.831
2098.	13.07	4913.	8.828
2099.	13.07	4914.	8.827
2100.	13.07	4915.	8.827
2101.	13.07	4916.	8.826
2102.	13.06	4917.	8.824
2103.	13.06	4918.	8.824
2104.	13.06	4919.	8.822

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2105.	13.06	4920.	8.821
2106.	13.05	4921.	8.821
2107.	13.05	4922.	8.819
2108.	13.05	4923.	8.819
2109.	13.05	4924.	8.814
2110.	13.04	4925.	8.814
2111.	13.04	4926.	8.813
2112.	13.04	4927.	8.813
2113.	13.04	4928.	8.813
2114.	13.04	4929.	8.811
2115.	13.04	4930.	8.81
2116.	13.03	4931.	8.808
2117.	13.03	4932.	8.808
2118.	13.03	4933.	8.806
2119.	13.03	4934.	8.807
2120.	13.02	4935.	8.806
2121.	13.02	4936.	8.807
2122.	13.02	4937.	8.804
2123.	13.02	4938.	8.804
2124.	13.02	4939.	8.801
2125.	13.01	4940.	8.801
2126.	13.01	4941.	8.801
2127.	13.01	4942.	8.802
2128.	13.01	4943.	8.801
2129.	13.01	4944.	8.8
2130.	13.01	4945.	8.8
2131.	13.	4946.	8.799
2132.	13.	4947.	8.797
2133.	13.	4948.	8.796
2134.	13.	4949.	8.794
2135.	13.	4950.	8.793
2136.	12.99	4951.	8.793
2137.	12.99	4952.	8.791
2138.	12.99	4953.	8.792
2139.	12.99	4954.	8.789
2140.	12.98	4955.	8.788
2141.	12.98	4956.	8.789
2142.	12.98	4957.	8.787
2143.	12.98	4958.	8.786
2144.	12.98	4959.	8.784
2145.	12.98	4960.	8.784
2146.	12.97	4961.	8.783
2147.	12.97	4962.	8.782
2148.	12.97	4963.	8.783
2149.	12.97	4964.	8.781
2150.	12.97	4965.	8.78
2151.	12.96	4966.	8.778
2152.	12.96	4967.	8.777
2153.	12.96	4968.	8.775
2154.	12.96	4969.	8.774
2155.	12.95	4970.	8.773
2156.	12.95	4971.	8.773
2157.	12.95	4972.	8.771
2158.	12.95	4973.	8.77
2159.	12.94	4974.	8.771
2160.	12.94	4975.	8.769
2161.	12.94	4976.	8.769
2162.	12.94	4977.	8.767
2163.	12.94	4978.	8.766
2164.	12.93	4979.	8.765
2165.	12.93	4980.	8.763
2166.	12.93	4981.	8.762
2167.	12.93	4982.	8.762
2168.	12.92	4983.	8.76
2169.	12.92	4984.	8.757
2170.	12.92	4985.	8.756
2171.	12.92	4986.	8.757

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2172.	12.92	4987.	8.758
2173.	12.92	4988.	8.755
2174.	12.91	4989.	8.754
2175.	12.91	4990.	8.754
2176.	12.91	4991.	8.752
2177.	12.91	4992.	8.749
2178.	12.91	4993.	8.748
2179.	12.9	4994.	8.747
2180.	12.9	4995.	8.748
2181.	12.9	4996.	8.747
2182.	12.9	4997.	8.744
2183.	12.9	4998.	8.745
2184.	12.89	4999.	8.741
2185.	12.89	5000.	8.74
2186.	12.89	5001.	8.741
2187.	12.89	5002.	8.741
2188.	12.88	5003.	8.739
2189.	12.88	5004.	8.738
2190.	12.88	5005.	8.737
2191.	12.88	5006.	8.737
2192.	12.88	5007.	8.735
2193.	12.88	5008.	8.735
2194.	12.87	5009.	8.734
2195.	12.87	5010.	8.733
2196.	12.87	5011.	8.734
2197.	12.87	5012.	8.732
2198.	12.86	5013.	8.732
2199.	12.86	5014.	8.732
2200.	12.86	5015.	8.73
2201.	12.86	5016.	8.73
2202.	12.86	5017.	8.727
2203.	12.85	5018.	8.726
2204.	12.85	5019.	8.724
2205.	12.85	5020.	8.722
2206.	12.85	5021.	8.723
2207.	12.85	5022.	8.723
2208.	12.85	5023.	8.721
2209.	12.84	5024.	8.72
2210.	12.84	5025.	8.721
2211.	12.84	5026.	8.72
2212.	12.84	5027.	8.718
2213.	12.83	5028.	8.718
2214.	12.83	5029.	8.717
2215.	12.83	5030.	8.715
2216.	12.83	5031.	8.714
2217.	12.82	5032.	8.713
2218.	12.82	5033.	8.712
2219.	12.82	5034.	8.709
2220.	12.82	5035.	8.71
2221.	12.82	5036.	8.709
2222.	12.82	5037.	8.707
2223.	12.82	5038.	8.706
2224.	12.82	5039.	8.707
2225.	12.81	5040.	8.705
2226.	12.81	5041.	8.704
2227.	12.81	5042.	8.704
2228.	12.81	5043.	8.703
2229.	12.8	5044.	8.7
2230.	12.8	5045.	8.699
2231.	12.8	5046.	8.697
2232.	12.8	5047.	8.696
2233.	12.8	5048.	8.695
2234.	12.79	5049.	8.697
2235.	12.79	5050.	8.695
2236.	12.79	5051.	8.693
2237.	12.79	5052.	8.693
2238.	12.79	5053.	8.693

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2239.	12.78	5054.	8.691
2240.	12.78	5055.	8.69
2241.	12.78	5056.	8.689
2242.	12.78	5057.	8.689
2243.	12.78	5058.	8.687
2244.	12.78	5059.	8.685
2245.	12.77	5060.	8.685
2246.	12.77	5061.	8.684
2247.	12.77	5062.	8.682
2248.	12.77	5063.	8.679
2249.	12.77	5064.	8.679
2250.	12.76	5065.	8.68
2251.	12.76	5066.	8.677
2252.	12.76	5067.	8.677
2253.	12.76	5068.	8.677
2254.	12.76	5069.	8.675
2255.	12.75	5070.	8.672
2256.	12.75	5071.	8.672
2257.	12.75	5072.	8.669
2258.	12.75	5073.	8.666
2259.	12.75	5074.	8.668
2260.	12.75	5075.	8.668
2261.	12.74	5076.	8.666
2262.	12.74	5077.	8.665
2263.	12.74	5078.	8.664
2264.	12.74	5079.	8.663
2265.	12.74	5080.	8.664
2266.	12.73	5081.	8.664
2267.	12.73	5082.	8.661
2268.	12.73	5083.	8.659
2269.	12.73	5084.	8.66
2270.	12.72	5085.	8.658
2271.	12.72	5086.	8.658
2272.	12.72	5087.	8.656
2273.	12.72	5088.	8.654
2274.	12.72	5089.	8.654
2275.	12.72	5090.	8.652
2276.	12.71	5091.	8.65
2277.	12.71	5092.	8.649
2278.	12.71	5093.	8.649
2279.	12.71	5094.	8.648
2280.	12.71	5095.	8.648
2281.	12.7	5096.	8.646
2282.	12.7	5097.	8.646
2283.	12.7	5098.	8.645
2284.	12.7	5099.	8.644
2285.	12.69	5100.	8.644
2286.	12.69	5101.	8.641
2287.	12.69	5102.	8.64
2288.	12.69	5103.	8.641
2289.	12.69	5104.	8.637
2290.	12.68	5105.	8.639
2291.	12.68	5106.	8.638
2292.	12.68	5107.	8.636
2293.	12.68	5108.	8.635
2294.	12.68	5109.	8.634
2295.	12.67	5110.	8.634
2296.	12.67	5111.	8.631
2297.	12.67	5112.	8.631
2298.	12.67	5113.	8.63
2299.	12.67	5114.	8.628
2300.	12.66	5115.	8.629
2301.	12.66	5116.	8.627
2302.	12.66	5117.	8.626
2303.	12.66	5118.	8.625
2304.	12.66	5119.	8.625
2305.	12.65	5120.	8.624

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2306.	12.65	5121.	8.622
2307.	12.65	5122.	8.622
2308.	12.65	5123.	8.619
2309.	12.65	5124.	8.619
2310.	12.64	5125.	8.617
2311.	12.64	5126.	8.616
2312.	12.64	5127.	8.614
2313.	12.64	5128.	8.615
2314.	12.64	5129.	8.614
2315.	12.64	5130.	8.612
2316.	12.64	5131.	8.611
2317.	12.63	5132.	8.61
2318.	12.63	5133.	8.609
2319.	12.63	5134.	8.607
2320.	12.63	5135.	8.606
2321.	12.62	5136.	8.605
2322.	12.62	5137.	8.604
2323.	12.62	5138.	8.604
2324.	12.62	5139.	8.603
2325.	12.62	5140.	8.601
2326.	12.61	5141.	8.601
2327.	12.61	5142.	8.602
2328.	12.61	5143.	8.599
2329.	12.61	5144.	8.598
2330.	12.6	5145.	8.597
2331.	12.6	5146.	8.596
2332.	12.6	5147.	8.594
2333.	12.6	5148.	8.591
2334.	12.6	5149.	8.594
2335.	12.6	5150.	8.592
2336.	12.59	5151.	8.591
2337.	12.59	5152.	8.589
2338.	12.59	5153.	8.589
2339.	12.59	5154.	8.588
2340.	12.58	5155.	8.588
2341.	12.58	5156.	8.586
2342.	12.58	5157.	8.585
2343.	12.58	5158.	8.584
2344.	12.58	5159.	8.584
2345.	12.57	5160.	8.582
2346.	12.57	5161.	8.582
2347.	12.57	5162.	8.58
2348.	12.57	5163.	8.58
2349.	12.57	5164.	8.579
2350.	12.56	5165.	8.578
2351.	12.56	5166.	8.576
2352.	12.56	5167.	8.576
2353.	12.56	5168.	8.574
2354.	12.56	5169.	8.575
2355.	12.56	5170.	8.574
2356.	12.55	5171.	8.572
2357.	12.55	5172.	8.572
2358.	12.55	5173.	8.569
2359.	12.55	5174.	8.569
2360.	12.54	5175.	8.568
2361.	12.54	5176.	8.566
2362.	12.54	5177.	8.565
2363.	12.54	5178.	8.563
2364.	12.54	5179.	8.563
2365.	12.54	5180.	8.564
2366.	12.53	5181.	8.563
2367.	12.53	5182.	8.563
2368.	12.53	5183.	8.563
2369.	12.53	5184.	8.562
2370.	12.53	5185.	8.559
2371.	12.52	5186.	8.559
2372.	12.52	5187.	8.558

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2373.	12.52	5188.	8.556
2374.	12.52	5189.	8.557
2375.	12.52	5190.	8.556
2376.	12.52	5191.	8.554
2377.	12.51	5192.	8.552
2378.	12.51	5193.	8.55
2379.	12.51	5194.	8.55
2380.	12.51	5195.	8.55
2381.	12.5	5196.	8.55
2382.	12.5	5197.	8.549
2383.	12.5	5198.	8.547
2384.	12.5	5199.	8.545
2385.	12.5	5200.	8.542
2386.	12.49	5201.	8.542
2387.	12.49	5202.	8.543
2388.	12.49	5203.	8.541
2389.	12.49	5204.	8.54
2390.	12.49	5205.	8.54
2391.	12.49	5206.	8.538
2392.	12.49	5207.	8.537
2393.	12.48	5208.	8.536
2394.	12.48	5209.	8.534
2395.	12.48	5210.	8.534
2396.	12.47	5211.	8.533
2397.	12.47	5212.	8.531
2398.	12.47	5213.	8.529
2399.	12.47	5214.	8.529
2400.	12.47	5215.	8.528
2401.	12.46	5216.	8.528
2402.	12.46	5217.	8.527
2403.	12.46	5218.	8.526
2404.	12.46	5219.	8.526
2405.	12.46	5220.	8.524
2406.	12.46	5221.	8.524
2407.	12.45	5222.	8.521
2408.	12.45	5223.	8.52
2409.	12.45	5224.	8.52
2410.	12.45	5225.	8.52
2411.	12.45	5226.	8.519
2412.	12.44	5227.	8.516
2413.	12.44	5228.	8.515
2414.	12.44	5229.	8.514
2415.	12.44	5230.	8.512
2416.	12.44	5231.	8.511
2417.	12.43	5232.	8.508
2418.	12.43	5233.	8.509
2419.	12.43	5234.	8.509
2420.	12.43	5235.	8.508
2421.	12.42	5236.	8.506
2422.	12.42	5237.	8.504
2423.	12.42	5238.	8.504
2424.	12.42	5239.	8.502
2425.	12.42	5240.	8.502
2426.	12.41	5241.	8.5
2427.	12.41	5242.	8.499
2428.	12.41	5243.	8.498
2429.	12.41	5244.	8.495
2430.	12.41	5245.	8.494
2431.	12.41	5246.	8.495
2432.	12.4	5247.	8.495
2433.	12.4	5248.	8.495
2434.	12.4	5249.	8.492
2435.	12.4	5250.	8.49
2436.	12.4	5251.	8.49
2437.	12.39	5252.	8.49
2438.	12.39	5253.	8.489
2439.	12.39	5254.	8.488

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2440.	12.39	5255.	8.486
2441.	12.39	5256.	8.484
2442.	12.39	5257.	8.484
2443.	12.38	5258.	8.484
2444.	12.38	5259.	8.483
2445.	12.38	5260.	8.482
2446.	12.38	5261.	8.481
2447.	12.37	5262.	8.479
2448.	12.37	5263.	8.479
2449.	12.37	5264.	8.479
2450.	12.37	5265.	8.477
2451.	12.36	5266.	8.477
2452.	12.36	5267.	8.475
2453.	12.36	5268.	8.474
2454.	12.36	5269.	8.474
2455.	12.36	5270.	8.474
2456.	12.35	5271.	8.472
2457.	12.35	5272.	8.47
2458.	12.35	5273.	8.469
2459.	12.35	5274.	8.469
2460.	12.35	5275.	8.467
2461.	12.35	5276.	8.466
2462.	12.34	5277.	8.465
2463.	12.34	5278.	8.463
2464.	12.34	5279.	8.463
2465.	12.34	5280.	8.461
2466.	12.34	5281.	8.46
2467.	12.34	5282.	8.459
2468.	12.34	5283.	8.459
2469.	12.33	5284.	8.456
2470.	12.33	5285.	8.455
2471.	12.33	5286.	8.455
2472.	12.33	5287.	8.454
2473.	12.33	5288.	8.454
2474.	12.32	5289.	8.452
2475.	12.32	5290.	8.45
2476.	12.32	5291.	8.45
2477.	12.32	5292.	8.448
2478.	12.32	5293.	8.446
2479.	12.32	5294.	8.444
2480.	12.31	5295.	8.444
2481.	12.31	5296.	8.442
2482.	12.31	5297.	8.44
2483.	12.31	5298.	8.441
2484.	12.31	5299.	8.438
2485.	12.3	5300.	8.439
2486.	12.3	5301.	8.437
2487.	12.3	5302.	8.434
2488.	12.3	5303.	8.432
2489.	12.29	5304.	8.432
2490.	12.29	5305.	8.431
2491.	12.29	5306.	8.43
2492.	12.29	5307.	8.428
2493.	12.29	5308.	8.426
2494.	12.28	5309.	8.425
2495.	12.28	5310.	8.427
2496.	12.28	5311.	8.427
2497.	12.28	5312.	8.425
2498.	12.28	5313.	8.425
2499.	12.27	5314.	8.423
2500.	12.27	5315.	8.423
2501.	12.27	5316.	8.421
2502.	12.27	5317.	8.418
2503.	12.27	5318.	8.419
2504.	12.27	5319.	8.417
2505.	12.26	5320.	8.416
2506.	12.26	5321.	8.415

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2507.	12.26	5322.	8.414
2508.	12.26	5323.	8.414
2509.	12.26	5324.	8.413
2510.	12.26	5325.	8.412
2511.	12.25	5326.	8.409
2512.	12.25	5327.	8.411
2513.	12.25	5328.	8.411
2514.	12.25	5329.	8.408
2515.	12.24	5330.	8.407
2516.	12.24	5331.	8.407
2517.	12.24	5332.	8.405
2518.	12.24	5333.	8.403
2519.	12.24	5334.	8.405
2520.	12.23	5335.	8.403
2521.	12.23	5336.	8.402
2522.	12.23	5337.	8.4
2523.	12.23	5338.	8.399
2524.	12.23	5339.	8.396
2525.	12.22	5340.	8.395
2526.	12.22	5341.	8.396
2527.	12.22	5342.	8.395
2528.	12.22	5343.	8.393
2529.	12.22	5344.	8.394
2530.	12.21	5345.	8.392
2531.	12.21	5346.	8.391
2532.	12.21	5347.	8.39
2533.	12.21	5348.	8.388
2534.	12.21	5349.	8.388
2535.	12.2	5350.	8.388
2536.	12.2	5351.	8.387
2537.	12.2	5352.	8.384
2538.	12.2	5353.	8.386
2539.	12.2	5354.	8.384
2540.	12.2	5355.	8.383
2541.	12.19	5356.	8.383
2542.	12.19	5357.	8.381
2543.	12.19	5358.	8.38
2544.	12.19	5359.	8.38
2545.	12.19	5360.	8.38
2546.	12.19	5361.	8.378
2547.	12.18	5362.	8.377
2548.	12.18	5363.	8.375
2549.	12.18	5364.	8.374
2550.	12.18	5365.	8.372
2551.	12.17	5366.	8.371
2552.	12.17	5367.	8.37
2553.	12.17	5368.	8.368
2554.	12.17	5369.	8.369
2555.	12.16	5370.	8.364
2556.	12.16	5371.	8.366
2557.	12.16	5372.	8.365
2558.	12.16	5373.	8.364
2559.	12.16	5374.	8.363
2560.	12.16	5375.	8.361
2561.	12.15	5376.	8.365
2562.	12.15	5377.	8.362
2563.	12.15	5378.	8.361
2564.	12.15	5379.	8.359
2565.	12.15	5380.	8.358
2566.	12.15	5381.	8.357
2567.	12.14	5382.	8.355
2568.	12.14	5383.	8.353
2569.	12.14	5384.	8.353
2570.	12.14	5385.	8.351
2571.	12.13	5386.	8.352
2572.	12.13	5387.	8.35
2573.	12.13	5388.	8.35

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2574.	12.13	5389.	8.347
2575.	12.13	5390.	8.346
2576.	12.12	5391.	8.348
2577.	12.12	5392.	8.347
2578.	12.12	5393.	8.344
2579.	12.12	5394.	8.343
2580.	12.12	5395.	8.342
2581.	12.12	5396.	8.342
2582.	12.12	5397.	8.34
2583.	12.11	5398.	8.343
2584.	12.11	5399.	8.341
2585.	12.11	5400.	8.341
2586.	12.11	5401.	8.338
2587.	12.11	5402.	8.339
2588.	12.11	5403.	8.337
2589.	12.1	5404.	8.336
2590.	12.1	5405.	8.335
2591.	12.1	5406.	8.334
2592.	12.1	5407.	8.332
2593.	12.1	5408.	8.333
2594.	12.1	5409.	8.33
2595.	12.09	5410.	8.33
2596.	12.09	5411.	8.328
2597.	12.09	5412.	8.326
2598.	12.09	5413.	8.325
2599.	12.09	5414.	8.322
2600.	12.08	5415.	8.324
2601.	12.08	5416.	8.324
2602.	12.08	5417.	8.324
2603.	12.08	5418.	8.323
2604.	12.07	5419.	8.32
2605.	12.07	5420.	8.321
2606.	12.07	5421.	8.32
2607.	12.07	5422.	8.319
2608.	12.07	5423.	8.318
2609.	12.07	5424.	8.316
2610.	12.06	5425.	8.316
2611.	12.06	5426.	8.315
2612.	12.06	5427.	8.313
2613.	12.06	5428.	8.313
2614.	12.06	5429.	8.313
2615.	12.05	5430.	8.31
2616.	12.05	5431.	8.309
2617.	12.05	5432.	8.311
2618.	12.05	5433.	8.31
2619.	12.05	5434.	8.31
2620.	12.04	5435.	8.308
2621.	12.04	5436.	8.307
2622.	12.04	5437.	8.307
2623.	12.04	5438.	8.303
2624.	12.04	5439.	8.302
2625.	12.04	5440.	8.302
2626.	12.03	5441.	8.3
2627.	12.03	5442.	8.297
2628.	12.03	5443.	8.297
2629.	12.03	5444.	8.296
2630.	12.02	5445.	8.295
2631.	12.03	5446.	8.296
2632.	12.02	5447.	8.296
2633.	12.02	5448.	8.294
2634.	12.02	5449.	8.292
2635.	12.02	5450.	8.29
2636.	12.02	5451.	8.292
2637.	12.01	5452.	8.29
2638.	12.01	5453.	8.288
2639.	12.01	5454.	8.289
2640.	12.01	5455.	8.286

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2641.	12.	5456.	8.286
2642.	12.	5457.	8.284
2643.	12.	5458.	8.285
2644.	12.	5459.	8.283
2645.	12.	5460.	8.283
2646.	12.	5461.	8.28
2647.	12.	5462.	8.281
2648.	11.99	5463.	8.281
2649.	11.99	5464.	8.279
2650.	11.99	5465.	8.277
2651.	11.99	5466.	8.276
2652.	11.99	5467.	8.275
2653.	11.98	5468.	8.276
2654.	11.98	5469.	8.275
2655.	11.98	5470.	8.273
2656.	11.98	5471.	8.271
2657.	11.97	5472.	8.269
2658.	11.97	5473.	8.268
2659.	11.97	5474.	8.267
2660.	11.97	5475.	8.265
2661.	11.97	5476.	8.265
2662.	11.97	5477.	8.266
2663.	11.96	5478.	8.264
2664.	11.96	5479.	8.263
2665.	11.96	5480.	8.263
2666.	11.96	5481.	8.261
2667.	11.96	5482.	8.261
2668.	11.96	5483.	8.259
2669.	11.96	5484.	8.257
2670.	11.95	5485.	8.257
2671.	11.95	5486.	8.255
2672.	11.95	5487.	8.254
2673.	11.95	5488.	8.253
2674.	11.95	5489.	8.251
2675.	11.94	5490.	8.251
2676.	11.94	5491.	8.252
2677.	11.94	5492.	8.251
2678.	11.94	5493.	8.25
2679.	11.94	5494.	8.248
2680.	11.94	5495.	8.247
2681.	11.93	5496.	8.246
2682.	11.93	5497.	8.247
2683.	11.93	5498.	8.246
2684.	11.93	5499.	8.244
2685.	11.93	5500.	8.243
2686.	11.92	5501.	8.242
2687.	11.92	5502.	8.243
2688.	11.92	5503.	8.242
2689.	11.92	5504.	8.24
2690.	11.92	5505.	8.237
2691.	11.91	5506.	8.236
2692.	11.91	5507.	8.235
2693.	11.91	5508.	8.234
2694.	11.91	5509.	8.233
2695.	11.91	5510.	8.232
2696.	11.91	5511.	8.23
2697.	11.9	5512.	8.231
2698.	11.9	5513.	8.229
2699.	11.9	5514.	8.23
2700.	11.9	5515.	8.23
2701.	11.9	5516.	8.227
2702.	11.89	5517.	8.226
2703.	11.89	5518.	8.223
2704.	11.89	5519.	8.221
2705.	11.89	5520.	8.222
2706.	11.89	5521.	8.22
2707.	11.89	5522.	8.218

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2708.	11.88	5523.	8.218
2709.	11.88	5524.	8.217
2710.	11.88	5525.	8.216
2711.	11.88	5526.	8.215
2712.	11.88	5527.	8.214
2713.	11.88	5528.	8.212
2714.	11.87	5529.	8.214
2715.	11.87	5530.	8.211
2716.	11.87	5531.	8.211
2717.	11.87	5532.	8.21
2718.	11.87	5533.	8.21
2719.	11.87	5534.	8.209
2720.	11.86	5535.	8.207
2721.	11.86	5536.	8.207
2722.	11.86	5537.	8.206
2723.	11.86	5538.	8.204
2724.	11.86	5539.	8.203
2725.	11.85	5540.	8.201
2726.	11.85	5541.	8.202
2727.	11.85	5542.	8.201
2728.	11.85	5543.	8.198
2729.	11.85	5544.	8.197
2730.	11.85	5545.	8.197
2731.	11.85	5546.	8.198
2732.	11.85	5547.	8.196
2733.	11.84	5548.	8.194
2734.	11.84	5549.	8.194
2735.	11.84	5550.	8.192
2736.	11.83	5551.	8.192
2737.	11.84	5552.	8.191
2738.	11.83	5553.	8.191
2739.	11.83	5554.	8.188
2740.	11.83	5555.	8.188
2741.	11.83	5556.	8.189
2742.	11.82	5557.	8.187
2743.	11.82	5558.	8.186
2744.	11.82	5559.	8.185
2745.	11.82	5560.	8.183
2746.	11.82	5561.	8.183
2747.	11.81	5562.	8.183
2748.	11.81	5563.	8.18
2749.	11.81	5564.	8.182
2750.	11.81	5565.	8.181
2751.	11.81	5566.	8.18
2752.	11.81	5567.	8.179
2753.	11.81	5568.	8.178
2754.	11.8	5569.	8.175
2755.	11.8	5570.	8.175
2756.	11.8	5571.	8.173
2757.	11.8	5572.	8.172
2758.	11.8	5573.	8.174
2759.	11.8	5574.	8.171
2760.	11.79	5575.	8.171
2761.	11.79	5576.	8.169
2762.	11.79	5577.	8.167
2763.	11.79	5578.	8.165
2764.	11.79	5579.	8.165
2765.	11.78	5580.	8.166
2766.	11.78	5581.	8.163
2767.	11.78	5582.	8.162
2768.	11.78	5583.	8.161
2769.	11.78	5584.	8.16
2770.	11.78	5585.	8.16
2771.	11.78	5586.	8.158
2772.	11.78	5587.	8.158
2773.	11.77	5588.	8.156
2774.	11.77	5589.	8.157

Time (min)	Displacement (m)	Time (min)	Displacement (m)
2775.	11.77	5590.	8.154
2776.	11.77	5591.	8.154
2777.	11.76	5592.	8.154
2778.	11.76	5593.	8.151
2779.	11.76	5594.	8.152
2780.	11.76	5595.	8.151
2781.	11.76	5596.	8.151
2782.	11.76	5597.	8.149
2783.	11.76	5598.	8.147
2784.	11.75	5599.	8.145
2785.	11.75	5600.	8.144
2786.	11.75	5601.	8.142
2787.	11.75	5602.	8.143
2788.	11.75	5603.	8.141
2789.	11.74	5604.	8.141
2790.	11.74	5605.	8.141
2791.	11.74	5606.	8.14
2792.	11.74	5607.	8.138
2793.	11.74	5608.	8.135
2794.	11.73	5609.	8.133
2795.	11.73	5610.	8.137
2796.	11.73	5611.	8.137
2797.	11.73	5612.	8.136
2798.	11.73	5613.	8.134
2799.	11.72	5614.	8.132
2800.	11.72	5615.	8.13
2801.	11.72	5616.	8.131
2802.	11.72	5617.	8.13
2803.	11.72	5618.	8.129
2804.	11.72	5619.	8.128
2805.	11.72	5620.	8.127
2806.	11.71	5621.	8.127
2807.	11.71	5622.	8.124
2808.	11.71	5623.	8.123
2809.	11.71	5624.	8.124
2810.	11.7	5625.	8.122
2811.	11.7	5626.	8.122
2812.	11.7	5627.	8.12
2813.	11.7	5628.	8.117
2814.	11.7	5629.	8.121

SOLUTION

Slug Test
Aquifer Model: Confined
Solution Method: Hvorslev
Shape Factor: 0.

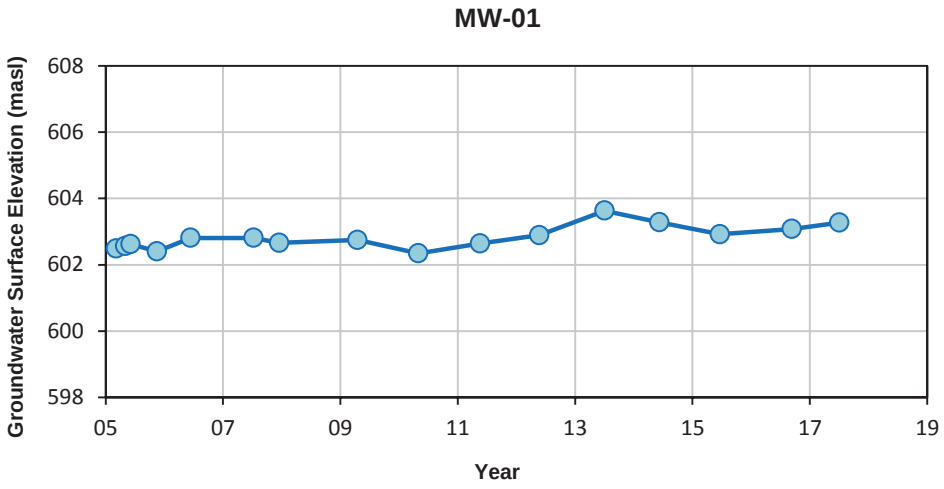
VISUAL ESTIMATION RESULTS

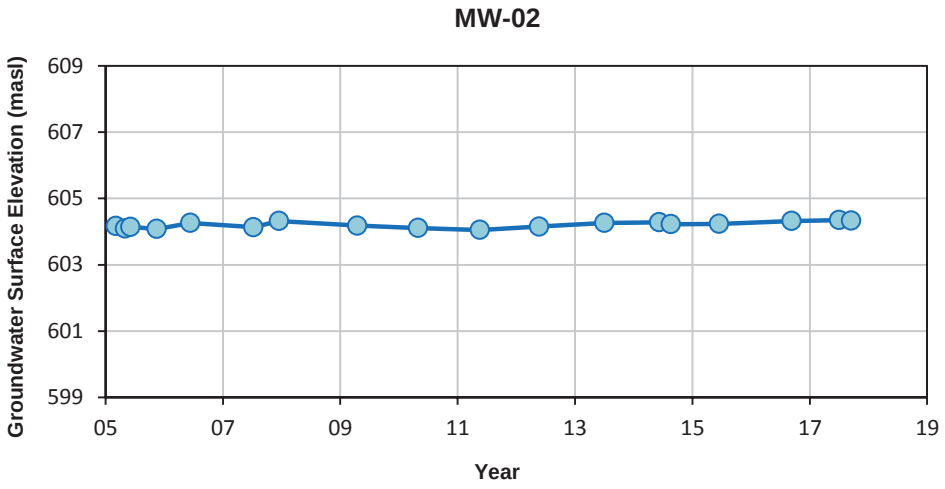
Estimated Parameters

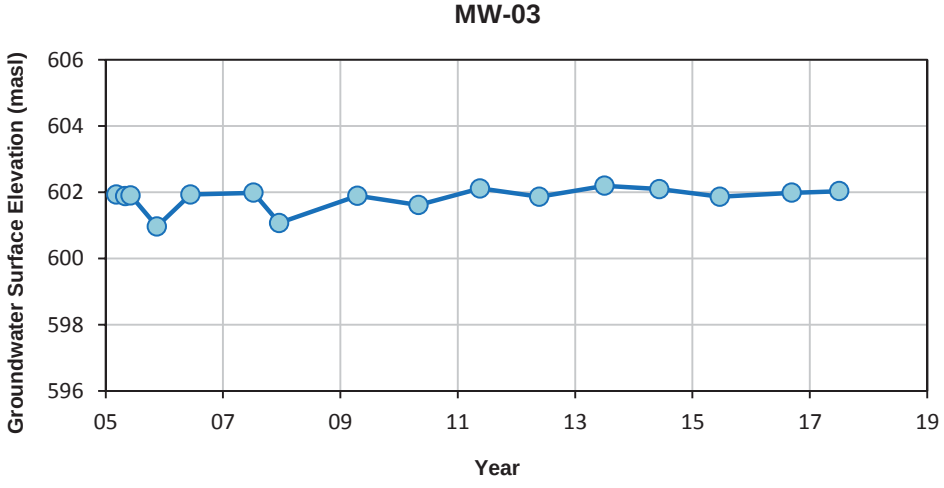
Parameter	Estimate	
K	1.108E-9	m/sec
y0	18.51	m

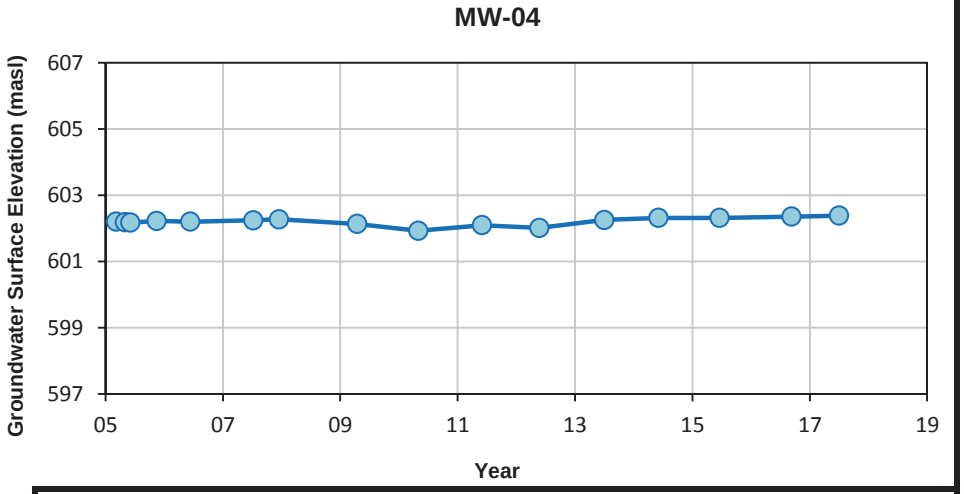
K = 1.108E-7 cm/sec
T = K*b = 4.43E-9 m²/sec (4.43E-5 sq. cm/sec)

Appendix 4 Groundwater Hydrographs









Notes:

- Filled symbols denote measurable values; unfilled symbols denote dry wells
- Dashed line between data points indicates data gap of more than two years

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

GROUNDWATER HYDROGRAPHS
MW-01, MW-02, MW-03, AND MW-04

Date:	Drawn by:	Edited by:	App'd by:
29-Nov-17	DS		

OneWay to zero harm

Advisian
WorleyParsons Group

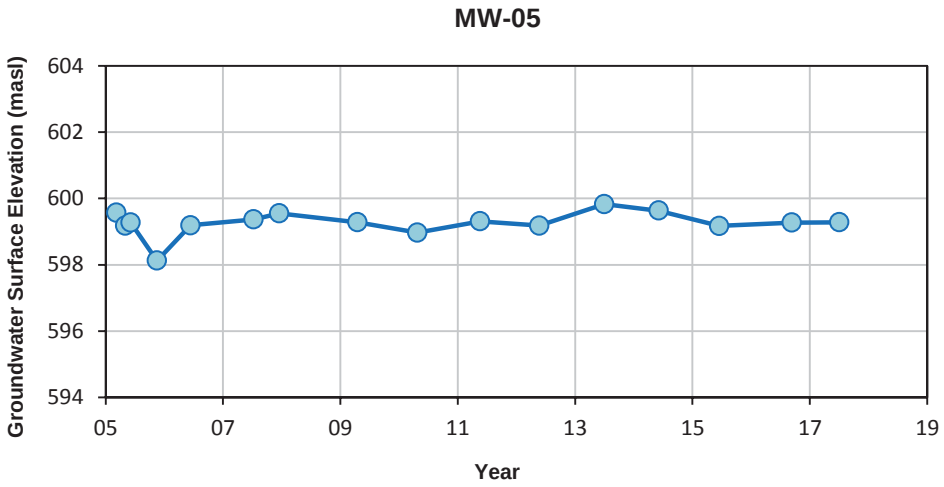
WorleyParsons Project No.
307075-01608-300

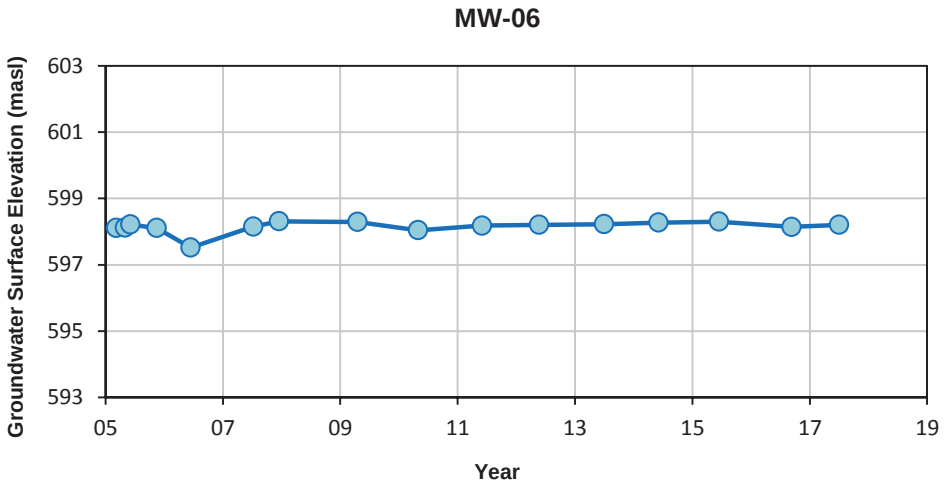
FIG No. 1

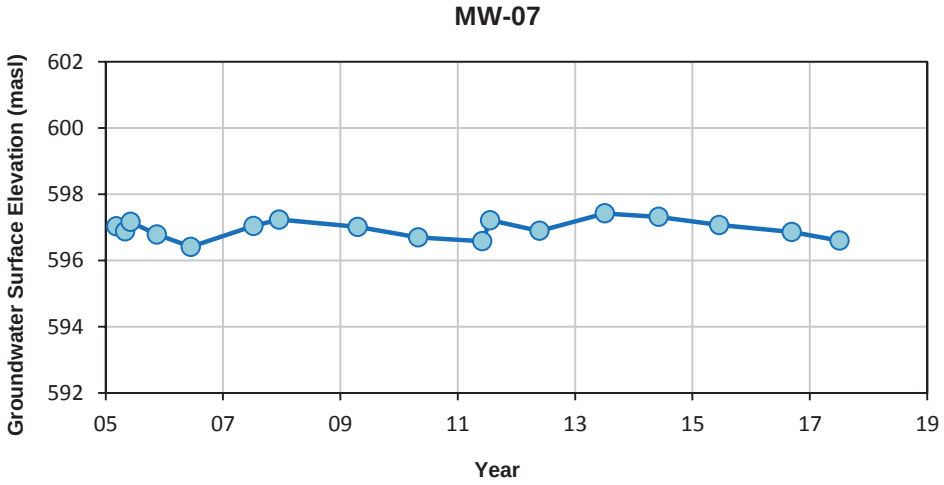
REV A

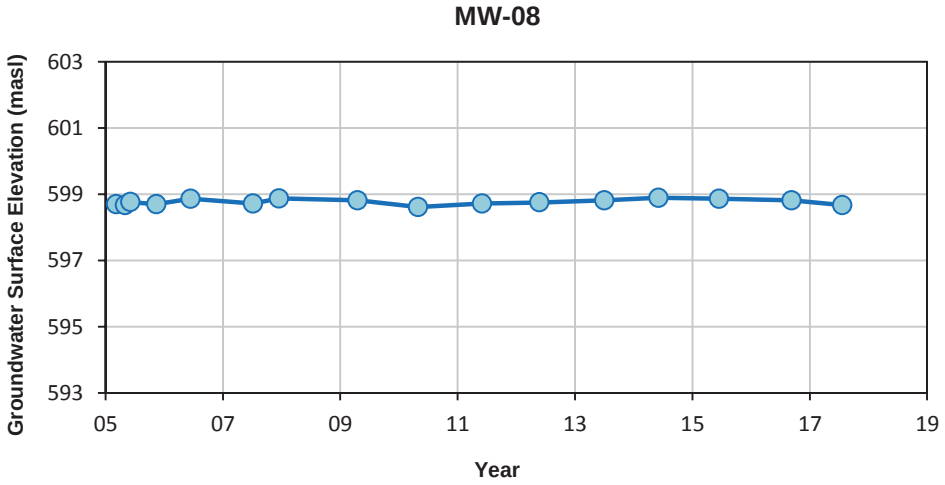
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDMGBS\307075-01608\300-2017_GW_MON\12.0_REPORTS\12.3_BACKENDAPDX 4 HYDROGRAPHS\WORKING FILES\









Notes:

- Filled symbols denote measurable values; unfilled symbols denote dry wells
- Dashed line between data points indicates data gap of more than two years

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

GROUNDWATER HYDROGRAPHS
MW-05, MW-06, MW-07, AND MW-08

Date:	Drawn by:	Edited by:	App'd by:
29-Nov-17	DS		

OneWay to zero harm

Advisian
WorleyParsons Group

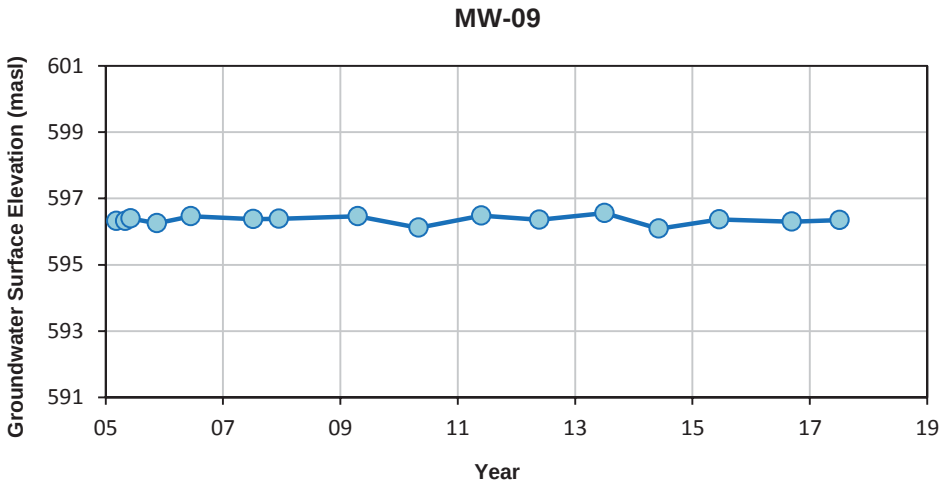
WorleyParsons Project No.: 307075-01608-300

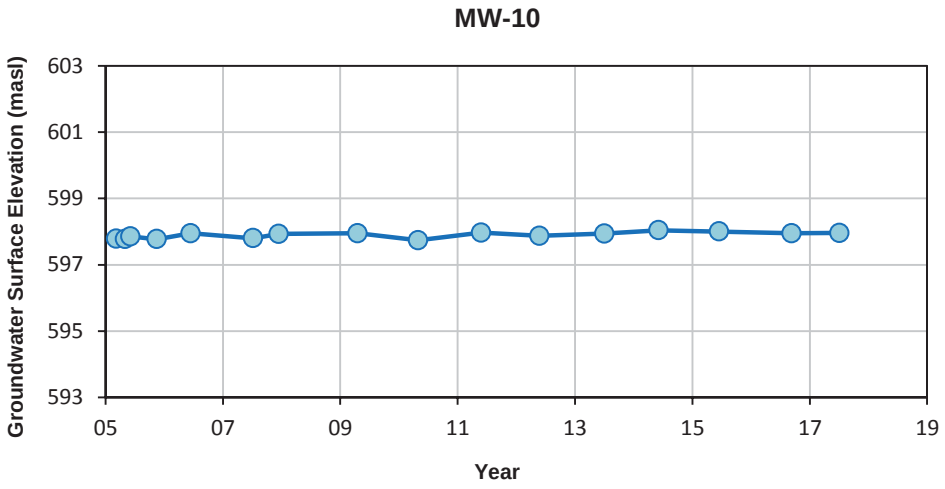
FIG No.: 2

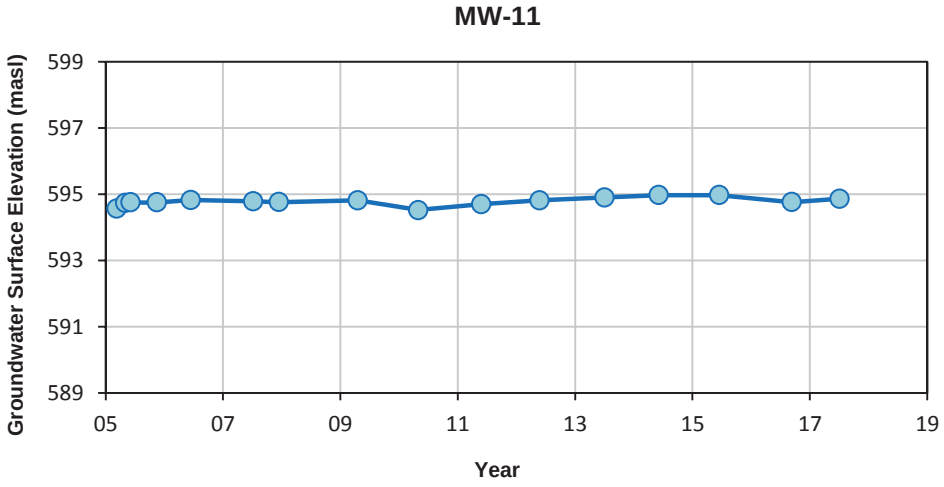
REV: A

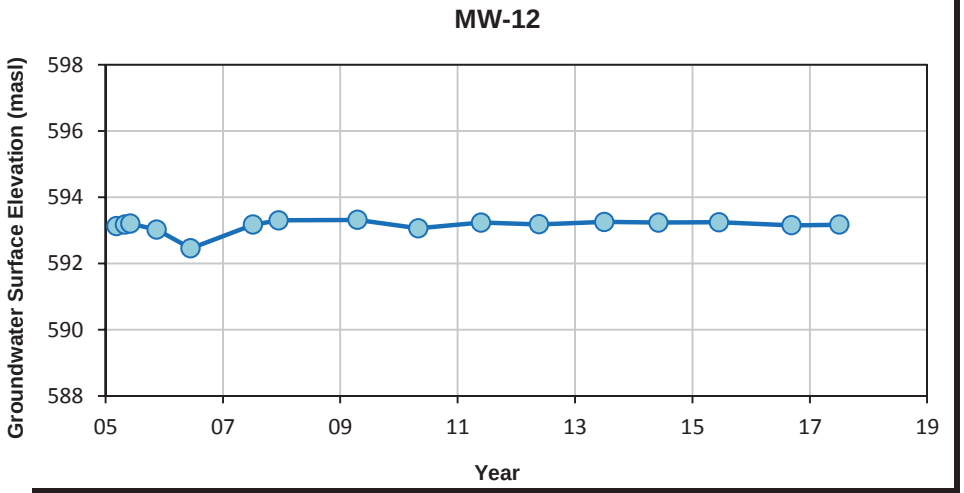
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDMGBS\307075-01608\300-2017_GW_MON\12.0_REPORTS\12.3_BACKENDAPDX 4 HYDROGRAPHS\WORKING FILES\









Notes:

- Filled symbols denote measurable values; unfilled symbols denote dry wells
- Dashed line between data points indicates data gap of more than two years

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

GROUNDWATER HYDROGRAPHS
MW-09, MW-10, MW-11, AND MW-12

Date:	Drawn by:	Edited by:	App'd by:
29-Nov-17	DS		

OneWay to zero harm

Advisian
WorleyParsons Group

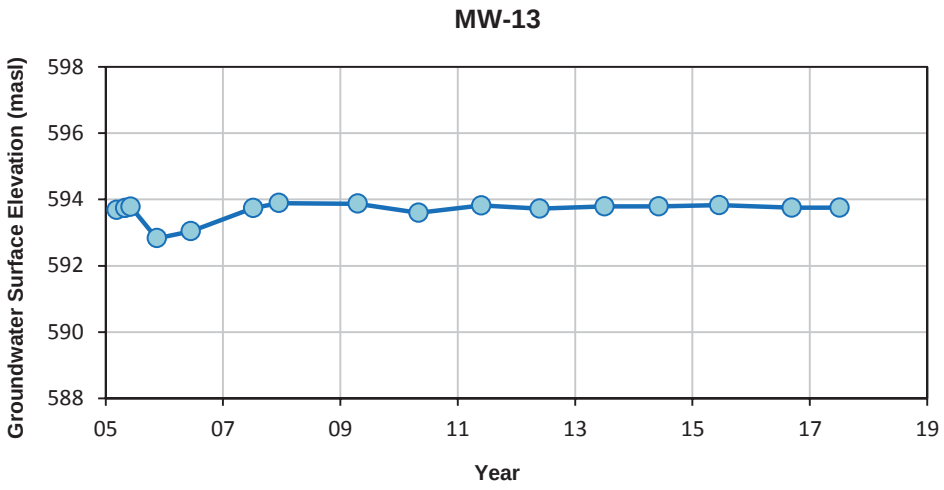
WorleyParsons Project No.: 307075-01608-300

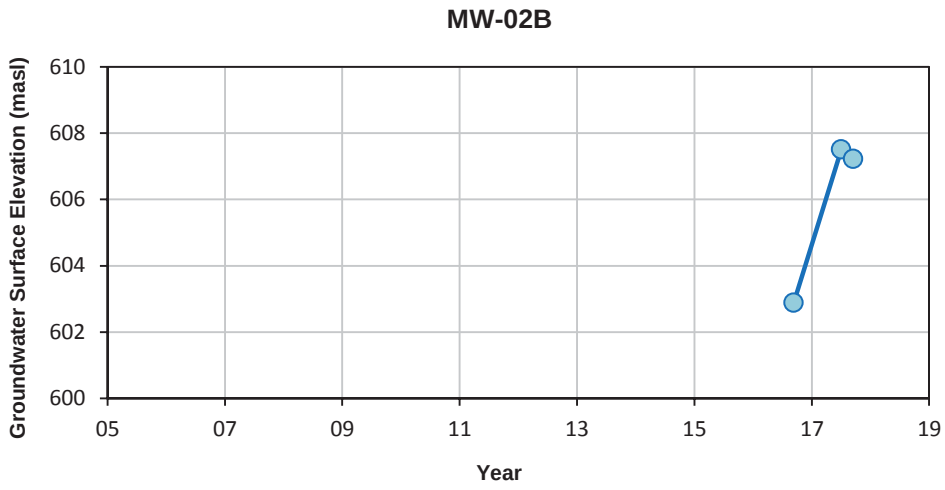
FIG No.: 3

REV: A

FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDMGBS\307075-01608\300-2017_GW_MON\12.0_REPORTS\12.3_BACKENDAPDX 4 HYDROGRAPHS\WORKING FILES\





Notes:

- Filled symbols denote measurable values; unfilled symbols denote dry wells
- Dashed line between data points indicates data gap of more than two years

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

GROUNDWATER HYDROGRAPHS
MW-13, AND MW-02B

Date:	Drawn by:	Edited by:	App'd by:
29-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: 4

REV: A

OneWay to zero harm

Advisian
WorleyParsons Group

FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDMGBS\307075-01608\300-2017_GW_MON\12.0_REPORTS\12.3_BACKENDAPDX 4 HYDROGRAPHS\WORKING FILES\

Appendix 5 Laboratory Analytical Data

WorleyParsons Canada
ATTN: Trevor Butterfield
8615 51 Avenue
Edmonton AB T6E 6A8

Date Received: 15-JUL-17
Report Date: 23-AUG-17 16:29 (MT)
Version: FINAL

Client Phone: 780-496-9055

Certificate of Analysis

Lab Work Order #: L1959232

Project P.O. #: NOT SUBMITTED
Job Reference: 307075-01608-300
C of C Numbers:
Legal Site Desc:

Dana Brown, Chem. Tech. DIPL
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1959232-1 MW-01							
Sampled By: PERD on 13-JUL-17 @ 15:15							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	98.0		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	89.5		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	91.3		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	94.4		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	0.245		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	2.4		1.0	mg/L		04-AUG-17	R3792847
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	489		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	6.27		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					03-AUG-17	R3790992
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00088		0.00010	mg/L		05-AUG-17	R3791712
Barium (Ba)-Dissolved	0.131		0.000050	mg/L		05-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Boron (B)-Dissolved	0.050		0.010	mg/L		05-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		05-AUG-17	R3791712
Calcium (Ca)-Dissolved	91.5		0.050	mg/L		05-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00069		0.00010	mg/L		05-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		05-AUG-17	R3791712
Iron (Fe)-Dissolved	1.93		0.010	mg/L		05-AUG-17	R3791712
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L		05-AUG-17	R3791712
Magnesium (Mg)-Dissolved	27.0		0.0050	mg/L		05-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.714		0.00010	mg/L		05-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000177		0.000050	mg/L		05-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00084		0.00050	mg/L		05-AUG-17	R3791712
Potassium (K)-Dissolved	2.66		0.050	mg/L		05-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		05-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Sodium (Na)-Dissolved	36.2		0.050	mg/L		05-AUG-17	R3791712

* 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
L1959232-1 MW-01							
Sampled By: PERD on 13-JUL-17 @ 15:15							
Matrix: GW							
Dissolved Metals in Water by CRC ICPMS							
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		05-AUG-17	R3791712
Uranium (U)-Dissolved	0.00209		0.000010	mg/L		05-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		05-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.121		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	91.6			%		05-AUG-17	
TDS (Calculated)	459			mg/L		05-AUG-17	
Hardness (as CaCO3)	340			mg/L		05-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	52.2		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.76		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	709		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	453		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	372		2.0	mg/L		16-JUL-17	R3772543
L1959232-2 MW-02							
Sampled By: PERD on 13-JUL-17 @ 12:41							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	96.2		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	86.4		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	89.0		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	97.4		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	0.521		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	6.2		1.0	mg/L		05-AUG-17	R3792393
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930

* 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
L1959232-2 MW-02							
Sampled By: PERD on 13-JUL-17 @ 12:41							
Matrix: GW							
Total Dissolved Solids	900		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	51.7		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					03-AUG-17	R3790992
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00345		0.00010	mg/L		05-AUG-17	R3791712
Barium (Ba)-Dissolved	0.124		0.000050	mg/L		05-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Boron (B)-Dissolved	0.150		0.010	mg/L		05-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		05-AUG-17	R3791712
Calcium (Ca)-Dissolved	140		0.050	mg/L		05-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00057		0.00010	mg/L		05-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		05-AUG-17	R3791712
Iron (Fe)-Dissolved	7.99		0.010	mg/L		05-AUG-17	R3791712
Lead (Pb)-Dissolved	0.000078		0.000050	mg/L		05-AUG-17	R3791712
Magnesium (Mg)-Dissolved	52.2		0.0050	mg/L		05-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.372		0.00010	mg/L		05-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000337		0.000050	mg/L		05-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00105		0.00050	mg/L		05-AUG-17	R3791712
Potassium (K)-Dissolved	4.92		0.050	mg/L		05-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		05-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Sodium (Na)-Dissolved	99.6		0.050	mg/L		05-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		05-AUG-17	R3791712
Uranium (U)-Dissolved	0.00127		0.000010	mg/L		05-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		05-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.056		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	96.4			%		05-AUG-17	
TDS (Calculated)	884			mg/L		05-AUG-17	
Hardness (as CaCO3)	565			mg/L		05-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	224		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.63		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	1310		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	585		5.0	mg/L		16-JUL-17	R3772543

* 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
L1959232-2 MW-02							
Sampled By: PERD on 13-JUL-17 @ 12:41							
Matrix: GW							
pH, Conductivity and Total Alkalinity							
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	480		2.0	mg/L		16-JUL-17	R3772543
L1959232-3 MW-03							
Sampled By: PERD on 13-JUL-17 @ 16:08							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	96.7		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	87.0		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	92.6		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	95.8		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	0.364		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	3.8		1.0	mg/L		05-AUG-17	R3792393
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	629		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	57.6		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					03-AUG-17	R3790992
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00148		0.00010	mg/L		05-AUG-17	R3791712
Barium (Ba)-Dissolved	0.0431		0.000050	mg/L		05-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Boron (B)-Dissolved	0.105		0.010	mg/L		05-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		05-AUG-17	R3791712
Calcium (Ca)-Dissolved	108		0.050	mg/L		05-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00071		0.00010	mg/L		05-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		05-AUG-17	R3791712
Iron (Fe)-Dissolved	5.50		0.010	mg/L		05-AUG-17	R3791712
Lead (Pb)-Dissolved	0.000094		0.000050	mg/L		05-AUG-17	R3791712
Magnesium (Mg)-Dissolved	40.1		0.0050	mg/L		05-AUG-17	R3791712

* 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
L1959232-3 MW-03							
Sampled By: PERD on 13-JUL-17 @ 16:08							
Matrix: GW							
Dissolved Metals in Water by CRC ICPMS							
Manganese (Mn)-Dissolved	0.282		0.00010	mg/L		05-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000371		0.000050	mg/L		05-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00096		0.00050	mg/L		05-AUG-17	R3791712
Potassium (K)-Dissolved	3.12		0.050	mg/L		05-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		05-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Sodium (Na)-Dissolved	52.6		0.050	mg/L		05-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		05-AUG-17	R3791712
Uranium (U)-Dissolved	0.000619		0.000010	mg/L		05-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		05-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.088		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	95.1			%		05-AUG-17	
TDS (Calculated)	612			mg/L		05-AUG-17	
Hardness (as CaCO3)	435			mg/L		05-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	121		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.65		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	958		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	419		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	344		2.0	mg/L		16-JUL-17	R3772543
L1959232-4 MW-04							
Sampled By: PERD on 13-JUL-17 @ 09:35							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	96.7		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	90.2		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	89.4		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							

* 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
L1959232-4 MW-04							
Sampled By: PERD on 13-JUL-17 @ 09:35							
Matrix: GW							
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	95.4		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	<0.050		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	3.7		1.0	mg/L		05-AUG-17	R3792393
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	877		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	171		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					03-AUG-17	R3790992
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00077		0.00010	mg/L		05-AUG-17	R3791712
Barium (Ba)-Dissolved	0.118		0.000050	mg/L		05-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Boron (B)-Dissolved	0.087		0.010	mg/L		05-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		05-AUG-17	R3791712
Calcium (Ca)-Dissolved	154		0.050	mg/L		05-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00043		0.00010	mg/L		05-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		05-AUG-17	R3791712
Iron (Fe)-Dissolved	2.24		0.010	mg/L		05-AUG-17	R3791712
Lead (Pb)-Dissolved	0.000073		0.000050	mg/L		05-AUG-17	R3791712
Magnesium (Mg)-Dissolved	47.7		0.0050	mg/L		05-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.616		0.00010	mg/L		05-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000189		0.000050	mg/L		05-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00210		0.00050	mg/L		05-AUG-17	R3791712
Potassium (K)-Dissolved	9.52		0.050	mg/L		05-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		05-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Sodium (Na)-Dissolved	62.6		0.050	mg/L		05-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		05-AUG-17	R3791712
Uranium (U)-Dissolved	0.00357		0.000010	mg/L		05-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		05-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.102		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	98.1			%		05-AUG-17	
TDS (Calculated)	797			mg/L		05-AUG-17	
Hardness (as CaCO3)	581			mg/L		05-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							

* 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
L1959232-4 MW-04							
Sampled By: PERD on 13-JUL-17 @ 09:35							
Matrix: GW							
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	130		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.78		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	1290		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	425		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	348		2.0	mg/L		16-JUL-17	R3772543
L1959232-5 MW-05							
Sampled By: PERD on 13-JUL-17 @ 11:15							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	100.8		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	92.8		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	89.2		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	93.4		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	0.244		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	4.1		1.0	mg/L		05-AUG-17	R3792393
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	644		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	38.1		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					03-AUG-17	R3790992
Aluminum (Al)-Dissolved	0.0022		0.0010	mg/L		05-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00200		0.00010	mg/L		05-AUG-17	R3791712
Barium (Ba)-Dissolved	0.0515		0.000050	mg/L		05-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712

* 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
L1959232-5 MW-05							
Sampled By: PERD on 13-JUL-17 @ 11:15							
Matrix: GW							
Dissolved Metals in Water by CRC ICPMS							
Boron (B)-Dissolved	0.055		0.010	mg/L		05-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		05-AUG-17	R3791712
Calcium (Ca)-Dissolved	115		0.050	mg/L		05-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		05-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00084		0.00010	mg/L		05-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		05-AUG-17	R3791712
Iron (Fe)-Dissolved	4.82		0.010	mg/L		05-AUG-17	R3791712
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L		05-AUG-17	R3791712
Magnesium (Mg)-Dissolved	38.1		0.0050	mg/L		05-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.742		0.00010	mg/L		05-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000296		0.000050	mg/L		05-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00127		0.00050	mg/L		05-AUG-17	R3791712
Potassium (K)-Dissolved	7.95		0.050	mg/L		05-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		05-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Sodium (Na)-Dissolved	44.6		0.050	mg/L		05-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		05-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		05-AUG-17	R3791712
Uranium (U)-Dissolved	0.000755		0.000010	mg/L		05-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		05-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		05-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.081		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	95.7			%		05-AUG-17	
TDS (Calculated)	610			mg/L		05-AUG-17	
Hardness (as CaCO3)	444			mg/L		05-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	131		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.83		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	934		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	440		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	360		2.0	mg/L		16-JUL-17	R3772543
L1959232-6 MW-06							
Sampled By: PERD on 13-JUL-17 @ 17:31							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985

* 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
L1959232-6 MW-06							
Sampled By: PERD on 13-JUL-17 @ 17:31							
Matrix: GW							
BTEX, Styrene and F1 (C6-C10)							
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	96.7		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	92.0		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	88.1		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	93.1		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	1.56		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	7.7		1.0	mg/L		05-AUG-17	R3792393
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	1240		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	4.81		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					03-AUG-17	R3790992
Aluminum (Al)-Dissolved	0.0124		0.0020	mg/L		05-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00020	DLDS	0.00020	mg/L		05-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00532		0.00020	mg/L		05-AUG-17	R3791712
Barium (Ba)-Dissolved	0.0276		0.00010	mg/L		05-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00020	DLDS	0.00020	mg/L		05-AUG-17	R3791712
Boron (B)-Dissolved	0.132		0.020	mg/L		05-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.000010	DLDS	0.000010	mg/L		05-AUG-17	R3791712
Calcium (Ca)-Dissolved	157		0.10	mg/L		05-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00020	DLDS	0.00020	mg/L		05-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00027		0.00020	mg/L		05-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00040	DLDS	0.00040	mg/L		05-AUG-17	R3791712
Iron (Fe)-Dissolved	5.83		0.020	mg/L		05-AUG-17	R3791712
Lead (Pb)-Dissolved	<0.00010	DLDS	0.00010	mg/L		05-AUG-17	R3791712
Magnesium (Mg)-Dissolved	58.9		0.010	mg/L		05-AUG-17	R3791712
Manganese (Mn)-Dissolved	1.63		0.00020	mg/L		05-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.00090		0.00010	mg/L		05-AUG-17	R3791712
Nickel (Ni)-Dissolved	<0.0010	DLDS	0.0010	mg/L		05-AUG-17	R3791712
Potassium (K)-Dissolved	5.12		0.10	mg/L		05-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.00010	DLDS	0.00010	mg/L		05-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000020	DLDS	0.000020	mg/L		05-AUG-17	R3791712
Sodium (Na)-Dissolved	143		0.10	mg/L		05-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000020	DLDS	0.000020	mg/L		05-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00060	DLDS	0.00060	mg/L		05-AUG-17	R3791712
Uranium (U)-Dissolved	0.00174		0.000020	mg/L		05-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.0010	DLDS	0.0010	mg/L		05-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0020	DLDS	0.0020	mg/L		05-AUG-17	R3791712

* 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
L1959232-6 MW-06							
Sampled By: PERD on 13-JUL-17 @ 17:31							
Matrix: GW							
Fluoride in Water by IC							
Fluoride (F)	0.136		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	91.7			%		05-AUG-17	
TDS (Calculated)	1180			mg/L		05-AUG-17	
Hardness (as CaCO3)	635			mg/L		05-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	494		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.79		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	1620		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	598		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	490		2.0	mg/L		16-JUL-17	R3772543
L1959232-7 MW-07							
Sampled By: PERD on 14-JUL-17 @ 16:20							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	95.7		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	87.5		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	90.7		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	94.1		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	1.79		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	7.3		1.0	mg/L		05-AUG-17	R3792393
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	2050		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	11.6	DLDS	1.0	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539

* 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
L1959232-7 MW-07							
Sampled By: PERD on 14-JUL-17 @ 16:20							
Matrix: GW							
Dissolved Mercury in Water by CVAAS							
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					03-AUG-17	R3790992
Aluminum (Al)-Dissolved	<0.0020	DLDS	0.0020	mg/L		05-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00020	DLDS	0.00020	mg/L		05-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00442		0.00020	mg/L		05-AUG-17	R3791712
Barium (Ba)-Dissolved	0.0503		0.00010	mg/L		05-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00020	DLDS	0.00020	mg/L		05-AUG-17	R3791712
Boron (B)-Dissolved	0.264		0.020	mg/L		05-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.000010	DLDS	0.000010	mg/L		05-AUG-17	R3791712
Calcium (Ca)-Dissolved	249		0.10	mg/L		05-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00020	DLDS	0.00020	mg/L		05-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00086		0.00020	mg/L		05-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00040	DLDS	0.00040	mg/L		05-AUG-17	R3791712
Iron (Fe)-Dissolved	11.2		0.020	mg/L		05-AUG-17	R3791712
Lead (Pb)-Dissolved	<0.00010	DLDS	0.00010	mg/L		05-AUG-17	R3791712
Magnesium (Mg)-Dissolved	83.7		0.010	mg/L		05-AUG-17	R3791712
Manganese (Mn)-Dissolved	1.80		0.00020	mg/L		05-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.00109		0.00010	mg/L		05-AUG-17	R3791712
Nickel (Ni)-Dissolved	<0.0010	DLDS	0.0010	mg/L		05-AUG-17	R3791712
Potassium (K)-Dissolved	5.45		0.10	mg/L		05-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.00010	DLDS	0.00010	mg/L		05-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000020	DLDS	0.000020	mg/L		05-AUG-17	R3791712
Sodium (Na)-Dissolved	238		0.10	mg/L		05-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000020	DLDS	0.000020	mg/L		05-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00060	DLDS	0.00060	mg/L		05-AUG-17	R3791712
Uranium (U)-Dissolved	0.00147		0.000020	mg/L		05-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.0010	DLDS	0.0010	mg/L		05-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0020	DLDS	0.0020	mg/L		05-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.058	DLDS	0.040	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	99.3			%		05-AUG-17	
TDS (Calculated)	1820			mg/L		05-AUG-17	
Hardness (as CaCO3)	966			mg/L		05-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLDS	0.040	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.045		0.045	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLDS	0.020	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	895	DLDS	0.60	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.51		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	2360		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	639		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	524		2.0	mg/L		16-JUL-17	R3772543

* 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
L1959232-8 MW-09							
Sampled By: PERD on 14-JUL-17 @ 10:17							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	99.3		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	84.4		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	105.3		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	95.6		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	2.00		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	6.9		1.0	mg/L		05-AUG-17	R3792847
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	1030		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	5.18		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					04-AUG-17	R3791734
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00260		0.00010	mg/L		04-AUG-17	R3791712
Barium (Ba)-Dissolved	0.0223		0.000050	mg/L		04-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Boron (B)-Dissolved	0.258		0.010	mg/L		04-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		04-AUG-17	R3791712
Calcium (Ca)-Dissolved	90.0		0.050	mg/L		04-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00157		0.00010	mg/L		04-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		04-AUG-17	R3791712
Iron (Fe)-Dissolved	1.96		0.010	mg/L		04-AUG-17	R3791712
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Magnesium (Mg)-Dissolved	27.1		0.0050	mg/L		04-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.872		0.00010	mg/L		04-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000861		0.000050	mg/L		04-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00096		0.00050	mg/L		04-AUG-17	R3791712
Potassium (K)-Dissolved	3.92		0.050	mg/L		04-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Sodium (Na)-Dissolved	240		0.050	mg/L		04-AUG-17	R3791712

* 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
L1959232-8 MW-09							
Sampled By: PERD on 14-JUL-17 @ 10:17							
Matrix: GW							
Dissolved Metals in Water by CRC ICPMS							
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		04-AUG-17	R3791712
Uranium (U)-Dissolved	0.00130		0.000010	mg/L		04-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.216		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	95.6			%		04-AUG-17	
TDS (Calculated)	1030			mg/L		04-AUG-17	
Hardness (as CaCO3)	336			mg/L		04-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	325		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	8.04		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	1440		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	650		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	533		2.0	mg/L		16-JUL-17	R3772543
L1959232-9 MW-10							
Sampled By: PERD on 14-JUL-17 @ 11:33							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	99.1		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	87.8		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	93.2		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	95.0		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	1.75		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	6.4		1.0	mg/L		05-AUG-17	R3792847
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930

* 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
L1959232-9 MW-10							
Sampled By: PERD on 14-JUL-17 @ 11:33							
Matrix: GW							
Total Dissolved Solids	834		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	0.62		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					04-AUG-17	R3791734
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00457		0.00010	mg/L		04-AUG-17	R3791712
Barium (Ba)-Dissolved	0.0311		0.000050	mg/L		04-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Boron (B)-Dissolved	0.154		0.010	mg/L		04-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		04-AUG-17	R3791712
Calcium (Ca)-Dissolved	117		0.050	mg/L		04-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00032		0.00010	mg/L		04-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		04-AUG-17	R3791712
Iron (Fe)-Dissolved	5.98		0.010	mg/L		04-AUG-17	R3791712
Lead (Pb)-Dissolved	0.000056		0.000050	mg/L		04-AUG-17	R3791712
Magnesium (Mg)-Dissolved	36.1		0.0050	mg/L		04-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.674		0.00010	mg/L		04-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000458		0.000050	mg/L		04-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00087		0.00050	mg/L		04-AUG-17	R3791712
Potassium (K)-Dissolved	5.49		0.050	mg/L		04-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Sodium (Na)-Dissolved	115		0.050	mg/L		04-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		04-AUG-17	R3791712
Uranium (U)-Dissolved	0.00112		0.000010	mg/L		04-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.139		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	89.5	BL:INT		%		04-AUG-17	
TDS (Calculated)	828			mg/L		04-AUG-17	
Hardness (as CaCO3)	441			mg/L		04-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	218		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.85		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	1200		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	640		5.0	mg/L		16-JUL-17	R3772543

* 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
L1959232-9 MW-10							
Sampled By: PERD on 14-JUL-17 @ 11:33							
Matrix: GW							
pH, Conductivity and Total Alkalinity							
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	525		2.0	mg/L		16-JUL-17	R3772543
L1959232-10 MW-11							
Sampled By: PERD on 14-JUL-17 @ 12:30							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	97.5		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	88.3		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	89.7		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	93.0		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	1.59		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	7.3		1.0	mg/L		05-AUG-17	R3792847
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	839		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	8.40		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					04-AUG-17	R3791734
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00246		0.00010	mg/L		04-AUG-17	R3791712
Barium (Ba)-Dissolved	0.0405		0.000050	mg/L		04-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Boron (B)-Dissolved	0.187		0.010	mg/L		04-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		04-AUG-17	R3791712
Calcium (Ca)-Dissolved	138		0.050	mg/L		04-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00027		0.00010	mg/L		04-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		04-AUG-17	R3791712
Iron (Fe)-Dissolved	6.84		0.010	mg/L		04-AUG-17	R3791712
Lead (Pb)-Dissolved	0.000051		0.000050	mg/L		04-AUG-17	R3791712
Magnesium (Mg)-Dissolved	43.7		0.0050	mg/L		04-AUG-17	R3791712

* 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
L1959232-10 MW-11							
Sampled By: PERD on 14-JUL-17 @ 12:30							
Matrix: GW							
Dissolved Metals in Water by CRC ICPMS							
Manganese (Mn)-Dissolved	0.618		0.00010	mg/L		04-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000359		0.000050	mg/L		04-AUG-17	R3791712
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Potassium (K)-Dissolved	4.59		0.050	mg/L		04-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Sodium (Na)-Dissolved	92.8		0.050	mg/L		04-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		04-AUG-17	R3791712
Uranium (U)-Dissolved	0.00104		0.000010	mg/L		04-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.087		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	91.6			%		04-AUG-17	
TDS (Calculated)	845			mg/L		04-AUG-17	
Hardness (as CaCO3)	525			mg/L		04-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	215		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.77		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	1220		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	650		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	533		2.0	mg/L		16-JUL-17	R3772543
L1959232-11 MW-12							
Sampled By: PERD on 14-JUL-17 @ 13:28							
Matrix: GW							
ICP Metals & Hg -Dissolved							
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					02-AUG-17	R3788608
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		02-AUG-17	R3789043
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					04-AUG-17	R3791734
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00268		0.00010	mg/L		04-AUG-17	R3791712
Barium (Ba)-Dissolved	0.122		0.000050	mg/L		04-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Boron (B)-Dissolved	0.237		0.010	mg/L		04-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		04-AUG-17	R3791712
Calcium (Ca)-Dissolved	94.1		0.050	mg/L		04-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712

* 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
L1959232-11 MW-12							
Sampled By: PERD on 14-JUL-17 @ 13:28							
Matrix: GW							
Dissolved Metals in Water by CRC ICPMS							
Cobalt (Co)-Dissolved	0.00037		0.00010	mg/L		04-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		04-AUG-17	R3791712
Iron (Fe)-Dissolved	4.18		0.010	mg/L		04-AUG-17	R3791712
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Magnesium (Mg)-Dissolved	27.9		0.0050	mg/L		04-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.437		0.00010	mg/L		04-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.000594		0.000050	mg/L		04-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00052		0.00050	mg/L		04-AUG-17	R3791712
Potassium (K)-Dissolved	4.53		0.050	mg/L		04-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Sodium (Na)-Dissolved	98.9		0.050	mg/L		04-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		04-AUG-17	R3791712
Uranium (U)-Dissolved	0.000867		0.000010	mg/L		04-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	350		0.13	mg/L		04-AUG-17	
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	1.24		0.050	mg/L		02-AUG-17	R3788807
Dissolved Organic Carbon	6.1		1.0	mg/L		03-AUG-17	R3791665
Phenols (4AAP)	<0.0010		0.0010	mg/L		03-AUG-17	R3791173
Total Dissolved Solids	614		10	mg/L		02-AUG-17	R3790116
L1959232-12 MW-13							
Sampled By: PERD on 14-JUL-17 @ 14:31							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	97.9		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	90.0		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	91.1		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	90.0		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	1.32		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	5.1		1.0	mg/L		05-AUG-17	R3792847
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	493		10	mg/L		18-JUL-17	R3777729

* 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
L1959232-12 MW-13							
Sampled By: PERD on 14-JUL-17 @ 14:31							
Matrix: GW							
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	2.43		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					04-AUG-17	R3791734
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00152		0.00010	mg/L		04-AUG-17	R3791712
Barium (Ba)-Dissolved	0.393		0.000050	mg/L		04-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Boron (B)-Dissolved	0.217		0.010	mg/L		04-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		04-AUG-17	R3791712
Calcium (Ca)-Dissolved	42.3		0.050	mg/L		04-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00062		0.00010	mg/L		04-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		04-AUG-17	R3791712
Iron (Fe)-Dissolved	1.29		0.010	mg/L		04-AUG-17	R3791712
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Magnesium (Mg)-Dissolved	15.5		0.0050	mg/L		04-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.227		0.00010	mg/L		04-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.00113		0.000050	mg/L		04-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00081		0.00050	mg/L		04-AUG-17	R3791712
Potassium (K)-Dissolved	3.52		0.050	mg/L		04-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Sodium (Na)-Dissolved	106		0.050	mg/L		04-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		04-AUG-17	R3791712
Uranium (U)-Dissolved	0.000615		0.000010	mg/L		04-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.125		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	89.8	BL:INT		%		04-AUG-17	
TDS (Calculated)	445			mg/L		04-AUG-17	
Hardness (as CaCO3)	169			mg/L		04-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	10.8		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	8.15		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	724		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	503		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543

* 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
L1959232-12 MW-13							
Sampled By: PERD on 14-JUL-17 @ 14:31							
Matrix: GW							
pH, Conductivity and Total Alkalinity							
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	412		2.0	mg/L		16-JUL-17	R3772543
L1959232-13 DUP17-01							
Sampled By: PERD on 13-JUL-17 @ 12:00							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	100.1		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	88.9		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	87.8		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	96.3		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	0.347		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	3.5		1.0	mg/L		05-AUG-17	R3792393
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	631		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	57.9		0.50	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					04-AUG-17	R3791734
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00138		0.00010	mg/L		04-AUG-17	R3791712
Barium (Ba)-Dissolved	0.0437		0.000050	mg/L		04-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Boron (B)-Dissolved	0.111		0.010	mg/L		04-AUG-17	R3791712
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		04-AUG-17	R3791712
Calcium (Ca)-Dissolved	111		0.050	mg/L		04-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00066		0.00010	mg/L		04-AUG-17	R3791712
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		04-AUG-17	R3791712
Iron (Fe)-Dissolved	5.20		0.010	mg/L		04-AUG-17	R3791712
Lead (Pb)-Dissolved	0.000090		0.000050	mg/L		04-AUG-17	R3791712
Magnesium (Mg)-Dissolved	37.2		0.0050	mg/L		04-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.260		0.00010	mg/L		04-AUG-17	R3791712

* 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
L1959232-13 DUP17-01							
Sampled By: PERD on 13-JUL-17 @ 12:00							
Matrix: GW							
Dissolved Metals in Water by CRC ICPMS							
Molybdenum (Mo)-Dissolved	0.000407		0.000050	mg/L		04-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.00088		0.00050	mg/L		04-AUG-17	R3791712
Potassium (K)-Dissolved	2.91		0.050	mg/L		04-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Sodium (Na)-Dissolved	49.8		0.050	mg/L		04-AUG-17	R3791712
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		04-AUG-17	R3791712
Uranium (U)-Dissolved	0.000597		0.000010	mg/L		04-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.082		0.020	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	93.3			%		04-AUG-17	
TDS (Calculated)	609			mg/L		04-AUG-17	
Hardness (as CaCO3)	430			mg/L		04-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	122		0.30	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	7.78		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	958		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	418		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Alkalinity, Total (as CaCO3)	343		2.0	mg/L		16-JUL-17	R3772543
L1959232-14 DUP17-02							
Sampled By: PERD on 14-JUL-17 @ 12:00							
Matrix: GW							
ICP Metals & Hg -Dissolved							
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					02-AUG-17	R3788608
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		02-AUG-17	R3789043
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					04-AUG-17	R3791734
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Arsenic (As)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Boron (B)-Dissolved	<0.010		0.010	mg/L		17-AUG-17	R3803285
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		04-AUG-17	R3791712
Calcium (Ca)-Dissolved	<0.050		0.050	mg/L		04-AUG-17	R3791712
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712

* 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
L1959232-14 DUP17-02							
Sampled By: PERD on 14-JUL-17 @ 12:00							
Matrix: GW							
Dissolved Metals in Water by CRC ICPMS							
Copper (Cu)-Dissolved	0.00027		0.00020	mg/L		17-AUG-17	R3803285
Iron (Fe)-Dissolved	<0.010		0.010	mg/L		04-AUG-17	R3791712
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Magnesium (Mg)-Dissolved	<0.0050		0.0050	mg/L		17-AUG-17	R3803285
Manganese (Mn)-Dissolved	<0.00010		0.00010	mg/L		04-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Potassium (K)-Dissolved	<0.050		0.050	mg/L		04-AUG-17	R3791712
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Sodium (Na)-Dissolved	0.102		0.050	mg/L		17-AUG-17	R3803285
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		04-AUG-17	R3791712
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		04-AUG-17	R3791712
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		04-AUG-17	R3791712
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.13		0.13	mg/L		18-AUG-17	
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	<0.050		0.050	mg/L		02-AUG-17	R3788807
Dissolved Organic Carbon	<1.0		1.0	mg/L		03-AUG-17	R3791665
Phenols (4AAP)	<0.0010		0.0010	mg/L		03-AUG-17	R3791173
Total Dissolved Solids	<10		10	mg/L		02-AUG-17	R3790116
L1959232-15 MW-02B							
Sampled By: PERD on 14-JUL-17 @ 17:30							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Toluene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
EthylBenzene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
m+p-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
o-Xylene	<0.00050		0.00050	mg/L	16-JUL-17	18-JUL-17	R3775985
Styrene	<0.0010		0.0010	mg/L	16-JUL-17	18-JUL-17	R3775985
F1(C6-C10)	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
F1-BTEX	<0.10		0.10	mg/L	16-JUL-17	18-JUL-17	R3775985
Xylenes	<0.00071		0.00071	mg/L	16-JUL-17	18-JUL-17	R3775985
Surrogate: 1,4-Difluorobenzene (SS)	97.3		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 4-Bromofluorobenzene (SS)	85.4		70-130	%	16-JUL-17	18-JUL-17	R3775985
Surrogate: 3,4-Dichlorotoluene (SS)	91.6		70-130	%	16-JUL-17	18-JUL-17	R3775985
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	16-JUL-17	16-JUL-17	R3777728
Surrogate: 2-Bromobenzotrifluoride	100.6		60-140	%	16-JUL-17	16-JUL-17	R3777728
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	1.59		0.050	mg/L		29-JUL-17	R3785154
Dissolved Organic Carbon	7.9		1.0	mg/L		04-AUG-17	R3792393
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-JUL-17	R3782274
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	1850		10	mg/L		18-JUL-17	R3777729
Major Ions & Trace Dissolved Metals							

* 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
L1959232-15 MW-02B							
Sampled By: PERD on 14-JUL-17 @ 17:30							
Matrix: GW							
Chloride in Water by IC							
Chloride (Cl)	804	DLDS	1.0	mg/L		16-JUL-17	R3776448
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					16-JUL-17	R3772539
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		16-JUL-17	R3772616
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					04-AUG-17	R3791734
Aluminum (Al)-Dissolved	0.0160		0.0050	mg/L		04-AUG-17	R3791712
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L		04-AUG-17	R3791712
Arsenic (As)-Dissolved	0.00707		0.00050	mg/L		04-AUG-17	R3791712
Barium (Ba)-Dissolved	0.646		0.00025	mg/L		04-AUG-17	R3791712
Beryllium (Be)-Dissolved	0.00325		0.00050	mg/L		04-AUG-17	R3791712
Boron (B)-Dissolved	0.705		0.050	mg/L		04-AUG-17	R3791712
Cadmium (Cd)-Dissolved	0.00297		0.000025	mg/L		04-AUG-17	R3791712
Calcium (Ca)-Dissolved	35.8		0.25	mg/L		04-AUG-17	R3791712
Chromium (Cr)-Dissolved	0.00321		0.00050	mg/L		04-AUG-17	R3791712
Cobalt (Co)-Dissolved	0.00328		0.00050	mg/L		04-AUG-17	R3791712
Copper (Cu)-Dissolved	0.0032		0.0010	mg/L		04-AUG-17	R3791712
Iron (Fe)-Dissolved	0.687		0.050	mg/L		04-AUG-17	R3791712
Lead (Pb)-Dissolved	0.00317		0.00025	mg/L		04-AUG-17	R3791712
Magnesium (Mg)-Dissolved	7.18		0.025	mg/L		04-AUG-17	R3791712
Manganese (Mn)-Dissolved	0.200		0.00050	mg/L		04-AUG-17	R3791712
Molybdenum (Mo)-Dissolved	0.0112		0.00025	mg/L		04-AUG-17	R3791712
Nickel (Ni)-Dissolved	0.0035		0.0025	mg/L		04-AUG-17	R3791712
Potassium (K)-Dissolved	3.60		0.25	mg/L		04-AUG-17	R3791712
Selenium (Se)-Dissolved	0.00332		0.00025	mg/L		04-AUG-17	R3791712
Silver (Ag)-Dissolved	<0.000050		0.000050	mg/L		04-AUG-17	R3791712
Sodium (Na)-Dissolved	589		0.25	mg/L		04-AUG-17	R3791712
Thallium (Tl)-Dissolved	0.00580		0.000050	mg/L		04-AUG-17	R3791712
Titanium (Ti)-Dissolved	<0.0015		0.0015	mg/L		04-AUG-17	R3791712
Uranium (U)-Dissolved	0.00601		0.000050	mg/L		04-AUG-17	R3791712
Vanadium (V)-Dissolved	0.0034		0.0025	mg/L		04-AUG-17	R3791712
Zinc (Zn)-Dissolved	0.0088		0.0050	mg/L		04-AUG-17	R3791712
Fluoride in Water by IC							
Fluoride (F)	0.475	DLDS	0.040	mg/L		16-JUL-17	R3776448
Ion Balance Calculation							
Ion Balance	93.8			%		04-AUG-17	
TDS (Calculated)	1660			mg/L		04-AUG-17	
Hardness (as CaCO3)	119			mg/L		04-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLDS	0.040	mg/L		16-JUL-17	R3776448
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.045		0.045	mg/L		18-JUL-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLDS	0.020	mg/L		16-JUL-17	R3776448
Sulfate in Water by IC							
Sulfate (SO4)	13.3	DLDS	0.60	mg/L		16-JUL-17	R3776448
pH, Conductivity and Total Alkalinity							
pH	8.29		0.10	pH		16-JUL-17	R3772543
Conductivity (EC)	3210		2.0	uS/cm		16-JUL-17	R3772543
Bicarbonate (HCO3)	403		5.0	mg/L		16-JUL-17	R3772543
Carbonate (CO3)	<5.0		5.0	mg/L		16-JUL-17	R3772543
Hydroxide (OH)	<5.0		5.0	mg/L		16-JUL-17	R3772543

* 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
L1959232-15 MW-02B							
Sampled By: PERD on 14-JUL-17 @ 17:30							
Matrix: GW							
pH, Conductivity and Total Alkalinity							
Alkalinity, Total (as CaCO3)	330		2.0	mg/L		16-JUL-17	R3772543
L1959232-16 MW-12 (RESAMPLE)							
Sampled By: CLIENT on 02-AUG-17 @ 10:22							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
Toluene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
EthylBenzene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
m+p-Xylene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
o-Xylene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
Styrene	<0.0010		0.0010	mg/L	03-AUG-17	04-AUG-17	R3791520
F1(C6-C10)	<0.10		0.10	mg/L	03-AUG-17	04-AUG-17	R3791520
F1-BTEX	<0.10		0.10	mg/L	03-AUG-17	04-AUG-17	R3791520
Xylenes	<0.00071		0.00071	mg/L	03-AUG-17	04-AUG-17	R3791520
Surrogate: 1,4-Difluorobenzene (SS)	101.3		70-130	%	03-AUG-17	04-AUG-17	R3791520
Surrogate: 4-Bromofluorobenzene (SS)	85.0		70-130	%	03-AUG-17	04-AUG-17	R3791520
Surrogate: 3,4-Dichlorotoluene (SS)	118.0		70-130	%	03-AUG-17	04-AUG-17	R3791520
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	03-AUG-17	03-AUG-17	R3791876
Surrogate: 2-Bromobenzotrifluoride	96.8		60-140	%	03-AUG-17	03-AUG-17	R3791876
Miscellaneous Parameters							
Special Request	See Attached					15-AUG-17	R3800930
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-17	R3805524
Calcium (Ca)-Dissolved	86.0		0.050	mg/L		21-AUG-17	R3804951
Magnesium (Mg)-Dissolved	26.9		0.0050	mg/L		21-AUG-17	R3804951
Potassium (K)-Dissolved	4.61		0.050	mg/L		21-AUG-17	R3804951
Sodium (Na)-Dissolved	95.7		0.050	mg/L		21-AUG-17	R3804951
Routine Water Analysis							
Chloride in Water by IC							
Chloride (Cl)	6.42		0.50	mg/L		02-AUG-17	R3791474
Fluoride in Water by IC							
Fluoride (F)	0.114		0.020	mg/L		02-AUG-17	R3791474
Ion Balance Calculation							
Ion Balance	89.4	BL:INT		%		22-AUG-17	
TDS (Calculated)	597			mg/L		22-AUG-17	
Hardness (as CaCO3)	326			mg/L		22-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		02-AUG-17	R3791474
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		06-AUG-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		02-AUG-17	R3791474
Sulfate in Water by IC							
Sulfate (SO4)	43.4		0.30	mg/L		02-AUG-17	R3791474
pH, Conductivity and Total Alkalinity							
pH	7.43		0.10	pH		02-AUG-17	R3788060
Conductivity (EC)	1010		2.0	uS/cm		02-AUG-17	R3788060
Bicarbonate (HCO3)	639		5.0	mg/L		02-AUG-17	R3788060
Carbonate (CO3)	<5.0		5.0	mg/L		02-AUG-17	R3788060

* 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
L1959232-16 MW-12 (RESAMPLE)							
Sampled By: CLIENT on 02-AUG-17 @ 10:22							
Matrix: GW							
pH, Conductivity and Total Alkalinity							
Hydroxide (OH)	<5.0		5.0	mg/L		02-AUG-17	R3788060
Alkalinity, Total (as CaCO3)	524		2.0	mg/L		02-AUG-17	R3788060
L1959232-17 DUP17-02 (RESAMPLE)							
Sampled By: CLIENT on 02-AUG-17 @ 09:45							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
Toluene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
EthylBenzene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
m+p-Xylene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
o-Xylene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
Styrene	<0.0010		0.0010	mg/L	03-AUG-17	04-AUG-17	R3791520
F1(C6-C10)	<0.10		0.10	mg/L	03-AUG-17	04-AUG-17	R3791520
F1-BTEX	<0.10		0.10	mg/L	03-AUG-17	04-AUG-17	R3791520
Xylenes	<0.00071		0.00071	mg/L	03-AUG-17	04-AUG-17	R3791520
Surrogate: 1,4-Difluorobenzene (SS)	101.1		70-130	%	03-AUG-17	04-AUG-17	R3791520
Surrogate: 4-Bromofluorobenzene (SS)	85.4		70-130	%	03-AUG-17	04-AUG-17	R3791520
Surrogate: 3,4-Dichlorotoluene (SS)	118.4		70-130	%	03-AUG-17	04-AUG-17	R3791520
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	03-AUG-17	03-AUG-17	R3791876
Surrogate: 2-Bromobenzotrifluoride	92.5		60-140	%	03-AUG-17	03-AUG-17	R3791876
Miscellaneous Parameters							
Special Request	See Attached					15-AUG-17	R3800930
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-17	R3805524
Calcium (Ca)-Dissolved	0.110		0.050	mg/L		21-AUG-17	R3804951
Magnesium (Mg)-Dissolved	0.0108		0.0050	mg/L		21-AUG-17	R3804951
Potassium (K)-Dissolved	<0.050		0.050	mg/L		21-AUG-17	R3804951
Sodium (Na)-Dissolved	0.085		0.050	mg/L		21-AUG-17	R3804951
Routine Water Analysis							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		02-AUG-17	R3791474
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		02-AUG-17	R3791474
Ion Balance Calculation							
Ion Balance	Low TDS			%		22-AUG-17	
TDS (Calculated)	<1.0			mg/L		22-AUG-17	
Hardness (as CaCO3)	<1.0			mg/L		22-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		02-AUG-17	R3791474
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.022		0.022	mg/L		06-AUG-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		02-AUG-17	R3791474
Sulfate in Water by IC							
Sulfate (SO4)	<0.30		0.30	mg/L		02-AUG-17	R3791474
pH, Conductivity and Total Alkalinity							
pH	6.17		0.10	pH		02-AUG-17	R3788060
Conductivity (EC)	<2.0		2.0	uS/cm		02-AUG-17	R3788060
Bicarbonate (HCO3)	<5.0		5.0	mg/L		02-AUG-17	R3788060

* 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
L1959232-17 DUP17-02 (RESAMPLE)							
Sampled By: CLIENT on 02-AUG-17 @ 09:45							
Matrix: GW							
pH, Conductivity and Total Alkalinity							
Carbonate (CO3)	<5.0		5.0	mg/L		02-AUG-17	R3788060
Hydroxide (OH)	<5.0		5.0	mg/L		02-AUG-17	R3788060
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		02-AUG-17	R3788060

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
BL:INT	Balance Reviewed: Interference Or Non-Measured Component
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTXS,F1-ED	Water	BTEX, Styrene and F1 (C6-C10)	EPA 5021/8015&8260 GC-MS & FID
C-DIS-ORG-CL	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

C-DIS-ORG-ED	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

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

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

ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
F-IC-N-ED	Water	Fluoride in Water by IC	EPA 300.1 (mod)

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

F2-ED	Water	F2 (>C10-C16)	EPA 3510/CCME PHC CWS-GC-FID
HG-D-CVAA-ED	Water	Dissolved Mercury in Water by CVAAS	APHA 3030B/EPA 1631E (mod)

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

IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-CL	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

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

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

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

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

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

NH3-D-COL-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	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-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed).
pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.
Alkalinity measurement is based on the sample's capacity to neutralize acid. Auto-titration to pH 4.5 using 0.02N H_2SO_4 is performed.
Conductivity measurement is based on the sample's capacity to convey an electric current, and is measured with a conductivity meter.

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

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

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

SOLIDS-TDS-ED	Water	Total Dissolved Solids	APHA 2540 C

Gravimetric determination of solids in waters by filtration and evaporating filtrate to dryness at 180 degrees Celsius.

SPECIAL REQUEST-IS	Misc.	Special Request Isobrine Solutions	SEE SUBLET LAB RESULTS

** 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
IS	ISOBRINE SOLUTIONS INC
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

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: WorleyParsons Canada
8615 51 Avenue
Edmonton AB T6E 6A8
Contact: Trevor Butterfield

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTXS,F1-ED	**Water**							
Batch R3775985								
WG2571176-4 DUP		**L1959232-2**						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	18-JUL-17
Toluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	18-JUL-17
EthylBenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	18-JUL-17
m+p-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	18-JUL-17
o-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	18-JUL-17
Styrene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	18-JUL-17
F1(C6-C10)		<0.10	<0.10	RPD-NA	mg/L	N/A	30	18-JUL-17
WG2571176-2 LCS								
Benzene			103.7		%		70-130	18-JUL-17
Toluene			98.0		%		70-130	18-JUL-17
EthylBenzene			104.3		%		70-130	18-JUL-17
m+p-Xylene			99.9		%		70-130	18-JUL-17
o-Xylene			106.7		%		70-130	18-JUL-17
Styrene			101.9		%		70-130	18-JUL-17
WG2571176-3 LCS								
F1(C6-C10)			104.2		%		70-130	18-JUL-17
WG2571176-1 MB								
Benzene			<0.00050		mg/L		0.0005	18-JUL-17
Toluene			<0.00050		mg/L		0.0005	18-JUL-17
EthylBenzene			<0.00050		mg/L		0.0005	18-JUL-17
m+p-Xylene			<0.00050		mg/L		0.0005	18-JUL-17
o-Xylene			<0.00050		mg/L		0.0005	18-JUL-17
Styrene			<0.0010		mg/L		0.001	18-JUL-17
F1(C6-C10)			<0.10		mg/L		0.1	18-JUL-17
Surrogate: 1,4-Difluorobenzene (SS)			95.5		%		70-130	18-JUL-17
Surrogate: 4-Bromofluorobenzene (SS)			90.2		%		70-130	18-JUL-17
Surrogate: 3,4-Dichlorotoluene (SS)			81.0		%		70-130	18-JUL-17
WG2571176-5 MS		**L1959232-15**						
Benzene			100.2		%		50-150	18-JUL-17
Toluene			93.3		%		50-150	18-JUL-17
EthylBenzene			105.9		%		50-150	18-JUL-17
m+p-Xylene			98.9		%		50-150	18-JUL-17
o-Xylene			106.3		%		50-150	18-JUL-17
Styrene			95.9		%		50-150	18-JUL-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTXS,F1-ED	**Water**							
Batch R3791520								
WG2585036-4 DUP		**L1959232-16**						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	04-AUG-17
Toluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	04-AUG-17
EthylBenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	04-AUG-17
m+p-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	04-AUG-17
o-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	04-AUG-17
Styrene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	50	04-AUG-17
F1(C6-C10)		<0.10	<0.10	RPD-NA	mg/L	N/A	30	04-AUG-17
WG2585036-2 LCS								
Benzene			100.9		%		70-130	04-AUG-17
Toluene			91.8		%		70-130	04-AUG-17
EthylBenzene			95.8		%		70-130	04-AUG-17
m+p-Xylene			98.0		%		70-130	04-AUG-17
o-Xylene			100.2		%		70-130	04-AUG-17
Styrene			99.0		%		70-130	04-AUG-17
WG2585036-3 LCS								
F1(C6-C10)			116.5		%		70-130	04-AUG-17
WG2585036-1 MB								
Benzene			<0.00050		mg/L		0.0005	04-AUG-17
Toluene			<0.00050		mg/L		0.0005	04-AUG-17
EthylBenzene			<0.00050		mg/L		0.0005	04-AUG-17
m+p-Xylene			<0.00050		mg/L		0.0005	04-AUG-17
o-Xylene			<0.00050		mg/L		0.0005	04-AUG-17
Styrene			<0.0010		mg/L		0.001	04-AUG-17
F1(C6-C10)			<0.10		mg/L		0.1	04-AUG-17
Surrogate: 1,4-Difluorobenzene (SS)			100.2		%		70-130	04-AUG-17
Surrogate: 4-Bromofluorobenzene (SS)			85.0		%		70-130	04-AUG-17
Surrogate: 3,4-Dichlorotoluene (SS)			113.2		%		70-130	04-AUG-17
C-DIS-ORG-CL	**Water**							
Batch R3792393								
WG2586557-11 DUP		**L1959232-13**						
Dissolved Organic Carbon		3.5	3.6		mg/L	4.0	20	05-AUG-17
WG2586557-10 LCS								
Dissolved Organic Carbon			103.2		%		80-120	04-AUG-17
WG2586557-6 LCS								
Dissolved Organic Carbon			103.0		%		80-120	04-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DIS-ORG-CL	**Water**							
Batch R3792393								
WG2586557-5 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	04-AUG-17
WG2586557-9 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	04-AUG-17
WG2586557-8 MS		**L1959232-15**						
Dissolved Organic Carbon			99.6		%		70-130	04-AUG-17
Batch R3792847								
WG2586680-2 LCS								
Dissolved Organic Carbon			93.9		%		80-120	04-AUG-17
WG2586680-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	04-AUG-17
C-DIS-ORG-ED	**Water**							
Batch R3791665								
WG2584923-3 DUP		**L1959232-11**						
Dissolved Organic Carbon		6.1	6.1		mg/L	0.1	20	03-AUG-17
WG2584923-2 LCS		**CARBON HI@40**						
Dissolved Organic Carbon			93.7		%		80-120	03-AUG-17
WG2584923-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	03-AUG-17
WG2584923-4 MS		**L1959232-14**						
Dissolved Organic Carbon			94.1		%		70-130	03-AUG-17
CL-IC-N-ED	**Water**							
Batch R3776448								
WG2570971-9 DUP		**L1959232-5**						
Chloride (Cl)		38.1	38.3		mg/L	0.6	20	16-JUL-17
WG2570971-15 LCS								
Chloride (Cl)			100.9		%		90-110	15-JUL-17
WG2570971-17 LCS								
Chloride (Cl)			100.3		%		90-110	15-JUL-17
WG2570971-19 LCS								
Chloride (Cl)			100.9		%		90-110	16-JUL-17
WG2570971-2 LCS								
Chloride (Cl)			100.2		%		90-110	16-JUL-17
WG2570971-21 LCS								
Chloride (Cl)			100.3		%		90-110	16-JUL-17
WG2570971-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	16-JUL-17
WG2570971-16 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-IC-N-ED	**Water**							
Batch R3776448								
WG2570971-16 MB								
Chloride (Cl)			<0.50		mg/L		0.5	15-JUL-17
WG2570971-18 MB								
Chloride (Cl)			<0.50		mg/L		0.5	15-JUL-17
WG2570971-20 MB								
Chloride (Cl)			<0.50		mg/L		0.5	16-JUL-17
WG2570971-22 MB								
Chloride (Cl)			<0.50		mg/L		0.5	16-JUL-17
WG2570971-10 MS		**L1959232-5**						
Chloride (Cl)			99.7		%		75-125	16-JUL-17
Batch R3791474								
WG2583691-13 LCS								
Chloride (Cl)			98.7		%		90-110	02-AUG-17
WG2583691-17 LCS								
Chloride (Cl)			98.1		%		90-110	02-AUG-17
WG2583691-2 LCS								
Chloride (Cl)			98.0		%		90-110	02-AUG-17
WG2583691-23 LCS								
Chloride (Cl)			98.7		%		90-110	02-AUG-17
WG2583691-5 LCS								
Chloride (Cl)			98.7		%		90-110	02-AUG-17
WG2583691-9 LCS								
Chloride (Cl)			98.8		%		90-110	02-AUG-17
WG2583691-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-10 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-14 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-18 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-24 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-6 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
F-IC-N-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-ED	**Water**							
Batch R3776448								
WG2570971-9 DUP		**L1959232-5**						
Fluoride (F)		0.081	0.081		mg/L	0.0	20	16-JUL-17
WG2570971-15 LCS								
Fluoride (F)			100.2		%		90-110	15-JUL-17
WG2570971-17 LCS								
Fluoride (F)			101.0		%		90-110	15-JUL-17
WG2570971-19 LCS								
Fluoride (F)			99.5		%		90-110	16-JUL-17
WG2570971-2 LCS								
Fluoride (F)			97.6		%		90-110	16-JUL-17
WG2570971-21 LCS								
Fluoride (F)			101.0		%		90-110	16-JUL-17
WG2570971-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	16-JUL-17
WG2570971-16 MB								
Fluoride (F)			<0.020		mg/L		0.02	15-JUL-17
WG2570971-18 MB								
Fluoride (F)			<0.020		mg/L		0.02	15-JUL-17
WG2570971-20 MB								
Fluoride (F)			<0.020		mg/L		0.02	16-JUL-17
WG2570971-22 MB								
Fluoride (F)			<0.020		mg/L		0.02	16-JUL-17
WG2570971-10 MS		**L1959232-5**						
Fluoride (F)			96.3		%		75-125	16-JUL-17
Batch R3791474								
WG2583691-13 LCS								
Fluoride (F)			104.3		%		90-110	02-AUG-17
WG2583691-17 LCS								
Fluoride (F)			104.3		%		90-110	02-AUG-17
WG2583691-2 LCS								
Fluoride (F)			100.3		%		90-110	02-AUG-17
WG2583691-23 LCS								
Fluoride (F)			106.9		%		90-110	02-AUG-17
WG2583691-5 LCS								
Fluoride (F)			108.2		%		90-110	02-AUG-17
WG2583691-9 LCS								
Fluoride (F)			105.8		%		90-110	02-AUG-17
WG2583691-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-10 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-14 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-18 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-24 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-6 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
F2-ED	**Water**							
Batch R3777728								
WG2571190-2 LCS		**DIESEL/MOTOR OIL**						
F2 (C10-C16)			105.7		%		70-130	16-JUL-17
WG2571190-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	16-JUL-17
Surrogate: 2-Bromobenzotrifluoride			90.3		%		60-140	16-JUL-17
Batch R3791876								
WG2584469-2 LCS								
F2 (C10-C16)			106.6		%		70-130	03-AUG-17
WG2584469-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	03-AUG-17
Surrogate: 2-Bromobenzotrifluoride			86.7		%		60-140	03-AUG-17
HG-D-CVAA-ED	**Water**							
Batch R3772616								
WG2571088-15 DUP		**L1959232-8**						
Mercury (Hg)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	16-JUL-17
WG2571088-10 LCS								
Mercury (Hg)-Dissolved			92.4		%		80-120	16-JUL-17
WG2571088-14 LCS								
Mercury (Hg)-Dissolved			92.0		%		80-120	16-JUL-17
WG2571088-13 MB								
Mercury (Hg)-Dissolved			<0.000005C		mg/L		0.000005	16-JUL-17
WG2571088-9 MB								
Mercury (Hg)-Dissolved			<0.000005C		mg/L		0.000005	16-JUL-17
WG2571088-16 MS		**L1959232-9**						
Mercury (Hg)-Dissolved			76.6		%		70-130	16-JUL-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-D-CVAA-ED	**Water**							
Batch R3789043								
WG2583933-2 LCS								
Mercury (Hg)-Dissolved			88.0		%		80-120	02-AUG-17
WG2583933-1 MB								
Mercury (Hg)-Dissolved			<0.000005(		mg/L		0.000005	02-AUG-17
MET-D-CCMS-CL	**Water**							
Batch R3804951								
WG2597409-12 LCS		**TMRM**						
Calcium (Ca)-Dissolved			97.6		%		80-120	21-AUG-17
Magnesium (Mg)-Dissolved			94.3		%		80-120	21-AUG-17
Potassium (K)-Dissolved			104.5		%		80-120	21-AUG-17
Sodium (Na)-Dissolved			98.6		%		80-120	21-AUG-17
WG2597409-15 LCS		**TMRM**						
Calcium (Ca)-Dissolved			96.2		%		80-120	21-AUG-17
Magnesium (Mg)-Dissolved			100.8		%		80-120	21-AUG-17
Potassium (K)-Dissolved			104.1		%		80-120	21-AUG-17
Sodium (Na)-Dissolved			105.2		%		80-120	21-AUG-17
WG2597409-18 LCS		**TMRM**						
Calcium (Ca)-Dissolved			97.6		%		80-120	21-AUG-17
Magnesium (Mg)-Dissolved			99.2		%		80-120	21-AUG-17
Potassium (K)-Dissolved			101.5		%		80-120	21-AUG-17
Sodium (Na)-Dissolved			99.3		%		80-120	21-AUG-17
WG2597409-2 LCS		**TMRM**						
Calcium (Ca)-Dissolved			93.7		%		80-120	21-AUG-17
Magnesium (Mg)-Dissolved			92.6		%		80-120	21-AUG-17
Potassium (K)-Dissolved			98.3		%		80-120	21-AUG-17
Sodium (Na)-Dissolved			102.5		%		80-120	21-AUG-17
WG2597409-5 LCS		**TMRM**						
Calcium (Ca)-Dissolved			97.8		%		80-120	21-AUG-17
Magnesium (Mg)-Dissolved			98.8		%		80-120	21-AUG-17
Potassium (K)-Dissolved			100.6		%		80-120	21-AUG-17
Sodium (Na)-Dissolved			104.0		%		80-120	21-AUG-17
WG2597409-9 LCS		**TMRM**						
Calcium (Ca)-Dissolved			97.9		%		80-120	21-AUG-17
Magnesium (Mg)-Dissolved			98.1		%		80-120	21-AUG-17
Potassium (K)-Dissolved			96.1		%		80-120	21-AUG-17
Sodium (Na)-Dissolved			101.3		%		80-120	21-AUG-17
WG2597409-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3804951								
WG2597409-1 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	21-AUG-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
WG2597409-11 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	21-AUG-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
WG2597409-14 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	21-AUG-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
WG2597409-17 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	21-AUG-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
WG2597409-4 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	21-AUG-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
WG2597409-8 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	21-AUG-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	21-AUG-17
MET-D-CCMS-ED	**Water**							
Batch R3791712								
WG2585071-3 DUP		**L1959232-1**						
Aluminum (Al)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	05-AUG-17
Antimony (Sb)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	05-AUG-17
Arsenic (As)-Dissolved		0.00088	0.00093		mg/L	5.2	20	05-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch R3791712								
WG2585071-3 DUP		**L1959232-1**						
Barium (Ba)-Dissolved		0.131	0.130		mg/L	0.6	20	05-AUG-17
Beryllium (Be)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	05-AUG-17
Boron (B)-Dissolved		0.050	0.046		mg/L	9.0	20	05-AUG-17
Cadmium (Cd)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	05-AUG-17
Calcium (Ca)-Dissolved		91.5	94.7		mg/L	3.5	20	05-AUG-17
Chromium (Cr)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	05-AUG-17
Cobalt (Co)-Dissolved		0.00069	0.00070		mg/L	1.3	20	05-AUG-17
Copper (Cu)-Dissolved		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	05-AUG-17
Iron (Fe)-Dissolved		1.93	1.89		mg/L	2.3	20	05-AUG-17
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	05-AUG-17
Magnesium (Mg)-Dissolved		27.0	27.7		mg/L	2.3	20	05-AUG-17
Manganese (Mn)-Dissolved		0.714	0.719		mg/L	0.8	20	05-AUG-17
Molybdenum (Mo)-Dissolved		0.000177	0.000188		mg/L	6.0	20	05-AUG-17
Nickel (Ni)-Dissolved		0.00084	0.00090		mg/L	6.6	20	05-AUG-17
Potassium (K)-Dissolved		2.66	2.68		mg/L	0.5	20	05-AUG-17
Selenium (Se)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	05-AUG-17
Silver (Ag)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	05-AUG-17
Sodium (Na)-Dissolved		36.2	36.3		mg/L	0.1	20	05-AUG-17
Thallium (Tl)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	05-AUG-17
Titanium (Ti)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	05-AUG-17
Uranium (U)-Dissolved		0.00209	0.00217		mg/L	3.8	20	05-AUG-17
Vanadium (V)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	05-AUG-17
Zinc (Zn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	05-AUG-17
WG2585861-3 DUP		**L1959232-8**						
Aluminum (Al)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	04-AUG-17
Antimony (Sb)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-AUG-17
Arsenic (As)-Dissolved		0.00260	0.00262		mg/L	0.8	20	04-AUG-17
Barium (Ba)-Dissolved		0.0223	0.0229		mg/L	2.9	20	04-AUG-17
Beryllium (Be)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-AUG-17
Boron (B)-Dissolved		0.258	0.260		mg/L	0.8	20	04-AUG-17
Cadmium (Cd)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	04-AUG-17
Calcium (Ca)-Dissolved		90.0	91.5		mg/L	1.6	20	04-AUG-17
Chromium (Cr)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	04-AUG-17
Cobalt (Co)-Dissolved		0.00157	0.00154		mg/L	1.7	20	04-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch R3791712								
WG2585861-3 DUP		**L1959232-8**						
Copper (Cu)-Dissolved		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	04-AUG-17
Iron (Fe)-Dissolved		1.96	1.93		mg/L	1.4	20	04-AUG-17
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	04-AUG-17
Magnesium (Mg)-Dissolved		27.1	27.8		mg/L	2.3	20	04-AUG-17
Manganese (Mn)-Dissolved		0.872	0.846		mg/L	3.0	20	04-AUG-17
Molybdenum (Mo)-Dissolved		0.000861	0.000862		mg/L	0.1	20	04-AUG-17
Nickel (Ni)-Dissolved		0.00096	0.00088		mg/L	8.4	20	04-AUG-17
Potassium (K)-Dissolved		3.92	3.89		mg/L	0.7	20	04-AUG-17
Selenium (Se)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	04-AUG-17
Silver (Ag)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	04-AUG-17
Sodium (Na)-Dissolved		240	240		mg/L	0.2	20	04-AUG-17
Thallium (Tl)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	04-AUG-17
Titanium (Ti)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	04-AUG-17
Uranium (U)-Dissolved		0.00130	0.00125		mg/L	3.6	20	04-AUG-17
Vanadium (V)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	04-AUG-17
Zinc (Zn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	04-AUG-17
WG2585071-2 LCS								
Aluminum (Al)-Dissolved			103.8		%		80-120	05-AUG-17
Antimony (Sb)-Dissolved			104.7		%		80-120	05-AUG-17
Arsenic (As)-Dissolved			101.5		%		80-120	05-AUG-17
Barium (Ba)-Dissolved			100.1		%		80-120	05-AUG-17
Beryllium (Be)-Dissolved			105.4		%		80-120	05-AUG-17
Boron (B)-Dissolved			103.5		%		80-120	05-AUG-17
Cadmium (Cd)-Dissolved			101.2		%		80-120	05-AUG-17
Calcium (Ca)-Dissolved			102.5		%		80-120	05-AUG-17
Chromium (Cr)-Dissolved			99.3		%		80-120	05-AUG-17
Cobalt (Co)-Dissolved			100.3		%		80-120	05-AUG-17
Copper (Cu)-Dissolved			98.5		%		80-120	05-AUG-17
Iron (Fe)-Dissolved			99.6		%		80-120	05-AUG-17
Lead (Pb)-Dissolved			105.1		%		80-120	05-AUG-17
Magnesium (Mg)-Dissolved			110.1		%		80-120	05-AUG-17
Manganese (Mn)-Dissolved			103.5		%		80-120	05-AUG-17
Molybdenum (Mo)-Dissolved			100.8		%		80-120	05-AUG-17
Nickel (Ni)-Dissolved			99.8		%		80-120	05-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch	**R3791712**							
WG2585071-2	**LCS**							
Potassium (K)-Dissolved			100.0		%		80-120	05-AUG-17
Selenium (Se)-Dissolved			99.3		%		80-120	05-AUG-17
Silver (Ag)-Dissolved			100.2		%		80-120	05-AUG-17
Sodium (Na)-Dissolved			108.9		%		80-120	05-AUG-17
Thallium (Tl)-Dissolved			101.7		%		80-120	05-AUG-17
Titanium (Ti)-Dissolved			99.3		%		80-120	05-AUG-17
Uranium (U)-Dissolved			107.3		%		80-120	05-AUG-17
Vanadium (V)-Dissolved			103.0		%		80-120	05-AUG-17
Zinc (Zn)-Dissolved			99.0		%		80-120	05-AUG-17
WG2585861-2	**LCS**							
Aluminum (Al)-Dissolved			107.0		%		80-120	04-AUG-17
Antimony (Sb)-Dissolved			111.2		%		80-120	04-AUG-17
Arsenic (As)-Dissolved			105.8		%		80-120	04-AUG-17
Barium (Ba)-Dissolved			106.1		%		80-120	04-AUG-17
Beryllium (Be)-Dissolved			113.0		%		80-120	04-AUG-17
Boron (B)-Dissolved			114.5		%		80-120	04-AUG-17
Cadmium (Cd)-Dissolved			106.2		%		80-120	04-AUG-17
Calcium (Ca)-Dissolved			111.2		%		80-120	04-AUG-17
Chromium (Cr)-Dissolved			101.0		%		80-120	04-AUG-17
Cobalt (Co)-Dissolved			104.5		%		80-120	04-AUG-17
Copper (Cu)-Dissolved			104.8		%		80-120	04-AUG-17
Iron (Fe)-Dissolved			106.2		%		80-120	04-AUG-17
Lead (Pb)-Dissolved			109.5		%		80-120	04-AUG-17
Magnesium (Mg)-Dissolved			107.3		%		80-120	04-AUG-17
Manganese (Mn)-Dissolved			108.1		%		80-120	04-AUG-17
Molybdenum (Mo)-Dissolved			109.3		%		80-120	04-AUG-17
Nickel (Ni)-Dissolved			101.6		%		80-120	04-AUG-17
Potassium (K)-Dissolved			102.9		%		80-120	04-AUG-17
Selenium (Se)-Dissolved			103.8		%		80-120	04-AUG-17
Silver (Ag)-Dissolved			107.6		%		80-120	04-AUG-17
Sodium (Na)-Dissolved			106.9		%		80-120	04-AUG-17
Thallium (Tl)-Dissolved			105.2		%		80-120	04-AUG-17
Titanium (Ti)-Dissolved			106.2		%		80-120	04-AUG-17
Vanadium (V)-Dissolved			106.9		%		80-120	04-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch R3791712								
WG2585861-2 LCS								
Zinc (Zn)-Dissolved			103.3		%		80-120	04-AUG-17
WG2585071-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	05-AUG-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	05-AUG-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	05-AUG-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	05-AUG-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	05-AUG-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	05-AUG-17
Cadmium (Cd)-Dissolved			<0.000005C		mg/L		0.000005	05-AUG-17
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	05-AUG-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	05-AUG-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	05-AUG-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	05-AUG-17
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	05-AUG-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	05-AUG-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	05-AUG-17
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	05-AUG-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	05-AUG-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	05-AUG-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	05-AUG-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	05-AUG-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	05-AUG-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	05-AUG-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	05-AUG-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	05-AUG-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	05-AUG-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	05-AUG-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	05-AUG-17
WG2585861-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	04-AUG-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	04-AUG-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	04-AUG-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	04-AUG-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	04-AUG-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	04-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch R3791712								
WG2585861-1 MB								
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	04-AUG-17
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	04-AUG-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	04-AUG-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	04-AUG-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	04-AUG-17
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	04-AUG-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	04-AUG-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	04-AUG-17
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	04-AUG-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	04-AUG-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	04-AUG-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	04-AUG-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	04-AUG-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	04-AUG-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	04-AUG-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	04-AUG-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	04-AUG-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	04-AUG-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	04-AUG-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	04-AUG-17
WG2585071-4 MS		**L1959232-2**						
Aluminum (Al)-Dissolved			105.1		%		70-130	05-AUG-17
Antimony (Sb)-Dissolved			120.7		%		70-130	05-AUG-17
Arsenic (As)-Dissolved			106.1		%		70-130	05-AUG-17
Barium (Ba)-Dissolved			N/A	MS-B	%		-	05-AUG-17
Beryllium (Be)-Dissolved			100.3		%		70-130	05-AUG-17
Boron (B)-Dissolved			N/A	MS-B	%		-	05-AUG-17
Cadmium (Cd)-Dissolved			103.9		%		70-130	05-AUG-17
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	05-AUG-17
Chromium (Cr)-Dissolved			100.2		%		70-130	05-AUG-17
Cobalt (Co)-Dissolved			99.8		%		70-130	05-AUG-17
Copper (Cu)-Dissolved			95.8		%		70-130	05-AUG-17
Iron (Fe)-Dissolved			N/A	MS-B	%		-	05-AUG-17
Lead (Pb)-Dissolved			99.5		%		70-130	05-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch R3791712								
WG2585071-4 MS		**L1959232-2**						
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	05-AUG-17
Manganese (Mn)-Dissolved			N/A	MS-B	%		-	05-AUG-17
Molybdenum (Mo)-Dissolved			81.1		%		70-130	05-AUG-17
Nickel (Ni)-Dissolved			95.5		%		70-130	05-AUG-17
Potassium (K)-Dissolved			N/A	MS-B	%		-	05-AUG-17
Selenium (Se)-Dissolved			110.1		%		70-130	05-AUG-17
Silver (Ag)-Dissolved			77.8		%		70-130	05-AUG-17
Sodium (Na)-Dissolved			N/A	MS-B	%		-	05-AUG-17
Thallium (Tl)-Dissolved			101.6		%		70-130	05-AUG-17
Titanium (Ti)-Dissolved			105.5		%		70-130	05-AUG-17
Uranium (U)-Dissolved			102.4		%		70-130	05-AUG-17
Vanadium (V)-Dissolved			106.4		%		70-130	05-AUG-17
Zinc (Zn)-Dissolved			94.6		%		70-130	05-AUG-17
WG2585861-4 MS		**L1959232-9**						
Aluminum (Al)-Dissolved			101.2		%		70-130	04-AUG-17
Antimony (Sb)-Dissolved			119.5		%		70-130	04-AUG-17
Arsenic (As)-Dissolved			110.0		%		70-130	04-AUG-17
Barium (Ba)-Dissolved			N/A	MS-B	%		-	04-AUG-17
Beryllium (Be)-Dissolved			93.4		%		70-130	04-AUG-17
Boron (B)-Dissolved			N/A	MS-B	%		-	04-AUG-17
Cadmium (Cd)-Dissolved			99.0		%		70-130	04-AUG-17
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	04-AUG-17
Chromium (Cr)-Dissolved			95.7		%		70-130	04-AUG-17
Cobalt (Co)-Dissolved			95.6		%		70-130	04-AUG-17
Copper (Cu)-Dissolved			93.0		%		70-130	04-AUG-17
Iron (Fe)-Dissolved			N/A	MS-B	%		-	04-AUG-17
Lead (Pb)-Dissolved			92.0		%		70-130	04-AUG-17
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	04-AUG-17
Manganese (Mn)-Dissolved			N/A	MS-B	%		-	04-AUG-17
Molybdenum (Mo)-Dissolved			84.9		%		70-130	04-AUG-17
Nickel (Ni)-Dissolved			93.3		%		70-130	04-AUG-17
Potassium (K)-Dissolved			N/A	MS-B	%		-	04-AUG-17
Selenium (Se)-Dissolved			114.4		%		70-130	04-AUG-17
Silver (Ag)-Dissolved			78.0		%		70-130	04-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch R3791712								
WG2585861-4 MS		**L1959232-9**						
Sodium (Na)-Dissolved			N/A	MS-B	%		-	04-AUG-17
Thallium (Tl)-Dissolved			92.2		%		70-130	04-AUG-17
Titanium (Ti)-Dissolved			117.9		%		70-130	04-AUG-17
Uranium (U)-Dissolved			97.8		%		70-130	04-AUG-17
Vanadium (V)-Dissolved			105.3		%		70-130	04-AUG-17
Zinc (Zn)-Dissolved			93.8		%		70-130	04-AUG-17
Batch R3793152								
WG2585861-2 LCS								
Uranium (U)-Dissolved			110.7		%		80-120	08-AUG-17
NH3-D-COL-ED	**Water**							
Batch R3785154								
WG2581223-11 DUP		**L1959232-7**						
Ammonia, Total Dissolved (as N)		1.79	1.83		mg/L	1.7	20	29-JUL-17
WG2581223-2 LCS								
Ammonia, Total Dissolved (as N)			106.4		%		85-115	29-JUL-17
WG2581223-4 LCS								
Ammonia, Total Dissolved (as N)			112.3		%		85-115	29-JUL-17
WG2581223-6 LCS								
Ammonia, Total Dissolved (as N)			113.7		%		85-115	29-JUL-17
WG2581223-1 MB								
Ammonia, Total Dissolved (as N)			<0.050		mg/L		0.05	29-JUL-17
WG2581223-3 MB								
Ammonia, Total Dissolved (as N)			<0.050		mg/L		0.05	29-JUL-17
WG2581223-5 MB								
Ammonia, Total Dissolved (as N)			<0.050		mg/L		0.05	29-JUL-17
WG2581223-12 MS		**L1959232-7**						
Ammonia, Total Dissolved (as N)			N/A	MS-B	%		-	29-JUL-17
Batch R3788807								
WG2584015-2 LCS								
Ammonia, Total Dissolved (as N)			106.4		%		85-115	02-AUG-17
WG2584015-1 MB								
Ammonia, Total Dissolved (as N)			<0.050		mg/L		0.05	02-AUG-17
NO2-IC-N-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-ED	**Water**							
Batch R3776448								
WG2570971-9 DUP		**L1959232-5**						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	16-JUL-17
WG2570971-15 LCS								
Nitrite (as N)			96.3		%		90-110	15-JUL-17
WG2570971-17 LCS								
Nitrite (as N)			94.9		%		90-110	15-JUL-17
WG2570971-19 LCS								
Nitrite (as N)			95.1		%		90-110	16-JUL-17
WG2570971-2 LCS								
Nitrite (as N)			100.8		%		90-110	16-JUL-17
WG2570971-21 LCS								
Nitrite (as N)			96.3		%		90-110	16-JUL-17
WG2570971-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	16-JUL-17
WG2570971-16 MB								
Nitrite (as N)			<0.010		mg/L		0.01	15-JUL-17
WG2570971-18 MB								
Nitrite (as N)			<0.010		mg/L		0.01	15-JUL-17
WG2570971-20 MB								
Nitrite (as N)			<0.010		mg/L		0.01	16-JUL-17
WG2570971-22 MB								
Nitrite (as N)			<0.010		mg/L		0.01	16-JUL-17
WG2570971-10 MS		**L1959232-5**						
Nitrite (as N)			93.2		%		75-125	16-JUL-17
Batch R3791474								
WG2583691-13 LCS								
Nitrite (as N)			100.7		%		90-110	02-AUG-17
WG2583691-17 LCS								
Nitrite (as N)			99.9		%		90-110	02-AUG-17
WG2583691-2 LCS								
Nitrite (as N)			100.1		%		90-110	02-AUG-17
WG2583691-23 LCS								
Nitrite (as N)			100.3		%		90-110	02-AUG-17
WG2583691-5 LCS								
Nitrite (as N)			100.5		%		90-110	02-AUG-17
WG2583691-9 LCS								
Nitrite (as N)			100.6		%		90-110	02-AUG-17
WG2583691-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-10 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-14 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-18 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-24 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-6 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
NO3-IC-N-ED	**Water**							
Batch R3776448								
WG2570971-9 DUP		**L1959232-5**						
Nitrate (as N)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	16-JUL-17
WG2570971-15 LCS								
Nitrate (as N)			97.0		%		90-110	15-JUL-17
WG2570971-17 LCS								
Nitrate (as N)			97.0		%		90-110	15-JUL-17
WG2570971-19 LCS								
Nitrate (as N)			98.0		%		90-110	16-JUL-17
WG2570971-2 LCS								
Nitrate (as N)			98.4		%		90-110	16-JUL-17
WG2570971-21 LCS								
Nitrate (as N)			97.7		%		90-110	16-JUL-17
WG2570971-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	16-JUL-17
WG2570971-16 MB								
Nitrate (as N)			<0.020		mg/L		0.02	15-JUL-17
WG2570971-18 MB								
Nitrate (as N)			<0.020		mg/L		0.02	15-JUL-17
WG2570971-20 MB								
Nitrate (as N)			<0.020		mg/L		0.02	16-JUL-17
WG2570971-22 MB								
Nitrate (as N)			<0.020		mg/L		0.02	16-JUL-17
WG2570971-10 MS		**L1959232-5**						
Nitrate (as N)			98.5		%		75-125	16-JUL-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-13 LCS								
Nitrate (as N)			98.7		%		90-110	02-AUG-17
WG2583691-17 LCS								
Nitrate (as N)			97.4		%		90-110	02-AUG-17
WG2583691-2 LCS								
Nitrate (as N)			98.2		%		90-110	02-AUG-17
WG2583691-23 LCS								
Nitrate (as N)			98.6		%		90-110	02-AUG-17
WG2583691-5 LCS								
Nitrate (as N)			98.0		%		90-110	02-AUG-17
WG2583691-9 LCS								
Nitrate (as N)			98.8		%		90-110	02-AUG-17
WG2583691-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-10 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-14 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-18 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-24 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-6 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
PH/EC/ALK-ED	**Water**							
Batch R3772543								
WG2571058-13 DUP		**L1959232-7**						
pH		7.51	7.57	J	pH	0.06	0.3	16-JUL-17
Conductivity (EC)		2360	2370		uS/cm	0.4	10	16-JUL-17
Bicarbonate (HCO3)		639	637		mg/L	0.2	25	16-JUL-17
Carbonate (CO3)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	16-JUL-17
Hydroxide (OH)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	16-JUL-17
Alkalinity, Total (as CaCO3)		524	523		mg/L	0.2	20	16-JUL-17
WG2571058-16 LCS		**ED-PH6**						
pH			5.99		pH		5.8-6.2	16-JUL-17
WG2571058-17 LCS		**MID 1412**						
Conductivity (EC)			93.8		%		90-110	16-JUL-17
WG2571058-18 LCS		**HI 12890**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R3772543								
WG2571058-18 LCS		**HI 12890**						
Conductivity (EC)			92.6		%		90-110	16-JUL-17
WG2571058-19 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			99.3		%		85-115	16-JUL-17
WG2571058-2 LCS		**MID 1412**						
Conductivity (EC)			94.3		%		90-110	16-JUL-17
WG2571058-21 LCS		**ED-PH6**						
pH			6.01		pH		5.8-6.2	16-JUL-17
WG2571058-22 LCS		**MID 1412**						
Conductivity (EC)			94.8		%		90-110	16-JUL-17
WG2571058-23 LCS		**HI 12890**						
Conductivity (EC)			93.3		%		90-110	16-JUL-17
WG2571058-24 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			99.3		%		85-115	16-JUL-17
WG2571058-26 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	16-JUL-17
WG2571058-27 LCS		**MID 1412**						
Conductivity (EC)			96.1		%		90-110	16-JUL-17
WG2571058-28 LCS		**HI 12890**						
Conductivity (EC)			94.3		%		90-110	16-JUL-17
WG2571058-29 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			96.9		%		85-115	16-JUL-17
WG2571058-3 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	16-JUL-17
WG2571058-31 LCS		**ED-PH6**						
pH			5.99		pH		5.8-6.2	16-JUL-17
WG2571058-32 LCS		**MID 1412**						
Conductivity (EC)			95.3		%		90-110	16-JUL-17
WG2571058-33 LCS		**HI 12890**						
Conductivity (EC)			94.6		%		90-110	16-JUL-17
WG2571058-34 LCS								
Alkalinity, Total (as CaCO3)			96.3		%		85-115	16-JUL-17
WG2571058-36 LCS		**ED-PH6**						
pH			5.99		pH		5.8-6.2	16-JUL-17
WG2571058-37 LCS		**MID 1412**						
Conductivity (EC)			94.5		%		90-110	16-JUL-17
WG2571058-38 LCS		**HI 12890**						
Conductivity (EC)			94.4		%		90-110	16-JUL-17
WG2571058-39 LCS		**PCTITRATE LCS**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R3772543								
WG2571058-39 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			98.0		%		85-115	16-JUL-17
WG2571058-4 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			97.3		%		85-115	16-JUL-17
WG2571058-5 LCS		**HI 12890**						
Conductivity (EC)			94.0		%		90-110	16-JUL-17
WG2571058-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	16-JUL-17
Bicarbonate (HCO3)			<5.0		mg/L		5	16-JUL-17
Carbonate (CO3)			<5.0		mg/L		5	16-JUL-17
Hydroxide (OH)			<5.0		mg/L		5	16-JUL-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	16-JUL-17
WG2571058-15 MB								
Conductivity (EC)			<2.0		uS/cm		2	16-JUL-17
Bicarbonate (HCO3)			<5.0		mg/L		5	16-JUL-17
Carbonate (CO3)			<5.0		mg/L		5	16-JUL-17
Hydroxide (OH)			<5.0		mg/L		5	16-JUL-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	16-JUL-17
WG2571058-20 MB								
Conductivity (EC)			<2.0		uS/cm		2	16-JUL-17
Bicarbonate (HCO3)			<5.0		mg/L		5	16-JUL-17
Carbonate (CO3)			<5.0		mg/L		5	16-JUL-17
Hydroxide (OH)			<5.0		mg/L		5	16-JUL-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	16-JUL-17
WG2571058-25 MB								
Conductivity (EC)			<2.0		uS/cm		2	16-JUL-17
Bicarbonate (HCO3)			<5.0		mg/L		5	16-JUL-17
Carbonate (CO3)			<5.0		mg/L		5	16-JUL-17
Hydroxide (OH)			<5.0		mg/L		5	16-JUL-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	16-JUL-17
WG2571058-30 MB								
Conductivity (EC)			<2.0		uS/cm		2	16-JUL-17
Bicarbonate (HCO3)			<5.0		mg/L		5	16-JUL-17
Carbonate (CO3)			<5.0		mg/L		5	16-JUL-17
Hydroxide (OH)			<5.0		mg/L		5	16-JUL-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	16-JUL-17
WG2571058-35 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R3772543								
WG2571058-35 MB								
Conductivity (EC)			<2.0		uS/cm		2	16-JUL-17
Bicarbonate (HCO3)			<5.0		mg/L		5	16-JUL-17
Carbonate (CO3)			<5.0		mg/L		5	16-JUL-17
Hydroxide (OH)			<5.0		mg/L		5	16-JUL-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	16-JUL-17
Batch R3788060								
WG2583638-12 LCS		**MID 1412**						
Conductivity (EC)			95.9		%		90-110	02-AUG-17
WG2583638-13 LCS		**ED-PH6**						
pH			6.01		pH		5.8-6.2	02-AUG-17
WG2583638-14 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			96.4		%		85-115	02-AUG-17
WG2583638-15 LCS		**HI 12890**						
Conductivity (EC)			93.2		%		90-110	02-AUG-17
WG2583638-17 LCS		**MID 1412**						
Conductivity (EC)			98.9		%		90-110	02-AUG-17
WG2583638-18 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	02-AUG-17
WG2583638-19 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			99.0		%		85-115	02-AUG-17
WG2583638-2 LCS		**MID 1412**						
Conductivity (EC)			98.5		%		90-110	02-AUG-17
WG2583638-20 LCS		**HI 12890**						
Conductivity (EC)			96.3		%		90-110	02-AUG-17
WG2583638-22 LCS		**MID 1412**						
Conductivity (EC)			96.2		%		90-110	02-AUG-17
WG2583638-23 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	02-AUG-17
WG2583638-24 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			98.2		%		85-115	02-AUG-17
WG2583638-25 LCS		**HI 12890**						
Conductivity (EC)			92.6		%		90-110	02-AUG-17
WG2583638-3 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	02-AUG-17
WG2583638-4 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			96.8		%		85-115	02-AUG-17
WG2583638-5 LCS		**HI 12890**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R3788060								
WG2583638-5 LCS		**HI 12890**						
Conductivity (EC)			98.0		%		90-110	02-AUG-17
WG2583638-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	02-AUG-17
Bicarbonate (HCO3)			<5.0		mg/L		5	02-AUG-17
Carbonate (CO3)			<5.0		mg/L		5	02-AUG-17
Hydroxide (OH)			<5.0		mg/L		5	02-AUG-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	02-AUG-17
WG2583638-16 MB								
Conductivity (EC)			<2.0		uS/cm		2	02-AUG-17
Bicarbonate (HCO3)			<5.0		mg/L		5	02-AUG-17
Carbonate (CO3)			<5.0		mg/L		5	02-AUG-17
Hydroxide (OH)			<5.0		mg/L		5	02-AUG-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	02-AUG-17
WG2583638-21 MB								
Conductivity (EC)			<2.0		uS/cm		2	02-AUG-17
Bicarbonate (HCO3)			<5.0		mg/L		5	02-AUG-17
Carbonate (CO3)			<5.0		mg/L		5	02-AUG-17
Hydroxide (OH)			<5.0		mg/L		5	02-AUG-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	02-AUG-17
PHENOLS-4AAP-WT	**Water**							
Batch R3782274								
WG2577084-15 DUP		**L1959232-7**						
Phenols (4AAP)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	24-JUL-17
WG2577084-10 LCS								
Phenols (4AAP)			102.3		%		85-115	24-JUL-17
WG2577084-14 LCS								
Phenols (4AAP)			103.7		%		85-115	24-JUL-17
WG2577084-13 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	24-JUL-17
WG2577084-9 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	24-JUL-17
WG2577084-16 MS		**L1959232-7**						
Phenols (4AAP)			98.7		%		75-125	24-JUL-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	**Water**							
Batch R3791173								
WG2585249-3 DUP		**L1959232-11**						
Phenols (4AAP)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	03-AUG-17
WG2585249-2 LCS								
Phenols (4AAP)			100.0		%		85-115	03-AUG-17
WG2585249-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	03-AUG-17
WG2585249-4 MS		**L1959232-11**						
Phenols (4AAP)			106.1		%		75-125	03-AUG-17
SO4-IC-N-ED	**Water**							
Batch R3776448								
WG2570971-9 DUP		**L1959232-5**						
Sulfate (SO4)		131	130		mg/L	0.3	20	16-JUL-17
WG2570971-15 LCS								
Sulfate (SO4)			102.2		%		90-110	15-JUL-17
WG2570971-17 LCS								
Sulfate (SO4)			101.4		%		90-110	15-JUL-17
WG2570971-19 LCS								
Sulfate (SO4)			103.0		%		90-110	16-JUL-17
WG2570971-2 LCS								
Sulfate (SO4)			99.8		%		90-110	16-JUL-17
WG2570971-21 LCS								
Sulfate (SO4)			102.0		%		90-110	16-JUL-17
WG2570971-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	16-JUL-17
WG2570971-16 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	15-JUL-17
WG2570971-18 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	15-JUL-17
WG2570971-20 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	16-JUL-17
WG2570971-22 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	16-JUL-17
WG2570971-10 MS		**L1959232-5**						
Sulfate (SO4)			N/A	MS-B	%		-	16-JUL-17
Batch R3791474								
WG2583691-13 LCS								
Sulfate (SO4)			102.5		%		90-110	02-AUG-17
WG2583691-17 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-17 LCS								
Sulfate (SO4)			101.4		%		90-110	02-AUG-17
WG2583691-2 LCS								
Sulfate (SO4)			99.96		%		90-110	02-AUG-17
WG2583691-23 LCS								
Sulfate (SO4)			102.3		%		90-110	02-AUG-17
WG2583691-5 LCS								
Sulfate (SO4)			103.3		%		90-110	02-AUG-17
WG2583691-9 LCS								
Sulfate (SO4)			103.1		%		90-110	02-AUG-17
WG2583691-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-10 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-14 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-18 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-24 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-6 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
SOLIDS-TDS-ED	**Water**							
Batch R3777729								
WG2572102-6 DUP		**L1959232-10**						
Total Dissolved Solids		839	861		mg/L	2.6	20	18-JUL-17
WG2572102-5 LCS								
Total Dissolved Solids			100.8		%		85-115	18-JUL-17
WG2572102-4 MB								
Total Dissolved Solids			<10		mg/L		10	18-JUL-17
Batch R3790116								
WG2583477-2 LCS								
Total Dissolved Solids			100.3		%		85-115	02-AUG-17
WG2583477-1 MB								
Total Dissolved Solids			<10		mg/L		10	02-AUG-17

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.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Total Dissolved Solids							
	11	14-JUL-17 13:28	02-AUG-17 00:00	7	18	days	EHT
	14	14-JUL-17 12:00	02-AUG-17 00:00	7	19	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 L1959232 were received on 15-JUL-17 14:55.

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.

Client:	**ALS Environmental**
Report date:	**15-Aug-17**

WATER ANALYSIS RESULTS

Isobrine ID	Client sample IDs		Client project ID	Collected	Received	$\delta^{18}O$
						‰ VSMOW
IB-17-930	L1959232-1	MW-01	L1959232	13-Jul-17	24-Jul-17	-17.72
IB-17-931	L1959232-2	MW-02	L1959232	13-Jul-17	24-Jul-17	-17.82
IB-17-932	L1959232-3	MW-03	L1959232	13-Jul-17	24-Jul-17	-18.54
IB-17-933	L1959232-4	MW-04	L1959232	13-Jul-17	24-Jul-17	-16.37
IB-17-934	L1959232-5	MW-05	L1959232	13-Jul-17	24-Jul-17	-16.00
IB-17-935	L1959232-6	MW-06	L1959232	13-Jul-17	24-Jul-17	-17.48
IB-17-936	L1959232-7	MW-07	L1959232	14-Jul-17	24-Jul-17	-17.91
IB-17-937	L1959232-8	MW-09	L1959232	14-Jul-17	24-Jul-17	-18.21
IB-17-938	L1959232-9	MW-10	L1959232	14-Jul-17	24-Jul-17	-18.23
IB-17-939	L1959232-10	MW-11	L1959232	14-Jul-17	24-Jul-17	-16.86
IB-17-940	L1959232-11	MW-12	L1959232	14-Jul-17	4-Aug-17	-16.95
IB-17-941	L1959232-12	MW-13	L1959232	14-Jul-17	24-Jul-17	-18.22
IB-17-942	L1959232-13	DUP17-01	L1959232	14-Jul-17	24-Jul-17	-18.55
IB-17-943	L1959232-14	DUP17-02	L1959232	14-Jul-17	4-Aug-17	-19.35
IB-17-944	L1959232-15	MW-02B	L1959232	14-Jul-17	24-Jul-17	-16.40

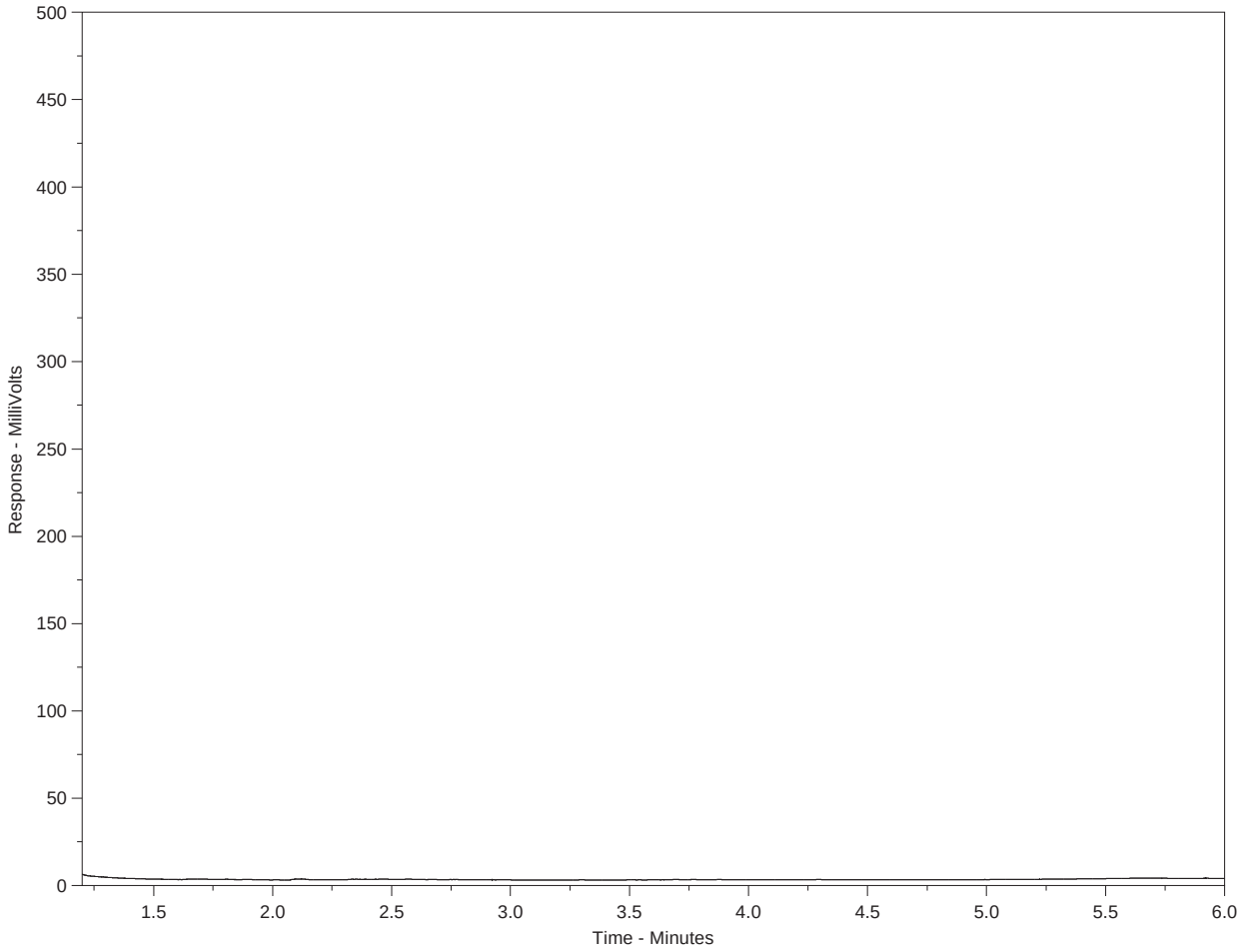
Oxygen and hydrogen stable isotope compositions determined on mechanically and chemically cleaned samples using a CRDS (Cavity Ring-down Mass Spectrometer).
Standard deviations for $\delta^{18}O$ and $\delta^{2}H$ are equal to or better than 0.2 ‰ and 2.0 ‰, respectively (±1σ).

Isobrine Solutions Inc.
4-341 Enterprise Square
10230 Jasper Ave
Edmonton, AB, T5J 4P6

)	δ^2H	
±1σ	‰ VSMOW	±1σ
0.03	-141.8	0.26
0.06	-142.8	0.24
0.06	-147.8	0.31
0.05	-133.8	0.23
0.01	-131.8	0.04
0.03	-143.2	0.27
0.03	-145.7	0.15
0.02	-147.3	0.07
0.03	-146.5	0.09
0.02	-139.3	0.10
0.02	-138.6	0.03
0.07	-145.1	0.55
0.03	-147.5	0.20
0.02	-148.8	0.19
0.03	-133.8	0.19

Hydrocarbon Distribution Report

ALS Sample ID: L1959232-1
Client ID: MW-01



F2		F3	F4	F4
nC10	nC16	nC34	nC50	
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F	
Gasoline		Motor Oils/ Lube Oils/ Grease		
Diesel/ Jet Fuels				

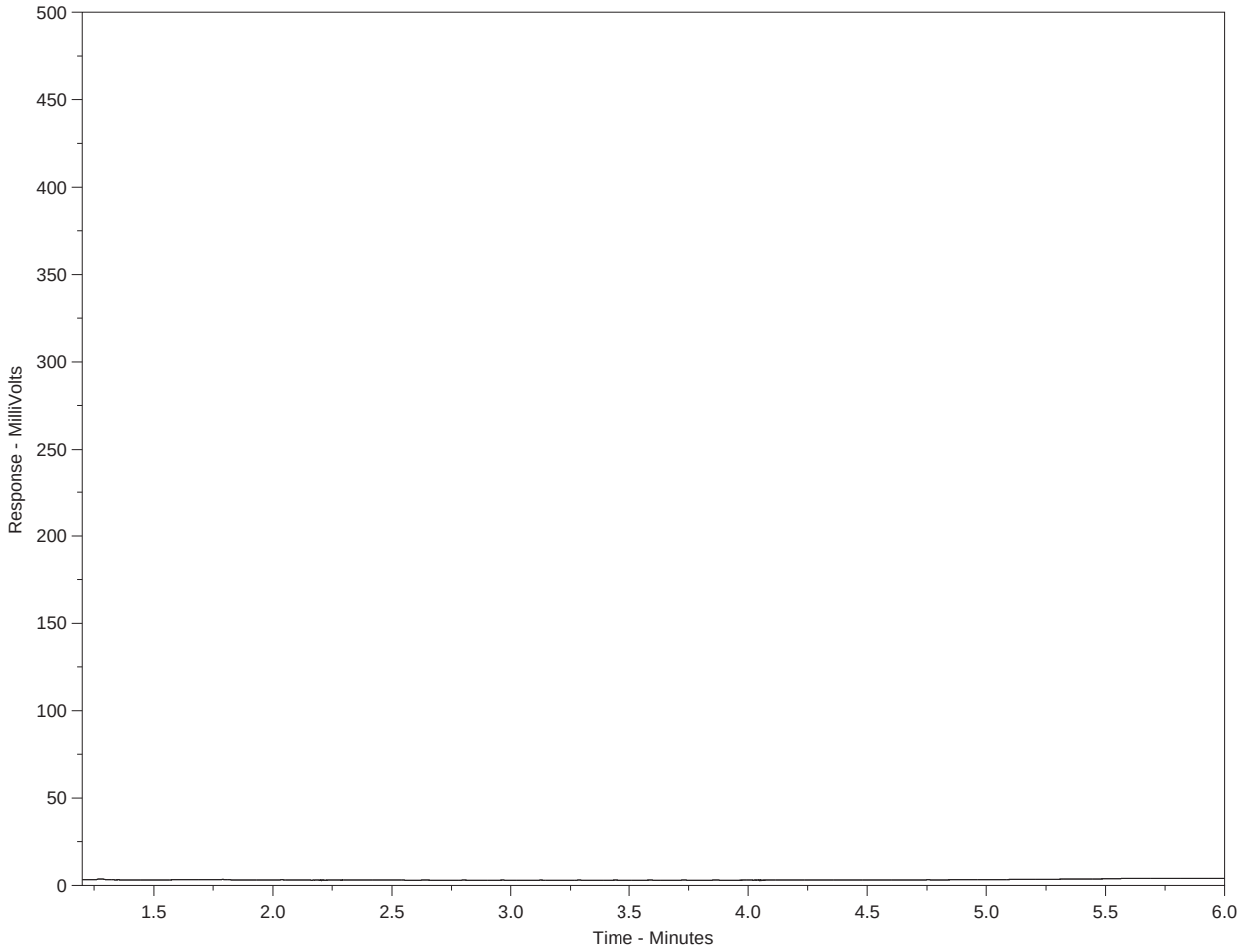
The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

Hydrocarbon Distribution Report

ALS Sample ID: L1959232-2
Client ID: MW-02



F2		F3		F4		F4
nC10		nC16		nC34		nC50
174°C 346°F		287°C 549°F		481°C 898°F		575°C 1067°F
Gasoline				Motor Oils/ Lube Oils/ Grease		
Diesel/ Jet Fuels						

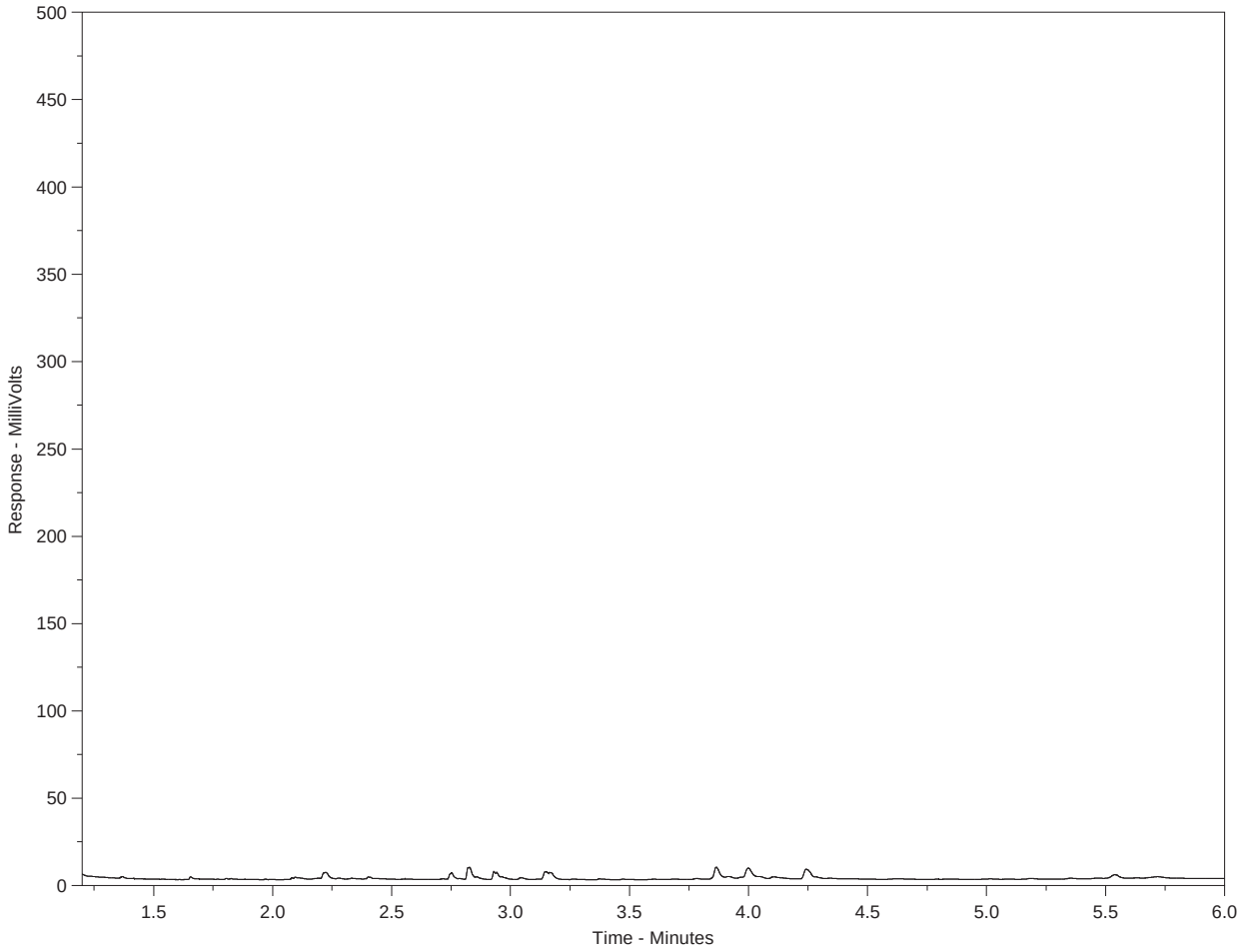
The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

Hydrocarbon Distribution Report

ALS Sample ID: L1959232-3
Client ID: MW-03



F2		F3		F4		F4
nC10	nC16		nC34		nC50	
174°C 346°F	287°C 549°F		481°C 898°F		575°C 1067°F	
Gasoline				Motor Oils/ Lube Oils/ Grease		
Diesel/ Jet Fuels						

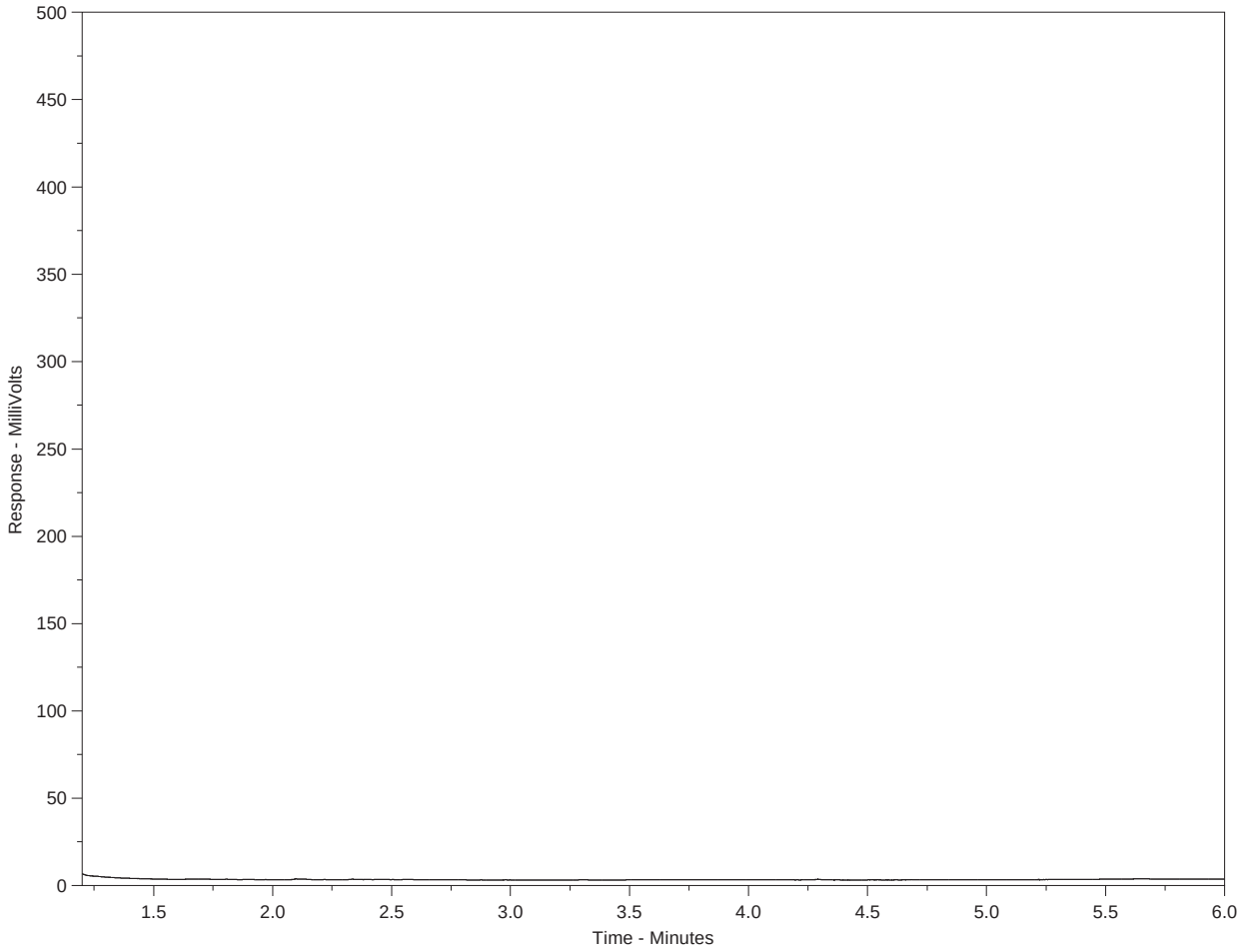
The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

Hydrocarbon Distribution Report

ALS Sample ID: L1959232-4
Client ID: MW-04



F2		F3		F4		F4
nC10	nC16		nC34		nC50	
174°C 346°F	287°C 549°F		481°C 898°F		575°C 1067°F	
Gasoline				Motor Oils/ Lube Oils/ Grease		
Diesel/ Jet Fuels						

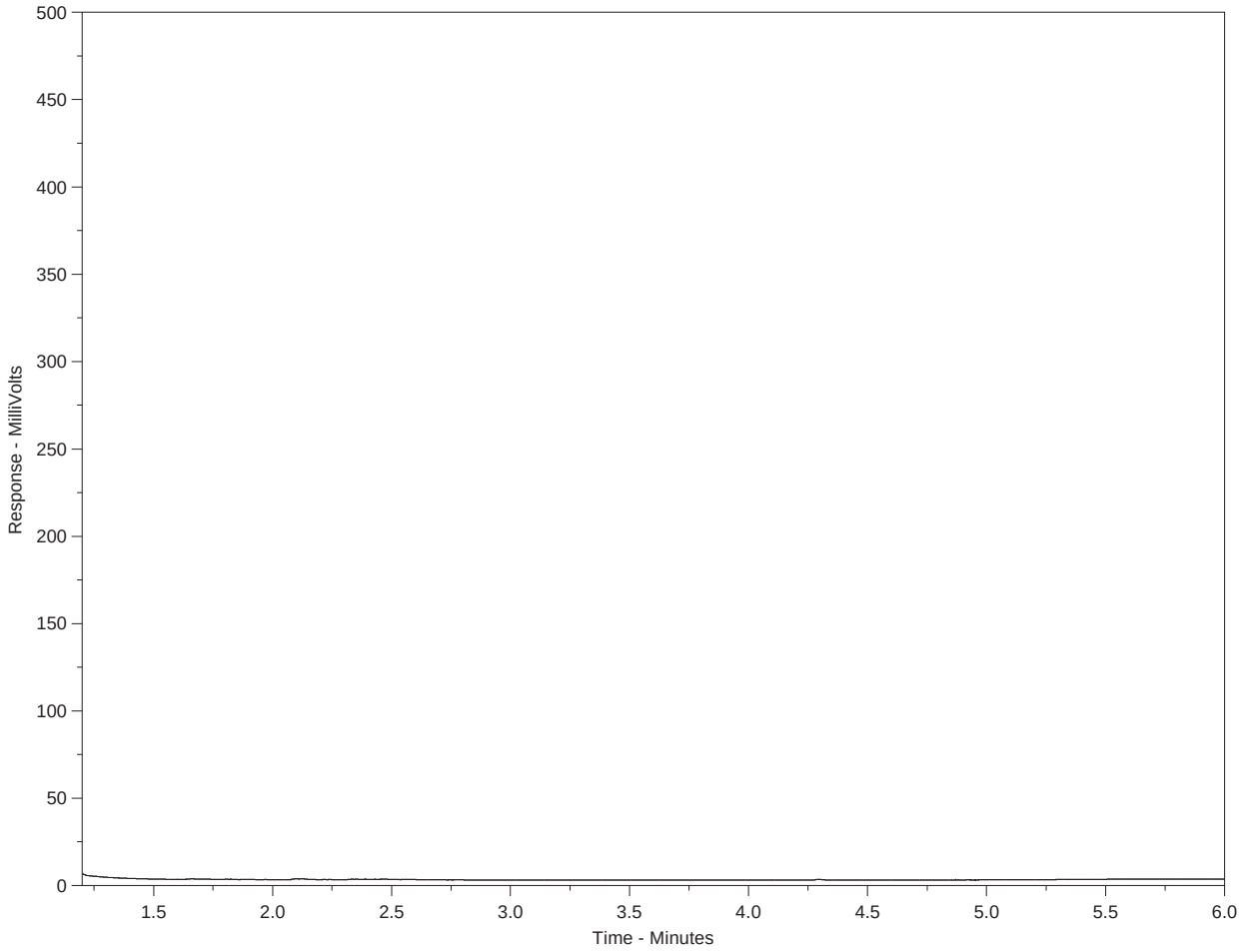
The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

Hydrocarbon Distribution Report

ALS Sample ID: L1959232-5
Client ID: MW-05



F2		F3	F4	F4
nC10	nC16	nC34	nC50	
174°C 346°F	287°C 549°F	481°C 898°F	575°C 1067°F	
Gasoline		Motor Oils/ Lube Oils/ Grease		
Diesel/ Jet Fuels				

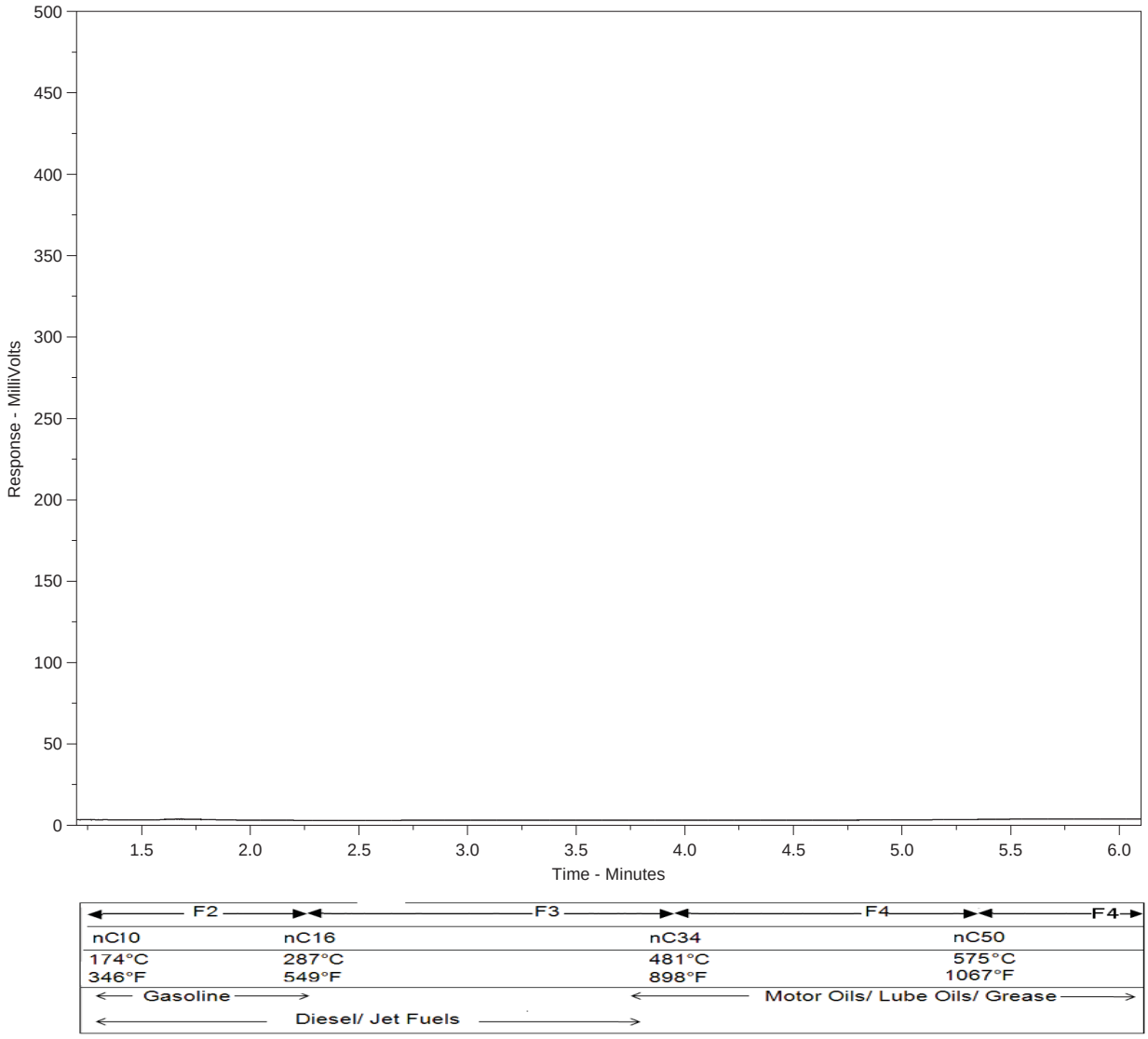
The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

Hydrocarbon Distribution Report

ALS Sample ID: L1959232-16
Client ID: MW-12 (RESAMPLE)



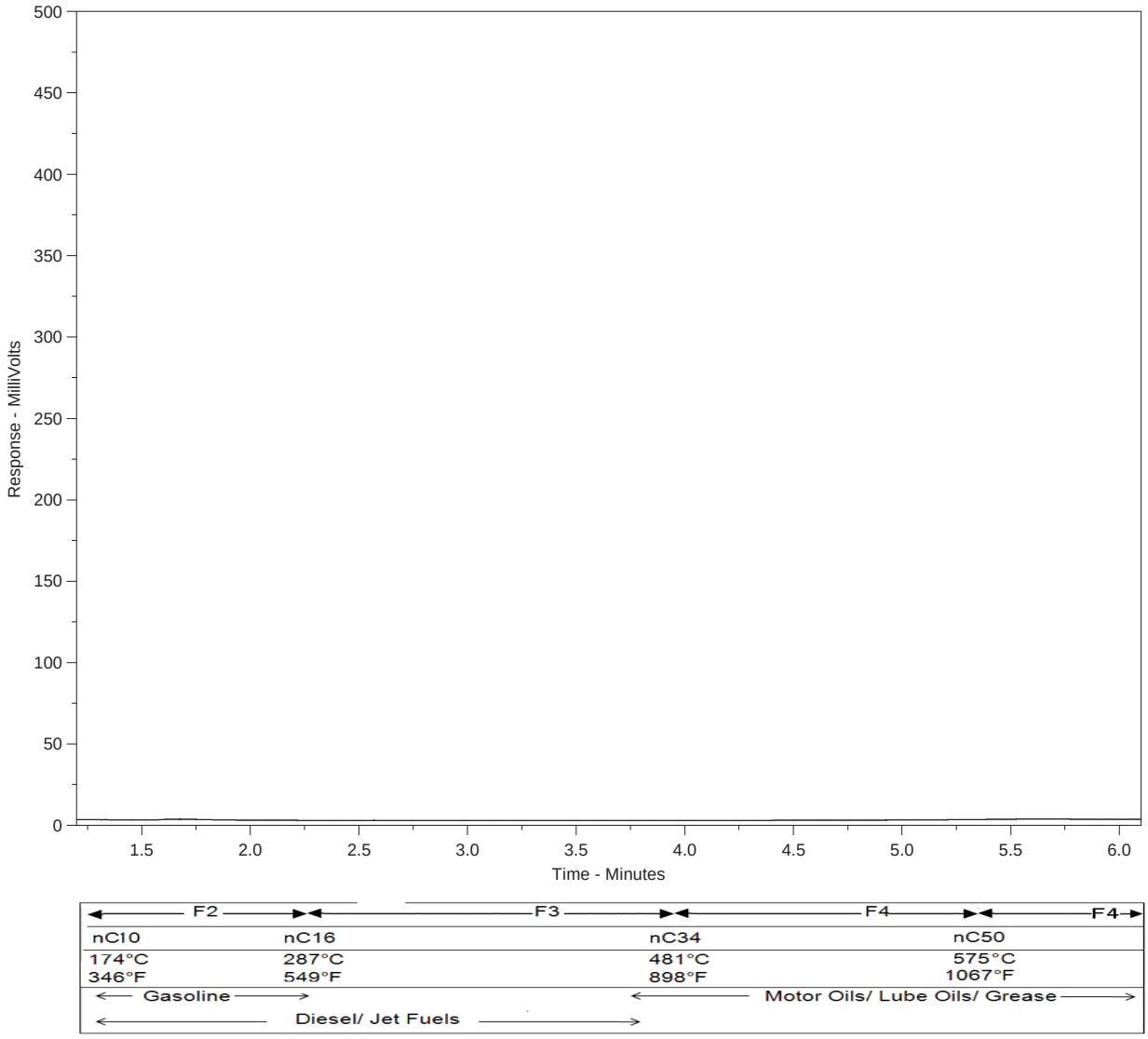
The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

Hydrocarbon Distribution Report

ALS Sample ID: L1959232-17
Client ID: DUP17-02 (RESAMPLE)



The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 - 520397

Page 1 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	WorleyParsons	Select Report Format:	☒ PDF ☐ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3pm)
Contact:	Trevor Butterfield	Quality Control (QC) Report with Report	☒ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	Suite 300 8815 51-Ave Edmonton, AB T6E 6A8	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
Phone:	780 918-7744	Select Distribution:	☒ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
		Email 1 or Fax	Trevor.Butterfield@Advisian.com	Specify Date Required for E2,E or P:
		Email 2	Canada.Chemistry@WorleyParsons.com	

Invoice To	Same as Report To ☒ Yes ☐ No	Invoice Distribution	
	Copy of Invoice with Report ☐ Yes ☒ No	Select Invoice Distribution:	☒ EMAIL ☐ MAIL ☐ FAX
Company:		Email 1 or Fax	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q61863	Approver ID:	Cost Center:
Job #:	307075-01608-300	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)	L1959232	ALS Contact: Dana	Sampler: PERO

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	BTEX, F1 (P)	F2 (P)	Routine/Major ions	DOC & DNTs (F/P)	Dissolved metals & Hg (F/P)	Phenols (P)	H^2, O^{18} isotopes	Number of Containers
	MW-01	13-Jul-17	15:15	GW	X	X	X	X	X	X	X	11
	MW-02		12:41		X	X	X	X	X	X	X	11
	MW-03		16:08		X	X	X	X	X	X	X	11
	MW-04		09:35		X	X	X	X	X	X	X	11
	MW-05		11:15		X	X	X	X	X	X	X	11
	MW-06		17:31		X	X	X	X	X	X	X	11
	MW-07	14-Jul-17	16:20		X	X	X	X	X	X	X	11
	MW-09		10:17		X	X	X	X	X	X	X	11
	MW-10		11:33		X	X	X	X	X	X	X	11
	MW-11		12:30		X	X	X	X	X	X	X	11
	MW-12		13:28		X	X	X	X	X	X	X	11
	MW-13		14:31		X	X	X	X	X	X	X	11

L1959232-COFC

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 (client Use)

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C	
9.2	8.9	7.3	7.8°C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: 15-Jul-17	Time: 14:50	Received by:	Date: 17/07/20	Time: 2:56P	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS FM-0325a (08 Front) January 2014

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 - 520396

Page 2 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)	
Company:		Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)		R ☒	Regular (Standard TAT if received by 3pm)
Contact:	Same AS Page 1 →	Quality Control (QC) Report with Report ☐ Yes ☐ No		P ☐	Priority (2-4 business days if received by 3pm)
Address:		☐ Criteria on Report - provide details below if box checked		E ☐	Emergency (1-2 business days if received by 3pm)
		Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		E2 ☐	Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:		Email 1 or Fax		Specify Date Required for E2,E or P:	
		Email 2		Analysis Request	
Invoice To	Same as Report To ☐ Yes ☐ No	Invoice Distribution		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	
	Copy of Invoice with Report ☐ Yes ☐ No	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		P P F/P F/P P	
Company:		Email 1 or Fax		BTEX, F1 / F2 / Routine / Major ions / DOC & DOH3 / Dissolved metals & Hg / Phenols / H2, O18 isotopes	Number of Containers
Contact:		Email 2			
Project Information		Oil and Gas Required Fields (client use)			
ALS Quote #:		Approver ID:	Cost Center:		
Job #:		GL Account:	Routing Code:		
PO / AFE:		Activity Code:			
LSD:		Location:			
ALS Lab Work Order # (lab use only)		ALS Contact: Dana	Sampler: PERD		

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
	DAP17-01	13-Jul-17	12:00	GW
	DUP17-02	14-Jul-17	12:00	GW
	MW-02B	↓	17:30	↓

L1959232-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☒ No	
Are samples for human drinking water use? ☐ Yes ☒ No	

(lab use only)
...ustody seal intact Yes ☐ No ☐
...ustody seal intact Yes ☐ No ☐

...OLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Dave Lewis	15-Jul-17	14:50						

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

WorleyParsons Canada
ATTN: Trevor Butterfield
8615 51 Avenue
Edmonton AB T6E 6A8

Date Received: 02-AUG-17
Report Date: 25-AUG-17 16:45 (MT)
Version: FINAL

Client Phone: 780-496-9055

Certificate of Analysis

Lab Work Order #: L1968626

Project P.O. #: NOT SUBMITTED
Job Reference: 307075-01608-300
C of C Numbers: 15-601481
Legal Site Desc:

Dana Brown, Chem. Tech. DIPL
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1968626-1 MW-08							
Sampled By: PERD on 02-AUG-17 @ 09:18							
Matrix: GW							
BTEX, Styrene & F1-F2							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
Toluene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
EthylBenzene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
m+p-Xylene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
o-Xylene	<0.00050		0.00050	mg/L	03-AUG-17	04-AUG-17	R3791520
Styrene	<0.0010		0.0010	mg/L	03-AUG-17	04-AUG-17	R3791520
F1(C6-C10)	<0.10		0.10	mg/L	03-AUG-17	04-AUG-17	R3791520
F1-BTEX	<0.10		0.10	mg/L	03-AUG-17	04-AUG-17	R3791520
Xylenes	<0.00071		0.00071	mg/L	03-AUG-17	04-AUG-17	R3791520
Surrogate: 1,4-Difluorobenzene (SS)	100.6		70-130	%	03-AUG-17	04-AUG-17	R3791520
Surrogate: 4-Bromofluorobenzene (SS)	89.0		70-130	%	03-AUG-17	04-AUG-17	R3791520
Surrogate: 3,4-Dichlorotoluene (SS)	107.1		70-130	%	03-AUG-17	04-AUG-17	R3791520
F2 (>C10-C16)							
F2 (C10-C16)	<0.10		0.10	mg/L	03-AUG-17	03-AUG-17	R3791876
Surrogate: 2-Bromobenzotrifluoride	96.4		60-140	%	03-AUG-17	03-AUG-17	R3791876
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	1.59		0.050	mg/L		15-AUG-17	R3800727
Dissolved Organic Carbon	4.8		1.0	mg/L		12-AUG-17	R3796542
Phenols (4AAP)	<0.0010		0.0010	mg/L		03-AUG-17	R3791173
Special Request	See Attached					15-AUG-17	R3800930
Total Dissolved Solids	1010		10	mg/L		04-AUG-17	R3792278
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-AUG-17	R3808961
Aluminum (Al)-Dissolved	0.0053		0.0010	mg/L		24-AUG-17	R3808976
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		24-AUG-17	R3808976
Arsenic (As)-Dissolved	0.00530		0.00010	mg/L		24-AUG-17	R3808976
Barium (Ba)-Dissolved	0.0318		0.000050	mg/L		24-AUG-17	R3808976
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		24-AUG-17	R3808976
Boron (B)-Dissolved	0.204		0.010	mg/L		24-AUG-17	R3808976
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		24-AUG-17	R3808976
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		24-AUG-17	R3808976
Cobalt (Co)-Dissolved	0.00018		0.00010	mg/L		24-AUG-17	R3808976
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		24-AUG-17	R3808976
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L		24-AUG-17	R3808976
Molybdenum (Mo)-Dissolved	0.00103		0.000050	mg/L		24-AUG-17	R3808976
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L		24-AUG-17	R3808976
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		24-AUG-17	R3808976
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		24-AUG-17	R3808976
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		24-AUG-17	R3808976
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		24-AUG-17	R3808976
Uranium (U)-Dissolved	0.000683		0.000010	mg/L		24-AUG-17	R3808976
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		24-AUG-17	R3808976
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		24-AUG-17	R3808976
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	2.4	DLDS	1.0	mg/L		02-AUG-17	R3791474
Dissolved Mercury in Water by CVAAS							
Dissolved Mercury Filtration Location	FIELD					09-AUG-17	R3793760
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		09-AUG-17	R3794090
Fluoride in Water by IC							

* 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
L1968626-1 MW-08							
Sampled By: PERD on 02-AUG-17 @ 09:18							
Matrix: GW							
Fluoride in Water by IC							
Fluoride (F)	0.103	DLDS	0.040	mg/L		02-AUG-17	R3791474
Ion Balance Calculation							
Ion Balance	92.6			%		25-AUG-17	
TDS (Calculated)	987			mg/L		25-AUG-17	
Hardness (as CaCO3)	540			mg/L		25-AUG-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLDS	0.040	mg/L		02-AUG-17	R3791474
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.045		0.045	mg/L		06-AUG-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLDS	0.020	mg/L		02-AUG-17	R3791474
Sulfate in Water by IC							
Sulfate (SO4)	357	DLDS	0.60	mg/L		02-AUG-17	R3791474
pH, Conductivity and Total Alkalinity							
pH	7.39		0.10	pH		02-AUG-17	R3788060
Conductivity (EC)	1460		2.0	uS/cm		02-AUG-17	R3788060
Bicarbonate (HCO3)	583		5.0	mg/L		02-AUG-17	R3788060
Carbonate (CO3)	<5.0		5.0	mg/L		02-AUG-17	R3788060
Hydroxide (OH)	<5.0		5.0	mg/L		02-AUG-17	R3788060
Alkalinity, Total (as CaCO3)	478		2.0	mg/L		02-AUG-17	R3788060

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

Reference Information

Sample Parameter Qualifier Key:

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

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTXS,F1-ED	Water	BTEX, Styrene and F1 (C6-C10)	EPA 5021/8015&8260 GC-MS & FID
C-DIS-ORG-ED	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

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

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

F-IC-N-ED	Water	Fluoride in Water by IC	EPA 300.1 (mod)

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

F2-ED	Water	F2 (>C10-C16)	EPA 3510/CCME PHC CWS-GC-FID
HG-D-CVAA-ED	Water	Dissolved Mercury in Water by CVAAS	APHA 3030B/EPA 1631E (mod)

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

IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-CL	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

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

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

NH3-D-COL-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-ED	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-ED	Water	Nitrate in Water by IC	EPA 300.1 (mod)

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

PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed).
pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.
Alkalinity measurement is based on the sample's capacity to neutralize acid. Auto-titration to pH 4.5 using 0.02N H_2SO_4 is performed.
Conductivity measurement is based on the sample's capacity to convey an electric current, and is measured with a conductivity meter.

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

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

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

SOLIDS-TDS-ED	Water	Total Dissolved Solids	APHA 2540 C

Gravimetric determination of solids in waters by filtration and evaporating filtrate to dryness at 180 degrees Celsius.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SPECIAL REQUEST-IS	Misc.	Special Request Isobrine Solutions	SEE SUBLET LAB RESULTS

** 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
IS	ISOBRINE SOLUTIONS INC
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

15-601481

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: L1968626 Report Date: 25-AUG-17

Client: WorleyParsons Canada
8615 51 Avenue
Edmonton AB T6E 6A8
Contact: Trevor Butterfield

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTXS,F1-ED	**Water**							
Batch R3791520								
WG2585036-2 LCS								
Benzene			100.9		%		70-130	04-AUG-17
Toluene			91.8		%		70-130	04-AUG-17
EthylBenzene			95.8		%		70-130	04-AUG-17
m+p-Xylene			98.0		%		70-130	04-AUG-17
o-Xylene			100.2		%		70-130	04-AUG-17
Styrene			99.0		%		70-130	04-AUG-17
WG2585036-3 LCS								
F1(C6-C10)			116.5		%		70-130	04-AUG-17
WG2585036-1 MB								
Benzene			<0.00050		mg/L		0.0005	04-AUG-17
Toluene			<0.00050		mg/L		0.0005	04-AUG-17
EthylBenzene			<0.00050		mg/L		0.0005	04-AUG-17
m+p-Xylene			<0.00050		mg/L		0.0005	04-AUG-17
o-Xylene			<0.00050		mg/L		0.0005	04-AUG-17
Styrene			<0.0010		mg/L		0.001	04-AUG-17
F1(C6-C10)			<0.10		mg/L		0.1	04-AUG-17
Surrogate: 1,4-Difluorobenzene (SS)			100.2		%		70-130	04-AUG-17
Surrogate: 4-Bromofluorobenzene (SS)			85.0		%		70-130	04-AUG-17
Surrogate: 3,4-Dichlorotoluene (SS)			113.2		%		70-130	04-AUG-17
C-DIS-ORG-ED	**Water**							
Batch R3796542								
WG2590920-2 LCS		**CARBON HI@40**						
Dissolved Organic Carbon			88.7		%		80-120	12-AUG-17
WG2590920-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	12-AUG-17
CL-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-13 LCS								
Chloride (Cl)			98.7		%		90-110	02-AUG-17
WG2583691-17 LCS								
Chloride (Cl)			98.1		%		90-110	02-AUG-17
WG2583691-2 LCS								
Chloride (Cl)			98.0		%		90-110	02-AUG-17
WG2583691-23 LCS								
Chloride (Cl)			98.7		%		90-110	02-AUG-17
WG2583691-5 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-5 LCS								
Chloride (Cl)			98.7		%		90-110	02-AUG-17
WG2583691-9 LCS								
Chloride (Cl)			98.8		%		90-110	02-AUG-17
WG2583691-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-10 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-14 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-18 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-24 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
WG2583691-6 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-AUG-17
F-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-13 LCS								
Fluoride (F)			104.3		%		90-110	02-AUG-17
WG2583691-17 LCS								
Fluoride (F)			104.3		%		90-110	02-AUG-17
WG2583691-2 LCS								
Fluoride (F)			100.3		%		90-110	02-AUG-17
WG2583691-23 LCS								
Fluoride (F)			106.9		%		90-110	02-AUG-17
WG2583691-5 LCS								
Fluoride (F)			108.2		%		90-110	02-AUG-17
WG2583691-9 LCS								
Fluoride (F)			105.8		%		90-110	02-AUG-17
WG2583691-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-10 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-14 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-18 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-24 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-24 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-6 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-AUG-17
F2-ED	**Water**							
Batch R3791876								
WG2584469-2 LCS								
F2 (C10-C16)			106.6		%		70-130	03-AUG-17
WG2584469-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	03-AUG-17
Surrogate: 2-Bromobenzotrifluoride			86.7		%		60-140	03-AUG-17
HG-D-CVAA-ED	**Water**							
Batch R3794090								
WG2588095-2 LCS								
Mercury (Hg)-Dissolved			99.0		%		80-120	09-AUG-17
WG2588095-1 MB								
Mercury (Hg)-Dissolved			<0.000005C		mg/L		0.000005	09-AUG-17
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-6 DUP		**L1968626-1**						
Aluminum (Al)-Dissolved		0.0053	0.0048		mg/L	9.6	20	24-AUG-17
Antimony (Sb)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-AUG-17
Arsenic (As)-Dissolved		0.00530	0.00538		mg/L	1.5	20	24-AUG-17
Barium (Ba)-Dissolved		0.0318	0.0298		mg/L	6.6	20	24-AUG-17
Beryllium (Be)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-AUG-17
Boron (B)-Dissolved		0.204	0.196		mg/L	4.2	20	24-AUG-17
Cadmium (Cd)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	24-AUG-17
Chromium (Cr)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-AUG-17
Cobalt (Co)-Dissolved		0.00018	0.00017		mg/L	2.5	20	24-AUG-17
Copper (Cu)-Dissolved		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	24-AUG-17
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-AUG-17
Molybdenum (Mo)-Dissolved		0.00103	0.000968		mg/L	6.4	20	24-AUG-17
Nickel (Ni)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-AUG-17
Selenium (Se)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-AUG-17
Silver (Ag)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	24-AUG-17
Thallium (Tl)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	24-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-6 DUP		**L1968626-1**						
Titanium (Ti)-Dissolved		<0.00030	0.00034	RPD-NA	mg/L	N/A	20	24-AUG-17
Uranium (U)-Dissolved		0.000683	0.000666		mg/L	2.5	20	24-AUG-17
Vanadium (V)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-AUG-17
Zinc (Zn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	24-AUG-17
WG2600609-11 LCS		**TMRM**						
Aluminum (Al)-Dissolved			114.5		%		80-120	24-AUG-17
Antimony (Sb)-Dissolved			105.6		%		80-120	24-AUG-17
Arsenic (As)-Dissolved			103.8		%		80-120	24-AUG-17
Barium (Ba)-Dissolved			101.2		%		80-120	24-AUG-17
Beryllium (Be)-Dissolved			88.8		%		80-120	24-AUG-17
Boron (B)-Dissolved			94.8		%		80-120	24-AUG-17
Cadmium (Cd)-Dissolved			99.1		%		80-120	24-AUG-17
Chromium (Cr)-Dissolved			98.1		%		80-120	24-AUG-17
Cobalt (Co)-Dissolved			102.6		%		80-120	24-AUG-17
Copper (Cu)-Dissolved			101.1		%		80-120	24-AUG-17
Lead (Pb)-Dissolved			102.4		%		80-120	24-AUG-17
Molybdenum (Mo)-Dissolved			98.6		%		80-120	24-AUG-17
Nickel (Ni)-Dissolved			101.9		%		80-120	24-AUG-17
Selenium (Se)-Dissolved			99.7		%		80-120	24-AUG-17
Silver (Ag)-Dissolved			97.0		%		80-120	24-AUG-17
Thallium (Tl)-Dissolved			111.5		%		80-120	24-AUG-17
Titanium (Ti)-Dissolved			100.2		%		80-120	24-AUG-17
Uranium (U)-Dissolved			87.7		%		80-120	24-AUG-17
Vanadium (V)-Dissolved			105.0		%		80-120	24-AUG-17
Zinc (Zn)-Dissolved			101.5		%		80-120	24-AUG-17
WG2600609-13 LCS		**TMRM**						
Aluminum (Al)-Dissolved			104.9		%		80-120	24-AUG-17
Antimony (Sb)-Dissolved			99.0		%		80-120	24-AUG-17
Arsenic (As)-Dissolved			104.3		%		80-120	24-AUG-17
Barium (Ba)-Dissolved			105.1		%		80-120	24-AUG-17
Beryllium (Be)-Dissolved			103.9		%		80-120	24-AUG-17
Boron (B)-Dissolved			93.8		%		80-120	24-AUG-17
Cadmium (Cd)-Dissolved			100.5		%		80-120	24-AUG-17
Chromium (Cr)-Dissolved			101.3		%		80-120	24-AUG-17
Cobalt (Co)-Dissolved			101.1		%		80-120	24-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-13 LCS		**TMRM**						
Copper (Cu)-Dissolved			101.0		%		80-120	24-AUG-17
Lead (Pb)-Dissolved			109.3		%		80-120	24-AUG-17
Molybdenum (Mo)-Dissolved			101.6		%		80-120	24-AUG-17
Nickel (Ni)-Dissolved			101.3		%		80-120	24-AUG-17
Selenium (Se)-Dissolved			101.2		%		80-120	24-AUG-17
Silver (Ag)-Dissolved			99.5		%		80-120	24-AUG-17
Thallium (Tl)-Dissolved			103.5		%		80-120	24-AUG-17
Titanium (Ti)-Dissolved			101.2		%		80-120	24-AUG-17
Uranium (U)-Dissolved			95.7		%		80-120	24-AUG-17
Vanadium (V)-Dissolved			103.7		%		80-120	24-AUG-17
Zinc (Zn)-Dissolved			97.8		%		80-120	24-AUG-17
WG2600609-16 LCS		**TMRM**						
Aluminum (Al)-Dissolved			105.9		%		80-120	24-AUG-17
Antimony (Sb)-Dissolved			95.6		%		80-120	24-AUG-17
Arsenic (As)-Dissolved			104.0		%		80-120	24-AUG-17
Barium (Ba)-Dissolved			105.2		%		80-120	24-AUG-17
Beryllium (Be)-Dissolved			108.6		%		80-120	24-AUG-17
Boron (B)-Dissolved			95.9		%		80-120	24-AUG-17
Cadmium (Cd)-Dissolved			97.8		%		80-120	24-AUG-17
Chromium (Cr)-Dissolved			101.6		%		80-120	24-AUG-17
Cobalt (Co)-Dissolved			101.0		%		80-120	24-AUG-17
Copper (Cu)-Dissolved			101.5		%		80-120	24-AUG-17
Lead (Pb)-Dissolved			103.2		%		80-120	24-AUG-17
Molybdenum (Mo)-Dissolved			105.9		%		80-120	24-AUG-17
Nickel (Ni)-Dissolved			101.2		%		80-120	24-AUG-17
Selenium (Se)-Dissolved			101.5		%		80-120	24-AUG-17
Silver (Ag)-Dissolved			96.9		%		80-120	24-AUG-17
Thallium (Tl)-Dissolved			98.6		%		80-120	24-AUG-17
Titanium (Ti)-Dissolved			105.6		%		80-120	24-AUG-17
Uranium (U)-Dissolved			100.2		%		80-120	24-AUG-17
Vanadium (V)-Dissolved			103.5		%		80-120	24-AUG-17
Zinc (Zn)-Dissolved			94.5		%		80-120	24-AUG-17
WG2600609-19 LCS		**TMRM**						
Aluminum (Al)-Dissolved			106.2		%		80-120	24-AUG-17
Antimony (Sb)-Dissolved			95.9		%		80-120	24-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-19 LCS		**TMRM**						
Arsenic (As)-Dissolved			103.5		%		80-120	24-AUG-17
Barium (Ba)-Dissolved			107.2		%		80-120	24-AUG-17
Beryllium (Be)-Dissolved			107.8		%		80-120	24-AUG-17
Boron (B)-Dissolved			84.9		%		80-120	24-AUG-17
Cadmium (Cd)-Dissolved			98.9		%		80-120	24-AUG-17
Chromium (Cr)-Dissolved			97.2		%		80-120	24-AUG-17
Cobalt (Co)-Dissolved			100.8		%		80-120	24-AUG-17
Copper (Cu)-Dissolved			99.95		%		80-120	24-AUG-17
Lead (Pb)-Dissolved			102.5		%		80-120	24-AUG-17
Molybdenum (Mo)-Dissolved			103.1		%		80-120	24-AUG-17
Nickel (Ni)-Dissolved			99.99		%		80-120	24-AUG-17
Selenium (Se)-Dissolved			96.7		%		80-120	24-AUG-17
Silver (Ag)-Dissolved			94.8		%		80-120	24-AUG-17
Thallium (Tl)-Dissolved			101.5		%		80-120	24-AUG-17
Titanium (Ti)-Dissolved			101.4		%		80-120	24-AUG-17
Uranium (U)-Dissolved			99.7		%		80-120	24-AUG-17
Vanadium (V)-Dissolved			102.4		%		80-120	24-AUG-17
Zinc (Zn)-Dissolved			95.5		%		80-120	24-AUG-17
WG2600609-2 LCS		**TMRM**						
Aluminum (Al)-Dissolved			102.2		%		80-120	24-AUG-17
Antimony (Sb)-Dissolved			92.9		%		80-120	24-AUG-17
Arsenic (As)-Dissolved			102.8		%		80-120	24-AUG-17
Barium (Ba)-Dissolved			101.4		%		80-120	24-AUG-17
Beryllium (Be)-Dissolved			99.7		%		80-120	24-AUG-17
Boron (B)-Dissolved			100.7		%		80-120	24-AUG-17
Cadmium (Cd)-Dissolved			100.5		%		80-120	24-AUG-17
Chromium (Cr)-Dissolved			102.4		%		80-120	24-AUG-17
Cobalt (Co)-Dissolved			99.3		%		80-120	24-AUG-17
Copper (Cu)-Dissolved			99.3		%		80-120	24-AUG-17
Lead (Pb)-Dissolved			101.1		%		80-120	24-AUG-17
Molybdenum (Mo)-Dissolved			100.3		%		80-120	24-AUG-17
Nickel (Ni)-Dissolved			100.1		%		80-120	24-AUG-17
Selenium (Se)-Dissolved			101.3		%		80-120	24-AUG-17
Silver (Ag)-Dissolved			98.1		%		80-120	24-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-2 LCS		**TMRM**						
Thallium (Tl)-Dissolved			103.2		%		80-120	24-AUG-17
Titanium (Ti)-Dissolved			96.8		%		80-120	24-AUG-17
Uranium (U)-Dissolved			86.3		%		80-120	24-AUG-17
Vanadium (V)-Dissolved			104.5		%		80-120	24-AUG-17
Zinc (Zn)-Dissolved			96.2		%		80-120	24-AUG-17
WG2600609-21 LCS		**TMRM**						
Aluminum (Al)-Dissolved			104.7		%		80-120	24-AUG-17
Antimony (Sb)-Dissolved			98.1		%		80-120	24-AUG-17
Arsenic (As)-Dissolved			101.5		%		80-120	24-AUG-17
Barium (Ba)-Dissolved			100.2		%		80-120	24-AUG-17
Beryllium (Be)-Dissolved			112.0		%		80-120	24-AUG-17
Boron (B)-Dissolved			92.3		%		80-120	24-AUG-17
Cadmium (Cd)-Dissolved			98.8		%		80-120	24-AUG-17
Chromium (Cr)-Dissolved			98.6		%		80-120	24-AUG-17
Cobalt (Co)-Dissolved			101.6		%		80-120	24-AUG-17
Copper (Cu)-Dissolved			101.5		%		80-120	24-AUG-17
Lead (Pb)-Dissolved			102.8		%		80-120	24-AUG-17
Molybdenum (Mo)-Dissolved			106.6		%		80-120	24-AUG-17
Nickel (Ni)-Dissolved			100.1		%		80-120	24-AUG-17
Selenium (Se)-Dissolved			102.4		%		80-120	24-AUG-17
Silver (Ag)-Dissolved			97.1		%		80-120	24-AUG-17
Thallium (Tl)-Dissolved			99.8		%		80-120	24-AUG-17
Titanium (Ti)-Dissolved			107.1		%		80-120	24-AUG-17
Uranium (U)-Dissolved			90.9		%		80-120	24-AUG-17
Vanadium (V)-Dissolved			101.9		%		80-120	24-AUG-17
Zinc (Zn)-Dissolved			97.8		%		80-120	24-AUG-17
WG2600609-24 LCS		**TMRM**						
Aluminum (Al)-Dissolved			104.4		%		80-120	24-AUG-17
Antimony (Sb)-Dissolved			94.4		%		80-120	24-AUG-17
Arsenic (As)-Dissolved			102.6		%		80-120	24-AUG-17
Barium (Ba)-Dissolved			97.7		%		80-120	24-AUG-17
Beryllium (Be)-Dissolved			113.0		%		80-120	24-AUG-17
Boron (B)-Dissolved			92.9		%		80-120	24-AUG-17
Cadmium (Cd)-Dissolved			97.9		%		80-120	24-AUG-17
Chromium (Cr)-Dissolved			101.1		%		80-120	24-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-24 LCS		**TMRM**						
Cobalt (Co)-Dissolved			100.6		%		80-120	24-AUG-17
Copper (Cu)-Dissolved			101.1		%		80-120	24-AUG-17
Lead (Pb)-Dissolved			104.1		%		80-120	24-AUG-17
Molybdenum (Mo)-Dissolved			109.1		%		80-120	24-AUG-17
Nickel (Ni)-Dissolved			99.2		%		80-120	24-AUG-17
Selenium (Se)-Dissolved			100.7		%		80-120	24-AUG-17
Silver (Ag)-Dissolved			95.4		%		80-120	24-AUG-17
Thallium (Tl)-Dissolved			104.7		%		80-120	24-AUG-17
Titanium (Ti)-Dissolved			95.4		%		80-120	24-AUG-17
Uranium (U)-Dissolved			107.9		%		80-120	24-AUG-17
Vanadium (V)-Dissolved			102.5		%		80-120	24-AUG-17
Zinc (Zn)-Dissolved			94.5		%		80-120	24-AUG-17
WG2600609-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	24-AUG-17
Cadmium (Cd)-Dissolved			<0.000005C		mg/L		0.000005	24-AUG-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	24-AUG-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	24-AUG-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
WG2600609-12 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-12 MB								
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	24-AUG-17
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	24-AUG-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	24-AUG-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	24-AUG-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
WG2600609-15 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	24-AUG-17
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	24-AUG-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	24-AUG-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-15 MB								
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	24-AUG-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
WG2600609-20 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	24-AUG-17
Cadmium (Cd)-Dissolved			<0.000005(		mg/L		0.000005	24-AUG-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	24-AUG-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	24-AUG-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
WG2600609-23 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	24-AUG-17
Cadmium (Cd)-Dissolved			<0.000005(		mg/L		0.000005	24-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3808976								
WG2600609-23 MB								
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	24-AUG-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	24-AUG-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	24-AUG-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	24-AUG-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	24-AUG-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	24-AUG-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	24-AUG-17
NH3-D-COL-ED	**Water**							
Batch R3800727								
WG2592662-12 LCS								
Ammonia, Total Dissolved (as N)			107.2		%		85-115	15-AUG-17
WG2592662-2 LCS								
Ammonia, Total Dissolved (as N)			101.9		%		85-115	15-AUG-17
WG2592662-1 MB								
Ammonia, Total Dissolved (as N)			<0.050		mg/L		0.05	15-AUG-17
WG2592662-11 MB								
Ammonia, Total Dissolved (as N)			<0.050		mg/L		0.05	15-AUG-17
NO2-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-13 LCS								
Nitrite (as N)			100.7		%		90-110	02-AUG-17
WG2583691-17 LCS								
Nitrite (as N)			99.9		%		90-110	02-AUG-17
WG2583691-2 LCS								
Nitrite (as N)			100.1		%		90-110	02-AUG-17
WG2583691-23 LCS								
Nitrite (as N)			100.3		%		90-110	02-AUG-17
WG2583691-5 LCS								
Nitrite (as N)			100.5		%		90-110	02-AUG-17
WG2583691-9 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-9 LCS								
Nitrite (as N)			100.6		%		90-110	02-AUG-17
WG2583691-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-10 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-14 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-18 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-24 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
WG2583691-6 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-AUG-17
NO3-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-13 LCS								
Nitrate (as N)			98.7		%		90-110	02-AUG-17
WG2583691-17 LCS								
Nitrate (as N)			97.4		%		90-110	02-AUG-17
WG2583691-2 LCS								
Nitrate (as N)			98.2		%		90-110	02-AUG-17
WG2583691-23 LCS								
Nitrate (as N)			98.6		%		90-110	02-AUG-17
WG2583691-5 LCS								
Nitrate (as N)			98.0		%		90-110	02-AUG-17
WG2583691-9 LCS								
Nitrate (as N)			98.8		%		90-110	02-AUG-17
WG2583691-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-10 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-14 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-18 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-24 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
WG2583691-6 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-6 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-AUG-17
PH/EC/ALK-ED	**Water**							
Batch R3788060								
WG2583638-12 LCS		**MID 1412**						
Conductivity (EC)			95.9		%		90-110	02-AUG-17
WG2583638-13 LCS		**ED-PH6**						
pH			6.01		pH		5.8-6.2	02-AUG-17
WG2583638-14 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			96.4		%		85-115	02-AUG-17
WG2583638-15 LCS		**HI 12890**						
Conductivity (EC)			93.2		%		90-110	02-AUG-17
WG2583638-17 LCS		**MID 1412**						
Conductivity (EC)			98.9		%		90-110	02-AUG-17
WG2583638-18 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	02-AUG-17
WG2583638-19 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			99.0		%		85-115	02-AUG-17
WG2583638-2 LCS		**MID 1412**						
Conductivity (EC)			98.5		%		90-110	02-AUG-17
WG2583638-20 LCS		**HI 12890**						
Conductivity (EC)			96.3		%		90-110	02-AUG-17
WG2583638-22 LCS		**MID 1412**						
Conductivity (EC)			96.2		%		90-110	02-AUG-17
WG2583638-23 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	02-AUG-17
WG2583638-24 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			98.2		%		85-115	02-AUG-17
WG2583638-25 LCS		**HI 12890**						
Conductivity (EC)			92.6		%		90-110	02-AUG-17
WG2583638-3 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	02-AUG-17
WG2583638-4 LCS		**PCTITRATE LCS**						
Alkalinity, Total (as CaCO3)			96.8		%		85-115	02-AUG-17
WG2583638-5 LCS		**HI 12890**						
Conductivity (EC)			98.0		%		90-110	02-AUG-17
WG2583638-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	02-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R3788060								
WG2583638-1 MB								
Bicarbonate (HCO3)			<5.0		mg/L		5	02-AUG-17
Carbonate (CO3)			<5.0		mg/L		5	02-AUG-17
Hydroxide (OH)			<5.0		mg/L		5	02-AUG-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	02-AUG-17
WG2583638-16 MB								
Conductivity (EC)			<2.0		uS/cm		2	02-AUG-17
Bicarbonate (HCO3)			<5.0		mg/L		5	02-AUG-17
Carbonate (CO3)			<5.0		mg/L		5	02-AUG-17
Hydroxide (OH)			<5.0		mg/L		5	02-AUG-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	02-AUG-17
WG2583638-21 MB								
Conductivity (EC)			<2.0		uS/cm		2	02-AUG-17
Bicarbonate (HCO3)			<5.0		mg/L		5	02-AUG-17
Carbonate (CO3)			<5.0		mg/L		5	02-AUG-17
Hydroxide (OH)			<5.0		mg/L		5	02-AUG-17
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	02-AUG-17
PHENOLS-4AAP-WT	**Water**							
Batch R3791173								
WG2585249-2 LCS								
Phenols (4AAP)			100.0		%		85-115	03-AUG-17
WG2585249-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	03-AUG-17
SO4-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-13 LCS								
Sulfate (SO4)			102.5		%		90-110	02-AUG-17
WG2583691-17 LCS								
Sulfate (SO4)			101.4		%		90-110	02-AUG-17
WG2583691-2 LCS								
Sulfate (SO4)			99.96		%		90-110	02-AUG-17
WG2583691-23 LCS								
Sulfate (SO4)			102.3		%		90-110	02-AUG-17
WG2583691-5 LCS								
Sulfate (SO4)			103.3		%		90-110	02-AUG-17
WG2583691-9 LCS								
Sulfate (SO4)			103.1		%		90-110	02-AUG-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-ED	**Water**							
Batch R3791474								
WG2583691-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-10 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-14 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-18 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-24 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
WG2583691-6 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-AUG-17
SOLIDS-TDS-ED	**Water**							
Batch R3792278								
WG2585578-2 LCS								
Total Dissolved Solids			97.6		%		85-115	04-AUG-17
WG2585578-1 MB								
Total Dissolved Solids			<10		mg/L		10	04-AUG-17

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.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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.

Client:	**ALS Environmental**
Report date:	**15-Aug-17**

WATER ANALYSIS RESULTS

Isobrine ID	Client sample IDs		Client project ID	Collected	Received	$\delta^{18}O$
						‰ VSMOW
IB-17-980	L1968626-1	MW-08	L1968626	2-Aug-17	4-Aug-17	-17.39

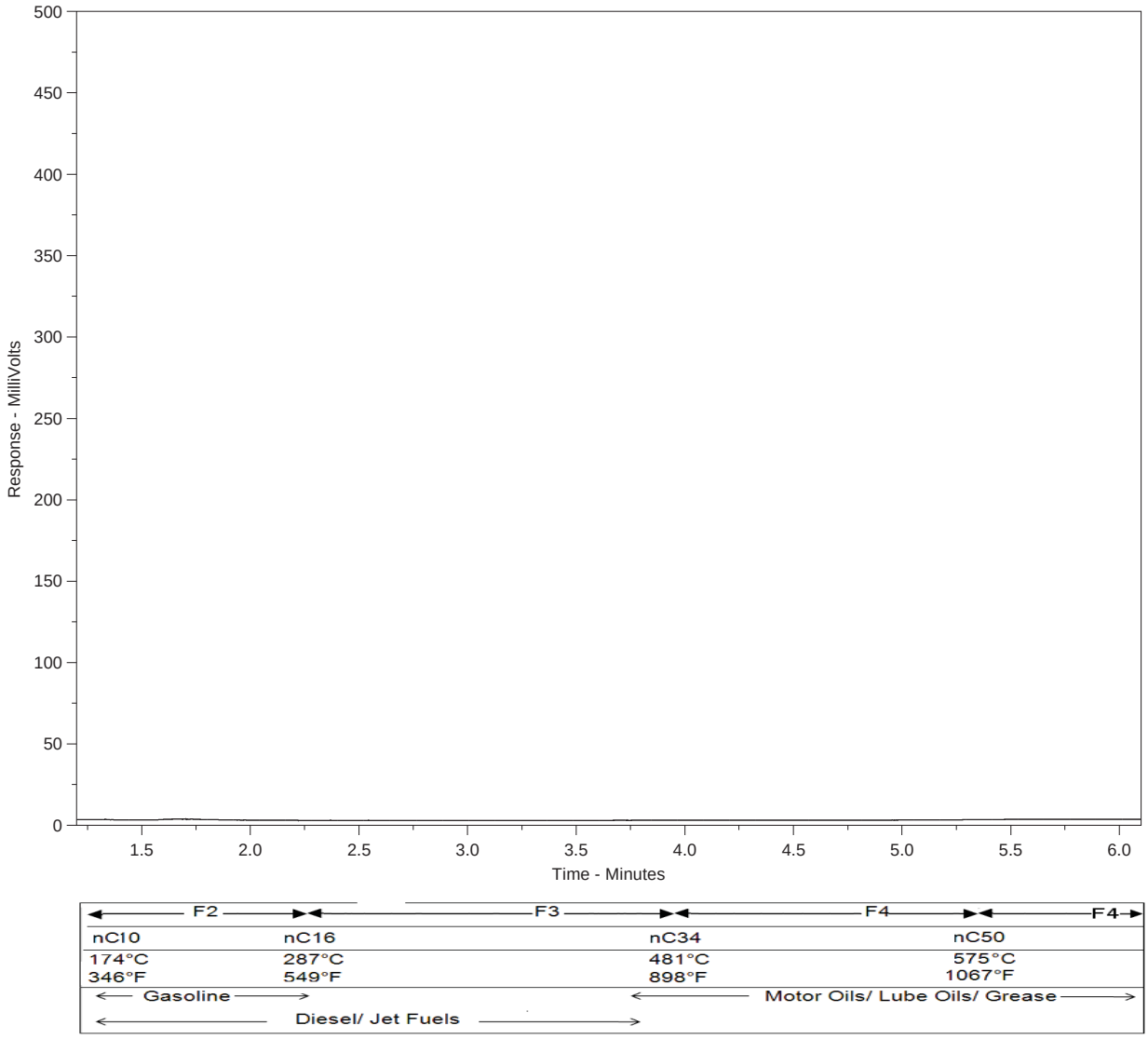
Oxygen and hydrogen stable isotope compositions determined on mechanically and chemically cleaned samples using a CRDS (Cavity Ring-down Mass Spectrometer).
Standard deviations for $\delta^{18}O$ and $\delta^{2}H$ are equal to or better than 0.2 ‰ and 2.0 ‰, respectively ($\pm 1\sigma$).

Isobrine Solutions Inc.
4-341 Enterprise Square
10230 Jasper Ave
Edmonton, AB, T5J 4P6

	δ^2H	
±1σ	‰ VSMOW	±1σ
0.04	-141.4	0.12

Hydrocarbon Distribution Report

ALS Sample ID: L1968626-1
Client ID: MW-08



The Canada Wide Standard Hydrocarbon Distribution Report is intended to assist you in characterizing hydrocarbon products that may be present in your sample. The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products as well as a number of specified n-alkane hydrocarbon marker compounds. Comparison of this report with those of reference standards may also assist in characterizing hydrocarbons present in the sample.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note:
This chromatogram was produced with a high temperature GC method that is specific to the Canada-Wide Standard method. Note that retention times and distribution profiles from reports produced using different GC programs will differ.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1968626-COFC

COC Number: 15 - 601481

Page of

Report To	Contact and company name below will appear on the final report
Company:	WorleyParsons
Contact:	Trevor Butterfield
Phone:	
	Company address below will appear on the final report
Street:	Suite 300 8615 51 Ave, AB
City/Province:	Edmonton, AB
Postal Code:	T6E 6A8
Invoice To	Same as Report To [X] YES [ ] NO
	Copy of Invoice with Report [ ] YES [ ] NO
Company:	
Contact:	

Report Format / Distribution

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

Invoice Distribution

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

Project Information

ALS Account # / Quote #: Q61863
Job #: 307075-01608-300
PO / AFE:
LSD:
ALS Lab Work Order # (lab use only): L1968626

Oil and Gas Required Fields (client use)

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

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

Regular [R] [X] 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.

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	BTEX, F1 (P)	F2 (P)	Routine/Major Ions	OC & DNH3 (F/P)	Dissolved metals, & Hg (F/P)	Phenols (P)	Hg, O18 Isotopes	Number of Containers
MW-08		02-Aug-17	09:18	GW	X	X	X	X	X	X	X	11
MW-12		"	10:22	"	X	X	X				X	7
DUP17-02		"	09:45	"	X	X	X				X	7

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

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

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

Please combine results from MW-12 & DUP17-02 with report for samples from same project submitted on July 15 2017

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		
9.5°C					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	02-Aug-17	12:17		Aug 2, 2017	12:PM			

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**.

WorleyParsons Canada
ATTN: Trevor Butterfield
8615 51 Avenue
Edmonton AB T6E 6A8

Date Received: 29-SEP-17
Report Date: 03-NOV-17 16:48 (MT)
Version: FINAL

Client Phone: 780-496-9055

Certificate of Analysis

Lab Work Order #: L1999973

Project P.O. #: NOT SUBMITTED
Job Reference: 307075-01608-300
C of C Numbers: 17-646682
Legal Site Desc:

Dana Brown, Chem. Tech. DIPL
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1999973-1 MW-02							
Sampled By: PERD on 29-SEP-17 @ 12:30							
Matrix: WATER							
BTEX,Styrene, F1 (C6-C10), F2 (>C10-C16)							
BTEX and Styrene							
Benzene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
Toluene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
Ethylbenzene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
o-Xylene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
m+p-Xylene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
Styrene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
Surrogate: 4-Bromofluorobenzene	95.9		70-130	%		13-OCT-17	R3854162
Surrogate: 1,4-Difluorobenzene	99.7		70-130	%		13-OCT-17	R3854162
CCME F2-4 Hydrocarbons							
F2: (C10-C16)	<0.10		0.10	mg/L	10-OCT-17	15-OCT-17	R3852805
Surrogate: 2-Bromobenzotrifluoride	88.7		60-140	%	10-OCT-17	15-OCT-17	R3852805
F1 (C6-C10)							
F1(C6-C10)	<0.10		0.10	mg/L	11-OCT-17	11-OCT-17	R3854174
F1-BTEX	<0.10		0.10	mg/L	11-OCT-17	11-OCT-17	R3854174
Surrogate: 3,4-Dichlorotoluene	122.9		70-130	%	11-OCT-17	11-OCT-17	R3854174
Sum of Xylene Isomer Concentrations							
Xylenes	<0.00071		0.00071	mg/L		13-OCT-17	
Miscellaneous Parameters							
Ammonia, Total Dissolved (as N)	0.73		0.10	mg/L		17-OCT-17	R3858143
Dissolved Organic Carbon	5.4		1.0	mg/L		18-OCT-17	R3859881
Phenols (4AAP)	<0.0010		0.0010	mg/L		10-OCT-17	R3851120
Special Request	See Attached					13-OCT-17	R3854122
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	25.0	DLHC	2.5	mg/L		02-OCT-17	R3859775
Dissolved Mercury in Water by CVAAS							
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		17-OCT-17	R3858799
Dissolved Mercury Filtration Location	FIELD					17-OCT-17	R3858681
Dissolved Metals by ICPOES							
Dissolved Metals Filtration Location	FIELD					22-OCT-17	R3863142
Calcium (Ca)-Dissolved	157		0.10	mg/L		23-OCT-17	R3863247
Iron (Fe)-Dissolved	11.2		0.030	mg/L		23-OCT-17	R3863247
Magnesium (Mg)-Dissolved	54.8		0.10	mg/L		23-OCT-17	R3863247
Manganese (Mn)-Dissolved	0.467		0.0050	mg/L		23-OCT-17	R3863247
Potassium (K)-Dissolved	5.08		0.50	mg/L		23-OCT-17	R3863247
Sodium (Na)-Dissolved	125		1.0	mg/L		23-OCT-17	R3863247
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					17-OCT-17	R3857923
Aluminum (Al)-Dissolved	<0.0010		0.0010	mg/L		17-OCT-17	R3857953
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L		17-OCT-17	R3857953
Arsenic (As)-Dissolved	0.00336		0.00010	mg/L		17-OCT-17	R3857953
Barium (Ba)-Dissolved	0.191		0.000050	mg/L		17-OCT-17	R3857953
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L		17-OCT-17	R3857953
Boron (B)-Dissolved	0.183		0.010	mg/L		17-OCT-17	R3857953
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		17-OCT-17	R3857953
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L		17-OCT-17	R3857953
Cobalt (Co)-Dissolved	0.00038		0.00010	mg/L		17-OCT-17	R3857953
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L		17-OCT-17	R3857953
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L		17-OCT-17	R3857953
Molybdenum (Mo)-Dissolved	0.000496		0.000050	mg/L		17-OCT-17	R3857953

* 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
L1999973-1 MW-02							
Sampled By: PERD on 29-SEP-17 @ 12:30							
Matrix: WATER							
Dissolved Metals in Water by CRC ICPMS							
Nickel (Ni)-Dissolved	0.00091		0.00050	mg/L		17-OCT-17	R3857953
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L		17-OCT-17	R3857953
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L		17-OCT-17	R3857953
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L		17-OCT-17	R3857953
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L		17-OCT-17	R3857953
Uranium (U)-Dissolved	0.000912		0.000010	mg/L		17-OCT-17	R3857953
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L		17-OCT-17	R3857953
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L		17-OCT-17	R3857953
Fluoride in Water by IC							
Fluoride (F)	<0.10	DLHC	0.10	mg/L		02-OCT-17	R3859775
Ion Balance Calculation							
Ion Balance	127	RRV		%		23-OCT-17	
TDS (Calculated)	862			mg/L		23-OCT-17	
Hardness (as CaCO3)	618			mg/L		23-OCT-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLHC	0.10	mg/L		02-OCT-17	R3859775
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.11		0.11	mg/L		19-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		02-OCT-17	R3859775
Sulfate in Water by IC							
Sulfate (SO4)	250	DLHC	1.5	mg/L		02-OCT-17	R3859775
pH, Conductivity and Total Alkalinity							
pH	8.14		0.10	pH		07-OCT-17	R3849602
Conductivity (EC)	1220		2.0	uS/cm		07-OCT-17	R3849602
Bicarbonate (HCO3)	498		5.0	mg/L		07-OCT-17	R3849602
Carbonate (CO3)	<5.0		5.0	mg/L		07-OCT-17	R3849602
Hydroxide (OH)	<5.0		5.0	mg/L		07-OCT-17	R3849602
Alkalinity, Total (as CaCO3)	408		5.0	mg/L		07-OCT-17	R3849602
L1999973-2 MW-02B							
Sampled By: PERD on 29-SEP-17 @ 12:00							
Matrix: WATER							
BTEX,Styrene, F1 (C6-C10), F2 (>C10-C16)							
BTEX and Styrene							
Benzene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
Toluene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
Ethylbenzene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
o-Xylene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
m+p-Xylene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
Styrene	<0.00050		0.00050	mg/L		13-OCT-17	R3854162
Surrogate: 4-Bromofluorobenzene	96.4		70-130	%		13-OCT-17	R3854162
Surrogate: 1,4-Difluorobenzene	99.4		70-130	%		13-OCT-17	R3854162
CCME F2-4 Hydrocarbons							
F2: (C10-C16)	<0.10		0.10	mg/L	10-OCT-17	15-OCT-17	R3852805
Surrogate: 2-Bromobenzotrifluoride	99.7		60-140	%	10-OCT-17	15-OCT-17	R3852805
F1 (C6-C10)							
F1(C6-C10)	<0.10		0.10	mg/L	11-OCT-17	11-OCT-17	R3854174
F1-BTEX	<0.10		0.10	mg/L	11-OCT-17	11-OCT-17	R3854174
Surrogate: 3,4-Dichlorotoluene	123.9		70-130	%	11-OCT-17	11-OCT-17	R3854174
Sum of Xylene Isomer Concentrations							
Xylenes	<0.00071		0.00071	mg/L		13-OCT-17	
Miscellaneous Parameters							

* 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
L1999973-2 MW-02B							
Sampled By: PERD on 29-SEP-17 @ 12:00							
Matrix: WATER							
Ammonia, Total Dissolved (as N)	1.57		0.25	mg/L		17-OCT-17	R3858143
Dissolved Organic Carbon	10.2		1.0	mg/L		18-OCT-17	R3859881
Phenols (4AAP)	0.0014		0.0010	mg/L		10-OCT-17	R3851120
Special Request	See Attached					13-OCT-17	R3854122
Major Ions & Trace Dissolved Metals							
Chloride in Water by IC							
Chloride (Cl)	975	DLHC	2.5	mg/L		02-OCT-17	R3859775
Dissolved Mercury in Water by CVAAS							
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L		17-OCT-17	R3858799
Dissolved Mercury Filtration Location	FIELD					17-OCT-17	R3858681
Dissolved Metals by ICPOES							
Dissolved Metals Filtration Location	FIELD					22-OCT-17	R3863142
Calcium (Ca)-Dissolved	37.2	DLDS	0.50	mg/L		23-OCT-17	R3863247
Iron (Fe)-Dissolved	0.44	DLDS	0.15	mg/L		23-OCT-17	R3863247
Magnesium (Mg)-Dissolved	7.34	DLDS	0.50	mg/L		23-OCT-17	R3863247
Manganese (Mn)-Dissolved	0.114	DLDS	0.025	mg/L		23-OCT-17	R3863247
Potassium (K)-Dissolved	4.0	DLDS	2.5	mg/L		23-OCT-17	R3863247
Sodium (Na)-Dissolved	673	DLDS	5.0	mg/L		23-OCT-17	R3863247
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					17-OCT-17	R3857923
Aluminum (Al)-Dissolved	<0.0050	DLDS	0.0050	mg/L		17-OCT-17	R3857953
Antimony (Sb)-Dissolved	<0.00050	DLDS	0.00050	mg/L		17-OCT-17	R3857953
Arsenic (As)-Dissolved	0.00379	DLDS	0.00050	mg/L		17-OCT-17	R3857953
Barium (Ba)-Dissolved	0.719	DLDS	0.00025	mg/L		17-OCT-17	R3857953
Beryllium (Be)-Dissolved	<0.00050	DLDS	0.00050	mg/L		17-OCT-17	R3857953
Boron (B)-Dissolved	0.765	DLDS	0.050	mg/L		17-OCT-17	R3857953
Cadmium (Cd)-Dissolved	<0.000025	DLDS	0.000025	mg/L		17-OCT-17	R3857953
Chromium (Cr)-Dissolved	<0.00050	DLDS	0.00050	mg/L		17-OCT-17	R3857953
Cobalt (Co)-Dissolved	<0.00050	DLDS	0.00050	mg/L		17-OCT-17	R3857953
Copper (Cu)-Dissolved	<0.0010	DLDS	0.0010	mg/L		17-OCT-17	R3857953
Lead (Pb)-Dissolved	<0.00025	DLDS	0.00025	mg/L		17-OCT-17	R3857953
Molybdenum (Mo)-Dissolved	0.00900	DLDS	0.00025	mg/L		17-OCT-17	R3857953
Nickel (Ni)-Dissolved	<0.0025	DLDS	0.0025	mg/L		17-OCT-17	R3857953
Selenium (Se)-Dissolved	<0.00025	DLDS	0.00025	mg/L		17-OCT-17	R3857953
Silver (Ag)-Dissolved	<0.000050	DLDS	0.000050	mg/L		17-OCT-17	R3857953
Thallium (Tl)-Dissolved	<0.000050	DLDS	0.000050	mg/L		17-OCT-17	R3857953
Titanium (Ti)-Dissolved	<0.0015	DLDS	0.0015	mg/L		17-OCT-17	R3857953
Uranium (U)-Dissolved	0.00225	DLDS	0.000050	mg/L		17-OCT-17	R3857953
Vanadium (V)-Dissolved	<0.0025	DLDS	0.0025	mg/L		17-OCT-17	R3857953
Zinc (Zn)-Dissolved	<0.0050	DLDS	0.0050	mg/L		17-OCT-17	R3857953
Fluoride in Water by IC							
Fluoride (F)	0.42	DLHC	0.10	mg/L		02-OCT-17	R3859775
Ion Balance Calculation							
Ion Balance	93.4			%		23-OCT-17	
TDS (Calculated)	1900			mg/L		23-OCT-17	
Hardness (as CaCO3)	123			mg/L		23-OCT-17	
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLHC	0.10	mg/L		02-OCT-17	R3859775
Nitrate+Nitrite							
Nitrate and Nitrite (as N)	<0.11		0.11	mg/L		19-OCT-17	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLHC	0.050	mg/L		02-OCT-17	R3859775

* 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
L1999973-2 MW-02B							
Sampled By: PERD on 29-SEP-17 @ 12:00							
Matrix: WATER							
Sulfate in Water by IC							
Sulfate (SO4)	5.8	DLHC	1.5	mg/L		02-OCT-17	R3859775
pH, Conductivity and Total Alkalinity							
pH	8.55		0.10	pH		07-OCT-17	R3849602
Conductivity (EC)	3370		2.0	uS/cm		07-OCT-17	R3849602
Bicarbonate (HCO3)	372		5.0	mg/L		07-OCT-17	R3849602
Carbonate (CO3)	10.4		5.0	mg/L		07-OCT-17	R3849602
Hydroxide (OH)	<5.0		5.0	mg/L		07-OCT-17	R3849602
Alkalinity, Total (as CaCO3)	322		5.0	mg/L		07-OCT-17	R3849602

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTXS-HS-MS-CL	Water	BTEX and Styrene	EPA 8260C/5021A

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a gas chromatograph. BTEX Target compound concentrations are measured using mass spectrometry detection.

C-DIS-ORG-CL	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

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

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

F-IC-N-CL	Water	Fluoride in Water by IC	EPA 300.1 (mod)

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

F1-HS-FID-CL	Water	F1 (C6-C10)	EPA 5021A / CWS PHC Tier 1

This analysis is based on the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, Canadian Council of Ministers of the Environment, December 2001." For F1 (C6-C10) analysis, the water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transferred into a GC-FID for analysis.

F2-4-ME-FID-CL	Water	CCME F2-4 Hydrocarbons	EPA 3511/ CCME PHC CWS GC-FID

Water samples are spiked with 2-BBTF surrogate, and extracted by reciprocal action shaker for 30 minutes using a single micro-extraction with hexane. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Tier 1 Method, CCME, December 2001.

HG-D-CVAA-CL	Water	Dissolved Mercury in Water by CVAAS	APHA 3030B/EPA 1631E (mod)

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

IONBALANCE-CL	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-CL	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

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

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

MET-DIS-ICP-CL	Water	Dissolved Metals by ICPOES	APHA 3030B/EPA 6010B

"This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (APHA Method 3030B) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NH3-D-COL-CL	Water	Ammonia, Total Dissolved (as N)	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the phenate colourimetric method.

NO2-IC-N-CL	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-CL	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH/EC/ALK-CL	Water	pH, Conductivity and Total Alkalinity	APHA 4500H,2510,2320
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode. Alkalinity measurement is based on the sample's capacity to neutralize acid Conductivity measurement is based on the sample's capacity to convey an electric current			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-CL	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SPECIAL REQUEST-IS	Misc.	Special Request Isobrine Solutions	SEE SUBLET LAB RESULTS
XYLENES-CALC-CL	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Calculation of Total Xylenes Total Xylenes is the sum of the concentrations of the ortho, meta, and para Xylene isomers. Results below detection limit (DL) are treated as zero. The DL for Total Xylenes is set to a value no less than the square root of the sum of the squares of the DLs of the individual Xylenes.			

** 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
IS	ISOBRINE SOLUTIONS INC
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

17-646682

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: WorleyParsons Canada
8615 51 Avenue
Edmonton AB T6E 6A8
Contact: Trevor Butterfield

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTXS-HS-MS-CL	**Water**							
Batch R3854162								
WG2639033-12 LCS								
Benzene			124.3		%		70-130	13-OCT-17
Toluene			123.3		%		70-130	13-OCT-17
Ethylbenzene			125.0		%		70-130	13-OCT-17
o-Xylene			129.8		%		70-130	13-OCT-17
m+p-Xylene			120.2		%		70-130	13-OCT-17
Styrene			127.8		%		70-130	13-OCT-17
WG2639033-4 LCS								
Benzene			118.5		%		70-130	13-OCT-17
Toluene			119.7		%		70-130	13-OCT-17
Ethylbenzene			101.2		%		70-130	13-OCT-17
o-Xylene			107.8		%		70-130	13-OCT-17
m+p-Xylene			102.8		%		70-130	13-OCT-17
Styrene			108.7		%		70-130	13-OCT-17
WG2639033-1 MB								
Benzene			<0.00050		mg/L		0.0005	13-OCT-17
Toluene			<0.00050		mg/L		0.0005	13-OCT-17
Ethylbenzene			<0.00050		mg/L		0.0005	13-OCT-17
o-Xylene			<0.00050		mg/L		0.0005	13-OCT-17
m+p-Xylene			<0.00050		mg/L		0.0005	13-OCT-17
Styrene			<0.00050		mg/L		0.0005	13-OCT-17
Surrogate: 4-Bromofluorobenzene			95.5		%		70-130	13-OCT-17
Surrogate: 1,4-Difluorobenzene			97.7		%		70-130	13-OCT-17
WG2639033-9 MB								
Benzene			<0.00050		mg/L		0.0005	13-OCT-17
Toluene			<0.00050		mg/L		0.0005	13-OCT-17
Ethylbenzene			<0.00050		mg/L		0.0005	13-OCT-17
o-Xylene			<0.00050		mg/L		0.0005	13-OCT-17
m+p-Xylene			<0.00050		mg/L		0.0005	13-OCT-17
Styrene			<0.00050		mg/L		0.0005	13-OCT-17
Surrogate: 4-Bromofluorobenzene			97.2		%		70-130	13-OCT-17
Surrogate: 1,4-Difluorobenzene			97.7		%		70-130	13-OCT-17
C-DIS-ORG-CL	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DIS-ORG-CL	**Water**							
Batch R3859881								
WG2643968-5 LCS								
Dissolved Organic Carbon			95.0		%		80-120	18-OCT-17
WG2643968-4 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	18-OCT-17
CL-IC-N-CL	**Water**							
Batch R3859775								
WG2643840-10 LCS								
Chloride (Cl)			102.0		%		90-110	02-OCT-17
WG2643840-9 MB								
Chloride (Cl)			<0.50		mg/L		0.5	02-OCT-17
F-IC-N-CL	**Water**							
Batch R3859775								
WG2643840-10 LCS								
Fluoride (F)			100.9		%		90-110	02-OCT-17
WG2643840-9 MB								
Fluoride (F)			<0.020		mg/L		0.02	02-OCT-17
F1-HS-FID-CL	**Water**							
Batch R3854174								
WG2639050-3 LCS								
F1(C6-C10)			128.4		%		70-130	11-OCT-17
WG2639050-6 LCS								
F1(C6-C10)			116.4		%		70-130	12-OCT-17
WG2639050-1 MB								
F1(C6-C10)			<0.10		mg/L		0.1	11-OCT-17
Surrogate: 3,4-Dichlorotoluene			126.4		%		70-130	11-OCT-17
WG2639050-4 MB								
F1(C6-C10)			<0.10		mg/L		0.1	11-OCT-17
Surrogate: 3,4-Dichlorotoluene			117.3		%		70-130	11-OCT-17
F2-4-ME-FID-CL	**Water**							
Batch R3852805								
WG2635545-2 LCS								
F2: (C10-C16)			88.0		%		70-130	11-OCT-17
WG2635545-1 MB								
F2: (C10-C16)			<0.10		mg/L		0.1	11-OCT-17
Surrogate: 2-Bromobenzotrifluoride			60.7		%		60-140	11-OCT-17
HG-D-CVAA-CL	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-D-CVAA-CL	**Water**							
Batch R3858799								
WG2642580-2 LCS								
Mercury (Hg)-Dissolved			104.0		%		80-120	17-OCT-17
WG2642580-1 MB								
Mercury (Hg)-Dissolved			<0.000005(		mg/L		0.000005	17-OCT-17
MET-D-CCMS-CL	**Water**							
Batch R3857953								
WG2641682-16 DUP		**L1999973-1**						
Aluminum (Al)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	17-OCT-17
Antimony (Sb)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-OCT-17
Arsenic (As)-Dissolved		0.00336	0.00334		mg/L	0.6	20	17-OCT-17
Barium (Ba)-Dissolved		0.191	0.190		mg/L	0.3	20	17-OCT-17
Beryllium (Be)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-OCT-17
Boron (B)-Dissolved		0.183	0.189		mg/L	3.2	20	17-OCT-17
Cadmium (Cd)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	17-OCT-17
Chromium (Cr)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-OCT-17
Cobalt (Co)-Dissolved		0.00038	0.00041		mg/L	7.0	20	17-OCT-17
Copper (Cu)-Dissolved		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	17-OCT-17
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-OCT-17
Molybdenum (Mo)-Dissolved		0.000496	0.000478		mg/L	3.8	20	17-OCT-17
Nickel (Ni)-Dissolved		0.00091	0.00089		mg/L	2.8	20	17-OCT-17
Selenium (Se)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-OCT-17
Silver (Ag)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	17-OCT-17
Thallium (Tl)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	17-OCT-17
Titanium (Ti)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	17-OCT-17
Uranium (U)-Dissolved		0.000912	0.000926		mg/L	1.5	20	17-OCT-17
Vanadium (V)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-OCT-17
Zinc (Zn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	17-OCT-17
WG2641682-11 LCS		**TMRM**						
Aluminum (Al)-Dissolved			98.5		%		80-120	17-OCT-17
Antimony (Sb)-Dissolved			96.8		%		80-120	17-OCT-17
Arsenic (As)-Dissolved			97.0		%		80-120	17-OCT-17
Barium (Ba)-Dissolved			99.4		%		80-120	17-OCT-17
Beryllium (Be)-Dissolved			94.3		%		80-120	17-OCT-17
Boron (B)-Dissolved			96.7		%		80-120	17-OCT-17
Cadmium (Cd)-Dissolved			96.8		%		80-120	17-OCT-17
Chromium (Cr)-Dissolved			92.0		%		80-120	17-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3857953								
WG2641682-11 LCS		**TMRM**						
Cobalt (Co)-Dissolved			95.8		%		80-120	17-OCT-17
Copper (Cu)-Dissolved			94.9		%		80-120	17-OCT-17
Lead (Pb)-Dissolved			95.5		%		80-120	17-OCT-17
Molybdenum (Mo)-Dissolved			100.1		%		80-120	17-OCT-17
Nickel (Ni)-Dissolved			95.3		%		80-120	17-OCT-17
Selenium (Se)-Dissolved			99.3		%		80-120	17-OCT-17
Silver (Ag)-Dissolved			90.6		%		80-120	17-OCT-17
Thallium (Tl)-Dissolved			93.7		%		80-120	17-OCT-17
Titanium (Ti)-Dissolved			91.8		%		80-120	17-OCT-17
Uranium (U)-Dissolved			89.1		%		80-120	17-OCT-17
Vanadium (V)-Dissolved			96.8		%		80-120	17-OCT-17
Zinc (Zn)-Dissolved			90.8		%		80-120	17-OCT-17
WG2641682-15 LCS		**TMRM**						
Aluminum (Al)-Dissolved			102.1		%		80-120	17-OCT-17
Antimony (Sb)-Dissolved			95.7		%		80-120	17-OCT-17
Arsenic (As)-Dissolved			98.9		%		80-120	17-OCT-17
Barium (Ba)-Dissolved			101.6		%		80-120	17-OCT-17
Beryllium (Be)-Dissolved			98.7		%		80-120	17-OCT-17
Boron (B)-Dissolved			98.3		%		80-120	17-OCT-17
Cadmium (Cd)-Dissolved			97.6		%		80-120	17-OCT-17
Chromium (Cr)-Dissolved			92.5		%		80-120	17-OCT-17
Cobalt (Co)-Dissolved			98.4		%		80-120	17-OCT-17
Copper (Cu)-Dissolved			95.8		%		80-120	17-OCT-17
Lead (Pb)-Dissolved			96.9		%		80-120	17-OCT-17
Molybdenum (Mo)-Dissolved			98.1		%		80-120	17-OCT-17
Nickel (Ni)-Dissolved			97.5		%		80-120	17-OCT-17
Selenium (Se)-Dissolved			96.4		%		80-120	17-OCT-17
Silver (Ag)-Dissolved			88.8		%		80-120	17-OCT-17
Thallium (Tl)-Dissolved			91.5		%		80-120	17-OCT-17
Titanium (Ti)-Dissolved			99.7		%		80-120	17-OCT-17
Uranium (U)-Dissolved			88.6		%		80-120	17-OCT-17
Vanadium (V)-Dissolved			99.7		%		80-120	17-OCT-17
Zinc (Zn)-Dissolved			90.2		%		80-120	17-OCT-17
WG2641682-2 LCS		**TMRM**						
Aluminum (Al)-Dissolved			100.3		%		80-120	17-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3857953								
WG2641682-2 LCS		**TMRM**						
Antimony (Sb)-Dissolved			106.1		%		80-120	17-OCT-17
Arsenic (As)-Dissolved			99.6		%		80-120	17-OCT-17
Barium (Ba)-Dissolved			102.1		%		80-120	17-OCT-17
Beryllium (Be)-Dissolved			100.2		%		80-120	17-OCT-17
Boron (B)-Dissolved			101.2		%		80-120	17-OCT-17
Cadmium (Cd)-Dissolved			100.3		%		80-120	17-OCT-17
Chromium (Cr)-Dissolved			99.2		%		80-120	17-OCT-17
Cobalt (Co)-Dissolved			97.3		%		80-120	17-OCT-17
Copper (Cu)-Dissolved			96.8		%		80-120	17-OCT-17
Lead (Pb)-Dissolved			101.0		%		80-120	17-OCT-17
Molybdenum (Mo)-Dissolved			102.8		%		80-120	17-OCT-17
Nickel (Ni)-Dissolved			98.5		%		80-120	17-OCT-17
Selenium (Se)-Dissolved			102.2		%		80-120	17-OCT-17
Silver (Ag)-Dissolved			96.5		%		80-120	17-OCT-17
Thallium (Tl)-Dissolved			98.5		%		80-120	17-OCT-17
Titanium (Ti)-Dissolved			81.4		%		80-120	17-OCT-17
Uranium (U)-Dissolved			95.6		%		80-120	17-OCT-17
Vanadium (V)-Dissolved			100.7		%		80-120	17-OCT-17
Zinc (Zn)-Dissolved			92.2		%		80-120	17-OCT-17
WG2641682-5 LCS		**TMRM**						
Aluminum (Al)-Dissolved			95.2		%		80-120	17-OCT-17
Antimony (Sb)-Dissolved			94.7		%		80-120	17-OCT-17
Arsenic (As)-Dissolved			95.4		%		80-120	17-OCT-17
Barium (Ba)-Dissolved			93.9		%		80-120	17-OCT-17
Beryllium (Be)-Dissolved			101.9		%		80-120	17-OCT-17
Boron (B)-Dissolved			97.7		%		80-120	17-OCT-17
Cadmium (Cd)-Dissolved			92.6		%		80-120	17-OCT-17
Chromium (Cr)-Dissolved			91.7		%		80-120	17-OCT-17
Cobalt (Co)-Dissolved			92.6		%		80-120	17-OCT-17
Copper (Cu)-Dissolved			89.7		%		80-120	17-OCT-17
Lead (Pb)-Dissolved			93.4		%		80-120	17-OCT-17
Molybdenum (Mo)-Dissolved			96.3		%		80-120	17-OCT-17
Nickel (Ni)-Dissolved			92.0		%		80-120	17-OCT-17
Selenium (Se)-Dissolved			93.7		%		80-120	17-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3857953								
WG2641682-5 LCS		**TMRM**						
Silver (Ag)-Dissolved			93.0		%		80-120	17-OCT-17
Thallium (Tl)-Dissolved			91.3		%		80-120	17-OCT-17
Titanium (Ti)-Dissolved			82.8		%		80-120	17-OCT-17
Uranium (U)-Dissolved			89.1		%		80-120	17-OCT-17
Vanadium (V)-Dissolved			96.7		%		80-120	17-OCT-17
Zinc (Zn)-Dissolved			86.4		%		80-120	17-OCT-17
WG2641682-8 LCS		**TMRM**						
Aluminum (Al)-Dissolved			101.8		%		80-120	17-OCT-17
Antimony (Sb)-Dissolved			98.0		%		80-120	17-OCT-17
Arsenic (As)-Dissolved			96.4		%		80-120	17-OCT-17
Barium (Ba)-Dissolved			99.3		%		80-120	17-OCT-17
Beryllium (Be)-Dissolved			98.4		%		80-120	17-OCT-17
Boron (B)-Dissolved			89.4		%		80-120	17-OCT-17
Cadmium (Cd)-Dissolved			96.1		%		80-120	17-OCT-17
Chromium (Cr)-Dissolved			95.4		%		80-120	17-OCT-17
Cobalt (Co)-Dissolved			94.9		%		80-120	17-OCT-17
Copper (Cu)-Dissolved			93.8		%		80-120	17-OCT-17
Lead (Pb)-Dissolved			97.6		%		80-120	17-OCT-17
Molybdenum (Mo)-Dissolved			98.4		%		80-120	17-OCT-17
Nickel (Ni)-Dissolved			95.1		%		80-120	17-OCT-17
Selenium (Se)-Dissolved			99.5		%		80-120	17-OCT-17
Silver (Ag)-Dissolved			94.0		%		80-120	17-OCT-17
Thallium (Tl)-Dissolved			93.2		%		80-120	17-OCT-17
Titanium (Ti)-Dissolved			87.6		%		80-120	17-OCT-17
Uranium (U)-Dissolved			93.7		%		80-120	17-OCT-17
Vanadium (V)-Dissolved			99.6		%		80-120	17-OCT-17
Zinc (Zn)-Dissolved			86.9		%		80-120	17-OCT-17
WG2641682-1 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	17-OCT-17
Cadmium (Cd)-Dissolved			<0.000005(		mg/L		0.000005	17-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3857953								
WG2641682-1 MB								
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	17-OCT-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	17-OCT-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
WG2641682-10 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	17-OCT-17
Cadmium (Cd)-Dissolved			<0.000005(		mg/L		0.000005	17-OCT-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	17-OCT-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	17-OCT-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
WG2641682-14 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3857953								
WG2641682-14 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	17-OCT-17
Cadmium (Cd)-Dissolved			<0.000005C		mg/L		0.000005	17-OCT-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	17-OCT-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	17-OCT-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
WG2641682-4 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	17-OCT-17
Cadmium (Cd)-Dissolved			<0.000005C		mg/L		0.000005	17-OCT-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	17-OCT-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-CL	**Water**							
Batch R3857953								
WG2641682-4 MB								
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	17-OCT-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
WG2641682-7 MB								
Aluminum (Al)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	17-OCT-17
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	17-OCT-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	17-OCT-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	17-OCT-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	17-OCT-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	17-OCT-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	17-OCT-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	17-OCT-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	17-OCT-17
MET-DIS-ICP-CL	**Water**							
Batch R3863247								
WG2646158-12 LCS		**TMRM**						
Calcium (Ca)-Dissolved			97.2		%		80-120	23-OCT-17
Iron (Fe)-Dissolved			89.1		%		80-120	23-OCT-17
Magnesium (Mg)-Dissolved			95.3		%		80-120	23-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-ICP-CL	**Water**							
Batch R3863247								
WG2646158-12 LCS		**TMRM**						
Manganese (Mn)-Dissolved			95.0		%		80-120	23-OCT-17
Potassium (K)-Dissolved			102.2		%		80-120	23-OCT-17
Sodium (Na)-Dissolved			97.2		%		80-120	23-OCT-17
WG2646158-15 LCS		**TMRM**						
Calcium (Ca)-Dissolved			98.7		%		80-120	23-OCT-17
Iron (Fe)-Dissolved			90.1		%		80-120	23-OCT-17
Magnesium (Mg)-Dissolved			96.0		%		80-120	23-OCT-17
Manganese (Mn)-Dissolved			96.0		%		80-120	23-OCT-17
Potassium (K)-Dissolved			104.3		%		80-120	23-OCT-17
Sodium (Na)-Dissolved			97.9		%		80-120	23-OCT-17
WG2646158-2 LCS		**TMRM**						
Calcium (Ca)-Dissolved			99.1		%		80-120	23-OCT-17
Iron (Fe)-Dissolved			93.6		%		80-120	23-OCT-17
Magnesium (Mg)-Dissolved			100.4		%		80-120	23-OCT-17
Manganese (Mn)-Dissolved			96.7		%		80-120	23-OCT-17
Potassium (K)-Dissolved			97.1		%		80-120	23-OCT-17
Sodium (Na)-Dissolved			99.1		%		80-120	23-OCT-17
WG2646158-6 LCS		**TMRM**						
Calcium (Ca)-Dissolved			100.6		%		80-120	23-OCT-17
Iron (Fe)-Dissolved			95.7		%		80-120	23-OCT-17
Magnesium (Mg)-Dissolved			101.6		%		80-120	23-OCT-17
Manganese (Mn)-Dissolved			100.3		%		80-120	23-OCT-17
Potassium (K)-Dissolved			105.9		%		80-120	23-OCT-17
Sodium (Na)-Dissolved			104.8		%		80-120	23-OCT-17
WG2646158-9 LCS		**TMRM**						
Calcium (Ca)-Dissolved			98.9		%		80-120	23-OCT-17
Iron (Fe)-Dissolved			92.4		%		80-120	23-OCT-17
Magnesium (Mg)-Dissolved			97.0		%		80-120	23-OCT-17
Manganese (Mn)-Dissolved			97.4		%		80-120	23-OCT-17
Potassium (K)-Dissolved			103.0		%		80-120	23-OCT-17
Sodium (Na)-Dissolved			100.1		%		80-120	23-OCT-17
WG2646158-1 MB								
Calcium (Ca)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Iron (Fe)-Dissolved			<0.030		mg/L		0.03	23-OCT-17
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	23-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DIS-ICP-CL	**Water**							
Batch R3863247								
WG2646158-1 MB								
Manganese (Mn)-Dissolved			<0.0050		mg/L		0.005	23-OCT-17
Potassium (K)-Dissolved			<0.50		mg/L		0.5	23-OCT-17
Sodium (Na)-Dissolved			<1.0		mg/L		1	23-OCT-17
WG2646158-11 MB								
Calcium (Ca)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Iron (Fe)-Dissolved			<0.030		mg/L		0.03	23-OCT-17
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Manganese (Mn)-Dissolved			<0.0050		mg/L		0.005	23-OCT-17
Potassium (K)-Dissolved			<0.50		mg/L		0.5	23-OCT-17
Sodium (Na)-Dissolved			<1.0		mg/L		1	23-OCT-17
WG2646158-14 MB								
Calcium (Ca)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Iron (Fe)-Dissolved			<0.030		mg/L		0.03	23-OCT-17
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Manganese (Mn)-Dissolved			<0.0050		mg/L		0.005	23-OCT-17
Potassium (K)-Dissolved			<0.50		mg/L		0.5	23-OCT-17
Sodium (Na)-Dissolved			<1.0		mg/L		1	23-OCT-17
WG2646158-5 MB								
Calcium (Ca)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Iron (Fe)-Dissolved			<0.030		mg/L		0.03	23-OCT-17
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Manganese (Mn)-Dissolved			<0.0050		mg/L		0.005	23-OCT-17
Potassium (K)-Dissolved			<0.50		mg/L		0.5	23-OCT-17
Sodium (Na)-Dissolved			<1.0		mg/L		1	23-OCT-17
WG2646158-8 MB								
Calcium (Ca)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Iron (Fe)-Dissolved			<0.030		mg/L		0.03	23-OCT-17
Magnesium (Mg)-Dissolved			<0.10		mg/L		0.1	23-OCT-17
Manganese (Mn)-Dissolved			<0.0050		mg/L		0.005	23-OCT-17
Potassium (K)-Dissolved			<0.50		mg/L		0.5	23-OCT-17
Sodium (Na)-Dissolved			<1.0		mg/L		1	23-OCT-17
NH3-D-COL-CL	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-D-COL-CL	**Water**							
Batch R3858143								
WG2641897-3 LCS								
Ammonia, Total Dissolved (as N)			102.7		%		85-115	17-OCT-17
WG2641897-1 MB								
Ammonia, Total Dissolved (as N)			<0.050		mg/L		0.05	17-OCT-17
NO2-IC-N-CL	**Water**							
Batch R3859775								
WG2643840-10 LCS								
Nitrite (as N)			103.1		%		90-110	02-OCT-17
WG2643840-9 MB								
Nitrite (as N)			<0.010		mg/L		0.01	02-OCT-17
NO3-IC-N-CL	**Water**							
Batch R3859775								
WG2643840-10 LCS								
Nitrate (as N)			102.9		%		90-110	02-OCT-17
WG2643840-9 MB								
Nitrate (as N)			<0.020		mg/L		0.02	02-OCT-17
PH/EC/ALK-CL	**Water**							
Batch R3849602								
WG2635053-17 LCS								
pH			7.02		pH		6.9-7.1	07-OCT-17
Conductivity (EC)			97.1		%		90-110	07-OCT-17
Alkalinity, Total (as CaCO3)			96.7		%		85-115	07-OCT-17
WG2635053-16 MB								
Conductivity (EC)			<2.0		uS/cm		2	07-OCT-17
Bicarbonate (HCO3)			<5.0		mg/L		5	07-OCT-17
Carbonate (CO3)			<5.0		mg/L		5	07-OCT-17
Hydroxide (OH)			<5.0		mg/L		5	07-OCT-17
Alkalinity, Total (as CaCO3)			<5.0		mg/L		5	07-OCT-17
PHENOLS-4AAP-WT	**Water**							
Batch R3851120								
WG2635549-2 LCS								
Phenols (4AAP)			113.3		%		85-115	10-OCT-17
WG2635549-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	10-OCT-17
SO4-IC-N-CL	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-CL	**Water**							
Batch R3859775								
WG2643840-10 LCS								
Sulfate (SO4)			103.0		%		90-110	02-OCT-17
WG2643840-9 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	02-OCT-17

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.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

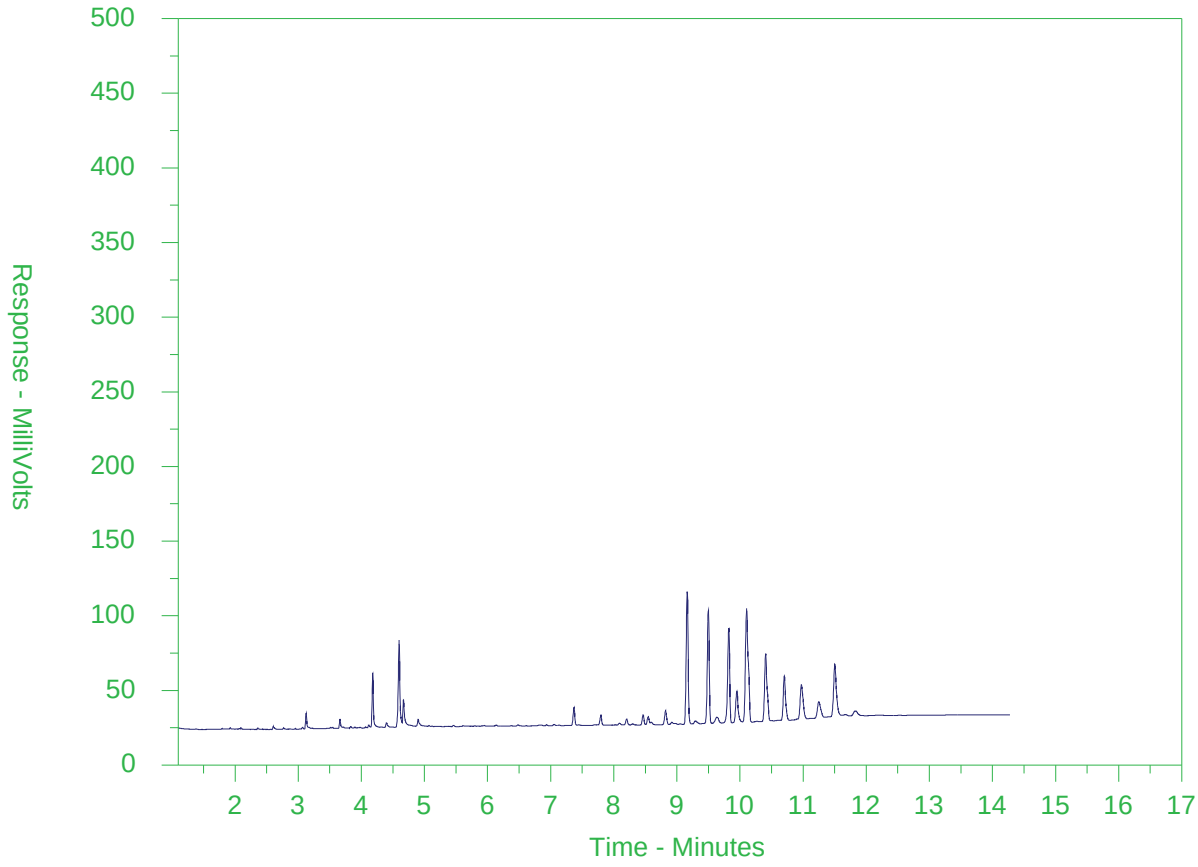
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1999973-2
Client Sample ID: MW-02B



← F2 →	← F3 →	← F4 →	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →	
← Diesel/ Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1999973-COFC

COC Number: 17 - 646682

Page 1 of 1

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)
Company:	WorleyParsons	Select Report Format: [X] PDF [ ] EXCEL [ ] EDD (DIGITAL)	Regular [R] [X] Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Trevor Butterfield	Quality Control (QC) Report with Report [X] YES [ ] NO	PRIORITY (Business Days): 4 day [P4-20%] [ ]; 3 day [P3-25%] [ ]; 2 day [P2-50%] [ ]
Phone:		[ ] Compare Results to Criteria on Report - provide details below if box checked	EMERGENCY: 1 Business day [E-100%] [ ]; Same Day, Weekend or Statutory holiday [E2-200% (Laboratory opening fees may apply)] [ ]
	Company address below will appear on the final report	Select Distribution: [X] EMAIL [ ] MAIL [ ] FAX	
Street:	Suite 300 8615 - 51 Ave	Email 1 or Fax Trevor.Butterfield@Advisian.com	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
City/Province:	Edmonton, AB	Email 2 Canada.Chemistry@WorleyParsons.com	For tests that can not be performed according to the service level selected, you will be contacted.
Postal Code:	T6E 6A8	Email 3	

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q61863	AFE/Cost Center:	PO#
Job #:	307075-01608-300	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):	L1999973	ALS Contact: Dana Brown	Sampler: PERD

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	BTEX, F1 (P)	F2 (P)	Routine / Major Ions (F)	DOC + DIVHg (F/P)	Dissolved metals + Hg (F/P)	Phenols (P)	Hg, D/O isotopes	SAMPLES ON HOLD	Sample is hazardous (please provide further details)	NUMBER OF CONTAINERS
	MW-02	29-Sep-17	12:30	GW	X	X	X	X	X X	X	X X			11
	MW-02B	29-Sep-17	12:00	GW	X	X	X	X	X X	X	X X			11

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 [X] NO	
Are samples for human consumption/ use? [ ] YES [X] 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		
10.1°C					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: 29-Sep-17	Time: 13:50	Received by:	Date: SEP 29 2017	Time: 1:50PM	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

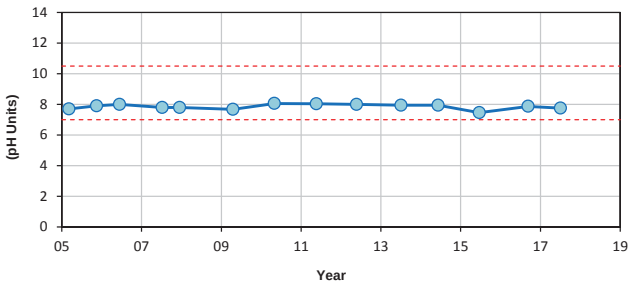
JULY 2017 FRONT

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.

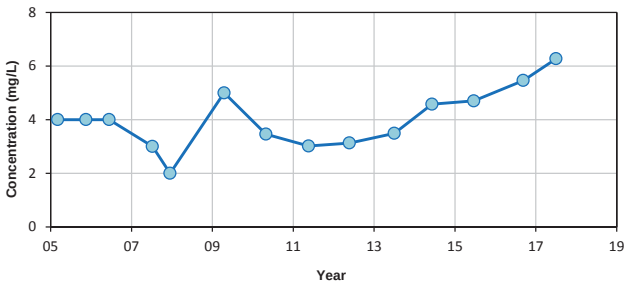
1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Appendix 6 Hydrochemical Control Charts

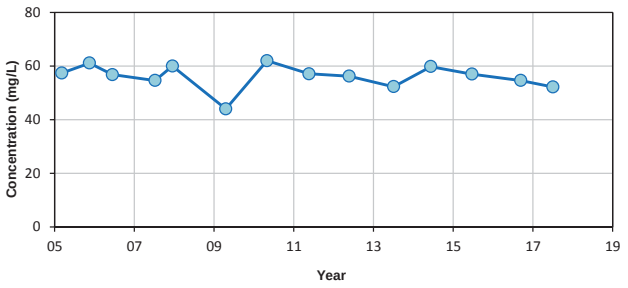
PH



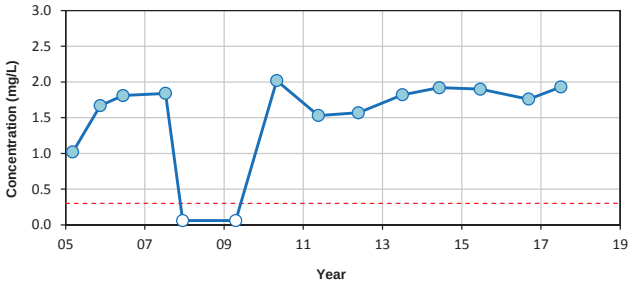
CHLORIDE



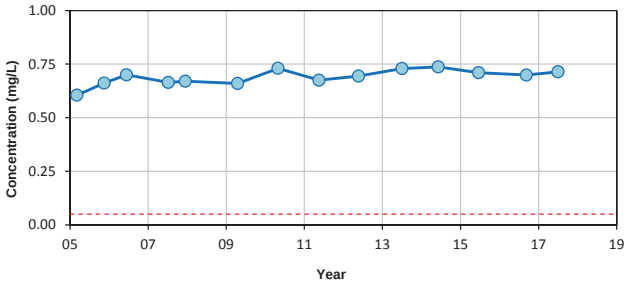
SULPHATE



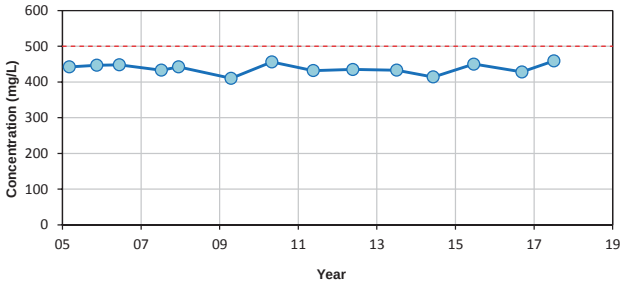
IRON



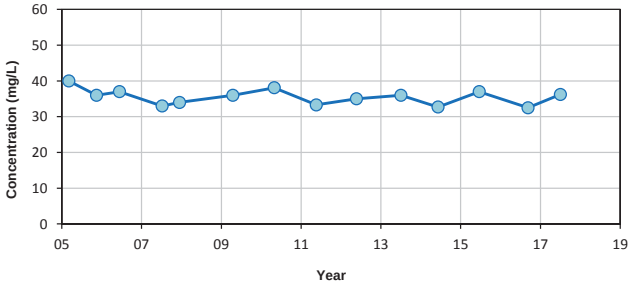
MANGANESE



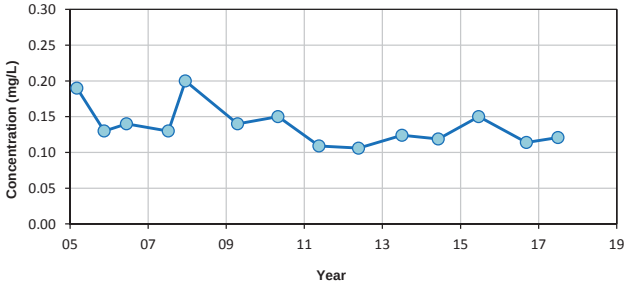
TOTAL DISSOLVED SOLIDS (CALCULATED)



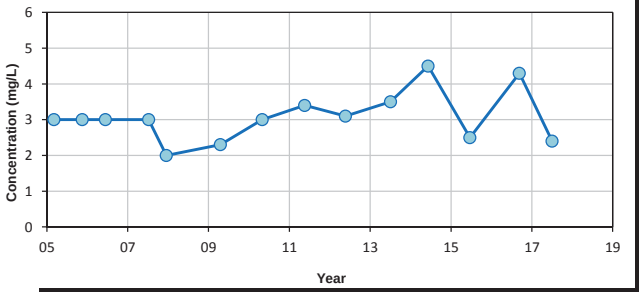
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



Notes:

- Filled symbols denote sample values; unfilled symbols denote values less than detection limit(s)
- Dashed line between data points indicates data gap of more than two years
- Canadian Drinking Water AO Guidelines 2017:
  - pH: 7-10.5 pH Units
  - Iron: 0.3 mg/L
  - Sodium: 200 mg/L
  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A
- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-01

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

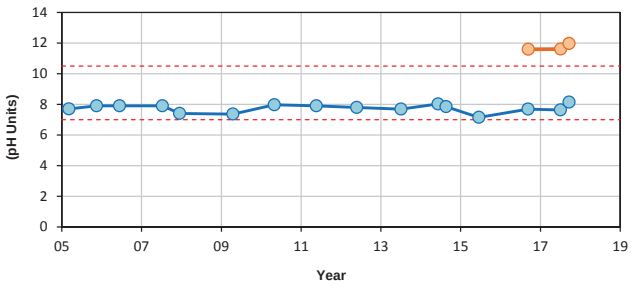
WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-1 REV: A

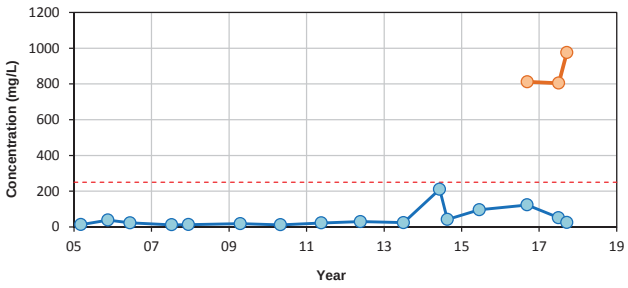
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

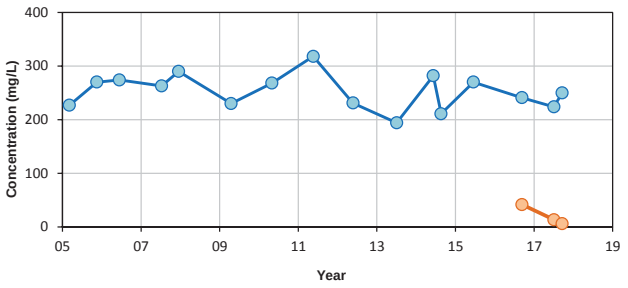
PH



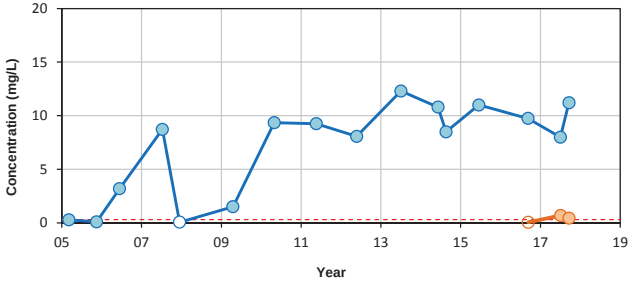
CHLORIDE



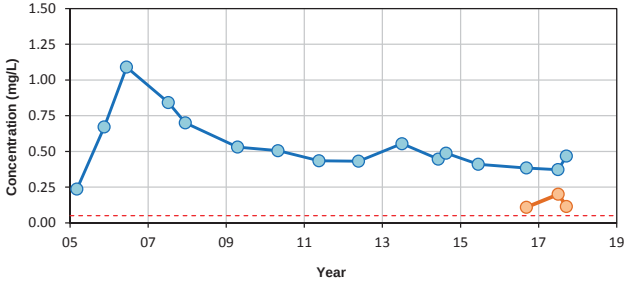
SULPHATE



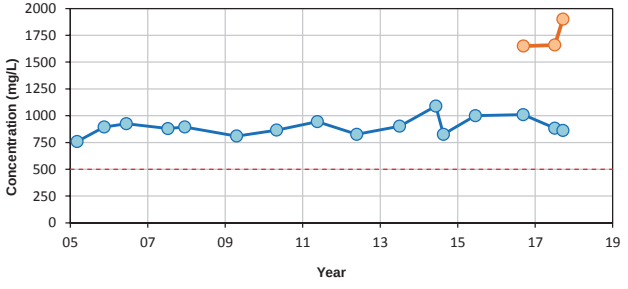
IRON



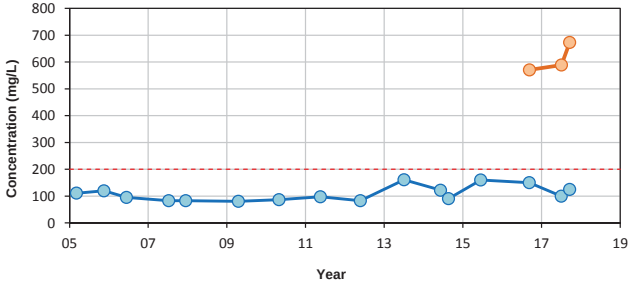
MANGANESE



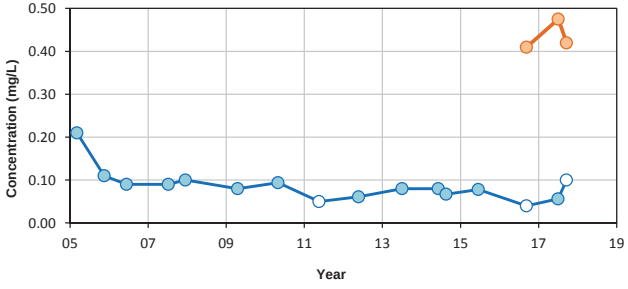
TOTAL DISSOLVED SOLIDS (CALCULATED)



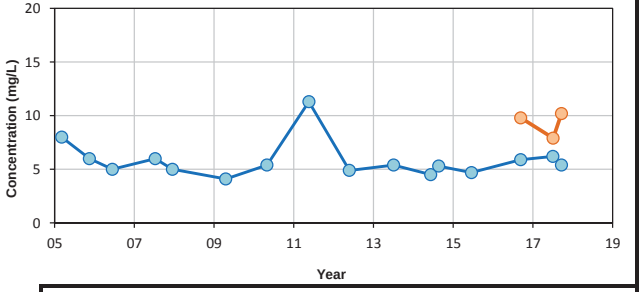
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



Notes:

- Filled symbols denote sample values; unfilled symbols denote values less than detection limit(s)
- Dashed line between data points indicates data gap of more than two years
- Canadian Drinking Water AO Guidelines 2017:
  - pH: 7-10.5 pH Units
  - Iron: 0.3 mg/L
  - Sodium: 200 mg/L
  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
- Canadian Drinking Water MAC Guidelines 2017:
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A

Bedrock Monitoring Well (MW-02B) data point.

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-02

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-2

REV: A

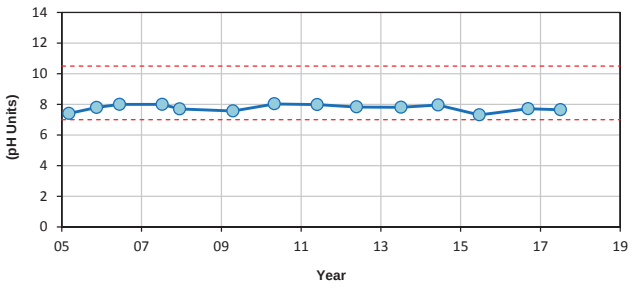
OneWay to zero harm

Advisian WorleyParsons Group

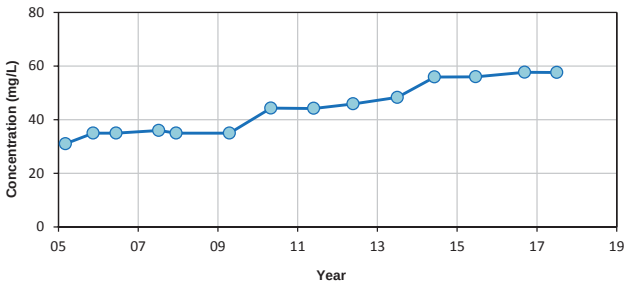
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

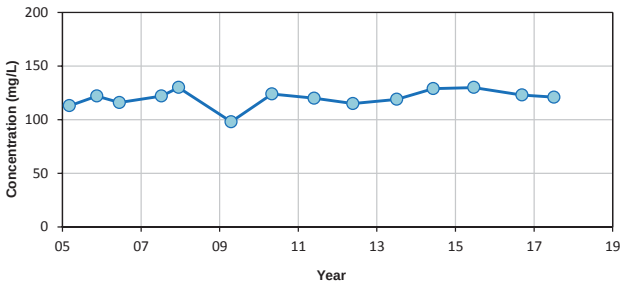
PH



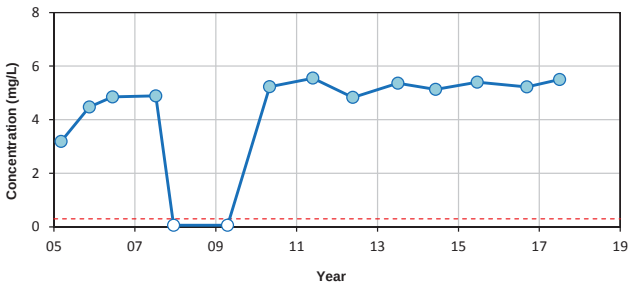
CHLORIDE



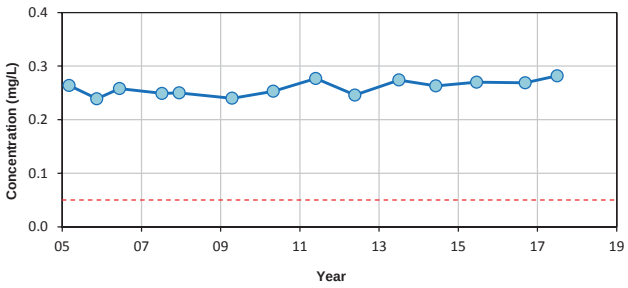
SULPHATE



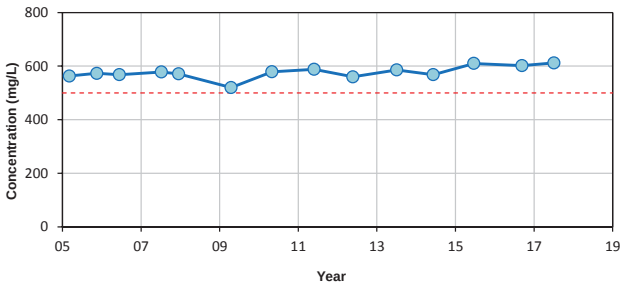
IRON



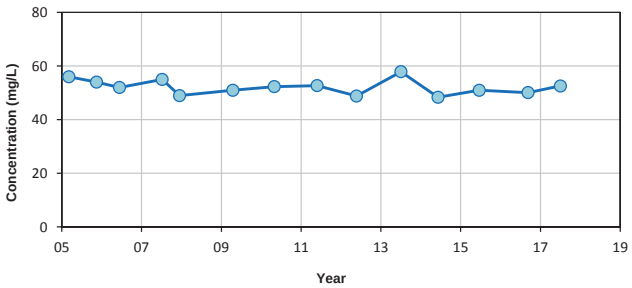
MANGANESE



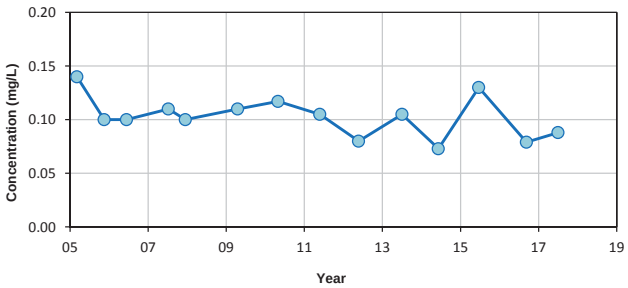
TOTAL DISSOLVED SOLIDS (CALCULATED)



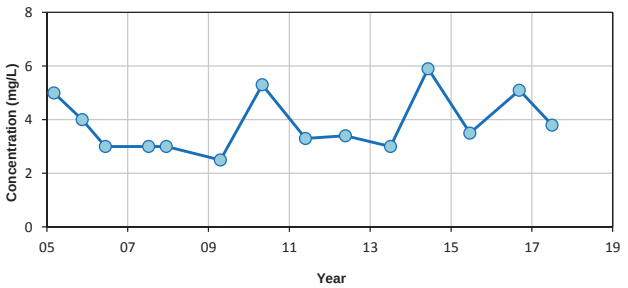
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



Notes:

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- Dashed line between data points indicates data gap of more than two years
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  - pH: 7-10.5 pH Units
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  - Sodium: 200 mg/L
  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A
- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-03

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-3

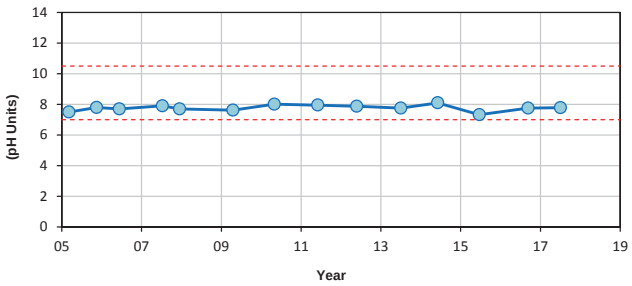
REV: A

OneWay to zero harm | Advisian WorleyParsons Group

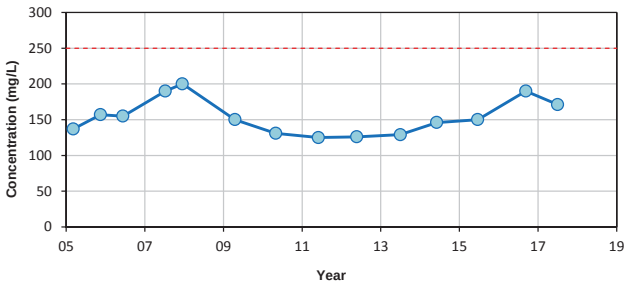
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

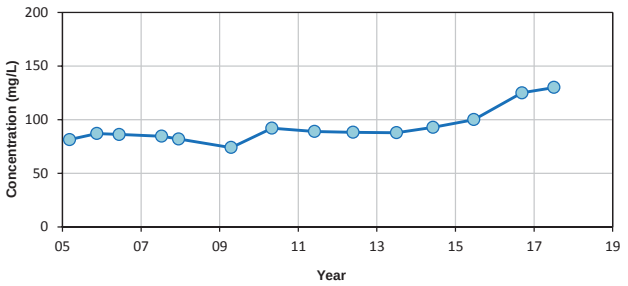
PH



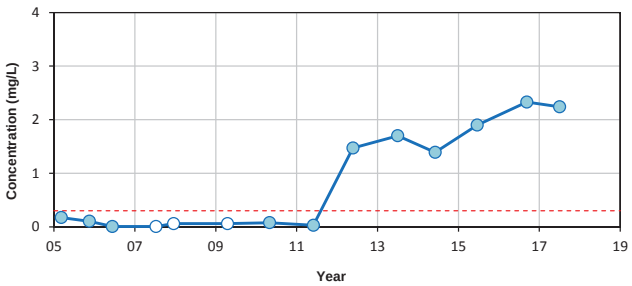
CHLORIDE



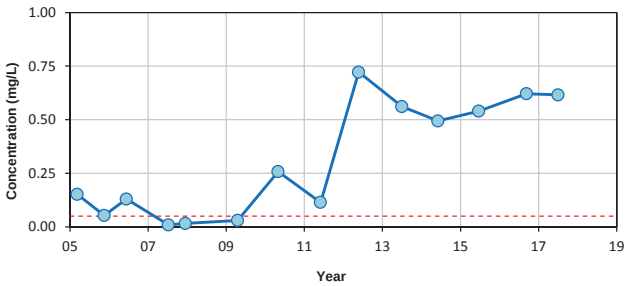
SULPHATE



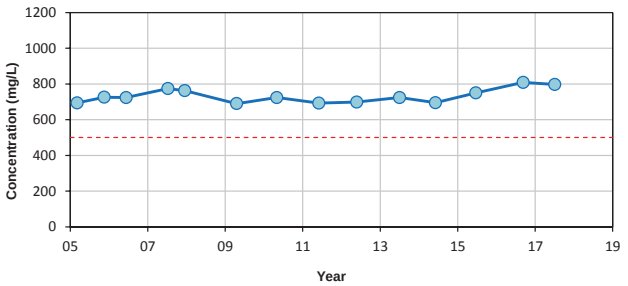
IRON



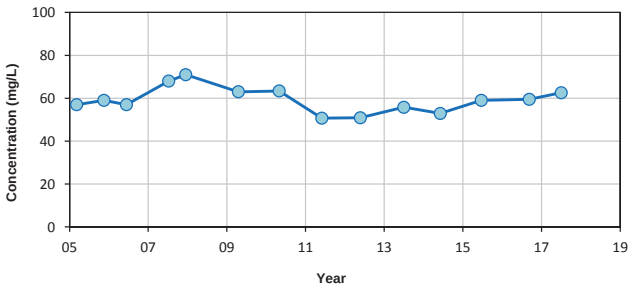
MANGANESE



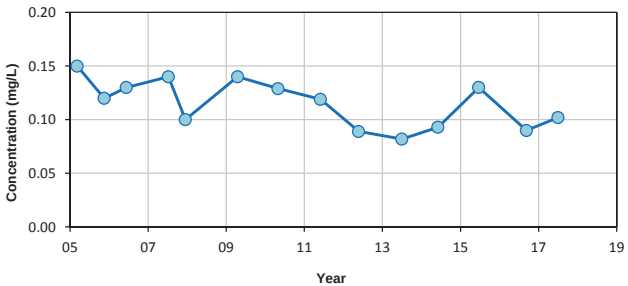
TOTAL DISSOLVED SOLIDS (CALCULATED)



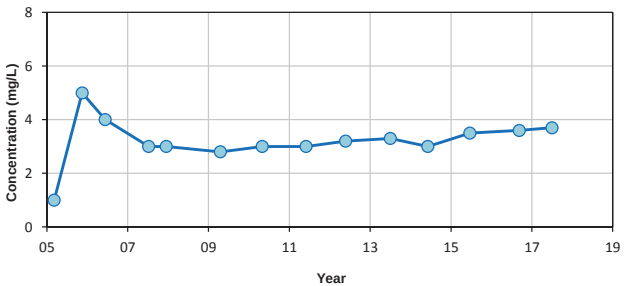
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



Notes:

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- Canadian Drinking Water AO Guidelines 2017:
  - pH: 7-10.5 pH Units
  - Iron: 0.3 mg/L
  - Sodium: 200 mg/L
  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A
- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-04

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-4

REV: A

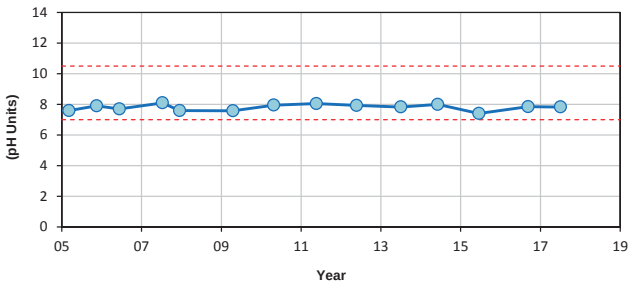
OneWay to zero harm

Advision WorleyParsons Group

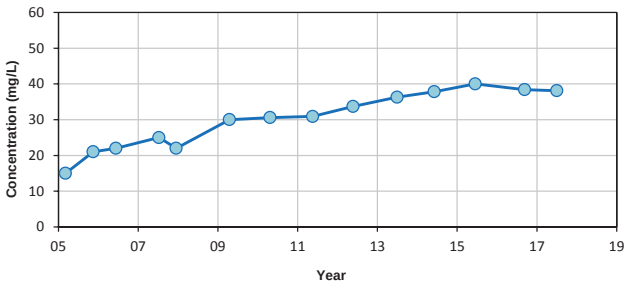
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

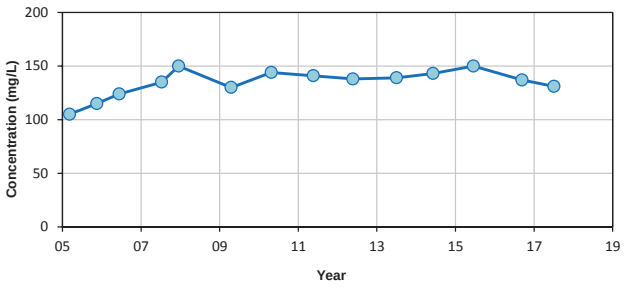
PH



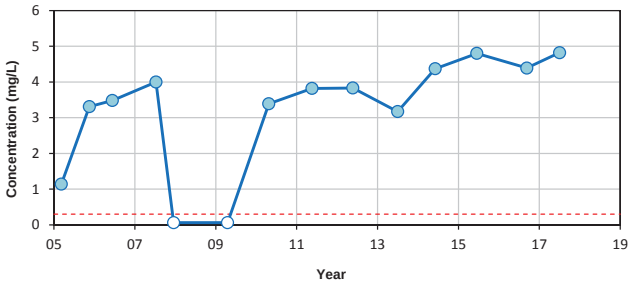
CHLORIDE



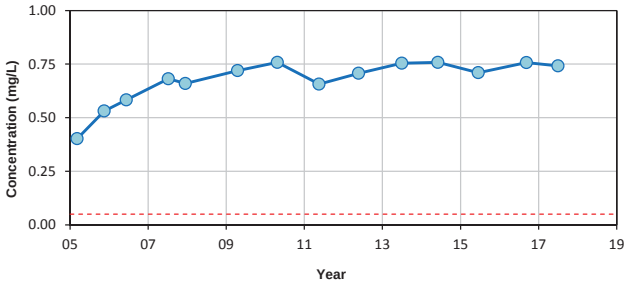
SULPHATE



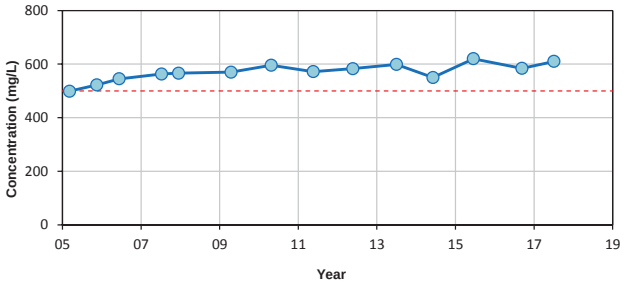
IRON



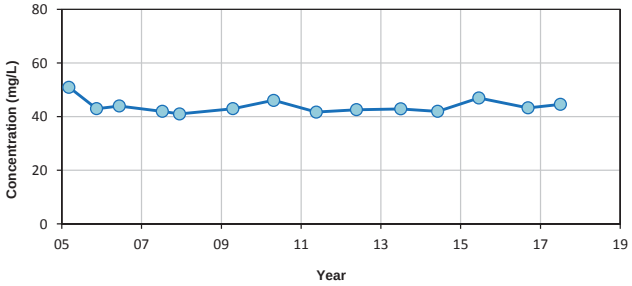
MANGANESE



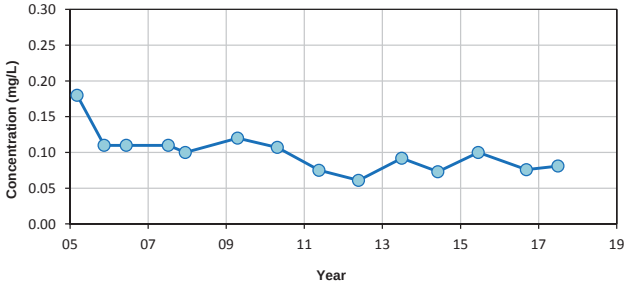
TOTAL DISSOLVED SOLIDS (CALCULATED)



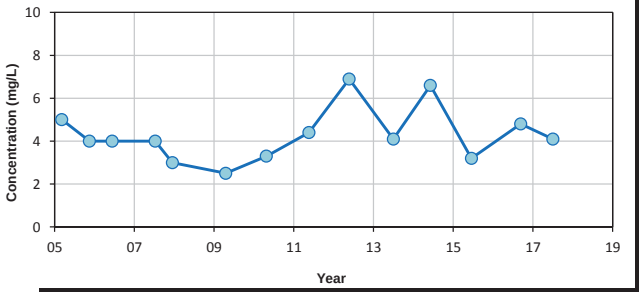
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



Notes:

- Filled symbols denote sample values; unfilled symbols denote values less than detection limit(s)
- Dashed line between data points indicates data gap of more than two years
- Canadian Drinking Water AO Guidelines 2017:
  - pH: 7-10.5 pH Units
  - Iron: 0.3 mg/L
  - Sodium: 200 mg/L
  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A
- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-05

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

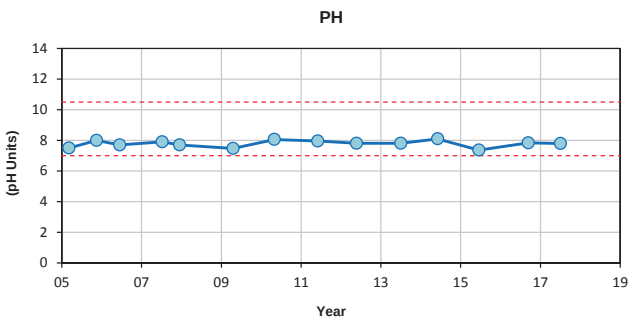
FIG No.: A6-5

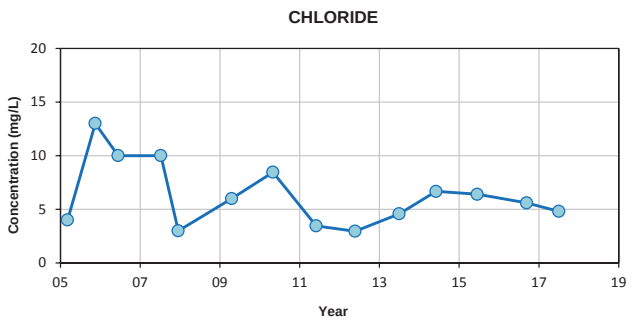
REV: A

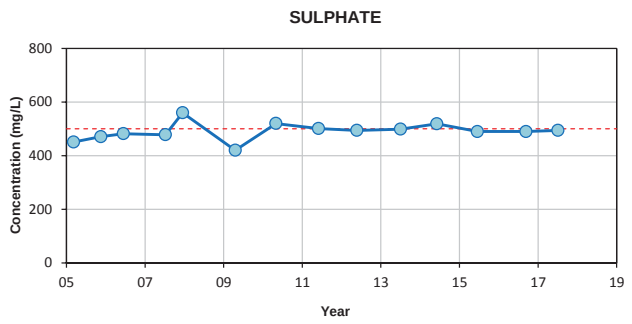
OneWay to zero harm | Advisian WorleyParsons Group

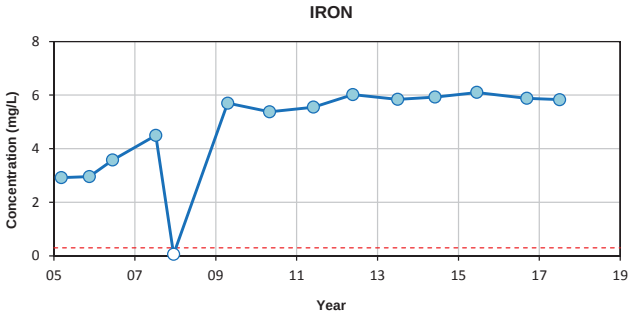
FILE LOCATION: EDMONTON

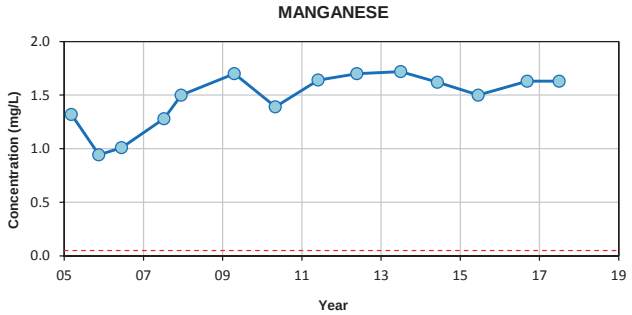
FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

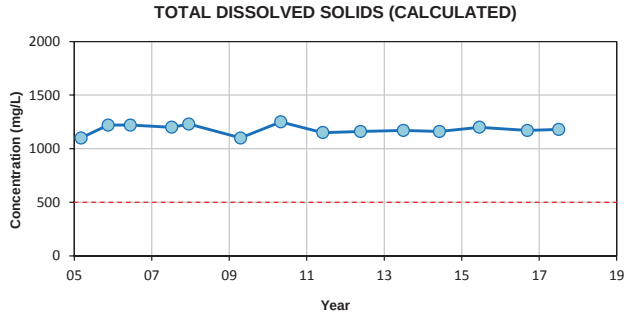


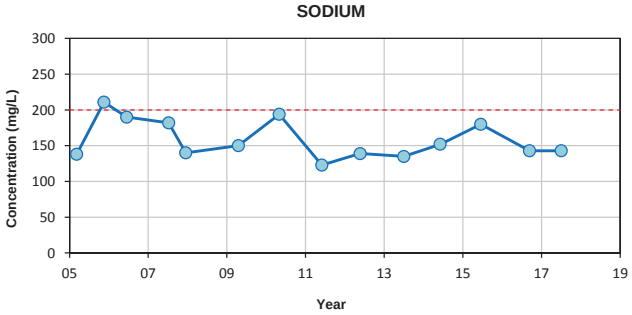


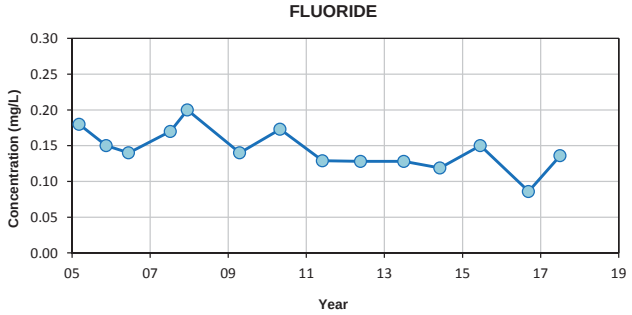


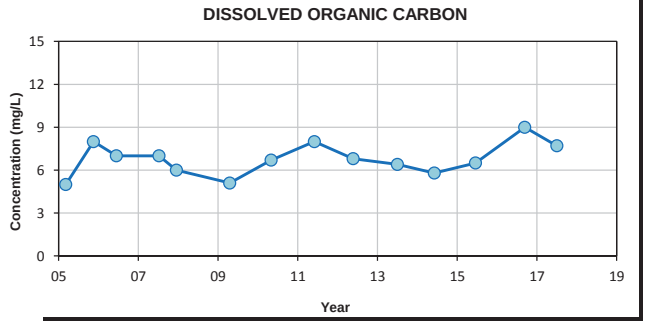












Notes:

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- Canadian Drinking Water AO Guidelines 2017:
- Canadian Drinking Water MAC Guidelines 2017:
  - pH: 7-10.5 pH Units
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  - Sodium: 200 mg/L
  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-06

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-6

REV: A

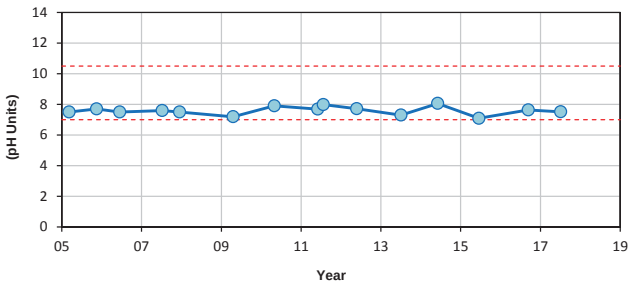
OneWay to zero harm

Advisian WorleyParsons Group

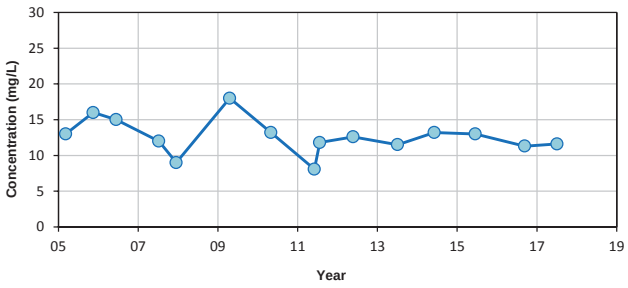
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

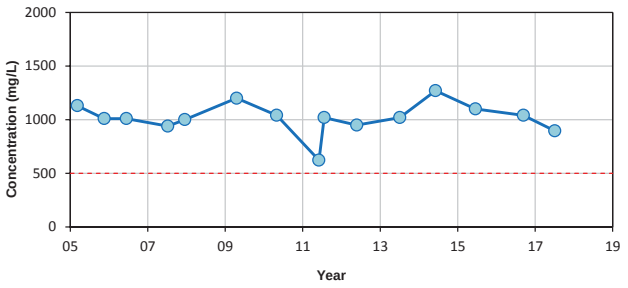
PH



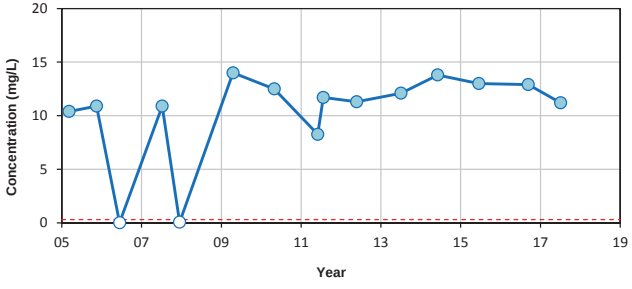
CHLORIDE



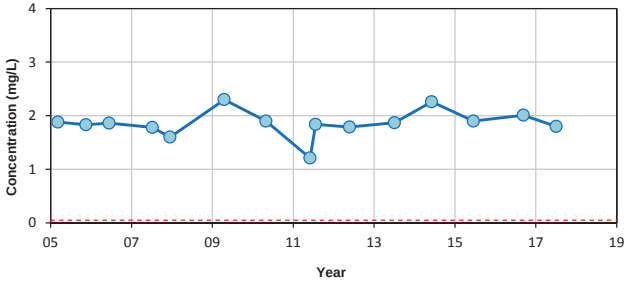
SULPHATE



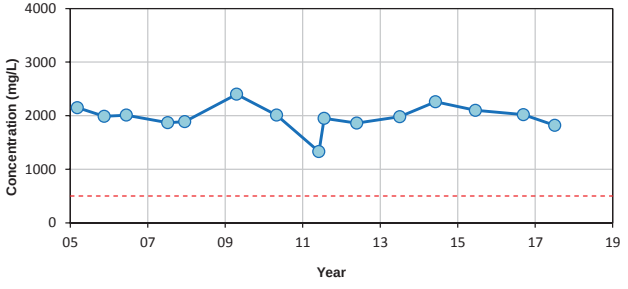
IRON



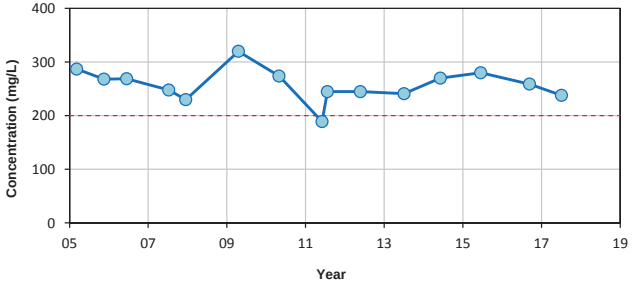
MANGANESE



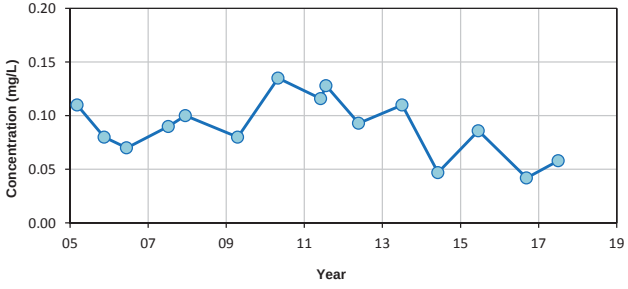
TOTAL DISSOLVED SOLIDS (CALCULATED)



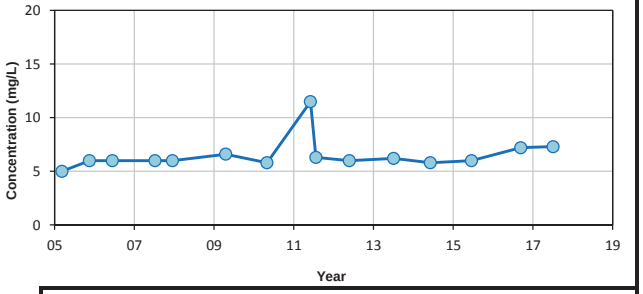
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



Notes:

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  - Sodium: 200 mg/L
  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A
- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-07

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-7

REV: A

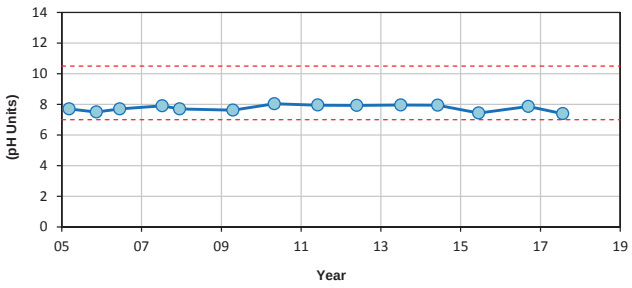
OneWay to zero harm

Advision WorleyParsons Group

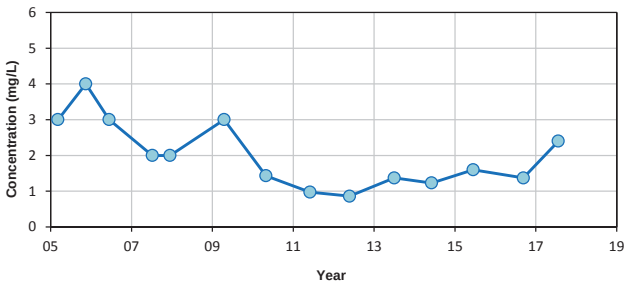
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

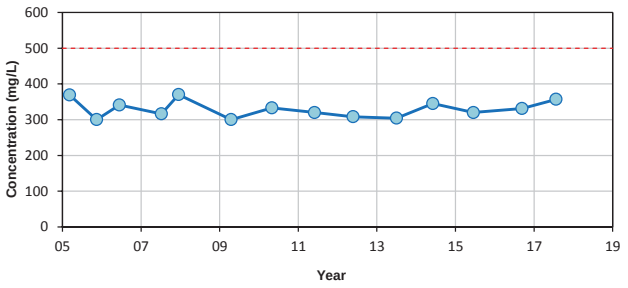
PH



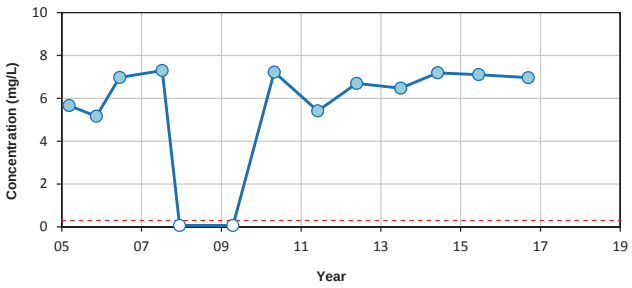
CHLORIDE



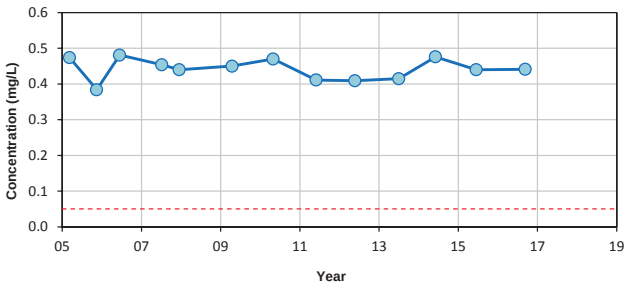
SULPHATE



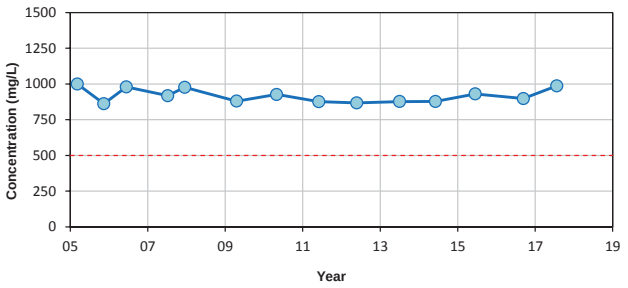
IRON



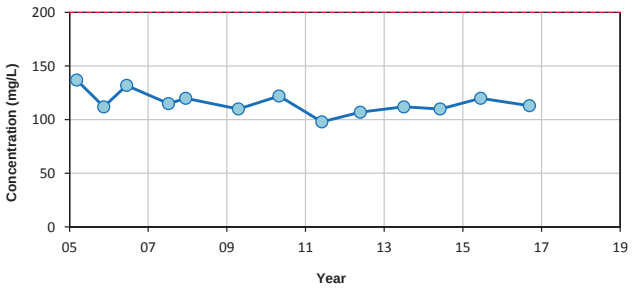
MANGANESE



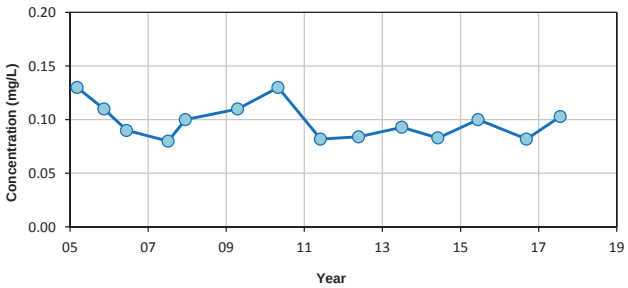
TOTAL DISSOLVED SOLIDS (CALCULATED)



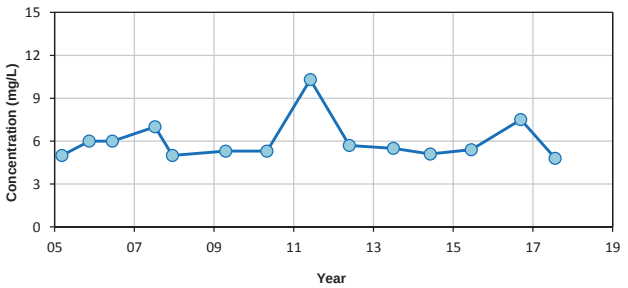
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



Notes:

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  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A
- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-08

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-8

REV: A

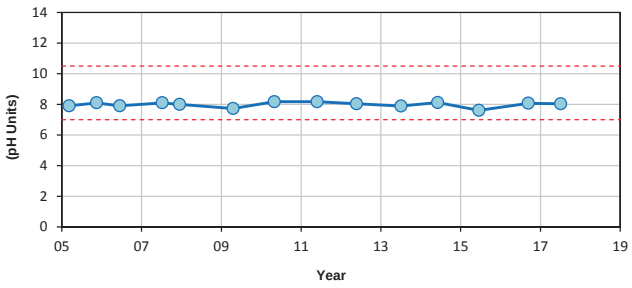
OneWay to zero harm

Advisian WorleyParsons Group

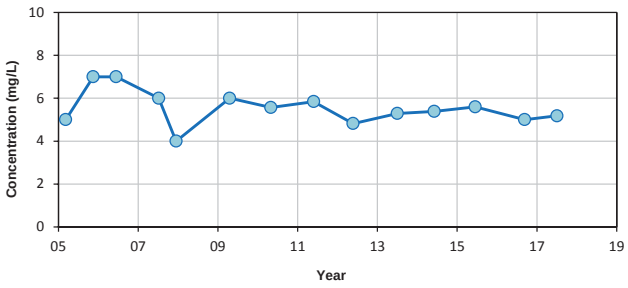
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GBS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

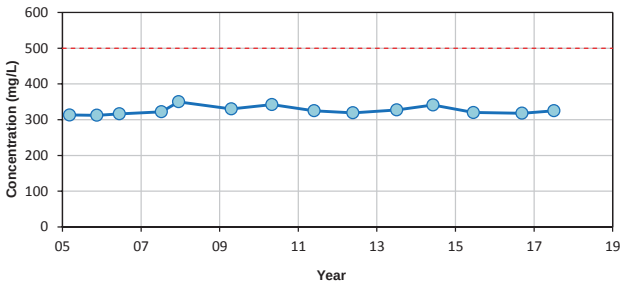
PH



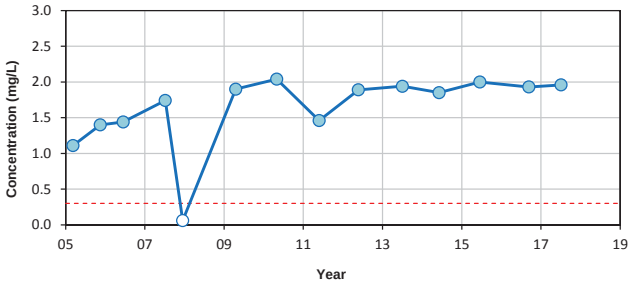
CHLORIDE



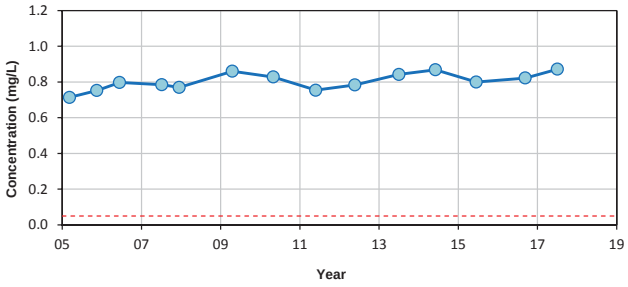
SULPHATE



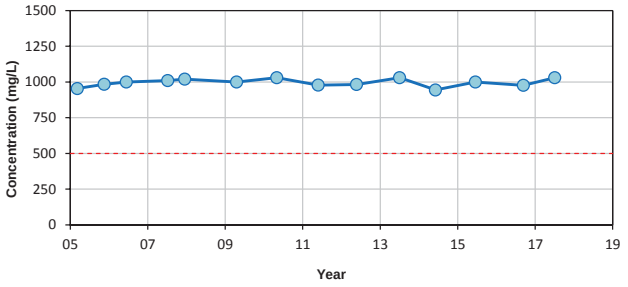
IRON



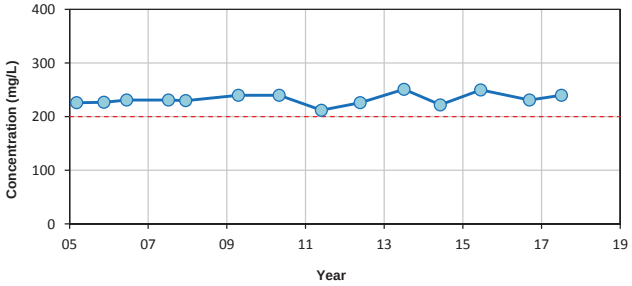
MANGANESE



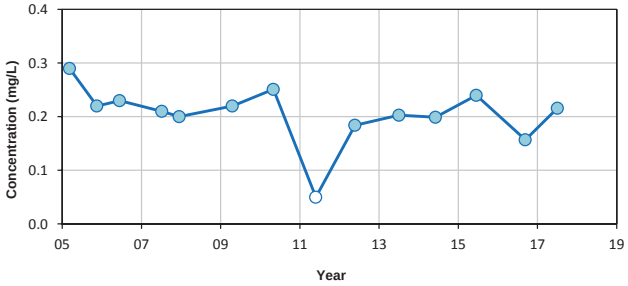
TOTAL DISSOLVED SOLIDS (CALCULATED)



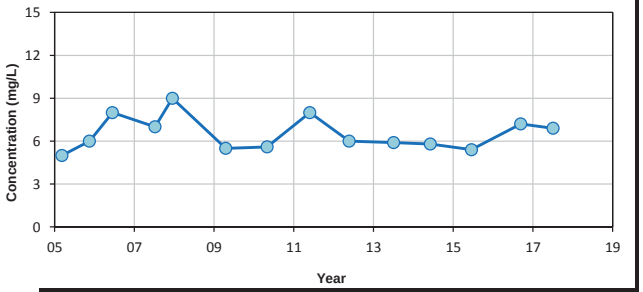
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



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  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A
- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-09

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-9

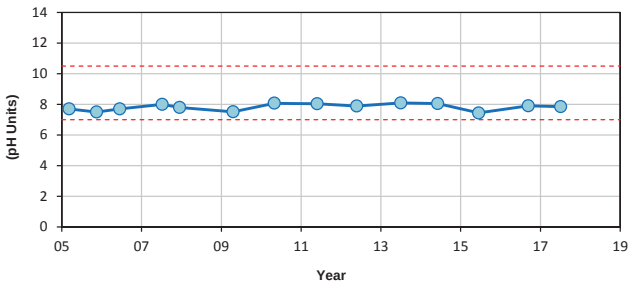
REV: A

OneWay to zero harm | Advisian WorleyParsons Group

FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

PH



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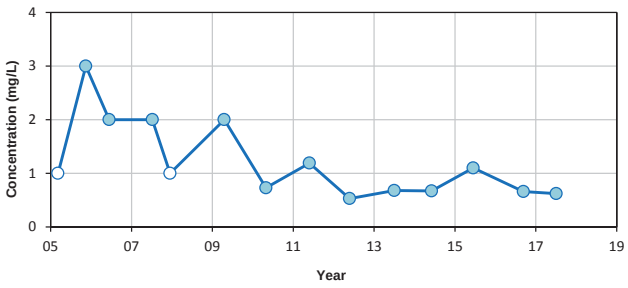

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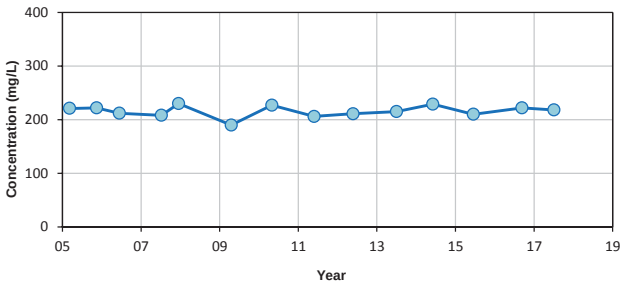

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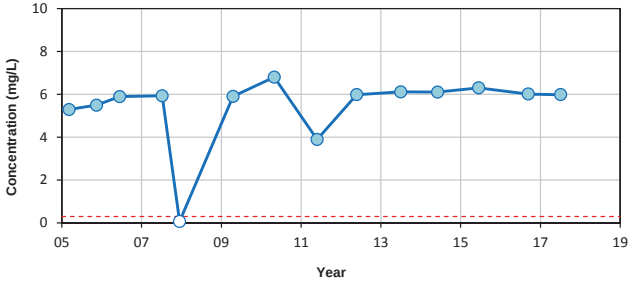
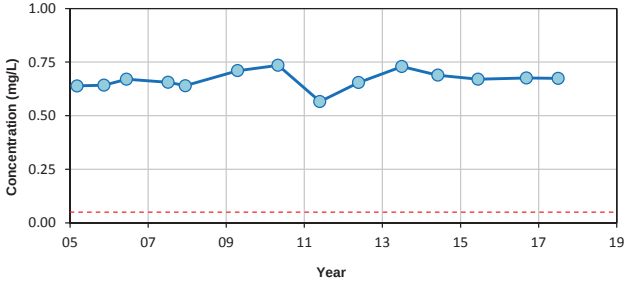
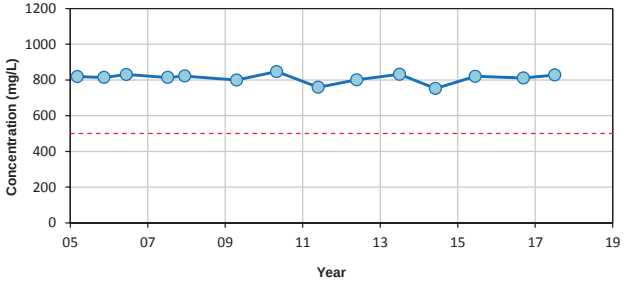


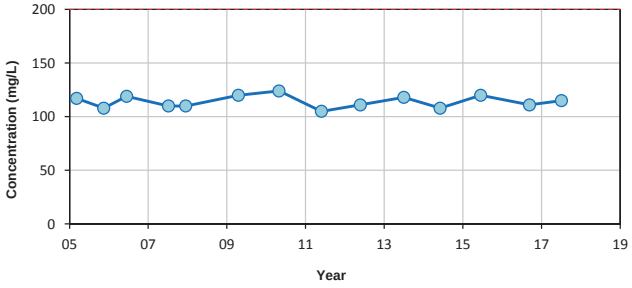
MANGANESE



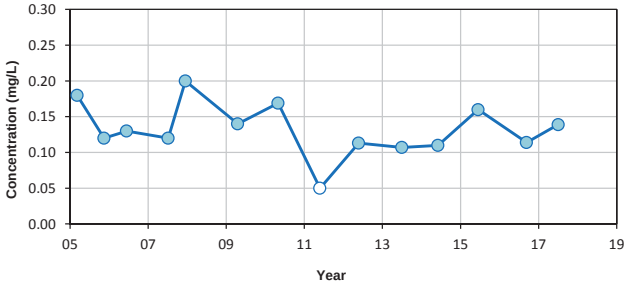
TOTAL DISSOLVED SOLIDS (CALCULATED)



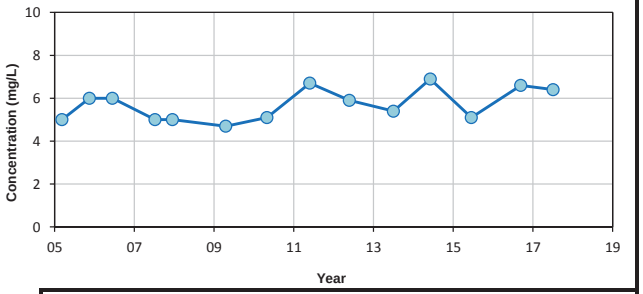
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



Notes:

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  - Sodium: 200 mg/L
  - Chloride: 250 mg/L
  - Manganese: 0.05 mg/L
  - Fluoride: 1.5 mg/L
  - Sulphate: 500 mg/L
  - Total Dissolved Solids (Calculated): 500 mg/L
  - Dissolved Organic Carbon: N/A
- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-10

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-10

REV: A

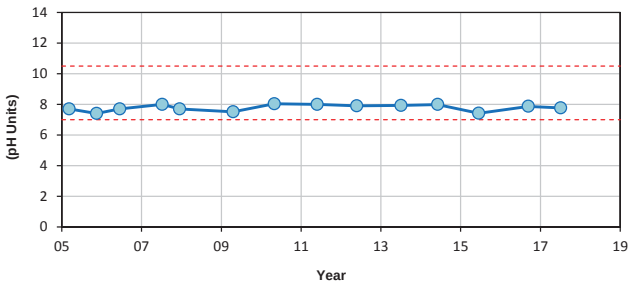
OneWay to zero harm

Advision WorleyParsons Group

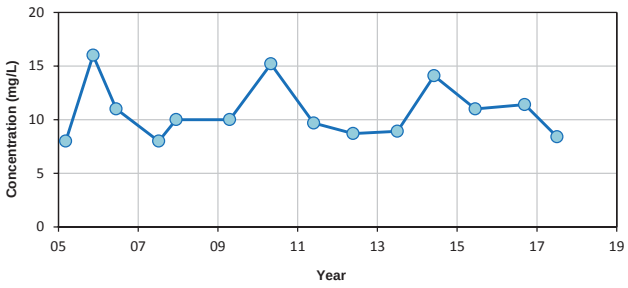
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

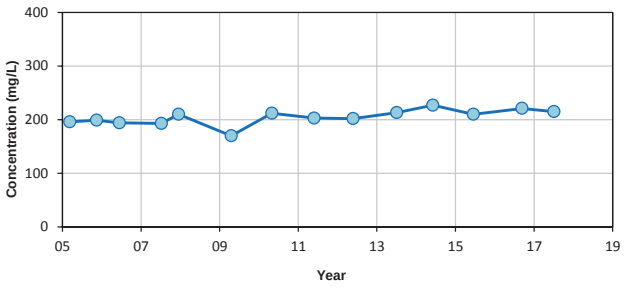
PH



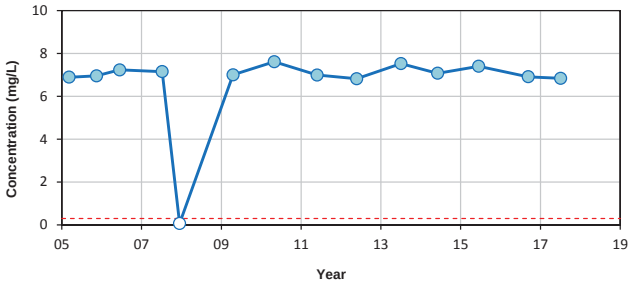
CHLORIDE



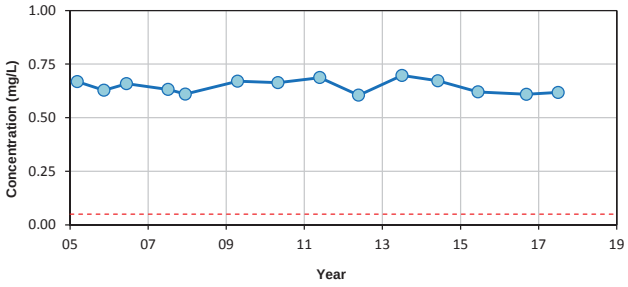
SULPHATE



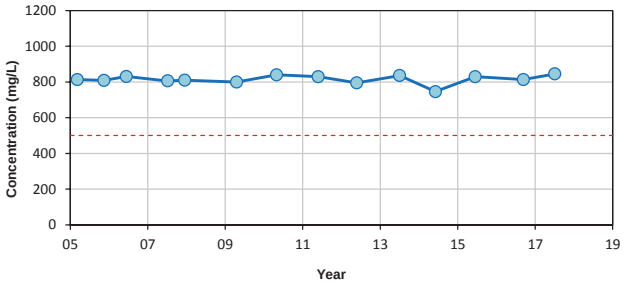
IRON



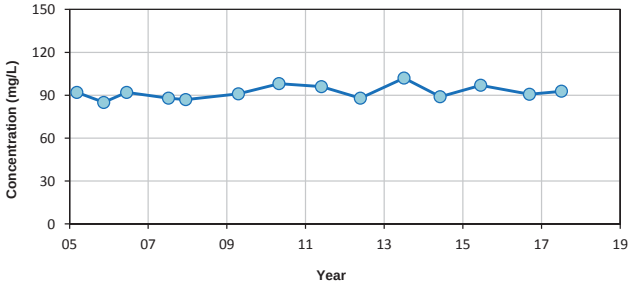
MANGANESE



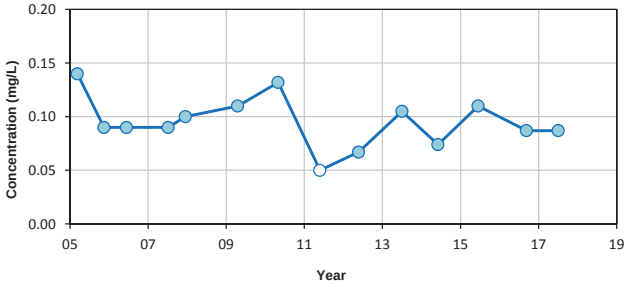
TOTAL DISSOLVED SOLIDS (CALCULATED)



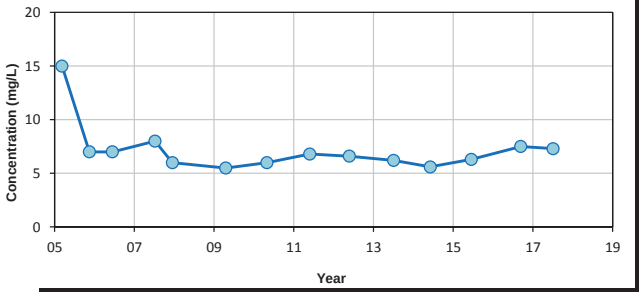
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



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  - Sulphate: 500 mg/L
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- Canadian Drinking Water MAC Guidelines 2017:

NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-11

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-11

REV: A

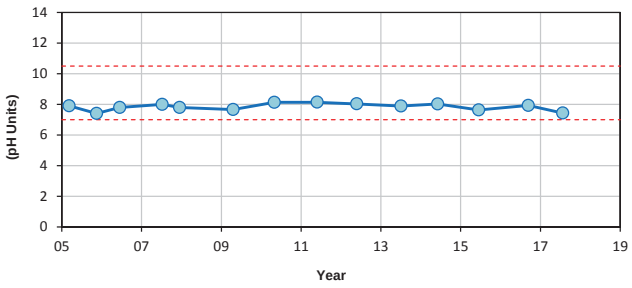
OneWay to zero harm

Advision WorleyParsons Group

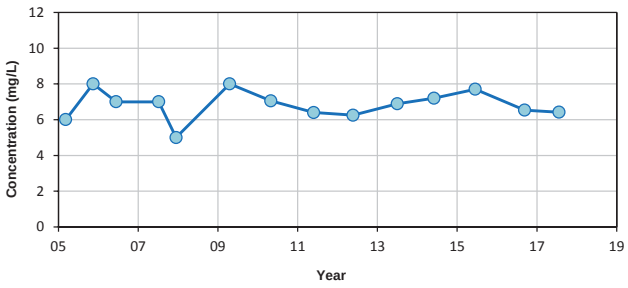
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

PH



CHLORIDE



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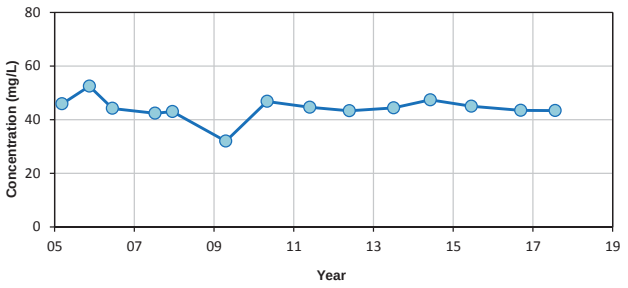
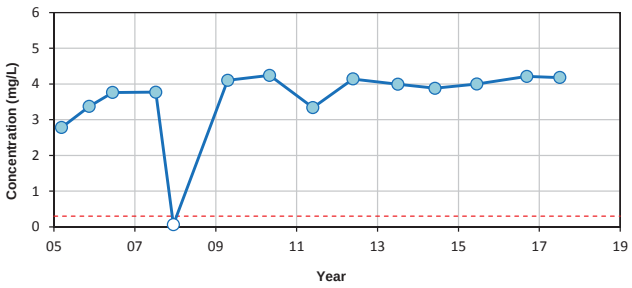
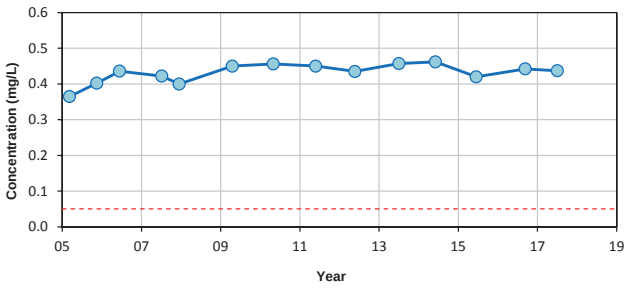


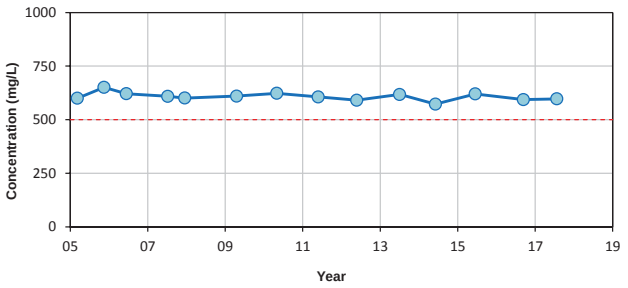
IRON



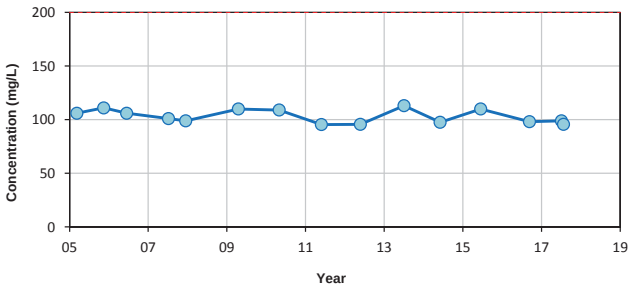
MANGANESE



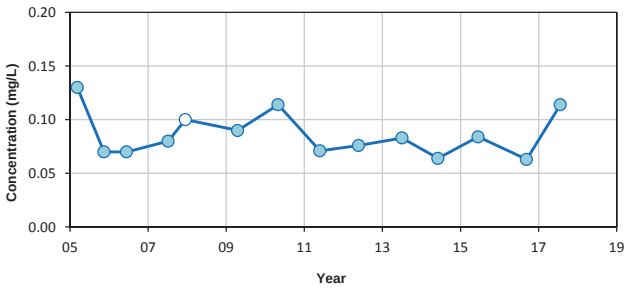
TOTAL DISSOLVED SOLIDS (CALCULATED)



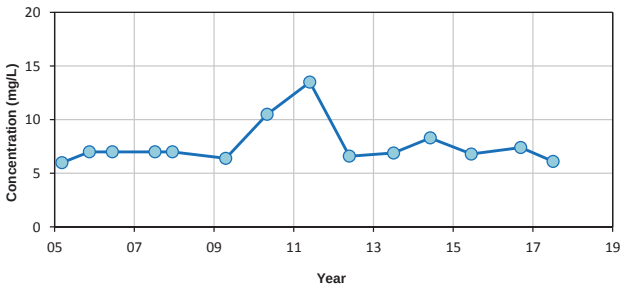
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



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  - Sulphate: 500 mg/L
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NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-12

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-12

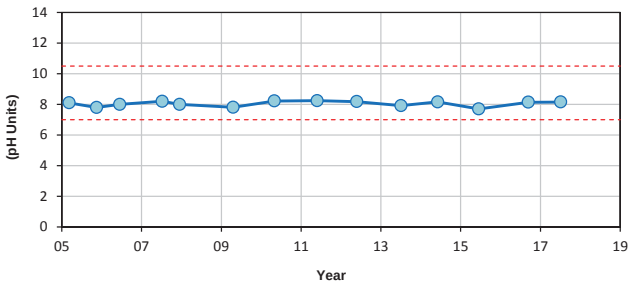
REV: A

OneWay to zero harm | Advisian WorleyParsons Group

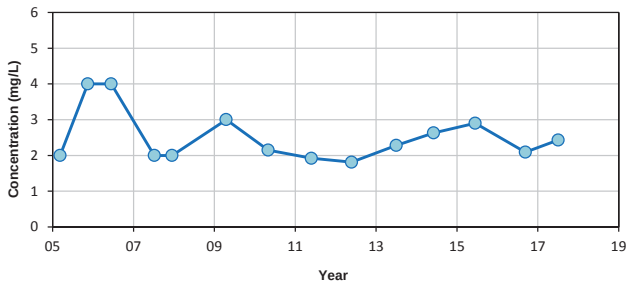
FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GIS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

PH



CHLORIDE



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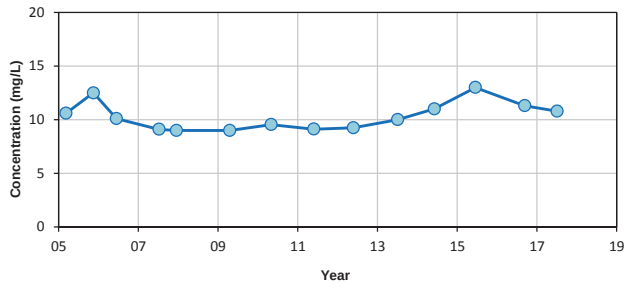

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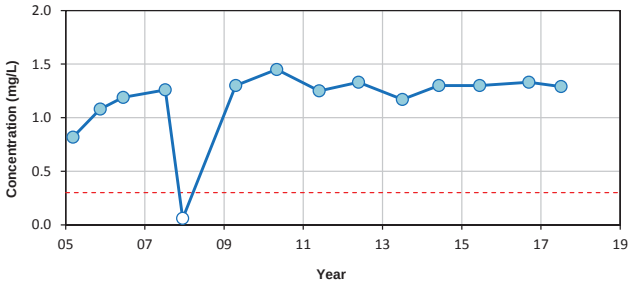

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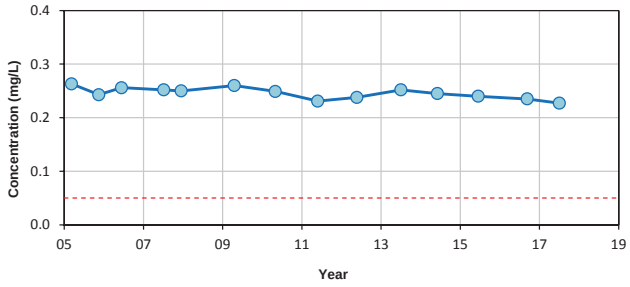
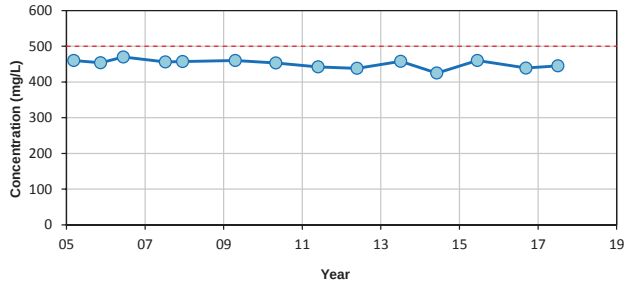
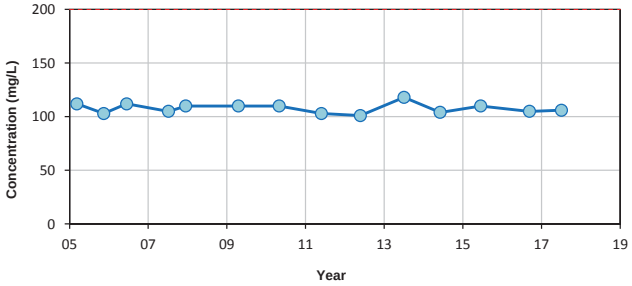


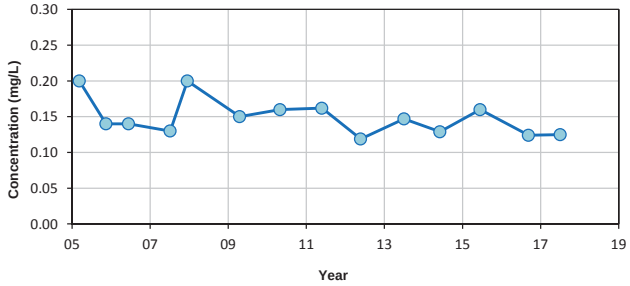
TOTAL DISSOLVED SOLIDS (CALCULATED)



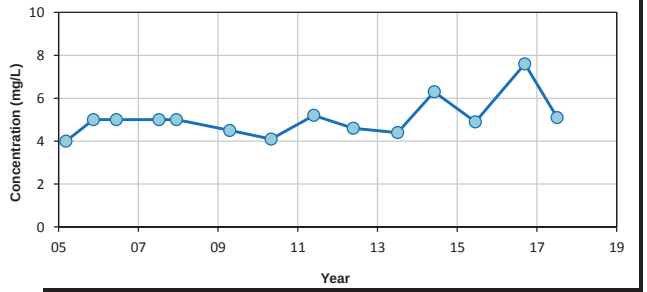
SODIUM



FLUORIDE



DISSOLVED ORGANIC CARBON



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  - Sulphate: 500 mg/L
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NORTHEAST CAPITAL INDUSTRIAL ASSOCIATION
2017 GROUNDWATER QUALITY MONITORING
BEVERLY CHANNEL MONITORING WELLS

HYDROCHEMICAL CONTROL CHARTS
MW-13

Date:	Drawn by:	Edited by:	App'd by:
27-Nov-17	DS		

WorleyParsons Project No.: 307075-01608-300

FIG No.: A6-13

REV: A

FILE LOCATION: EDMONTON

FILE DIRECTORY: U:\EDM\GBS\307075-01608\300-2017_GW_MON\9.0_DATA\9.4_OTHER\TREND CHARTS\WORKING FILES\

Appendix 7 Mann-Kendall/Sen's Slope Analysis and Statistical Table

Appendix 7
Statistical Analysis

Project No.: 307075-01608-300		Trend Analysis								Basic Analysis						
Monitoring Station	Parameter	S-Stat (-)	Z-Stat (-)	P Value of Two Tailed Test (-)	Inferred Confidence Level (of Trend Present in Data Set) (%)	Slope (mg/L/yr)	Normalized Slope (%/yr)	Meets Trend Assumptions? [4]	Statistically Significant Mann-Kendall Trend [3]	Count	Min (mg/L)	Median (mg/L)	Max (mg/L)	Range (mg/L)	Average (mg/L)	Standard Deviation (mg/L)
Groundwater Monitoring																
MW-01	Chloride	34	1.82	0.07	93.1%	0.14	3.56	Y	---	14	2	4	6.27	4.27	4.01	1.12
	Sulphate	-28	1.48	0.14	86.1%	-0.40	-0.70	Y	---	14	44	56.9	62	18	56.08	4.58
	Iron	34	1.81	0.07	93.0%	0.04	2.21	Y	---	14	0.06	1.785	2.02	1.96	1.49	0.66
	Manganese	47	2.52	0.01	98.8%	0.01	0.76	Y	---	14	0.605	0.6965	0.737	0.132	0.69	0.04
	Sodium	-19	0.99	0.32	67.9%	-0.17	-0.48	Y	---	14	32.5	36	40	7.5	35.49	2.20
	Fluoride	-30	1.59	0.11	88.9%	-2.5E-03	-1.95	Y	---	14	0.106	0.13	0.2	0.094	0.14	0.03
	pH	-8	0.38	0.70	30.0%	-4.2E-03	-0.05	Y	---	14	7.46	7.885	8.06	0.6	7.85	0.17
	Total Dissolved Solids (Calculated)	-5	0.22	0.83	17.4%	-0.54	-0.12	Y	---	14	410	438.5	459	49	437.79	14.35
	Dissolved Organic Carbon	21	1.12	0.26	73.9%	0.03	1.08	Y	---	14	2	3	4.5	2.5	3.07	0.70
MW-02	Chloride	55	2.43	0.01	98.5%	3.09	12.57	Y	U	16	11.6	24.6	211	199.4	47.08	53.74
	Sulphate	-17	0.72	0.47	52.9%	-1.61	-0.63	Y	---	16	194	256.5	318	124	252.69	32.36
	Iron	58	2.57	0.01	99.0%	0.69	8.06	Y	---	16	0.06	8.605	12.3	12.24	7.00	4.38
	Manganese	-54	2.39	0.02	98.3%	-0.02	-4.69	Y	---	16	0.236	0.4775	1.09	0.854	0.53	0.21
	Sodium	31	1.35	0.18	82.4%	1.73	1.75	Y	---	16	81	98.75	161	80	109.34	27.77
	Fluoride	-57	2.54	0.01	98.9%	-3.5E-03	-4.43	Y	---	16	0.04	0.08	0.21	0.17	0.09	0.04
	pH	-7	0.27	0.78	21.5%	-4.3E-04	-0.01	Y	---	16	7.15	7.825	8.14	0.99	7.75	0.26
	Total Dissolved Solids (Calculated)	23	0.99	0.32	67.9%	6.91	0.78	Y	---	16	759	889	1090	331	898.31	82.85
	Dissolved Organic Carbon	-11	0.45	0.65	34.9%	-0.02	-0.36	Y	---	16	4.1	5.4	11.3	7.2	5.82	1.71
MW-03	Chloride	77	4.22	0.00	100.0%	2.18	4.94	Y	---	14	31	44.25	57.7	26.7	44.06	9.76
	Sulphate	21	1.10	0.27	72.8%	0.65	0.53	Y	---	14	98	121.5	130	32	120.14	8.27
	Iron	46	2.47	0.01	98.6%	0.09	1.81	Y	---	14	0.06	5.01	5.55	5.49	4.27	1.88
	Manganese	37	1.97	0.05	95.1%	2.2E-03	0.83	Y	---	14	0.239	0.2605	0.282	0.043	0.26	0.01
	Sodium	-24	1.26	0.21	79.3%	-0.28	-0.53	Y	---	14	48.4	52.15	57.9	9.5	52.20	2.80
	Fluoride	-24	1.27	0.20	79.6%	-2.0E-03	-2.00	Y	---	14	0.073	0.1025	0.14	0.067	0.10	0.02
	pH	-14	0.71	0.48	52.4%	-0.01	-0.11	Y	---	14	7.31	7.805	8.03	0.72	7.77	0.23
	Total Dissolved Solids (Calculated)	44	2.36	0.02	98.2%	3.35	0.58	Y	---	14	520	575.5	612	92	577.00	23.36
	Dissolved Organic Carbon	17	0.89	0.37	62.5%	0.06	1.75	Y	---	14	2.5	3.45	5.9	3.4	3.84	1.06
MW-04	Chloride	-1	0.00	1.00	0.0%	0.00	0.00	Y	---	14	125	150	200	75	154.07	25.07
	Sulphate	57	3.07	0.00	99.8%	1.80	2.05	Y	---	14	74	88	130	56	92.85	15.89
	Iron	51	2.75	0.01	99.4%	0.19	135.02	Y	U	14	0.005	0.1385	2.33	2.325	0.82	0.94
	Manganese	47	2.52	0.01	98.8%	0.05	23.57	Y	---	14	0.009	0.205	0.722	0.713	0.31	0.27
	Sodium	-3	0.11	0.91	8.7%	-0.05	-0.08	Y	---	14	50.7	59	71	20.3	59.27	5.96
	Fluoride	-39	2.09	0.04	96.3%	-3.8E-03	-3.18	Y	---	14	0.082	0.1195	0.15	0.068	0.12	0.02
	pH	11	0.55	0.58	41.7%	0.01	0.11	Y	---	14	7.32	7.77	8.1	0.78	7.77	0.20
	Total Dissolved Solids (Calculated)	20	1.05	0.30	70.4%	2.90	0.40	Y	---	14	690	724	809	119	733.00	39.81
	Dissolved Organic Carbon	27	1.46	0.14	85.6%	0.07	2.21	Y	---	14	1	3.1	5	4	3.22	0.86
MW-05	Chloride	82	4.44	0.00	100.0%	1.88	6.13	Y	---	14	15	30.75	40	25	30.06	7.90
	Sulphate	32	1.70	0.09	91.1%	2.10	1.53	Y	---	14	105	137.5	150	45	134.43	12.76
	Iron	52	2.80	0.01	99.5%	0.18	4.94	Y	---	14	0.06	3.65	4.82	4.76	3.19	1.60
	Manganese	54	2.91	0.00	99.6%	0.02	2.39	Y	---	14	0.402	0.7085	0.758	0.356	0.67	0.10
	Sodium	3	0.11	0.91	8.7%	0.03	0.06	Y	---	14	41	43	51	10	43.87	2.64
	Fluoride	-49	2.65	0.01	99.2%	-3.7E-03	-3.70	Y	---	14	0.061	0.1	0.18	0.119	0.10	0.03
	pH	-1	0.00	1.00	0.0%	0.00	0.00	Y	---	14	7.41	7.84	8.1	0.69	7.81	0.20
	Total Dissolved Solids (Calculated)	65	3.50	0.00	100.0%	6.88	1.21	Y	---	14	499	571	620	121	569.93	33.31
	Dissolved Organic Carbon	11	0.55	0.58	41.9%	0.01	0.32	Y	---	14	2.5	4.05	6.9	4.4	4.28	1.25
MW-06	Chloride	-20	1.04	0.30	70.2%	-0.40	-6.88	Y	---	14	2.95	5.8	13	10.05	6.35	3.02
	Sulphate	21	1.10	0.27	72.8%	1.98	0.40	Y	---	14	420	492	560	140	490.64	32.65
	Iron	59	3.18	0.00	99.9%	0.22	3.98	Y	---	14	0.06	5.625	6.1	6.04	4.73	1.76
	Manganese	42	2.25	0.02	97.6%	0.04	2.50	Y	---	14	0.943	1.56	1.72	0.777	1.47	0.25
	Sodium	-16	0.82	0.41	58.9%	-2.40	-1.64	Y	---	14	123	146.5	211	88	158.57	27.14
	Fluoride	-46	2.47	0.01	98.7%	-3.9E-03	-2.76	Y	---	14	0.086	0.14	0.2	0.114	0.14	0.03
	pH	3	0.11	0.91	8.7%	0.01	0.09	Y	---	14	7.37	7.81	8.1	0.73	7.79	0.22
	Total Dissolved Solids (Calculated)	0	0.00	1.00	0.0%	0.00	0.00	Y	---	14	1100	1175	1250	150	1179.29	44.80
	Dissolved Organic Carbon	11	0.55	0.58	41.7%	0.07	0.99	Y	---	14	5	6.75	9	4	6.79	1.13
MW-07	Chloride	-29	1.39	0.16	83.5%	-0.19	-1.49	Y	---	15	8.07	12.6	18	9.93	12.62	2.48
	Sulphate	2	0.05	0.96	4.0%	0.00	0.00	Y	---	15	622	1020	1270	648	1016.40	146.40
	Iron	40	1.93	0.05	94.7%	0.22	1.93	Y	---	15	0.005	11.3	14	13.995	10.20	4.37
	Manganese	14	0.64	0.52	48.1%	3.9E-03	0.21	Y	---	15	1.21	1.86	2.3	1.09	1.86	0.25
	Sodium	-20	0.94	0.35	65.4%	-1.17	-0.45	Y	---	15	189	259	320	131	257.53	29.83
	Fluoride	-21	0.99	0.32	67.9%	-2.7E-03	-2.97	Y	---	15	0.042	0.09	0.135	0.093	0.09	0.03
	pH	6	0.25	0.80	19.6%	9.0E-04	0.01	Y	---	15	7.09	7.6	8.06	0.97	7.59	0.27
	Total Dissolved Solids (Calculated)	-8	0.35	0.73	27.1%	-4.86	-0.24	Y	---	15	1330	1990	2400	1070	1976.00	236.79
	Dissolved Organic Carbon	33	1.64	0.10	90.0%	0.08	1.35	Y	---	15	5	6	11.5	6.5	6.51	1.49
MW-08	Chloride	-38	2.04	0.04	95.9%	-0.14	-7.59	Y	---	14	0.86	1.8	4	3.14	2.02	0.94
	Sulphate	5	0.22	0.83	17.4%	0.50	0.15	Y	---	14	300	325.5	370	70	329.57	24.11
	Iron	15	0.86	0.39	60.8%	0.12	1.84	Y	---	13	0.06	6.69	7.29	7.23	5.56	2.54
	Manganese	-9	0.49	0.62	37.5%	-1.5E-03	-0.34	Y	---	13	0.384	0.441	0.481	0.097	0.44	0.03
	Sodium	-21	1.23	0.22	78.0%	-1.15	-1.02	Y	---	13	98	113	137	39	116.00	10.34
	Fluoride	-17	0.88	0.38	62.2%	-8.8E-04	-0.91	Y	---	14	0.08	0.0965	0.13	0.05	0.10	0.02
	pH	2	0.06	0.96	4.4%	0.00	0.00	Y	---	14	7.39	7.78	8.04	0.65	7.76	0.21
	Total Dissolved Solids (Calculated)	-5	0.22	0.83	17.3%	-0.97	-0.11	Y	---	14	862	908	999	137	918.29	49.22
	Dissolved Organic Carbon	-4	0.16	0.87	13.1%	-0.02	-0.30	Y	---	14	4.8	5.45	10.3	5.5	5.99	1.46
MW-09	Chloride	-28	1.48	0.14	86.2%	-0.09	-1.61	Y	---	14	4	5.48	7	3	5.55	0.81
	Sulphate	16	0.82	0.41	58.9%	0.68	0.21	Y	---	14	312	323.5	350	38	325.71	11.45
	Iron	51	2.74	0.01	99.4%	0.05	2.74	Y	---	14	0.06	1.87	2.04	1.98	1.62	0.53
	Manganese	47	2.52	0.01	98.8%	0.01	1.08	Y	---	14	0.714	0.7985	0.872	0.158	0.80	0.05
	Sodium	22	1.16	0.24	75.6%	1.13	0.49	Y	---	14	212	231	251	39	232.64	10.65
	Fluoride	-28	1.48	0.14	86.1%	-4.0E-03	-1.89	Y	---	14	0.05	0.213	0.29	0.24	0.21	0.05
	pH	-1	0.00	1.00	0.0%	0.00	0.00	Y	---	14	7.61	8.04	8.17	0.56	7.99	0.17
	Total Dissolved Solids (Calculated)	9	0.44	0.66	34.2%	1.67	0.17	Y	---	14	944	1000	1030	86	995.64	27.43
	Dissolved Organic Carbon	-1	0.00	1.00	0.0%	0.00	0.00	Y	---	14	5	6	9	4	6.52	1.19
MW-10	Chloride	-51	2.76	0.01	99.4%	-0.10	-9.98	Y	---	14	0.53	1	3	2.47	1.23	0.74
	Sulphate	2	0.05	0.96	4.4%	0.09	0.04	Y	---	14	190	216.5	230	40	215.79	10.76
	Iron	40	2.14	0.03	96.8%	0.05	0.78	Y	---	14	0.06	5.955	6.8	6.74	5.41	1.67
	Manganese	26	1.37	0.17	83.0%	2.9E-03	0.44	Y	---	14	0.566	0.67	0.735	0.169	0.67	0.04
	Sodium	7	0.33	0.74	25.9%	0.11	0.10	Y	---	14	105	113	124	19	114.00	5.72
	Fluoride	-18	0.93	0.35	64.9%	-1.6E-03	-1.25	Y	---	14	0.05	0.125	0.2	0.15	0.13	0.04
	pH	20	1.04	0.30	70.2%	0.01	0.17	Y	---	14	7.44	7.87	8.09	0.65	7.82	0.22
	Total Dissolved Solids (Calculated)	-6	0.27	0.78	21.6%	-0.28	-0.03	Y	---	14	752	816.5	847	95	810.71	26.48
	Dissolved Organic Carbon	28	1.49	0.14	86.4%	0.06	1.15	Y	---	14	4.7	5.65	6.9	2.2	5.70	0.75
MW-11	Chloride	0	0.00	1.00	0.0%	0.00	0.00	Y	---	14	8	10	16	8	10.74	2.62
	Sulphate	48	2.58	0.01	99.0%	1.96	0.95	Y	---	14	170	206.5	227	57	204.64	14.20
	Iron	1	0.00	1.00	0.0%	1.7E-03	0.02	Y	---	14	0.06	6.995	7.61	7.55	6.60	1.90
	Manganese	-9	0.44	0.66	33.9%	-9.7E-04	-0.15	Y	---	14	0.605	0.6455	0.697	0.092	0.65	0.03
	Sodium	22	1.15	0.25	75.0%	0.47	0.51	Y	---	14	85	91.5	102	17	92.04	4.78
	Fluoride	-16	0.83	0.41	59.2%	-3.3E-04	-0.36	Y	---	14	0.05	0.09	0.14	0.09	0.10	0.02
	pH	9	0.44	0.66	34.1%	0.01	0.08	Y	---	14	7.4	7.82	8.04	0.64	7.78	0.22
	Total Dissolved Solids (Calculated)	9	0.44	0.66	34.0%	0.70	0.09	Y	---	14	746	813	845	99	814.57	25.12
	Dissolved Organic Carbon	-13	0.66	0.51	49.0%	-0.07	-1.00	Y	---	14	5.5	6.7	15	9.5	7.20	2.36
MW-12	Chloride	-1	0.00	1.00	0.0%	0.00	0.00	Y	---	14	5	6.945	8	3	6.82	0.81
	Sulphate	-5	0.22	0.83	17.3%	-0.09	-0.20	Y	---	14	32	44.3	52.5	20.5	44.17	4.34
	Iron	45	2.41	0.02	98.4%	0.07	1.77	Y	---	14	0.06	3.935	4.24	4.18	3.56	1.09
	Manganese	34	1.81	0.07	93.0%	3.3E-03	0.75	Y	---	14	0.365	0.4365	0.462	0.097	0.43	0.03
	Sodium	-28	1.34	0.18	82.0%	-0.61	-0.60	Y	---	15	95.4	101	113	17.6	103.10	6.38
	Fluoride	-7	0.33	0.74	25.8%	-6.8E-04	-0.84	Y	---	14	0.063	0.0815	0.13	0.067	0.09	0.02
	pH	0	0.00	1.00	0.0%	0.00	0.00	Y	---	14	7.4	7.895	8.14	0.74	7.84	0.24
	Total Dissolved Solids (Calculated)	-25	1.31	0.19	81.1%	-1.57	-0.26	Y	---	14	573	607.5	651	78	608.14	18.48
	Dissolved Organic Carbon	3	0.11	0.91	8.8%	0.00	0.00	Y	---	14	6	7	13.5	7.5	7.61	2.03

Appendix 7
Statistical Analysis

Project No.: 307075-01608-300		Trend Analysis								Basic Analysis						
Monitoring Station	Parameter	S-Stat (-)	Z-Stat (-)	P Value of Two Tailed Test (-)	Inferred Confidence Level (of Trend Present in Data Set) (%)	Slope (mg/L/yr)	Normalized Slope (%/yr)	Meets Trend Assumptions? [4]	Statistically Significant Mann-Kendall Trend [3]	Count	Min (mg/L)	Median (mg/L)	Max (mg/L)	Range (mg/L)	Average (mg/L)	Standard Deviation (mg/L)
MW-13	Chloride	-3	0.11	0.91	8.8%	0.00	0.00	Y	---	14	1.81	2.215	4	2.19	2.52	0.72
	Sulphate	22	1.15	0.25	75.0%	0.08	0.77	Y	---	14	9	10.05	13	4	10.31	1.30
	Iron	37	1.98	0.05	95.3%	0.02	1.18	Y	---	14	0.06	1.275	1.45	1.39	1.15	0.35
	Manganese	-50	2.69	0.01	99.3%	-2.0E-03	-0.83	Y	---	14	0.227	0.247	0.263	0.036	0.25	0.01
	Sodium	-12	0.61	0.54	46.0%	-0.19	-0.18	Y	---	14	101	108	118	17	107.79	4.68
	Fluoride	-28	1.48	0.14	86.2%	-2.2E-03	-1.53	Y	---	14	0.119	0.1435	0.2	0.081	0.15	0.03
	pH	4	0.16	0.87	13.1%	3.5E-03	0.04	Y	---	14	7.7	8.12	8.24	0.54	8.04	0.18
	Total Dissolved Solids (Calculated)	-32	1.71	0.09	91.2%	-1.68	-0.37	Y	---	14	425	455	470	45	451.21	11.87
	Dissolved Organic Carbon	25	1.33	0.18	81.7%	0.05	1.03	Y	---	14	4	5	7.6	3.6	5.05	0.92
MW-02B	Chloride	---	---	---	---	---	---	N (Ins. trend data)	---	3	804	812	975	171	863.67	96.50
	Sulphate	---	---	---	---	---	---	N (Ins. trend data)	---	3	5.8	13.3	41.7	35.9	20.27	18.94
	Iron	---	---	---	---	---	---	N (Ins. trend data)	---	3	0.05	0.44	0.687	0.637	0.39	0.32
	Manganese	---	---	---	---	---	---	N (Ins. trend data)	---	3	0.109	0.114	0.2	0.091	0.14	0.05
	Sodium	---	---	---	---	---	---	N (Ins. trend data)	---	3	571	589	673	102	611.00	54.44
	Fluoride	---	---	---	---	---	---	N (Ins. trend data)	---	3	0.41	0.42	0.475	0.065	0.44	0.04
	pH	---	---	---	---	---	---	N (Ins. trend data)	---	3	8.28	8.29	8.55	0.27	8.37	0.15
	Total Dissolved Solids (Calculated)	---	---	---	---	---	---	N (Ins. trend data)	---	3	1650	1660	1900	250	1736.67	141.54
	Dissolved Organic Carbon	---	---	---	---	---	---	N (Ins. trend data)	---	3	7.9	9.8	10.2	2.3	9.30	1.23

1. Shading in the parameter column indicates one or more analyses returned notable results (analysis-specific shading is further specified below)
2. Basic analysis performed with the following conditions:
- Analyses performed on all sample data before 31-Dec-2017 (inclusive)
3. Trend Analysis:
- Analyses performed on all sample data before 31-Dec-2017 (inclusive)
- Statistically signficant trend defined as:
-- Inferred confidence level greater than 95%
(in other words, P-value of two-tailed test is less than or equal to 0.05)
-- Absolute value of Sen's normalized slope is greater than 10%
-- Absolute slope criteria met for individual parameters (see criteria below)
- U: Denotes statistically significant upward trend
- D: Denotes statistically significant downward trend
- "---": Denotes no trend
- Shading of trend analysis cells indicates a Mann-Kendall trend has been detected
4. Legend for trend assumptions:
- Y: All conditions are met
- N: Not all conditions are met, specified as follows:
-- Ins. trend data: Found fewer than 6 data points in the date range specified from which to calculate Mann-Kendall information
-- Ins. >DL data: Less than 50% of trend data was above detection limit
-- U Trend: An upward Mann-Kendall trend is present
-- D Trend: A downward Mann-Kendall trend is present
-- Non-Monotonic: Trend is non-monotonic (ie. trend reversal or termination is not present)
-- Damaged: The well is damaged
5. Parameter dependent criteria as follows:
- Chloride - absolute slope criteria: 2.0 mg/L
- Sulphate - absolute slope criteria: 2.0 mg/L
- Iron - absolute slope criteria: 0.1 mg/L
- Manganese - absolute slope criteria: 0.1 mg/L
- Sodium - absolute slope criteria: 2.0 mg/L
- Fluoride - absolute slope criteria: 0.1 mg/L
- pH - absolute slope criteria: n/a
- Total Dissolved Solids (Calculated) - absolute slope criteria: 2.0 mg/L
- Dissolved Organic Carbon - absolute slope criteria: 0.5 mg/L