2018 Groundwater Monitoring Program
Class I Waste Management Facility
Ryley, Alberta

PRESENTED TO

Clean Harbors Environmental Services, Inc.

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EXECUTIVE SUMMARY

Clean Harbors Environmental Services, Inc. (Clean Harbors) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2018 Groundwater Monitoring Program (GMP) at the Ryley Landfill facility (the facility), located at the southeast quarter section of Section 9, Township 50, Range 17, West of the 4th Meridian, approximately 2 km north of the Village of Ryley, Alberta.

The facility is a Class I landfill, storage, and disposal facility, licensed to accept various hazardous waste liquids and solids for disposal and/or transfer to authorized treatment or disposal facilities in accordance with the Alberta Environmental Protection and Enhancement Act (EPEA). The facility operates under Alberta Environment (AENV), currently Alberta Environment and Parks (AEP), EPEA Approval No. 10348-03-00 (as amended) (Approval). This approval was granted in March 2017 and is effective until March 31, 2027. As per the renewed Approval requirements, Tetra Tech submitted a revised GMP to AEP on behalf of Clean Harbors in September 2017 and received authorization to implement the revised GMP in 2018.

The objective of the 2018 GMP is to assess the current groundwater conditions, comment on the results, and provide recommendations for future groundwater monitoring.

Tetra Tech conducted the GMP at the facility in June 2018. The 2018 GMP included monitoring and sampling of 52 existing monitoring wells at the facility.

The results of the 2018 GMP are summarized below:

- Similar to previous years, the interpreted groundwater elevations in June 2018 indicated that the facility is primarily located in a groundwater recharge area, creating a radial pattern of the groundwater flow both in shallow and deep groundwater zones.
- The natural groundwater type is sodium sulphate and natural mineralization accounts for high concentrations of sodium, sulphate, and total dissolved solids (TDS) concentrations in the groundwater at the facility.
- In 2018, dissolved metal and routine parameters were generally within the historical concentration ranges.
- Overall, there were no indications of adverse groundwater impacts resulting from facility activities.
- Eight monitoring wells were decommissioned as part of the proposed Cell 4 construction activities after the 2018 groundwater monitoring program was completed.

Based on the results from the work conducted in 2018, the following is recommended for Clean Harbors' consideration:

- The 2019 groundwater monitoring and sampling fieldwork should be conducted in late May or early June to minimize the number of frozen wells and maximize groundwater availability for sampling. The parameters that were analyzed in 2018 should be continued to be analyzed in 2019.
- Tetra Tech recommends installing two nested pairs (four wells) between the existing facility and the expansion once construction activities related to Cell 4 are complete.

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LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Clean Harbors Environmental Services, Inc. and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Clean Harbors Environmental Services, Inc., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

Clean Harbors Environmental Services Inc. (Clean Harbors) retained Tetra Tech Canada Inc. (Tetra Tech) to conduct the 2018 Groundwater Monitoring Program (GMP) at the Ryley Landfill facility (the facility), located at the southeast quarter section of Section 9, Township 50, Range 17, West of the 4th Meridian, approximately 2 km north of the Village of Ryley, Alberta (Figure 1). The facility is a Class I landfill, storage, and disposal facility, licensed to accept various hazardous waste liquids and solids for disposal and/or transfer to authorized treatment or disposal facilities in accordance with the Alberta's *Environmental Protection and Enhancement Act* (EPEA).

The facility operates under Alberta Environment (AENV), currently Alberta Environment and Parks (AEP), EPEA Approval No. 10348-03-00 (as amended) (Approval). This approval was renewed in March 2017 and is effective until March 31, 2027. As per the renewed Approval requirements, Tetra Tech submitted a revised GMP to AEP on behalf of Clean harbors in September 2017 (Tetra Tech, 2017a) and received authorization to implement the revised GMP in 2018. A copy of the Approval, the AEP letter approving the revised GMP, and the Record of Site Conditions, are presented in Appendix A.

Tetra Tech conducted the groundwater monitoring program at the facility in June 2018 as per the revised GMP, which included monitoring and sampling of the existing 52 monitoring wells on site. Following the monitoring and sampling activities in June, eight wells were decommissioned to allow the construction of Cell 4. This report provides methods and results of the 2018 GMP.

The objectives of the 2018 GMP were to provide an assessment of the groundwater conditions compared to historical data, comment on the results, and provide recommendations for future groundwater monitoring.

Mr. Stan Yuha, Facility Manager at Clean Harbors, provided Tetra Tech written authorization to proceed with this work on June 11, 2018.

2.0 SCOPE OF WORK

The scope of work for the 2018 GMP included:

- Measuring groundwater levels within each monitoring well and observing monitoring well integrity;
- Purging each well until approximately three standing well volumes of water had been removed or until practically dry, and allowing the water level in the well to recover prior to sampling;
- Collecting groundwater samples from each monitoring well within the sampling program, and submitting samples for laboratory chemical analyses;
- Evaluating groundwater flow conditions and quality; and
- Preparing an annual report to summarize the field activities undertaken during the year, providing and interpreting the measured groundwater levels and groundwater analytical results.

3.0 GROUNDWATER REGULATORY CONTEXT

As per Section 4.9.7(a) of the Approval, the historical groundwater chemistry results were compared to the Canadian Environmental Quality Guidelines (CEQG) for drinking water, published by the Canadian Council of Ministers of the Environment (CCME[1]), however according to the revised GMP, approved by AEP, the 2018

[1] The CCME now directs users to the Health Canada Federal Provincial Territorial Committee on Drinking Water Guidelines for Canadian Drinking Water Quality (CDWQ guidelines) (Health Canada, 2017)

analytical data were compared to Alberta's 2018 Tier 1 Soil and Groundwater Remediation Guidelines (Tier 1 Guidelines) for fine-grained material under agricultural land use. The surficial soils and bedrock material in the area is primarily fine-grained (clay till, overlaying shale bedrock) and surrounding land use is primarily agricultural.

The Approval states that groundwater analytical results are to be compared to background groundwater chemistry. Nested monitoring wells 15MW35A, 15MW35B, 15MW35C, and 15MW35-Deep are located up- or cross-gradient to the groundwater flow directions observed and approximately 100 m away from any facility operations. Therefore, the groundwater quality in these wells can be considered to represent background groundwater quality.

4.0 BACKGROUND INFORMATION

4.1 Groundwater

As required in Section 4.9.14(e) of the Approval, a water well database search must be conducted to a minimum of a 1.6 km radius from the facility. The Alberta Water Well Information Database (AEP, 2018) is maintained by AEP and was used to identify nearby licenced water wells. To account for the distance from the centre of the facility, and spatial inaccuracies within the water well database, a 2.0 km radius was used. The search provided records of 41 water wells as of January 2019.

Table A summarizes the well use within the search radius.

Table A: Water Well Information Database Summary

Domestic	Domestic & Industrial	Domestic & Stock	Industrial	Municipal	Observation Monitoring and Investigation	Stock	Unknown/ Other
7	2	3	1	2	13	2	11

The average drilling depth of the water wells is 50.5 m below ground level (mbgl), and the maximum depth is 140.2 mbgl. A full reconnaissance report is provided in Appendix B.

A series of monitoring wells were installed in 2016 in the adjacent quarter section north of the facility as part of an application to expand the facility. Tetra Tech submitted a proposal to Clean Harbors to implement baseline groundwater monitoring and sampling, however it has not yet been implemented (Tetra Tech, 2017b).

4.2 Surface Water

A map showing the locations of the surface water users, and a table containing the water allocation details is contained in Appendix B. Surface water sampling locations surrounding the facility (dugout sites as shown on Figure 2) are sampled annually in the fall of each year. The analytical results for these surface water sampling locations are reported under a separate cover.

Figures 3 shows the surface water drainage and monitoring well locations at the facility. The northwest corner of the facility is a local topographic high point for surface water. Ditches have been constructed around the waste cells to collect surface water and allow perimeter drainage to the retention pond, located on the east side of the facility. A ditch on the northern edge is sloped downward to the east along the north base of Cells 1 and 2 to a gravelled storage pad. It then drains water into a second ditch that conveys the surface runoff east to connect to the ditch that drains water to the retention pond. Surface water from the northwest corner also drains south through a

perimeter ditch that collects water from the west base of Cells 2 and 3A. At the southwest corner of Cell 3A, the ditch turns east to collect perimeter drainage along the south portion of the facility. Surface water then drains east into the retention pond. All surface water runoff is collected and not discharged off site until it meets surface water quality discharge requirements. Surface water from outside of the facility is diverted from flowing into the facility.

4.3 Geology and Hydrogeology

Various parties, (HCL, 1999., Stein & Carlson, 2005., and APE, 2016) have documented regional geology and hydrogeology in the area. The data gathered from various reports are presented as Figures A, B, and C in Appendix B.

The regional information suggests that the surficial geology in the area consists of unconsolidated glacial deposits (till), of Quaternary age. The till is up to 4 m thick beneath the facility and overlies Cretaceous sedimentary bedrock. The Bearpaw Formation underlies the till and consists of marine shales, silty shales, sandstone, and bentonite beds that interfinger with sandstone. The Belly River Group lies underneath the Bearpaw Formation. The group contains the Oldman Formation and the Continental and Marine Foremost Formations. In the upper portion of the group, bedrock consists mainly of non-marine, grey to greenish grey, thick bedded, feldspathic sandstone, grey, clayey siltstone, grey and green mudstone (Stein & Carlson, 2005., Fenton, et al. 2013). Due to the similarities between the two units, and the overlapping deposition and subsequent interfingering of the layers, distinct boundaries are not well defined. Together these formations are estimated up to approximately 24 m thick beneath the facility (Prior, et al. 2013). The nearest buried valley is reported to exist approximately 5 km to the north of the site, (Appendix B, Figure A).

Based on review of a hydrogeological report and map of the area east of Edmonton (Stein and Carlson, 2005), the regional groundwater flow is inferred to generally mimic the surface topography in the area. This would suggest a flow towards the north to Beaverhill Lake and eventually to the North Saskatchewan River, although local flow direction may vary. Hydraulic conductivity values for the Belly River and Bearpaw Formations are reported to be approximately 0.5 m/day (5.8×10^{-6} m/s). The facility is situated in an area where groundwater in the bedrock contains total dissolved solids (TDS) concentrations ranging from 1,500 mg/L to more than 8,000 mg/L. Groundwater chemistry within the till material is naturally mineralized and is sodium sulphate water type.

Geologic cross-section alignments are shown on Figure 4a and cross-sections through different portions of the facility are presented in Figures 4b to 4e. Complete borehole logs are presented in Appendix C.

4.4 Groundwater Monitoring Network

There are 52 existing monitoring wells at the facility. All 52 wells were monitored in June 2018, however 15MW35C had insufficient water after being purged and did not recover in time to obtain a groundwater sample. The locations of the monitoring wells are shown on Figure 3.

Table B presents each well and corresponding hydro-stratigraphic unit.

Table B: Monitoring well Hydro-Stratigraphic Units

Wells	Hydro-stratigraphic Unit
MW9*, MW10, MW18B, MW19B, MW20B, MW21B, MW22B, MW24B*, MW29B, MW30B, MW31B, MW32B, MW33B and 15MW34B	Surficial Materials
MW1C, MW5A*, MW8B, MW11, MW12A, MW14*, MW23B, MW25B, MW26B, MW27B, MW28B, MW29A, MW30A, MW31A, MW33A and 15MW35B*	Upper Sandstone
MW1B, MW5B*, MW8A, MW12B, MW18A, MW19A, MW20A, MW21A, MW22A, MW23A, MW24A*, MW25A, MW26A, MW27A, MW28A, MW32A, 15MW34A*, 15MW35A and 15MW36A	Clay Shale
15MW35-Deep and 15MW36-Deep	Lower Bedrock

*Decommissioned in 2018

Monitoring wells MW5A, MW5B, MW9, MW14, MW24A, MW24B, 15MW34A, and 15MW34B were decommissioned by Tetra Tech after the groundwater monitoring program took place to allow for the construction of Cell 4. Currently, there are 44 groundwater monitoring wells in the network. Decommissioning of these wells was conducted as per the procedures outlined in the Alberta *Water Act* (Alberta, 1998).

5.0 FIELD WORK METHODS

5.1 Safety

Tetra Tech contacted Clean Harbors prior to starting fieldwork to coordinate field activities. A Tetra Tech safe work form (SWF) that identified hazards on site, and associated hazard controls was completed before beginning the fieldwork. Tetra Tech personnel reviewed and signed the SWF before starting work each day.

5.2 Groundwater Monitoring and Sampling

Tetra Tech personnel followed environmental industry accepted practices to ensure that representative groundwater samples were obtained for analysis. Monitoring of the monitoring well network was conducted on June 19, and sampling on June 19 and 26, 2018. Monitoring and sampling involved the following field activities and data collection process:

- Recorded static groundwater levels in each well using an interface probe;
- Purged water from each monitoring well by removing three well volumes, or until nearly dry;
- Recorded volume and description of the groundwater purged;
- Recorded field parameters including electrical conductivity (EC), pH, and temperature using a multi meter probe;
- Allowed wells to recover groundwater levels to sufficient levels in order to obtain representative samples; and
- Collected groundwater samples using dedicated rigid polyvinyl chloride (PVC) bailers or Waterra tubing with a foot valve. Deep monitoring wells 15MW35-Deep and 15MW36-Deep were sampled using Hydrasleeves™.

Groundwater samples were collected in laboratory-supplied containers, stored in coolers with ice to keep sample temperature below 10°C throughout the fieldwork, and submitted to Maxxam Analytics (Maxxam) in Edmonton, Alberta under chain-of-custody (COC).

A total of 58 samples were submitted:

- Fifty-one standard samples from all monitoring wells with sufficient groundwater to sample;
- Five duplicate sets of samples from [MW32A (18DUP01), MW29A (18DUP02), MW8A (18DUP03), MW21B (18DUP04), and MW14 (18DUP05)];
- One Trip Blank; and
- One Field Blank.

Samples were analyzed for the following parameters as required by the Approval:

- Major ions (routine), including pH, EC, and nitrate and nitrite;
- Trace metals (dissolved);
- Nutrients (total Kjeldahl nitrogen [TKN] and ammonia-N);
- Chemical oxygen demand (COD);
- Dissolved organic carbon (DOC);
- Benzene, toluene, ethylbenzene and xylenes (BTEX) and petroleum hydrocarbon (PHC) fractions F1 and F2;
- Total phenols, and
- Volatile Organic Carbons (VOCs).

In previous years, monitoring wells MW25A, MW25B, MW26B, and MW27B were analyzed for polycyclic aromatic hydrocarbon (PAH) compounds. No PAH compound has been detected since 2015, and therefore, analysis for PAH compounds were removed from the analytical program in the 2018 revised GWP.

5.3 Groundwater Monitoring Well Decommissioning

Monitoring wells MW9, MW14, MW5A, MW5B, MW24A, MW24B, 15MW34A, and 15MW34B were decommissioned after the 2018 groundwater monitoring program was completed as the wells conflicted with the construction activities related to Cell 4. Tetra Tech decommissioned the monitoring wells following the Alberta *Water Act* (Alberta, 205/1998) requirements, which included:

- Removing the metal well casing and PVC pipe from the ground;
- Backfilling the borehole with bentonite to approximately 0.5 m below ground; and
- Filling the remaining 0.5 m to ground surface with bentonite and native material.

6.0 RESULTS

The laboratory analytical schedule for groundwater samples collected in 2018 is provided in Table 1. Table 2 shows the dates the monitoring wells were installed and the hydro-stratigraphic units of the well groupings. Tables 3a to 3d summarize the water levels for 2018 by hydro-stratigraphic group. Tables 4a to 4d summarize the laboratory analytical results from 2014 to 2018. Groundwater chemistry is compared to the Tier 1 Guidelines for fine-grained soils under agricultural land use.

The following Section 6.1 and Section 6.2 provides historical and 2018 results of the physical groundwater flow conditions and the groundwater chemistry results, respectively.

6.1 Groundwater Flow Conditions

The 2018 groundwater elevations in each of the 52 monitoring wells were compared to historic groundwater elevations from April 1991 to June 2017. The wells were resurveyed in 2015 and historic groundwater elevations were adjusted to the 2015 survey data.

The lithology beneath the site is divided in four hydro-stratigrahic units; surficial material, upper sandstone, clay shale, and lower bedrock. The hydrographs based on the groundwater elevations measured in the monitoring wells installed in the surficial material, upper sandstone, clay shale, and lower bedrock units are shown on Figures 5a through 5g. The groundwater elevations measured in 2018 are generally consistent with historical groundwater elevations with the following observed visual trends:

- Surficial Material – Generally, groundwater elevations were between 0.2 to 0.5 m lower in 2018 compared to 2017. An exception to this was at monitoring well MW29B which shows an increasing trend.
- Upper Sandstone – Generally, groundwater elevations were similar to historical ranges. Exceptions to this were MW29A, MW30A, and 15MW35B showing increasing trends in 2018, and MW12A showing a decreasing trend.
- Clay shale – Generally, groundwater elevations were similar to historical ranges with one exception, MW21A, showing an increasing trend.
- Lower Bedrock – Generally, groundwater elevations were similar to historical ranges.

Groundwater elevations in monitoring wells installed in 2015 (15MW34A, 15MW34B, 15MW35A, 15MW35B, 15MW36A, and 15MW36-Deep) showed recovery to static levels from the initial installation in 2015 to 2016, and then generally stable levels from 2016 to 2018.

Groundwater elevations measured during the 2018 monitoring event were contoured using Surfer Mapping System Version 15. Contours were created by grouping wells within the same water bearing units, and interpolating groundwater elevation data between wells. Through analysis of the contour maps by using integrated software tools, an estimate of flow direction was determined. Professional judgement was applied to ensure that the information presented in the figures is reasonably applicable given site history and hydrogeological conditions.

Figures 6a through 6d show groundwater flow directions in four geologic units beneath the site including surficial material, upper sandstone, clay shale, and lower bedrock. The contours on each of these maps were created using wells screened across a similar unit, within a general depth range. Monitoring wells, which are screened across multiple units were not used to create these contour maps. The 2018 groundwater flow patterns in all units beneath the site were similar to 2017 patterns and are discussed below.

- Figure 6a shows groundwater elevation contour map for the clay till (surficial) unit. The screen depths range from 4.2 mbgl to 5.8 mbgl. Groundwater in this unit flows to the northeast. It is likely that groundwater flow through this unit is discontinuous across the facility due to the depth of the landfill cell and the presence of above and below ground infrastructure.
- Figure 6b shows groundwater elevation contour map for the upper sandstone unit. This unit is likely laterally continuous in wells across the facility. Screen depths in this unit range from 4.5 mbgl to 13.9 mbgl. Groundwater in this unit appears to be split through the centre of the facility. Groundwater flows to the southeast, northeast and west in the eastern half of the facility, to the northwest and southwest in the western half of the facility, with little to no hydraulic gradient under Cell 3C. Changes in groundwater flow direction compared to 2017 have been observed and could be due to greater groundwater recharge in the vicinity of MW29A and MW30A, indicating that the groundwater flow conditions and recharge may be shifting as construction activities progress. The groundwater flow direction will be confirmed once construction activities are completed and groundwater levels have stabilized.

- Figure 6c shows groundwater elevation contour map for the clay shale unit. This material is laterally continuous in wells across the facility. Screen depths range from 9.4 mbgl to 10.1 mbgl. The groundwater flow direction in this zone is generally to the east towards MW32A. Groundwater elevation data for this unit is limited for the east portion of the facility with only one monitoring well screened within this unit. On the west side of the facility, groundwater flow is to the southwest in the southwestern corner and northwest in the northwestern corner of the facility. Overall the groundwater flow direction in this unit is consistent with historical flow directions.
- Figure 6d shows deep groundwater elevation contour map, based on groundwater elevations monitored in four monitoring wells installed in the Belly River Formation. Additional data from two wells (16MW09A and 16MW11A), which are installed in the lateral expansion area to the north (Tetra Tech, 2016) were used. Well depths in this zone range from 38.8 to 42.4 mbgl. The groundwater flow direction in this zone is interpreted to be towards the northeast and is overall in agreement with regional groundwater flow.

From the 2018 groundwater elevations, and interpreted groundwater flow directions, the southwest area of the facility is considered to be generally up-gradient. Therefore, nested monitoring wells 15MW35A/B/C/Deep can be considered up-gradient monitoring wells.

Calculated vertical and horizontal hydraulic gradients based on 2018 groundwater elevations are reported in Tables C and D below, respectively.

Table C: Vertical Hydraulic Gradients

Wells	Vertical Groundwater Flow Direction
MW1B/MW1C, MW5A/MW5B, MW18A/MW18B, MW20A/MW20B, MW21A/MW21B, MW22A/MW22B, MW24A/MW24B, MW26A/MW26B, MW31A/MW31B, MW33A/MW33B, MW34A/MW34B, MW35A/MW35B, MW36-Deep/MW36A	Downward
MW12A/MW12B, MW19A/MW19B, MW23A/MW23B, MW25A/MW25B, MW27A/MW27B, MW30A/MW30B, MW35-Deep/MW35A	Upward

No vertical gradient: MW28A/MW28B, MW8A/MW8B, MW29A/MW29B, MW32A/MW32B.

Table D: Horizontal Hydraulic Gradients

Hydro-stratigraphic Unit	Gradient (m/m)
Surficial Material	0.001 to 0.008
Upper Sandstone	0.001 to 0.030
Clay Shale	0.0001 to 0.020
Lower Bedrock	0.002

6.2 Groundwater Chemistry

Parameters with concentrations greater than the Tier 1 Guidelines or outside of the guideline range are shaded on Tables 4a to 4c. Laboratory certificates of analysis are presented in Appendix D. Historical chemistry results are contained in Appendix E. Concentration trend graphs are provided in Appendix F.

The three nested background/upgradient monitoring wells 15MW35A/B/Deep generally have concentrations of sulphate around 3,500 mg/L in the upper sandstone unit and concentrations around 20 to 40 mg/L in the deeper

units. Chloride concentrations in the background wells increase with depth, the upper sandstone chloride concentrations are around 7 mg/L, the clay shale around 40 mg/L and deeper bedrock around 1,400 mg/L. These chloride concentrations are interpreted to be naturally occurring.

As with previous years, groundwater data collected in 2018 from the site overall shows a moderate to high degree of mineralization, likely caused by concentrations of sodium, sulphate, and TDS.

The parameters exceeding the Tier 1 Guidelines and other key parameters are discussed in the following Table E.

Table E: 2018 Analytical Results Summary for Select Parameters

Parameter	Tier 1 Guideline	2018 Measured Concentrations	Wells greater than Tier 1 Guideline Value in 2018	Comments
Sodium Appendix F1	-	350 – 4,600 mg/L	-	▪ Sodium concentrations have generally remained within historical ranges, no notable trends are observed with the exception of MW24A, sodium concentrations have increased in this well since 2016. The 2018 sodium concentration in MW24A was 4,600 mg/L.
Chloride Appendix F2	120 mg/L	< 1.0 – 1,400.0 mg/L	MW32B, 15MW35-Deep, and 15MW36-Deep	▪ All monitoring wells have chloride concentrations less than the referenced guideline, except for MW32B, MW35-Deep, and MW36-Deep. ▪ Chloride concentrations have remained within historical ranges at most wells. ▪ Increasing trends are observed in monitoring wells MW8B, MW11, and MW27B. Concentrations remain below the guideline at this time. ▪ Chloride concentrations in MW32B show an increasing trend and were greater than the guideline for the first time in 2018.
Nitrate (N) Appendix F3	3.0 mg/L	<0.089 – 62.0 mg/L	MW1B, MW5B, MW20A, MW22A, MW24A, MW26A, MW27B, MW31A, and 15MW35B	▪ Trends show monitoring well MW22A has been consistently exceeding the guideline since 2012 and spiked to 70 mg/L in 2017; however, concentrations returned to 14 mg/L in 2018. ▪ MW01B, MW01C, and MW20A have been less than the guideline since 2008; however, concentrations increased to greater than the guideline in 2017 and decreased to less than the guideline in 2018. ▪ Nitrate concentrations appear to have spiked in multiple wells in 2017. Concentrations have decreased to pre-2017 ranges in 2018.
Sulphate Appendix F4	128 – 429 mg/L (guideline is hardness dependent)	<2.1 to 6,400 mg/L	All wells except MW1B, MW8A, MW18A, MW21A, MW23A, MW25A, MW30A, MW31A MW33A.MW34A, 15MW35A, 15MW35-DEEP, 15MW36A, and 15MW36-DEEP.	▪ Sulphate concentrations have remained within historical ranges at most wells. ▪ An increasing concentration trend is present in monitoring well MW24A and MW14, with the highest concentration to date at both wells measured in 2018. Both wells were decommissioned in 2018 due to Cell 4 construction.
TDS, Appendix F5	3,000 mg/L	910 to 11,000 mg/L	MW1C, MW5A, MW8B, MW9, MW10, MW11, MW12A, MW12B, MW14, MW19B, MW19A, MW20B, MW22A, MW22B, MW23B, MW24B, MW25B, MW26B, MW27B, MW29B, MW32A, MW33B and 15MW35B,	▪ TDS concentrations have remained within historical ranges at most monitoring wells. ▪ There is an increasing concentration trend in monitoring wells MW14 and MW24A, with the highest concentration measured to date in 2018. The increasing trend observed in TDS is likely caused by increasing sulphate concentrations.
pH (Laboratory), Appendix F6	6.5 – 8.5	7.82 – 8.57	MW23A, MW25A, MW33A and 15MW36A	▪ pH values have remained within historical ranges, no notable trends are observed., Wells along the southern boundary, in the clay shale unit have an overall higher average pH levels, near the upper guideline limit of 8.5. Field pH values overall show a similar trend.
pH (Field), Appendix F7		6.9 – 9.6	MW12A, MW5A, MW18A, MW24B, MW23A, MW32A, MW33A, MW34A, and MW36A	
Aluminum	0.007 – 0.050 (Guideline value based on pH)	<0.003 – 0.55 mg/L	MW31A, MW32B, MW33A, MW33B, and 15MW35A	▪ Aluminum has been greater than the guideline in monitoring well MW31A, 15MW35A since monitoring began in 2015.
Iron (greater than guideline), Appendix F8	0.3 mg/L	0.069 – 0.28 mg/L	MW-35-Deep and MW36-Deep	▪ Iron concentrations have generally remained within historical ranges. ▪ Some isolated spikes in iron concentrations have been observed in the past; however, no increasing iron concentration trends are observed. ▪ In 2018, due to high sediment content, some samples were diluted to bring the iron concentrations of parameters within the calibrated range while completing the analysis. The result is that some groundwater samples have iron detection limits greater than guideline. Appendix D contains specific details under General Comments.
Iron (detection limit greater than guideline)		<0.6 mg/L	MW1C, MW5A, MW8B, MW9, MW11, MW12A, MW12B, MW19A, MW19B, MW22A, MW22B, MW23B, MW24A, MW24B, MW25B, MW26B, MW27B, MW28B, MW29B, MW32A, MW32B, and 15MW35B	
Manganese, Appendix F9	No Guideline	<0.004 – 0.57 mg/L	-	▪ Manganese concentrations across the facility appear to be generally stable. ▪ Manganese concentrations in monitoring wells MW19A, MW24A, and MW29B have slight increasing trends. ▪ Monitoring wells MW14 and MW32B show a slight decreasing trend.
Uranium	0.015 mg/L	0.00013 – 0.03 mg/L	MW11, MW12B, MW24A, and MW24B	▪ No notable increasing concentration trends have been observed

Concentrations of benzene were less than Tier 1 Guideline at all wells, however, monitoring well MW35A had a detectible concentration of 0.0030 mg/L (Tier 1 Guideline is 0.088 mg/L). Toluene, ethylbenzene, xylene, and PHC fractions F1 and F2 were not detected, and were less than Tier 1 Guidelines in all wells. There are no Tier 1 Guidelines for ammonia, TKN, COD, or DOC. The table below summarizes the results of these parameters in 2018. No notable increasing trends have been observed for any of the parameters listed below, except for at monitoring well MW24A. DOC concentrations at this well increased since 2016, however this well was decommissioned in 2018.

Table F: Ammonia-N, TKN, COD and DOC Summary

Parameter	Maximum Concentration (mg/L)	Monitoring Well	Minimum Concentration (mg/L)	Monitoring Well	Average in All Wells (mg/L)
Ammonia, Appendix F10	2.8	MW32A	< 0.015	MW26A	0.57
TKN, Appendix F11	7.0	MW35A	0.26	MW22B	1.5
COD, Appendix F12	310.0	MW31A	22.0	MW29B	64
DOC, Appendix F13	71.0	MW24A	5.4	MW20A	14.6

6.3 Quality Assurance and Quality Control

To evaluate field sampling reproducibility, duplicate groundwater samples were collected during the sampling event in 2018. Duplicates were collected from MW22A (DUP01), MW29A (DUP02), MW8B (DUP03), MW21B (DUP04), and MW14 (DUP05) and submitted for laboratory analysis for the same suite of parameters as the parent samples.

The field sampling and laboratory testing reproducibility of each sample-duplicate pair was evaluated using the relative percent difference (RPD) method, involving calculation of RPD when both sample-duplicate concentrations were greater than, or equal to, five times the laboratory method detection limit (MDL), as shown in Equation 1.

Equation 1:

$$\%RPD = \left(\frac{|Sample - Duplicate|}{\overline{X}} \right) * 100$$

Where $\overline{X}$ is the calculated average concentration of the parent sample and the corresponding duplicate.

Groundwater quality parameters were considered as having passed the quality assurance and quality control (QA/QC) reproducibility procedure if the RPD was less than or equal to 20%, indicating a close correlation between the sample-duplicate pair.

The RPD values were not calculated if one or both of the sample-duplicate concentrations were between the MDL and five times the MDL. In these cases, groundwater quality parameters were still considered as having passed the QA/QC reproducibility procedure if the sample-duplicate concentration difference was less than one MDL value.

The RPD calculations are summarized in Table 6. These results indicate that all the parameters had RPD less than 20% except the following listed in Table G:

Table G: Parameters with RPD greater than 20%

MW32A and 18DUP01	MW8A and 18DUP03
Total Kjeldahl Nitrogen (TKN) = 32% Copper = 153 %	Carbonate = 57 %

The relatively low percent of RPD values for the majority of samples allow the 2018 results to be included into the historical database for trend comparison.

6.4 Monitoring Dell Decommissioning

Tetra Tech decommissioned eight monitoring wells, the following table outlines the specific decommissioning procedure at each well, and the depth and unit where the well was installed.

Table H: Decommissioned Monitoring Wells

Monitoring Well	Decommissioning Procedure	Depth of Well (mbg)	Monitoring Unit
MW9	Well pipe broken at depth of 30 cm below ground, well casing filled with bentonite chips	4.93	Clay till / sandstone
MW5A	Well pulled out intact, hole filled with bentonite chips	6.74	Clay shale / sandstone
MW5B	Well pulled out intact, hole filled with bentonite chips	9.69	Clay shale
MW14	Well pulled out intact, hole sluffed in at 60 cm below ground, hole filled with bentonite chips	6.14	Clay till / sandstone
MW24A	Well pulled out intact, hole filled with bentonite chips	9.80	Sandstone / siltstone
MW24B	Well pulled out intact, hole filled with bentonite chips	5.38	Clay till/clay shale
MW34A	Well pulled out intact, hole filled with bentonite chips	11.94	Clay shale
MW34B	Well pulled out intact, hole filled with bentonite chips	4.80	Clay

6.5 Discussion

Groundwater quality at the background monitoring well monitoring wells 15MW35A, 15MW35B, and 15MW35-Deep have a high degree of natural mineralization producing elevated concentrations for sodium, sulphate, and TDS, which are greater than the Tier 1 Guidelines. All wells in the monitoring network exhibit evidence of groundwater mineralization (sodium, sulphate, TDS, and uranium). This is consistent with the chemical quality of shallow groundwater in the area (Stein et al., 2005), and the background wells.

Sulphate and TDS concentrations are greater than Tier 1 Guidelines at many of the monitoring wells on site. Elevated concentrations of TDS are primarily caused by the elevated sulphate concentrations. Sulphate is often naturally occurring in groundwater, and elevated concentrations are not suspected to be caused by on site activities.

Chloride concentrations have overall remained stable at the site since monitoring began in 1996. Between 2006 and 2012, monitoring wells MW9, MW5B, and MW24B showed increasing trends; however, they have since decreased to historical levels. Since 2014, monitoring wells MW08B, MW9, MW10, MW11, MW18B, and MW27B have shown slight increasing trends (Appendix F2). Monitoring wells MW08B, MW9, MW10, and MW11 are located near the northeast corner of the site (Figure 3) and increasing trends in chloride concentrations could be due to the application of road salts in the area. Monitoring well MW18B is located on the northwestern side of the site along the west border. Monitoring well MW27B is located near the southern border of the site.

Sodium, sulphate, TDS, and DOC concentrations in monitoring well MW24A show an increasing trend since 2016. Ammonia and TKN also show similar increasing trends. Monitoring well MW24A is in the centre of the facility, at the intersection of Cells 1, 3B, 3C, and proposed Cell 4 (Figure 3). Monitoring well MW24A is the deeper of two nested wells, screened from 8.30 to 9.80 while monitoring well MW24B is screened from 2.38 to 5.38 mbg. Monitoring well MW24B does not show increasing concentration trends in these parameters. Both these wells were decommissioned in 2018 for the proposed Cell 4 construction.

Since groundwater monitoring and sampling at this facility has been conducted, nitrate concentrations at MW22A, which is located south of Cells 3A and 3B, have varied from less than to greater than the referenced guideline concentration of 10 mg/L (Appendix F3). In 2017, the nitrate concentration at MW22A increased from 17.0 mg/L to 70.0 mg/L and in 2018 decreased to within historical range. The elevated nitrate concentrations detected at MW22A may be associated with land use in the area (i.e., agriculture, livestock, etc.) or it could be related to current livestock use immediately west of the facility. MW22A is located hydraulically down-gradient of Cells 3A and 3B. The sudden increase in nitrate concentration at MW22A in 2017 is interpreted to be anomalous. All wells monitored in 2017 showed increased nitrate concentrations which have decreased again to pre-2017 concentrations in 2018. The trends observed in nitrate concentrations across the site should be reconfirmed in 2019.

Historically, pH values have been slightly greater or marginally less than the upper guideline value at the facility. It is likely that pH is naturally elevated in the area.

The dissolved iron concentrations at monitoring well MW12B, MW33A and MW35A were greater than the referenced guideline concentration of 0.3 mg/L in 2018. Iron concentrations at multiple monitoring wells (Table D) were reported having detection limits greater than the guideline value.

Dissolved manganese has only been analyzed for the past four sampling events; however, some visual trends are apparent. Manganese concentrations in MW19A, MW24A, and MW29B show a slight increasing trend, and MW14 and MW32B show a slight decreasing trend.

Dissolved iron and manganese concentrations appear to be related to naturally occurring anoxic subsurface conditions. The changes in concentrations over time may be an indicator to redox reactions occurring in the

groundwater and concentrations should continue to be assessed. All hydrocarbon parameter analysis results to date have been less than detection or less than guideline across the site.

Uranium is reported as being in exceedance of the Guideline (0.015 mg/L) at wells MW11, MW12B, MW24A, MW24B. Uranium is considered to be naturally occurring in surface waters, and groundwater around Alberta within glacial till deposits (CCME, 2007).

Due to decommissioning activities that took place for the construction of Cell 4, there is now a gap in the monitoring well network at the facility across the north west side of the site boundary. Tetra Tech recommends that the wells be replaced once construction activities have been completed, when there is lower risk that newly installed wells would be damaged by site construction activities. Tetra Tech recommends that two nested pairs be installed between the existing facility and the expansion to the north. The exact location of the nested pairs can be determined once construction is complete.

7.0 CONCLUSIONS

The 2018 groundwater monitoring report findings are summarized as follows:

- The interpreted groundwater flow in surficial materials, clay shale, and deep groundwater are relatively un-changed compared to previous years. The interpreted groundwater flow direction in the upper sandstone appears to have changed in 2018, indicating that the groundwater flow conditions may be shifting as construction activities progress. Ongoing annual monitoring will to confirm if this is the case.
- The natural groundwater type is sodium sulphate and natural mineralization accounts for high concentrations of sodium, sulphate, and TDS concentrations in the groundwater across the facility.
- In 2018, dissolved metal and routine parameters were generally within the historical concentration ranges.
- Increasing concentration trends in sodium, sulphate, and other parameters can be observed at monitoring well MW24A (decommissioned).
- Overall, there were no indications of adverse groundwater impacts resulting from facility activities.
- Eight monitoring wells were decommissioned as part of the proposed Cell 4 construction activities after the 2018 groundwater monitoring program was completed.

8.0 RECOMMEDATIONS

Based on the results from the work conducted in 2018, the following is recommended for Clean Harbors' consideration:

- The 2019 groundwater monitoring and sampling fieldwork should be conducted in late May or early June to minimize the number of frozen wells and maximize groundwater availability for sampling. The parameters that were analyzed in 2018 should be continued to be analyzed in 2019.
- Tetra Tech recommends installing two nested pairs (four wells) between the existing facility and the expansion once construction activities related to Cell 4 are complete.

9.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
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TABLES

Table 1: 2018 Groundwater Analytical Schedule

Sample	Laboratory Analytical Parameters
52 Groundwater Monitoring Wells 5 Field Duplicates 1 Trip Blank 1 Field Blank	pH (field and laboratory)
	Electrical Conductivity (field and laboratory)
	Routine (major ions) - total dissolved solids (TDS), alkalinity, hardness (as CaCO3), chloride, calcium, magnesium, sodium, potassium, sulphate, nitrate-N, and nitrite-N
	Dissolved Metals
	Total Kjeldahl Nitrogen (TKN)
	Ammonia-N
	Chemical Oxygen Demand (COD)
	Dissolved Organic Carbon (DOC)
	Benzene, Toluene, Ethylbenzene, Xylenes (BTEX)
	Petroleum Hydrocarbon (PHC) Fractions F1 and F2
	Total Phenols
	Volatile Organic Compounds (VOCs) - methylene chloride, vinyl chloride, trichloroethylene (TCE), and tetrachloroethylene (PCE)

Table 2: Monitoring Well Details

Groundwater Monitoring Zone	Well Identification	Date Installed	Elevations		Measured Stick-up (m)	Measured Well Depth			Screened Interval				Sand Pack Interval		Lithology Screened
			Surface (m AMSL)	Top of Pipe (m AMSL)		(m BTOP)	(mbgl)	(m AMSL)	Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)	Top Screen Elevation (m AMSL)	Bottom Screen Elevation (m AMSL)	Top Depth (mbgl)	Bottom Depth (mbgl)	
Surficial Materials 15 Wells	MW9 Decommissioned July 2018	19-Feb-1991	686.97	687.47	0.42	5.35	4.93	682.12	3.43	4.93	683.55	682.05	3.13	4.93	clay till / sandstone
	MW10	19-Feb-1991	687.44	687.96	0.38	3.87	3.49	684.09	1.99	3.49	685.45	683.95	1.69	3.49	clay till / clay shale / sandstone
	MW18B	30-Sep-1996	687.12	687.85	0.74	6.01	5.27	681.85	2.27	5.27	684.84	681.84	2.10	5.27	clay till / clay shale / sandstone
	MW19B	1-Oct-1996	686.65	687.14	0.50	5.33	4.84	681.81	1.84	4.84	684.81	681.81	1.64	4.84	clay shale / sandstone
	MW20B	1-Oct-1996	688.92	689.65	0.71	5.11	4.40	684.55	1.40	4.40	687.53	684.53	1.20	4.40	clay till / clay shale / sandstone
	MW21B	1-Oct-1998	687.54	688.55	0.97	6.08	5.11	682.47	2.11	5.11	685.43	682.43	1.81	5.11	clay till / sandstone / siltstone
	MW22B	1-Oct-1998	687.81	688.70	0.87	6.09	5.22	682.61	2.22	5.22	685.59	682.59	2.22	5.22	clay till / sandstone / clay shale
	MW24B Decommissioned July 2018	13-Aug-2004	688.86	689.63	0.70	6.07	5.38	683.56	2.38	5.38	686.49	683.49	2.18	5.38	clay till/clay shale
	MW29B	8-Oct-2014	688.13	688.93	0.78	5.45	4.67	683.47	3.17	4.67	684.96	683.46	2.87	4.67	sand
	MW30B	8-Oct-2014	688.52	689.31	0.75	5.45	4.70	683.86	3.20	4.70	685.32	683.82	2.90	4.70	clay till
	MW31B	8-Oct-2014	686.40	687.17	0.73	3.92	3.19	683.25	1.69	3.19	684.71	683.21	1.39	3.19	clay till / sandstone
	MW32B	8-Oct-2014	686.54	687.23	0.68	4.88	4.20	682.35	2.70	4.20	683.84	682.34	2.40	4.50	clay till / sand
	MW33B	6-Oct-2014	686.94	687.87	0.90	5.51	4.61	682.36	3.11	4.61	683.83	682.33	2.81	4.61	sand / sandstone
	15MW34B Decommissioned July 2018	21-Jul-2015	687.97	688.96	0.99	5.79	4.80	683.17	3.20	4.80	684.77	683.17	2.80	4.80	clay
	15MW35C	28-Jul-2015	688.53	689.50	0.94	4.19	3.25	685.31	2.00	3.25	686.53	685.29	1.70	3.25	clay till
Upper Sandstone 16 Wells	MW1C	14-Jun-2011	687.64	688.61	0.94	6.45	5.51	682.16	4.01	5.51	683.64	682.14	3.70	5.51	clay shale/ sandstone
	MW5A Decommissioned July 2018	19-Feb-1991	688.28	689.17	0.90	7.64	6.74	681.53	5.24	6.74	683.04	681.54	4.74	6.74	clay shale / sandstone
	MW8B	4-Oct-2012	686.82	687.69	0.85	5.418	4.57	682.27	3.07	4.57	683.76	682.26	1.8	4.57	clay / sand
	MW11	19-Feb-1991	687.95	688.37	0.42	6.25	5.83	682.12	4.33	5.83	683.61	682.11	4.03	5.83	clay shale / sandstone
	MW12A	19-Feb-1991	686.62	687.13	0.39	6.17	5.78	680.96	4.28	5.78	682.34	680.84	3.98	5.78	clay till / clay shale / sandstone
	MW14 Decommissioned July 2018	22-Jul-1992	686.52	687.56	0.94	7.08	6.14	680.48	4.64	6.14	681.88	680.38	4.34	6.14	clay till / sandstone
	MW23B	1-Oct-1998	686.48	687.38	0.86	5.35	4.50	682.03	1.50	4.50	684.98	681.98	1.30	4.50	sand / sandstone
	MW25B	13-Aug-2004	686.91	687.48	0.59	6.10	5.51	681.39	2.51	5.51	684.41	681.41	2.31	5.51	sandstone / clay shale
	MW26B	13-Aug-2004	687.14	687.63	0.49	6.04	5.56	681.58	2.56	5.56	684.58	681.58	2.26	5.56	clay shale / sandstone / siltstone
	MW27B	1-Oct-2007	686.50	687.15	0.63	6.61	5.98	680.54	2.98	5.98	683.52	680.52	2.68	5.98	sand / siltstone
	MW28B	4-Oct-2012	687.44	687.97	0.52	7.08	6.57	680.89	3.57	6.57	683.87	680.87	3.27	6.57	sand / siltstone
	MW29A	6-Oct-2014	688.06	688.89	0.82	10.24	9.42	678.64	7.92	9.42	680.13	678.63	7.42	9.42	sandstone
	MW30A	8-Oct-2014	688.57	689.37	0.76	8.91	8.15	680.46	6.15	8.15	682.42	680.42	5.85	9.00	sandstone
	MW31A	8-Oct-2014	686.38	687.12	0.69	9.75	9.07	677.37	7.07	9.07	679.31	677.31	6.77	9.07	sandstone
	MW33A	6-Oct-2014	686.92	687.93	0.92	14.12	13.20	673.82	11.20	13.20	675.72	673.72	10.90	13.20	sandstone
	15MW35B	28-Jul-2015	688.47	689.40	0.81	7.98	7.17	681.41	5.50	7.17	682.97	681.30	5.20	7.17	sandstone

Table 2: Monitoring Well Details

Groundwater Monitoring Zone	Well Identification	Date Installed	Elevations		Measured Stick-up (m)	Measured Well Depth			Screened Interval				Sand Pack Interval		Lithology Screened
			Surface (m AMSL)	Top of Pipe (m AMSL)		(m BTOP)	(mbgl)	(m AMSL)	Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)	Top Screen Elevation (m AMSL)	Bottom Screen Elevation (m AMSL)	Top Depth (mbgl)	Bottom Depth (mbgl)	
Clay Shale 19 Wells	MW1B	30-Sep-1996	687.82	688.70	0.87	10.72	9.86	677.98	8.36	9.86	679.46	677.96	8.00	9.86	clay shale
	MW5B Decommissioned July 2018	23-Sep-1996	688.25	689.10	0.83	10.52	9.69	678.58	8.19	9.69	680.07	678.57	7.90	9.69	clay shale
	MW8A	4-Oct-2012	686.84	687.83	0.98	11.26	10.28	676.57	7.28	10.28	679.56	676.56	6.6	10.28	clay / sand / siltstone
	MW12B	30-Sep-1996	687.27	687.78	0.20	10.69	10.49	677.09	8.99	10.49	678.29	676.79	8.69	10.49	clay shale
	MW18A	1-Oct-1996	687.13	687.77	0.64	10.72	10.08	677.05	8.58	10.08	678.56	677.06	8.15	10.08	clay shale
	MW19A	1-Oct-1996	686.60	687.10	0.46	10.72	10.26	676.38	8.76	10.26	677.84	676.34	8.20	10.26	clay shale
	MW20A	1-Oct-1996	688.89	689.54	0.60	10.60	10.00	678.94	8.50	10.00	680.39	678.89	8.30	10.00	clay shale / sandstone
	MW21A	1-Oct-1998	687.60	688.30	0.69	10.67	9.98	677.63	8.48	9.98	679.12	677.62	8.18	9.98	clay shale / siltstone
	MW22A	1-Oct-1998	687.83	688.66	0.84	10.66	9.82	678.01	8.32	9.82	679.52	678.02	8.02	9.82	clay shale / sandstone / siltstone
	MW23A	1-Oct-1998	686.45	687.16	0.67	10.66	9.99	676.50	8.49	9.99	677.96	676.46	7.99	9.99	clay shale / sandstone / siltstone
	MW24A Decommissioned July 2018	13-Aug-2004	688.88	689.68	0.70	10.50	9.80	679.18	8.30	9.80	680.58	679.08	8.00	9.80	sandstone / siltstone
	MW25A	13-Aug-2004	686.73	687.54	0.82	10.72	9.90	676.82	8.40	9.90	678.34	676.84	7.90	9.90	clay shale
	MW26A	13-Aug-2004	687.00	687.60	0.56	10.73	10.17	676.87	8.67	10.17	678.33	676.83	8.17	10.17	clay shale
	MW27A	1-Oct-2007	686.65	687.19	0.53	10.97	10.44	676.23	8.94	10.44	677.72	676.22	9.24	10.44	siltstone
	MW28A	4-Oct-2012	687.36	687.96	0.59	11.77	11.18	676.19	9.68	11.18	677.67	676.17	9.38	11.18	siltstone
	MW32A	8-Oct-2014	686.53	687.19	0.65	10.12	9.47	677.08	7.47	9.47	679.06	677.06	7.17	9.47	clay
	15MW34A Decommissioned July 2018	21-Jul-2015	687.98	689.02	1.05	12.98	11.94	676.04	10.20	11.94	677.78	676.04	9.80	11.94	clay shale
	15MW35A	28-Jul-2015	688.46	689.32	0.85	14.56	13.71	674.76	11.70	13.71	676.76	674.75	11.50	13.71	clay shale
	15MW36A	28-Jul-2015	687.05	687.95	0.85	15.83	14.98	672.12	12.70	14.98	674.35	672.08	12.40	14.98	clay shale
Lower Bedrock 2 Wells	15MW35-Deep	28-Jul-2015	688.43	689.32	0.85	33.44	32.59	655.88	31.00	32.59	657.43	655.85	29.70	32.59	sandstone
	15MW36-Deep	21-Jul-2015	687.03	687.79	0.74	35.38	34.64	652.41	33.60	34.64	653.43	652.39	33.30	34.64	sandstone

Notes:
Monitoring well network re-surveyed on July 30, 2015
m AMSL - metres above mean sea level
mbgl - metres below ground level
m BTOP - metres below top of pipe

Table 3a: Groundwater Monitoring Results - Surficial Materials

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW9 Decommissioned July 2018			686.97	687.47	0.42	4.93	3.43	4.93	Apr-91	2.51	2.09	684.96
									Oct-91	2.73	2.31	684.74
									Apr-92	2.26	1.84	685.21
									Oct-92	3.20	2.78	684.27
									Apr-93	3.20	2.78	684.27
									Oct-93	3.12	2.70	684.35
									Apr-94	3.54	3.12	683.93
									Oct-94	2.92	2.50	684.55
									Apr-95	2.46	2.04	685.01
									Oct-95	3.06	2.64	684.41
									Apr-96	2.74	2.32	684.73
									Oct-96	2.73	2.31	684.74
									Apr-97	2.61	2.19	684.86
									Oct-97	2.65	2.23	684.82
									Apr-98	2.84	2.42	684.63
									Oct-98	2.83	2.41	684.64
									Apr-99	2.75	2.33	684.72
									Oct-99	4.00	3.58	683.47
									Apr-00	3.45	3.03	684.02
									Oct-00	2.76	2.34	684.71
									Apr-01	3.55	3.13	683.92
									Oct-01	3.10	2.68	684.37
									Apr-02	3.80	3.38	683.67
									Oct-02	3.24	2.82	684.23
									Apr-03	3.56	3.14	683.91
									Oct-03	2.87	2.45	684.60
									Apr-04	3.28	2.86	684.19
									Oct-04	2.00	1.58	685.47
									Apr-05	2.99	2.57	684.48
									Oct-05	2.64	2.22	684.83
									Apr-06	3.59	3.17	683.88
									Oct-06	2.54	2.12	684.93
									Apr-07	2.47	2.05	685.00
									Oct-07	2.41	1.99	685.06
									May-08	2.41	1.99	685.06
									May-09	2.76	2.34	684.71
									Jun-11	2.76	2.34	684.71
									May-12	2.76	2.34	684.71
									Jun-13	1.83	1.41	685.64
									May-14	2.33	1.91	685.14
									May-15	2.12	1.70	685.35
									May-16	1.92	1.50	685.55
									May-17	1.45	1.03	686.02
									Jun-18	2.28	1.86	685.19
MW10			687.44	687.96	0.38	3.49	1.99	3.49	Apr-91	2.56	2.18	685.40
									Oct-91	3.04	2.66	684.92
									Apr-92	Dry	-	-
									Oct-92	Dry	-	-
									Apr-93	Dry	-	-
									Oct-93	Dry	-	-
									Apr-94	Dry	-	-
									Oct-94	2.25	1.87	685.71
									Apr-95	Dry	-	-
									Oct-95	2.30	1.92	685.66
									Apr-96	Dry	-	-
									Oct-96	2.07	1.69	685.89
									Apr-97	1.80	1.42	686.16
									Oct-97	1.90	1.52	686.06
									Apr-98	2.37	1.99	685.59
									Oct-98	2.16	1.78	685.80
									Apr-99	2.05	1.67	685.91
									Oct-99	2.25	1.87	685.71
									Apr-00	Dry	-	-
									Oct-00	2.25	1.87	685.71
									Apr-01	Dry	-	-
									Oct-01	2.33	1.95	685.63
									Apr-02	Dry	-	-
									Oct-02	2.48	2.10	685.48
									Apr-03	Dry	-	-
									Oct-03	2.22	1.84	685.74
									Apr-04	2.58	2.20	685.38
									Oct-04	2.13	1.75	685.82
									Apr-05	2.01	1.63	685.95
									Oct-05	1.76	1.38	686.20
									Apr-06	2.33	1.95	685.63
									Oct-06	1.98	1.60	685.98
									Apr-07	1.63	1.25	686.32
									Oct-07	1.78	1.40	686.18
									May-08	1.78	1.40	686.18
									May-09	2.25	1.87	685.71
									Jun-10	2.29	1.91	685.67
									Jun-11	2.25	1.87	685.71
									May-12	2.25	1.87	685.71
									Jun-13	1.85	1.47	686.11
									May-14	2.20	1.82	685.76
									May-15	1.82	1.44	686.13
									May-16	2.06	1.68	685.89
									May-17	1.31	0.93	686.64
									Jun-18	1.95	1.57	686.01

Table 3a: Groundwater Monitoring Results - Surficial Materials

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW18B			687.12	687.85	0.74	5.27	2.27	5.27	Oct-96	1.91	1.18	685.94
									Apr-97	2.60	1.87	685.25
									Oct-97	2.26	1.53	685.59
									Apr-98	2.80	2.07	685.05
									Oct-98	2.28	1.55	685.57
									Apr-99	2.50	1.77	685.35
									Oct-99	2.55	1.82	685.30
									Apr-00	2.93	2.20	684.92
									Oct-00	2.42	1.69	685.43
									Apr-01	2.96	2.23	684.89
									Oct-01	2.59	1.86	685.26
									Apr-02	3.10	2.37	684.75
									Oct-02	2.90	2.17	684.95
									Apr-03	3.36	2.63	684.49
									Oct-03	2.47	1.74	685.38
									Apr-04	2.85	2.12	685.00
									Oct-04	2.37	1.64	685.48
									Apr-05	2.68	1.95	685.17
									Oct-05	2.30	1.57	685.55
									Apr-06	2.68	1.95	685.17
									Oct-06	2.18	1.45	685.67
									Apr-07	2.55	1.82	685.3
									Oct-07	1.84	1.11	686.01
									May-08	1.84	1.11	686.01
									May-09	2.42	1.69	685.43
									Jun-10	2.46	1.72	685.40
									Jun-11	2.42	1.69	685.43
									May-12	2.42	1.69	685.43
									Jun-13	1.88	1.15	685.97
									May-14	1.83	1.09	686.03
									May-15	1.88	1.14	685.98
									May-16	2.05	1.32	685.80
									May-17	1.24	0.51	686.61
									Jun-18	1.53	0.79	686.33
MW19B			686.65	687.14	0.50

Table 3a: Groundwater Monitoring Results - Surficial Materials

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW20B			688.92	689.65	0.71	4.40	1.40	4.40	Oct-96	3.86	3.15	685.79
									Apr-97	4.32	3.61	685.33
									Oct-97	3.52	2.81	686.13
									Apr-98	4.14	3.43	685.51
									Oct-98	3.15	2.44	686.50
									Apr-99	4.09	3.38	685.56
									Oct-99	3.69	2.98	685.96
									Apr-00	4.36	3.65	685.29
									Oct-00	3.65	2.94	686.00
									Apr-01	4.39	3.68	685.26
									Oct-01	3.79	3.08	685.86
									Apr-02	4.43	3.72	685.22
									Oct-02	4.10	3.39	685.55
									Apr-03	4.67	3.96	684.98
									Oct-03	3.73	3.02	685.92
									Apr-04	4.18	3.47	685.47
									Oct-04	3.49	2.78	686.16
									Apr-05	3.88	3.17	685.77
									Oct-05	3.40	2.69	686.25
									Apr-06	4.11	3.40	685.54
									Oct-06	3.30	2.59	686.35
									Apr-07	3.48	2.77	686.17
									Oct-07	3.28	2.57	686.37
									May-08	3.28	2.57	686.37
									May-09	3.65	2.94	686.00
									Jun-10	3.99	3.28	685.66
									Jun-11	3.65	2.94	686.00
									May-12	3.65	2.94	686.00
									Jun-13	3.82	3.11	685.84
									May-14	3.66	2.95	685.99
									May-15	3.77	3.06	685.88
									May-16	3.91	3.20	685.74
									May-17	3.38	2.67	686.28
					0.64				Jun-18	3.75	3.11	685.91
MW21B			687.541	688.548	0.97	5.11	2.11	5.11	Oct-98	2.08	1.11	686.47
									Apr-99	2.88	1.91	685.67
									Oct-99	2.55	1.58	686.00
									Apr-00	3.24	2.27	685.31
									Oct-00	2.51	1.54	686.04
									Apr-01	3.20	2.23	685.35
									Oct-01	2.67	1.70	685.88
									Apr-02	3.41	2.44	685.14
									Oct-02	3.11	2.14	685.44
									Apr-03	3.58	2.61	684.97
									Oct-03	2.72	1.75	685.83
									Apr-04	3.25	2.28	685.30
									Oct-04	2.49	1.52	686.06
									Apr-05	2.93	1.96	685.62
									Oct-05	2.36	1.39	686.19
									Apr-06	3.06	2.09	685.49
									Oct-06	2.28	1.31	686.27
									Apr-07	2.52	1.55	686.03
									Oct-07	2.19	1.22	686.36
									May-08	2.19	1.22	686.36
									May-09	2.51	1.54	686.04
									Jun-10	2.84	1.87	685.71
									Jun-11	2.51	1.54	686.04
									May-12	2.51	1.54	686.04
									Jun-13	2.93	1.96	685.62
									May-14	3.01	2.04	685.54
									May-15	3.09	2.12	685.46
									May-16	3.28	2.31	685.27
									May-17	2.99	2.02	685.56
									Jun-18	2.94	1.97	685.60
MW22B			687.81	688.70	0.87	5.22	2.22	5.22	Oct-98	2.41	1.54	686.29
									Apr-99	2.99	2.12	685.71
									Oct-99	2.83	1.96	685.87
									Apr-00	3.38	2.51	685.32
									Oct-00	2.74	1.87	685.96
									Apr-01	3.34	2.47	685.36
									Oct-01	2.91	2.04	685.79
									Apr-02	3.60	2.73	685.10
									Oct-02	3.40	2.53	685.30
									Apr-03	3.74	2.87	684.96
									Oct-03	2.93	2.06	685.77
									Apr-04	3.39	2.52	685.31
									Oct-04	2.64	1.77	686.06
									Apr-05	2.99	2.12	685.71
									Oct-05	2.53	1.66	686.17
									Apr-06	3.15	2.28	685.55
									Oct-06	2.47	1.60	686.23
									Apr-07	2.52	1.65	686.18
									Oct-07	2.34	1.47	686.36
									May-08	2.34	1.47	686.36
									May-09	2.74	1.87	685.96
									Jun-10	2.58	1.71	686.12
									Jun-11	2.74	1.87	685.96
									May-12	2.74	1.87	685.96
									Jun-13	3.08	2.21	685.62
									May-14	3.14	2.27	685.56
									May-15	3.28	2.41	685.43
									May-16	3.50	2.63	685.20
									May-17	3.23	2.36	685.47
									Jun-18	3.086	2.22	685.62

Table 3a: Groundwater Monitoring Results - Surficial Materials

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW24B Decommissioned July 2018			688.86	689.63	0.70 0.63	5.38	2.38	5.38	Oct-04	3.50	2.81	686.13
									Apr-05	3.76	3.07	685.87
									Oct-05	3.33	2.64	686.30
									Apr-06	3.95	3.26	685.68
									Oct-06	3.16	2.46	686.48
									Apr-07	3.34	2.64	686.30
									Oct-07	2.88	2.18	686.76
									May-08	2.88	2.18	686.76
									May-09	3.42	2.72	686.21
									Jun-10	3.22	2.53	686.41
									Jun-11	2.47	1.77	687.16
									May-12	2.61	1.91	687.02
									Jun-13	2.85	2.16	686.78
									May-14	3.81	3.11	685.82
									May-15	2.74	2.05	686.89
									May-16	2.55	1.86	687.08
									May-17	2.49	1.80	687.14
									Jun-18	2.68	2.05	686.96
MW29B	405411	5906365	688.13	688.93	0.78	4.67	3.17	4.67	May-15	3.97	3.19	684.95
									May-16	2.83	2.05	686.10
									May-17	2.92	2.14	686.01
									Jun-18	2.23	1.45	686.70
MW30B	405485.017	5906376.113	688.52	689.31	0.75	4.70	3.20	4.70	May-15	4.41	3.66	684.90
									May-16	3.51	2.76	685.80
									May-17	3.44	2.69	685.87
									Jun-18	3.68	2.93	685.63
MW31B	405537	5906465	686.40	687.17	0.73 0.53	3.19	1.69	3.19	May-15	2.46	1.73	684.71
									May-16	2.23	1.50	684.95
									May-17	2.10	1.37	685.07
									Jun-18	2.12	1.59	685.05
MW32B	405529.206	5906577.503	686.54	687.23	0.68	4.20	2.70	4.20	May-15	2.54	1.86	684.68
									May-16	2.33	1.65	684.90
									May-17	2.31	1.63	684.91
									Jun-18	2.37	1.69	684.86
MW33B			686.94	687.87	0.90	4.61	3.11	4.61	Aug-15	1.65	0.75	686.21
									May-16	1.60	0.70	686.27
									May-17	1.40	0.50	686.47
									Jun-18	1.73	0.83	686.14
15MW34B Decommissioned July 2018	405099.201	5906742.345	687.967	688.955	0.99	4.8	3.2	4.8	Aug-15	5.79	4.80	683.17
									May-16	3.07	2.08	685.89
									May-17	2.73	1.74	686.23
									Jun-18	3.56	2.57	685.40
15MW35C			688.53	689.50	0.94	3.25	2.00	3.25	Aug-15	3.82	2.88	685.68
									May-16	Dry	-	-
									May-17	Dry	-	-
									Jun-18	4.04	3.10	685.46

Notes:
Monitoring well network re-surveyed on July 30, 2015
mAMSL - metres above mean sea level
mbgl - metres below ground level
mBTOP - metres below top of pipe
-' - no information available

Table 3b: Groundwater Monitoring Results - Upper Sandstone

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW1C	404794.157	5906756.064	687.64	688.61	0.94	5.51	4.01	5.51	May-12	3.37	2.43	685.24
									Jun-13	6.20	5.26	682.41
									May-14	2.88	1.94	685.73
									May-15	2.99	2.05	685.62
									May-16	3.46	2.52	685.15
									May-17	2.49	1.55	686.12
									Jun-18	3.15	2.21	685.46
MW5A Decommissioned July 2018	405028.015	5906686.824	688.28	689.17	0.90	6.74	5.24	6.74	Apr-91	4.00	3.10	685.17
									Oct-91	3.73	2.83	685.44
									Apr-92	4.12	3.22	685.05
									Oct-92	4.13	3.23	685.04
									Apr-93	4.40	3.50	684.77
									Oct-93	4.68	3.78	684.49
									Apr-94	4.92	4.02	684.25
									Oct-94	4.14	3.24	685.03
									Apr-95	4.42	3.52	684.75
									Oct-95	4.25	3.35	684.92
									Apr-96	5.00	4.10	684.17
									Apr-97	3.42	2.52	685.75
									Oct-97	3.20	2.30	685.97
									Apr-98	3.63	2.73	685.535
									36069.00	3.42	2.52	685.75
									Apr-99	3.41	2.51	685.76
									Oct-99	3.56	2.66	685.61
									Apr-00	3.84	2.94	685.33
									Oct-00	3.16	2.26	686.01
									Apr-01	3.59	2.69	685.58
									Oct-01	3.51	2.61	685.66
									Apr-02	4.10	3.20	685.07
									Oct-02	4.03	3.13	685.14
									Apr-03	4.34	3.44	684.83
									Oct-03	3.68	2.78	685.49
									Apr-04	4.31	3.41	684.86
									Oct-04	3.54	2.64	685.63
									Apr-05	3.80	2.90	685.37
									Oct-05	3.29	2.39	685.88
									Apr-06	3.93	3.03	685.24
									Oct-06	4.33	3.43	684.84
									Apr-07	2.86	1.96	686.31
									Oct-07	3.85	2.95	685.32
									May-08	3.85	2.95	685.32
									May-09	3.16	2.26	686.01
									Jun-10	3.78	2.88	685.39
									Jun-11	3.16	2.26	686.01
									May-12	3.16	2.26	686.01
									Jun-13	3.85	2.95	685.32
									May-14	4.06	3.16	685.11
									May-15	2.21	1.31	686.96
									May-16	3.38	2.48	685.79
									May-17	3.03	2.13	686.14
									Jun-18	3.61	2.71	685.57
MW8B	405329.293	5906650.025	686.82	687.69	0.85	4.57	3.07	4.57	Jun-13	1.46	0.61	686.23
									May-14	2.30	1.45	685.39
									May-15	1.84	0.99	685.86
									May-16	1.56	0.71	686.13
									May-17	1.43	0.58	686.27
									Jun-18	1.76	0.91	685.93

Table 3b: Groundwater Monitoring Results - Upper Sandstone

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW11	405514	5906740	687.95	688.37	0.42	5.83	4.33	5.83	Apr-91	2.75	2.33	685.62
									Oct-91	3.51	3.09	684.86
									Apr-92	3.06	2.64	685.31
									Oct-92	2.96	2.54	685.41
									Apr-93	3.22	2.80	685.15
									Oct-93	2.84	2.42	685.53
									Apr-94	3.01	2.59	685.36
									Oct-94	2.52	2.10	685.85
									Apr-95	3.01	2.59	685.36
									Oct-95	2.57	2.15	685.8
									Apr-96	2.88	2.46	685.49
									Oct-96	3.10	2.68	685.27
									Apr-97	1.84	1.42	686.53
									Oct-97	2.24	1.82	686.13
									Apr-98	2.59	2.18	685.78
									Oct-98	2.42	2.00	685.95
									Apr-99	2.29	1.87	686.08
									Oct-99	2.56	2.14	685.81
									Apr-00	3.00	2.58	685.37
									Oct-00	2.41	1.99	685.96
									Apr-01	3.12	2.70	685.25
									Oct-01	2.60	2.18	685.77
									Apr-02	3.18	2.76	685.19
									Oct-02	2.87	2.45	685.50
									Apr-03	3.12	2.70	685.25
									Oct-03	2.41	1.99	685.96
									Apr-04	3.38	2.96	684.99
									Oct-04	2.24	1.82	686.13
									Apr-05	2.45	2.03	685.92
									Oct-05	2.90	2.48	685.47
									Apr-06	3.00	2.58	685.37
									Oct-06	2.53	2.11	685.84
									Apr-07	1.96	1.54	686.41
									Oct-07	1.99	1.57	686.38
									May-08	1.99	1.57	686.38
									May-09	2.41	1.99	685.96
									Jun-10	2.69	2.27	685.68
									Jun-11	2.41	1.99	685.96
									May-12	2.41	1.99	685.96
									Jun-13	2.35	1.93	686.02
									May-14	2.48	2.07	685.89
									May-15	2.31	1.89	686.06
									May-16	2.47	2.05	685.90
									May-17	1.73	1.31	686.64
					0.32				Jun-18	2.57	2.25	685.80
MW12A			686.62	687.13	0.39	5.78	4.28	5.78	Apr-91	1.06	0.67	686.07
									Oct-91	1.76	1.37	685.37
									Apr-92	1.52	1.13	685.61
									Oct-92	1.43	1.04	685.70
									Apr-93	1.71	1.32	685.42
									Oct-93	2.18	1.79	684.95
									Apr-94	2.37	1.98	684.76
									Oct-94	1.57	1.18	685.56
									Apr-95	1.79	1.40	685.34
									Oct-95	2.14	1.75	684.99
									Apr-96	2.41	2.02	684.72
									Oct-96	1.56	1.17	685.57
									Apr-97	1.33	0.94	685.80
									Oct-97	0.93	0.54	686.20
									Apr-98	1.34	0.95	685.79
									Oct-98	1.14	0.75	685.99
									Apr-99	1.29	0.90	685.84
									Oct-99	1.26	0.87	685.87
									Apr-00	1.62	1.23	685.51
									Oct-00	1.12	0.73	686.01
									Apr-01	1.59	1.20	685.54
									Oct-01	1.41	1.02	685.72
									Apr-02	1.80	1.41	685.33
									Oct-02	1.88	1.49	685.25
									Apr-03	2.13	1.74	685.00
									Oct-03	1.53	1.14	685.60
									Apr-04	1.96	1.57	685.17
									Oct-04	1.45	1.06	685.68
									Apr-05	1.45	1.06	685.68
									Oct-05	0.98	0.59	686.15
									Apr-06	1.66	1.27	685.47
									Oct-06	1.19	0.80	685.94
									Apr-07	0.93	0.54	686.20
									Oct-07	0.72	0.33	686.41
									May-08	0.72	0.33	686.41
									May-09	1.12	0.73	686.01
									Jun-10	2.06	1.67	685.07
									Jun-11	1.12	0.73	686.01
									May-12	1.12	0.73	686.01
									Jun-13	1.54	1.15	685.59
									May-14	1.69	1.30	685.44
									May-15	1.47	1.08	685.67
									May-16	1.74	1.35	685.40
									May-17	1.20	0.81	685.93
					0.34				Jun-18	2.99	2.65	684.14

Table 3b: Groundwater Monitoring Results - Upper Sandstone

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW14 Decommissioned July 2018			686.52	687.56	0.94	6.14	4.64	6.14	Oct-92	3.20	2.26	684.36
									Apr-93	2.78	1.84	684.78
									Oct-93	3.14	2.20	684.42
									Apr-94	3.37	2.43	684.19
									Oct-94	2.95	2.01	684.61
									Apr-95	3.12	2.18	684.44
									Oct-95	3.24	2.30	684.32
									Apr-96	3.49	2.55	684.07
									Oct-96	2.70	1.76	684.86
									Apr-97	2.45	1.51	685.11
									Oct-97	2.92	1.98	684.64
									Apr-98	2.61	1.68	684.945
									Oct-98	2.87	1.93	684.69
									Apr-99	2.57	1.63	684.99
									Oct-99	3.25	2.31	684.31
									Apr-00	3.20	2.26	684.36
									Oct-00	2.83	1.89	684.73
									Apr-01	3.48	2.54	684.08
									Oct-01	3.25	2.31	684.31
									Apr-02	3.83	2.89	683.73
									Oct-02	3.19	2.25	684.37
									Apr-03	3.29	2.35	684.27
									Oct-03	2.86	1.92	684.70
									Apr-04	2.94	2.00	684.62
									Oct-04	3.10	2.16	684.46
									Apr-05	3.03	2.09	684.53
									Oct-05	3.34	2.40	684.22
									Apr-06	3.60	2.66	683.96
									Oct-06	2.98	2.04	684.58
									Apr-07	2.76	1.82	684.8
									Oct-07	3.19	2.25	684.37
									May-08	3.19	2.25	684.37
									May-09	2.83	1.89	684.73
									Jun-10	2.07	1.13	685.49
									Jun-11	2.83	1.89	684.73
									May-12	2.83	1.89	684.73
									Jun-13	2.28	1.34	685.28
									May-14	2.18	1.25	685.38
									May-15	2.70	1.77	684.86
									May-16	1.63	0.70	685.92
									May-17	1.75	0.82	685.81
									Jun-18	2.67	1.73	684.89
MW23B	404898	5906361	686.48	687.38	0.86	4.50	1.50	4.50	Oct-98	1.21	0.35	686.17
									Oct-99	1.72	0.86	685.66
									Apr-00	2.16	1.30	685.22
									Oct-00	1.60	0.74	685.78
									Apr-01	2.27	1.41	685.11
									Oct-01	1.75	0.89	685.63
									Apr-02	2.45	1.59	684.93
									Oct-02	2.19	1.33	685.19
									Apr-03	2.60	1.74	684.78
									Oct-03	1.79	0.93	685.59
									Apr-04	2.10	1.24	685.28
									Oct-04	1.38	0.52	686.00
									Apr-05	1.76	0.90	685.62
									Oct-05	1.60	0.74	685.78
									Apr-06	3.88	3.02	683.50
									Oct-06	1.46	0.60	685.92
									Apr-07	2.25	1.39	685.13
									Oct-07	1.10	0.24	686.28
									May-08	1.10	0.24	686.28
									May-09	1.60	0.74	685.78
									Jun-10	1.65	0.80	685.72
									Jun-11	1.60	0.74	685.78
									May-12	1.60	0.74	685.78
									Jun-13	1.61	0.75	685.77
									May-14	1.58	0.72	685.80
									May-15	1.66	0.81	685.71
									May-16	1.94	1.09	685.44
									May-17	1.70	0.85	685.67
									Jun-18	1.58	0.72	685.80
MW25B	404969	5906384	686.91	687.48	0.59

Table 3b: Groundwater Monitoring Results - Upper Sandstone

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl)	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW26B	405056	5906389	687.14	687.63	0.49 0.42	5.56	2.56	5.56	Oct-04	1.63	1.14	686.00
									Apr-05	2.11	1.62	685.52
									Oct-05	1.63	1.14	686.00
									Apr-06	2.27	1.78	685.36
									Oct-06	1.64	1.16	685.99
									Apr-07	1.54	1.06	686.09
									Oct-07	0.99	0.51	686.64
									May-08	0.99	0.51	686.64
									May-09	1.77	1.28	685.86
									Jun-10	1.74	1.25	685.89
									Jun-11	1.32	0.83	686.31
									May-12	1.27	0.79	686.36
									Jun-13	1.47	0.99	686.16
									May-14	0.67	0.18	686.96
									May-15	1.68	1.20	685.94
									May-16	1.99	1.51	685.64
									May-17	1.64	1.16	685.98
									Jun-18	1.83	1.41	685.80
MW27B	405212	5906397	686.50	687.15	0.63	5.98	2.98	5.98	Oct-07	0.90	0.27	686.25
									May-08	0.90	0.27	686.25
									May-09	1.88	1.25	685.26
									Jun-10	1.62	0.99	685.53
									Jun-11	1.08	0.45	686.07
									May-12	0.36	-0.27	686.79
									Jun-13	2.77	2.14	684.38
									May-14	0.68	0.05	686.47
									May-15	1.00	0.37	686.15
									May-16	1.17	0.54	685.98
									May-17	0.96	0.33	686.19
									Jun-18	1.29	0.66	685.86
MW28B	405317	5906380	687.44	687.97	0.52	6.57	3.57	6.57	Jun-13	2.77	2.25	685.20
									May-14	2.59	2.07	685.38
									May-15	2.39	1.87	685.58
									May-16	2.13	1.61	685.84
									May-17	1.85	1.33	686.13
									Jun-18	2.07	1.55	685.91
MW29A	405409.437	5906364.971	688.06	688.89	0.82 0.87	9.42	7.92	9.42	May-15	3.96	3.14	684.93
									May-16	2.91	2.09	685.98
									May-17	2.88	2.06	686.01
									Jun-18	2.19	1.32	686.70
MW30A	405484	5906375	688.57	689.37	0.76	8.15	6.15	8.15	May-15	4.51	3.75	684.87
									May-16	3.42	2.66	685.95
									May-17	3.48	2.72	685.90
									Jun-18	2.73	1.97	686.65
MW31A	405538	5906465	686.38	687.12	0.69 0.48	9.07	7.07	9.07	May-15	2.05	1.37	685.07
									May-16	2.80	2.11	684.32
									May-17	2.41	1.73	684.71
									Jun-18	2.40	1.92	684.72
MW33A	405513	5906661	686.92	687.93	0.92	13.20	11.20	13.20	May-15	2.41	1.49	685.52
									May-16	2.30	1.39	685.63
									May-17	2.11	1.20	685.82
									Jun-18	2.17	1.25	685.77
15MW35B			688.47	689.40	0.81	7.17	5.50	7.17	Aug-15	6.34	5.53	683.06
									May-16	4.78	3.97	684.62
									May-17	4.45	3.64	684.95
									Jun-18	4.02	3.21	685.38

Notes:
Monitoring well network re-surveyed on July 30, 2015
mAMSL - metres above mean sea level
mbgl - metres below ground level
mBTOP - metres below top of pipe
-' - no information available

Table 3c: Groundwater Monitoring Results - Clay Shale

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW1B	404797	5906757	687.819	688.702	0.865	9.855	8.355	9.855	Oct-96	4.99	4.13	683.71
									Apr-97	3.58	2.72	685.12
									Oct-97	3.60	2.74	685.10
									Apr-98	4.49	3.63	684.21
									Oct-98	3.68	2.82	685.02
									Apr-99	3.96	3.10	684.74
									Oct-99	3.64	2.78	685.06
									Apr-00	4.25	3.39	684.45
									Oct-00	3.68	2.82	685.02
									Apr-01	4.18	3.31	684.53
									Oct-01	3.84	2.98	684.86
									Apr-02	3.93	3.07	684.77
									Oct-02	4.15	3.29	684.55
									Apr-03	4.32	3.46	684.38
									Oct-03	3.81	2.95	684.89
									Apr-04	4.12	3.26	684.58
									Oct-04	3.69	2.83	685.01
									Apr-05	3.92	3.06	684.78
									Oct-05	3.34	2.48	685.36
									Apr-06	3.86	3.00	684.84
									Oct-06	3.69	2.83	685.01
									Apr-07	3.79	2.93	684.91
									Oct-07	3.97	3.11	684.73
									May-08	3.97	3.11	684.73
									May-09	3.68	2.82	685.02
									Jun-10	4.16	3.30	684.54
									Jun-11	3.68	2.82	685.02
									May-12	3.68	2.82	685.02
									Jun-13	3.72	2.86	684.98
									May-14	3.80	2.94	684.90
									May-15	3.65	2.78	685.06
									May-16	3.87	3.00	684.83
									May-17	3.53	2.66	685.17
									Jun-18	3.63	2.76	685.07
MW5B Decommissioned July 2018			688.251	689.096	0.83	9.685	8.185	9.685	Oct-96	10.55	9.72	678.55
									Apr-97	7.96	7.13	681.14
									Oct-97	7.13	6.30	681.97
									Apr-98	6.72	5.89	682.38
									Oct-98	7.05	6.22	682.05
									Apr-99	6.87	6.04	682.23
									Oct-99	7.45	6.62	681.65
									Apr-00	7.17	6.34	681.93
									Oct-00	8.28	7.45	680.82
									Apr-01	7.21	6.38	681.89
									Oct-01	8.07	7.24	681.03
									Apr-02	7.55	6.72	681.55
									Oct-02	8.36	7.53	680.74
									Apr-03	8.16	7.33	680.94
									Oct-03	8.04	7.21	681.06
									Apr-04	8.21	7.38	680.89
									Oct-04	7.71	6.88	681.39
									Apr-05	6.57	5.74	682.53
									Oct-05	6.69	5.86	682.41
									Apr-06	7.05	6.22	682.05
									Oct-06	7.25	6.42	681.85
									Apr-07	8.44	7.61	680.66
									Oct-07	10.50	9.67	678.60
									May-08	10.50	9.67	678.60
									May-09	8.28	7.45	680.82
									Jun-10	1.70	0.87	687.39
									Jun-11	8.28	7.45	680.82
									May-12	8.28	7.45	680.82
									Jun-13	3.23	2.40	685.87
									May-14	4.03	3.20	685.07
									May-15	4.83	4.00	684.27
									May-16	5.62	4.79	683.48
									May-17	4.76	3.93	684.34
					0.88				Jun-18	4.79	3.91	684.31
MW8A			686.835	687.827	0.98	10.28	7.28	10.28	Jun-13	1.43	0.45	686.39
									May-14	2.05	1.07	685.78
									May-15	1.87	0.89	685.96
									May-16	1.76	0.78	686.06
									May-17	1.54	0.56	686.29
									Jun-18	1.92	0.94	685.90

Table 3c: Groundwater Monitoring Results - Clay Shale

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW12B	404902	5906756	687.27	687.78	0.20	10.49	8.99	10.49	Oct-96	9.11	8.91	678.67
									Apr-97	2.56	2.36	685.22
									Oct-97	2.14	1.94	685.64
									Apr-98	2.59	2.39	685.19
									Oct-98	2.37	2.17	685.41
									Apr-99	2.64	2.44	685.14
									Oct-99	2.53	2.33	685.25
									Apr-00	2.89	2.69	684.89
									Oct-00	2.65	2.45	685.13
									Apr-01	2.86	2.66	684.92
									Oct-01	2.65	2.45	685.13
									Apr-02	3.03	2.83	684.75
									Oct-02	3.03	2.83	684.75
									Apr-03	3.35	3.15	684.43
									Oct-03	2.74	2.54	685.04
									Apr-04	3.11	2.91	684.67
									Oct-04	2.74	2.54	685.04
									Apr-05	2.72	2.52	685.06
									Oct-05	2.25	2.05	685.53
									Apr-06	2.78	2.58	685.00
									Oct-06	2.41	2.21	685.37
									Apr-07	2.75	2.55	685.03
									Oct-07	2.01	1.81	685.77
									May-08	2.01	1.81	685.77
									May-09	2.65	2.45	685.13
									Jun-10	2.65	2.45	685.12
									Jun-11	2.65	2.45	685.13
									May-12	2.65	2.45	685.13
									Jun-13	2.22	2.02	685.56
									May-14	2.38	2.18	685.40
									May-15	2.21	2.01	685.57
									May-16	2.53	2.33	685.24
									May-17	1.99	1.79	685.79
					0.27				Jun-18	1.88	1.61	685.90
MW18A	404791	5906705	687.13	687.77	0.64	10.08	8.58	10.08	Oct-96	4.98	4.34	682.79
									Apr-97	1.68	1.04	686.09
									Oct-97	2.04	1.40	685.73
									Apr-98	2.09	1.45	685.68
									Oct-98	2.90	2.26	684.87
									Apr-99	2.12	1.48	685.65
									Oct-99	2.23	1.59	685.54
									Apr-00	2.44	1.80	685.33
									Oct-00	2.46	1.82	685.31
									Apr-01	2.47	1.83	685.30
									Oct-01	2.71	2.07	685.06
									Apr-02	2.53	1.89	685.24
									Oct-02	2.77	2.13	685.00
									Apr-03	2.78	2.14	684.99
									Oct-03	2.64	2.00	685.13
									Apr-04	2.41	1.77	685.36
									Oct-04	2.31	1.67	685.46
									Apr-05	2.22	1.58	685.55
									Oct-05	2.04	1.40	685.73
									Apr-06	2.13	1.49	685.64
									Oct-06	2.05	1.41	685.72
									Apr-07	1.94	1.30	685.83
									Oct-07	2.02	1.38	685.75
									May-08	2.02	1.38	685.75
									May-09	2.46	1.82	685.31
									Jun-10	2.60	1.96	685.16
									Jun-11	2.46	1.82	685.31
									May-12	2.46	1.82	685.31
									Jun-13	2.15	1.51	685.62
									May-14	2.13	1.49	685.63
									May-15	2.04	1.40	685.73
									May-16	2.20	1.56	685.57
									May-17	1.92	1.28	685.84
									Jun-18	2.08	1.44	685.69

Table 3c: Groundwater Monitoring Results - Clay Shale

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW19A	404792	5906618	686.60	687.10	0.46	10.26	8.76	10.26	Oct-96	2.31	1.85	684.79
									Apr-97	5.40	4.95	681.69
									Oct-97	6.57	6.11	680.53
									Apr-98	4.81	4.35	682.29
									Oct-98	0.77	0.32	686.32
									Apr-99	1.56	1.10	685.54
									Oct-99	1.26	0.81	685.83
									Apr-00	5.87	5.41	681.23
									Oct-00	5.62	5.16	681.48
									Apr-01	Frozen	-	-
									Oct-01	1.36	0.90	685.74
									Apr-02	Frozen	-	-
									Oct-02	1.70	1.24	685.40
									Apr-03	5.51	5.05	681.59
									Oct-03	1.51	1.06	685.58
									Apr-04	1.59	1.13	685.51
									Oct-04	1.08	0.62	686.02
									Apr-05	1.35	0.89	685.75
									Oct-05	1.00	0.54	686.10
									Apr-06	1.52	1.07	685.57
									Oct-06	0.88	0.42	686.22
									Apr-07	1.01	0.56	686.08
									Oct-07	0.86	0.40	686.24
									May-08	0.86	0.40	686.24
									May-09	5.62	5.16	681.48
									Jun-10	1.38	0.93	685.71
									Jun-11	5.62	5.16	681.48
									May-12	5.62	5.16	681.48
									Jun-13	1.19	0.73	685.91
									May-14	1.09	0.64	686.00
									May-15	1.05	0.60	686.04
									May-16	1.34	0.88	685.76
									May-17	0.81	0.35	686.29
					0.26				Jun-18	0.99	0.73	686.11
MW20A	404789	5906514	688.89	689.54	0.60	10.00	8.50	10.00	Oct-96	9.34	8.74	680.20
									Apr-97	4.32	3.72	685.22
									Oct-97	3.42	2.82	686.12
									Apr-98	4.02	3.42	685.52
									Oct-98	3.40	2.80	686.14
									Apr-99	3.77	3.17	685.77
									Oct-99	3.47	2.87	686.07
									Apr-00	4.27	3.67	685.27
									Oct-00	3.63	3.03	685.91
									Apr-01	4.21	3.61	685.33
									Oct-01	3.67	3.07	685.87
									Apr-02	4.22	3.62	685.32
									Oct-02	4.03	3.43	685.51
									Apr-03	4.51	3.91	685.03
									Oct-03	3.63	3.03	685.91
									Apr-04	4.21	3.61	685.33
									Oct-04	3.42	2.82	686.12
									Apr-05	3.80	3.20	685.74
									Oct-05	3.31	2.71	686.23
									Apr-06	3.92	3.32	685.62
									Oct-06	3.59	2.99	685.95
									Apr-07	3.50	2.90	686.04
									Oct-07	3.03	2.43	686.51
									May-08	3.03	2.43	686.51
									May-09	3.63	3.03	685.91
									Jun-10	4.19	3.59	685.35
									Jun-11	3.63	3.03	685.91
									May-12	3.63	3.03	685.91
									Jun-13	3.87	3.27	685.67
									May-14	3.79	3.19	685.75
									May-15	2.66	2.06	686.87
									May-16	3.99	3.39	685.55
									May-17	3.72	3.12	685.82
									Jun-18	3.94	3.34	685.60

Table 3c: Groundwater Monitoring Results - Clay Shale

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW21A	404786	5906390	687.60	688.30	0.69	9.98	8.48	9.98	Oct-98	4.76	4.07	683.54
									Apr-99	4.37	3.68	683.93
									Oct-99	5.30	4.61	683.00
									Apr-00	4.58	3.89	683.72
									Oct-00	5.91	5.22	682.39
									Apr-01	4.93	4.24	683.37
									Oct-01	6.34	5.65	681.96
									Apr-02	5.55	4.86	682.75
									Oct-02	6.90	6.21	681.40
									Apr-03	6.73	6.04	681.57
									Oct-03	7.46	6.77	680.84
									Apr-04	6.82	6.13	681.48
									Oct-04	7.02	6.33	681.28
									Apr-05	5.28	4.59	683.02
									Oct-05	6.46	5.77	681.84
									Apr-06	7.42	6.73	680.88
									Oct-06	6.68	5.99	681.62
									Apr-07	6.20	5.51	682.10
									Oct-07	7.02	6.33	681.28
									May-08	7.02	6.33	681.28
									May-09	5.91	5.22	682.39
									Jun-10	4.54	3.85	683.77
									Jun-11	5.91	5.22	682.39
									May-12	5.91	5.22	682.39
									Jun-13	4.62	3.93	683.68
									May-14	5.01	4.32	683.29
									May-15	5.00	4.31	683.31
									May-16	4.21	3.52	684.09
									May-17	4.98	4.29	683.33
									Jun-18	4.05	3.36	684.25
MW22A			687.831	688.664	0.84	9.815	8.315	9.815	Oct-98	9.69	8.85	678.97
									Apr-99	3.23	2.39	685.43
									Oct-99	3.11	2.27	685.55
									Apr-00	3.64	2.80	685.02
									Oct-00	3.63	2.79	685.03
									Apr-01	3.80	2.96	684.86
									Oct-01	4.09	3.25	684.57
									Apr-02	4.24	3.40	684.42
									Oct-02	5.02	4.18	683.64
									Apr-03	5.11	4.27	683.55
									Oct-03	5.35	4.51	683.31
									Apr-04	5.27	4.43	683.39
									Oct-04	5.00	4.16	683.66
									Apr-05	4.38	3.54	684.28
									Oct-05	4.03	3.19	684.63
									Apr-06	5.05	4.21	683.61
									Oct-06	4.85	4.01	683.81
									Apr-07	5.98	5.14	682.68
									Oct-07	5.58	4.74	683.08
									May-08	5.58	4.74	683.08
									May-09	3.63	2.79	685.03
									Jun-10	4.27	3.43	684.40
									Jun-11	3.63	2.79	685.03
									May-12	3.63	2.79	685.03
									Jun-13	4.31	3.47	684.35
									May-14	4.69	3.85	683.97
									May-15	4.76	3.92	683.90
									May-16	5.06	4.22	683.60
									May-17	5.03	4.19	683.63
									Jun-18	4.84	4.00	683.82
MW23A	404899	5906362	686.45	687.16	0.67	9.99	8.49	9.99	Oct-98	6.13	5.46	681.03
									Apr-99	2.89	2.22	684.27
									Oct-99	3.72	3.05	683.44
									Apr-00	3.19	2.52	683.97
									Oct-00	3.16	2.49	684.00
									Apr-01	3.11	2.44	684.05
									Oct-01	3.63	2.96	683.53
									Apr-02	3.07	2.40	684.09
									Oct-02	3.63	2.96	683.53
									Apr-03	3.06	2.39	684.10
									Oct-03	3.57	2.90	683.59
									Apr-04	2.49	1.82	684.67
									Oct-04	2.58	1.91	684.58
									Apr-05	2.03	1.36	685.13
									Oct-05	2.10	1.43	685.06
									Apr-06	2.47	1.80	684.69
									Oct-06	2.28	1.61	684.88
									Apr-07	2.53	1.86	684.63
									Oct-07	1.99	1.32	685.17
									May-08	1.99	1.32	685.17
									May-09	3.16	2.49	684.00
									Jun-10	1.51	0.84	685.65
									Jun-11	3.16	2.49	684.00
									May-12	3.16	2.49	684.00
									Jun-13	1.01	0.34	686.15
									May-14	0.89	0.22	686.28
									May-15	1.01	0.34	686.15
									May-16	1.03	0.36	686.13
									May-17	0.98	0.31	686.18
									Jun-18	1.11	0.44	686.05

Table 3c: Groundwater Monitoring Results - Clay Shale

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW24A Decommissioned July 2018			688.88	689.68	0.70	9.80	8.30	9.80	Oct-04	3.69	2.99	685.98
									Apr-05	3.91	3.21	685.76
									Oct-05	3.57	2.87	686.10
									Apr-06	4.01	3.31	685.67
									Oct-06	3.36	2.66	686.31
									Apr-07	3.34	2.64	686.33
									Oct-07	3.01	2.31	686.66
									May-08	3.01	2.31	686.66
									May-09	4.06	3.36	685.61
									Jun-10	3.72	3.02	685.96
									Jun-11	2.97	2.27	686.70
									May-12	3.18	2.48	686.50
									Jun-13	3.50	2.80	686.18
									May-14	3.53	2.83	686.14
									May-15	3.33	2.63	686.34
									May-16	3.59	2.89	686.09
									May-17	3.21	2.51	686.47
									Jun-18	3.57	2.87	686.11
MW25A	404968	5906383	686.73	687.54	0.82 0.59	9.90	8.40	9.90	Oct-04	3.09	2.27	684.45
									Apr-05	1.94	1.12	685.60
									Oct-05	1.75	0.93	685.79
									Apr-06	1.79	0.97	685.75
									Oct-06	2.02	1.20	685.51
									Apr-07	1.53	0.71	686.00
									Oct-07	1.44	0.62	686.09
									May-08	1.44	0.62	686.09
									May-09	1.45	0.63	686.09
									Jun-10	1.71	0.89	685.83
									Jun-11	1.39	0.57	686.15
									May-12	0.86	0.04	686.68
									Jun-13	1.19	0.37	686.35
									May-14	1.08	0.26	686.46
									May-15	1.15	0.33	686.39
									May-16	1.32	0.50	686.22
									May-17	1.25	0.43	686.29
									Jun-18	1.37	0.78	686.17
MW26A	405056	5906388	687.00	687.60	0.56 0.49	10.17	8.67	10.17	Oct-04	3.76	3.21	683.83
									Apr-05	2.96	2.40	684.64
									Oct-05	3.25	2.69	684.35
									Apr-06	3.43	2.87	684.17
									Oct-06	3.62	3.07	683.98
									Apr-07	5.27	4.71	682.33
									Oct-07	3.35	2.80	684.25
									May-08	3.35	2.80	684.25
									May-09	2.03	1.48	685.56
									Jun-10	2.18	1.63	685.41
									Jun-11	1.85	1.29	685.75
									May-12	1.81	1.25	685.79
									Jun-13	1.81	1.26	685.78
									May-14	1.89	1.34	685.70
									May-15	1.83	1.28	685.76
									May-16	2.09	1.53	685.51
									May-17	2.04	1.48	685.56
									Jun-18	2.11	1.62	685.48
MW27A			686.65	687.19	0.53 0.48	10.44	8.94	10.44	Oct-07	2.27	1.74	684.92
									May-08	2.27	1.74	684.92
									May-09	1.64	1.11	685.55
									Jun-10	2.06	1.53	685.13
									Jun-11	1.69	1.16	685.50
									May-12	1.03	0.50	686.16
									Jun-13	1.60	1.07	685.59
									May-14	0.32	-0.21	686.87
									May-15	0.33	-0.20	686.86
									May-16	0.43	-0.10	686.76
									May-17	0.50	-0.03	686.69
									Jun-18	0.57	0.09	686.62
MW28A			687.36	687.96	0.59	11.18	9.68	11.18	Jun-13	2.57	1.98	685.39
									May-14	2.39	1.80	685.57
									May-15	2.18	1.59	685.78
									May-16	2.24	1.65	685.71
									May-17	2.01	1.42	685.95
									Jun-18	2.04	1.45	685.92

Table 3c: Groundwater Monitoring Results - Clay Shale

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
MW32A	405528	5906578	686.53	687.19	0.65	9.47	7.47	9.47	May-15	2.62	1.97	684.58
									May-16	2.32	1.67	684.87
									May-17	2.25	1.60	684.95
									Jun-18	2.30	1.65	684.90
15MW34A Decommissioned July 2018	405098	5906743	687.98	689.02	1.05	11.94	10.20	11.94	Aug-15	5.42	4.38	683.59
									May-16	3.63	2.59	685.38
									May-17	3.40	2.35	685.62
					0.94				Jun-18	3.66	2.72	685.35
15MW35A	404801	5906266	688.46	689.32	0.85	13.71	11.70	13.71	Aug-15	11.68	10.83	677.64
									May-16	7.71	6.86	681.61
									May-17	7.55	6.70	681.77
									Jun-18	7.85	7.00	681.47
15MW36A			687.05	687.95	0.85	14.975	12.7	`	Aug-15	4.05	3.20	683.89
									May-16	3.98	3.13	683.97
									May-17	3.16	2.31	684.78
					0.55				Jun-18	3.08	2.53	684.87

Notes:
Monitoring well network re-surveyed on July 30, 2015
mAMSL - metres above mean sea level
mbgl - metres below ground level
mBTOP - metres below top of pipe
-' - no information available
negative water level = water level above ground level

Table 3d: Groundwater Monitoring Results - Lower Bedrock

Monitoring Well	UTM Coordinates		Elevations		Measured Stick-up (m)	Well Depth (mbgl	Screened Interval		Date	Water Depth		Groundwater Elevation (mAMSL)
	Easting	Northing	Surface (mAMSL)	Top of Pipe (mAMSL)			Top Screen Depth (mbgl)	Bottom Screen Depth (mbgl)		mBTOP	mbgl	
15MW35-Deep	404801	5906264	688.43	689.32	0.85	32.59	31.00	32.59	Aug-15	7.04	6.19	682.28
									May-16	6.88	6.03	682.44
									May-17	6.64	5.79	682.68
									Jun-18	6.51	5.66	682.81
15MW36-Deep	405552	5906436	687.033	687.787	0.74	34.64	33.6	34.64	Aug-15	22.77	22.03	665.02
									May-16	5.92	5.18	681.87
									May-17	5.78	5.04	682.01
					0.44				Jun-18	5.21	4.77	682.57

Notes:
Monitoring well network re-surveyed on July 30, 2015
mAMSL - metres above mean sea level
mbgl - metres below ground level
mBTOP - metres below top of pipe
-' - no information available

Table 4a - Field and Groundwater Analytical Results Summary - Surfical Material Wells

Parameter		Field			Routine										
		pH	Electical Conductivity	Temperature	pH	Electical Conductivity	Calcium	Magnesium	Sodium	Potassium	Sulphate	Chloride	Bicarbonate	Carbonate	Hydroxide
Monitoring Well	Unit	-	µS/cm	°C	-	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	6.5-8.5	1000	NG	6.5-8.5	1000	NG	NG	200	NG	128-429[2]	100	NG	NG	NG
	Date														
MW9 Decommissioned July 2018	May-14	7.7	8100	5.3	8.27	7800	120	66	1800	15	4000	2.1	1100	<0.50	-
	May-15	7.9	8260	5.5	7.81	7800	110	56	1900	15	3800	1.6	1100	<0.50	<0.50
	Jun-16	7.59	8320	8.0	7.96	7800	120	66	1900	15	4000	1.2	1100	<0.50	<0.50
	Jun-17	7.7	6590	6.5	7.88	6400	79	46	1200	12	2800	69	920	<0.50	<0.5
	Jun-18	7.8	8360	5.8	8.00	7500	110	57	1800	14	3400	16	1000	<1.0	<1.0
MW10	May-14	8.3	4920	4.2	8.12	4600	68	35	990	4.0	2100	26	600	<0.50	-
	May-15	8.3	4980	7.5	7.79	4700	140	44	910	4.5	1900	140	590	<0.50	<0.50
	Jun-16	8.06	4420	9.8	8.26	4500	60	31	840	4.4	1700	60	620	<0.50	<0.50
	Jun-17	8.0	4260	10.3	8.11	4100	71	32	870	4.2	1600	59	630	<0.50	<0.5
	Jun-18	7.70	4530	8.5	8.27	4100	68	32	910	4.0	1600	55	650	<1.0	<1.0
MW18B	May-14	7.6	2920	8.9	8.27	2900	120	33	510	3.7	1400	14	350	<0.50	-
	May-15	8.0	3800	5.9	7.79	3600	190	47	670	4.6	1700	17	410	<0.50	<0.50
	Jun-16	6.00	4240	8.3	7.96	3400	180	45	570	4.5	1500	22	390	<0.50	<0.50
	Jun-17	7.4	3160	8.0	8.05	3000	180	48	530	4.4	1100	29	760	<0.50	<0.5
	Jun-18	7.4	3500	8.7	7.89	3300	210	55	560	4.7	1100	44	800	<1.0	<1.0
MW19B	May-14	7.5	8080	8.3	8.33	6000	29	20	1500	6.7	2600	2.6	1100	5.0	-
	May-15	8.4	6260	6.5	8.26	5900	32	17	1500	7.4	2400	3.1	1100	<0.50	<0.50
	Jun-16	8.09	7170	-	8.43	5700	31	17	1300	7.6	2200	3.1	1000	13	<0.50
	Jun-17	8.2	6430	7.0	8.5	5800	29	18	1400	7.5	2000	2.7	1100	22	<0.5
	Jun-18	8.2	6100	8.0	8.3	5800	30	17	1400	7.7	2200	2.8	1100	<1.0	<1.0
MW20B	May-14	7.9	5320	7.9	8.02	4900	130	47	1000	9.4	2200	1.3	950	<0.50	-
	May-15	7.9	5030	5.5	8.04	4700	120	39	1000	9.0	1900	1.5	990	<0.50	<0.50
	Jun-16	7.64	4970	7.3	8.04	4700	110	37	1000	9.0	1800	1.4	1100	<0.50	<0.50
	Jun-17	7.6	5180	6.2	8.17	5000	140	50	1100	9.8	1900	1.1	960	<0.50	<0.5
	Jun-18	7.3	5300	5.0	8.10	4800	120	42	1100	9.3	1800	<1.0	1000	<1.0	<1.0
MW21B	May-14	8.0	2870	6.6	8.21	2700	17	5.6	610	4	650	1.5	1000	<0.50	-
	May-15	8.3	2820	6.9	8.16	2700	16	4.9	630	4.2	570	1.6	1000	<0.50	<0.50
	Jun-16	7.89	2840	6.5	8.25	2600	16	5.0	630	3.9	530	1.1	1000	<0.50	<0.50
	Jun-17	7.8	2780	6.5	8.39	2600	17	5.3	640	4.1	570	1.1	1000	9.2	<0.5
	Jun-18	-	-	-	8.29	2900	19	6.1	680	4.2	650	1.3	1100	<1.0	<1.0
MW22B	May-14	7.7	8560	6.4	8.07	8100	110	51	2100	8.5	3900	1.3	1200	<0.50	-
	May-15	7.8	8250	8.4	7.86	8200	120	55	1900	10	3900	1.8	1200	<0.50	<0.50
	Jun-16	7.57	8780	9.7	7.97	8200	110	55	2000	10	3900	1.4	1300	<0.50	<0.50
	Jun-17	7.5	7870	7.8	8.23	8000	110	54	2000	9.8	3300	1.9	1200	<0.50	<0.5
	Jun-18	7.03	8750	6.7	7.98	8000	110	53	1900	9.4	3600	1.7	1200	<1.0	<1.0

Table 4a - Field and Groundwater Analytical Results Summary - Surfical Material Wells

Parameter		Nutrients								
		Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Dissolved Solids	Hardness	Alkalinity (total as CaCO3)	Ionic Balance	Ammonia-N	Total Kjeldahl Nitrogen
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L
	AB Tier 1 Guideline[1]	3	0.06-0.60[3]	100	500	NG	NG	NG	0.035-125[4]	NG
	Date									
MW9 Decommissioned July 2018	May-14	0.079	-	n/a	6600	-	-	-	0.81	1.6
	May-15	0.17	0.033	0.21	6400	510	860	0.96	0.53	1.3
	Jun-16	0.081	<0.050	0.081	6500	560	890	0.92	0.32	0.77
	Jun-17	1.8	0.047	-	4700	390	760	10	0.23	2.4
	Jun-18	0.46	0.013	0.47	5800	510	860	0.019	0.32	1.6
MW10	May-14	0.079	-	-	3500	-	-	-	0.17	0.68
	May-15	0.014	<0.010	0.014	3400	520	490	0.95	0.23	0.68
	Jun-16	0.04	0.01	0.05	3000	280	500	0.9	0.16	0.57
	Jun-17	3.0	<0.16	-	3000	310	520	2.0	0.052	0.49
	Jun-18	0.13	<0.010	0.13	3000	300	530	1.3	0.06	0.49
MW18B	May-14	0.2	-	-	2300	-	-	-	0.09	0.68
	May-15	0.13	0.011	0.14	2800	670	330	1.0	0.14	1.5
	Jun-16	0.089	0.015	0.10	2600	630	320	0.96	0.10	0.32
	Jun-17	0.36	0.037	-	2200	660	620	1.8	0.17	0.87
	Jun-18	0.17	<0.010	0.17	2400	740	650	1.9	0.072	1.1
MW19B	May-14	<0.010	-	-	4700	-	-	-	0.76	1.1
	May-15	<0.010	<0.010	<0.010	4500	150	900	0.98	0.76	1.1
	Jun-16	0.015	0.013	0.028	4100	150	860	0.96	0.73	1.1
	Jun-17	<0.044	0.11	-	4100	150	910	3.6	0.84	1.0
	Jun-18	0.038	0.012	0.049	4300	150	910	0.54	0.63	1.1
MW20B	May-14	0.27	-	-	3800	-	-	-	0.058	3.0
	May-15	0.17	<0.010	0.17	3600	450	810	0.98	<0.050	3.7
	Jun-16	0.14	<0.010	0.14	3500	430	880	0.96	<0.050	0.29
	Jun-17	0.86	<0.033	-	3700	570	790	4.5	0.035	0.74
	Jun-18	0.079	<0.010	0.079	3500	480	820	1.2	<0.015	0.32
MW21B	May-14	<0.010	-	-	1800	-	-	-	<0.050	0.34
	May-15	0.11	<0.010	0.11	1800	61	860	0.99	<0.050	0.28
	Jun-16	0.11	<0.010	0.11	1700	61	850	1.0	<0.050	<0.05
	Jun-17	0.19	<0.033	-	1800	64	860	0.56	0.016	0.31
	Jun-18	0.1	<0.010	0.1	1900	72	870	0.26	<0.015	0.31
MW22B	May-14	0.11	-	-	6800	-	-	-	<0.050	0.36
	May-15	0.16	<0.010	0.16	6600	520	1000	0.92	<0.050	0.52
	Jun-16	<0.010	<0.010	<0.020	6600	510	1000	0.95	<0.050	0.27
	Jun-17	0.38	*<0.16*	-	6000	490	1000	4.0	0.04	0.32
	Jun-18	0.039	<0.010	0.039	6300	480	1000	0.19	<0.015	0.26

Table 4a - Field and Groundwater Analytical Results Summary - Surfical Material Wells

Parameter		Hydrocarbons							Organics			Volatile Organic Compounds			
		Benzene	Toluene	Ethylbenzene	Xylenes	Styrene	F1-BTEX (C6-C10)	F2 (>C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon	Methylene Chloride	Vinyl Chloride	TCE	PCE
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.005	0.024	0.0016	0.02	0.072	2.2	1.1	0.002	NG	NG	0.05	0.002	0.005	0.01
	Date														
MW9 Decommissioned July 2018	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	42	5.5	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	62	6.9	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	21	5.9	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	110	23	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.0023	72	12	<0.0020	<0.00050	<0.00050	<0.00050
MW10	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	33	9.6	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	35	11	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	32	9.7	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	24	8	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	28	8.6	<0.0020	<0.00050	<0.00050	<0.00050
MW18B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	27	7.3	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	64	9.2	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	30	8.2	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	24	11	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	49	12	<0.0020	<0.00050	<0.00050	<0.00050
MW19B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	28	5	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	17	5.7	-	-	-	-
	Jun-16	<0.00040	<0.00060	<0.00040	<0.00080	-	<0.10	<0.10	-	17	6.0	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	17	6.3	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	34	6.1	<0.0020	<0.00050	<0.00050	<0.00050
MW20B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	96	7.2	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	120	6.4	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	15	4.3	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	81	6	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	32	6	<0.0020	<0.00050	<0.00050	<0.00050
MW21B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	31	3.8	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	20	4.2	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	20	4.4	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	20	6.1	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	27	6.5	<0.0020	<0.00050	<0.00050	<0.00050
MW22B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	15	5.3	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	51	5.7	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	18	4.7	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	20	6.6	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	23	5.9	<0.0020	<0.00050	<0.00050	<0.00050

Table 4a - Field and Groundwater Analytical Results Summary - Surfical Material Wells

Parameter		Dissolved Metals																
		Aluminum	**Antimony**	**Arsenic**	**Barium**	**Boron**	**Cadmium**	**Chromium**	**Copper**	**Iron**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Silver**	**Uranium**	**Zinc**
Monitoring Well	**Unit**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.007-0.050[5]	0.006	0.005	1	1.0	0.00004-0.00037[2]	NG	0.007	0.3	0.001-0.007[2]	0.05	0.000005	0.004-0.130[2]	0.001	0.0001	0.01	0.03
	Date																	
MW9 **Decommissioned July 2018**	May-14	-	<0.0060	-	<0.10	-	<0.000050	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	0.0061	-	-	-	<0.030
	May-15	<0.030	<0.0060	<0.0020	0.010	0.29	<0.00020	<0.010	<0.0020	<0.060	<0.0020	0.22	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	0.0037	<0.030
	Jun-16	0.011	<0.00060	0.00036	<0.10	0.31	<0.000020	<0.0010	0.0013	*<0.60*	0.00027	0.21	<0.0000020	0.0020	0.00023	<0.00010	0.004	0.0034
	Jun-17	0.0038	<0.00060	0.00093	0.046	0.28	0.000053	<0.0010	0.0042	<0.060	0.0003	0.37	<0.0000020	0.013	0.0021	<0.00010	0.0056	0.0094
	Jun-18	<0.003	<0.00060	0.00063	<0.1	0.31	<0.000020	<0.0010	0.001	*<0.6*	<0.00020	0.24	<0.0000020	0.004	0.00027	<0.00010	0.0032	0.0037
MW10	May-14	-	<0.00060	-	0.016	-	<0.000025	0.0014	0.17	<0.060	0.009	-	<0.0000050	0.0078	-	-	-	0.11
	May-15	<0.0030	<0.00060	0.00049	0.087	0.11	0.000049	<0.0010	0.0079	8.3	<0.00020	1.8	<0.0000050	1.5	0.0003	<0.00010	0.0048	0.0038
	Jun-16	0.0091	<0.00060	0.0006	0.023	0.12	0.000023	0.0021	0.0035	<0.060	<0.00020	0.094	0.0000034	0.059	0.00052	<0.00010	0.0093	0.0065
	Jun-17	<0.0030	<0.00060	0.00042	0.023	0.13	0.000021	0.0018	0.0033	<0.060	<0.00020	0.076	<0.0000020	0.033	0.00053	<0.00010	0.0086	<0.0030
	Jun-18	0.0068	<0.00060	0.00059	0.018	0.11	<0.000020	0.0059	0.002	<0.06	<0.00020	<0.004	0.000005	0.02	0.0006	<0.00010	0.0099	<0.0030
MW18B	May-14	-	<0.00060	-	0.017	-	<0.000025	<0.0010	0.0012	<0.060	<0.00020	-	<0.0000050	0.0035	-	-	-	<0.0030
	May-15	0.0034	<0.00060	0.0004	0.012	0.071	<0.000020	<0.0010	0.0007	<0.060	<0.00020	0.15	<0.0000050	0.0039	<0.00020	<0.00010	0.0011	<0.0030
	Jun-16	0.11	<0.00060	0.00041	0.014	0.075	<0.000020	<0.0010	0.0013	0.25	0.00037	0.046	0.0000068	0.0044	<0.00020	<0.00010	0.00091	0.0047
	Jun-17	0.0062	<0.00060	0.00037	0.016	0.062	<0.000020	<0.0010	0.00064	<0.060	<0.00020	0.15	<0.0000020	0.004	<0.00020	<0.00010	0.0044	<0.0030
	Jun-18	0.004	<0.00060	0.00037	0.015	0.069	<0.000020	<0.0010	0.0012	<0.06	<0.00020	0.057	0.0000035	0.0037	<0.0002	<0.00010	0.0042	<0.0030
MW19B	May-14	-	<0.0060	-	<0.10	-	<0.000050	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.0060	0.0021	0.027	0.47	<0.00020	<0.010	<0.0020	0.36	<0.0020	0.21	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	<0.0010	<0.030
	Jun-16	<0.0030	<0.00060	0.0025	0.029	0.48	<0.000020	0.0010	0.00023	0.21	<0.00020	0.21	<0.0000020	0.0025	<0.00020	<0.00010	0.00021	<0.0030
	Jun-17	0.0034	<0.00060	0.0017	<0.10	0.52	<0.000020	<0.0010	<0.00020	*<0.6*	<0.00020	0.19	<0.0000020	<0.00050	<0.00020	<0.00010	0.00024	<0.0030
	Jun-18	<0.003	<0.00060	0.0017	<0.1	0.49	<0.000020	<0.0010	<0.0002	*<0.6*	<0.00020	0.17	<0.0000020	0.00082	<0.0002	<0.00010	0.00027	<0.0030
MW20B	May-14	-	<0.00060	-	0.022	-	<0.000025	0.0036	0.002	0.24	0.00036	-	<0.0000050	0.0023	-	-	-	0.0045
	May-15	0.0035	<0.00060	0.00032	0.014	0.33	<0.000020	0.0029	0.0013	<0.060	<0.00020	<0.0040	<0.0000050	0.0011	0.0031	<0.00010	0.0033	<0.0030
	Jun-16	<0.0030	<0.00060	0.00030	<0.10	0.38	<0.000020	0.0035	0.00053	*<0.60*	<0.00020	<0.040	0.0000026	0.0016	<0.00020	<0.00010	0.0013	<0.0030
	Jun-17	0.0041	<0.00060	0.00032	<0.10	0.35	<0.000020	0.0011	0.00059	*<0.60*	<0.00020	<0.040	<0.0000020	0.00067	0.013	<0.00010	0.0050	<0.0030
	Jun-18	<0.003	<0.00060	0.00027	0.016	0.34	<0.000020	0.0016	0.00073	<0.06	<0.00020	<0.004	<0.0000020	0.0015	0.00073	<0.00010	0.0034	<0.0030
MW21B	May-14	-	<0.00060	-	<0.010	-	0.000042	<0.0010	0.0014	0.071	<0.00020	-	<0.0000050	0.0015	-	-	-	0.0030
	May-15	0.0042	<0.00060	0.00053	<0.010	0.22	<0.000020	<0.0010	0.0008	<0.060	<0.00020	<0.004	<0.0000050	0.0013	<0.00020	<0.00010	0.0016	<0.0030
	Jun-16	<0.0030	<0.00060	0.00064	<0.010	0.25	<0.000020	<0.0010	0.00066	<0.060	<0.00020	<0.0040	<0.0000020	0.0013	<0.00020	<0.00010	0.0017	<0.0030
	Jun-17	0.0035	<0.00060	0.00064	<0.010	0.23	<0.000020	<0.0010	0.00033	<0.060	0.00034	0.0041	<0.0000020	0.00086	<0.00020	<0.00010	0.0017	<0.0030
	Jun-18	<0.003	<0.00060	0.00066	<0.01	0.23	<0.000020	<0.0010	0.00072	<0.06	<0.00020	<0.004	<0.0000020	0.0012	<0.0002	<0.00010	0.0019	<0.0030
MW22B	May-14	-	<0.0060	-	<0.010	-	0.00018	<0.010	<0.0020	0.075	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.0060	<0.0020	<0.10	0.25	<0.00020	<0.010	<0.0020	*<0.60*	<0.0020	<0.040	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	0.0073	<0.030
	Jun-16	<0.0030	<0.00060	0.00035	<0.10	0.25	<0.000020	0.0015	0.0012	*<0.60*	<0.00020	<0.040	<0.0000020	0.0020	0.00036	<0.00010	0.0079	<0.0030
	Jun-17	0.0037	<0.00060	0.00027	<0.10	0.25	<0.000020	<0.0010	0.00037	*<0.60*	<0.00020	<0.040	<0.0000020	0.0013	0.00028	<0.00010	0.0079	<0.0030
	Jun-18	<0.003	<0.00060	0.00024	<0.1	0.24	0.000021	<0.0010	0.00072	*<0.6*	<0.00020	<0.04	<0.0000020	0.0016	0.00037	<0.00010	0.0072	<0.0030

Table 4a - Field and Groundwater Analytical Results Summary - Surfical Material Wells

Parameter		Field			Routine										
		pH	Electical Conductivity	Temperature	pH	Electical Conductivity	Calcium	Magnesium	Sodium	Potassium	Sulphate	Chloride	Bicarbonate	Carbonate	Hydroxide
Monitoring Well	Unit	-	µS/cm	°C	-	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	6.5-8.5	1000	NG	6.5-8.5	1000	NG	NG	200	NG	128-429[2]	100	NG	NG	NG
	Date														
MW24B Decommissioned July 2018	May-14	7.8	10,010	4.9	8.15	9100	270	160	2000	9.1	5100	82	1100	<0.50	-
	May-15	7.5	9480	7.8	7.74	9000	280	140	2000	10	4700	81	1100	<0.50	<0.50
	Jun-16	6.15	11,850	-	7.96	9100	320	170	1900	12	4400	72	1000	<0.50	<0.50
	Jun-17	7.3	9590	7.3	7.86	9200	360	200	1900	10	4600	54	970	<0.50	<0.50
	Jun-18	8.8	9730	9.2	7.97	9100	370	200	2000	12	4800	45	940	<1.0	<1.0
MW29B	May-15	7.4	8670	7.1	7.62	8200	520	260	1400	12	4700	5.7	570	<0.50	<0.50
	Jun-16	7.21	8800	7.7	7.85	8400	560	230	1600	11	5100	5.2	520	<0.50	<0.50
	Jun-17	7.2	9230	6.0	7.90	8500	530	240	1600	11	4700	6.0	550	0<0.5	<0.50
	Jun-18	6.90	8620	9.0	7.76	8600	530	260	1700	12	5000	6.3	560	<1.0	<1.0
MW30B	May-15	8.1	2830	6.5	8.06	2700	29	9.1	680	3.3	830	1.4	670	<0.50	<0.50
	Jun-16	8.19	2650	7.4	8.44	2600	26	9.5	610	3.2	830	1.5	610	8.0	<0.50
	Jun-17	7.9	2680	5.6	8.32	2500	24	8.9	560	2.9	750	1.8	680	<0.50	<0.5
	Jun-18	7.28	2500	8.7	8.27	2500	22	8.0	610	2.6	720	<1.0	710	<1.0	<1.0
MW31B	May-15	8.4	2530	8.0	8.29	2400	15	4.3	550	3.7	670	1.1	690	<0.50	<0.50
	Jun-16	8.33	2500	9.4	8.56	2500	15	5.4	590	3.6	750	1.4	610	13.0	<0.50
	Jun-17	8.1	2660	8.1	8.4	2500	14	5.6	570	3.3	780	1.4	640	5.2	<0.50
	Jun-18	7.55	2720	9.5	8.39	2700	15	5.7	660	3.4	850	<1.0	630	7.2	<1.0
MW32B	May-15	7.7	12,550	7.6	7.73	12,000	210	100	2800	18	6300	110	1300	<0.50	<0.50
	Jun-16	7.69	13,260	9.1	7.97	13,000	230	120	3200	17	6800	120	1300	<0.50	<0.50
	Jun-17	7.4	13,010	6.8	7.98	12,000	210	100	3000	15	5700	120	1300	<0.50	<0.50
	Jun-18	7.48	8330	9.6	7.82	12,000	220	110	3200	16	6400	130	1300	<1.0	<1.0
MW33B	May-15	7.5	5180	6.0	7.89	5000	91	26	1200	6.9	1900	21	1000	<0.50	<0.50
	Jun-16	7.48	5340	6.9	8.15	5400	110	38	1300	6.9	2000	20	1100	<0.50	<0.50
	Jun-17	-	-	-	7.99	5600	130	42	1200	6.1	2100	21	1200	<0.50	<0.50
	Jun-18	7.88	5650	11.6	7.82	5500	120	39	1300	6.4	2100	22	1300	<1.0	<1.0
15MW34B Decommissioned July 2018	Jun-16	7.05	2490	7.9	7.65	2400	180	55	320	11.0	510	39	1000	<0.50	<0.50
	Jun-17	6.9	2460	6.2	7.51	2400	180	60	320	9.7	470	39	1100	<0.5	<0.5
	Jun-18	7.5	2740	6.5	7.49	2500	180	61	350	11.0	500	37	1100	<1.0	<1.0

Table 4a - Field and Groundwater Analytical Results Summary - Surfical Material Wells

Parameter		Nutrients								
		Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Dissolved Solids	Hardness	Alkalinity (total as CaCO3)	Ionic Balance	Ammonia-N	Total Kjeldahl Nitrogen
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L
	AB Tier 1 Guideline[1]	3	0.06-0.60[3]	100	500	NG	NG	NG	0.035-125[4]	NG
	Date									
MW24B **Decommissioned July 2018**	May-14	0.013	-	-	8100	-	-	-	0.064	1.2
	May-15	0.014	<0.010	0.014	7700	1300	890	0.97	0.094	1.1
	Jun-16	<0.010	<0.010	<0.020	7300	1500	820	1.0	0.11	0.75
	Jun-17	<0.22	<0.16	<0.05	7600	1700	790	1.9	0.035	0.85
	Jun-18	0.04	<0.01	0.04	7900	1700	770	2.0	0.082	0.72
MW29B	May-15	0.39	0.027	0.42	7200	2300	470	1.0	0.72	4.5
	Jun-16	0.11	0.025	0.13	7700	2400	420	1.0	1.1	0.96
	Jun-17	<0.22	<0.16	-	7400	2300	450	4.6	1.4	1.8
	Jun-18	0.13	0.032	0.17	7800	2400	460	3.5	1.2	1.9
MW30B	May-15	1.3	<0.010	1.3	1900	110	550	1.1	0.16	0.49
	Jun-16	0.12	0.012	0.13	1800	100	520	1.0	<0.050	0.40
	Jun-17	1.5	<0.033	-	1700	97	560	0.76	<0.015	0.6
	Jun-18	0.4	<0.010	0.4	1700	87	580	3.4	<0.015	0.62
MW31B	May-15	0.046	<0.010	0.046	1600	55	570	0.99	0.59	2.2
	Jun-16	<0.010	<0.010	<0.020	1700	59	520	1.0	0.13	0.38
	Jun-17	0.8	<0.033	-	1700	59	530	1.7	0.034	0.51
	Jun-18	0.14	<0.010	0.14	1900	61	530	2.6	<0.015	0.4
MW32B	May-15	<0.050	<0.050	<0.050	10,000	930	1100	0.91	1.3	3.5
	Jun-16	<0.050	<0.050	<0.020	11,000	1100	1100	0.97	1.5	2.6
	Jun-17	<0.22	<0.16	-	9800	950	1000	1.9	1.5	2.3
	Jun-18	0.14	0.073	0.22	11,000	1000	1000	1.1	1.1	2.0
MW33B	May-15	<0.010	<0.010	<0.010	3700	340	850	1.0	0.83	5.3
	Jun-16	<0.050	<0.050	<0.020	4000	440	920	1.0	0.78	2.6
	Jun-17	0.68	0.2	0.21	4100	490	1000	0.82	0.6	2.7
	Jun-18	0.097	0.056	0.15	4200	460	1000	1.3	0.44	2.3
15MW34B **Decommissioned July 2018**	Jun-16	0.014	<0.010	<0.020	1600	670	840	0.96	0.16	0.89
	Jun-17	<0.22	<0.16	<0.05	1600	690	890	1.6	0.069	0.85
	Jun-18	0.035	<0.010	0.035	1700	710	890	0.38	0.033	0.86

Table 4a - Field and Groundwater Analytical Results Summary - Surfical Material Wells

Parameter		Hydrocarbons							Organics			Volatile Organic Compounds			
		Benzene	Toluene	Ethylbenzene	Xylenes	Styrene	F1-BTEX (C6-C10)	F2 (>C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon	Methylene Chloride	Vinyl Chloride	TCE	PCE
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.005	0.024	0.0016	0.02	0.072	2.2	1.1	0.002	NG	NG	0.05	0.002	0.005	0.01
	Date														
MW24B **Decommissioned July 2018**	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	58	19	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	62	19	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	47	19	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	44	16	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	37	14	<0.0020	<0.00050	<0.00050	<0.00050
MW29B	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	150	17	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	41	15	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	45	18	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	76	14	<0.0020	<0.00050	<0.00050	<0.00050
MW30B	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	110	8.4	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	44	9.1	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	38	10	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	55	8	<0.0020	<0.00050	<0.00050	<0.00050
MW31B	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	0.12	<0.10	-	140	9	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	28	8.2	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	30	8.8	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.002	24	7.7	<0.0020	<0.00050	<0.00050	<0.00050
MW32B	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	210	18	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	78	15	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	74	17	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.0024	85	15	<0.0020	<0.00050	<0.00050	<0.00050
MW33B	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	280	45	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	140	44	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	150	49	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.0021	120	48	<0.0020	<0.00050	<0.00050	<0.00050
15MW34B **Decommissioned July 2018**	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	81	14	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	35	13	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.0028	35	13	<0.0020	<0.00050	<0.00050	<0.00050

Table 4a - Field and Groundwater Analytical Results Summary - Surfical Material Wells

Parameter		Dissolved Metals																
		Aluminum	**Antimony**	**Arsenic**	**Barium**	**Boron**	**Cadmium**	**Chromium**	**Copper**	**Iron**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Silver**	**Uranium**	**Zinc**
Monitoring Well	**Unit**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.007-0.050[5]	0.006	0.005	1	1.0	0.00004-0.00037[2]	NG	0.007	0.3	0.001-0.007[2]	0.05	0.000005	0.004-0.130[2]	0.001	0.0001	0.01	0.03
	Date																	
MW24B **Decommissioned July 2018**	May-14	-	<0.0060	-	<0.10	-	0.000064	<0.010	0.0042	*<0.60*	<0.0020	-	<0.0000050	0.06	-	-	-	<0.030
	May-15	<0.030	<0.0060	<0.0020	<0.010	0.24	<0.00020	<0.010	0.0036	<0.060	<0.0020	0.0041	<0.0000050	0.06	*<0.0020*	*<0.0010*	0.18	<0.030
	Jun-16	<0.0030	<0.00060	0.00085	<0.010	0.26	0.000047	<0.0010	0.0041	<0.060	<0.00020	<0.0040	0.0000029	0.071	0.00035	<0.00010	0.20	<0.0030
	Jun-17	0.0039	<0.00060	0.00071	<0.10	0.24	0.000029	<0.0010	0.0022	*<0.60*	<0.00020	<0.040	<0.0000020	0.068	0.00028	<0.00010	0.17	<0.0030
	Jun-18	<0.003	<0.00060	0.00065	<0.1	0.25	0.000034	<0.0010	0.0027	*<0.6*	<0.00020	<0.04	0.0000032	0.066	0.00029	<0.00010	0.14	<0.0030
MW29B	May-15	0.0041	0.0017	0.0077	<0.10	<0.20	0.00017	<0.0010	0.0019	*<0.60*	<0.00020	0.77	<0.0000050	0.048	0.001	<0.00010	0.019	0.014
	Jun-16	0.022	<0.00060	0.00054	0.019	0.20	0.000082	0.0014	0.0019	0.54	<0.00020	0.85	0.0000043	0.0099	<0.00020	<0.00010	0.0042	0.0051
	Jun-17	0.01	<0.00060	0.00031	<0.10	0.21	0.00006	<0.0010	0.00098	*<0.60*	<0.00020	0.88	<0.0000020	0.0075	<0.00020	<0.00010	0.0061	<0.0030
	Jun-18	0.0049	<0.00060	0.00035	<0.1	<0.2	0.000057	<0.0010	0.0009	*<0.6*	<0.00020	0.96	0.0000036	0.0075	0.0002	<0.00010	0.0049	<0.0030
MW30B	May-15	<0.030	<0.0060	0.0024	0.022	0.11	*<0.00020*	<0.010	0.0035	<0.060	<0.0020	0.068	<0.0000050	0.0053	*<0.0020*	*<0.0010*	0.0053	<0.030
	Jun-16	0.011	<0.00060	0.0010	0.022	0.14	<0.000020	0.0012	0.0024	<0.060	<0.00020	<0.0040	<0.0000020	0.0023	0.00024	<0.00010	0.0032	0.0064
	Jun-17	0.0039	<0.00060	0.00068	0.024	0.12	<0.000020	<0.0010	0.00083	<0.060	<0.00020	<0.004	<0.0000020	0.001	0.00046	<0.00010	0.0038	<0.0030
	Jun-18	<0.003	<0.00060	0.00068	0.019	0.12	<0.000020	<0.0010	0.00091	<0.06	<0.00020	<0.004	0.0000033	0.00098	0.0006	<0.00010	0.0024	<0.0030
MW31B	May-15	0.70	0.00095	0.0094	0.024	0.16	<0.000020	<0.0010	0.0022	0.75	0.00048	0.061	<0.0000050	0.0086	0.00064	<0.00010	0.0034	<0.0030
	Jun-16	0.084	<0.00060	0.0017	0.023	0.20	<0.000020	<0.0010	0.0022	0.26	<0.00020	0.041	0.0000027	0.0033	<0.00020	<0.00010	0.00099	0.0078
	Jun-17	0.011	<0.00060	0.0011	0.022	0.17	<0.000020	<0.0010	0.00027	<0.060	<0.00020	0.017	<0.0000020	0.00081	<0.00020	<0.00010	0.0012	<0.0030
	Jun-18	0.0038	<0.00060	0.0011	0.018	0.18	<0.000020	<0.0010	0.00064	<0.06	<0.00020	0.01	0.0000035	0.0008	<0.0002	<0.00010	0.0008	<0.0030
MW32B	May-15	0.0045	0.0016	0.012	<0.10	0.40	0.00011	<0.0010	0.0012	<0.60	<0.00020	0.68	<0.0000050	0.031	0.00079	<0.00010	0.0027	0.0055
	Jun-16	0.0038	<0.00060	0.0016	<0.10	0.48	0.00046	<0.0010	0.0036	<0.60	<0.00020	0.85	<0.0000020	0.013	0.00046	<0.00010	0.00085	0.0040
	Jun-17	0.016	<0.00060	0.00085	<0.10	0.46	0.000083	<0.0010	0.0022	<0.60	<0.00020	0.67	<0.0000020	0.0066	<0.00020	<0.00010	0.00084	<0.0030
	Jun-18	0.27	<0.00060	0.0011	<0.10	0.48	0.00014	<0.0010	0.001	<0.6	<0.00020	0.57	0.0000037	0.0089	0.00028	<0.00010	0.0006	<0.0030
MW33B	May-15	0.0056	0.0013	0.0065	0.038	0.23	<0.000020	<0.0010	0.00037	<0.060	<0.00020	0.19	<0.0000050	0.015	0.00064	<0.00010	0.0021	<0.0030
	Jun-16	0.060	<0.00060	0.0013	0.031	0.28	<0.000020	0.0020	0.0027	0.35	0.00024	0.24	0.00023	0.0096	0.00038	<0.00010	0.00016	0.0056
	Jun-17	0.0049	<0.00060	0.0014	<0.10	0.25	0.000044	<0.0010	0.0028	*<0.6*	<0.00020	0.25	0.0000076	0.011	0.00043	<0.00010	0.00026	<0.0030
	Jun-18	0.073	<0.00060	0.0021	0.025	0.27	0.00002	<0.0010	0.0012	<0.06	<0.00020	0.23	0.0000053	0.01	0.00048	<0.00010	0.00014	<0.0030
15MW34B **Decommissioned July 2018**	Jun-16	0.0064	<0.00060	0.00054	0.054	0.060	0.00010	<0.0010	0.0041	<0.060	<0.00020	0.11	0.0000025	0.0096	<0.00020	<0.00010	0.0050	0.0073
	Jun-17	<0.003	<0.00060	0.00034	0.052	0.06	0.000056	<0.0010	0.002	<0.06	<0.00020	0.053	<0.0000020	0.0057	<0.0002	<0.00010	0.0034	<0.0030
	Jun-18	0.0046	<0.00060	0.00036	0.051	0.066	0.00004	<0.0010	0.0033	<0.06	<0.00020	0.045	0.000003	0.0052	<0.0002	<0.00010	0.0038	0.0034

Notes

1. Alberta Environment and Parks (AEP). 2016. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 197 pp. Agricultural Land Use for fine-grained soils.
2. Guideline value based on hardness
3. Guideline value based on chloride
4. Guideline value based on pH and temperature
5. Guideline value based on pH

italic - laboratory detection limit greater than Tier 1 Guideline

Highlighted - value greater than Tier 1 Guideline

NG - no guideline

µS/cm - microSiemens per centimetre

PCE - perchloroethylene / tetrachloroethylene

TCE - trichloroethene / trichloroethylene

Blank - no data available

Table 4b - Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter		Field			Routine									
		pH	Electical Conductivity	Temperature	pH	Electical Conductivity	Calcium	Magnesium	Sodium	Potassium	Sulphate	Chloride	Bicarbonate	Carbonate
Monitoring Well	Unit	-	µS/cm	°C	-	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	6.5-8.5	1000	NG	6.5-8.5	1000	NG	NG	200	NG	128-429[2]	100	NG	NG
	Date													
MW1C	May-14	8.0	6100	6.7	8.08	5900	130	33	1300	4.8	3000	1.1	770	<0.50
	May-15	8.2	6420	6.6	7.98	6100	140	34	1400	6.6	2900	1.7	750	<0.50
	Jun-16	6.43	7540	8.1	8.18	6100	140	36	1300	6.9	2800	1.4	710	<0.50
	Jun-17	7.6	7270	9.7	8.23	6100	150	38	1400	7.1	2600	<1.0	760	<0.5
	Jun-18	8.0	6980	6.1	8.1	6100	140	37	1400	6.7	2700	<1.0	760	<1.0
MW5A **Decommissioned July 2018**	May-14	7.8	9710	6.0	8.18	9200	260	95	2400	10	5500	2.6	740	<0.50
	May-15	7.8	10,050	7.1	7.83	9500	250	100	2300	10	5500	2.4	730	<0.50
	Jun-16	6.15	12,740	-	8.00	9600	270	95	2100	11	5200	2.1	660	<0.50
	Jun-17	8.4	2050	8.2	7.99	9600	290	100	2200	10	4900	2.6	720	<0.50
	Jun-18	8.30	9100	9.3	7.85	9900	270	110	2400	12	5400	2.4	730	<1.0
MW8B	May-14	7.6	8960	4.0	8.37	8500	110	62	2300	5.4	4500	23	1100	18
	May-15	8.0	9280	6.6	7.95	8700	90	56	2200	6.2	4200	26	1100	<0.50
	Jun-16	7.73	8940	6.8	8.19	8700	97	54	2000	6.7	3900	28	1100	<0.50
	Jun-17	7.8	9250	5.8	8.17	8800	97	57	2100	6.7	3900	30	1100	<0.50
	Jun-18	7.50	8880	7.8	8.16	8400	88	52	2100	6.8	3800	38	1200	<1.0
MW11	May-14	7.5	10,020	6.2	8.19	9500	240	130	2300	7.6	5600	14	840	<0.50
	May-15	7.8	10,140	6.4	7.79	9500	210	110	2200	8.4	5100	20	900	<0.50
	Jun-16	7.61	9900	8.6	8.03	9600	230	120	2100	9.1	4800	32	930	<0.50
	Jun-17	7.7	9710	7.4	7.88	9100	200	120	2100	8.0	4500	37	1000	<0.50
	Jun-18	7.5	10,350	7.9	8.01	9800	240	130	2300	8.7	4600	36	1000	<1.0
MW12A	May-14	7.8	11,380	8.7	8.25	11,000	150	86	3000	10	6700	1.9	900	<0.50
	May-15	7.6	11,130	5.7	7.75	11,000	120	64	2600	10	5600	2.2	900	<0.50
	Jun-16	6.15	15,400	-	8.00	11,000	150	82	2600	11	6300	1.6	880	<0.50
	Jun-17	7.5	11,640	7.7	8.02	11,000	160	90	2800	10	5600	1.3	950	<0.50
	Jun-18	7.8	11,280	9.6	8.02	10,000	130	74	2600	11	4900	1.7	960	<1.0
MW14 **Decommissioned July 2018**	May-14	7.5	3810	5.6	8.14	3500	160	130	550	21	1300	2.7	1200	<0.50
	May-15	7.8	4300	7.0	7.78	4000	190	140	630	22	1500	1.7	1200	<0.50
	Jun-16	7.61	4730	8.5	8.05	4600	230	190	690	25	1900	1.6	1100	<0.50
	Jun-17	7.6	4800	7.4	7.90	4700	230	200	730	25	1900	1.5	1200	<0.5
	Jun-18	8.3	5260	8.3	8.00	5100	250	230	800	28	2200	1.4	1200	<1.0
MW23B	May-14	7.5	9800	9.9	8.06	9600	170	64	2400	11	5200	2.2	1100	<0.50
	May-15	7.8	9750	9.8	7.76	9700	170	62	2300	13	4900	2.6	1000	<0.50
	Jun-16	7.45	10170	10.3	7.89	9900	170	63	2400	12	4900	1.9	1100	<0.50
	Jun-17	7.3	9700	9.3	8.05	10,000	170	66	2400	12	4700	3.7	1100	<0.50
	Jun-18	7.7	10,680	8.0	7.95	10,000	170	68	2400	12	4800	3.2	1100	<1.0
MW25B	May-14	7.4	9910	7.2	8.12	9400	190	54	2300	11	5200	1.9	1100	<0.50
	May-15	7.8	10,020	8.2	7.85	9500	190	53	2200	12	4600	2.2	1000	<0.50
	Jun-16	7.56	9510	8.6	8.09	9500	190	51	2100	12	4500	2.5	970	<0.50
	Jun-17	7.4	9720	7.5	8.14	9500	190	54	2300	12	4100	2.3	1000	<0.5
	Jun-18	7.7	9200	7.6	7.85	9600	200	54	2400	13	4600	2.3	1000	<1.0

Table 4b - Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter		Nutrients									
		Hydroxide	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Dissolved Solids	Hardness	Alkalinity (total as CaCO3)	Ionic Balance	Ammonia-N	Total Kjeldahl Nitrogen
Monitoring Well	**Unit**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L
	AB Tier 1 Guideline[1]	NG	3	0.06-0.60[3]	100	500	NG	NG	NG	0.035-125[4]	NG
	Date										
MW1C	May-14	-	0.093	-	-	4800	-	-	-	0.57	1.2
	May-15	<0.50	0.080	<0.010	0.080	4800	490	620	0.99	0.60	1.2
	Jun-16	<0.50	0.22	0.018	0.23	4700	510	580	0.96	0.46	0.58
	Jun-17	<0.5	0.41	0.28	-	4600	530	620	3.8	0.7	1.1
	Jun-18	<1.0	0.15	<0.010	0.15	4700	510	620	0.72	0.56	1.1
MW5A **Decommissioned July 2018**	May-14	-	0.3	-	-	8600	-	-	-	0.52	1.6
	May-15	<0.50	0.058	0.031	0.089	8500	1000	600	0.96	1.0	2.2
	Jun-16	<0.50	0.20	0.069	0.27	8000	1100	540	0.93	0.67	1.3
	Jun-17	<0.5	1.7	1.1	0.71	7900	1200	590	3.2	0.22	1.2
	Jun-18	<1.0	0.21	0.1	0.31	8600	1100	600	1.4	0.91	1.7
MW8B	May-14	-	0.074	-	-	7600	-	-	-	0.57	1.4
	May-15	<0.50	0.12	<0.010	0.12	7100	460	910	1.0	0.69	1.6
	Jun-16	<0.50	0.10	<0.050	0.10	6600	460	870	0.97	0.62	1.3
	Jun-17	<0.5	1.5	<0.16	0.35	6800	480	940	0.098	0.38	1.3
	Jun-18	<1.0	0.17	0.03	0.2	6700	430	1000	0.79	0.49	1.4
MW11	May-14	-	0.27	-	-	8800	-	-	-	0.14	1.7
	May-15	<0.50	0.19	<0.010	0.19	8200	980	740	0.96	0.17	1.7
	Jun-16	<0.50	0.23	0.015	0.25	7800	1100	770	0.97	0.15	0.81
	Jun-17	<0.5	0.71	<0.16	-	7500	980	850	0.26	0.086	1.5
	Jun-18	<1.0	0.33	<0.01	0.33	7800	1100	830	3.8	0.063	1.7
MW12A	May-14	-	0.11	-	-	10,000	-	-	-	0.26	0.89
	May-15	<0.50	0.082	0.05	0.13	8900	580	730	0.96	0.38	1.3
	Jun-16	<0.50	0.082	0.04	0.12	9600	710	720	0.89	0.21	0.45
	Jun-17	<0.5	0.87	<0.16	0.20	9200	770	780	2.1	0.067	0.7
	Jun-18	<1.0	0.18	0.054	0.23	8200	630	790	3.9	0.11	0.8
MW14 **Decommissioned July 2018**	May-14	-	0.09	-	-	2700	-	-	-	0.37	1.1
	May-15	<0.50	0.091	0.015	0.11	3100	1000	1000	0.95	0.53	1.1
	Jun-16	<0.50	0.19	0.025	0.22	3600	1400	940	1.0	0.35	0.91
	Jun-17	<0.5	7.8	0.29	-	3700	1400	990	0.14	0.2	0.8
	Jun-18	<1.0	0.19	0.026	0.22	4100	1600	1000	0.13	0.43	1.1
MW23B	May-14	-	0.36	-	-	8400	-	-	-	0.18	0.56
	May-15	<0.50	0.072	0.015	0.087	7900	670	860	0.94	0.42	0.76
	Jun-16	<0.50	0.32	<0.010	0.32	8000	670	860	0.98	<0.050	0.46
	Jun-17	<0.5	0.85	<0.16	-	7900	690	870	1.3	0.39	0.67
	Jun-18	<1.0	0.068	<0.01	0.068	8000	710	860	1.2	0.33	0.71
MW25B	May-14	-	0.42	-	-	8300	-	-	-	0.59	0.84
	May-15	<0.50	0.77	0.016	0.78	7600	690	850	0.97	0.29	0.86
	Jun-16	<0.50	0.62	0.019	0.64	7300	680	790	0.95	0.58	1.2
	Jun-17	<0.5	2.5	<0.16	-	7100	700	840	6.0	0.44	0.87
	Jun-18	<1.0	0.6	0.05	0.65	7800	710	840	2.2	<0.015	0.55

Table 4b - Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter		Hydrocarbons							Organics			Volatile Organic Compounds			
		Benzene	Toluene	Ethylbenzene	Xylenes	Styrene	F1-BTEX (C6-C10)	F2 (>C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon	Methylene Chloride	Vinyl Chloride	TCE	PCE
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.005	0.024	0.0016	0.02	0.072	2.2	1.1	0.002	NG	NG	0.05	0.002	0.005	0.01
	Date														
MW1C	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	39	9.6	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	42	11	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	51	11	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.0008	-	<0.10	<0.10	-	28	10	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.002	30	11	<0.0020	<0.00050	<0.00050	<0.00050
MW5A **Decommissioned July 2018**	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	63	21	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	71	28	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	64	24	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	59	24	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.002	62	22	<0.0020	<0.00050	<0.00050	<0.00050
MW8B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	39	13	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	48	14	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	47	15	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	44	16	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	0.002	44	15	<0.0020	<0.00050	<0.00050	<0.00050
MW11	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	96	29	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	100	34	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	100	36	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	84	31	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	0.0024	98	36	<0.0020	<0.00050	<0.00050	<0.00050
MW12A	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	41	15	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	68	16	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	48	17	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	40	16	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	0.002	53	17	<0.0020	<0.00050	<0.00050	<0.00050
MW14 **Decommissioned July 2018**	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	37	8.6	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	34	9.6	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	34	11	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	25	8.2	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.002	37	11	<0.0020	<0.00050	<0.00050	<0.00050
MW23B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	47	5.8	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	23	7.4	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	22	5.5	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	22	9.5	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.002	28	6.6	<0.0020	<0.00050	<0.00050	<0.00050
MW25B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	35	9	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	29	9.9	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	30	10	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.0008	-	<0.10	<0.10	-	27	12	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.002	27	10	<0.0020	<0.00050	<0.00050	<0.00050

Table 4b - Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter		Dissolved Metals															
		Aluminum	Antimony	Arsenic	Barium	Boron	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Uranium	Zinc
Monitoring Well	**Unit**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.007-0.050[5]	0.006	0.005	1	1.0	0.00004-0.00037[2]	NG	0.007	0.3	0.001-0.007[2]	0.05	0.000005	0.004-0.130[2]	0.001	0.0001	0.01	0.03
	Date																	
MW1C	May-14	-	<0.0060	-	<0.10	-	<0.000050	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.0060	<0.0020	0.025	0.24	<0.00020	<0.010	<0.0020	<0.060	<0.0020	0.27	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	<0.0010	<0.030
	Jun-16	0.0079	<0.00060	0.0011	0.023	0.24	0.000036	<0.0010	0.00070	<0.060	<0.00020	0.28	<0.0000020	0.0021	<0.00020	<0.00010	0.00036	0.0037
	Jun-17	0.0069	<0.00061	0.00068	<0.1	0.24	<0.00002	<0.0010	0.00039	*<0.6*	<0.0002	0.28	<0.000002	0.0013	<0.00020	<0.00010	0.00022	<0.003
	Jun-18	<0.0030	<0.00062	0.00068	<0.10	0.24	<0.000020	<0.0010	0.00043	*<0.60*	<0.00020	0.27	<0.0000020	0.0016	<0.00020	<0.00010	0.00018	<0.0030
MW5A **Decommissioned July 2018**	May-14	-	<0.00063	-	<0.10	-	<0.000050	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.00064	<0.0020	<0.10	0.60	<0.00020	<0.010	<0.0020	*<0.60*	<0.0020	0.15	<0.0000050	0.0065	*<0.0020*	*<0.0010*	<0.0010	<0.030
	Jun-16	<0.0030	<0.00065	0.00058	<0.010	0.56	<0.000020	<0.0010	0.0057	<0.060	<0.00020	0.15	<0.0000020	0.0086	<0.00020	<0.00010	0.00031	0.0033
	Jun-17	0.016	<0.00066	0.00047	<0.10	0.57	<0.000020	<0.0010	0.0008	*<0.60*	<0.00020	0.69	<0.0000020	0.0045	<0.00020	<0.0001	0.00046	<0.0030
	Jun-18	0.0044	<0.00067	0.00064	<0.10	0.58	<0.000020	<0.0010	0.0026	*<0.60*	<0.00020	0.15	0.0000027	0.0024	0.00020	<0.00010	0.00039	<0.0030
MW8B	May-14	-	<0.00068	-	<0.10	-	<0.000050	<0.010	0.0031	*<0.60*	<0.0020	-	<0.0000050	0.006	-	-	-	<0.030
	May-15	<0.030	<0.00069	0.0021	<0.10	0.41	<0.00020	<0.010	<0.0020	*<0.60*	<0.0020	0.18	<0.0000050	<0.0050	<0.0020	<0.0010	0.0022	<0.030
	Jun-16	0.0050	<0.00070	0.0015	0.013	0.41	0.00003	<0.0010	0.00034	<0.060	<0.00020	0.18	<0.0000020	0.0035	<0.00020	<0.00010	0.0024	<0.0030
	Jun-17	0.0600	<0.00071	0.0013	<0.10	0.40	<0.000020	<0.0010	0.00039	*<0.60*	<0.00020	0.180	<0.0000020	0.0027	0.00025	<0.00010	0.0022	<0.0030
	Jun-18	0.0045	<0.00072	0.0012	<0.10	0.41	0.000021	<0.0010	0.001	*<0.60*	<0.00020	0.15	0.0000041	0.0029	<0.00020	<0.00010	0.0018	<0.0030
MW11	May-14	-	<0.00073	-	<0.10	-	<0.000050	<0.010	0.0024	*<0.60*	<0.0020	-	<0.0000050	0.006	-	-	-	<0.030
	May-15	<0.030	<0.00074	<0.0020	<0.010	0.19	<0.00020	<0.010	<0.0020	<0.060	<0.0020	0.015	<0.0000050	0.0058	<0.0020	<0.0010	0.024	<0.030
	Jun-16	0.0060	<0.00075	0.0011	<0.010	0.20	0.000024	0.0011	0.0025	<0.060	<0.00020	0.0081	0.0000022	0.0060	0.0011	<0.00010	0.030	0.0077
	Jun-17	<0.0030	<0.00076	0.0011	<0.10	<0.20	0.000029	<0.0010	0.0025	*<0.60*	<0.00020	<0.040	<0.0000020	0.0055	0.00079	<0.00010	0.030	0.0044
	Jun-18	0.0055	<0.00077	0.0011	<0.10	0.21	<0.000020	0.0011	0.0026	*<0.60*	<0.00020	<0.040	<0.0000020	0.0056	0.00095	<0.00010	0.030	<0.0030
MW12A	May-14	-	<0.00078	-	<0.10	-	<0.000050	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	0.19	<0.012	<0.0040	<0.010	0.44	<0.00040	<0.020	<0.0040	0.75	<0.0040	0.087	<0.0000050	<0.010	*<0.0040*	*<0.0020*	<0.0020	*<0.060*
	Jun-16	0.0087	<0.00060	0.00097	<0.010	0.42	0.000042	<0.0010	0.0028	<0.060	0.00022	0.055	<0.0000020	0.0035	0.00023	<0.00010	0.0021	0.010
	Jun-17	<0.0030	<0.00061	0.00078	<0.10	0.46	0.000022	<0.0010	0.00074	*<0.60*	<0.00020	<0.040	<0.0000020	0.007	<0.00020	<0.00010	0.0023	0.0042
	Jun-18	<0.0030	<0.00062	0.00054	<0.10	0.44	<0.000020	<0.0010	0.0019	*<0.60*	<0.00020	<0.040	<0.0000020	0.0034	<0.00020	<0.00010	0.0013	0.0050
MW14 **Decommissioned July 2018**	May-14	-	<0.00063	-	0.066	-	0.000030	<0.0010	0.00087	<0.060	<0.00020	-	<0.0000050	0.0044	-	-	-	0.0059
	May-15	<0.0030	<0.00064	0.00077	0.052	0.12	<0.000020	<0.0010	<0.00020	<0.060	<0.00020	0.62	<0.0000050	0.0033	<0.00020	<0.00010	0.0008	<0.0030
	Jun-16	<0.0030	<0.00065	0.00069	0.042	0.13	0.000025	<0.0010	0.00045	<0.060	<0.00020	0.63	<0.0000020	0.0031	<0.00020	<0.00010	0.0011	<0.0030
	Jun-17	<0.0030	<0.00066	0.00054	0.040	0.14	0.000029	<0.0010	0.00084	<0.060	<0.00020	0.57	<0.0000020	0.0031	<0.00020	<0.00010	0.00075	<0.003
	Jun-18	<0.003	<0.00067	0.00053	0.033	0.12	0.000027	<0.0010	0.0008	<0.060	<0.00020	0.42	<0.0000020	0.0028	<0.00020	<0.00010	0.00051	<0.003
MW23B	May-14	-	<0.00068	-	<0.10	-	0.00005	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.00069	<0.0020	<0.10	0.35	<0.00020	<0.010	<0.0020	*<0.60*	<0.0020	0.14	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	0.0023	<0.030
	Jun-16	0.0081	<0.00070	0.00024	<0.10	0.40	0.00028	<0.0010	0.0013	*<0.60*	<0.00020	0.065	<0.0000020	0.0028	<0.00020	<0.00010	0.0020	0.0039
	Jun-17	<0.0030	<0.00071	0.0003	<0.10	0.36	0.000047	<0.0010	<0.00020	*<0.60*	<0.00020	0.12	<0.0000020	0.0012	<0.00020	<0.00010	0.0035	<0.0030
	Jun-18	<0.003	<0.00072	0.00022	<0.10	0.35	0.000035	<0.0010	0.0003	*<0.60*	<0.0002	0.12	<0.0000020	0.0013	<0.00020	<0.00010	0.0032	<0.0030
MW25B	May-14	-	<0.00073	-	<0.10	-	0.00021	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.00074	<0.0020	<0.10	0.46	<0.00020	<0.010	<0.0020	*<0.60*	<0.0020	0.17	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	<0.0010	<0.030
	Jun-16	0.0084	<0.00075	0.00055	0.011	0.46	<0.000020	0.0016	0.00081	<0.060	<0.00020	0.18	<0.0000020	0.0031	<0.00020	<0.00010	0.00033	<0.0030
	Jun-17	0.0053	<0.00076	0.00047	<0.10	0.47	<0.00002	<0.0010	0.00041	*<0.60*	<0.0002	0.21	<0.0000020	0.0028	<0.00020	<0.00010	0.00028	<0.0030
	Jun-18	<0.003	<0.00077	0.00041	<0.10	0.48	<0.00002	<0.0010	0.00096	*<0.60*	<0.0002	0.18	<0.0000020	0.0025	<0.00020	<0.00010	0.00027	<0.0030

Table 4b - Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter		Field			Routine									
		pH	Electical Conductivity	Temperature	pH	Electical Conductivity	Calcium	Magnesium	Sodium	Potassium	Sulphate	Chloride	Bicarbonate	Carbonate
Monitoring Well	Unit	-	µS/cm	°C	-	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	6.5-8.5	1000	NG	6.5-8.5	1000	NG	NG	200	NG	128-429[2]	100	NG	NG
	Date													
MW26B	May-14	7.7	5280	5.8	8.09	6100	73	36	1400	5.0	3000	1.7	960	<0.50
	May-15	7.5	7450	9.1	7.93	7100	100	56	1600	8.3	3300	3.5	1000	<0.50
	Jun-16	7.63	6450	8.9	8.15	7400	110	58	1600	7.7	3400	3.9	990	<0.50
	Jun-17	7.4	7810	5.9	8.19	7600	120	66	1800	7.5	3200	4.5	1000	<0.5
	Jun-18	6.85	6850	6.7	8.12	7400	120	67	1800	8.0	3300	5.6	1100	<1.0
MW27B	May-14	7.5	11,560	9.8	8.14	11,000	130	110	2800	9.2	6100	40	1700	<0.50
	May-15	8.1	11,530	9.1	7.97	11,000	130	100	2700	11	5100	35	1700	<0.50
	Jun-16	7.74	11,530	7.8	8.19	11,000	140	100	2700	11	5300	42	1600	<0.50
	Jun-17	7.6	11,410	8.3	8.10	12,000	140	130	3100	11	5100	51	1900	<0.50
	Jun-18	7.40	12,540	6.9	7.96	12,000	150	110	3100	11	5400	49	1800	<1.0
MW28B	May-14	7.4	12,780	6.5	8.08	12,000	230	89	3200	11	6900	37	1100	<0.50
	May-15	7.8	13,020	7.2	7.90	12,000	220	95	3000	13	6500	35	1100	<0.50
	Jun-16	7.58	12,860	7.8	8.14	13,000	210	93	2800	13	6700	33	1000	<0.50
	Jun-17	7.5	12,890	6.2	8.08	12,000	220	100	3200	12	5700	30	1100	<0.50
	Jun-18	7.30	13570	7.4	7.86	13,000	230	110	3300	12	6500	28	1000	<1.0
MW29A	Jun-15	8.5	4740	6.7	8.28	4900	72	9.9	1200	7.4	2000	7.3	680	<0.50
	Jun-16	8.15	3440	7.0	8.41	3400	33	5.1	810	4.1	1200	3.3	710	7.7
	Jun-17	8.1	3740	6.5	8.34	3400	32	5.2	810	4.1	1100	3.6	760	3.0
	Jun-18	7.48	3440	8.4	8.33	3400	30	4.8	850	3.8	1100	3.2	770	4.2
MW30A	Jun-15	8.5	2400	7.5	8.34	2300	16	2.2	540	2.9	510	5.3	770	3.5
	Jun-16	8.29	2320	8.7	8.37	2200	12	1.6	540	2.4	510	3.0	780	5.3
	Jun-17	8.2	2020	7.0	8.57	1900	8.9	1.4	460	2.2	360	1.3	770	17
	Jun-18	7.98	1932	8.4	8.44	1900	7.9	1.3	450	2.1	350	1.5	770	12
MW31A	Jun-15	8.6	1980	10.5	8.57	1900	7.8	3.1	420	3.2	220	12	920	22
	Jun-16	8.53	1720	9.5	8.53	1800	4.5	<2.0	430	<3.0	120	6.7	940	18
	Jun-17	-	-	-	8.57	1700	4.9 *	0.52 *	470	1.9 *	76	5.2	1000	23
	Jun-18	8.03	1796	13.8	8.48	1700	4.9	0.51	440	1.6	67	11	1100	19
MW33A	May-15	8.6	2540	6.9	8.32	3300	35	10	930	5.8	860	28	1100	2.6
	Jun-16	8.66	2010	7.0	8.52	2100	7.4	1.4	480	2.2	230	27	990	16
	Jun-17	-	-	-	8.52	1800	4.7	0.7	390	1.4	130	24	990	18
	Jun-18	8.97	2370	10.9	8.57	1800	6.4	0.81	460	2	75	28	1100	30
15MW35B	Jun-16	7.83	8080	7.6	8.16	7700	99	14	1800	7.8	3700	5.2	790	<0.50
	Jun-17	7.8	7270	8.0	8.22	7600	98	14	1800	8.6	3300	6.8	780	<0.50
	Jun-18	7.05	8530	7.1	8.12	7700	110	15	2000	8.4	3500	6.3	830	<1.0

Table 4b - Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter		Nutrients									
		Hydroxide	Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Dissolved Solids	Hardness	Alkalinity (total as CaCO3)	Ionic Balance	Ammonia-N	Total Kjeldahl Nitrogen
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L
	AB Tier 1 Guideline[1]	NG	3	0.06-0.60[3]	100	500	NG	NG	NG	0.035-125[4]	NG
	Date										
MW26B	May-14	n/a	0.052	-	-	4900	-	-	-	0.52	0.89
	May-15	<0.50	0.23	0.039	0.27	5600	490	830	0.95	0.43	0.86
	Jun-16	<0.50	0.19	0.036	0.23	5600	500	810	0.91	0.43	0.73
	Jun-17	<0.5	0.42	<0.16	-	5700	570	860	3.1	0.66	0.99
	Jun-18	<1.0	0.09	0.012	0.1	5800	560	860	3.7	0.49	1.1
MW27B	May-14	-	0.29	-	-	10,000	-	-	-	0.51	1.5
	May-15	<0.50	1.1	0.01	1.1	9000	740	1400	0.99	0.15	1.0
	Jun-16	<0.50	0.91	0.014	0.92	9100	770	1300	0.97	0.42	0.55
	Jun-17	<0.5	1.5	0.21	-	9400	860	1500	4.4	0.67	1.4
	Jun-18	<1.0	1.0	<0.01	1.0	9700	830	1500	2.5	0.16	1.1
MW28B	May-14	-	0.075	-	-	11,000	-	-	-	1.6	2.5
	May-15	<0.50	0.24	0.094	0.34	10,000	940	900	0.95	1.2	2.0
	Jun-16	<0.50	0.31	0.038	0.35	10,000	920	840	0.91	1.4	2.1
	Jun-17	<0.50	<0.22	0.38	-	9700	960	870	7.3	1.6	2.1
	Jun-18	<1.0	0.39	0.043	0.43	11,000	1000	860	3.5	1.1	1.7
MW29A	Jun-15	<0.50	0.054	0.084	0.14	3600	220	560	1.0	4.3	16
	Jun-16	<0.50	0.063	0.014	0.077	2400	100	590	1.0	1.2	1.3
	Jun-17	<0.50	0.33	1.1	-	2400	100	630	2	1.4	1.6
	Jun-18	<1.0	0.32	0.026	0.35	2400	95	640	3.6	0.9	1.3
MW30A	Jun-15	<0.50	0.013	<0.033	0.023	1500	48	640	1.0	0.78	2.6
	Jun-16	<0.50	0.16	0.046	0.21	1500	36	650	1.0	0.42	1.1
	Jun-17	<0.5	0.19	0.081	-	1200	28	660	0.27	0.46	0.8
	Jun-18	<1.0	0.1	<0.01	0.1	1200	25	650	0.61	0.39	0.75
MW31A	Jun-15	<0.50	0.017	0.013	0.03	1100	32	790	0.94	1.1	5.2
	Jun-16	<0.50	2.0	0.028	2.0	1000	11	800	1.0	1.1	1.0
	Jun-17	<0.50	14	0.077	3.2	1100	15	880	3.2	1.2	7.4
	Jun-18	<1.0	1.5	<0.01	1.5	1100	15	900	2.0	0.52	1.9
MW33A	May-15	<0.50	<0.010	<0.010	<0.010	2400	130	870	1.2	1.3	8.0
	Jun-16	<0.50	<0.010	<0.010	<0.020	1200	24	840	0.96	0.89	2.6
	Jun-17	<0.50	<0.044	<0.033	<0.010	1100	15	840	7.7	0.79	2.4
	Jun-18	<1.0	0.021	<0.01	0.021	1100	19	930	0.47	0.70	1.5
15MW35B	Jun-16	<0.50	0.42	<0.010	0.42	6000	300	650	0.95	1.9	2.7
	Jun-17	<0.50	2.5	<0.16	-	5700	300	640	2.3	2.0	2.5
	Jun-18	<1.0	0.76	<0.01	0.76	6000	330	680	2.8	1.3	2.0

Table 4b - Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter		Hydrocarbons							Organics			Volatile Organic Compounds			
		Benzene	Toluene	Ethylbenzene	Xylenes	Styrene	F1-BTEX (C6-C10)	F2 (>C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon	Methylene Chloride	Vinyl Chloride	TCE	PCE
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.005	0.024	0.0016	0.02	0.072	2.2	1.1	0.002	NG	NG	0.05	0.002	0.005	0.01
	Date														
MW26B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	49	7.3	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	24	9.0	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	35	10	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	28	12	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.002	29	9.6	<0.0020	<0.00050	<0.00050	<0.00050
MW27B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	64	13	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	35	13	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	37	15	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	43	18	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	0.0024	43	13	<0.0020	<0.00050	<0.00050	<0.00050
MW28B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	61	15	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	45	16	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	48	17	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	35	17	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.002	37	14	<0.0020	<0.00050	<0.00050	<0.00050
MW29A	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	1100	13	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	55	8.3	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	25	9.1	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.0020	22	7.7	<0.0020	<0.00050	<0.00050	<0.00050
MW30A	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	130	15	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	43	9.9	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	23	7.8	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.0020	57	7.1	<0.0020	<0.00050	<0.00050	<0.00050
MW31A	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	560	19	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	380	17	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	300	-	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.0020	140	11	<0.0020	<0.00050	<0.00050	<0.00050
MW33A	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	460	39	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	140	33	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	130	25	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.0020	110	26	<0.0020	<0.00050	<0.00050	<0.00050
15MW35B	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	37	8.2	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	66	12	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.0005	<0.10	<0.10	<0.0020	33	10	<0.0020	<0.00050	<0.00050	<0.00050

Table 4b - Field and Groundwater Analytical Results Summary - Upper Sandstone Wells

Parameter		Dissolved Metals															
		Aluminum	Antimony	Arsenic	Barium	Boron	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Uranium	Zinc
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.007-0.050[5]	0.006	0.005	1	1.0	0.00004-0.00037[2]	NG	0.007	0.3	0.001-0.007[2]	0.05	0.000005	0.004-0.130[2]	0.001	0.0001	0.01	0.03
	Date																	
MW26B	May-14	-	<0.00078	-	0.010	-	<0.000050	<0.010	<0.0020	<0.060	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.00079	<0.0020	<0.10	0.30	<0.00020	<0.010	<0.0020	*<0.60*	<0.0020	0.20	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	0.0010	<0.030
	Jun-16	0.0095	<0.00080	0.00081	0.010	0.32	<0.000020	0.0017	0.0014	<0.060	<0.00020	0.20	0.0000040	0.0029	<0.00020	<0.00010	0.0012	0.0084
	Jun-17	0.0072	<0.00081	0.00077	<0.10	0.29	<0.00002	<0.0010	0.00039	*<0.60*	<0.0002	0.22	<0.0000020	0.0013	<0.0002	<0.0001	0.00082	<0.0030
	Jun-18	<0.003	<0.00082	0.00056	<0.10	0.3	<0.00002	<0.0010	0.00071	*<0.60*	<0.0002	0.20	0.0000026	0.0019	0.00020	<0.00010	0.00094	<0.0030
MW27B	May-14	-	<0.012	-	<0.10	-	<0.0001	<0.020	<0.0040	*<0.60*	<0.0040	-	<0.0000050	<0.010	-	-	-	*<0.060*
	May-15	*<0.060*	<0.012	<0.0040	<0.10	0.42	*<0.00040*	<0.020	<0.0040	*<0.60*	<0.0040	0.052	<0.0000050	<0.010	<0.0040	*<0.0020*	0.0021	*<0.060*
	Jun-16	0.0056	<0.00060	0.0020	<0.010	0.43	0.00004	0.0011	0.0010	<0.060	<0.00020	0.052	<0.0000020	0.0077	0.00039	<0.00010	0.0025	0.0048
	Jun-17	0.01	<0.00060	0.0019	<0.10	0.46	0.000022	<0.0010	<0.00020	*<0.60*	<0.00020	0.062	<0.0000020	0.0051	0.00020	<0.00010	0.0034	<0.0030
	Jun-18	0.0031	<0.00060	0.0018	<0.10	0.45	0.000027	<0.0010	0.00067	*<0.60*	<0.00020	0.053	0.0000035	0.0050	0.00033	<0.00010	0.0021	<0.0030
MW28B	May-14	-	<0.012	-	<0.10	-	<0.00010	<0.020	<0.0040	*<0.60*	<0.0040	-	<0.0000050	<0.010	-	-	-	*<0.060*
	May-15	<0.060	<0.012	<0.0040	<0.10	0.44	<0.00040	<0.020	<0.0040	*<0.60*	<0.0040	0.27	<0.0000050	<0.010	*<0.0040*	*<0.0020*	<0.0020	*<0.060*
	Jun-16	0.011	<0.00060	0.00044	0.010	0.45	0.000034	0.0012	0.0015	<0.060	<0.00020	0.25	<0.0000020	0.0049	<0.00020	<0.00010	0.00062	0.0052
	Jun-17	0.0039	<0.00060	0.0004	<0.10	0.44	0.000022	<0.0010	0.00033	*<0.60*	<0.00020	0.25	<0.0000020	0.0038	<0.00020	<0.0001	0.00054	<0.0030
	Jun-18	<0.003	<0.00060	0.00038	<0.10	0.44	0.000024	<0.0010	0.00064	*<0.60*	<0.00020	0.25	0.0000022	0.0034	<0.00020	<0.0001	0.00047	<0.0030
MW29A	Jun-15	0.0048	0.0012	0.0030	0.021	0.50	<0.000020	<0.0010	0.0012	<0.060	<0.00020	0.081	<0.0000050	0.0036	0.00039	<0.00010	0.0093	<0.0030
	Jun-16	0.0067	<0.00060	0.0011	0.015	0.75	<0.000020	<0.0010	0.0020	<0.060	<0.00020	0.064	<0.0000020	0.0020	0.00022	<0.00010	0.0006	<0.0030
	Jun-17	0.0079	0.23	0.00093	0.018	0.74	<0.000020	<0.0010	0.00093	<0.060	<0.00020	0.06	<0.000002	0.0014	0.00027	<0.00010	0.00055	<0.0030
	Jun-18	0.0042	<0.0006	0.00076	0.014	0.72	<0.000020	<0.0010	0.00098	<0.060	<0.00020	0.051	0.0000028	0.0011	0.00023	<0.00010	0.00043	<0.0030
MW30A	Jun-15	1.0	0.00080	0.0037	0.028	0.43	0.000040	0.0016	0.0056	0.44	0.00077	0.081	<0.0000050	0.013	0.0012	<0.00010	0.0063	0.0034
	Jun-16	3.8	<0.00060	0.0030	0.025	0.52	0.000026	0.0045	0.0075	0.63	0.00054	0.059	<0.0000020	0.010	0.00064	<0.00010	0.0035	0.0037
	Jun-17	0.011	<0.00060	0.00089	0.015	0.40	<0.000020	<0.0010	0.00034	<0.06	<0.00020	0.018	<0.0000020	0.0023	<0.00020	<0.00010	0.00018	<0.0030
	Jun-18	0.0059	<0.00060	0.00077	0.013	0.38	<0.000020	<0.0010	0.00057	<0.06	<0.00020	0.016	0.0000025	0.00065	<0.00020	<0.00010	0.00017	<0.0030
MW31A	Jun-15	1.5	0.0013	0.0069	0.097	0.58	0.000048	0.0017	0.0093	9.0	0.0021	0.068	0.000008	0.020	0.0013	<0.00010	0.0095	0.0051
	Jun-16	0.31	<0.00060	0.00088	<0.10	0.66	*<0.000020*	<0.0010	0.00093	*<0.60*	0.00043	<0.040	0.000043	0.0026	<0.00020	<0.00010	0.00054	<0.0030
	Jun-17	0.55 *	0.00077 *	0.0042 *	0.085 *	0.74 *	0.000025 *	<0.0010 *	0.0046 *	0.18 *	0.00043 *	0.036 *	<0.0000020 *	0.012 *	0.00078 *	<0.00010 *	0.0041 *	<0.0030 *
	Jun-18	0.097	0.00065	0.0035	0.05	0.76	<0.000020	<0.0010	0.0021	0.074	<0.0002	<0.004	0.0000051	0.0033	0.00051	<0.00010	0.0039	<0.0030
MW33A	May-15	0.0044	0.00076	0.0089	0.070	0.50	<0.000020	<0.0010	0.0017	<0.060	<0.00020	0.13	<0.0000050	0.016	0.00058	<0.00010	0.0096	<0.0030
	Jun-16	0.66	<0.00060	0.0042	0.080	0.71	<0.000020	<0.0010	0.028	0.60	0.00094	0.058	*<0.0000060*	0.0083	<0.00020	<0.00010	0.0035	<0.0030
	Jun-17	0.005	<0.00060	0.0018	0.053	0.68	<0.000020	<0.0010	<0.00020	<0.060	<0.00020	0.027	<0.0000020	0.0022	<0.00020	<0.0001	0.0012	<0.0030
	Jun-18	0.22	<0.00060	0.0056	0.11	0.82	<0.000020	<0.0010	0.0012	1.2	0.00073	0.081	0.000016	0.009	0.00028	<0.00010	0.0013	0.0040
15MW35B	Jun-16	0.012	0.00069	0.0019	<0.10	0.70	<0.000020	<0.0010	0.0018	<0.60	<0.00020	0.066	<0.0000020	0.0041	0.00082	<0.00010	0.0023	<0.0030
	Jun-17	0.0035	<0.00060	0.0014	<0.10	0.71	0.000022	<0.0010	0.0032	<0.60	<0.00020	0.074	<0.0000020	0.0036	0.00053	<0.00010	0.0015	<0.0030
	Jun-18	0.0047	<0.00060	0.0011	<0.10	0.82	<0.000020	<0.0010	0.0016	*<0.60*	<0.00020	0.049	0.0000027	0.0028	0.00034	<0.00010	0.0010	<0.0030

Notes

1. Alberta Environment and Parks (AEP). 2016. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 197 pp. Agricultural Land Use for fine-grained soils.
2. Guideline value based on hardness
3. Guideline value based on chloride
4. Guideline value based on pH and temperature
5. Guideline value based on pH

italic - laboratory detection limit greater than Tier 1 Guideline
Highlighted - value greater than Tier 1 Guideline
NG - no guideline
µS/cm - microSiemens per centimetre
PCE - perchloroethylene / tetrachloroethylene
TCE - trichloroethene / trichloroethylene
-' - no data available
Blank - no data available

Table 4c - Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter		Field			Routine										
		pH	Electical Conductivity	Temperature	pH	Electical Conductivity	Calcium	Magnesium	Sodium	Potassium	Sulphate	Chloride	Bicarbonate	Carbonate	Hydroxide
Monitoring Well	Unit	-	µS/cm	°C	-	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	6.5-8.5	1000	NG	6.5-8.5	1000	NG	NG	200	NG	128-429[2]	100	NG	NG	NG
	Date														
MW1B	Jun-14	9.9	2950	7.5	8.05	2800	12	1.7	740	2.5	680	5.1	1100	<0.50	-
	May-15	8.4	3050	8.3	8.24	2900	12	1.6	740	2.4	680	6.1	1100	<0.50	<0.50
	Jun-16	6.33	3670	-	8.44	2700	10	1.3	680	2.1	540	6.1	1100	13	<0.50
	Jun-17	-	-	-	8.54	2900	12	1.6	670	2.2	610	6.2	1000	21	<0.50
	Jun-18	-	-	-	8.29	2500	9.1	1.1	620	2.2	390	9.6	1100	<1.0	<1.0
MW5B Decommissioned July 2018	May-14	8.3	2430	10.0	8.56	2700	23	11	570	3.7	630	30	950	36	-
	May-15	8.3	2890	9.3	8.28	2700	13	16	600	3.6	600	24	1000	<0.50	<0.50
	Jun-16	-	-	-	8.34	3000	13	3.2	750	4.2	650	16	1200	5	<0.50
	Jun-17	-	-	-	9.09	2300	8.2	3.4	520	13	440	17	790	80	<0.50
	Jun-18	-	-	-	8.33	2900	11	3.8	720	6	620	12	1200	7.1	<1.0
MW8A	May-14	8.5	2560	5.4	8.67	2400	7.7	1.7	610	2.2	300	8.0	1300	49	-
	May-15	8.5	2910	6.0	8.32	2700	7.6	1.5	670	2.1	450	7.6	1300	3.0	<0.50
	Jun-16	8.51	2510	8.7	8.49	2400	7.8	1.3	600	2.3	290	7.4	1200	25	<0.50
	Jun-17	8.5	2670	8.4	8.49	2500	8.3	1.3	630	2.4	360	7.1	1300	21	<0.50
	Jun-18	7.84	2630	6.9	8.48	2400	7.1	1.0	650	2.0	270	7.3	1300	27	<1.0
MW12B	May-14	7.3	11870	6.9	8.17	11,000	380	78	3400	11	6800	6.2	870	<0.50	-
	May-15	7.7	11500	7.5	7.71	11,000	260	60	2800	10	6100	5.6	850	<0.50	<0.50
	Jun-16	6.28	13830	-	8.00	11,000	270	54	2500	11	5600	6.0	820	<0.50	<0.50
	Jun-17	7.4	11500	6.3	7.87	11,000	280	63	2600	9.3	5300	4.6	860	<0.50	<0.50
	Jun-18	8.2	11720	5.8	8.01	11,000	230	47	2500	9.3	4900	4.7	820	<1.0	<1.0
MW18A	May-14	8.4	15820	6.4	8.61	1500	3	<2.0	390	<3.0	2.4	7.3	970	38	-
	May-15	8.8	1640	6.6	8.39	1500	2.7	0.30	360	1.3	1.4	7.2	1000	8.9	<0.50
	Jun-16	6.75	1920	8.3	8.44	1500	3.0	0.34	380	1.5	6.9	7.4	950	9.5	<0.50
	Jun-17	8.5	1520	8.7	8.50	1500	2.9	0.31	380	1.4	2.1	7.3	1000	17	<0.50
	Jun-18	8.2	1719	6.1	8.45	1500	2.8	0.30	380	1.4	<1.0	7.5	1000	14	<1.0
MW19A	May-14	8.2	6350	8.7	8.09	7900	90	42	2200	8.9	3700	8.8	1200	<0.50	-
	May-15	7.7	7870	6.3	7.99	7500	62	37	1900	9.4	3400	8.9	1200	<0.50	<0.50
	Jun-16	7.97	8510	-	8.25	6900	55	32	1500	8.9	3000	6.7	1100	<0.50	<0.50
	Jun-17	7.6	6000	7.7	8.31	6900	57	32	1700	8.6	2800	7.4	1200	<0.50	<0.50
	Jun-18	8.1	7390	12.0	8.22	7000	63	21	1700	7.4	2900	8.2	1200	<1.0	<1.0
MW20A	May-14	8.0	3500	7.8	8.05	3300	19	2.7	800	3.3	800	6.9	1300	<0.50	-
	May-15	8.2	3310	7.9	8.03	3100	18	2.4	750	3.5	680	8.3	1200	<0.50	<0.50
	Jun-16	8.6	3570	8.1	8.15	3300	19	2.5	830	3.3	740	7.0	1300	<0.50	<0.50
	Jun-17	7.8	3000	6.9	8.34	3200	18	2.4	780	2.9	660	7.9	1200	5.5	<0.50
	Jun-18	7.8	3120	6.5	8.08	3400	21	2.8	850	3.4	820	8.1	1300	<1.0	<1.0
MW21A	Jun-14	9.9	2120	8.3	8.18	2000	4.4	0.47	470	1.8	90	9.3	1300	<0.50	-
	Jun-15	8.3	2110	8.4	8.19	2000	4.4	0.44	490	1.9	72	9.4	1300	<0.50	<0.50
	Jun-16	7.88	2140	7.9	8.29	2000	4.7	0.45	490	1.7	71	8.7	1300	<0.50	<0.50
	Jun-17	7.9	2030	7.5	8.41	2000	4.3	0.40	480	1.5	65	11	1300	11	<0.50
	Jun-18	7.9	2240	7.8	8.35	2000	4.3	0.40	530	1.7	63	11	1300	8	<1.0
MW22A	Jun-14	9.9	5640	7.4	7.83	5300	36	3.7	1300	4.1	2200	11	940	<0.50	-
	Jun-15	-	-	-	8.08	5300	36	3.6	1200	4.7	2000	12	960	<0.50	<0.50
	Jun-16	7.76	5600	10.0	8.09	5300	35	3.4	1200	4.1	2000	11	960	<0.50	<0.50
	Jun-17	7.6	5290	9	8.33	5200	36	3.6	1300	4.6	1900	13	950	2.4	<0.50
	Jun-18	7.74	5710	7.2	8.08	5300	36	3.3	1300	4.3	1900	13	940	<1.0	<1.0

Table 4c - Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter		Nutrients								
		Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Dissolved Solids	Hardness	Alkalinity (total as CaCO3)	Ionic Balance	Ammonia-N	Total Kjeldahl Nitrogen
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L
	AB Tier 1 Guideline[1]	3	0.06-0.60[3]	100	500	NG	NG	NG	0.035-125[4]	NG
	Date									
MW1B	Jun-14	3.7	-	-	2000	-	-	-	<0.050	2.2*
	May-15	0.89	0.016	0.91	2000	37	880	1.0	0.26	1.6
	Jun-16	1.1	0.019	1.1	1800	30	900	1.0	0.36	0.96
	Jun-17	13	<0.033	2.8	1800	35	890	1.9	-	-
	Jun-18	3.3	0.037	3.3	1600	27	940	0.52	0.2	3.2
MW5B Decommissioned July 2018	May-14	0.93	-	-	1800	-	-	-	0.36	1.1
	May-15	1.1	0.082	1.2	1800	97	840	0.93	0.50	1.4
	Jun-16	0.36	0.051	0.41	2000	45	970	1.0	0.10	0.49
	Jun-17	1.7	<0.033	0.38	1500	34	780	2.9	0.32	0.93
	Jun-18	0.79	0.071	0.86	2000	42	960	0.067	0.10	0.71
MW8A	May-14	<0.010	-	-	1600	-	-	-	0.89	1.5
	May-15	<0.010	0.012	0.012	1800	25	1100	0.97	0.96	1.6
	Jun-16	<0.010	<0.010	<0.020	1500	25	1000	1.0	0.81	1.1
	Jun-17	<0.044	<0.033	<0.010	1700	26	1100	2.2	0.63	1.3
	Jun-18	<0.020	<0.010	<0.020	1600	22	1100	1.4	0.72	1.4
MW12B	May-14	0.2	-	-	11,000	-	-	-	2.1	3.3
	May-15	0.12	0.038	0.16	9700	890	700	0.98	2.2	3.4
	Jun-16	0.19	0.053	0.25	8900	900	670	0.99	2.1	2.8
	Jun-17	<0.22	<0.16	<0.050	8600	950	710	3.2	1.7	2.8
	Jun-18	0.64	0.012	0.65	8200	780	670	4.5	1.1	2.1
MW18A	May-14	<0.010	-	-	920	-	-	-	0.62	1.1
	May-15	<0.010	<0.010	<0.010	880	8.1	840	0.95	0.64	0.98
	Jun-16	0.011	<0.010	<0.020	870	8.9	800	1.0	0.66	0.90
	Jun-17	<0.044	<0.033	-	910	8.4	850	0.86	0.72	0.94
	Jun-18	<0.020	<0.010	<0.020	910	8.3	850	1.1	0.59	0.92
MW19A	May-14	0.15	-	-	6700	-	-	-	0.98	1.4
	May-15	0.023	0.015	0.038	6000	310	950	0.96	0.43	0.80
	Jun-16	<0.050	<0.050	<0.020	5200	270	880	0.91	0.49	0.96
	Jun-17	0.16	0.28	-	5200	270	970	2.2	0.76	1.1
	Jun-18	0.022	<0.010	0.022	5300	250	980	0.51	1.2	1.5
MW20A	May-14	1.8	-	-	2300	-	-	-	0.33	1
	May-15	6.6	0.061	6.7	2100	54	1000	0.96	0.23	0.93
	Jun-16	3.1	0.041	3.1	2200	58	1100	1.0	0.53	1.2
	Jun-17	21	0.28	4.9	2100	54	1000	0.38	0.30	1.0
	Jun-18	2.8	0.036	2.8	2300	64	1000	0.042	0.28	1.0
MW21A	Jun-14	2.3	-	-	1200	-	-	-	0.068	1.4
	Jun-15	1.2	0.012	1.2	1200	13	1100	0.92	0.12	1.7
	Jun-16	1.3	0.023	1.3	1200	14	1100	0.93	0.12	0.81
	Jun-17	4.1	0.064	0.96	1200	12	1100	4.4	0.071	0.96
	Jun-18	0.62	<0.010	0.62	1300	12	1100	0.25	0.039	0.92
MW22A	Jun-14	16	-	-	4100	-	-	-	<0.050	1.2
	Jun-15	16	0.011	16	3800	100	790	0.93	0.11	0.99
	Jun-16	17	<0.010	17	3800	100	790	0.93	<0.050	0.070
	Jun-17	70	<0.033	-	3800	110	780	1.2	0.15	1
	Jun-18	14	<0.010	14	3800	100	770	1.1	0.049	0.88

Table 4c - Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter		Hydrocarbons							Organics			Volatile Organic Compounds			
		Benzene	Toluene	Ethylbenzene	Xylenes	Styrene	F1-BTEX (C6-C10)	F2 (>C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon	Methylene Chloride	Vinyl Chloride	TCE	PCE
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Monitoring Well	AB Tier 1 Guideline[1]	0.005	0.024	0.0016	0.02	0.072	2.2	1.1	0.002	NG	NG	0.05	0.002	0.005	0.01
	Date														
MW1B	Jun-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	98	9.9	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	120	10	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	47	8.8	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.27	-	-	11	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	130	9.3	<0.0020	<0.00050	<0.00050	<0.00050
MW5B Decommissioned July 2018	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	52	5.2	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	56	6.1	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	23	7.2	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	48	7.7	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	84	8.2	<0.0020	<0.00050	<0.00050	<0.00050
MW8A	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	68	9	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	71	10	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	36	11	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	40	12	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	51	12	<0.0020	<0.00050	<0.00050	<0.00050
MW12B	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	71	21	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	61	22	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	71	24	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	52	21	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	53	19	<0.0020	<0.00050	<0.00050	<0.00050
MW18A	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	29	5.2	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	28	6.9	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	27	6.9	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	26	7.2	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	35	7.4	<0.0020	<0.00050	<0.00050	<0.00050
MW19A	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	20	6	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	25	7.5	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	19	7.1	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	27	7.1	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	23	8.0	<0.0020	<0.00050	<0.00050	<0.00050
MW20A	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	66	4.4	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	28	5.7	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	19	4.3	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	35	6.4	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	26	5.4	<0.0020	<0.00050	<0.00050	<0.00050
MW21A	Jun-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	96	7	-	-	-	-
	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	74	8.4	-	-	-	-
	Jun-16	<0.00040	0.00074	<0.00040	<0.00080	-	<0.10	<0.10	-	28	7.1	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	43	9.2	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.0023	49	9.1	<0.0020	<0.00050	<0.00050	<0.00050
MW22A	Jun-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	92	5.1	-	-	-	-
	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	49	7.0	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	21	5.4	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	36	6.7	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.002	67	6.8	<0.0020	<0.00050	<0.00050	<0.00050

Table 4c - Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter		Dissolved Metals																
		Aluminum	Antimony	Arsenic	Barium	Boron	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Uranium	Zinc
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.007-0.050[5]	0.006	0.005	1	1.0	0.00004-0.00037[2]	NG	0.007	0.3	0.001-0.007[2]	0.05	0.000005	0.004-0.130[2]	0.001	0.0001	0.01	0.03
	Date																	
MW1B	Jun-14	-	<0.00060	-	0.039	-	<0.000025	0.0034	0.0057	0.64	0.00056	-	0.00003	0.0068	-	-	-	0.0034
	May-15	0.0044	<0.00060	0.0012	0.017	0.63	0.000029	<0.0010	0.0020	<0.060	<0.00020	0.10	<0.0000050	0.0038	<0.00020	<0.00010	0.0019	<0.0030
	Jun-16	0.061	<0.00060	0.0015	0.021	0.62	0.000029	<0.0010	0.0035	<0.060	<0.00020	0.057	<0.0000020	0.0060	0.00058	<0.00010	0.0022	<0.0030
	Jun-17	0.059	<0.00060	0.00098	0.024	0.64	0.000022	<0.0010	0.0018	<0.060	<0.00020	0.095	<0.0000020	0.0056	0.00035	<0.00010	0.0020	<0.0030
	Jun-18	0.003	<0.00060	0.0012	0.03	0.72	<0.00002	<0.0010	0.0021	<0.06	<0.00020	0.027	0.0000021	0.0044	0.00023	<0.00010	0.0018	<0.0030
MW5B Decommissioned July 2018	May-14	-	<0.00060	-	0.027	-	<0.000025	0.011	0.0033	0.13	<0.00020	-	<0.0000050	0.0077	-	-	-	0.0033
	May-15	0.0049	<0.00060	0.00068	0.016	0.53	<0.00002	0.0082	0.0015	<0.060	<0.00020	0.024	<0.0000050	0.0077	<0.00020	<0.00010	0.011	<0.0030
	Jun-16	0.0062	<0.00060	0.00094	0.018	0.84	<0.000020	0.010	0.0033	<0.060	<0.00020	0.026	<0.0000020	0.013	<0.00020	<0.00010	0.0041	0.0033
	Jun-17	0.031	<0.00060	0.002	0.035	0.44	<0.000020	0.0012	0.0034	<0.060	<0.00020	<0.0040	<0.000002	0.0073	0.00029	<0.00010	0.0032	<0.0030
	Jun-18	0.022	<0.00060	0.001	0.019	0.71	<0.00002	0.011	0.0016	<0.06	<0.00020	<0.004	0.0000036	0.0067	0.00021	<0.00010	0.0025	<0.0030
MW8A	May-14	-	<0.00060	-	0.041	-	<0.000025	<0.0010	0.00047	0.31	<0.00020	-	<0.0000050	0.0023	-	-	-	0.007
	May-15	0.0043	<0.00060	0.0014	0.025	0.68	<0.000020	<0.0010	0.00064	<0.060	<0.00020	0.017	<0.0000050	0.0020	<0.00020	<0.00010	0.00071	<0.0030
	Jun-16	0.0093	<0.00060	0.0021	0.045	0.72	<0.000020	<0.0010	0.00042	<0.060	<0.00020	0.015	<0.0000020	0.0023	<0.00020	<0.00010	0.00092	<0.0030
	Jun-17	0.0088	<0.00060	0.0019	0.049	0.77	<0.000020	<0.0010	<0.00020	<0.060	<0.00020	0.025	<0.0000020	0.0011	<0.00020	<0.00010	0.00074	<0.0030
	Jun-18	0.0079	<0.00060	0.0027	0.044	0.73	<0.00002	<0.0010	0.00055	<0.06	<0.00020	0.042	0.0000025	0.0012	<0.00020	<0.00010	0.00056	<0.0030
MW12B	May-14	-	<0.0060	-	<0.10	-	<0.000050	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	*<0.060*	<0.012	<0.0040	<0.10	0.56	<0.00040	<0.020	<0.0040	*<0.60*	<0.0040	0.43	<0.0000050	<0.010	<0.0040	*<0.0020*	0.019	*<0.060*
	Jun-16	<0.0030	<0.00060	0.00088	<0.010	0.57	0.000027	<0.0010	0.0023	0.13	0.00021	0.36	<0.0000020	0.0030	0.00029	<0.00010	0.021	0.0061
	Jun-17	0.0037	<0.00060	0.00067	<0.10	0.55	<0.000020	<0.0010	0.0015	*<0.6*	<0.00020	0.42	<0.0000020	0.0012	<0.00020	<0.00010	0.025	<0.0030
	Jun-18	<0.003	<0.00060	0.00066	<0.10	0.59	<0.00002	<0.0010	0.0027	*<0.6*	<0.00020	0.3	<0.000002	0.0022	0.00022	<0.00010	0.018	<0.0030
MW18A	May-14	-	<0.00060	-	<0.10	-	<0.000025	<0.0010	0.00057	*<0.60*	0.00033	-	<0.0000050	0.0044	-	-	-	0.0033
	May-15	0.0046	<0.00060	0.0010	0.089	0.78	<0.000020	<0.0010	0.00025	<0.060	<0.00020	0.045	<0.0000050	0.0039	<0.00020	<0.00010	0.00026	<0.0030
	Jun-16	0.029	<0.00060	0.00092	0.091	0.81	<0.000020	<0.0010	0.00023	0.11	<0.00020	0.059	<0.0000020	0.0035	<0.00020	<0.00010	0.00013	<0.0030
	Jun-17	0.0045	<0.00060	0.001	0.1	0.83	<0.000020	<0.0010	0.00038	<0.060	<0.00020	0.040	<0.0000020	0.0024	<0.00020	<0.00010	0.00026	<0.0030
	Jun-18	0.0074	<0.00060	0.0013	0.1	0.83	<0.00002	<0.0010	<0.00020	<0.06	<0.00020	0.049	<0.000002	0.0025	<0.00020	<0.00010	0.00029	<0.0030
MW19A	May-14	-	<0.0060	-	<0.10	-	0.000055	<0.010	<0.0020	*<0.60*	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.0060	<0.0020	<0.010	0.40	<0.00020	<0.010	<0.0020	<0.060	<0.0020	0.39	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	0.005	<0.030
	Jun-16	0.0072	<0.00060	0.00065	<0.010	0.41	0.000039	<0.0010	0.0014	<0.060	<0.00020	0.36	<0.0000020	0.0028	<0.00020	<0.00010	0.006	0.0082
	Jun-17	<0.0030	<0.00060	0.00054	<0.10	0.43	<0.000020	<0.0010	0.00041	*<0.60*	<0.00020	0.40	<0.0000020	0.0017	<0.00020	<0.00010	0.006	<0.0030
	Jun-18	<0.003	<0.00060	0.00056	<0.10	0.47	<0.00002	<0.0010	0.00022	*<0.6*	<0.00020	0.71	<0.000002	0.0029	<0.00020	<0.00010	0.006	<0.0030
MW20A	May-14	-	<0.00060	-	0.025	-	<0.000025	0.0019	0.0036	0.44	0.0003	-	<0.0000050	0.0031	-	-	-	0.0036
	May-15	0.0052	<0.00060	0.00037	0.015	0.80	<0.000020	<0.0010	0.00075	<0.060	<0.00020	0.026	<0.0000050	0.0015	<0.00020	<0.00010	0.0015	<0.0030
	Jun-16	0.0040	<0.00060	0.00051	0.018	0.92	<0.000020	<0.0010	0.00038	<0.060	<0.00020	0.026	<0.0000020	0.0011	0.0014	<0.00010	0.0016	<0.0030
	Jun-17	0.0078	<0.00060	0.00040	0.027	0.79	<0.000020	<0.0010	0.00031	<0.060	<0.00020	0.031	<0.0000020	0.0014	<0.00020	<0.00010	0.0015	<0.0030
	Jun-18	0.0040	<0.00060	0.00040	0.022	0.88	<0.00002	<0.0010	0.00088	<0.06	<0.00020	0.016	0.000002	0.0012	<0.00020	<0.00010	0.0015	<0.0030
MW21A	Jun-14	-	<0.00060	-	0.073	-	0.000034	0.0014	0.0015	0.22	0.00024	-	0.0000058	0.0027	-	-	-	<0.0030
	Jun-15	0.0058	<0.00060	0.00093	0.062	0.83	0.000067	<0.0010	0.0012	<0.060	<0.00020	<0.0040	<0.0000050	0.0029	0.00022	<0.00010	0.0034	<0.0030
	Jun-16	0.0047	<0.00060	0.0010	0.073	0.93	0.000079	<0.0010	0.0025	<0.060	<0.00020	<0.0040	<0.0000020	0.0031	<0.00020	<0.00010	0.0033	<0.0030
	Jun-17	0.0043	<0.00060	0.0011	0.096	0.82	0.000099	<0.0010	0.0016	<0.060	<0.00020	0.0047	<0.0000020	0.0028	0.00020	<0.00010	0.0036	<0.0030
	Jun-18	<0.003	<0.00060	0.0012	0.081	0.90	0.00012	<0.0010	0.0021	<0.06	<0.00020	0.0048	-	0.0031	0.00025	<0.00010	0.0035	<0.0030
MW22A	May-14	-	<0.00060	-	0.014	-	0.000059	<0.0010	0.00084	0.065	<0.00020	-	<0.0000050	0.0024	-	-	-	<0.0030
	Jun-15	<0.030	<0.0060	<0.0020	<0.010	0.82	*<0.00020*	<0.010	<0.0020	<0.060	<0.0020	0.018	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	0.004	<0.030
	Jun-16	0.0047	<0.00060	0.00033	<0.10	0.85	0.000026	<0.0010	0.0024	*<0.60*	<0.00020	<0.040	<0.0000020	0.0051	<0.00020	<0.00010	0.0042	0.0033
	Jun-17	0.0058	<0.00060	0.0003	<0.10	0.9	0.000058	<0.0010	0.002	*<0.60*	<0.00020	<0.040	<0.0000020	0.0023	<0.00020	<0.00010	0.0041	<0.0030
	Jun-18	<0.003	<0.00060	0.00028	<0.10	0.84	0.000047	<0.0010	0.0012	*<0.6*	<0.00020	<0.04	-	0.0022	<0.00020	<0.00010	0.0041	<0.0030

Table 4c - Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter		Field			Routine										
		pH	Electical Conductivity	Temperature	pH	Electical Conductivity	Calcium	Magnesium	Sodium	Potassium	Sulphate	Chloride	Bicarbonate	Carbonate	Hydroxide
Monitoring Well	Unit	-	µS/cm	°C	-	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	6.5-8.5	1000	NG	6.5-8.5	1000	NG	NG	200	NG	128-429[2]	100	NG	NG	NG
	Date														
MW23A	May-14	8.5	2250	7.9	8.48	2200	5.4	0.63	570	1.8	110	17	1300	28	-
	Jun-15	8.8	2240	8.9	8.44	2100	4.1	0.48	500	2.2	90	20	1300	17	<0.50
	Jun-16	8.65	2240	8.6	8.53	2100	4.1	0.49	560	2.0	85	18	1300	26	<0.50
	Jun-17	8.8	2310	8.5	8.75	2100	4.4	0.47	570	2.0	77	21	1300	54	<0.50
	Jun-18	8.6	2380	6.8	8.51	2200	4.1	0.49	560	2.0	88	20	1300	31	<1.0
MW24A Decommissioned July 2018	May-14	7.9	6240	9.9	8.28	6200	80	9.7	1500	5.2	3100	4.3	720	<0.50	-
	May-15	8.1	6570	8.0	7.98	6200	67	7.5	1500	5.6	2900	5.0	710	<0.50	<0.50
	Jun-16	7.85	6910	8.5	8.08	6100	69	7.9	1400	5.6	2800	4.0	710	<0.50	<0.50
	Jun-17	7.7	12,150	7.6	7.96	12,000	260	180	3100	11	6400	16	970	<0.50	<0.50
	Jun-18	7.90	16,630	8.3	8.07	15,000	590	310	4600	18	8600	23	1100	<1.0	<1.0
MW25A	Jun-14	10	2220	7.1	8.28	2000	4.7	0.49	480	1.9	14	8	1400	<0.50	-
	Jun-15	8.6	2190	8.3	8.39	2100	4.6	0.44	490	2.3	13	9.2	1400	11	<0.50
	Jun-16	8.39	2130	9.4	8.45	2100	5.1	0.47	540	1.8	4.3	8.4	1400	19	<0.50
	Jun-17	8.4	2050	8.2	8.55	2000	4.5	0.42	490	1.7	3.1	8.9	1400	28	<0.50
	Jun-18	8.5	2320	6.5	8.51	2100	4.7	0.45	550	1.8	<1.0	9.4	1400	30	<1.0
MW26A	Jun-14	9.9	2910	6.7	8.45	2700	9.5	1.4	680	2.4	610	5.9	1000	15	-
	Jun-15	-	-	-	8.38	2700	9.1	1.2	650	2.7	520	5.3	1100	8.6	<0.50
	Jun-16	-	-	-	8.53	2600	8.7	1.1	640	2.5	490	5.0	1100	23	<0.50
	Jun-17	-	-	-	8.56	2600	8.5 *	1.2 *	670 *	2.4 *	510	5.4	1100	23	<0.50
	Jun-18	8.6	2960	7.0	8.51	2700	9.5	1.2	640	2.4	510	5.9	1100	24	<1.0
MW27A	May-14	8.3	2890	7.0	8.52	2800	9.0	1.2	730	2.1	770	6.2	920	27	-
	Jun-15	8.9	2880	10.3	8.38	2900	8.5	1.1	690	2.5	730	5.2	930	7.5	<0.50
	Jun-16	8.62	2860	6.2	8.57	2800	8.5	1.0	620	2.2	710	5.0	850	21	<0.50
	Jun-17	8.5	2810	8.2	8.60	2900	8.7	1	700	2.3	720	6.9	920	26	<0.50
	Jun-18	7.96	3120	6.5	8.41	2800	8.4	1	740	2.2	700	5.1	950	11	<1.0
MW28A	May-14	8.4	3630	6.2	8.46	3400	13	1.4	850	2.5	1200	5.3	830	19	-
	Jun-15	8.4	3590	8.5	8.34	3400	13	1.3	870	3.1	1100	5.0	850	3.4	<0.50
	Jun-16	8.51	3380	7.7	8.54	3300	12	1.1	800	2.6	1000	5.2	780	16	<0.50
	Jun-17	8.5	3490	6.7	8.47	3300	13	1.2	810	2.7	1000	5.0	850	13	<0.50
	Jun-18	7.94	3380	8.6	8.43	3300	12	1.2	860	2.5	1000	4.7	850	15	<1.0
MW32A	Jun-15	8.2	8660	7.6	8.16	8200	120	15	2000	11	4100	8.9	960	<0.50	<0.50
	Jun-16	7.79	7910	8.2	8.25	8100	120	15	2000	8.4	3900	3.1	980	<0.50	<0.50
	Jun-17	7.6	8490	7.3	8.12	8000	120	15	2000	7.7	3400	3.2	1000	<0.50	<0.50
	Jun-18	7.51	13,260	11.7	8.00	8100	120	16	2100	8.0	3500	2.8	1000	<1.0	<1.0
15MW34A **Decommissioned July 2018**	Jun-16	8.66	3020	8.1	8.57	3000	19	4.5	710	4.1	510	51	1200	25	<0.50
	Jun-17	6.9	2460	6.2	8.43	2500	12	2.2	600	2.6	310	25	1200	15	<0.50
	Jun-18	8.9	2660	6.9	8.34	2400	11	2.3	590	2.9	250	18	1300	7.8	<1.0
15MW35A	Jun-16	-	-	-	8.60	1500	3.8	0.36	370	2.2	41	36	900	26	<0.50
	Jun-17	-	-	-	8.61	1600	3.6	0.34	390	3.1	21	36	960	23	<0.50
	Jun-18	-	-	-	8.44	1600	3.6	0.32	410	2.2	17	40	1000	16	<1.0
15MW36A	Jun-16	8.87	1590	9.1	8.66	1600	3.9	0.41	390	1.4	<1.0	7.4	970	25	<0.50
	Jun-17	8.8	1630	6.5	8.52	1600	3.3	0.32	380	1.3	2.9	7.1	1000	18	<0.50
	Jun-18	8.57	1609	9.2	8.52	1600	3.2	0.33	410	1.4	<1.0	7.1	1000	24	<1.0

Table 4c - Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter		Nutrients								
		Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Dissolved Solids	Hardness	Alkalinity (total as CaCO3)	Ionic Balance	Ammonia-N	Total Kjeldahl Nitrogen
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L
	AB Tier 1 Guideline[1]	3	0.06-0.60[3]	100	500	NG	NG	NG	0.035-125[4]	NG
	Date									
MW23A	May-14	<0.010	-	-	1400	-	-	-	0.60	1.5
	Jun-15	<0.010	<0.010	<0.010	1300	12	1100	0.90	0.76	1.4
	Jun-16	<0.010	<0.010	<0.020	1300	12	1100	1.0	0.76	1.5
	Jun-17	<0.044	<0.033	-	1300	13	1100	0.52	0.93	1.6
	Jun-18	<0.020	<0.010	<0.020	1300	12	1100	0.13	0.79	1.5
MW24A Decommissioned July 2018	May-14	1.1	-	-	5100	-	-	-	0.84	1.4
	May-15	1.2	0.086	1.3	4800	200	580	0.95	1.1	1.5
	Jun-16	1.2	<0.050	1.2	4700	200	580	0.95	0.061	0.45
	Jun-17	9.2	0.22	2.1	10,000	1400	800	3.9	1.3	2.7
	Jun-18	1.3	0.20	1.5	15,000	2700	930	13	1.8	4.5
MW25A	Jun-14	0.97	-	-	1200	-	-	-	0.42	1.1
	Jun-15	0.85	0.21	1.1	1200	13	1200	0.91	0.41	1.1
	Jun-16	0.18	0.029	0.21	1300	15	1200	1.0	0.62	1.2
	Jun-17	2	0.27	0.53	1200	13	1200	4.6	0.55	1.2
	Jun-18	<0.020	<0.010	<0.020	1300	14	1200	0.22	0.76	1.2
MW26A	Jun-14	1.6	-	-	1800	-	-	-	<0.050	0.78
	Jun-15	0.94	<0.010	0.94	1700	28	900	1.0	<0.050	1.7
	Jun-16	1.0	0.075	1.1	1700	26	910	1.0	<0.050	1.2
	Jun-17	5.7	<0.033	1.3	1700	26	900	1	<0.015	0.77
	Jun-18	0.92	<0.010	0.92	1700	29	910	0.78	<0.015	1.8
MW27A	May-14	0.11	-	-	2000	-	-	-	0.97	1.2
	Jun-15	0.046	0.17	0.22	1900	26	780	0.99	0.63	1.2
	Jun-16	0.21	0.071	0.28	1800	25	730	0.94	0.86	0.76
	Jun-17	0.47	0.28	-	1900	26	800	0.027	0.86	1.2
	Jun-18	0.26	<0.010	0.26	1900	25	790	3.6	0.61	1.1
MW28A	May-14	0.027	-	-	2500	-	-	-	1.3	1.6
	Jun-15	<0.010	0.012	0.012	2400	38	710	1.1	1.1	1.6
	Jun-16	0.066	0.030	0.096	2200	35	660	1.0	1.2	1.7
	Jun-17	0.044	<0.033	-	2300	36	720	0.99	1.4	1.6
	Jun-18	0.047	0.037	0.084	2300	35	720	3.6	1.1	1.5
MW32A	Jun-15	<0.010	0.013	0.013	6700	370	790	0.92	3.5	6.8
	Jun-16	<0.050	<0.050	<0.020	6500	360	800	1.0	2.9	3.2
	Jun-17	<0.22	0.71	-	6100	350	850	4.4	3.2	3.2
	Jun-18	0.058	0.017	0.075	6300	360	840	4.5	2.8	3.2
15MW34A **Decommissioned July 2018**	Jun-16	<0.050	<0.050	<0.020	1900	67	990	1.0	1.1	2.6
	Jun-17	<0.044	<0.033	<0.010	1600	40	1000	2.4	0.94	1.8
	Jun-18	<0.020	<0.010	<0.020	1500	37	1100	0.6	1.0	1.7
15MW35A	Jun-16	<0.010	<0.010	<0.020	930	11	780	0.95	0.83	12
	Jun-17	<0.044	<0.033	<0.010	950	10	830	2.4	-	-
	Jun-18	<0.020	<0.010	<0.020	990	10	860	1.2	0.33	7
15MW36A	Jun-16	<0.010	<0.010	<0.020	900	12	830	1.0	0.60	1.3
	Jun-17	<0.044	<0.033	<0.010	930	9.5	880	2.7	0.52	1.2
	Jun-18	<0.020	<0.010	<0.020	960	9.3	900	0.69	0.63	1.0

Table 4c - Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter		Hydrocarbons							Organics			Volatile Organic Compounds			
		Benzene	Toluene	Ethylbenzene	Xylenes	Styrene	F1-BTEX (C6-C10)	F2 (>C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon	Methylene Chloride	Vinyl Chloride	TCE	PCE
	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Monitoring Well	AB Tier 1 Guideline[1]	0.005	0.024	0.0016	0.02	0.072	2.2	1.1	0.002	NG	NG	0.05	0.002	0.005	0.01
	Date														
MW23A	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	81	16	-	-	-	-
	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	55	16	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	55	16	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	57	21	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.0021	67	17	<0.0020	<0.00050	<0.00050	<0.00050
MW24A Decommissioned July 2018	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	27	4.5	-	-	-	-
	May-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	37	5.3	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	16	4.3	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	84	38	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	170	71	<0.0020	<0.00050	<0.00050	<0.00050
MW25A	Jun-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	32	7.9	-	-	-	-
	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	35	8.1	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	29	7.9	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	25	9.6	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.0023	29	8.7	<0.0020	<0.00050	<0.00050	<0.00050
MW26A	Jun-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	29	7.8	-	-	-	-
	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.26	-	-	9.3	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	51	10	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	26	-	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.002	120	9.4	<0.0020	<0.00050	<0.00050	<0.00050
MW27A	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	43	11	-	-	-	-
	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	34	11	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	39	11	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	30	14	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	32	11	<0.0020	<0.00050	<0.00050	<0.00050
MW28A	May-14	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	42	9.6	-	-	-	-
	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	39	8.5	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	31	10	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	28	12	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	31	9.0	<0.0020	<0.00050	<0.00050	<0.00050
MW32A	Jun-15	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	410	12	-	-	-	-
	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	26	7.9	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	19	7.2	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	39	7.6	<0.0020	<0.00050	<0.00050	<0.00050
15MW34A **Decommissioned July 2018**	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	470	72	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	190	60	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	160	40	<0.0020	<0.00050	<0.00050	<0.00050
15MW35A	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.27	-	1100	15	-	-	-	-
	Jun-17	0.00049	<0.00040	<0.00040	<0.00080	-	<0.10	<0.27	-	-	-	-	-	-	-
	Jun-18	0.0030	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	-	0.0026	310	-	<0.0020	<0.00050	<0.00050	<0.00050
15MW36A	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	55	13	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	42	14	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	<0.0020	44	13	<0.0020	<0.00050	<0.00050	<0.00050

Table 4c - Field and Groundwater Analytical Results Summary - Clay Shale Wells

Parameter		Dissolved Metals																
		Aluminum	Antimony	Arsenic	Barium	Boron	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Uranium	Zinc
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.007-0.050[5]	0.006	0.005	1	1.0	0.00004-0.00037[2]	NG	0.007	0.3	0.001-0.007[2]	0.05	0.000005	0.004-0.130[2]	0.001	0.0001	0.01	0.03
	Date																	
MW23A	May-14	-	0.00082	-	0.040	-	0.000075	<0.0010	0.0028	0.38	0.00088	-	<0.0000050	0.0097	-	-	-	0.0031
	Jun-15	0.0043	<0.00060	0.0065	0.038	0.77	<0.000020	<0.0010	0.00042	<0.060	<0.00020	0.0071	<0.0000050	0.0032	<0.00020	<0.00010	0.0032	<0.0030
	Jun-16	0.0049	<0.00060	0.0058	0.050	0.88	<0.000020	<0.0010	0.00049	<0.060	<0.00020	0.0079	<0.0000020	0.0031	<0.00020	<0.00010	0.0027	<0.0030
	Jun-17	0.010	0.0013	0.009	0.063	0.85	<0.000020	<0.0010	<0.00020	<0.060	<0.00020	0.0064	<0.0000020	0.0095	<0.00020	<0.00010	0.0049	<0.0030
	Jun-18	<0.003	<0.00060	0.0056	0.058	0.87	0.000026	<0.0010	0.00029	<0.06	<0.00020	0.0084	<0.000002	0.0022	<0.00020	<0.00010	0.0024	<0.0030
MW24A Decommissioned July 2018	May-14	-	<0.0060	-	<0.10	-	<0.000050	<0.010	<0.0020	1.1	<0.0020	-	<0.0000050	<0.0050	-	-	-	<0.030
	May-15	<0.030	<0.0060	<0.0020	0.018	0.79	<0.00020	<0.010	<0.0020	<0.060	<0.0020	0.055	<0.0000050	<0.0050	*<0.0020*	*<0.0010*	<0.0010	<0.030
	Jun-16	0.0049	<0.00060	0.00045	<0.10	0.84	<0.000020	<0.0010	0.00069	*<0.60*	<0.00020	0.065	<0.0000020	0.0019	<0.00020	<0.00010	0.00090	<0.0030
	Jun-17	0.0034	<0.00060	0.0014	<0.10	0.62	0.00009	<0.0010	0.0040	*<0.60*	<0.00020	0.38	<0.0000020	0.016	0.0027	<0.00010	0.25	<0.0030
	Jun-18	0.0063	0.00063	0.0024	<0.10	0.48	0.000044	<0.0010	0.0061	*<0.6*	<0.00020	0.42	0.0000046	0.029	0.0025	<0.00010	0.34	0.0034
MW25A	Jun-14	-	0.00078	-	0.081	-	<0.000025	<0.0010	0.0009	<0.060	<0.00020	-	<0.0000050	0.0025	-	-	-	<0.0030
	Jun-15	0.0051	0.0011	0.0021	0.081	0.81	0.000022	<0.0010	0.0009	<0.060	<0.00020	0.051	<0.0000050	0.0032	0.00041	<0.00010	0.0015	<0.0030
	Jun-16	0.0046	<0.00060	0.0019	0.088	0.94	<0.000020	<0.0010	0.00045	<0.060	<0.00020	0.10	<0.0000020	0.0023	<0.00020	<0.00010	0.00074	<0.0030
	Jun-17	0.0043	0.00064	0.0023	0.100	0.83	<0.000020	<0.0010	<0.00020	<0.060	<0.00020	0.07	<0.0000020	0.0022	<0.00020	<0.00010	0.0012	<0.0030
	Jun-18	0.0034	<0.00060	0.0024	0.083	0.89	<0.00002	<0.0010	<0.00020	0.069	<0.00020	0.13	<0.000002	0.0015	<0.00020	<0.00010	0.00036	<0.0030
MW26A	Jun-14	-	<0.00060	-	0.045	-	0.000034	0.0012	0.0018	0.15	0.0012	-	<0.0000050	0.0024	-	-	-	0.013
	Jun-15	0.0049	<0.00060	0.0021	0.033	0.74	<0.000020	<0.0010	0.0015	<0.060	<0.00020	0.0098	<0.0000050	0.0017	<0.00020	<0.00010	0.00063	<0.0030
	Jun-16	0.15	<0.00060	0.0024	0.047	0.85	<0.000020	<0.0010	0.0058	0.084	0.00083	<0.0040	<0.0000020	0.0039	<0.00020	<0.00010	0.00065	<0.0030
	Jun-17	0.0099 *	<0.00060 *	0.0023 *	0.054 *	0.81 *	<0.000020 *	<0.0010 *	0.004 *	<0.060 *	<0.060 *	<0.0040 *	-	8.5 *	0.0019 *	-	0.00063 *	0.0032 *
	Jun-18	0.0038	<0.00060	0.0021	0.053	0.80	<0.00002	<0.0010	0.0034	<0.06	<0.00020	0.005	0.000003	0.0020	<0.00020	<0.00010	0.00069	<0.0030
MW27A	May-14	-	<0.00060	-	0.025	-	<0.000025	0.0031	0.0019	0.46	0.00077	-	<0.0000050	0.003	-	-	-	0.0049
	Jun-15	0.0043	<0.00060	0.0024	0.011	0.77	<0.000020	<0.0010	0.00053	<0.060	<0.00020	0.013	<0.0000050	0.0012	<0.00020	<0.00010	0.00055	<0.0030
	Jun-16	0.073	<0.00060	0.0028	0.014	0.75	<0.000020	<0.0010	0.00098	<0.060	<0.00020	0.011	0.0000021	0.0033	<0.00020	<0.00010	0.00065	<0.0030
	Jun-17	0.029	<0.00060	0.0030	0.016	0.83	<0.000020	<0.0010	0.0003	<0.060	<0.00020	0.012	<0.0000020	0.0014	<0.00020	<0.00010	0.00057	<0.0030
	Jun-18	0.006	<0.00060	0.0027	0.014	0.82	<0.00002	<0.0010	0.00047	<0.06	<0.00020	0.011	0.0000023	0.00073	<0.00020	<0.00010	0.00055	<0.0030
MW28A	May-14	-	<0.00060	-	0.015	-	<0.000025	<0.0010	0.0021	0.29	0.00022	-	<0.0000050	0.0024	-	-	-	0.0039
	Jun-15	0.0046	<0.00060	0.0010	<0.010	0.74	<0.000020	<0.0010	0.00044	<0.060	<0.00020	0.029	<0.0000050	0.0014	<0.00020	<0.00010	0.00056	<0.0030
	Jun-16	0.012	<0.00060	0.00084	<0.010	0.77	<0.000020	<0.0010	0.00085	<0.060	<0.00020	<0.0040	<0.0000020	0.0018	<0.00020	<0.00010	0.00031	<0.0030
	Jun-17	0.005	<0.00060	0.00053	<0.010	0.82	<0.000020	<0.0010	<0.00020	<0.060	<0.00020	0.019	<0.0000020	0.00082	<0.00020	<0.00010	0.00025	<0.0030
	Jun-18	<0.003	<0.00060	0.00085	<0.010	0.80	<0.00002	<0.0010	0.00041	<0.06	<0.00020	0.023	<0.000002	0.00079	<0.00020	<0.00010	0.00051	<0.0030
MW32A	Jun-15	<0.030	<0.0060	0.0041	<0.10	0.85	<0.00020	<0.010	<0.0020	*<0.60*	<0.0020	0.15	<0.0000050	0.011	*<0.0020*	*<0.0010*	0.0080	<0.030
	Jun-16	0.029	<0.00060	0.00051	0.015	1.2	<0.000020	0.0015	0.0031	0.12	<0.00020	0.12	0.0000023	0.0032	<0.00020	<0.00010	0.00016	0.015
	Jun-17	0.008	<0.00060	0.00037	<0.10	1.2	0.000021	<0.0010	0.00073	*<0.60*	<0.00020	0.14	<0.0000020	0.0016	<0.00020	<0.00010	0.00014	<0.0030
	Jun-18	0.008	<0.00060	0.00035	<0.10	1.2	0.000021	<0.0010	0.0082	*<0.6*	<0.00020	0.12	0.0000032	0.0026	<0.00020	<0.00010	0.00013	0.0091
15MW34A **Decommissioned July 2018**	Jun-16	0.036	0.00078	0.0030	0.030	0.80	<0.000020	0.0010	0.0019	0.13	<0.00020	0.14	0.000044	0.0074	0.00029	<0.00010	0.018	0.011
	Jun-17	0.0049	<0.00060	0.0028	0.039	0.84	<0.000020	<0.0010	<0.00020	0.31	<0.00020	0.13	<0.0000020	0.0039	<0.00020	<0.00010	0.005	<0.0030
	Jun-18	0.005	<0.00060	0.0018	0.025	0.83	<0.00002	<0.0010	0.00052	<0.06	<0.00020	0.059	0.0000025	0.0055	0.00036	<0.00010	0.0051	<0.0030
15MW35A	Jun-16	0.092	<0.00060	0.0035	0.080	0.75	<0.000020	<0.0010	0.0011	0.11	<0.00020	0.012	*<0.000020*	0.0053	<0.00020	<0.00010	0.0013	0.0035
	Jun-17	0.055	<0.00060	0.0023	0.130	0.74	<0.000020	<0.0010	0.00065	<0.060	<0.00020	0.013	<0.0000020	0.0034	<0.00020	<0.00010	0.00095	<0.0030
	Jun-18	0.12	<0.00060	0.0015	0.084	0.79	<0.00002	<0.0010	0.0022	0.28	<0.00020	0.028	-	0.0016	<0.00020	<0.00010	0.00073	<0.0030
15MW36A	Jun-16	0.015	<0.00060	0.0012	0.031	0.82	<0.000020	<0.0010	0.0026	<0.060	<0.00020	0.022	0.000017	0.0019	0.00023	<0.00010	0.00037	0.0033
	Jun-17	0.0093	<0.00060	0.00075	0.034	0.79	<0.000020	<0.0010	<0.00020	<0.060	<0.00020	0.032	<0.0000020	0.00085	<0.00020	<0.00010	0.00026	<0.0030
	Jun-18	0.0071	<0.00060	0.001	0.033	0.84	<0.00002	<0.0010	0.00041	<0.06	<0.00020	0.039	0.0000026	0.0012	<0.00020	<0.00010	0.00058	<0.0030

Notes

1. Alberta Environment and Parks (AEP). 2016. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 197 pp. Agricultural Land Use for fine-grained soils.
2. Guideline value based on hardness
3. Guideline value based on chloride
4. Guideline value based on pH and temperature
5. Guideline value based on pH

italic - laboratory detection limit greater than Tier 1 Guideline

Highlighted - value greater than Tier 1 Guideline

NG - no guideline

µS/cm - microSiemens per centimetre

PCE - perchloroethylene / tetrachloroethylene

TCE - trichloroethene / trichloroethylene

Blank - no data available

* - laboratory filtered

Table 4d - Field and Groundwater Analytical Results Summary - Lower Bedrock Wells

Parameter		Field			Routine										
		pH	Electical Conductivity	Temperature	pH	Electical Conductivity	Calcium	Magnesium	Sodium	Potassium	Sulphate	Chloride	Bicarbonate	Carbonate	Hydroxide
Monitoring Well	Unit	-	µS/cm	°C	-	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	6.5-8.5	1000	NG	6.5-8.5	1000	NG	NG	200	NG	128-429[2]	100	NG	NG	NG
	Date														
15MW35-Deep	Jun-16	8.22	4900	8.9	8.19	4700	18	2.1	970	3.3	25	1100	560	<0.50	<0.50
	Jun-17	8.10	3920	10.0	8.13	5300	20	2.1	1100	3.8	13	1400	500	<0.50	<0.50
	Jun-18	7.66	-	13.2	8.14	5100	20	2.0	1100	3.7	25	1400	540	<1.0	<1.0
15MW36-Deep	Jun-16	8.52	3830	7.7	8.51	3600	17	2.4	800	5.4	46	770	650	13	<0.50
	Jun-17	8.0	4840	10.3	8.33	4800	18	2.1	1100	3.9	11	1100	940	3.1	<0.50
	Jun-18	7.38	4900	10.9	8.19	4700	18	2.0	1100	3.7	10	1000	960	<1.0	<1.0

Table 4d - Field and Groundwater Analytical Results Summary - Lower Bedrock Wells

Parameter		Nutrients								
		Nitrate (N)	Nitrite (N)	Nitrate and Nitrate (N)	Total Dissolved Solids	Hardness	Alkalinity (total as CaCO3)	Ionic Balance	Ammonia-N	Total Kjeldahl Nitrogen
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	-	mg/L	mg/L
	AB Tier 1 Guideline[1]	3	0.06-0.60[3]	100	500	NG	NG	NG	0.035-125[4]	NG
	Date									
15MW35-Deep	Jun-16	0.25	<0.010	0.25	2400	53	460	1.0	1.1	2.2
	Jun-17	<0.22	<0.16	<0.050	2800	58	410	2.3	1.2	2.5
	Jun-18	<0.02	<0.010	<0.020	2800	59	450	1.7	1.0	2.2
15MW36-Deep	Jun-16	0.018	0.043	0.061	2000	52	550	1.1	0.92	1.9
	Jun-17	<0.044	<0.033	<0.010	2600	53	770	2.3	1.3	2.6
	Jun-18	<0.02	<0.010	<0.020	2600	53	780	2.6	1.3	2.8

Table 4d - Field and Groundwater Analytical Results Summary - Lower Bedrock Wells

Parameter		Hydrocarbons							Organics			Volatile Organic Compounds			
		Benzene	Toluene	Ethylbenzene	Xylenes	Styrene	F1-BTEX (C6-C10)	F2 (>C10-C16)	Total Phenols	Chemical Oxygen Demand	Dissolved Organic Carbon	Methylene Chloride	Vinyl Chloride	TCE	PCE
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.005	0.024	0.0016	0.02	0.072	2.2	1.1	0.002	NG	NG	0.05	0.002	0.005	0.01
	Date														
15MW35-Deep	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	110	18	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	130	-	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.0033	100	19	<0.0020	<0.00050	<0.00050	<0.00050
15MW36-Deep	Jun-16	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	99	12	-	-	-	-
	Jun-17	<0.00040	<0.00040	<0.00040	<0.00080	-	<0.10	<0.10	-	140	-	-	-	-	-
	Jun-18	<0.00040	<0.00040	<0.00040	<0.00089	<0.00050	<0.10	<0.10	0.01	130	35	<0.0020	<0.00050	<0.00050	<0.00050

Table 4d - Field and Groundwater Analytical Results Summary - Lower Bedrock Wells

Parameter		Dissolved Metals																
		Aluminum	Antimony	Arsenic	Barium	Boron	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Uranium	Zinc
Monitoring Well	Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	AB Tier 1 Guideline[1]	0.007-0.050[5]	0.006	0.005	1	1.0	0.00004-0.00037[2]	NG	0.007	0.3	0.001-0.007[2]	0.05	0.000005	0.004-0.130[2]	0.001	0.0001	0.01	0.03
	Date																	
15MW35-Deep	Jun-16	0.017	<0.00060	0.0018	0.27	0.69	0.000040	<0.0010	0.00094	<0.060	<0.00020	0.048	0.0000020	0.0038	0.00020	<0.00010	0.0023	<0.0030
	Jun-17	0.0031	<0.00060	0.00081	0.41	0.75	<0.000020	<0.0010	0.00048	<0.060	<0.00020	0.053	<0.0000020	0.0013	<0.00020	<0.00010	0.00064	0.16
	Jun-18	0.0034	<0.00060	0.00089	0.38	0.81	<0.000020	<0.0010	0.00079	<0.060	<0.00020	0.061	<0.0000020	0.0017	0.0003	<0.00010	0.00075	0.48
15MW36-Deep	Jun-16	0.19	0.0030	0.0088	0.23	0.71	0.000070	<0.0010	0.011	0.41	0.00094	0.030	0.00019	0.0086	0.00096	<0.00010	0.0066	0.0068
	Jun-17	0.0069	<0.00060	0.0024	0.32	0.97	<0.000020	<0.0010	0.0006	<0.060	<0.00020	0.071	<0.0000020	0.0046	0.00030	<0.00010	0.0016	0.10
	Jun-18	0.0039	<0.00060	0.0025	0.32	1.00	<0.000020	<0.0010	0.00085	<0.060	<0.00020	0.072	<0.0000020	0.0050	0.00064	<0.00010	0.0016	0.11

Notes

1. Alberta Environment and Parks (AEP). 2016. Alberta Tier 1 Soil and Groundwater Remediation Guidelines. Land Policy Branch, Policy and Planning Division. 197 pp. Agricultural Land Use for fine-grained soils.
2. Guideline value based on hardness
3. Guideline value based on chloride
4. Guideline value based on pH and temperature
5. Guideline value based on pH

italic - laboratory detection limit greater than Tier 1 Guideline

Highlighted - value greater than Tier 1 Guideline

NG - no guideline

µS/cm - microSiemens per centimetre

PCE - perchloroethylene / tetrachloroethylene

TCE - trichloroethene / trichloroethylene

Blank - no data available

Table 5a: Quality Assurance / Quality Control - Field Duplicates

Parameter	Unit	RDL	MW32A	18DUP01	RPD (%)	MW29A	18DUP02	RPD (%)
			19-Jun-18			19-Jun-18		
Routine								
pH	pH Units	N/A	8.00	8.05	1	8.33	8.25	1
Electrical Conductivity (EC)	µS/cm	2	8100	8100	0	3400	3400	0
Total Dissolved Solids (TDS)	mg/L	0.022	6300	6200	2	2400	2400	0
Hardness as $CaCO_3$	mg/L	0.5	360	370	3	95	100	5
Alkalinity (total as $CaCO_3$)	mg/L	1	840	830	1	640	630	2
Bicarbonate	mg/L	1	1000	1000	0	770	770	0
Carbonate	mg/L	1	<1.0	<1.0	-	4.2	<1.0	-
Hydroxide	mg/L	1	<1.0	<1.0	-	<1.0	<1.0	-
Calcium	mg/L	0.3	120	120	0	30	32	6
Magnesium	mg/L	0.2	16	16	0	4.8	4.9	2
Potassium	mg/L	0.3	8.0	8.3	4	3.8	3.9	3
Sodium	mg/L	0.5	2100	2100	0	850	840	1
Chloride	mg/L	1.0	2.8	2.9	-	3.2	2.8	-
Sulphate	mg/L	5	3500	3500	0	1100	1100	0
Nutrients								
Ammonia as N	mg/L	0.015	2.8	2.8	0	0.9	0.88	2
Total Kjeldahl Nitrogen (TKN)	mg/L	0.05	3.2	4.4	32	1.3	1.2	8
Nitrate (as NO_3-N)	mg/L	0.02	0.058	0.059	-	0.32	0.33	3
Nitrite (as NO_2-N)	mg/L	0.01	0.017	0.025	-	0.026	0.024	-
Nitrate and Nitrite (as N)	mg/L	0.02	0.075	0.085	-	0.35	0.35	0
Hydrocarbons								
Benzene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-
Toluene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-
Ethylbenzene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-
Xylenes Total	mg/L	0.00089	<0.00089	<0.00089	-	<0.00089	<0.00089	-
Styrene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
F1 (C_6-C_{10}) - BTEX	mg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-
F2 (C_{10}-C_{16})	mg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-
Organics								
Phenols (4AAP)	mg/L	0.002	<0.0020	0.0021	-	<0.0020	<0.0020	-
Chemical Oxygen Demand (COD)	mg/L	5	39.0	21.0	-	22	24	-
Dissolved Organic Carbon (DOC)	mg/L	0.5	7.6	8.3	9	7.7	8.4	9
Volatile Organic Compounds								
Methylene Chloride	mg/L	0.002	<0.0020	<0.0020	-	<0.0020	<0.0020	-
Vinyl chloride	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Trichloroethene (TCE)	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Tetrachloroethene (PCE)	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Dissolved Metals								
Aluminum	mg/L	0.003	0.0080	0.0047	-	0.0042	0.0044	-
Antimony	mg/L	0.0006	<0.00060	<0.00060	-	<0.00060	<0.00060	-
Arsenic	mg/L	0.0002	0.00035	0.00044	-	0.00076	0.00084	-
Barium	mg/L	0.01	<0.10	<0.10	-	0.014	0.015	-
Boron	mg/L	0.02	1.20	1.20	0	0.72	0.74	3
Cadmium	mg/L	0.00002	0.000021	0.000021	-	<0.000020	<0.000020	-
Chromium	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Copper	mg/L	0.0002	0.0082	0.0011	153	0.00098	0.001	-
Iron	mg/L	0.06	<0.60	<0.60	-	<0.060	<0.060	-
Lead	mg/L	0.0002	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Manganese	mg/L	0.004	0.12	0.13	8	0.051	0.053	4
Mercury	mg/L	0.000002	0.0000032	0.0000031	-	0.0000028	0.0000026	-
Nickel	mg/L	0.0005	0.0026	0.0014	-	0.0011	0.001	-
Selenium	mg/L	0.0002	<0.00020	<0.00020	-	0.00023	<0.00020	-
Silver	mg/L	0.0001	<0.00010	<0.00010	-	<0.00010	<0.00010	-
Uranium	mg/L	0.0001	0.00013	0.00012	-	0.00043	0.00045	-
Zinc	mg/L	0.003	0.0091	<0.0030	-	<0.0030	<0.0030	-

Notes:
RDL - reportable detection limit
RPD - relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD was not calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
N/A - Not applicable
Blank - Not analyzed
Highlighted - RPD value greater than 20%

Table 5a: Quality Assurance / Quality Control - Field Duplicates

Parameter	Unit	RDL	MW8A	18DUP03	RPD (%)	MW21B	18DUP04	RPD (%)	MW14	18DUP05	RPD (%)
			19-Jun-18			26-Jun-18			26-Jun-18		
Routine											
pH	pH Units	N/A	8.48	8.39	1	8.29	8.18	1	8.00	7.92	1
Electrical Conductivity (EC)	µS/cm	2	2400	2400	0	2900	2900	0	5100	5100	0
Total Dissolved Solids (TDS)	mg/L	0.022	1600	1600	0	1900	1900	0	4100	4200	2
Hardness as $CaCO_3$	mg/L	0.5	22	23	4	72	72	0	1600	1600	0
Alkalinity (total as $CaCO_3$)	mg/L	1	1100	1100	0	870	870	0	1000	1000	0
Bicarbonate	mg/L	1	1300	1300	0	1100	1100	0	1200	1200	0
Carbonate	mg/L	1	27	15	57	<1.0	<1.0	-	<1.0	<1.0	-
Hydroxide	mg/L	1	<1.0	<1.0	-	<1.0	<1.0	-	<1.0	<1.0	-
Calcium	mg/L	0.3	7.1	7.4	4	19	19	0	250	260	4
Magnesium	mg/L	0.2	1.0	1.1	10	6.1	5.9	3	230	230	0
Potassium	mg/L	0.3	2.0	2.2	10	4.2	4.1	2	28	29	4
Sodium	mg/L	0.5	650	660	2	680	680	0	800	850	6
Chloride	mg/L	1.0	7.3	6.5	12	1.3	1.6	-	1.4	1.3	-
Sulphate	mg/L	5	270	250	8	650	660	2	2200	2200	0
Nutrients											
Ammonia as N	mg/L	0.015	0.72	0.69	4	<0.015	<0.015	-	0.43	0.36	18
Total Kjeldahl Nitrogen (TKN)	mg/L	0.05	1.4	1.4	0	0.31	0.32	3	1.10	0.95	15
Nitrate (as NO_3-N)	mg/L	0.02	<0.020	0.027	-	0.10	0.11	10	0.19	0.21	10
Nitrite (as NO_2-N)	mg/L	0.01	<0.010	<0.010	-	<0.010	<0.010	-	0.026	0.025	-
Nitrate and Nitrite (as N)	mg/L	0.02	<0.020	0.027	-	0.10	0.11	10	0.22	0.23	4
Hydrocarbons											
Benzene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-
Toluene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-
Ethylbenzene	mg/L	0.0004	<0.00040	<0.00040	-	<0.00040	<0.00040	-	<0.00040	<0.00040	-
Xylenes Total	mg/L	0.00089	<0.00089	<0.00089	-	<0.00089	<0.00089	-	<0.00089	<0.00089	-
Styrene	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
F1 (C_6-C_{10}) - BTEX	mg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
F2 (C_{10}-C_{16})	mg/L	0.1	<0.10	<0.10	-	<0.10	<0.10	-	<0.10	<0.10	-
Organics											
Phenols (4AAP)	mg/L	0.002	<0.0020	<0.0020	-	<0.0020	<0.0020	-	<0.0020	<0.0020	-
Chemical Oxygen Demand (COD)	mg/L	5	51	42	19	27	27	0	37	24	-
Dissolved Organic Carbon (DOC)	mg/L	0.5	12	13	8	6.5	6.5	0	11	9.5	15
Volatile Organic Compounds											
Methylene Chloride	mg/L	0.002	<0.0020	<0.0020	-	<0.0020	<0.0020	-	<0.0020	<0.0020	-
Vinyl chloride	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Trichloroethene (TCE)	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Tetrachloroethene (PCE)	mg/L	0.0005	<0.00050	<0.00050	-	<0.00050	<0.00050	-	<0.00050	<0.00050	-
Dissolved Metals											
Aluminum	mg/L	0.003	0.0079	0.0067	-	<0.0030	0.0075	-	<0.0030	<0.0030	-
Antimony	mg/L	0.0006	<0.00060	<0.00060	-	<0.00060	<0.00060	-	<0.00060	<0.00060	-
Arsenic	mg/L	0.0002	0.0027	0.0027	0	0.00066	0.00067	-	0.00053	0.00055	-
Barium	mg/L	0.01	0.044	0.045	-	<0.010	<0.010	-	0.033	<0.10	-
Boron	mg/L	0.02	0.73	0.74	1	0.23	0.23	0	0.12	<0.20	-
Cadmium	mg/L	0.00002	<0.000020	<0.000020	-	<0.000020	<0.000020	-	0.000027	0.000022	-
Chromium	mg/L	0.001	<0.0010	<0.0010	-	<0.0010	<0.0010	-	<0.0010	<0.0010	-
Copper	mg/L	0.0002	0.00055	0.00031	-	0.00072	0.00083	-	0.0008	0.00066	-
Iron	mg/L	0.06	<0.060	<0.060	-	<0.060	<0.060	-	<0.060	<0.60	-
Lead	mg/L	0.0002	<0.00020	<0.00020	-	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Manganese	mg/L	0.004	0.042	0.044	5	<0.0040	<0.0040	-	0.42	0.43	2
Mercury	mg/L	0.000002	0.0000025	0.0000022	-	<0.0000020	<0.0000020	-	<0.0000020	<0.0000020	-
Nickel	mg/L	0.0005	0.0012	0.0012	-	0.0012	0.0011	-	0.0028	0.0031	10
Selenium	mg/L	0.0002	<0.00020	<0.00020	-	<0.00020	<0.00020	-	<0.00020	<0.00020	-
Silver	mg/L	0.0001	<0.00010	<0.00010	-	<0.00010	<0.00010	-	<0.00010	<0.00010	-
Uranium	mg/L	0.0001	0.00056	0.00058	4	0.0019	0.0019	0	0.00051	0.00054	6
Zinc	mg/L	0.003	<0.0030	<0.0030	-	<0.0030	<0.0030	-	<0.0030	<0.0030	-

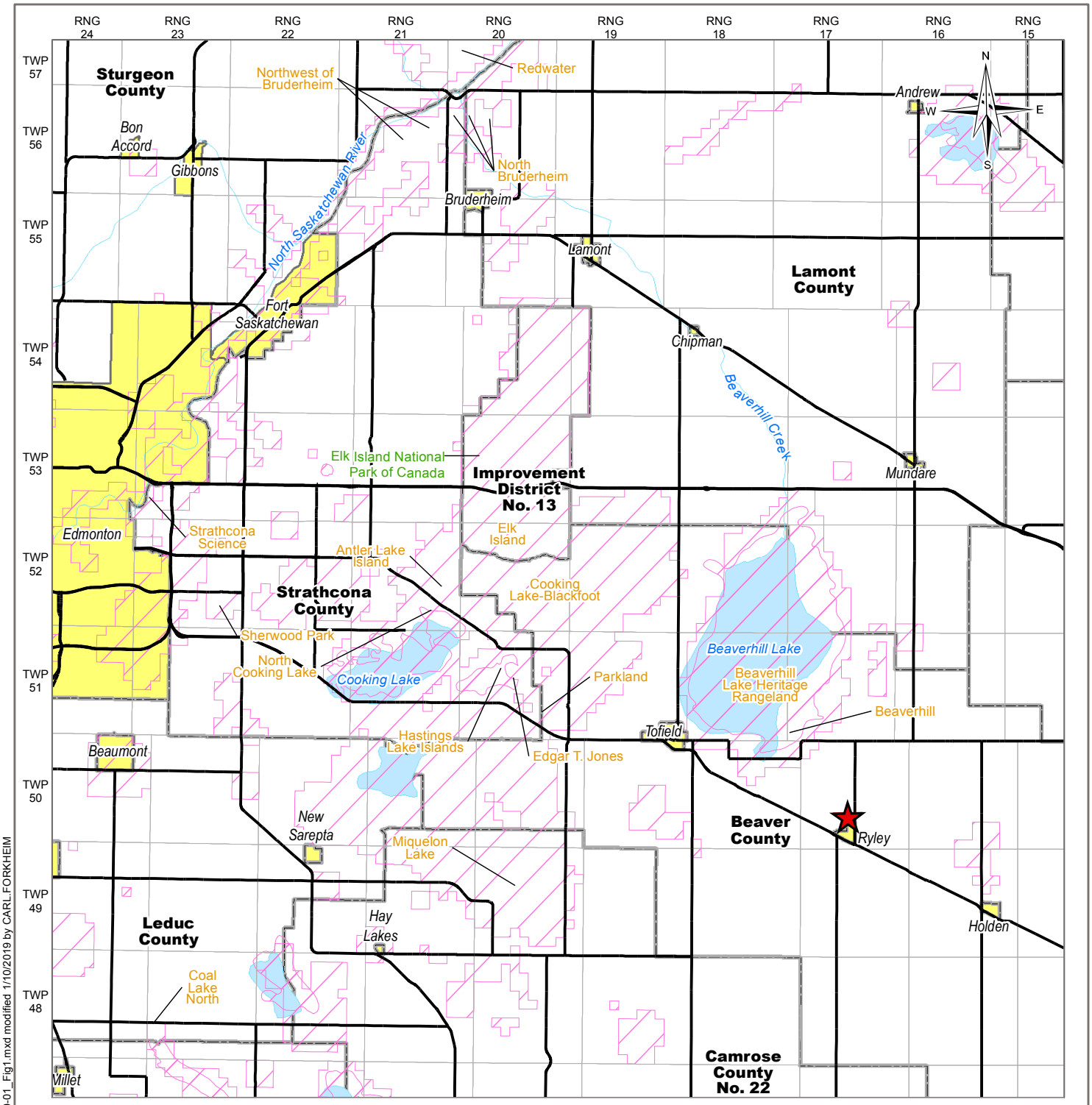
Notes:
RDL - reportable detection limit
RPD - relative percent difference calculated as (abs(C1-C2)/average(C1+C2))*100
"-" Indicates RPD not calculated. RPD was not calculated if one or more of the analytical results are less than detection limits or within 5 times the detection limits.
N/A - Not applicable
Blank - Not analyzed
Highlighted - RPD value greater than 20%

Table 5b: Quality Assurance / Quality Control - Blanks

Parameter	Unit	RDL	Field Blank	Trip Blank
Routine				
Calcium	mg/L	0.3	<0.3	-
Magnesium	mg/L	0.2	<0.2	-
Potassium	mg/L	0.3	<0.3	-
Sodium	mg/L	0.5	<0.5	-
Hydrocarbons				
Benzene	mg/L	0.0004	-	<0.0004
Toluene	mg/L	0.0004	-	<0.0004
Ethylbenzene	mg/L	0.0004	-	<0.0004
Xylenes Total	mg/L	0.00089	-	<0.00089
Styrene	mg/L	0.0005	-	<0.0005
F1 (C_6-C_{10}) - BTEX	mg/L	0.1	-	<0.1
F2 (C_{10}-C_{16})	mg/L	0.1	-	<0.1
Organics				
Phenols (4AAP)	mg/L	0.002	<0.002	<0.002
Dissolved Organic Carbon (DOC)	mg/L	0.5	<0.5	-
Volatile Organic Compounds				
Methylene Chloride	mg/L	0.002	-	<0.002
Vinyl chloride	mg/L	0.0005	-	<0.0005
Trichloroethene (TCE)	mg/L	0.0005	-	<0.0005
Tetrachloroethene (PCE)	mg/L	0.0005	-	<0.0005
Dissolved Metals				
Aluminum	mg/L	0.003	<0.003	-
Antimony	mg/L	0.0006	<0.0006	-
Arsenic	mg/L	0.0002	<0.0002	-
Barium	mg/L	0.01	<0.01	-
Boron	mg/L	0.02	<0.02	-
Cadmium	mg/L	0.00002	<0.00002	-
Chromium	mg/L	0.001	<0.001	-
Copper	mg/L	0.0002	0.00058	-
Iron	mg/L	0.06	<0.06	-
Lead	mg/L	0.0002	<0.0002	-
Manganese	mg/L	0.004	<0.004	-
Mercury	mg/L	0.000002	<0.000002	-
Nickel	mg/L	0.0005	<0.0005	-
Selenium	mg/L	0.0002	<0.0002	-
Silver	mg/L	0.0001	<0.0001	-
Uranium	mg/L	0.0001	<0.0001	-
Zinc	mg/L	0.003	<0.003	-

Notes:
RDL - reportable detection limit
"-" - parameter not analyzed.
Highlighted - parameter has a detectable concentration.

FIGURES

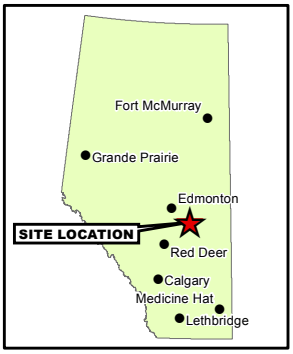


LEGEND

- Site Location
- Primary/Secondary Highway
- Environmentally Significant Area
- Protected Area
- National Parks
- Indian Reserve
- Urban Area
- Municipal Area
- Watercourse
- Waterbody

NOTES

Base data source: ESRI, CanVec (50,000), AltaLIS, ESRD & Government of Alberta (Tourism, Parks and Recreation)



STATUS
ISSUED FOR USE

2018 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Regional Environmental Context

PROJECTION	DATUM
UTM Zone 12	NAD83

Scale: 1:500,000
10 5 0 10
Kilometers

FILE NO.
SWOP03800-01_Fig1.mxd

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03652-01	RG/CF	BS	AS	0

OFFICE	DATE
Tt EBA-CAL	January 10, 2019

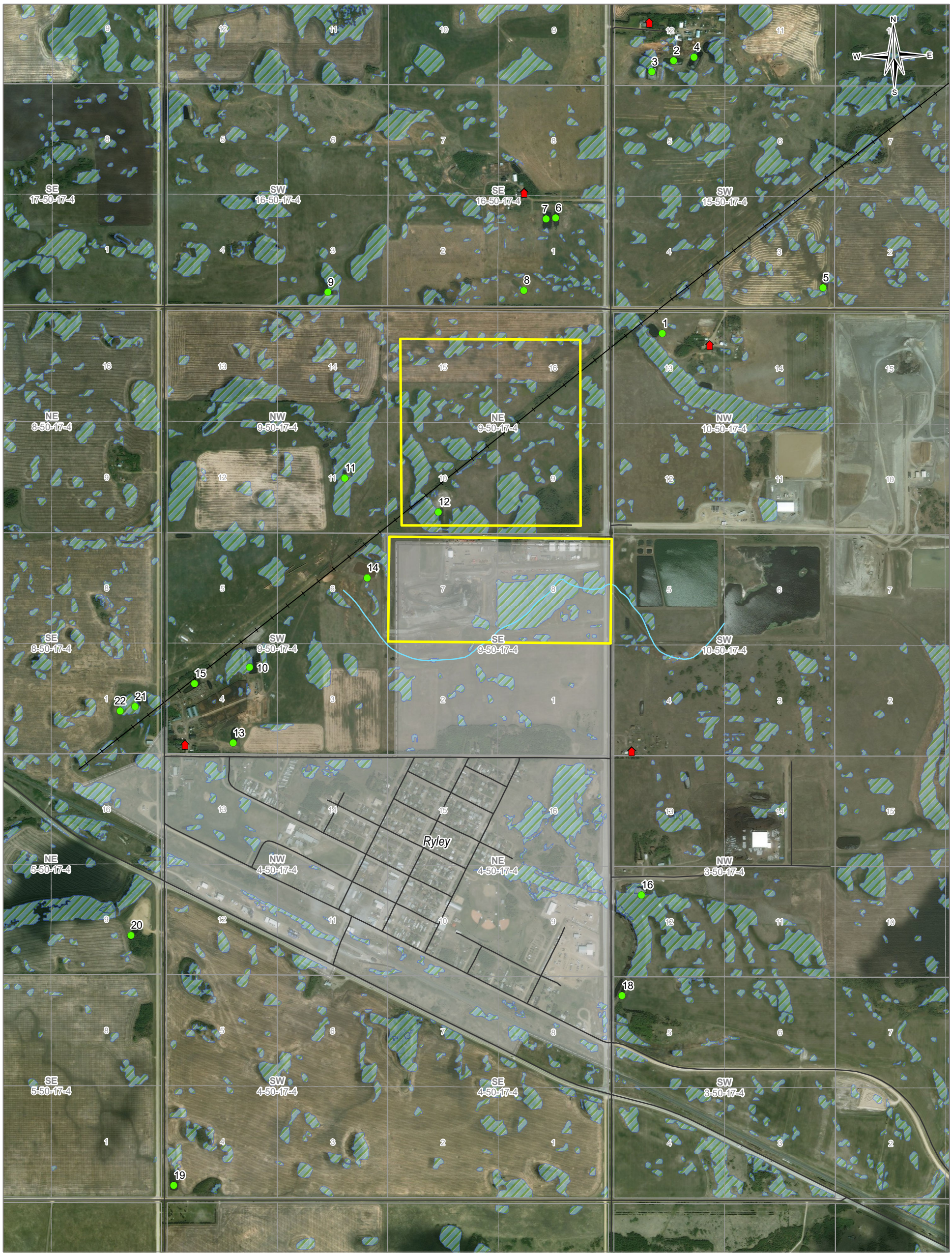
CleanHarbors

PREPARED BY:
TETRA TECH

Figure 1

\\tt.local\eba\Projects\CGY\78070\SWOP03652\GIS\Maps\2018\SWOP03800-01_Fig1.mxd modified 1/10/2019 by CARL.FORKHEIM

\\tt.local\eba\Projects\CGY\78070\SWOP03800-01\GIS\Maps\SWOP03800-01_Fig2_11x17.mxd modified 1/30/2019 by carl.forkheim



LEGEND

- Rural Residence
- Water Sample Location
- Site Outline
- Proposed Expansion Boundary
- Road
- Historical Railway Bed (Approximate Centreline)
- Bible Creek (Approximate Centreline)
- Potential Wetland
- Town Boundary

NOTES
Base data source: ESRI, CanVec (50,000) & ESRD

STATUS
ISSUED FOR USE

2018 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Local Environmental Context

PROJECTION: UTM Zone 12			DATUM: NAD83	CLIENT: CleanHarbors
Scale: 1:13,500 — 200 100 0 200 Metres				TETRA TECH
FILE NO.: SWOP03800-01_Fig2_11x17.mxd				
OFFICE: Tt-CAL	DWN: RG/CF	CKD: AK	APVD: AS	REV: 0
DATE: January 30, 2019	PROJECT NO.: SWM.SWOP03800-01			Figure 2

PROPERTY LINE
MW1B
MW1C
MW12B
MW12A
15MW34A
15MW34B
MW9
MW11
MW14
MW10
MW18A
MW18B
MW5A
MW5B
PROPOSED CELL 4
ACCESS RAMP
MW8B
MW8A
MW33B
MW33A
CELL 2
CELL 1
CELL 2 LEACHATE TANK
CELL 1 LEACHATE TANK
MW24A
MW24B
MW19A
MW19B
EL. 686.84
MW32B
MW32A
PROPERTY LINE
EL. 685.90
CELL 3D
CELL 3E
RETENTION POND
MW20A
MW20B
CELL 3A
CELL 3B
CELL 3C
MW31B
MW31A
87.2 m
CELL 3A LEACHATE PIPES
RUN-ON DIVERSION DITCH CENTRELINE
15MW36A
15MW36DEEP
EL. 685.86
EL. 685.96
MW27B
MW27A
MW28B
MW28A
EL. 686.48
EL. 683.34
MW21A
MW21B
EL. 686.09
MW25B
MW25A
MW26B
MW26A
EL. 686.29
EL. 685.95
CELL 3B LEACHATE TANK
CELL 3C LEACHATE TANK
ACCESS ROAD
CELL 3D LEACHATE TANK
MW29B
MW29A
MW30B
MW30A
MW23A
MW23B
MW22A
MW22B
EL. 685.00
EL. 683.81
RUN-ON DIVERSION DITCH
RUN-OFF CONTROL DITCH
15MW35C
15MW35B
15MW35A
15MW35DEEP

LEGEND:

- MONITORING WELL LOCATION
- SURFICIAL MATERIALS
- UPPER SANDSTONE
- CLAY SHALE
- LOWER BEDROCK
- TOPOGRAPHIC CONTOURS
- DECOMMISIONED MONITORING WELLS
- SURFACE WATER DRAINAGE DIRECTION

0 100 m

Scale: 1: 2 500

CLIENT

Clean Harbors

TETRA TECH

2018 GROUNDWATER MONITORING PROGRAM RYLEY, AB

SITE PLAN

PROJECT NO.	DWN	CKD	REV
SWM.SWOP03800-01	MM/DBD	MC	0

OFFICE: EDM

DATE: January 2019

Figure 3

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP03800-01_Groundwater Monitoring 2018\SWM.SWOP03800-01 Figure 3_January 2019.dwg [FIGURE 3] January 24, 2019 - 9:41:42 am (BY: DAS, DEBASHIS)

PROPERTY LINE
MW1B
MW1C
MW12B
MW12A
15MW34A
15MW34B
MW9
MW11
MW10
MW14
MW5A
MW5B
MW18A
MW18B
PROPOSED CELL 4
ACCESS RAMP
MW8B
MW8A
MW33B
MW33A
CELL 2
CELL 1
CELL 2 LEACHATE TANK
CELL 1 LEACHATE TANK
MW19A
MW19B
MW24A
MW24B
MW32B
MW32A
EL. 686.84
PROPERTY LINE
CELL 3D
CELL 3E
RETENTION POND
EL. 685.90
CELL 3A
CELL 3B
CELL 3C
MW20A
MW20B
MW31B
MW31A
87.2 m
CELL 3A LEACHATE PIPES
15MW36A
15MW36DEEP
RUN-ON DIVERSION DITCH CENTRELINE
EL. 685.96
EL. 685.86
MW27B
MW27A
MW28B
MW28A
EL. 686.48
EL. 683.34
MW21A
MW21B
EL. 686.09
MW26B
MW26A
MW25B
MW25A
EL. 686.29
EL. 685.95
ACCESS ROAD
CELL 3D LEACHATE TANK
MW30B
MW30A
MW29B
MW29A
MW23A
MW23B
MW22A
MW22B
CELL 3B LEACHATE TANK
CELL 3C LEACHATE TANK
EL. 685.00
EL. 683.81
RUN-ON DIVERSION DITCH
RUN-OFF CONTROL DITCH
15MW35C
15MW35B
15MW35A
15MW35DEEP

LEGEND:

- MONITORING WELL LOCATION
- SURFICIAL MATERIALS
- UPPER SANDSTONE
- CLAY SHALE
- LOWER BEDROCK
- CROSS-SECTION LOCATION
- DECOMMISIONED MONITORING WELLS
- TOPOGRAPHIC CONTOURS

0 100 m
Scale: 1: 2 500

CLIENT
Clean Harbors

TETRA TECH

2018 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Cross-Section Location

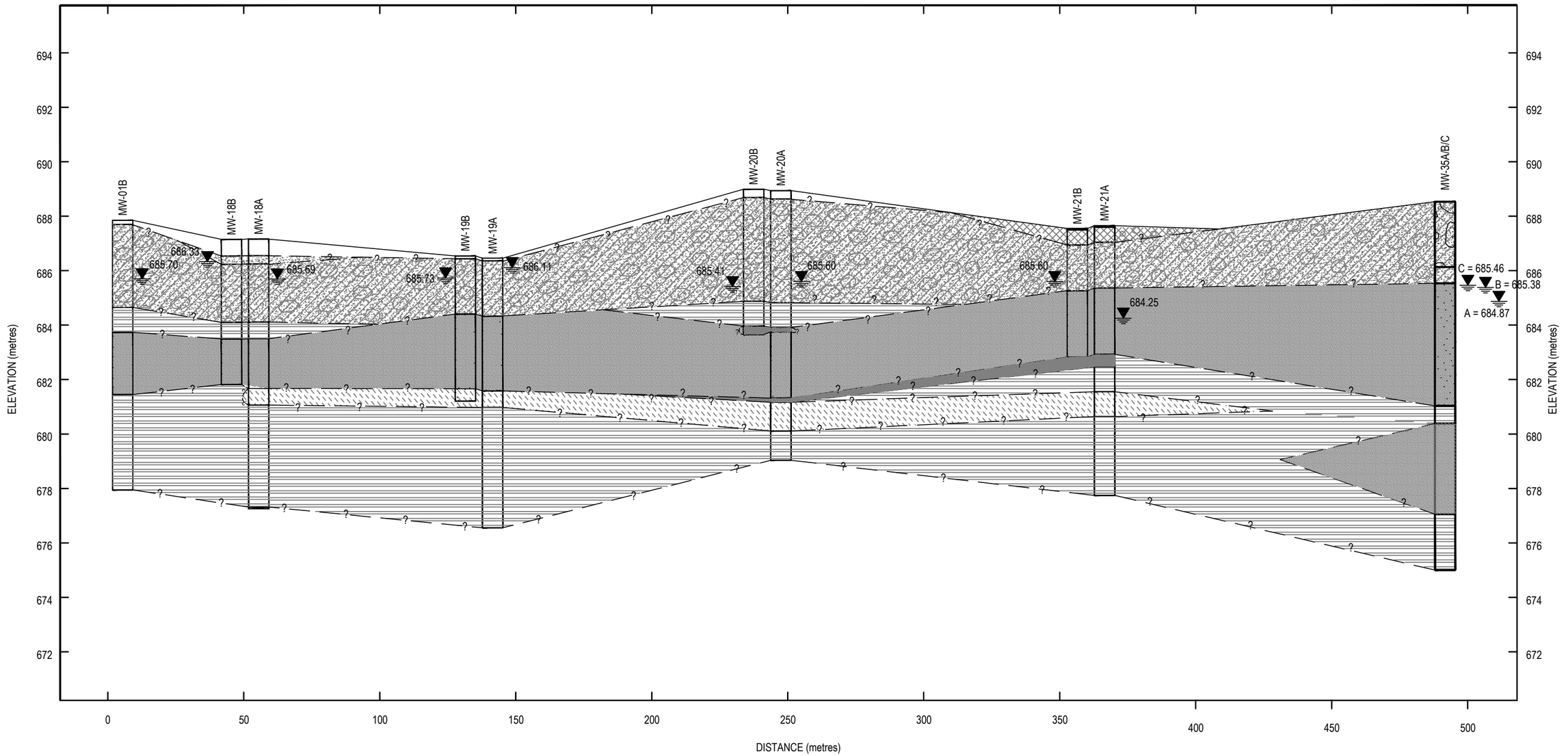
PROJECT NO.	DWN	CKD	REV
SWM.SWOP03800-01	MM/DBD	CF	0
OFFICE: EDM	DATE: January 2019		

Figure 4a

Q:\Edmonton\Drafting\00_MASTER PROJECT BASE PLANS\Clean Harbors Ryley\PROJECTS\SWM.SWOP03800-01_Groundwater Monitoring 2018\SWM.SWOP03800-01 Figure 4a_January 2019.dwg [FIGURE 4A] January 24, 2019 - 9:43:04 am (BY: DAS, DEBASHIS)

A (NORTH)

A' (SOUTH)



SCALE AS SHOWN

10 X VERTICAL EXAGGERATION

LEGEND:

- TOPSOIL
- SAND
- SHALE
- SAND AND SHALE STONE
- CLAY
- GRAVEL
- SANDSTONE
- FILL
- SILT
- TILL
- SILTSTONE
- xxx.xx - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL)
- ? ? ? - INFERRED

CLIENT

Clean Harbors

TETRA TECH

2018 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Cross-Section A-A'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP03800-01	MM/DBD	CF	0

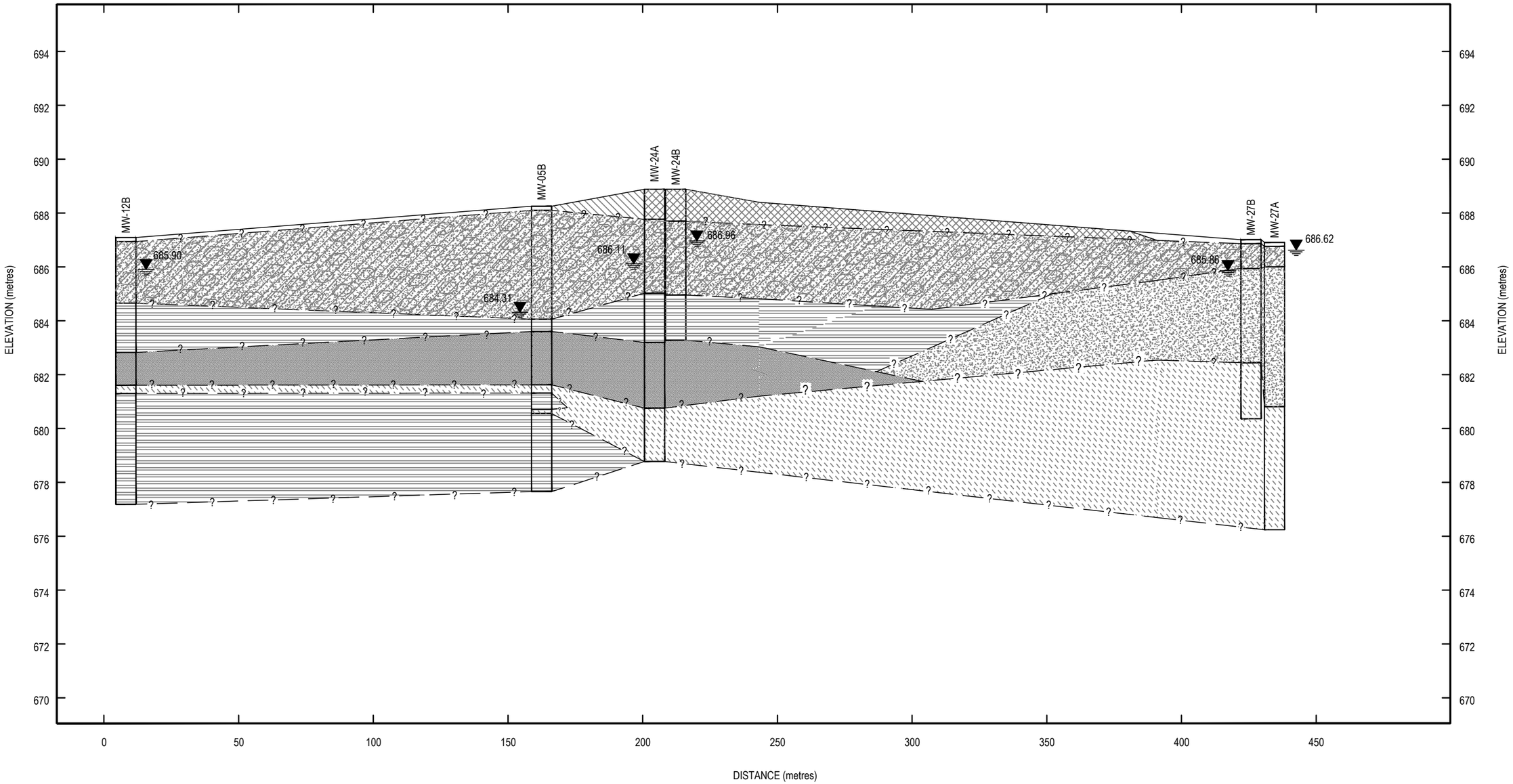
OFFICE: EDM

DATE: January 2019

Figure 4b

B (NORTH-WEST)

B' (SOUTH-EAST)



SCALE AS SHOWN
10 X VERTICAL EXAGGERATION

LEGEND:

- TOPSOIL
- SAND
- SHALE
- SAND AND SHALE STONE
- CLAY
- GRAVEL
- SANDSTONE
- FILL
- SILT
- TILL
- SILTSTONE
- XXX.XX - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL)
- INFERRED

CLIENT

CleanHarbors

TETRA TECH

2018 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Cross-Section B-B'

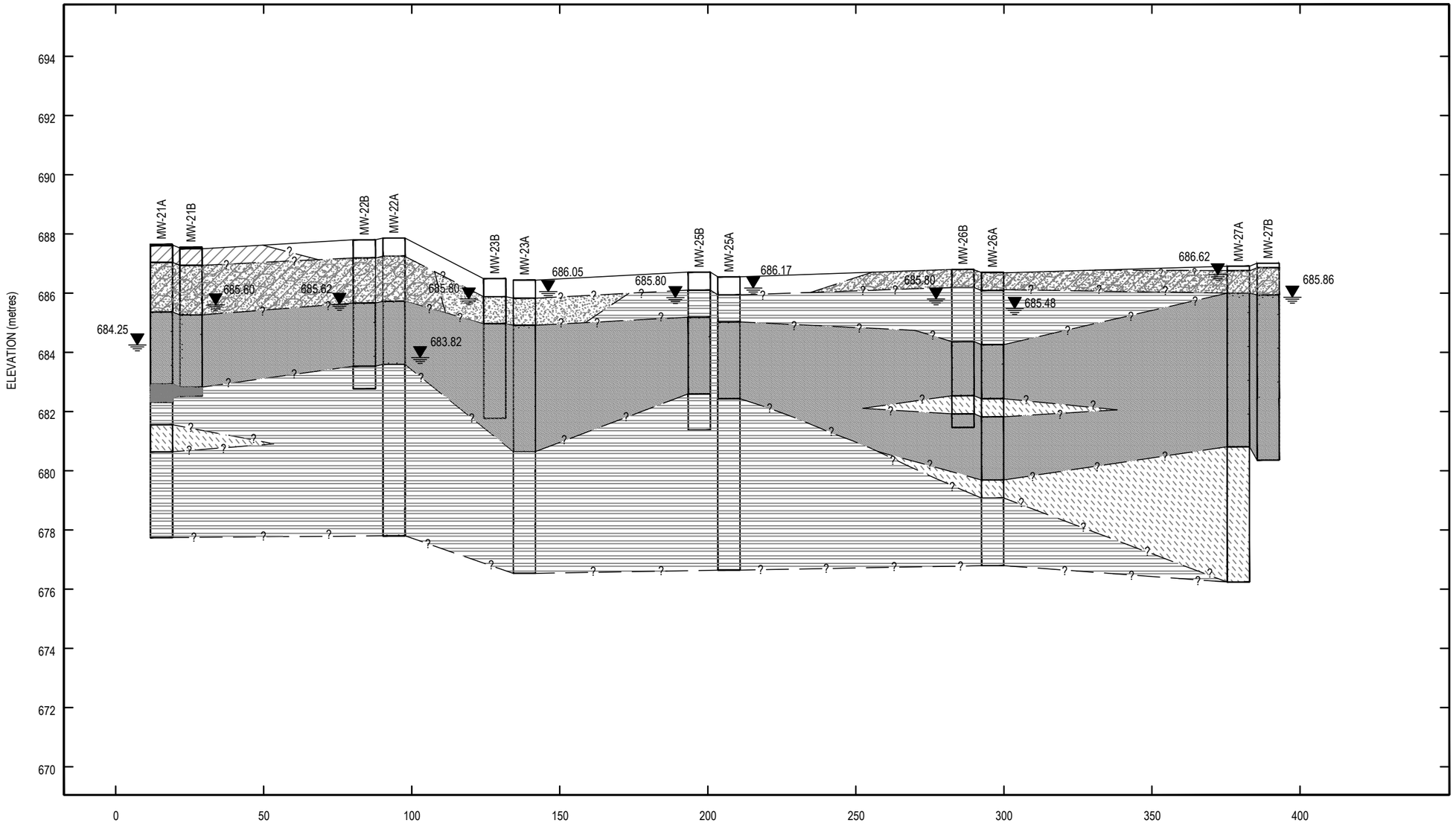
PROJECT NO.	DWN	CKD	REV
SWM.SWOP03800-01	MM/DBD	CF	0

OFFICE: EDM
DATE: January 2019

Figure 4c

C (WEST)

C' (EAST)



SCALE AS SHOWN
10 X VERTICAL EXAGGERATION

LEGEND:

- TOPSOIL
- SAND
- SHALE
- SAND AND SHALE STONE
- CLAY
- GRAVEL
- SANDSTONE
- FILL
- SILT
- TILL
- SILTSTONE
- xxx.xx - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL)
- —?——?——?— - INFERRED

CLIENT

CleanHarbors

TETRA TECH

2018 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Cross-Section C-C'

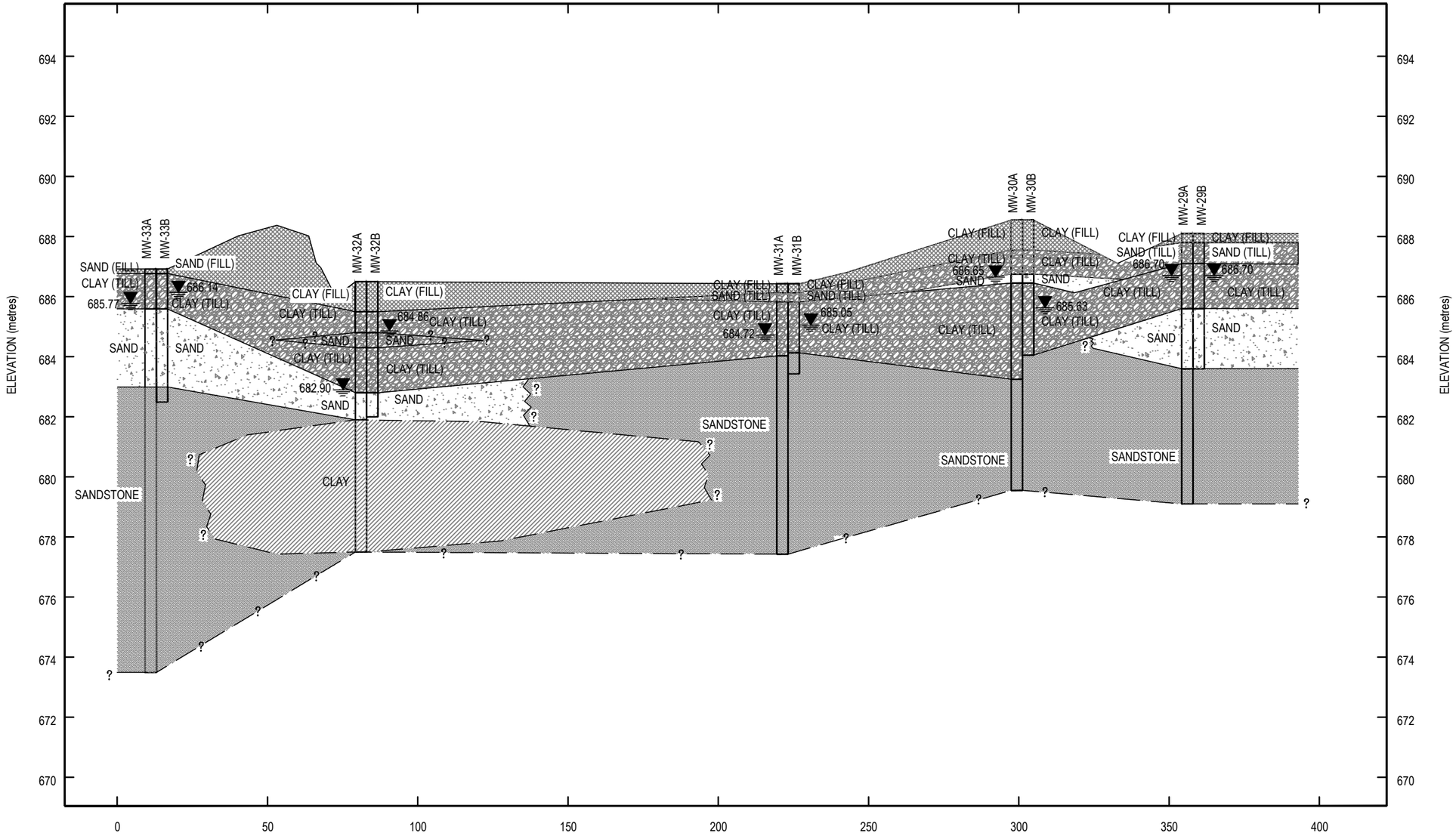
PROJECT NO.	DWN	CKD	REV
SWM.SWOP03800-01	MM/DBD	CF	0

OFFICE: EDM
DATE: January 2019

Figure 4d

D (NORTH)

D' (SOUTH)



SCALE AS SHOWN
10 X VERTICAL EXAGGERATION

LEGEND:

- FILL
- SAND
- CLAY
- SANDSTONE
- TILL
- xxx.xx - GROUNDWATER ELEVATIONS IN METRES ABOVE SEA LEVEL (MASL)
- — ? — ? — ? — - INFERRED

CLIENT

Clean Harbors

TETRA TECH

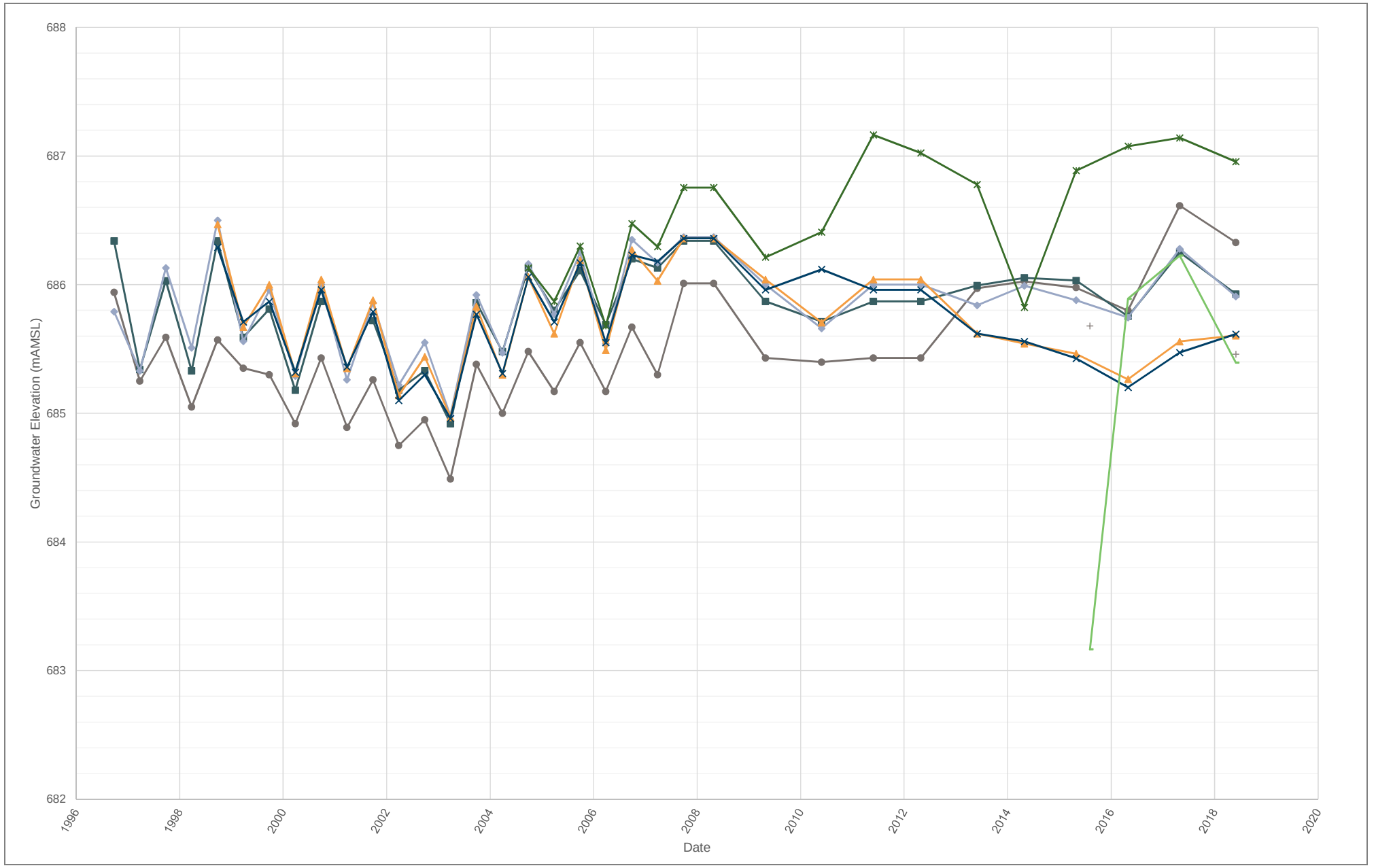
2018 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Cross-Section D-D'

PROJECT NO.	DWN	CKD	REV
SWM.SWOP03800-01	MM/DBD	CF	0

OFFICE: EDM
DATE: January 2019

Figure 4e



LEGEND

MW18B
MW19B
MW20B
MW21B
MW22B
MW24B
15MW34B
15MW35C

CLIENT

CleanHarbors

TETRA TECH

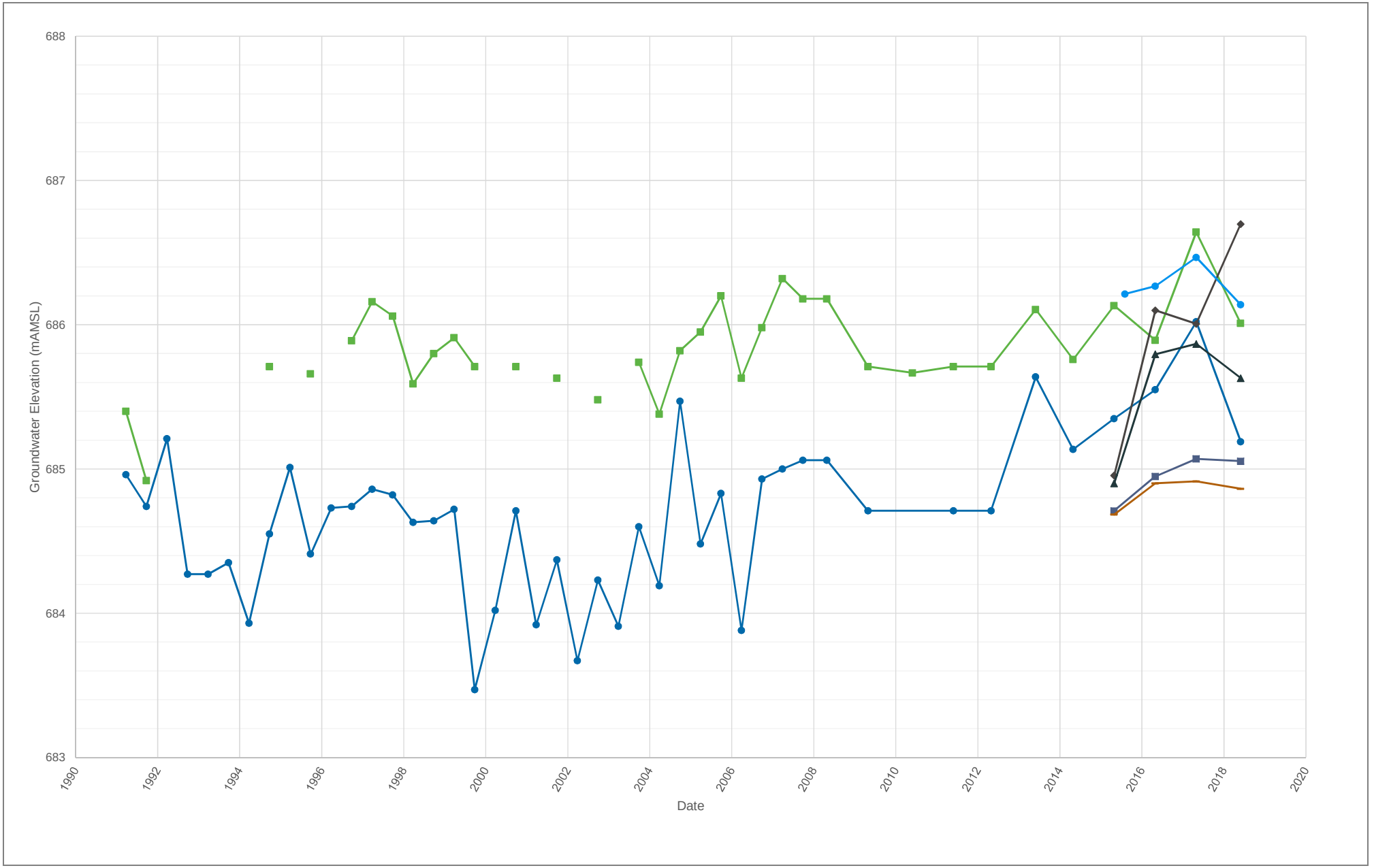
2018 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Surficial Materials West - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	001

OFFICE	DATE	STATUS
Tt - EBA - CAL	January, 2019	Issued for Use

Figure 5a



LEGEND

MW9 MW10 MW29B MW30B MW31B MW32B MW33B

CLIENT

CleanHarbors

TETRA TECH

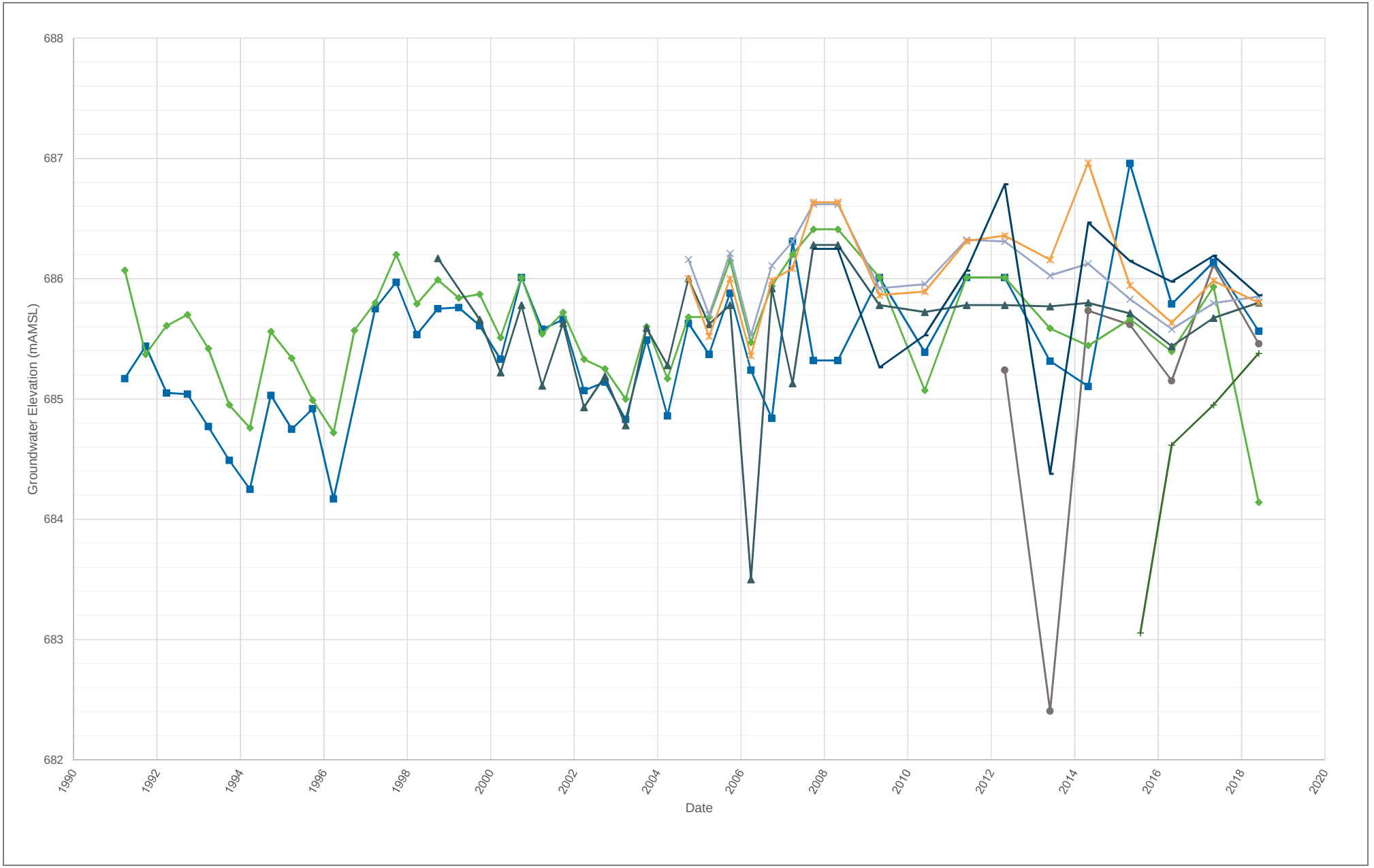
2018 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Surficial Materials East - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	001

OFFICE	DATE	STATUS
Tt - EBA - CAL	January, 2019	Issued for Use

Figure 5b



LEGEND

MW1C
MW5A
MW12A
MW23B
MW25B
MW26B
MW27B
15MW35B

CLIENT

CleanHarbors

TETRA TECH

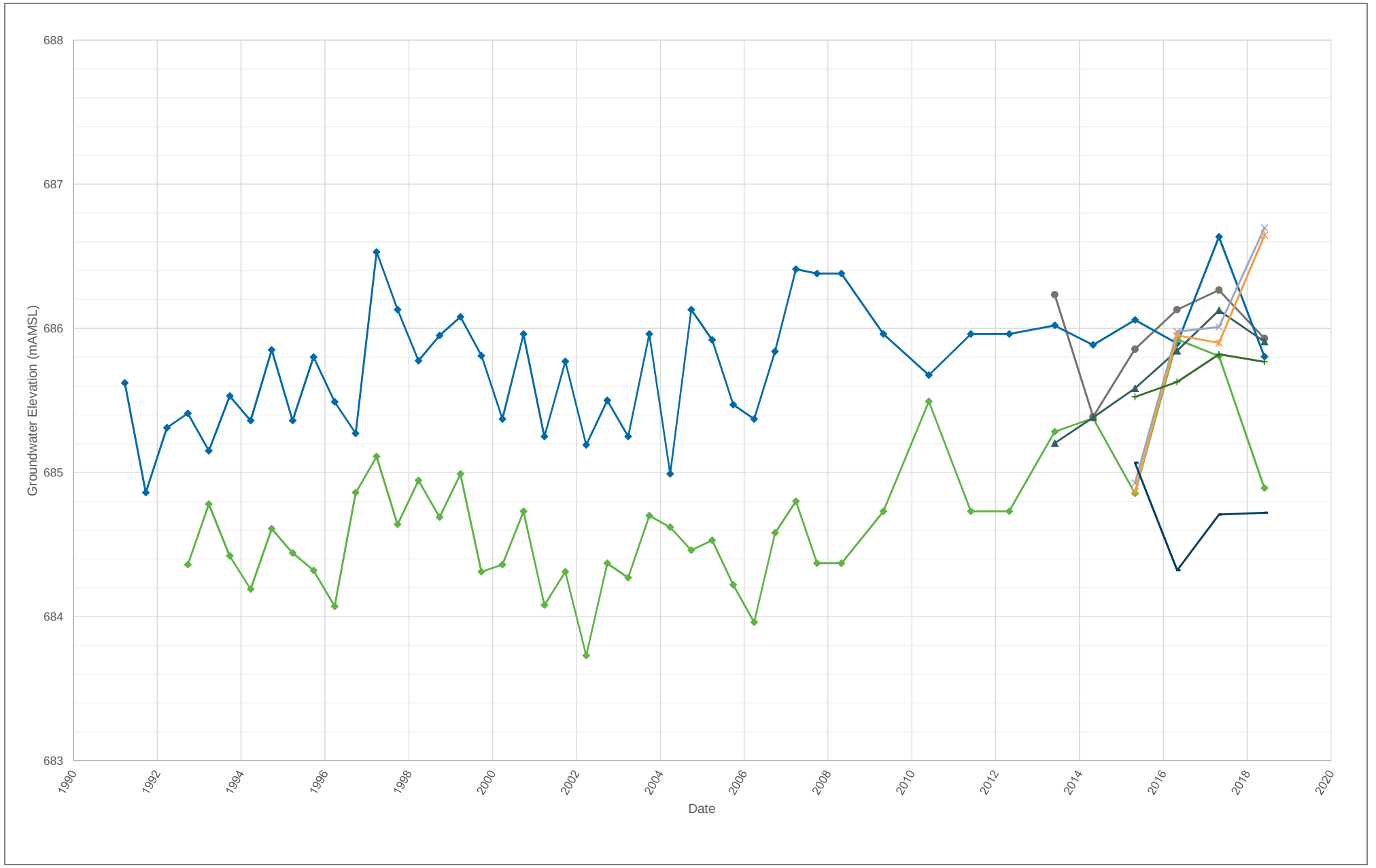
2018 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Upper Sandstone West - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	001

OFFICE	DATE	STATUS
Tt - EBA - CAL	January, 2019	Issued for Use

Figure 5c



LEGEND

MW8B MW11 MW14 MW28B

MW29A MW30A MW31A MW33A

CLIENT

CleanHarbors

TETRA TECH

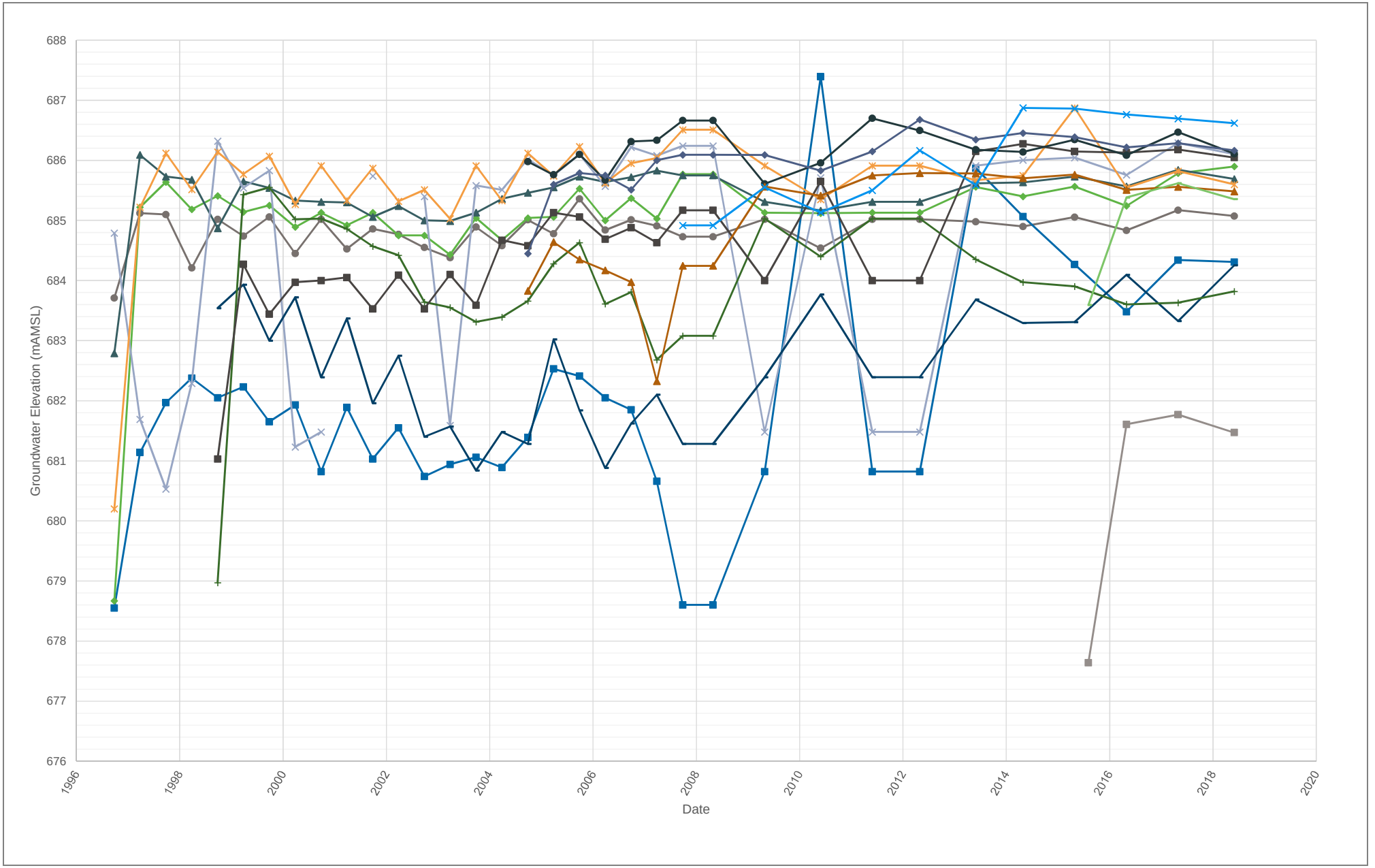
2018 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Upper Sandstone East - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	001

OFFICE	DATE	STATUS
Tt - EBA - CAL	January, 2019	Issued for Use

Figure 5d



LEGEND

MW1B, MW5B, MW12B, MW18A, MW19A, MW20A, MW21A, MW22A, MW23A, MW24A, MW25A, MW26A, MW27A, 15MW34A, 15MW35A

CLIENT

CleanHarbors

TETRA TECH

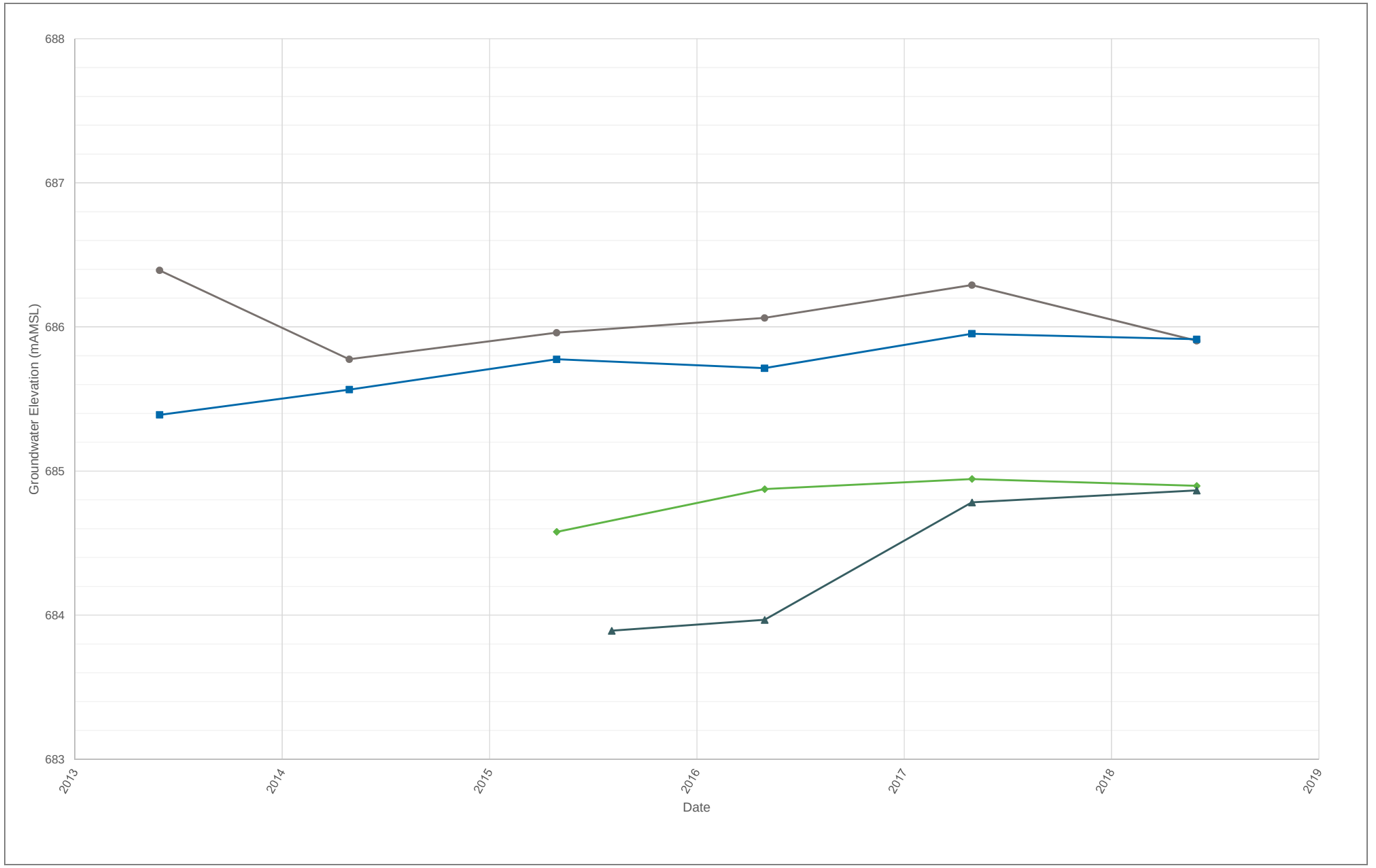
2018 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Clay Shale West - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	001

OFFICE	DATE	STATUS
Tt - EBA - CAL	January, 2019	Issued for Use

Figure 5e



LEGEND

MW8A MW28A MW32A 15MW36A

CLIENT

CleanHarbors

TETRA TECH

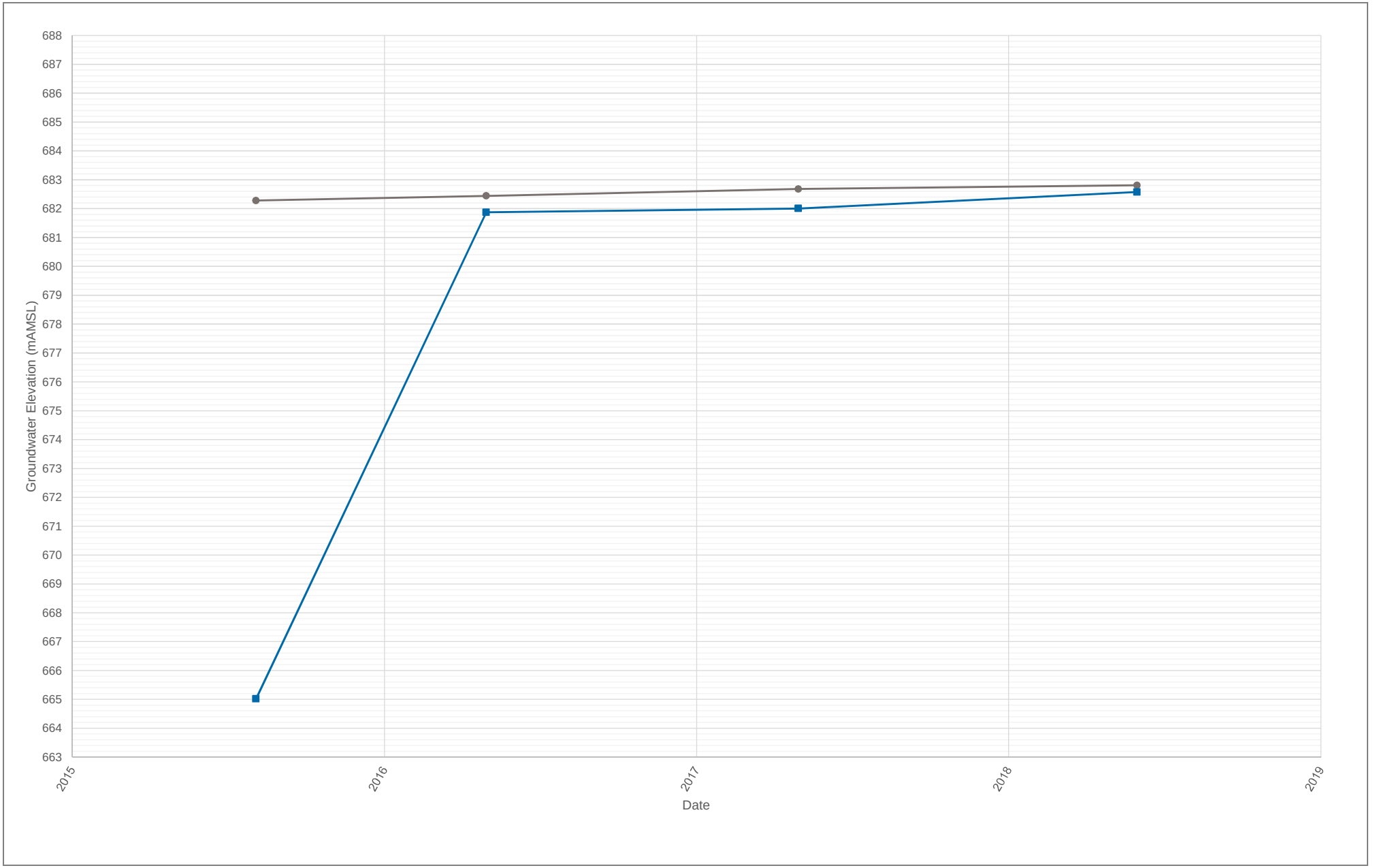
2018 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Clay Shale East - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	001

OFFICE	DATE	STATUS
Tt - EBA - CAL	January, 2019	Issued for Use

Figure 5f



LEGEND

15MW35-Deep

15MW36-Deep

CLIENT

CleanHarbors

TETRA TECH

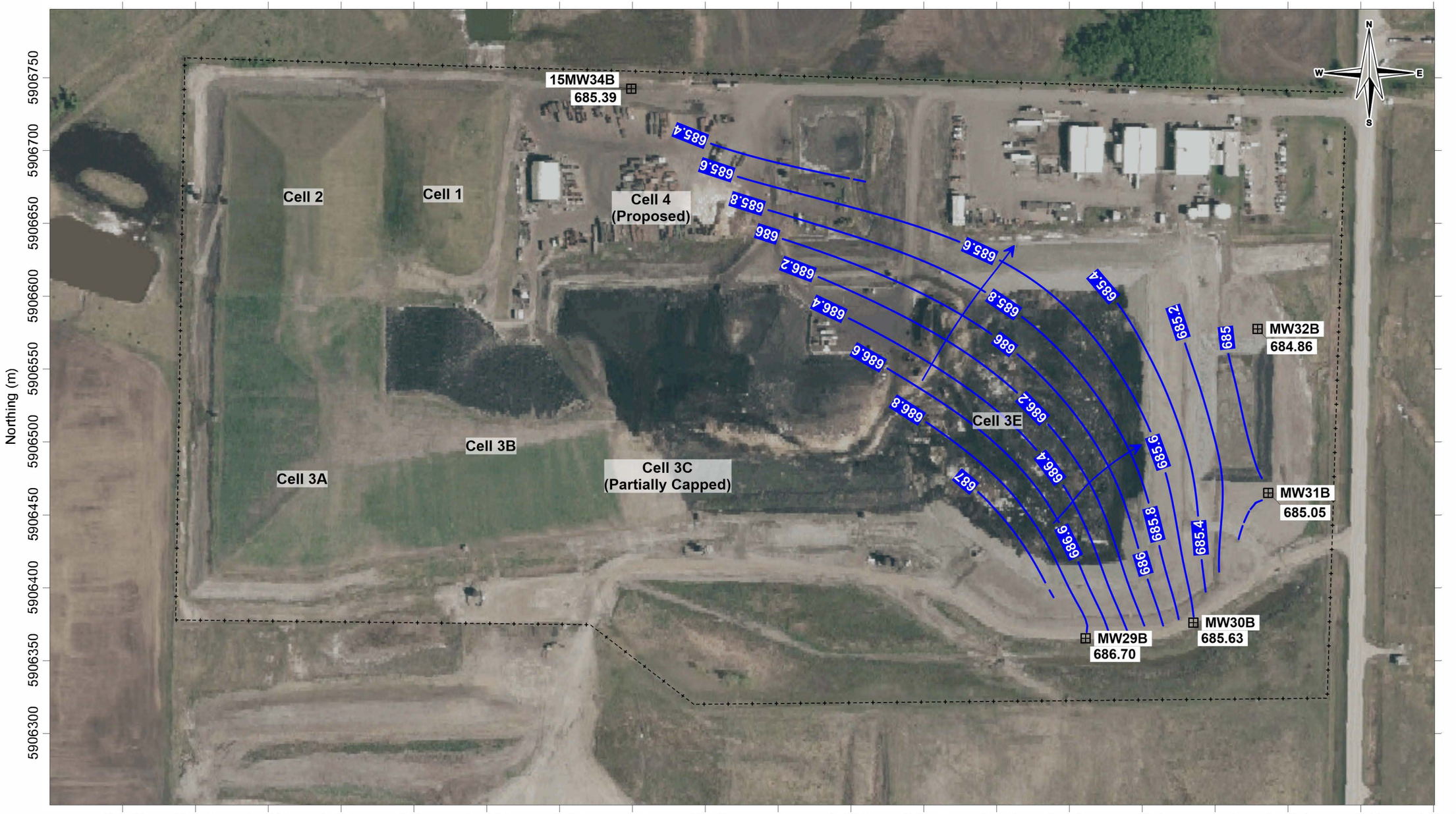
2018 GROUNDWATER MONITORING PROGRAM RYLEY, AB

Lower Bedrock - Hydrograph

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	001

OFFICE	DATE	STATUS
Tt - EBA - CAL	January, 2019	Issued for Use

Figure 5g



LEGEND

- ⊞ - MONITORING WELL LOCATION
- 686.55 m - GROUNDWATER ELEVATION (MASL = Metres above sea level)
- GROUNDWATER ELEVATION CONTOUR
- INTERPOLATED GROUNDWATER FLOW DIRECTION
- SITE BOUNDARY

Note: Imagery obtained from AbaData, January 2019

filepath here:W:\eba\Projects\CGY\78070\SWOP03652\Data\2018\Figre 6A - Surficial Materials.srf

CLIENT

CleanHarbors®

TETRA TECH

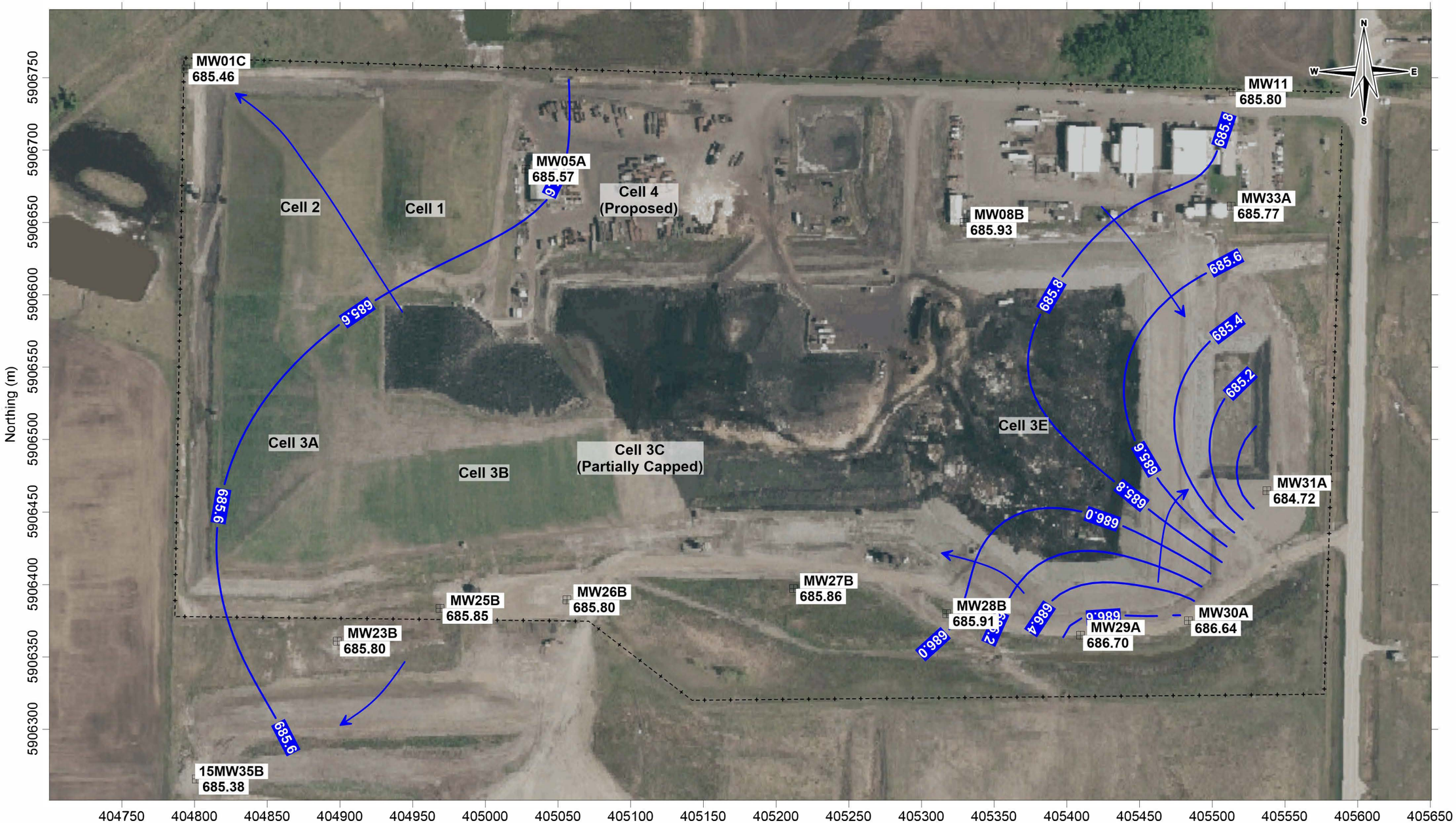
2018 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Groundwater Elevation Contours
Surficial Materials - June 6, 2018

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	000

OFFICE	DATE	STATUS
TT- EBA - Cal	January 2019	Issued for Use

Figure 6a



LEGEND

- ⊞ - MONITORING WELL LOCATION
- 686.55 m - GROUNDWATER ELEVATION (MASL = Metres above sea level)
- GROUNDWATER ELEVATION CONTOUR
- INTERPOLATED GROUNDWATER FLOW DIRECTION
- SITE BOUNDARY
- * Well not included in groundwater elevation contours

Note: Imagery obtained from AbaData, January 2019

CLIENT

CleanHarbors®

TETRA TECH

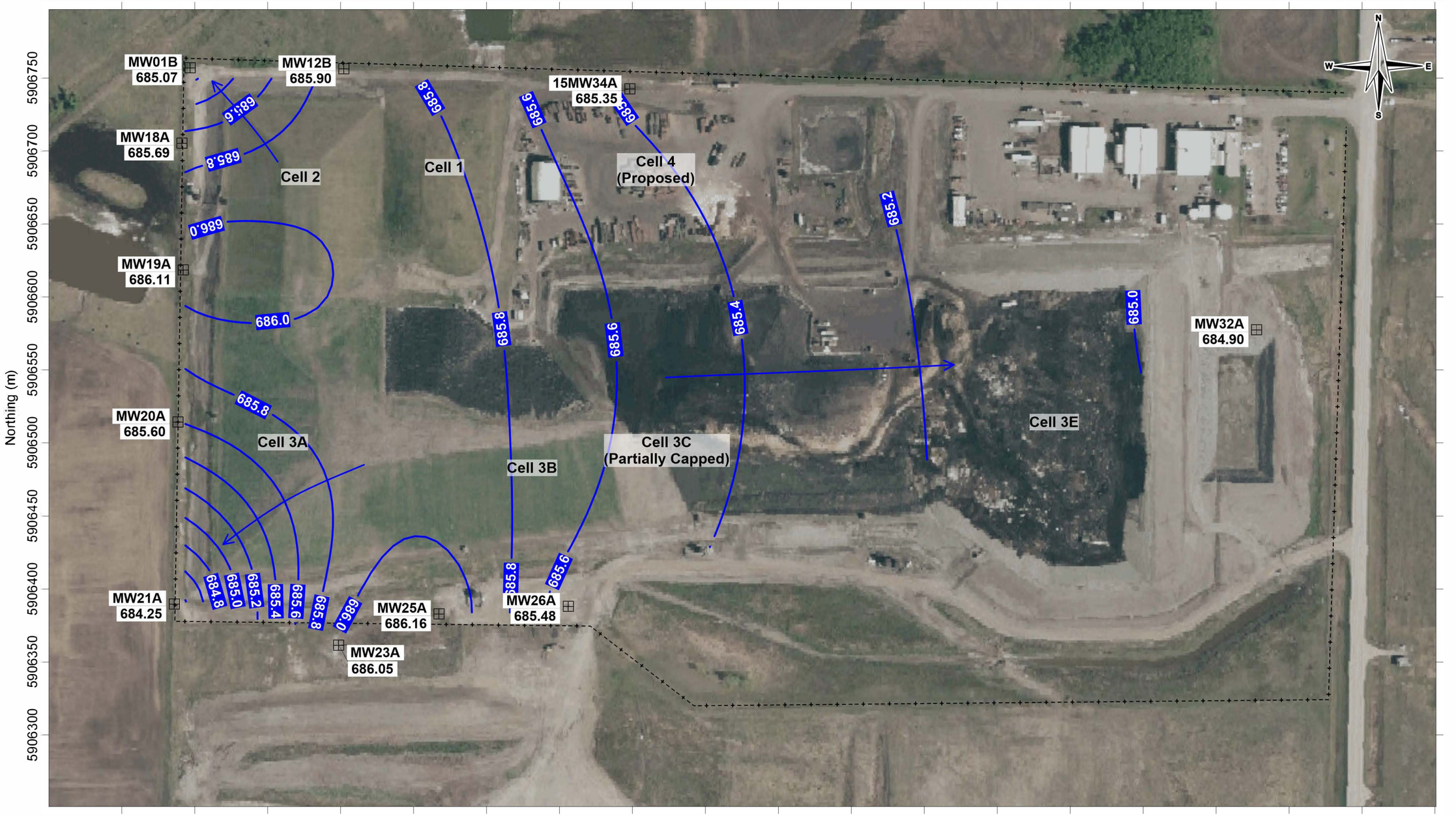
2018 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Groundwater Elevation Contours
Upper Sandstone - June 6, 2018

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	000
OFFICE: TT- EBA - Cal	DATE: January 2019	STATUS: Issued for Use		

Figure 6b

filepath here:W:\ebaProjects\CGY\178070\SWOP03652\Data\2018\Figure 5B - Upper Bedrock.srf



filepath here:W:\eba\Projects\CGY\78070\SWOP03652\Data\2018\Figure 6C - Middle Bedrock.srf

LEGEND

- ⊞ - MONITORING WELL LOCATION
- 686.55 m - GROUNDWATER ELEVATION (MASL = Metres above sea level)
- — - GROUNDWATER ELEVATION CONTOUR
- → - INTERPOLATED GROUNDWATER FLOW DIRECTION
- + - - - SITE BOUNDARY

Note: Imagery obtained from AbaData, January 2019

CLIENT

CleanHarbors®

TETRA TECH

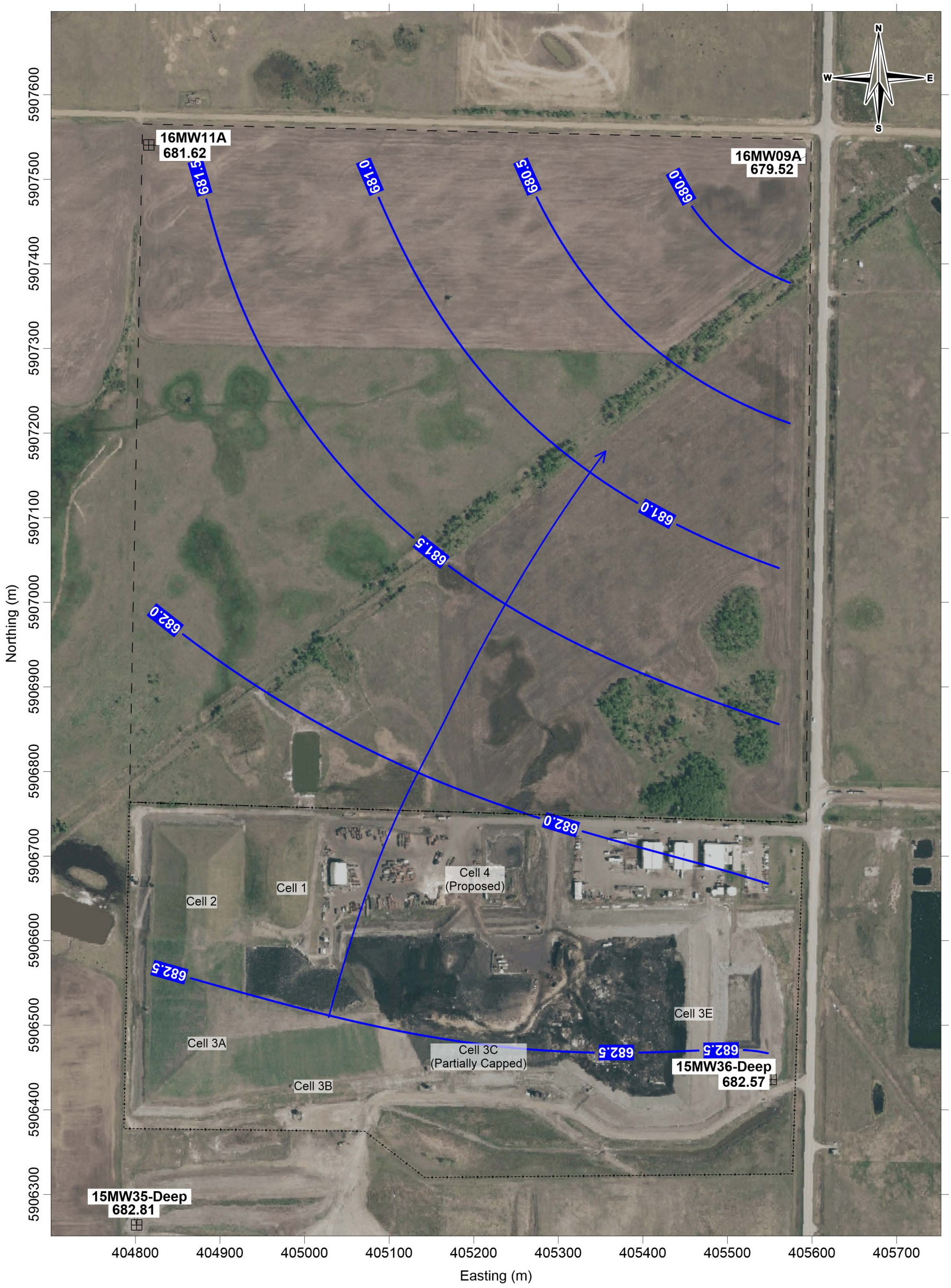
2018 GROUNDWATER MONITORING PROGRAM
RYLEY, AB

Groundwater Elevation Contours
Clay Shale - June 6, 2018

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	000

OFFICE	DATE	STATUS
TT - EBA - Cal	January 2019	Issued for Use

Figure 6c



LEGEND

- ⊞ - MONITORING WELL LOCATION
- 686.55 m - GROUNDWATER ELEVATION (MASL = Metres above sea level)
- ——— - GROUNDWATER ELEVATION CONTOUR
- ↗ - INTERPOLATED GROUNDWATER FLOW DIRECTION
- – + – – - SITE BOUNDARY
- — — – - APPROXIMATE EXPANSION AREA

Note: Data from wells 16MW11A and 16MW09A from expansion used for contouring purposes.
Imagery obtained from AbaData, January 2019

STATUS
Issued for Use

2018 GROUNDWATER MONITORING PROGRAM, RYLEY, ALBERTA

Groundwater Elevation Contours Lower Bedrock - June 6, 2018

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 40 80 120 160
Metres

TETRA TECH

FILE NO.
Figure6D - LowerBedrock.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	0

OFFICE	DATE
Tt-CAL	January 2019

Figure 6d

filepath here: \ebal\Projects\CGY\178070\SWOP03652\Data\2018\Figure6D - Lowerbedrock_Portrait.srf

APPENDIX A

REGULATORY APPROVAL – ALBERTA ENVIRONMENT AND RECORD OF SITE CONDITION

Alberta Environment and Parks

Operations
111 Twin Atria Building, 4999 - 98 Avenue
Edmonton, Alberta T6B 2X3
Telephone: 780-427-7617
www.aep.alberta.ca

File No.: 10348-03-00

May 25, 2018

Mr. Michael E. Parker
Vice President, Canadian Environmental Compliance
Clean Harbors Environmental Services
RR 1 4090 Telfer Road
Corunna, ON N0N 1G0
e-mail: parker.michaele@cleanharbors.com

Dear Mr. Parker:

Re: *Environmental Protection and Enhancement Act* (EPEA) Approval No. 10348-03-00
Revised Groundwater Monitoring Program

Alberta Environment and Parks (AEP) has reviewed the referenced revised Groundwater Monitoring Program submitted by Tetra Tech Canada Inc. on behalf of Clean Harbors Canada, Inc. (Clean Harbors) on September 25, 2017 pursuant to Section 4.9.2 of the *Environmental Protection and Enhancement Act* Approval No. 10348-03-00 (the Approval).

In accordance with Section 4.9.4 of the Approval, Clean Harbors is hereby authorized to proceed with the aforementioned revised Groundwater Monitoring Program.

If you have any questions or require clarification with respect to this letter, please contact Weiguo Wu, Industrial Approvals Engineer, at (780) 427-0630.

Sincerely,

Mohammad Habib, P.Eng.
(Designated Director under the Act)
Red-Deer – North Saskatchewan Region

cc: Stan Yuha, Clean Harbors Canada, Inc (e-mail: YUHA.STAN@cleanharbors.com)
Bryan Hensel, Tetra Tech Canada Inc. (e-mail: Bryan.Hensel@tetratech.com)
Gene Leskiw, Contaminant Hydrogeologist, AEP
Weiguo Wu, Industrial Approvals Engineer, AEP

Alberta Environment and Parks

Operations
Regulatory Approvals Centre
5 Floor, South Petroleum Plaza
9915 – 108 Street
Edmonton, Alberta T5K 2G8
Telephone: (780) 427-6311
Fax: (780) 422-0154
www.aep.alberta.ca

April 19, 2017

Michael Parker
Vice President, Canadian Environmental Compliance
Clean Harbors Canada, Inc.
4090 Telfer Road RR#1
Corunna ON NON 1G0

Dear Mr. Parker:

Re: Ryley Hazardous Waste Storage Facility and Landfill
Application No. 014-10348

Your application for a renewal of an existing approval under the *Environmental Protection and Enhancement Act* (EPEA) has been reviewed and enclosed is Approval No. 10348-03-00.

It is your responsibility to obtain any approvals, permits or licences that are required from other agencies.

The Act may provide the approval holder a right of appeal against any term or condition contained in the approval to the Alberta Environmental Appeals Board. You should note that there are strict time lines for filing an appeal dependent on the type of appeal. If you choose to appeal, please contact the office of the Registrar of Appeals, Environmental Appeals Board of Alberta, 3rd Floor, 10011 - 109 Street, Edmonton, Alberta, T5J 3S8, telephone (780) 427-6207.

If you have any questions, please contact me at (780) 415-2201 in Edmonton.

Yours truly,

A Vawter

Annette Vawter
Application Coordinator

Enclosure

cc: Weiguo Wu, Red Deer/North Saskatchewan Region - Edmonton
cc: Tetra Tech EBA Inc.
Attention: J. Paul Ruffell

Alberta Environment and Parks

APPROVAL

PROVINCE OF ALBERTA

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT
R.S.A. 2000, c.E-12, as amended.

APPROVAL NO. 10348-03-00

APPLICATION NO. 014-10348

EFFECTIVE DATE: March 31, 2017

EXPIRY DATE: March 31, 2027

APPROVAL HOLDER: Clean Harbors Canada, Inc.

ACTIVITY: **CONSTRUCTION, OPERATION AND RECLAMATION OF THE**

Ryley Industrial Waste Management Facility, consisting of a Class I and Class II Industrial Landfill and a Hazardous Waste/Recyclable Storage and Processing Facility,

IS SUBJECT TO THE ATTACHED TERMS AND CONDITIONS.

Designated Director under the Act .....
Mohammad Habib, P. Eng.

Date Signed March 31, 2017

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 1: DEFINITIONS

SECTION 1.1: DEFINITIONS

1.1.1 All definitions from the Act and the regulations apply except where expressly defined in this approval.

1.1.2 In all PARTS of this approval:

(a) "Act" means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended;

(b) "action leakage rate" means the leakage rate that would occur through the primary liner, based on two holes per hectare, each with a diameter of 2 mm and that is calculated to be 790L/ha/day;

(c) "active landfill area" means the portion of the landfill that has received or is receiving waste for disposal, where final cover has not been placed, and includes areas that are being used for interim management of waste prior to disposition;

(d) "active landfill life" means the period of landfill life during which waste is received for disposal at the landfill, beginning with the initial receipt of waste and ending with the start of final landfill closure activities;

(e) "AER" means Alberta Energy Regulator;

(f) "affected lands" means lands which have received substances released from the facility;

(g) "air effluent stream" means any substance in a gaseous medium released by or from a facility;

(h) "APEGA" means the Association of Professional Engineers and Geoscientists of Alberta;

(i) "application" means the written submissions from the approval holder to the Director in respect of application No. 014-10348 and any subsequent applications where amendments are issued for this approval;

(j) "application No. 005-10348" means the written submissions from the approval holder to the Director in respect of renewal application No. 005-10348;

(k) "application No. 008-10348" means the written submissions from the approval holder to the Director in respect of amendment application No. 008-10348;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(l) "application No. 012-10348" means the written submissions from the approval holder to the Director in respect of amendment application No. 012-10348;

(m) "as-built plans" means survey plans, signed and stamped by a professional registered with APEGA, that document variances from design or construction plans that were either approved or authorized according to the terms and conditions of this approval;

(n) "BTEX" means benzene, toluene, ethylbenzene and xylene;

(o) "COD" means Chemical Oxygen Demand;

(p) "composite liner" means a liner that meets the specifications in 3.1.2(b) of this approval;

(q) "container" means any portable device in which a substance is kept, including but not limited to the following:

(i) drums, barrels and pails which have a capacity greater than 18 litres but less than 210 litres,

(ii) 320 litre overpack drums, and

(iii) 1000 litre tote tanks or sacks;

(r) "cover" means soil or other approved material that is used to cover compacted wastes in a landfill cell;

(s) "day", when referring to sampling, means any sampling period of 24 consecutive hours;

(t) "decommissioning" means the dismantling and decontamination of the facility undertaken subsequent to the termination or abandonment of any activity or any part of any activity regulated under the Act, excluding the landfill cells and those infrastructure components and facilities that are required for the landfill post-closure;

(u) "decontamination" means the treatment or removal of substances from the facility and affected lands;

(v) "Director" means an employee of the Government of Alberta designated as a Director under the Act;

(w) "dismantling" means the removal of buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling

TERMS AND CONDITIONS ATTACHED TO APPROVAL

facilities, railways, roadways, pipelines and any other installations that are being or have been used or held for or in connection with the facility;

(x) "DOC" means Dissolved Organic Carbon;

(y) "domestic wastewater" means wastewater that is the composite of liquid and water-carried wastes associated with the use of water for drinking, cooking, cleaning, washing, hygiene, sanitation or other domestic purposes, together with any infiltration and inflow wastewater, that is released into a wastewater collection system;

(z) "domestic wastewater system" means the parts of the facility that collect, store, or treat domestic wastewater from the facility;

(aa) "existing landfill cells" means Cell 1, Cell 2, Cell 3A, Cell 3B, and Cell 3C as described in application No. 005-10348;

(bb) "facility" means all buildings, structures, process and pollution abatement equipment, vessels, storage facilities, material handling facilities, roadways, railways, pipelines and other installations, the Class I and Class II industrial landfill and the HWRSP Facility, and includes the land, located on the SE 1/4 of Section 9, Township 50, Range 17, West of the 4th Meridian, that is being or has been used or held for or in connection with the Ryley Industrial Waste Management Facility;

(cc) "facility developed area" means the areas of the facility used for the storage, treatment, processing, transport, or handling of raw material, intermediate product, by-product, finished product, process chemicals, or waste material, and includes the active landfill area;

(dd) "final cover" means a designed system, natural or man-made, that is placed on the surface of a landfill or landfill cell that has reached its maximum designated waste elevation to control transmission of moisture and landfill gas, and conforms to the end use plan;

(ee) "final landfill closure" means the period of time when waste is no longer placed in the defined portion of a landfill and activities are undertaken to complete the final cover system and decommission components and facilities that are no longer required, and includes the construction of any additional components or monitoring systems that are necessary for post-closure;

(ff) "free liquids" means the liquids as determined by the US EPA SW-846 Test Method 9095B: Paint Filter Liquids Test, as specified in Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, US EPA Publication No. SW-846, as amended;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(gg) "fugitive emissions" means emissions of substances to the atmosphere other than ozone depleting substances, originating from a facility source other than a flue, vent, or stack but does not include sources which may occur due to breaks or ruptures in process equipment;

(hh) "GCL" means geosynthetic clay liner that is made of a thin layer of bentonite either bonded to a geomembrane or fixed between two sheets of geotextile;

(ii) "geomembrane" means a sheet of manufactured synthetic material designed to control migration of liquid and gas;

(jj) "grab sample" means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;

(kk) "groundwater" means groundwater as defined in the *Water Act,* R.S.A. 2000, c.W-3, as amended;

(ll) "groundwater monitoring well" means a well drilled at a site to measure groundwater levels and collect groundwater samples for the purpose of physical, chemical, or biological analysis to determine the concentration of groundwater constituents;

(mm) "HDPE" means High Density Polyethylene;

(nn) "HWRSP Facility" means the Hazardous Waste/Recyclable Storage and Processing Facility as described in the application for storage, processing and transfer of hazardous wastes and hazardous recyclables and which includes the Maintenance Shop, and is an integral part of the facility;

(oo) "hydraulic conductivity" means the ease with which water can be transported through a material

(pp) "hydrocarbon" means a chemical compound that consists entirely of hydrogen and carbon;

(qq) "ISO/IEC 17025" means the international standard, developed and published by International Organization for Standardization (ISO), specifying management and technical requirements for laboratories;

(rr) "incompatible waste" means waste materials which could cause dangerous reactions from direct contact with one another;

(ss) "industrial wastewater" means the composite of liquid wastes and water-carried wastes, any portion of which results from any industrial process carried on at the HWRSP Facility;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(tt) "landfill" means the Class I and Class II industrial landfill as described in the application and which includes the waste stabilization area, and is an integral part of the facility;

(uu) "landfill cell" means a designed area of a landfill comprised of an excavation or earthen structure in which waste is enclosed;

(vv) "landfill cell closure" means the construction of a final cover for landfill cell including placement of previously conserved top soil and upper subsoil and re-vegetation as required for the intended future use of the landfill;

(ww) "landfill gas" means a mixture of gases generated by the microbial decomposition of and chemical reactions between wastes in a landfill;

(xx) "lateral expansion" means an expansion of landfill cell boundaries beyond the approved area;

(yy) "leachate" means a liquid that has been in contact with waste in the landfill cell and has undergone chemical or physical changes;

(zz) "leachate collection system" means a system that gathers leachate so that it may be removed from a landfill, and includes a permeable drainage material, a network of perforated pipes and sumps or manholes from where leachate can be removed;

(aaa) "leak detection liquid" means any liquid collected within the leak detection system;

(bbb) "leak detection system" means a system that gathers liquid between a primary liner and a secondary liner system, and consists of a permeable drainage material, a network of perforated pipes and sumps or manholes from where the liquid can be removed;

(ccc) "liner" means a continuous layer of synthetic material or compacted natural clay placed beneath and at the sides of a landfill cell that is compatible with the waste and restricts the migration of leachate, or landfill gas, or both;

(ddd) "local environmental authority" means the Department of Environment and Parks, in the Province of Alberta, or the agency that has the equivalent responsibilities for any jurisdiction outside the Province;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(eee) "major ions" means the following:

Calcium	Carbonate
Magnesium	Bicarbonate
Sodium	Chloride
Potassium	Sulfate

(fff) "maximum acceptable leachate head" means the maximum depth of leachate above the lowest part of the primary liner, not including the sumps or leachate collection pipe trenches, and is:

(i) 1.0 m in each of the existing landfill cells, and

(ii) 0.3 m in each of the new landfill cells

during active landfill life, landfill cell closure, final landfill closure, and post-closure;

(ggg) "maximum designated waste elevation" means the maximum elevation of waste in metres above sea level that can be disposed of at the landfill prior to construction of final cover, and is 714 metres;

(hhh) "metals" means the following:

Aluminum, dissolved	Chromium, dissolved (hexavalent)	Nickel, dissolved
Antimony, dissolved	Cobalt, dissolved	Selenium, dissolved
Arsenic, dissolved	Copper, dissolved	Silver, dissolved
Barium, dissolved	Lead, dissolved	Thallium, dissolved
Boron, dissolved	Manganese, dissolved	Tin, dissolved
Cadmium, dissolved	Mercury, total	Uranium, dissolved
Chromium, total	Molybdenum, dissolved	Zinc, dissolved

(iii) "monitoring system" means all equipment used for sampling, conditioning, analyzing or recording data in respect of any parameter listed or referred to in this approval, including equipment used for continuous monitoring;

(jjj) "month" means calendar month;

(kkk) "municipal solid waste" means solid waste resulting from or incidental to municipal, community, commercial, institutional and recreation activities, and includes garbage, rubbish, ashes, street cleanings, abandoned automobiles and all other solid wastes except hazardous waste, industrial solid waste, oilfield waste and biomedical wastes;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(lll) "new landfill cells" means Cell 3D as described in application No. 005-10348, Cell 3E as described in application No. 012-10348, and Cell 4 as described in the application;

(mmm) "new surface water detention pond" means the surface water detention pond as described in application No. 012-10348;

(nnn) "NORM" means Naturally Occurring Radioactive Materials;

(ooo) "NORM waste" means any waste material with concentrations of NORM above the limits specified in Tables 5.1, 5.2, or 5.3 of the *Canadian Guidelines for the Management of Naturally Occurring Radioactive Materials (NORM)*, Health Canada, 2011, as amended;

(ppp) "nutrients" means the following:

Ammonia nitrogen	Nitrite nitrogen
Total Kjeldahl nitrogen	Total phosphorus
Nitrate nitrogen	Dissolved phosphorus

(qqq) "old surface water detention pond" means the surface water detention pond as described in application No. 005-10348;

(rrr) "Petroleum Hydrocarbons Fractions F1 and F2" means the specific hydrocarbon fraction measured by the analytical methods described in the *Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method,* published by the Canadian Council of Ministers of the Environment, 2001, as amended;

(sss) "points of compliance" means the location or locations of the groundwater monitoring wells where measurements of groundwater quality are taken to assess landfill and waste treatment performance;

(ttt) "post-closure" means the period of time after completion of the final landfill closure;

(uuu) "ppm" means concentration in parts per million;

(vvv) "primary liner" means the uppermost geomembrane liner;

(www) "QA/QC" means quality assurance and quality control;

(xxx) "quarter year" means a time period of three consecutive months designated as January, February and March; or April, May and June; or July, August and September; or October, November and December;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(yyy) "regulations" means the regulations enacted pursuant to the Act, as amended;

(zzz) "representative grab" means a sample consisting of equal volume portions of water collected from at least four sites between 0.20 to 0.30 metres below the water surface within a pond;

(aaaa) "runoff" means any rainwater or melt water that drains as surface flow from the facility developed areas, excluding leachate;

(bbbb) "runoff control system" means the parts of the facility that collect, store or treat runoff from the facility, and includes but is not limited to runoff collection ditches, surface water detention pond(s) and tank farm bermed area;

(cccc) "run-on" means any rainwater or melt water that drains as surface flow toward the active landfill area;

(dddd) "run-on control system" means the parts of the facility that divert run-on away from the active landfill area;

(eeee) "scrubber exhaust stack" means the exhaust stack through which the air effluent streams that are:

(i) collected from the exhaust vents of the Drum Processing Building or Staging Building or both, and

(ii) treated with the caustic scrubber and activated carbon filter

are released to the atmosphere as described in the application;

(ffff) "secondary liner" means the lowermost geomembrane liner;

(gggg) "soil" means mineral or organic earthen materials that can, have, or are being altered by weathering, biological processes, or human activity;

(hhhh) "SOP" means Standard Operating Procedures;

(iiii) "storm event" means a 1 in 25 year, 24 hour duration rainfall event at Ryley, Alberta;

(jjjj) "tank" means a stationary device, designed to contain an accumulation of a substance, which is constructed primarily of non-earthen materials that provide structural support including wood, concrete, steel, and plastic;

(kkkk) "TDGR" means the *Transportation of Dangerous Goods Regulations* (SOR/2001-286) made under the *Transportation of Dangerous Goods Act*, 1992 (Canada), as amended;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(llll) "TDS" means Total Dissolved Solids;

(mmmm) "topsoil" means the uppermost layer of soil and consists of:

(i) the A-horizons and all organic horizons as defined in *The Canadian System of Soil Classification* (Third Edition), Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended, and

(ii) the soil ordinarily moved during tillage;

(nnnn) "TSS" means Total Suspended Solids;

(oooo) "upper subsoil" means the layer of soil directly below the topsoil layer that consists of the B-horizons as defined in *The Canadian System of Soil Classification,* (Third Edition), Agriculture and Agri-Food Canada, Publication 1646, 1998, as amended;

(pppp) "volume estimate" means a technical evaluation based on the sources contributing to the release including but not limited to pump capabilities, water meters, and batch release volumes;

(qqqq) "waste stabilization area" means the portion of the landfill that is used for waste stabilization or solidification or both, as described in application no. 008-10348;

(rrrr) "waste storage area" means the areas designated for storage of containers for waste or hazardous recyclable or both, or for storage of tanks for waste or hazardous recyclable or both, or for storage of both, as described in application No. 005-10348;

(ssss) "week" means any consecutive 7-day period;

(tttt) "working face" means that portion of the active landfill area where waste is currently being deposited, spread and compacted; and

(uuuu) "year" means calendar year.

PART 2: GENERAL

SECTION 2.1: REPORTING

2.1.1 The approval holder shall immediately report to the Director by telephone any contravention of the terms and conditions of this approval at 1-780-422-4505.

2.1.2 The approval holder shall submit a written report to the Director within 7 days of the reporting pursuant to 2.1.1.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

2.1.3 The approval holder shall immediately notify the Director in writing if any of the following events occurs:

(a) the approval holder is served with a petition into bankruptcy;

(b) the approval holder files an assignment in bankruptcy or Notice of Intent to make a proposal;

(c) a receiver or receiver-manager is appointed;

(d) an application for protection from creditors is filed for the benefit of the approval holder under any creditor protection legislation; or

(e) any of the assets which are the subject matter of this approval are seized for any reason.

2.1.4 If the approval holder monitors for any substances or parameters which are the subject of operational limits as set out in this approval more frequently than is required and uses procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the reports required by this approval.

2.1.5 The approval holder shall submit all monthly reports required by this approval to be compiled or submitted to the Director on or before the end of the month following the month in which the information was collected, unless otherwise specified in this approval.

2.1.6 The approval holder shall submit all annual reports required by this approval to be compiled or submitted to the Director on or before March 31 of the year following the year in which the information was collected, unless otherwise specified in this approval.

SECTION 2.2: RECORD KEEPING

2.2.1 The approval holder shall:

(a) record; and

(b) retain

all the following information in respect of any sampling conducted or analyses performed in accordance with this approval for a minimum of ten years, unless otherwise authorized in writing by the Director:

(i) the place, date and time of sampling,

(ii) sample type,

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iii) the dates the analyses were performed,

(iv) the analytical techniques, methods or procedures used in the analyses,

(v) the names of the persons who collected and analysed each sample, and

(vi) the results of the analyses.

2.2.2 The approval holder shall keep and maintain an Operating Record of the landfill as per 4.6.34(a) until the end of the landfill post-closure.

2.2.3 The Operating Record referred to in 2.2.2 shall include, at a minimum, all of the following information:

(a) the information required in section 7.3(c) of the *Standards for Landfills in Alberta*, as amended;

(b) the name and contact information of all persons who discover any contravention;

(c) the names and contact information of all persons who take any remedial actions arising from the contravention of the Act, the regulations, or this approval; and

(d) a description of the remedial measures taken in respect of a contravention of the Act, the regulations, or this approval.

2.2.4 The approval holder shall submit a copy of the most recent Operating Record to the Director upon written request from the Director within the timeline specified in writing by the Director.

SECTION 2.3: ANALYTICAL REQUIREMENTS

2.3.1 With respect to any sample required to be taken pursuant to this approval, the approval holder shall ensure that:

(a) collection;

(b) preservation;

(c) storage;

(d) handling; and

(e) analysis

TERMS AND CONDITIONS ATTACHED TO APPROVAL

shall be conducted in accordance with the following unless otherwise authorized in writing by the Director:

(i) for air:

(A) the *Alberta Stack Sampling Code*, Alberta Environment, 1995, as amended,

(B) the *Methods Manual for Chemical Analysis of Atmospheric Pollutants*, Alberta Environment, 1993, as amended, and

(C) the *Air Monitoring Directive*, Alberta Environment, 1989, as amended;

(ii) for industrial wastewater, industrial runoff, groundwater and domestic wastewater:

(A) the *Standard Methods for the Examination of Water and Wastewater*, published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, 1998, as amended;

(iii) for whole effluent toxicity tests:

(A) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, Environment Canada, Environmental Protection Series 1/RM/13, December 2000, as amended,

(B) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna*, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended,

(C) the *Biological Test Method: Growth Inhibition Test Using the Freshwater Alga Selenastrum capricornutum*, Environment Canada, Environmental Protection Series, November 1992, as amended,

(D) the *Biological Test Method: Test of Reproduction and Survival Using the Cladoceran Ceriodaphnia dubia*, Environment Canada, Environmental Protection Series 1/RM/21, February 1992, as amended,

(E) the *Biological Test Method: Test of Larval Growth and Survival Using Fathead Minnows*, Environment Canada,

TERMS AND CONDITIONS ATTACHED TO APPROVAL

Environmental Protection Series 1/RM/22, February 1992, as amended, and

(F) the *Biological Test Method: Toxicity Test Using Luminescent Bacteria (Photobacterium phosphoreum)*, Environment Canada, Environmental Protection Series, 1/RM/24, November 1992, as amended;

(iv) for soil:

(A) the *Soil Monitoring Directive,* Alberta Environment, May 2009, as amended, and

(B) the *Soil Quality Criteria Relative to Disturbance and Reclamation*, Alberta Agriculture, March 1987, as amended; and

(v) for waste:

(A) the *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, USEPA, SW-846, September 1986, as amended,

(B) the *Methods Manual for Chemical Analysis of Water and Wastes*, Alberta Environmental Centre, Vegreville, Alberta, 1996, AECV96-M1, as amended,

(C) the *Toxicity Characteristic Leaching Procedure (TCLP)* USEPA Regulation 40 CFR261, Appendix II, Method No. 1311, as amended, or

(D) the *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, American Water Works Association, and the Water Environment Federation, 2010, as amended.

2.3.2 The approval holder shall analyse all samples that are required to be obtained by this approval in a laboratory accredited pursuant to ISO/IEC 17025, as amended, for the specific parameter(s) to be analysed, unless otherwise authorized in writing by the Director.

2.3.3 The term sample used in 2.3.2 does not include samples directed to continuous monitoring equipment, unless specifically required in writing by the Director.

2.3.4 The approval holder shall comply with the terms and conditions of any written authorization issued by the Director under 2.3.2.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 2.4: OTHER

2.4.1 The terms and conditions of this approval are severable. If any term or condition of this approval or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.

2.4.2 Any conflict between the *Standards for Landfills in Alberta*, as amended, and the terms and conditions of this approval shall be resolved in favour of this approval.

2.4.3 *Environmental Protection and Enhancement Act* Approval No. 10348-02-00, as amended, is cancelled.

2.4.4 All tanks shall conform to the *Guidelines for Secondary Containment for Above Ground Storage Tanks,* Alberta Environmental Protection, 1997, as amended, unless otherwise authorized in writing by the Director.

2.4.5 All above ground storage tanks containing liquid hydrocarbons or organic compounds shall conform to the *Environmental Guidelines for Controlling Emissions of Volatile Organic Compounds from Aboveground Storage Tanks*, Canadian Council of Ministers of the Environment, PN 1180, 1995, as amended.

PART 3: CONSTRUCTION

SECTION 3.1: LANDFILL

3.1.1 The approval holder shall not commence construction of Cell 4 unless and until updated financial security of the facility has been provided to include Cell 4 lateral expansion.

3.1.2 The approval holder shall construct each new Class I industrial landfill cell in such a way that each new Class I landfill cell shall consist of the following components, at a minimum, unless otherwise authorized in writing by the Director:

(a) a minimum of 0.45 metre thick cover of clean sand or soil placed over top of the uppermost drainage layer;

(b) a composite liner that consists of, at a minimum:

(i) a GCL liner placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a primary liner;

(ii) a GCL liner placed in direct contact with an underlying 80 mil HDPE geomembrane liner as a secondary liner; and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iii) a GCL liner placed in direct contact with an underlying clay liner that has:

(A) a minimum thickness of 1.0 metre at all points, measured perpendicular to the slope, and

(B) been compacted to achieve an in-place hydraulic conductivity of 1×10^{-9} m/s or less;

(c) a leachate collection system that:

(i) is placed over the primary liner;

(ii) is capable of maintaining the maximum acceptable leachate head; and

(iii) consists of:

(A) a geo-composite drainage layer with a transmissivity of at least 1×10^{-4} m^2/s placed over top of the primary liner,

(B) a network of perforated leachate collection pipes, and

(C) a leachate collection sump placed over the primary liner;

(d) a leak detection system that:

(i) is installed over the secondary liner;

(ii) is capable of detecting the leakage through the primary liner; and

(iii) consists of:

(A) a geo-composite drainage layer with a transmissivity of at least 1×10^{-4} m^2/s placed over top of the secondary liner,

(B) a network of perforated leak detection liquid collection pipes, and

(C) a leak detection liquid collection sump placed over the secondary liner;

(e) a final cover:

(i) that meets the requirements in section 6.1(c) of the *Standards for Landfills in Alberta*, as amended; or

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(ii) as specified in the Landfill Cell Closure Plan submitted by the approval holder and authorized in writing by the Director pursuant to 7.1.1 and 7.1.4;

(f) a run-on control system capable of preventing flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event at the facility; and

(g) a runoff control system capable of collecting and controlling at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.

3.1.3 The composite liner for the landfill shall be constructed on a foundation or base such that there shall be no failure of the liners due to settlement, compression, or uplift.

3.1.4 The approval holder shall submit to the Director the following plans and specifications for the proposed construction of each of the items listed in 3.1.2, signed and stamped by a professional registered with APEGA at least three (3) months prior to construction:

(a) a Detailed Construction Plan and Specifications prepared as per 3.1.2;

(b) a Construction Quality Assurance Plan; and

(c) a Construction Quality Control Plan.

3.1.5 If the Detailed Construction Plan and Specifications in 3.1.4 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

3.1.6 The approval holder shall implement the Detailed Construction Plan and Specifications in 3.1.4 as authorized in writing by the Director.

3.1.7 During construction of any of the items listed in 3.1.2, the approval holder shall not deviate from the Detailed Construction Plan and Specifications as authorized in writing by the Director in 3.1.6, unless the following conditions are met:

(a) the deviation results in a minor adjustment to the Detailed Construction Plan and Specifications in order to suit field conditions encountered; and

(b) the deviation will result in an equivalent or better design performance of the landfill.

3.1.8 The approval holder shall submit to the Director a summary report of the Construction Quality Assurance and Construction Quality Control results signed and stamped by a professional registered with APEGA.

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3.1.9 The summary report in 3.1.8 shall contain the following information, at a minimum:

(a) confirmation that the landfill has been constructed according to:

(i) the Construction Quality Assurance Plan,

(ii) the Construction Quality Control Plan, and

(iii) the Detailed Construction Plan and Specifications as authorized in writing by the Director in 3.1.6, subject to the deviations as per 3.1.7;

(b) description of any minor deviations as per 3.1.7;

(c) confirmation by the professional registered with APEGA, that deviations as per 3.1.7 will result in an equivalent or better design performance of the landfill;

(d) "as-built" plans;

(e) photo-documentation of important stages of construction including any repair work or remediation activities to establish or maintain liner integrity; and

(f) any other information as required in writing by the Director.

3.1.10 The approval holder shall notify the Director in writing at least fourteen (14) days prior to commencing operations of any new landfill cell.

3.1.11 The approval holder shall construct the off-loading area (tipping area) as described in the application, unless otherwise authorized in writing by the Director.

3.1.12 The approval holder shall manage landfill progression in such a manner as to minimize off-site visual impacts of the landfill, as described in the Landfill Cell Closure Plan submitted by the approval holder and authorized in writing by the Director pursuant to 7.1.1 and 7.1.4.

SECTION 3.2: WASTE STABILIZATION AREA

3.2.1 The approval holder shall construct the waste stabilization area in accordance with the following:

(a) application No. 008-10348; and

(b) within a Class I landfill cell;

unless otherwise authorized in writing by the Director.

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SECTION 3.3: SOIL CONSERVATION

3.3.1 The approval holder shall:

(a) salvage; and

(b) conserve

all topsoil for land reclamation of the landfill.

3.3.2 The approval holder shall:

(a) salvage; and

(b) conserve

all upper subsoil for land reclamation of the landfill.

3.3.3 The approval holder shall:

(a) conserve; and

(b) stockpile

all topsoil separately from the upper subsoil.

3.3.4 The approval holder shall place all:

(a) topsoil stockpiles; and

(b) upper subsoil stockpiles

at the landfill.

3.3.5 The approval holder shall stockpile all topsoil as follows:

(a) on stable foundations; and

(b) on undisturbed topsoil.

3.3.6 The approval holder shall stockpile all upper subsoil as follows:

(a) on stable foundations; and

(b) on areas where the topsoil has been removed.

3.3.7 The approval holder shall take all steps necessary to prevent any erosion (e.g., wind or water), including but not limited to, all of the following:

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(a) revegetating the stockpiles; and

(b) any other steps authorized in writing by the Director.

3.3.8 The approval holder shall immediately suspend conservation of:

(a) topsoil; and

(b) upper subsoil

when:

(i) wet or frozen conditions will result in mixing, loss, degradation or compaction of topsoil or upper subsoil, or

(ii) high wind velocities, any other field conditions or facility operations will result in mixing, loss, or degradation of topsoil or upper subsoil.

3.3.9 The approval holder shall recommence conservation of:

(a) topsoil; and

(b) upper subsoil

only when conditions in 3.3.8 no longer exist.

PART 4: OPERATIONS, LIMITS, MONITORING AND REPORTING

SECTION 4.1: GENERAL

4.1.1 The approval holder shall maintain the geographical boundaries of the landfill to that located within SE 1/4 of Section 9, Township 50, Range 17, West of the 4th Meridian, as described in the application.

4.1.2 The approval holder shall limit the waste elevation of the landfill to no more than the maximum designated waste elevation.

4.1.3 The approval holder shall restrict access to the facility to only personnel authorized by the approval holder.

4.1.4 The approval holder shall maintain a publicly available 24 hour "HOTLINE" number for a prompt response during an emergency.

4.1.5 The approval holder shall:

(a) operate; and

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(b) maintain the integrity of

the following waste management facilities at the facility:

(i) the HWRSP Facility;

(ii) the Class I and Class II industrial landfill, including:

(A) Class I landfill cells,

(B) Class II landfill cell(s), and

(C) waste stabilization area within a Class I landfill cell; and

(iii) waste storage area(s);

as described in the application.

4.1.6 In addition to 4.1.5, the approval holder shall:

(a) operate; and

(b) maintain the integrity of

the following infrastructure components at the facility:

(i) the composite liner;

(ii) the leachate collection system,

(iii) the leak detection system,

(iv) the run-on control system,

(v) the runoff control system,

(vi) the groundwater monitoring wells,

(vii) the weigh scale, and

(viii) the site access control;

as described in the application.

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FACILITY AUDIT

4.1.7 The approval holder shall cause the facility to be audited by an independent third-party environmental consultant or organization to assess compliance with the terms and conditions of this approval:

(a) at least once every three years; and

(b) commencing on or before October 1, 2018 for the first audit.

4.1.8 The approval holder shall submit the audit report required in 4.1.7 in the Annual Landfill Operations Report as required in 4.6.58(c).

4.1.9 The requirements in 4.1.7 and 4.1.8 shall not relieve the approval holder of any duty under the Act, or its associated regulations, or this approval.

SECTION 4.2: AIR

OPERATIONS

4.2.1 The approval holder shall not release any air effluent streams to the atmosphere except as authorized by this approval.

4.2.2 The approval holder shall only release air effluent streams to the atmosphere from the following sources:

(a) the scrubber exhaust stack;

(b) the Drum Processing Building natural gas fired air make up unit exhaust vent;

(c) the Staging Building natural gas fired air make up unit exhaust vent;

(d) the Administration Building natural gas fired furnaces exhaust vents;

(e) the Laboratory fume hood and natural gas fired air make up unit exhaust vents;

(f) the Maintenance Shop equipment and natural gas fired Radiant Heater exhaust vents;

(g) the Leachate Collection Tanks natural gas fired heaters exhaust vents;

(h) the leachate transfer lines passive gas vents; and

(i) any other source authorized in writing by the Director.

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4.2.3 The approval holder shall not operate any process equipment unless and until the pollution abatement equipment associated with the corresponding process equipment is:

(a) operational; and

(b) operating.

4.2.4 The approval holder shall treat all air effluent streams from the exhaust vents of the Drum Processing or Staging or both Buildings with a caustic scrubber and an activated carbon filter before directing the air effluent streams to the scrubber exhaust stack for release to the atmosphere while:

(a) hazardous waste or hazardous recyclables or both are being processed;

(b) hazardous waste or hazardous recyclables or both are being transferred; or

(c) containers of hazardous waste or hazardous recyclables or both are open

in the Drum Processing or Staging or both Buildings.

4.2.5 The approval holder shall control fugitive emissions and any source not specified in 4.2.2 in accordance with 4.2.6 of this approval unless otherwise authorized in writing by the Director.

4.2.6 With respect to fugitive emissions and any source not specified in 4.2.2, the approval holder shall not release a substance or cause to be released a substance that causes or may cause any of the following:

(a) impairment, degradation or alteration of the quality of natural resources;

(b) material discomfort, harm or adverse effect to the well being or health of a person; or

(c) harm to property or to vegetative or animal life.

4.2.7 The approval holder shall not burn any debris by means of an open fire unless authorized in writing by the Director.

4.2.8 If the approval holder receives complaints of offensive odours, or fugitive dust, or both, beyond the facility boundaries, the approval holder shall:

(a) conduct the following to reduce the release of those odours, or fugitive dust, or both by:

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(i) placing restrictions on types, or volumes, or both, of the wastes being handled or processed or deposited that are causing those odours, or fugitive dust, or both,

(ii) increasing the frequency of cover placement, or modifying waste handling activities, or performing both, at the landfill,

(iii) modifying waste handling activities at the HWRSP Facility, or

(iv) performing any combination of the above; and

(b) activate the Odour and Fugitive Dust Response Program as specified in the Landfill Operations Plan 4.6.34(j).

LIMITS

4.2.9 The approval holder shall maintain the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4 at 8.0 or higher.

4.2.10 The approval holder shall replace activated carbon in the activated carbon filter referred to in 4.2.4 immediately when the concentration of total petroleum hydrocarbons in the air effluent streams released from the scrubber exhaust stack to the atmosphere exceeds 25 ppm.

MONITORING AND REPORTING

4.2.11 The approval holder shall monitor, daily at a minimum, the pH of the scrubbing liquid of the caustic scrubber referred to in 4.2.4.

4.2.12 The approval holder shall monitor, weekly at a minimum, the air effluent streams released from the scrubber exhaust stack, using a portable total petroleum hydrocarbon analyzer while:

(a) hazardous waste or hazardous recyclables or both are being processed;

(b) hazardous waste or hazardous recyclables or both are being transferred; or

(c) containers of hazardous waste or hazardous recyclables or both are open

in the Drum Processing or Staging or both Buildings.

4.2.13 The portable total petroleum hydrocarbon analyzer referred to in 4.2.12 shall:

(a) have a detection limit of 1 ppm or lower for total petroleum hydrocarbons;

(b) be located in a straight section of the scrubber exhaust stack, a minimum of one (1) metre downstream from the last flow disturbance; and

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(c) be calibrated regularly in accordance with the analyzer manufacturer's specifications.

4.2.14 The approval holder shall continue to implement the Ambient Air Monitoring Program as authorized in writing by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.

4.2.15 The approval holder shall submit to the Director the results of the Ambient Air Monitoring Program in 4.2.14 with the following reports:

(a) a Monthly Ambient Air Monitoring Report; and

(b) an Annual Ambient Air Monitoring Report

in accordance with the written authorization by the Director on June 24, 2009, unless and until otherwise authorized in writing by the Director pursuant to 4.2.18.

4.2.16 The approval holder shall submit:

(a) a revised Ambient Air Monitoring Program;

(b) revised reporting requirements, or

(c) both of the above

to the Director upon written request from the Director within the timeline specified in writing by the Director.

4.2.17 If the revised:

(a) Ambient Air Monitoring Program;

(b) reporting requirements; or

(c) both of the above

submitted pursuant to 4.2.16 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

4.2.18 The approval holder shall implement the revised:

(a) Ambient Air Monitoring Program;

(b) reporting requirements; or

(c) both of the above

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submitted pursuant to 4.2.16 as authorized in writing by the Director within the timeline specified in writing by the Director.

SECTION 4.3: RUNOFF AND INDUSTRIAL WASTEWATER

OPERATIONS

4.3.1 The approval holder shall not release any substances from the facility to the surrounding watershed except as authorized by this approval.

4.3.2 The approval holder shall operate and maintain the integrity of:

(a) the run-on control system to prevent flow onto the active landfill area from at least the peak discharge from a 1 in 25 year, 24 hour duration storm event at the facility; and

(b) the runoff control system for the facility to collect and control at least the runoff volume resulting from a 1 in 25 year, 24 hour duration storm event at the facility.

4.3.3 All runoff from the facility developed area shall be directed to the runoff control system as described in:

(a) application No. 012-10348, prior to decommissioning and reclamation of the old surface water detention pond; and

(b) the application, after decommissioning and reclamation of the old surface water detention pond;

unless otherwise authorized in writing by the Director.

4.3.4 Prior to decommissioning and reclamation of the old surface water detention pond and subject to 4.3.7, the approval holder shall only make or permit a release from the old surface water detention pond:

(a) at the release point as designated in application No. 012-10348, which is:

(i) located in the south east corner of the old surface water detention pond, and

(ii) referred to as sampling location A1 in 4.3.11;

(b) through a pump and a release hose over the south berm into the drainage control ditch, east of the landfill access road, to the new surface water detention pond, under normal operating conditions; and

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(c) through a pump and a release hose over the south berm directly to the culvert under Highway 854, during periods of high runoff exceeding the holding capacity of the old surface water detention pond;

unless otherwise authorized in writing by the Director.

4.3.5 Subject to 4.3.7, the approval holder shall only make or permit a release from the new surface water detention pond:

(a) at the release point as designated in application No. 012-10348, which is:

(i) located in the north east corner of the new surface water detention pond, and

(ii) referred to as sampling location B1 in 4.3.11; and

(b) through a pump and a release hose over the east berm into the culvert under Highway 854;

unless otherwise authorized in writing by the Director.

4.3.6 The approval holder shall only dispose of industrial wastewaters, or specified runoff in TABLE 4.3-A, or both, by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER;

(d) as per 4.6.51; or

(e) as otherwise authorized in writing by the Director.

TABLE 4.3-A: SPECIFIED RUNOFF

SOURCES
Runoff that exceeds any of the limits for the parameters listed in TABLE 4.3-B.
Runoff for which the results of the parameters listed in TABLE 4.3-B are unavailable at the time that the runoff must be disposed of.
Runoff from within the tank farm bermed area.

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LIMITS

4.3.7 Releases of runoff from:

(a) the old surface water detention pond;

(b) the new surface water detention pond; or

(c) both ponds

to the surrounding watershed shall comply with the limits specified in TABLE 4.3-B.

4.3.8 Releases of runoff from within the tank farm bermed area to the old or new or both surface water detention ponds shall comply with the limits specified in TABLE 4.3-C.

TABLE 4.3-B: RUNOFF LIMITS FOR SURFACE WATER DETENTION POND

PARAMETER	LIMITS Maximum unless otherwise indicated
pH	6.0 – 9.5 pH units
COD	50 mg/L
TDS	2500 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Chloride	250 mg/L
Sodium	200 mg/L
Sulphate	500 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen
96-Hour Multiple Concentration Acute Lethality Test Using Rainbow Trout (*Oncorhynchus mykiss*)	50% or greater survival

TABLE 4.3-C: RUNOFF LIMITS FOR TANK FARM BERMED AREA

PARAMETER	LIMITS Maximum unless otherwise indicated
pH	6.0 – 9.5 pH units
COD	50 mg/L
TSS	25 mg/L
Ammonia (expressed as Nitrogen)	5 mg/L
Oil or other substances	Not present in amounts sufficient to create a visible film or sheen

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MONITORING AND REPORTING

4.3.9 The approval holder shall monitor the runoff control system as required in TABLE 4.3-D, subject to 4.3.12.

4.3.10 The approval holder shall report to the Director the results of the runoff control system monitoring as required in TABLE 4.3-D, subject to 4.3.12.

4.3.11 For the purpose of TABLE 4.3-D:

(a) sampling location A1 is defined as the old surface water detention pond release point;

(b) sampling location A2 is defined as the old surface water detention pond;

(c) sampling location B1 is defined as the new surface water detention pond release point;

(d) sampling location B2 is defined as the new surface water detention pond; and

(e) sampling location C is defined as the tank farm bermed area.

4.3.12 The monitoring and reporting requirements in 4.3.9 and 4.3.10 for the old surface water detention pond (sampling locations A1 and A2) shall not apply after decommissioning and reclamation of the old surface water detention pond.

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TABLE 4.3-D: RUNOFF CONTROL SYSTEM MONITORING AND REPORTING

MONITORING				REPORTING	
Parameter	**Frequency**	**Sample Type**	**Sampling Location**	**Monthly**	**Annually**
Surface Water Detention Pond(s)				Monthly Runoff and Industrial Wastewater Report, for each month when release occurs	Annual Runoff and Industrial Wastewater Report
Flow (m^3/day)	Daily during release	Estimate	A1, B1		
pH	Once per batch release, prior to release	Representative Grab	A2, B2		
COD					
TDS					
TSS					
Ammonia (expressed as nitrogen)					
Chloride					
Sodium					
Sulphate					
Oil or other substances	Daily during release	Visual			
96-hour multiple concentration acute lethality test using rainbow trout (*oncorhynchus mykiss*)	Each month when release occurs, prior to release, for the first batch release of the month	Representative Grab			
48-hour static acute lethality test using *daphnia magna*					
Tank Farm Bermed Area					
Volume (m^3)	Total batch volume released	Estimate	C		
pH	Once per batch release, prior to release to the surface water detention pond(s)	Representative Grab			
COD					
TSS					
Ammonia (expressed as nitrogen)					
Oil or other substances		Visual			

4.3.13 The monitoring and reporting required in TABLE 4.3-D for the acute lethality tests shall comply with:

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(a) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, Environment Canada, Environmental Protection Series 1/RM/13, December2000, as amended; and

(b) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna*, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended.

4.3.14 The approval holder shall:

(a) treat any acute lethality test that deviates from the corresponding test method referred to in 4.3.13 as invalid; and

(b) repeat the test as soon as logistically possible.

4.3.15 In the event that less than 50% of the rainbow trout survived in the 100% concentration sample, the approval holder shall:

(a) implement a program immediately to identify the source of the toxicity; and

(b) submit to the Director within 90 days after the test result is available, a proposed program to reduce the toxicity of the runoff.

4.3.16 The approval holder shall submit the Monthly Runoff and Industrial Wastewater Report in TABLE 4.3-D to the Director.

4.3.17 The Monthly Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:

(a) a monthly assessment of the monitoring results relative to the limits in TABLE 4.3-B;

(b) a monthly assessment of the monitoring results relative to the limits in TABLE 4.3-C;

(c) a monthly assessment of the performance of the:

(i) runoff control system,

(ii) pollution abatement equipment, and

(iii) monitoring equipment;

(d) a monthly summary of management and disposal of the:

(i) industrial wastewaters, and

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(ii) specified runoff

as per 4.3.6;

(e) a monthly summary of management and disposal of runoff in general;

(f) a monthly summary of runoff contraventions reported pursuant to 2.1.1; and

(g) any other information as required in writing by the Director.

4.3.18 The approval holder shall submit the Annual Runoff and Industrial Wastewater Report in TABLE 4.3-D to the Director.

4.3.19 The Annual Runoff and Industrial Wastewater Report shall include, at a minimum, all of the following information:

(a) an annual summary assessment of the monitoring results relative to the limits in TABLE 4.3-B;

(b) an annual summary assessment of the monitoring results relative to the limits in TABLE 4.3-C;

(c) an annual summary assessment of the performance of the:

(i) runoff control system,

(ii) pollution abatement equipment, and

(iii) monitoring equipment;

(d) an annual summary of management and disposal of the:

(i) industrial wastewaters, and

(ii) specified runoff

as per 4.3.6;

(e) an annual summary and evaluation of management and disposal of runoff in general;

(f) an annual summary of the results pursuant to 4.3.21;

(g) an annual summary of runoff contraventions reported pursuant to 2.1.1; and

(h) any other information as required in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.3.20 The approval holder shall:

(a) collect a representative grab sample from the old surface water detention pond at least once per year, prior to decommissioning and reclamation of the pond;

(b) collect a representative grab sample from the new surface water detention pond at least once per year; and

(c) analyze the sample(s) for all of the parameters specified in TABLE 4.3-E.

4.3.21 The approval holder shall submit the results of the analyses in 4.3.20 to the Director in the Annual Runoff and Industrial Wastewater Report.

TABLE 4.3-E: ANNUAL MONITORING OF SURFACE WATER DETENTION POND

PARAMETERS			
pH	TDS; TSS	Fluoride, dissolved	Phenols
Electrical conductivity	Metals	Cyanide (weak acid dissociable)	Total chlorinated phenols
COD	Major ions	BTEX	Polychlorinated biphenyls, total
DOC	Nutrients	Petroleum Hydrocarbons Fractions F1 and F2	Total organic halogens

SECTION 4.4: LEACHATE COLLECTION AND LEAK DETECTION

OPERATIONS

4.4.1 The approval holder shall only dispose of leachate removed from the leachate collection system by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as per 4.6.51.

4.4.2 The approval holder shall only dispose of liquid removed from the leak detection system by one or more of the following methods:

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(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as per 4.6.51.

LIMITS

4.4.3 Subject to 4.4.4, the approval holder shall not exceed the maximum acceptable leachate head in any landfill cell.

4.4.4 Subsequent to a storm event, the leachate head in any landfill cell shall not exceed the maximum acceptable leachate head for more than fourteen (14) days, unless otherwise authorized in writing by the Director.

4.4.5 The volume of liquid in the leak detection system, as monitored in TABLE 4.6-D, shall not exceed the action leakage rate in any landfill cell.

MONITORING AND REPORTING

4.4.6 The approval holder shall monitor the leachate collection and leak detection systems as required in TABLE 4.6-D and for all parameters specified in TABLE 4.4-A, subject to 4.4.8 and 4.4.9.

4.4.7 The approval holder shall report to the Director the results of the leachate collection and leak detection systems monitoring as required in TABLE 4.6-D, including the results of the analyses for all parameters specified in TABLE 4.4-A, subject to 4.4.8 and 4.4.9.

TABLE 4.4-A: LEACHATE AND LEAK DETECTION LIQUID MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

4.4.8 The requirements in 4.4.6 and 4.4.7 for monitoring and reporting the parameters in TABLE 4.4-A for leachate shall not apply if insufficient leachate is available for conducting the analyses.

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4.4.9 The requirements in 4.4.6 and 4.4.7 for monitoring and reporting the parameters in TABLE 4.4-A for leak detection liquid shall not apply if insufficient leak detection liquid is available for conducting the analyses.

4.4.10 If the volume of liquid removed from the leak detection system exceeds the action leakage rate, in addition to reporting pursuant to 2.1.1, the approval holder shall submit a Response Action Plan to the Director within 30 days of the exceedance.

SECTION 4.5: DUGOUTS AND WATER WELLS IN SURROUNDING AREA

MONITORING AND REPORTING

4.5.1 The approval holder shall:

(a) collect a representative sample from:

(i) each of the dugouts, and

(ii) each of the water wells

within an approximate 1.6 kilometre radius around the facility; and

(b) analyze the sample for the parameters listed in TABLE 4.5-A;

unless the approval holder is not granted access by the landowner.

4.5.2 The monitoring required in 4.5.1 shall be conducted once each year in October unless otherwise authorized in writing by the Director.

4.5.3 The approval holder shall record the analytical results of the sampling information required in 4.5.1 in an Annual Dugout and Water Well Sampling Program Report.

4.5.4 The approval holder shall submit the Annual Dugout and Water Well Sampling Program Report to the Director pursuant to 4.6.58(i).

TABLE 4.5-A: DUGOUT AND WATER WELL MONITORING

PARAMETERS		
pH (field and laboratory)	TDS	Nutrients
Electrical conductivity (field and laboratory)	TSS	BTEX
COD	Metals	Phenols
DOC	Major Ions	Petroleum Hydrocarbons Fractions F1 and F2

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 4.6: HWRSP FACILITY AND LANDFILL

GENERAL

4.6.1 The approval holder shall not:

(a) receive;

(b) process;

(c) dispose of; or

(d) perform any combination of the above for

any of the following wastes, individually or in any combination, at the places specified below respectively:

(i) explosives (Class 1 TDGR wastes), at the facility;

(ii) radioactive wastes (Class 7 TDGR wastes), at the facility;

(iii) radioactive wastes regulated under the *Nuclear Safety and Control Act* (Canada), at the facility;

(iv) biomedical waste, at the facility;

(v) waste containing free liquids, at the landfill, excluding the waste stabilization area;

(vi) material containing ozone depleting substances, at the landfill;

(vii) municipal solid waste, at the facility; and

(viii) NORM waste, at the facility.

4.6.2 Incompatible wastes and incompatible hazardous recyclables shall be prevented from mixing.

4.6.3 The approval holder shall dispose of wastes generated at the facility only:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

HWRSP FACILITY

OPERATIONS PLAN

4.6.4 The approval holder shall:

(a) develop;

(b) keep up-to-date; and

(c) implement

an HWRSP Facility Operations Plan.

4.6.5 The approval holder shall:

(a) review the HWRSP Facility Operations Plan annually, at a minimum; and

(b) update the HWRSP Facility Operations Plan if any of the following circumstances apply:

(i) there are facility expansions or changes in site operations or equipment,

(ii) there is an applicable change to an applicable regulation, or

(iii) an update is required in writing by the Director.

4.6.6 The approval holder shall retain a copy of the most recent HWRSP Facility Operations Plan at the facility.

4.6.7 The approval holder shall submit a copy of the most recent HWRSP Facility Operations Plan to the Director upon written request from the Director within the timeline specified in writing by the Director.

4.6.8 If the HWRSP Facility Operations Plan submitted pursuant to 4.6.7 is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.6.9 The approval hold shall implement the latest HWRSP Facility Operations Plan, unless otherwise authorized in writing by the Director.

OPERATIONS

4.6.10 The approval holder shall only transfer wastes and hazardous recyclables at designated transfer areas designed to contain spills and leaks.

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4.6.11 The approval holder shall use the following when transferring substances to, from, and between containers, tanks, and trucks:

(a) couplings equipped with seals that are compatible with the substance transferred;

(b) the necessary precautions to prevent spills when the couplings are disconnected;

(c) emergency shut-off valves;

(d) established transfer areas and associated curbing, paving and catchment areas;

(e) drip trays to capture potential losses under coupling devices and other connections; and

(f) manual inspections of the transfer area for leaks and spills during and after waste transfer.

4.6.12 All wastes and all hazardous recyclables that are unloaded shall be immediately transferred to the waste storage area.

4.6.13 All containers and unrinsed empty containers shall be stored in the waste storage area.

4.6.14 The approval holder shall:

(a) provide and maintain an adequate aisle space between containers in the waste storage area to allow:

(i) inspection, and

(ii) unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of the waste storage area; and

(b) arrange inspection aisles in the waste storage area such that the identification label on each container is readable.

4.6.15 All tanks within the tank farm area shall be equipped, at a minimum, with all of the following:

(a) sensors for detecting the level in each tank;

(b) high level alarms that activate when a tank overfill is imminent;

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(c) automatic shut-off devices or sufficient free board space above the high level sensor to allow operators time to prevent overfill from occurring; and

(d) earthen dikes or equivalent secondary containment structures capable of containing 110% of the volume of the largest tank within the bermed area plus 10% of the aggregate capacity of all other tanks in the bermed area.

4.6.16 All tanks containing hazardous waste and all tanks containing hazardous recyclables in each building shall be equipped, at a minimum, with all of the following:

(a) sensors or gauges for detecting the level in each tank;

(b) a written operating procedure to prevent tank overfill; and

(c) secondary containment structures capable of containing 110% of the volume of the largest tank within the building plus 10% of the aggregate capacity of all other tanks containing hazardous waste and hazardous recyclables in the same building.

4.6.17 Hazardous waste and hazardous recyclables stored in containers and tanks shall be stored in accordance with the *Hazardous Waste Storage Guidelines*, June 1988, Alberta Environment, as amended.

4.6.18 The approval holder shall only carry out the following activities, individually or in any combination, at the HWRSP Facility in relation to hazardous waste or hazardous recyclables or both:

(a) commingling of hazardous waste or hazardous recyclables to make maximum use of available container or tank capacity, only if the resultant mixture has the same TDGR hazard classification as any one of the individual components;

(b) phase separation by gravity settling, only without the addition of any chemicals designed to accelerate settling;

(c) dispersion of solids into liquids by natural or mechanical means, only if the resultant mixture has the same TDGR hazard classification as the original waste;

(d) physical segregation of hazardous from non-hazardous articles or components from the same container, only if no process equipment is used;

(e) washing of drums or other objects, only for the purpose of removing hazardous residue;

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(f) crushing or shredding of used filters, rags, absorbent materials, or empty containers, only for the purpose of volume reduction or liquid recovery, unless otherwise authorized in writing by the Director; or

(g) treatment of hazardous waste, only as authorized in writing by the Director.

4.6.19 Notwithstanding 4.6.18(g), the approval holder shall not incinerate waste at the facility.

LIMITS

4.6.20 The approval holder shall not store a total of more than 752,500 litres of hazardous waste or hazardous recyclables or both at the HWRSP Facility at any time.

4.6.21 In addition to the storage limits in 4.6.20, the approval holder shall not exceed the waste storage limits as specified in TABLE 4.6-A.

TABLE 4.6-A: STORAGE LIMITS FOR HAZARDOUS WASTE OR HAZARDOUS RECYCLABLES OR BOTH AT HWRSP FACILITY

Waste/Recyclable Type	Material	Maximum Quantity
Containers: Hazardous waste or hazardous recyclables or both	TDGR Classification 2, 3, 4, 5, 6, 8 or 9 waste type only	512,500 litres (consisting of 2,500 drum equivalents, each 205 litre capacity)
Bulk Tanks: Hazardous waste or hazardous recyclables or both	Waste flammable liquids, used oil, or wastewaters; or TDGR Classification 3, 5, 6, 8 or 9 waste type only	240,000 litres (consisting of a total of 135 m^3 in the tank farm area, and a total of 105 m^3 inside the buildings)

4.6.22 Containers other than 205 litre drums shall be prorated to 205 litre drum equivalents based on their nominal volumes, e.g., 10 X 20 litre pails = 1 X 205 litre drum.

4.6.23 The limits referred to in 4.6.20 and 4.6.21 shall be calculated based on the:

(a) total nominal volumes of all containers, treating all partially filled containers as if they were full; and

(b) total filled capacities of all tanks.

MONITORING AND REPORTING

4.6.24 The approval holder shall:

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(a) identify;

(b) characterize; and

(c) classify

all waste streams and all hazardous recyclables, generated or received at the HWRSP Facility, not including runoff, industrial wastewater streams and air effluent streams in accordance with the:

(i) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended, and

(ii) *Alberta User Guide for Waste Managers*, Alberta Environment, August 1996, as amended.

4.6.25 The approval holder shall measure or, when not feasible to measure, estimate, the quantity of each waste and hazardous recyclable identified in 4.6.24 each year.

4.6.26 The approval holder shall keep a daily:

(a) total; and

(b) inventory

of all materials being stored at the HWRSP Facility.

4.6.27 The daily total and inventory records in 4.6.26 shall be available at the facility at all times for inspection by the Director or an inspector.

4.6.28 The approval holder shall submit a Monthly Waste Management Report to the Director.

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TABLE 4.6-B: MONTHLY WASTE INVENTORY REPORT (BY WASTE CLASS)

COMPANY NAME: _____ APPROVAL NO.: _____

REPORT PERIOD: MONTH _____ YEAR _____

CLASS	UNIT (Kg or L)	OPENING BALANCE	+ RECEIVED IN PROVINCE	+ RECEIVED OUT OF PROVINCE	- SHIPPED *		- ON-SITE DISPOSAL	+ or - ADJUSTMENT **	CLOSING BALANCE	APPROVAL LIMIT
					RECYCLING / PRODUCT	OFF-SITE DISPOSAL				
2										
3										
4										
5										
6.1										
8										
9.1										
9.2										
9.3										
PCB										
NR										
TOTAL										XXXXX
							No. of Containers On site			XXXXX
							Total Litres in Bulk Tanks			XXXXX

Name of Company Official: _____ Title: _____ Signature: _____

Report Date: _____

* Provide a list of the recycling and disposal locations.

** Identity the amount and reason for each adjustment.
Adjustments include consolidation/reclassification, losses to processing, spills, volume miscalculations, or any other circumstances, which would affect the mass balance of the monthly inventory report.

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4.6.29 The approval holder shall compile all of the information indicated in TABLE 4.6-B in the Monthly Waste Management Report which shall contain, at minimum, all of the following information:

(a) an opening waste and hazardous recyclables inventory balance in kilograms or litres by waste class or material type;

(b) the amount and type of waste and hazardous recyclables received:

(i) within the province, and

(ii) from outside the province;

(c) the amount and type of waste and hazardous recyclables:

(i) shipped for recycling or product,

(ii) shipped off-site for disposal, and

(iii) disposed on-site;

(d) any adjustments, including but not limited to, consolidation, reclassification, losses to processing, spills, volume miscalculations, or any other circumstances, which would affect the mass balance of the monthly inventory report;

(e) closing balance in kilograms or litres;

(f) a summary of contraventions reported pursuant to 2.1.1 related to waste and hazardous recyclables; and

(g) any other information as required in writing by the Director.

4.6.30 The approval holder shall compile all the information required by 4.6.24 and 4.6.25 in an Annual Waste Management Summary Report:

(a) as specified in TABLE 4.6-C; and

(b) in accordance with the:

(i) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended, and

(ii) *Alberta User Guide for Waste Managers*, Alberta Environment, August 1996, as amended.

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TABLE 4.6-C: ANNUAL WASTE MANAGEMENT SUMMARY

Waste or Hazardous Recyclable Name	Uniform Waste Code				Quantity (kg or L)		Stored	Recycled		Disposed	
	WC	PIN	Class	Mgmt	Hazardous	Non-hazardous	On-site	On-site	Off-site	On-site	Off-site
TOTAL											

4.6.31 The approval holder shall submit the Annual Waste Management Summary Report to the Director.

LANDFILL

OPERATIONS PLAN

4.6.32 The approval holder shall:

(a) develop;

(b) keep up-to-date; and

(c) implement

a Landfill Operations Plan that does not contravene with the requirements of this approval.

4.6.33 The approval holder shall:

(a) review the Landfill Operations Plan annually, at a minimum; and

(b) update the Landfill Operations Plan if any of the following circumstances apply:

(i) there are facility expansions or changes in site operations or equipment,

(ii) there is an applicable change to the *Standards for Landfills in Alberta,* as amended,

(iii) an update is required in writing by the Director, or

(iv) there is an update to an applicable regulation.

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4.6.34 The Landfill Operations Plan shall include, at a minimum, all of the following:

(a) SOP for keeping and maintaining an Operating Record;

(b) SOP for waste control, run-on and runoff controls, and nuisance controls;

(c) SOP for the waste stabilization area operations;

(d) SOP for the acceptance, handling and disposal of wastes, including;

(i) waste characterization and classification at source,

(ii) waste manifesting and tracking,

(iii) QA/QC waste acceptance procedures, and

(iv) waste sampling;

(e) SOP for detecting, preventing and disposal of unauthorized wastes;

(f) SOP for placing waste in a landfill cell including;

(i) working face width,

(ii) lift depth,

(iii) compaction, and

(iv) waste placement location using a grid system;

(g) SOP for managing contaminated sulphur and sulphur containing wastes;

(h) SOP for managing asbestos wastes;

(i) SOP for placing leachate, leak detection liquid, or other authorized wastes and liquids over the surface of the active landfill area for the purpose of evaporation or dust suppression;

(j) an Odour and Fugitive Dust Response Program;

(k) a Fugitive Dust and Odour Best Management Plan;

(l) a runoff and industrial wastewater monitoring and management program;

(m) a leachate monitoring and management program;

(n) a leak detection liquid monitoring and management program;

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(o) a groundwater monitoring program;

(p) a Remediation Plan to deal with groundwater quality deterioration;

(q) a soil monitoring program;

(r) a soil management program;

(s) a landfill cell cover system;

(t) a monitoring and maintenance program for the scale house and heavy operational equipment;

(u) a health and safety program;

(v) an emergency response program, including SOP for handling fires, substance releases to the environment, and health concerns; and

(w) an up-to-date plan of the landfill layout with survey records showing the location of all infrastructure components of the landfill including final cover elevations and contours.

4.6.35 The approval holder shall retain a copy of the most recent Landfill Operations Plan at the facility.

4.6.36 The approval holder shall submit to the Director the most recent Landfill Operations Plan when requested in writing by the Director within the timeline specified in writing by the Director.

4.6.37 The approval holder shall correct all deficiencies in the Landfill Operations Plan submitted pursuant to 4.6.36, as outlined in writing by the Director, within the timeline specified in writing by the Director.

4.6.38 The approval holder shall implement the latest Landfill Operations Plan, unless otherwise authorized in writing by the Director.

OPERATIONS

4.6.39 The approval holder shall classify all materials entering the landfill in accordance with the:

(a) *Waste Control Regulation (AR 192/96)*;

(b) *Industrial Waste Identification and Management Options*, Alberta Environment, May 1996, as amended; and

(c) *Alberta User Guide for Waste Managers*, May 1995, as amended.

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4.6.40 The approval holder shall obtain a detailed representative physical and chemical analysis of a waste prior to disposal of the waste into the landfill at the following times, at a minimum:

(a) the first time a waste is received from a new generator;

(b) the first time a delivery is received from a different process associated with a known waste generator;

(c) the first time a waste is received from a different location associated with a known waste generator; and

(d) when the nature or composition of the waste that was previously characterized by the generator changes.

4.6.41 The approval holder shall not dispose of hazardous waste in any Class II landfill cell.

4.6.42 The approval holder shall:

(a) only carry out waste stabilization or solidification or both within the waste stabilization area; and

(b) not transfer waste from the waste stabilization area to the Class I landfill cell before the waste stabilization or solidification or both have completed.

4.6.43 The approval holder shall only dispose of any liquid collected within the waste stabilization area by one or more of the following methods:

(a) to facilities holding a current Act authorization to accept such waste;

(b) to facilities approved by a local environmental authority outside of Alberta to accept such waste;

(c) to a disposal well approved by AER; or

(d) as otherwise authorized in writing by the Director.

4.6.44 The approval holder shall conduct:

(a) annually, in-house visual inspections for corrosion; and

(b) biennially, ultrasonic testing to monitor thickness

of the steel plate liner of the stabilization pits in the waste stabilization area, unless otherwise authorized in writing by the Director.

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4.6.45 The approval holder shall dispose of asbestos wastes in accordance with *"Guidelines for the Disposal of Asbestos Waste"*, Environmental Protection Services, Alberta Environment, 1989, as amended.

4.6.46 The approval holder shall dispose of sulphur waste in accordance with *"Guidelines for Landfill Disposal of Sulphur Wastes and Remediation of Sulphur Containing Soils"*, Alberta Environment, 2011, as amended.

4.6.47 The approval holder shall only dispose of wastes that the landfill is not authorized to dispose of:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

4.6.48 If an unauthorized waste is received at the landfill, the approval holder shall remove the waste from the landfill within seven (7) days of the receipt, unless otherwise authorized in writing by the Director.

4.6.49 The approval holder shall restrict the working face of each landfill cell to the smallest practical area.

4.6.50 For any waste disposed of at the landfill that is subject to wind dispersal, the approval holder shall:

(a) wet the waste to prevent dispersal of particulate matter; or

(b) immediately apply cover on top of the waste to minimize entrainment of particulate matter.

4.6.51 Notwithstanding 4.6.1(v), the approval holder may place any of the following wastes over the surface of the active landfill area for the purpose of dust suppression:

(a) specified runoff;

(b) leachate;

(c) leak detection liquid;

(d) sump waste of car wash bays or similar operations;

(e) waste from hydrovac excavation operations; or

(f) any other waste authorized by t*he Alberta User Guide for Waste Managers*, May 1995, as amended;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

provided that placement of such wastes will not cause offensive odours.

4.6.52 The approval holder shall inspect the landfill, at a minimum:

(a) weekly; and

(b) immediately after each storm event to:

(i) detect evidence of deterioration of any infrastructure components, including the composite liner,

(ii) detect any malfunction or improper operation of the run-on and runoff control systems, leachate collection system, or leak detection system, and

(iii) take corrective measures to repair any damage to infrastructure components, including the composite liner.

4.6.53 The approval holder shall:

(a) keep a record of inspections conducted pursuant to 4.6.52;

(b) have the record of inspections available for review upon written request from the Director; and

(c) immediately report any deficiencies detected by the inspection in 4.6.52 to the Director in writing along with any corrective measures taken or proposed.

4.6.54 The approval holder shall not stockpile waste exceeding the maximum designated waste elevation of the landfill for a period of more than two (2) weeks, unless otherwise authorized in writing by the Director.

4.6.55 The approval holder shall take all practical measures to prevent off-site tracking of waste from vehicles and equipment leaving the facility.

MONITORING AND REPORTING

4.6.56 The approval holder shall monitor the landfill operations as required in TABLE 4.6-D.

4.6.57 The approval holder shall report to the Director the results of the landfill operations monitoring as required in TABLE 4.6-D.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

TABLE 4.6-D: LANDFILL OPERATIONS MONITORING AND REPORTING REQUIREMENTS

MONITORING AND REPORTING				
Parameter	**Frequency**	**Sample Type**	**Sampling Location**	**Reporting**
Quantity and type of waste received	Continuously, When operating	Measured or estimated	At entrance to landfill	Annual Landfill Operations Report
Quantity and type of material removed	Continuously, when operating	Measured or estimated	At entrance to landfill	
General location of waste deposited	Continuously, when operating	As per survey, or using grid system	At active landfill area, or survey coordinates	
Leachate head	at least: - once every three working days; - after storm event; and - immediately prior to leachate removal	Calculated	At primary leachate collection system sumps for existing landfill Cell 1	
		Measured	At primary leachate collection system sumps for all other landfill cells	
Leachate analysis, as per TABLE 4.4-A	At least once every quarter year, unless insufficient sample volume is available	Grab sample	At each primary leachate collection system sump	
Volume of leachate removed from the leachate collection system	As removed	Measured or calculated	At leachate collection system sumps	
Leak detection liquid analysis, as per TABLE 4.4-A	At least once every quarter year, unless insufficient sample volume is available	Grab sample	At each leak detection system sump	
Volume of leak detection liquid removed from the leak detection system	At least once every working day, as removed	Measured or calculated	At leak detection system sumps	
Final cover	When final cover is applied	Final cover by survey cores or test pits or both	On each completed landfill cell	

4.6.58 The Annual Landfill Operations Report required in TABLE 4.6-D shall include, at a minimum, all of the following:

(a) the name and contact information of the person responsible for the facility;

(b) a summary of all information collected as required in TABLE 4.6-D;

(c) a summary of the results of any audit conducted in accordance with 4.1.7;

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(d) a summary of the operations of the waste stabilization area;

(e) a summary of the performance of the run-on and runoff control systems, including a comparison to the limits in TABLES 4.3-B and 4.3-C;

(f) a summary of the performance of the leachate collection system, including a comparison to the maximum acceptable leachate head;

(g) a summary of the performance of the leak detection system, including a comparison to the action leakage rate limit;

(h) the Response Action Plan for the leak detection system pursuant to 4.4.10;

(i) the Annual Dugout and Water Well Sampling Program Report pursuant to 4.5.4;

(j) a summary of all revisions to the Landfill Operations Plan pursuant to 4.6.33(b);

(k) any groundwater remedial action taken pursuant to 4.6.34(p);

(l) a summary of records of landfill inspections pursuant to 4.6.53;

(m) a summary of:

  (i) operational issues encountered,

  (ii) emergencies occurred, and

  (iii) measures or actions taken;

(n) a summary of records of:

  (i) public complaints, and

  (ii) the approval holder's responses;

(o) an up-to-date financial security estimate pursuant to 5.1.2;

(p) an updated site development plan showing the status of the landfill progression at the end of the operating year, including but not limited to:

  (i) contour mapping,

  (ii) the location of active and inactive disposal areas,

  (iii) areas where a final cover has been placed, and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iv) the location of new landfill cell(s) constructed;

(q) the Annual Landfill Cell Closure Report pursuant to 7.1.7;

(r) a summary of contraventions reported pursuant to 2.1.1 related to landfill operations; and

(s) any other information as required in writing by the Director.

4.6.59 The approval holder shall submit the Annual Landfill Operations Report to the Director.

SECTION 4.7: DOMESTIC WASTEWATER

OPERATIONS

4.7.1 The approval holder shall not release any substances from the domestic wastewater system to the surrounding watershed except as authorized by this approval.

4.7.2 The approval holder shall direct all domestic wastewater to the domestic wastewater system.

4.7.3 The approval holder shall only dispose of substances from the domestic wastewater system:

(a) to facilities holding a current Act authorization;

(b) to facilities approved by a local environmental authority outside of Alberta; or

(c) as otherwise authorized in writing by the Director.

SECTION 4.8: WATERWORKS

Not used at this time.

SECTION 4.9: GROUNDWATER

MONITORING

4.9.1 The approval holder shall continue to implement the existing Groundwater Monitoring Program as authorized in writing by the Director, unless and until otherwise authorized in writing by the Director pursuant to 4.9.4.

4.9.2 The approval holder shall submit a revised Groundwater Monitoring Program to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.9.3 If the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

4.9.4 The approval holder shall implement the revised Groundwater Monitoring Program submitted pursuant to 4.9.2 as authorized in writing by the Director within the timeline specified in writing by the Director.

4.9.5 The approval holder shall:

(a) collect a representative groundwater sample from each of the groundwater monitor wells specified in the Groundwater Monitoring Program, including the groundwater monitoring wells designated as points of compliance; and

(b) analyze each sample for the parameters listed in TABLE 4.9-A.

TABLE 4.9-A: GROUNDWATER MONITORING PROGRAM

PARAMETERS	
pH	Metals
Electrical conductivity	Major ions
COD	Nutrients
DOC	BTEX
TDS	Petroleum Hydrocarbons Fractions F1 and F2

4.9.6 The monitoring required in 4.9.5 shall be conducted at the following frequencies, unless otherwise authorized in writing by the Director:

(a) a minimum of once per year during each of the active landfill life, landfill cell closure, final landfill closure, and post-closure periods; and

(b) a minimum of four times per year following detection of leachate constituents in groundwater at levels above those specified in 4.9.7, and until the levels specified in 4.9.7 have been met.

4.9.7 The groundwater quality in the monitoring wells, designated as points of compliance in the Groundwater Monitoring Program, shall not exceed the higher of:

(a) the objectives established in the water quality objectives in the *Canadian Environmental Quality Guidelines (CEQG)* for drinking water published by the Canadian Council of Ministers of the Environment (CCME), as amended; or

(b) background groundwater chemistry as determined through a statistical analysis, as a derived alternate groundwater performance standard.

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4.9.8 The approval holder shall implement the Remediation Plan as specified in the Landfill Operations Plan, when groundwater quality exceeds the groundwater performance criteria in 4.9.7.

4.9.9 The samples extracted from the groundwater monitor wells shall be collected using scientifically acceptable purging, sampling and preservation procedures so that a representative groundwater sample is obtained.

4.9.10 The approval holder shall:

(a) protect from damage; and

(b) keep locked except when being sampled

all groundwater monitoring wells unless otherwise authorized in writing by the Director.

4.9.11 If a representative groundwater sample cannot be collected because the groundwater monitoring well is damaged or is no longer capable of producing a representative groundwater sample, the approval holder shall:

(a) clean, repair or replace the groundwater monitoring well; and

(b) collect and analyse a representative groundwater sample prior to the next scheduled sampling event;

unless otherwise authorized in writing by the Director.

4.9.12 In addition to the sampling information recorded in 2.2.1, the approval holder shall record the following sampling information for all groundwater samples collected:

(a) a description of purging and sampling procedures;

(b) the static elevations above sea level, and depth below ground surface of fluid phases in the groundwater monitoring well prior to purging;

(c) the temperature of each sample at the time of sampling;

(d) the pH of each sample at the time of sampling; and

(e) the specific conductance of each sample at the time of sampling.

4.9.13 The approval holder shall carry out remediation of the groundwater in accordance with the following:

(a) *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended; and

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(b) *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended.

REPORTING

4.9.14 The approval holder shall compile an Annual Groundwater Monitoring Program Report which shall include, at a minimum, all of the following information:

(a) a completed *Record of Site Condition Form*, Alberta Environment, 2009, as amended;

(b) a legal land description of the facility and a map illustrating the facility boundaries;

(c) a topographic map of the facility;

(d) a description of the industrial activity and processes;

(e) a map showing the location of all surface and groundwater users, and a listing describing surface water and water well use details, within at least a 1.6 kilometre radius of the facility;

(f) a general hydrogeological characterization of the region within a five kilometre radius of the facility;

(g) a detailed hydrogeological characterization of the facility, including an interpretation of groundwater flow patterns;

(h) cross-sections showing depth to water table, patterns of groundwater movement and hydraulic gradients at the facility;

(i) borehole logs and completion details for groundwater monitoring wells;

(j) a map showing locations of all known buried channels within at least five kilometre of the facility;

(k) a map of surface drainage within the facility and surrounding area to include nearby water bodies;

(l) a map of groundwater monitoring well locations and a table summarizing the existing groundwater monitoring program for the facility;

(m) a summary of any changes to the groundwater monitoring program made since the last groundwater monitoring report;

(n) analytical data recorded as required in 4.9.5 and 4.9.11(b);

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(o) a summary of fluid elevations recorded as required in 4.9.12(b) and an interpretation of changes in fluid elevations;

(p) an interpretation of QA/QC program results;

(q) an interpretation of all the data in this report, including the following:

  (i) diagrams indicating the location and extent of any contamination,

  (ii) a description of probable sources of contamination, and

  (iii) a site map showing the location and type of current and historical potential sources of groundwater contamination;

(r) a summary and interpretation of the data collected since the groundwater monitoring program began including:

  (i) control charts which indicate trends in concentrations of parameters, and

  (ii) the migration of contaminants;

(s) a description of the following:

  (i) contaminated groundwater remediation techniques employed,

  (ii) source elimination measures employed,

  (iii) risk assessment studies undertaken, and

  (iv) risk management studies undertaken;

(t) a proposed sampling schedule for the following year(s);

(u) a description of any contaminant remediation, risk assessment or risk management action conducted at the facility; and

(v) recommendations for:

  (i) changes to the groundwater monitoring program to make it more effective, and

  (ii) remediation, risk assessment or risk management of contamination identified.

4.9.15 The approval holder shall submit the Annual Groundwater Monitoring Program Report to the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.9.16 If the Annual Groundwater Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director, within the timeline specified in writing by the Director.

SECTION 4.10: SOIL

4.10.1 In addition to any other requirements specified in this approval, the approval holder shall conduct all of the following activities related to soil monitoring and soil management required by this approval in accordance with the *Soil Monitoring Directive,* Alberta Environment, 2009, as amended:

(a) designing and developing proposals for the Soil Monitoring Program;

(b) designing and developing proposals for the Soil Management Program;

(c) all other actions, including sampling, analysing, and reporting, associated with the Soil Monitoring Program; and

(d) all other actions, including sampling, analysing and reporting, associated with the Soil Management Program.

MONITORING AND REPORTING

4.10.2 The approval holder shall submit the Soil Monitoring Program proposal to the Director according to the following schedule:

(a) for the first soil monitoring event on or before January 31, 2019; and

(b) for the second soil monitoring event on or before January 31, 2024;

unless otherwise authorized in writing by the Director.

4.10.3 If any Soil Monitoring Program proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.10.4 Subject to 4.10.3, the approval holder shall implement the Soil Monitoring Program as authorized in writing by the Director.

4.10.5 If an authorization or a deficiency letter is not issued within 120 days of the applicable date required by 4.10.2, the approval holder shall implement the Soil Monitoring Program:

(a) in accordance with the program as set out in the proposal submitted by the approval holder; and

(b) within 270 days after the applicable date required by 4.10.2.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

4.10.6 The approval holder shall submit to the Director each Soil Monitoring Program Report obtained from the soil monitoring referred to in 4.10.4 and 4.10.5 according to the following schedule:

(a) for the first Soil Monitoring Program Report on or before January 31, 2020; and

(b) for the second Soil Monitoring Program Report on or before January 31, 2025;

unless otherwise authorized in writing by the Director.

4.10.7 If any Soil Monitoring Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

SOIL MANAGEMENT PROGRAM

4.10.8 If the Soil Monitoring Program, or any other soil monitoring, reveals that there are substances present in the soil at concentrations greater than any of the applicable concentrations set out in the standards in the *Soil Monitoring Directive*, Alberta Environment, 2009, as amended, the approval holder shall develop a Soil Management Program Proposal.

4.10.9 If a Soil Management Program Proposal is required pursuant to 4.10.8, the approval holder shall submit a Soil Management Program Proposal to the Director according to the following schedule:

(a) for Soil Management Program Proposal that is triggered by the findings from the first soil monitoring event on or before the date in 4.10.6(a);

(b) for Soil Management Program Proposal that is triggered by the findings from a second soil monitoring event on or before the date in 4.10.6(b); or

(c) for any other soil monitoring event not specified in this approval within six months of completion of the soil monitoring event.

4.10.10 If any Soil Management Program Proposal is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

4.10.11 The approval holder shall implement the Soil Management Program as authorized in writing by the Director.

4.10.12 If the approval holder is required to implement a Soil Management Program pursuant to 4.10.11, the approval holder shall submit a written Soil Management Program

TERMS AND CONDITIONS ATTACHED TO APPROVAL

Report to the Director on or before March 31 of each year following the year in which the information was collected.

4.10.13 If any Soil Management Program Report is found deficient by the Director, the approval holder shall correct all deficiencies identified by the Director by the date specified in writing by the Director.

PART 5: FINANCIAL SECURITY REQUIREMENTS

5.1.1 The approval holder shall annually review and revise the cost estimate for reclamation of the facility including decommissioning and land reclamation.

5.1.2 The annual revised cost estimate for the facility shall be submitted to the Director by March 31 of each year.

5.1.3 The approval holder shall review and revise the cost estimate for reclamation of the facility when one or more of the following occurs:

(a) the cost estimate of future conservation and reclamation of the facility changes;

(b) the extent of the operation of the facility is increased or reduced;

(c) the facility or any portion of it is conserved and reclaimed;

(d) the conservation and reclamation plan required by this approval is changed; or

(e) the activities conducted at the facility for which security is required is increased or decreased.

5.1.4 The approval holder shall submit the revised cost estimate arising from 5.1.3 to the Director within 30 days after the occurrence of any of the circumstances described in 5.1.3.

5.1.5 The approval holder shall provide additional financial security as required in writing by the Director.

5.1.6 The approval holder shall renew the financial security for the facility at least 30 days prior to the date it expires.

5.1.7 The approval holder shall maintain the financial security for the facility until returned in accordance with the Act or the regulations.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 6: DECOMMISSIONING AND LAND RECLAMATION OF HWRSP FACILITY

SECTION 6.1: GENERAL

6.1.1 The approval holder shall apply for an amendment to this approval to reclaim the HWRSP Facility by submitting to the Director:

(a) a Decommissioning Plan; and

(b) a Land Reclamation Plan.

6.1.2 The approval holder shall submit the:

(a) Decommissioning Plan; and

(b) Land Reclamation Plan

referred to in 6.1.1 within six (6) months of the HWRSP Facility ceasing operation, except for repairs and maintenance, unless otherwise authorized in writing by the Director.

SECTION 6.2: DECOMMISSIONING

6.2.1 The Decommissioning Plan referred to in 6.1.1 shall include, at a minimum, all of the following:

(a) a plan for dismantling the HWRSP Facility;

(b) a comprehensive study to determine the nature, degree and extent of contamination at the HWRSP Facility and affected lands;

(c) a plan to manage all wastes at the HWRSP Facility;

(d) evaluation of remediation technologies proposed to be used at the HWRSP Facility and affected lands;

(e) a plan for decontamination of the HWRSP Facility and affected lands in accordance with the following:

(i) for soil or groundwater, *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

(ii) for soil or groundwater, *Alberta Tier 2 Soil and Groundwater Remediation Guidelines*, Alberta Environment, February 2009, as amended,

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(iii) for drinking water, *Canadian Environmental Quality Guidelines*, Canadian Council of Ministers of the Environment, PN 1299, 1999, as amended, and

(iv) for surface water, *Surface Water Quality Guidelines for Use in Alberta*, Alberta Environment, November 1999, as amended;

(f) confirmatory testing to indicate compliance with the remediation objectives;

(g) a plan for maintaining and operating contaminant monitoring systems;

(h) a schedule for activities (a) through (g) above; and

(i) any other information as required in writing by the Director.

6.2.2 If the Decommissioning Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

SECTION 6.3: LAND RECLAMATION

6.3.1 The Land Reclamation Plan referred to in 6.1.1 shall include, at a minimum, all of the following:

(a) the final use of the reclaimed area and how equivalent land capability will be achieved;

(b) removal of infrastructure;

(c) restoration of drainage;

(d) soil replacement;

(e) erosion control;

(f) revegetation and conditioning of the HWRSP Facility including:

(i) species list, seed source and quality, seeding rates and methods,

(ii) fertilization rates and methods, and

(iii) wildlife habitat plans where applicable;

(g) reclamation schedule; and

(h) any other information as required in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

6.3.2 If the Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

PART 7: FINAL LANDFILL CLOSURE AND POST-CLOSURE

SECTION 7.1: LANDFILL CELL CLOSURE AND MAINTENANCE

7.1.1 The approval holder shall submit a Landfill Cell Closure Plan for individual landfill cell closure to the Director on or before September 30, 2017, unless otherwise authorized in writing by the Director.

7.1.2 The Landfill Cell Closure Plan submitted pursuant to 7.1.1 shall be signed and stamped by a professional registered with APEGA.

7.1.3 If the Landfill Cell Closure Plan submitted pursuant to 7.1.1 is found deficient by the Director, the approval holder shall correct all deficiencies as outlined in writing by the Director within the timeline specified in writing by the Director.

7.1.4 The approval holder shall implement the Landfill Cell Closure Plan submitted pursuant to 7.1.1 as authorized in writing by the Director.

7.1.5 The approval holder shall maintain the closed landfill cells to:

(a) protect and maintain the integrity of the final cover and surface water drainage systems;

(b) prevent erosion;

(c) prevent surface water ponding;

(d) remediate areas affected by subsidence and differential settlement; and

(e) prevent leachate break out.

7.1.6 If the approval holder completes landfill cell closure in a year, the approval holder shall prepare an Annual Landfill Cell Closure Report, and include, at a minimum, all of the following information in the Report:

(a) as-built plans and details on the location of landfill cells that have been closed;

(b) certified construction QA/QC procedures employed during cover construction and installation; and

(c) survey reports showing the final cover depths.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

7.1.7 The approval holder shall submit the Annual Landfill Cell Closure Report with the Annual Landfill Operations Report required in 4.6.58.

SECTION 7.2: FINAL LANDFILL CLOSURE AND POST-CLOSURE

7.2.1 The approval holder shall apply for an amendment to this approval for final landfill closure by submitting to the Director:

(a) a Detailed Final Landfill Closure Plan ; and

(b) a Landfill Post-Closure Plan.

7.2.2 The approval holder shall submit the:

(a) Detailed Final Landfill Closure Plan; and

(b) Landfill Post-Closure Plan

referred to in 7.2.1 within six (6) months of the landfill ceasing operations, unless otherwise authorized in writing by the Director.

DETAILED FINAL LANDFILL CLOSURE PLAN

7.2.3 The Detailed Final Landfill Closure Plan shall be developed in accordance with sections 6.1(b) and 6.1(c) of the *Standards for Landfills in Alberta*, as amended.

7.2.4 In addition to 7.2.3, the Detailed Final Landfill Closure Plan shall include, at a minimum, all of the following:

(a) a plan for replacement of soil;

(b) a QA/QC Program; and

(c) any deviations from the most recently submitted closure plan.

7.2.5 The Detailed Final Landfill Closure Plan shall be signed and stamped by a professional registered with APEGA.

7.2.6 If the Detailed Final Landfill Closure Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

7.2.7 The approval holder shall implement the Detailed Final Landfill Closure Plan as authorized in writing by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

LANDFILL POST-CLOSURE PLAN

7.2.8 The Landfill Post-Closure Plan shall be developed in accordance with sections 6.2 and 6.3 of the *Standards for Landfills in Alberta*, as amended.

7.2.9 In addition to 7.2.8, the Landfill Post-Closure Plan shall include, at a minimum, all of the following:

(a) the groundwater monitoring program including performance standards and points of compliance;

(b) the subsurface landfill gas monitoring program and performance standards at points of compliance;

(c) a plan for erosion control;

(d) a plan for maintaining vegetative cover; and

(e) any other information requested in writing by the Director.

7.2.10 The Landfill Post-Closure Plan shall be signed and stamped by a professional registered with APEGA.

7.2.11 If the Landfill Post-Closure Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

7.2.12 The approval holder shall implement the Landfill Post-Closure Plan as authorized in writing by the Director.

PART 8: DECOMMISSIONING AND LAND RECLAMATION OF OLD SURFACE WATER DETENTION POND

8.1.1 The approval holder shall:

(a) decommission; and

(b) reclaim

the old surface water detention pond prior to construction of Cell 4.

8.1.2 The approval holder shall submit a Decommissioning and Land Reclamation Plan for the old surface water detention pond to the Director a minimum of six (6) months prior to decommissioning and land reclamation of the pond.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

8.1.3 If the Decommissioning and Land Reclamation Plan is found deficient by the Director, the approval holder shall correct all deficiencies identified in writing by the Director by the date specified in writing by the Director.

DATED March 31, 2017

DESIGNATED DIRECTOR UNDER THE ACT
Mohammad Habib, P. Eng.

RECORD OF SITE CONDITION

Record of Site Condition

1 REPORT AND FORM INFORMATION

Title of report	Groundwater Monitoring Program – 2017 Class I Waste Management Facility, Ryley, Alberta		
Report date (*dd-mon-yyyy*)	06-Feb-2019	Record of Site Condition (RSC) ID No.[Ψ]	

2 SITE IDENTIFICATION AND PHYSICAL LOCATION

2.1 Site name	Clean Harbors, Ryley Facility		
2.2 Address of site	2 km No. of Hwy.14 on Secondary Rd.854, Ryley, AB T0B 4A0		
	Municipality	Beaver County	**Alberta**

2.3 Legal land description of site *(if multiple, list all.)*

Plan, Block, Lot (PBL)			Alberta Township System (ATS)					
Plan	Block	Lot	LSD	Quarter	Section	Township	Range	Meridian
				SE	9	50	17	4

3 STAKEHOLDERS

3.1 Operator

Company	Clean Harbors Inc.	Contact person	Mr. Stan Yuha
Mailing address	P.O. Box 390 Ryley, AB T0B 4A0	Position held	Facility Manager
		Business phone No.	780.717.9606
		Business fax No.	
		Business e-mail	Yuha.Stan@cleanharbors.com

3.2 Consultant ☐ Not applicable

Company	Tetra Tech Canada Inc.	Contact person	Michele Crawford
Mailing address	**14940 123 Ave NW** **Edmonton, AB T5V 1B4**	Position held	Project Manager
		Business phone No.	780.451.2121
		Business fax No.	
		Business e-mail	Michele.Crawford@tetratech.com

3.3 Landowner(s)

Land type	☒ Private ☐ Special Areas ☐ Parks and protected area ☐ Public (*if not private, provide Disposition No.: _____*)
Landowner(s)	☒ Same as operator ☐ Other

[Ψ]: Do not fill in. Reserved for internal administrative purposes only.

3.4 Occupant(s)			
Are there occupants at the site?	☒ Yes	☐ No	☐ To be determined (TBD)
Occupant(s)	☒ Same as operator	☐ Same as landowner	☐ Other
What is the type of occupancy?	☐ Apartment building	☐ Town house	☐ Single detached house
	☐ Agricultural	☒ Industrial	☐ Commercial
	☐ Other (*specify*) Waste Management Facility		

4 OPERATING STATUS

☒ Operating ☐ Suspended ☐ Abandoned ☐ Decommissioning in progress ☐ Closed
☐ Reclaimed (*provide Reclamation Certificate No.(s):* _____) ☐ Not applicable

5 TYPE OF ACTIVITY AND SITE

5.1 Petroleum Storage Tank Site ☐ Yes

5.1.1 ESRD file No.(s)		PTMAA site No.	

5.1.2 Types of activity

☐	Retail gas station	☐	Aviation fuelling station	☐	Bulk fuel	☐	Other *(specify)*: _____

5.2 Upstream Oil and Gas Facility ☐ Yes

5.2.1 ESRD file No.(s)		AER approval No.(s)	

5.2.2 AER authorization type ☐ Approval ☐ License ☐ Permit ☐ Order ☐ Other (*specify*)_____

5.2.3 Types of activity

☐	Wellsite and associated facility	☐	Satellite	☐	Battery	☐	Pipeline
☐	Compressor and pumping station	☐	Other (*specify*): _____				

5.3 Approved Facility Under Environmental Protection and Enhancement Act (EPEA) ☒ Yes

5.3.1 ESRD approval No.(s)	10348-03-00	AER approval No.(s)	

5.3.2 Types of approved activity

☐	Chemical manufacturing plant	☐	Enhanced recovery in-situ oil sands or heavy oil processing plant	☐	Fertilizer manufacturing plant	☐	Landfill
☐	Metal manufacturing plant	☐	Oil refinery	☐	Oilsands processing plant	☐	Oil production site
☐	Pesticide manufacturing plant	☐	Petrochemical manufacturing plant	☐	Pipeline	☐	Power plant
☐	Pulp and paper processing plant	☐	Sour gas processing plant	☐	Sulphur manufacturing or processing plant	☒	Waste management facility
☐	Wood treatment plant	☐	Other *(specify)*: _____				

5.4 Facility Under EPEA Code of Practice	☐ Yes						
5.4.1 ESRD registration No.(s)		**AER registration No.(s)**					
5.4.2 Type of Code of Practice							
☐	Asphalt paving plant	☐	Compressor and pumping station	☐	Concrete producing plant	☐	Landfill
☐	Pesticides	☐	Pipeline	☐	Land treatment of soils containing hydrocarbons	☐	Sand and gravel pit
☐	Small incinerator	☐	Sweet gas processing plant	☐	Other *(specify)*: _____		

5.5 Other Activity	☐ Yes				
5.5.1 ESRD file No.(s)		Other site ID No.(s)		Authorized by	
5.5.2 Types of activity					
☐	Dry cleaning operation	☐	Highway maintenance yard	☐	Transportation
☐	Other *(specify)*: _____				

6 SITE CHARACTERIZATION

6.1 What Environmental Site Assessments (ESA) Have Been Conducted and Completed to Date?

☐ Phase I ESA

☐ Phase II ESA (*check all that apply.*)

☐ Initial intrusive sampling ☐ delineation completed ☐ post-remediation monitoring ☐ final confirmatory sampling

6.2 Contaminants of Potential Concern (COPC)

6.2.1 Does the site have any of the conditions that require the mandatory use of *Alberta Tier 2 Soil and Groundwater Remediation Guidelines* (ESRD, 2007 and updates)? *(check all that apply in Section 6.2.1.1.)*

☐ Yes ☒ No *(➔proceed to Section 6.2.2.)*

6.2.1.1 Identify any conditions that require the approaches of the Alberta Tier 2 guidelines. *(see Alberta Tier I Soil and Groundwater Remediation Guidelines (ESRD, 2007 and updates), for details.)*

☐	Contamination within 30 cm of building foundation	☐	Unusual building feature (*eg. earthen floor*)	☐	Contamination within 10 m distance of surface water body
☐	Fractured bedrock	☐	Potentially high hydraulic conductivity *(> 10^{-5} m/sec.)*	☐	Other (*see Alberta Tier 1 guidelines and specify):* _____

6.2.1.2 Did the Alberta Tier 2 approach lead to a soil or groundwater guideline that was lower than the corresponding Tier 1 guideline for the same contaminant(s)?

☐ Yes ☐ TBD ☐ No *(➔proceed to Section 6.2.2.)*

6.2.1.3 If you answered 'yes' or 'TBD' to Section 6.2.1.2, identify the group of contaminants for each COPC with a mandatory Tier 2 guideline that is lower than the corresponding Tier 1 guideline (*check all that apply*, *see Alberta Tier 1 guidelines, Tables 1-4 for detailed listing).*

☐	General and inorganic parameters	☐	Metals
☐	Hydrocarbons	☐	Halogenated aliphatics
☐	Chlorinated aromatics	☐	Pesticides
☐	Other organics	☐	Radionuclides
☐	Salt	☐	Other (*specify*): _____

6.2.1.4 Did any past or current ESA relevant to this investigation identify an exceedance of the mandatory Tier 2 guidelines referred to in Section 6.2.1.3 (e.g. Tier 2 guidelines that are lower than the corresponding Tier 1 guidelines)? ☐ Yes ☐ No ☐ TBD

6.2.1.5 If you answered 'yes' in Section 6.2.1.4, have all relevant COPC been remediated to meet the mandatory Tier 2 guidelines? ☐ Yes ☐ No

6.2.2. Did any past or current ESA relevant to this investigation identify a drilling waste disposal area?

☐ Yes ☒ No *(➔proceed to Section 6.2.3.)*

6.2.2.1 If a drilling waste disposal area was identified, did any past or current ESA identify non-compliance with the compliance options outlined in *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification* (AER, 2014), as amended?

☐ Yes ☐ No

6.2.2.2 If you answered 'yes' in Section 6.2.2.1, have all COPC been remediated to meet the compliance options outlined in *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification* (AER, 2014), as amended?

☐ Yes ☐ No

6.2.2.3 For any COPC that did not meet the compliance options in Assessing Drilling Waste Disposal Areas, identify the group of contaminants (*check of all that apply, see the Alberta Tier 1 guidelines, Tables 1-4 for detailed listing).*

☐	General and inorganic parameters	☐	Metals
☐	Hydrocarbons	☐	Halogenated aliphatics
☐	Chlorinated aromatics	☐	Pesticides
☐	Other organics	☐	Radionuclides
☐	Salt	☐	Other (*specify*): _____

6.2.3 For all areas and COPCs not assessed under Sections 6.2.1 or 6.2.2, did any ESA relevant to this investigation identify an exceedance over the Alberta Tier 1 guidelines?

☐ Yes ☒ No *(➔proceed to Section 6.3.)*

6.2.3.1 If you answered 'yes' in Section 6.2.3, have all COPC been remediated to meet the Alberta Tier 1 guidelines?

☐ Yes ☐ No ☐ TBD

6.2.3.2 For any COPC that exceeded Alberta Tier 1 guidelines in Section 6.2.3.1, identify the group of contaminants. (*check all that apply, see the Alberta Tier 1 guidelines, Tables 1-4 for detailed listing.)*

☐	General and inorganic parameters	☐	Metals
☐	Hydrocarbons	☐	Halogenated aliphatics
☐	Chlorinated aromatics	☐	Pesticides
☐	Other organics	☐	Radionuclides
☐	Salt	☐	Other (*specify*): _____

6.3 Status of Investigation

6.3.1 Identify soil and groundwater guidelines used to assess the COPCs that are the subject of this investigation *(check all that apply).*

☐ *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* – 2007 and updates,
☐ Coarse grained ☐ Fine grained

☐ *Alberta Tier 2 Soil and Groundwater Remediation Guidelines* – 2007 and updates,
☐ Pathway exclusion ☐ Guideline adjustment ☐ Site specific remediation objectives

☐ *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification* (AER, 2014), as amended

☒ Other (*specify*): Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2017)

6.3.2 What land use classification(s) is used?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify:* Drinking Water Quality)

6.3.3 What is the outcome of the investigation? *(check one only.)*

☐ For all COPCs on-site and off-site, no exceedance has been found above any applicable soil and groundwater guidelines in any prior and current assessments.

☐ All contamination on-site and off-site has been completely remediated and meets the applicable soil and groundwater guidelines.

☒ One or more COPC still exceeds the applicable soil or groundwater guidelines.

6.3.4 How many contaminated areas are there currently at the site?

_____ ☐ None ☒ TBD

6.3.5 Are all contaminated areas and potential contaminated areas assessed during this investigation?

☐ Yes ☐ No

6.3.6 For all areas of potential environmental concern, list the dates when the contamination was discovered *(specify dd-mon-yyyy)*: _____; _____

6.3.7 For all areas that have been identified in Section 6.3.4, have all substance releases been reported to ESRD?

☐ Yes ☐ No ☒ Not applicable

6.3.8 If the answer to Section 6.3.7 is 'yes', list all Incident No.(s) (*attach separate sheet if necessary*):

_____; _____ ☐ Not assigned

6.3.9 What is the approximate, cumulative amount of land area remaining exceeding applicable remediation guidelines? _____ (m^2) ☐ None ☒ TBD

6.3.10 Is there non-aqueous phase liquid (NAPL) product remaining on site? ☐ Yes ☒ No ☐ TBD

6.3.11 Is there non-aqueous phase liquid (NAPL) product remaining off site? ☐ Yes ☒ No ☐ TBD

6.3.12 What is the remediation status of the contaminated areas at site?

☒	No remediation required	☐	Site has exceedance but no remediation plan
☐	Remediation plan developed	☐	Active remediation
☐	Remediation completed	☐	Post remediation assessment completed
☐	Ongoing risk management plan – on-site	☐	Ongoing risk management plan – off-site
☐	Remediation Certificate issued for some area(s) *(provide Remediation Certificate No.(s):_____)*		
☐	Remediation Certificate cancelled for some area(s) *(provide Remediation Certificate No.(s):_____)*		

Direction for Completing the Remainder of the Form

Attach the analytical summary tables of the COPCs that are the subject of this investigation and still present at this site. A detailed listing of COPCs can be found with Tables 1-4 in *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* (ESRD, 2007 and updates), as amended. Refer to the *RSC User's Guide* for detailed information on format and other requirements regarding the summary table.

For the remainder of the form, follow the directions below:

- If the COPCs on-site and off-site have never exceeded any applicable soil and groundwater guidelines in any prior and current assessments, ➔proceed to Section 8, or
- If the COPCs on-site and off-site have been completely remediated and meet the applicable soil and groundwater guidelines, ➔proceed to Section 8, or
- For all other circumstances, continue with Section 6.4.

6.4 Key Transport Factors for Existing COPCs

6.4.1 What is the horizontal distance to the nearest water well from the edge of the nearest contaminated area?

☐ 0-50 m ☐ 50-100 m ☐ 100-300 m ☐ 300-1000 m ☐ > 1000 m

6.4.2 What is the horizontal distance to the nearest surface water body from the edge of the contaminated area?

☐ ≤10 m ☐ 10-50 m ☐ 50-100 m ☐ 100-300 m ☐ 300-1000 m ☐ > 1000 m

6.4.3 Does delineation achieve closure above the groundwater water table that is nearest to the ground surface?

☐ Yes *(➔ go to Section 6.5.)* ☐ No ☐ TBD

6.4.4 Is the groundwater that is nearest the ground surface a domestic use aquifer (DUA) as defined in Alberta Tier 2 guidelines?

☐ Yes ☐ No ☐ TBD ☐ Not required (NR)

6.4.5 Is there a hydraulic barrier, as defined in Alberta Tier 2 guidelines, between the base of the contaminated area and the DUA?

☐ Yes ☐ No ☐ TBD ☐ NR

6.4.6 If you answered 'yes' to Section 6.4.5, provide the measured largest value of the hydraulic conductivity (as value ×10^{-7} m/sec.) for the 5.0 m vertical layer from the bottom of the contaminated zone.

_____(×10^{-7} m/sec.) ☐ TBD ☐ NR

6.5 On-site Characterization

6.5.1 What is the dominant soil texture that governs substance transport at the site?

☐ Coarse grained ☐ Fine grained ☐ TBD ☐ Not applicable (*must identify reason in Section 6.2.1.1.)*

6.5.2 What are the shallowest and deepest measured depths (meters below ground surface) of the water table at site?

Shallowest: **0.79** (m) Deepest: 5.66(m) ☐ TBD ☐ NR (*specify max. depth assessed*: _____(m))

6.5.3 What is the dominant horizontal direction of groundwater flow for the near surface water table?

(*N, NW, etc.:* _____) ☐ TBD ☐ NR

6.5.4 What is the existing land use classification?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.5.5 What is the end land use classification?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.5.6 Identify exposure pathways for which the applicable guidelines are exceeded on-site *(check all that apply).*			
☐	Vapour inhalation	☐	Soil ingestion
☐	Ingestion of potable water	☐	Soil dermal (skin) contact
☐	Fresh water aquatic life	☐	Soil contact for plants and invertebrates
☐	TBD	☐	Other *(specify):* _____

6.6 Off-site Characterization

6.6.1 Are there COPCs off-site exceeding applicable soil or groundwater guidelines?

☐ No *(➔if on-site contamination was reported, proceed to Section 7, otherwise, proceed to Section 8.)*
☐ Yes ☐ TBD

6.6.2 What is the current land use classification for any off-site area(s) identified in Section 6.6.1?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.6.3 What is the end land use classification for any off-site area(s) identified in Section 6.6.1?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.6.4 Is there any substance concentration under a road allowance exceeding the applicable soil or groundwater guidelines?

☐ Yes ☐ No (➔*proceed to Section 6.6.6.)* ☐ TBD

6.6.5 What is the most sensitive land use classification adjacent to the road allowance?

☐ Natural ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other (*specify*) _____

6.6.6 Identify exposure pathways for which the applicable guidelines are exceeded off-site *(check all that apply).*			
☐	Vapour inhalation	☐	Soil ingestion
☐	Ingestion of potable water	☐	Soil dermal (skin) contact
☐	Fresh water aquatic life	☐	Soil contact for plants and invertebrates
☐	TBD	☐	Other *(specify):* _____

7 RISK MANAGEMENT PLAN (RMP)

7.1 What is the Plan for Contaminated Areas Still Remaining on and off the Site? *(check one only.)*

- ☐ Complete remediation *(➔proceed to Section 8).*
- ☐ Partial remediation with risk management for some residual contamination.
- ☐ Risk management for all remaining contamination.

7.2 Key Progress of RMP

7.2.1 If the site needs an on-going RMP, answer all the following questions that apply to the RMP.

☐ Yes	☐ No	Are contaminated areas completely delineated horizontally and vertically in soil?
☐ Yes	☐ No	Are contaminated areas completely delineated horizontally and vertically in groundwater?
☐ Yes	☐ No	Is source identified and completely delineated?
☐ Yes	☐ No	Is source migrating or has migrated off-site?
☐ Yes	☐ No	Is source left as is?
☐ Yes	☐ No	Is source partially removed and residual source being managed?
☐ Yes	☐ No	Is source controlled with physical or administrative methods?
☐ Yes	☐ No	Are all pathways of concern identified?
☐ Yes	☐ No	Have all relevant receptors been identified and protected?
☐ Yes	☐ No	Is there a monitoring program in place to verify RMP success?
☐ Yes	☐ No	Are there third parties related to this RMP? (*if the answer is 'no', skip the next question.*)
☐ Yes	☐ No	If there are third parties, have all of them accepted the RMP?
☐ Yes	☐ No	Is there a commitment from person(s) responsible to implement and monitor the RMP until final remediation guidelines are achieved?
☐ Yes	☐ No	Is there a contingency plan in place should the RMP fail?
☐ Yes	☐ No	Is the RMP implemented for the site?

Public Disclosure and Privacy Notification

The *Record of Site Condition* form is a public record that is disclosed in accordance with section 35 of the *Environmental Protection and Enhancement Act, Disclosure of Information Regulation*, and *Ministerial Order 23/2004*. Reasonable efforts have been made to minimize collection of personal information where possible. Personal information on the form is collected under the authority of section 12(c) and other provisions of the *Environmental Protection and Enhancement Act* and is in compliance with section 33(a) and 33(c) of the *Freedom of Information and Protection of Privacy Act* (FOIP). Personal information collected on this form will be used by Alberta Environment and Sustainable Resource Development (ESRD) or the Alberta Energy Regulator (AER), as the case may be, for the purposes of administering its programs.

Accuracy of Information

The information in this document has been submitted by persons other than ESRD or the AER. The Department, the Government of Alberta, and the AER cannot and do not warrant that the information in this document is current, accurate, complete, or free of errors. Persons accessing the information provided should not rely on it, and any reliance on the information provided is taken at the sole risk of the user. Users of this information are advised to conduct their own due diligence to satisfy themselves of the environmental condition of the property of interest.

8 DECLARATION

This *Record of Site Condition* form was prepared for the purpose of reporting on the state of environmental site conditions and, where applicable, for the purpose of remediation or reclamation, for:
Ryley Facility (site name) (the "Site").

I, as the licensed operator or authorized representative, have reviewed all information that was used in preparation of this form and I am satisfied that it was prepared in a manner consistent with the Applicable Standard[1] together with any relevant additional guidance that is available from Alberta Environment and Sustainable Resource Development as of this date for conducting environmental site assessments.

Having conducted reasonable inquiries to obtain all relevant information, to my knowledge, the statements made in this form are true as of this date. I have disclosed all pertinent information of which I am aware concerning the historical and current environmental condition of the Site to the Director.

Any use which a third party, other than the Crown in right of Alberta or the AER, makes of this form, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The undersigned accepts no responsibility for damages, if any, suffered by any third party, other than the Crown in right of Alberta and the AER, as a result of decisions made or actions based on this form. Any exclusions or disclaimers to the contrary contained in any attachment to this form are of no force or effect as against the Crown in right of Alberta and the AER.

Footnote [1]:

"Applicable Standard" means

a) for the purposes of upstream oil and gas sites,

   i) *2010 Reclamation Criteria for Wellsites and Associated Facilities Application Guidelines* (ESRD 2011),

   ii) CSA Standard Z769, *Phase II Environmental Site Assessment,* as amended, for any Phase II site assessment information used in preparation of this form on all upstream oil and gas sites not included in a) i);

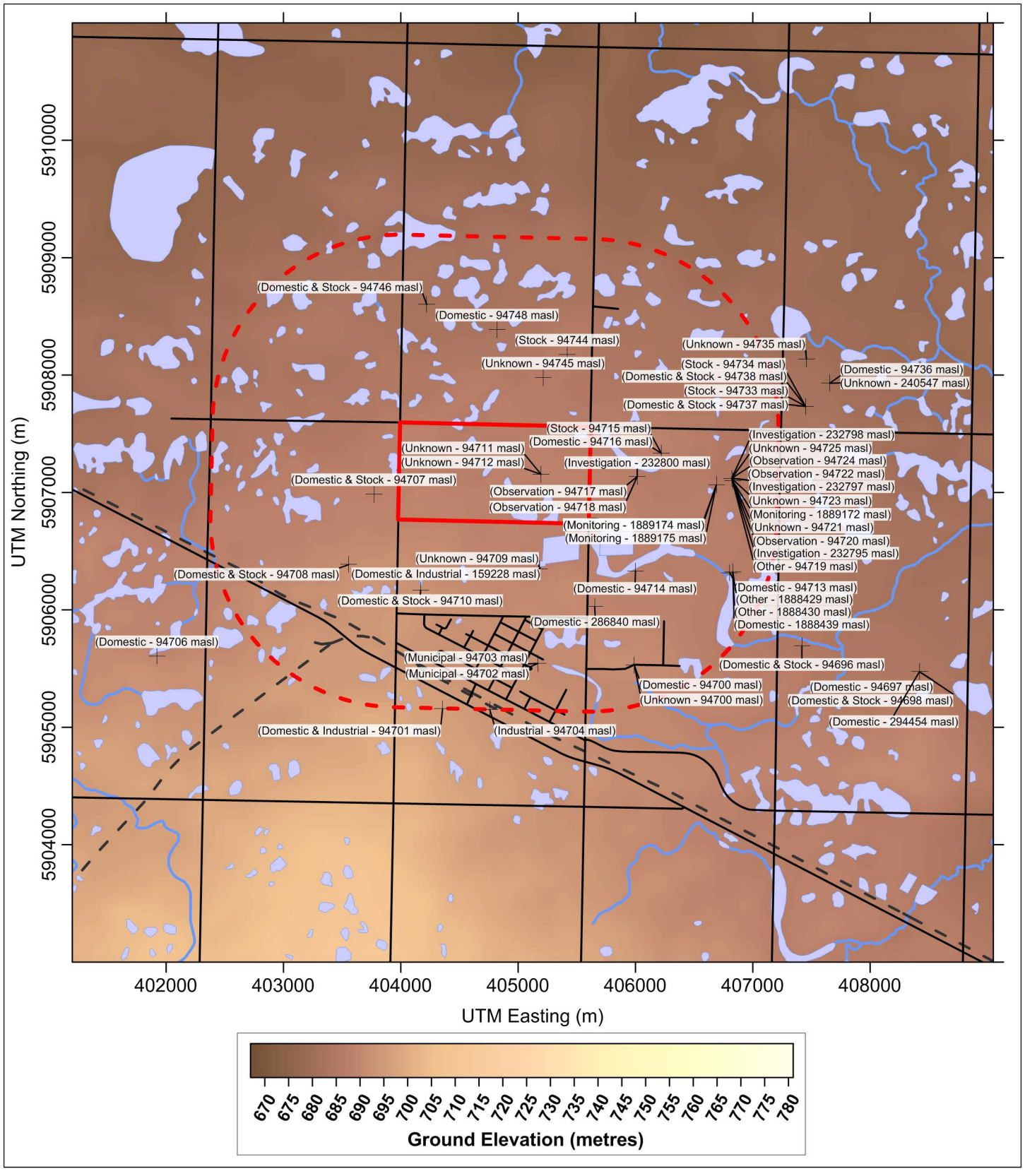
b) for the purposes of all other sites, CSA Standard Z768, *Phase I Environmental Site Assessment,* as amended, for any Phase I site assessment information and with CSA Standard Z769, *Phase II Environmental Site Assessment,* as amended, for any Phase II site assessment information used in preparation of this form.

By signing below, I as the licensed operator or authorized representative, confirm the information provided herein is correct and complete, to the best of my knowledge and belief.

Clean Harbors Inc.	Aziz Shaikh	Senior Hydrogeological Engineer		06-Feb-2019
Name of operator	Name of authorized representative	Title of authorized representative (*e.g. officer, director*)	Signature	Date (*dd-mon-yyyy*)

APPENDIX B

WATER WELL AND SURFACE WATER SEARCH RESULTS



LEGEND

- Water Well (Use - Well ID)
- Approximate Site (N1/2 9-50-17 W4M)
- Search Radius
- Road
- Rail
- Waterbody
- Watercourse

UTM ZONE 12
NAD 83 DATUM

CLIENT

CleanHarbors

TETRA TECH

2018 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Alberta Water Well Information Database 2.0 km Search Radius

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	BS	AS	000

OFFICE	DATE	STATUS
EBA-CALGARY	July, 2017	Issued for Use

Appendix B

\\tt.local\eba\Projects\CGY\178070\SWOP03097-01\Data\AppendixD - WaterWellDatabaseSearch.srf

Reconnaissance Report

View in Imperial

Export to Excel

Groundwater Wells

Please click the water Well ID to generate the Water Well Drilling Report.

GIC Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)	SC_DIA (cm)
94700	NW	3	50	17	4	HOLLAND WATER WELLS		106.68	Existing Well-Decommissioned	Unknown		1		BEAVER COUNTY			
94700	NW	3	50	17	4	UNKNOWN DRILLER		106.68	Chemistry	Domestic				MIZERA, RUDY	45.72		0.00
94701	WH	4	50	17	4	MERV'S WATER WELL DRILLING	1986-05-01	120.40	New Well	Domestic & Industrial		13		ABRAHAM, JOE	24.38	11.37	13.97
94702	NE	4	50	17	4	UNKNOWN DRILLER		15.24	Chemistry	Municipal	2			RYLEY, VILL OF			
94703	NE	4	50	17	4	UNKNOWN DRILLER		60.96	Chemistry	Municipal	1			RYLEY, VILL OF			
94704		4	50	17	4	ALF'S DRILLING & SUPPLIES LTD.	1986-10-02	132.59	New Well	Industrial		9		ANDRUKOW FARM SALES LTD	21.95	272.77	14.12
94707	9	8	50	17	4	UNKNOWN DRILLER	1930-01-01	4.27	Federal Well Survey	Domestic & Stock				MAGNUSSEN			0.00
94708	SE	8	50	17	4	UNKNOWN DRILLER		121.92	Federal Well Survey	Domestic & Stock							0.00
94709	SE	9	50	17	4	UNKNOWN DRILLER		7.32	Chemistry	Unknown				MAGNUSSEN, E.	3.05		0.00
94710	4	9	50	17	4	UNKNOWN DRILLER		4.27	Federal Well Survey	Domestic & Stock				HOSTLUND			0.00
94711	NE	9	50	17	4	BIG QUILL DRILLING LTD.	1983-01-31	90.53	Test Hole-Decommissioned	Unknown		13		C.E. MOELL CONSULTING LTD#1	0.00	13.64	17.78
94712	NE	9	50	17	4	BIG QUILL DRILLING LTD.	1983-02-01	90.53	Test Hole-Decommissioned	Unknown		13		C.E. MOELL CONSULTING LTD#2	0.00	18.18	17.78
94713	SE	10	50	17	4	UNKNOWN DRILLER	1915-01-01	7.01	Federal Well Survey	Domestic				MASTERS, J.E.	3.96		0.00
94714	SW	10	50	17	4	UNKNOWN DRILLER		67.06	Chemistry	Domestic				GARSTAD, MARK	48.77		0.00
94715	14	10	50	17	4	UNKNOWN DRILLER	1919-01-01	91.44	Federal Well Survey	Stock				MCDONAGH, W.N.			5.08
94716	14	10	50	17	4	UNKNOWN DRILLER	1912-01-01	6.10	Federal Well Survey	Domestic				MCDONAGH, W.N.			0.00
94717	NW	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	29.87	Piezometer	Observation		5		ALTA ENV #2143E			0.00
94718	NW	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	42.37	Piezometer	Observation		7		ALTA ENV #2144E			0.00
94719	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	4.57	Test Hole	Other		3		ALTA ENV #2133E			0.00
94720	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-26	14.94	Piezometer	Observation		4		ALTA ENV #2140E			0.00

Reconnaissance Report

View in Imperial

Export to Excel

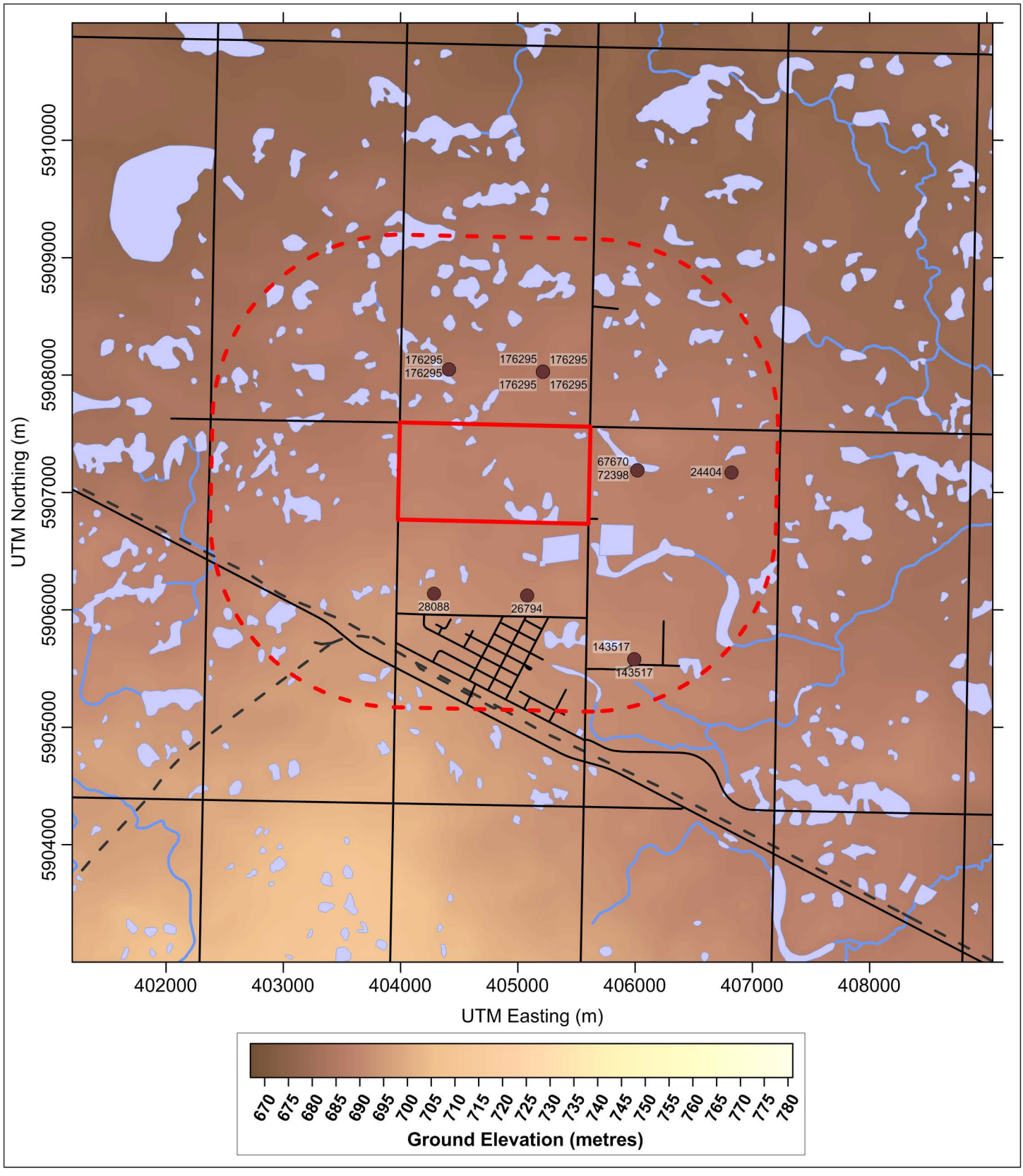
GIC Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)	SC_DIA (cm)
94721	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-26	15.24	Test Hole	Unknown		4		ALTA ENV #2137E			0.00
94722	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-26	26.21	Piezometer	Observation		4		ALTA ENV #2141E			0.00
94723	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-31	14.63	Test Hole	Unknown		3		ALTA ENV #2139E			5.08
94724	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-31	25.30	Piezometer	Observation		5		ALTA ENV #2138E			5.08
94725	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-28	29.87	Test Hole	Unknown		6		ALTA ENV #2136E			5.08
94744	8	16	50	17	4	UNKNOWN DRILLER	1929-01-01	123.44	Federal Well Survey	Stock				NICHOLS	21.34		15.24
94745	SE	16	50	17	4	UNKNOWN DRILLER	1920-01-01	7.62	Federal Well Survey	Unknown				NICHOLS			0.00
94748		16	50	17	4	UNKNOWN DRILLER		45.72	Chemistry	Domestic				BROOKS, ROBERT	3.05		0.00
159228	SE	9	50	17	4	LAKELAND DRILLING LTD.	1991-09-07	140.21	New Well	Domestic & Industrial		11		LAIDLAW ENVIRONMENTAL SVC LTD	18.59	45.46	12.70
232795	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	91.44	Test Hole	Investigation		13		ALTA ENV #2132E			0.00
232797	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	60.96	Test Hole	Investigation		14		ALTA ENV #2134E			0.00
232798	NE	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-28	60.96	Test Hole	Investigation		13		ALTA ENV #2135E			0.00
232800	NW	10	50	17	4	ALBERTA ENVIRONMENT/EARTH SCIENCES DIVISION	1983-01-27	60.35	Test Hole	Investigation		10		ALTA ENV #2142			0.00
286840	4	10	50	17	4	LOSNESS DRILLING (1975) LTD.	1997-05-14	82.30	New Well	Domestic		11	25	PEPPES, RONALD	9.30	18.18	0.00
1888429	SE	10	50	17	4	HILL DRILLING LTD.	2004-04-16	48.77	Test Hole	Other		8		C. E. MODELL & ASSOC. LTD			12.70
1888430	SE	10	50	17	4	HILL DRILLING LTD.	2004-04-15	48.77	Test Hole	Other		11		C. E. MOELLL & ASSOC. LLTD			12.70
1888439	SE	10	50	17	4	HILL DRILLING LTD.	2004-04-13	46.33	New Well	Domestic		7	19	C.E. MOELL & ASSOCIATES LTD.		0.00	12.70
1889172	9	10	50	17	4	HILL DRILLING LTD.	2013-05-21	36.88	Piezometer	Monitoring		1		BEAVER MUNICIPAL SOLUTIONS			
1889173	10	10	50	17	4	HILL DRILLING LTD.	2013-05-21	5.49	Piezometer	Monitoring		1		BEAVER MUNICIPAL SOLUTIONS			
1889174	10	10	50	17	4	HILL DRILLING LTD.	2013-05-22	10.06	Piezometer	Monitoring		1		BEAVER MUNICIPAL SOLUTIONS			

Reconnaissance Report

View in Imperial

Export to Excel

GIC Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)	SC_DIA (cm)
1889175	10	10	50	17	4	HILL DRILLING LTD.	2013-05-22	21.34	Piezometer	Monitoring		1		BEAVER MUNICIPAL SOLUTIONS			



LEGEND

- Surface water user (WA ID)
- Approximate Site (N1/2 9-50-17 W4M)
- Search Radius
- Road
- Rail
- Waterbody
- Watercourse

UTM ZONE 12
NAD 83 DATUM

CLIENT

CleanHarbors

TETRA TECH

2018 GROUNDWATER MONITORING PROGRAM RYLEY, ALBERTA

Alberta Surface Water Users 2.0 km Search Radius

PROJECT NO.	DWN	CKD	APVD	REV
SWM.SWOP03800-01	CF	AK	AS	000
OFFICE	**DATE**		**STATUS**	
EBA-CALGARY	July, 2017		Issued for Use	

Appendix B

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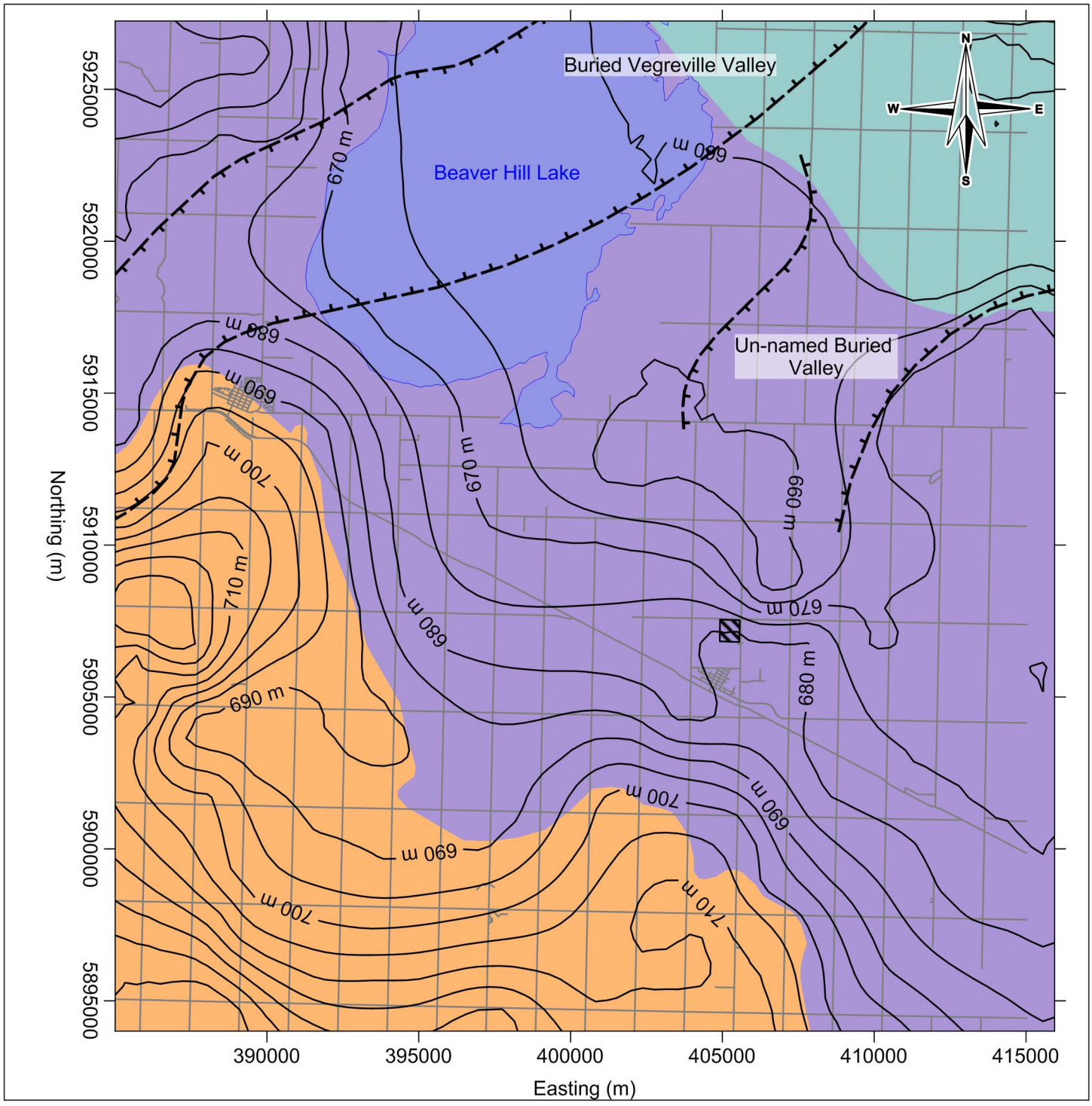
Appendix B: Surface Water Users

Priority	Applicant	Project	Approval ID	Quantity (m^3)	Consumptive Use (m^3)	Latitude	Longitude	Specific Purpose	Licenced Date
19601231912	LYONS, BRIAN	RYLEY/FARM UNIT/LYONS BRIAN - F00176295	176295	419	419	53.312959	-112.422725	REGISTRY	28-Mar-02
19601231913	LYONS, BRIAN	RYLEY/FARM UNIT/LYONS BRIAN - F00176295	176295	28	28	53.312959	-112.422725	REGISTRY	28-Mar-02
19701231829	LYONS, BRIAN	RYLEY/FARM UNIT/LYONS BRIAN - F00176295	176295	28	28	53.312974	-112.434753	REGISTRY	28-Mar-02
19801231084	RUDY & GERTIE MIZERA	RYLEY/FARM UNIT/MIZERA, RUDY & GERTIE - F00143517	143517	285	285	53.291074	-112.410307	REGISTRY	28-Jan-02
19801231085	RUDY & GERTIE MIZERA	RYLEY/FARM UNIT/MIZERA, RUDY & GERTIE - F00143517	143517	285	285	53.291074	-112.410307	REGISTRY	28-Jan-02
19881223001	STIER, PAT	MAGNESON, WR, 23378	28088	6160	4930	53.2958	-112.4361	STCKWT	30-Sep-91
19901231805	LYONS, BRIAN	RYLEY/FARM UNIT/LYONS BRIAN - F00176295	176295	419	419	53.312959	-112.422725	REGISTRY	28-Mar-02
19901231806	LYONS, BRIAN	RYLEY/FARM UNIT/LYONS BRIAN - F00176295	176295	279	279	53.312959	-112.422725	REGISTRY	28-Mar-02
19901231807	LYONS, BRIAN	RYLEY/FARM UNIT/LYONS BRIAN - F00176295	176295	56	56	53.312974	-112.434753	REGISTRY	28-Mar-02
19910826001	LAIDLAW ENVIRONMENTAL SERVICES LTD.	LAIDLAW ENVIRONMENTAL SERVICE, WR, 24753	26794	0	0	53.2958	-112.4242	FLOODCNT	9-Mar-92
19950303013	BEAVER REGIONAL WASTE MANAGEMENT SERVICES COMMISSION	RYLEY/MUNICIPAL/BEAVER REGIONAL WASTE MANAGEMENT SERVICES (BEAVER COUNTY) - F26835	24404	9860	1230	53.305535	-112.398341	OTHR	30-Aug-96
19980417001	BEAVER REGIONAL WASTE MANAGEMENT SERVICES COMMISSION	RYLEY/DIVERSION/BRWMSC	67670	57000	57000	53.305539	-112.410384	SOTHER	28-Jul-98
19981021002	BEAVER REGIONAL WASTE MANAGEMENT SERVICES COMMISSION	RYLEY/RECREATION/BRWMSC	72398	18000	15000	53.305539	-112.410384	RCRTN	21-Oct-98

Notes:

Active Surface Water Authorizations Within a 1.6 km radius of SE 9-050-17W4M as of January 11, 2019



LEGEND

- Buried Valley
- Bedrock Elevation Contour
- Roadway
- Water body
- Site Location

Bedrock Formation

- Lower Horseshoe Canyon
- Bearpaw
- Oldman (Belly River Group)

NOTES

Geological data obtained from:
County of Beaver No.9
Revised Regional Groundwater Assesment
HCL, 1999
NRC, CanVec+ Base Map

STATUS
Issued for Use

2018 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Regional Geology

PROJECTION	DATUM
UTM Zone 12	NAD83

0 2 4 6
Kilometres

FILE NO.
AppendixBa - Regional Geology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWOP03800-01	CF	BS	AS	0

OFFICE	DATE
TtEBA-CAL	September 2017

CLIENT
CleanHarbors

TETRA TECH

Appendix B Figure A

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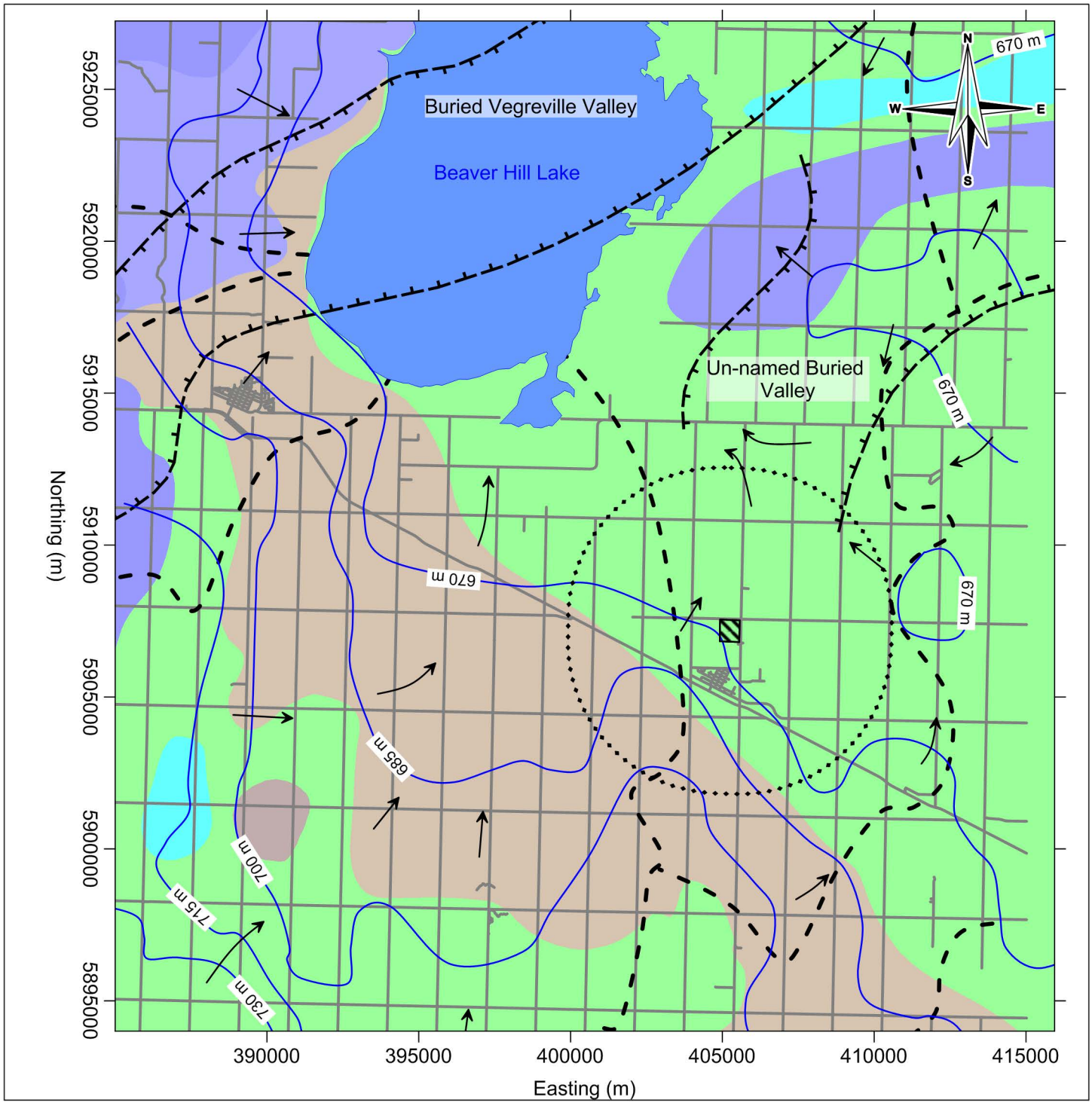

LEGEND

- Surface Water Divide
- Buried Valley
- Groundwater Flow Direction
- Groundwater Elevation
- Roadway
- Water body
- Site Location
- 5 km Site Radius

Expected Groundwater Yield (L/sec)

- < 0.1
- 0.1 - 0.4
- 0.4 - 2
- 2 - 8

NOTES

Hydrogeological data obtained from:
Hydrogeology of the Edmonton Area
Southeast Segment, Alberta
R.Stein, 1982
NRC, CanVec+ Base Map

STATUS
Issued for Use

2018 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Regional Hydrogeology Groundwater Flow

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 2 4 6
Kilometres

TETRA TECH

FILE NO.
AppendixBb - Regional Hydrogeology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWOP03800-01	CF	BS	AS	0

OFFICE	DATE
TtEBA-CAL	September 2017

Appendix B Figure B

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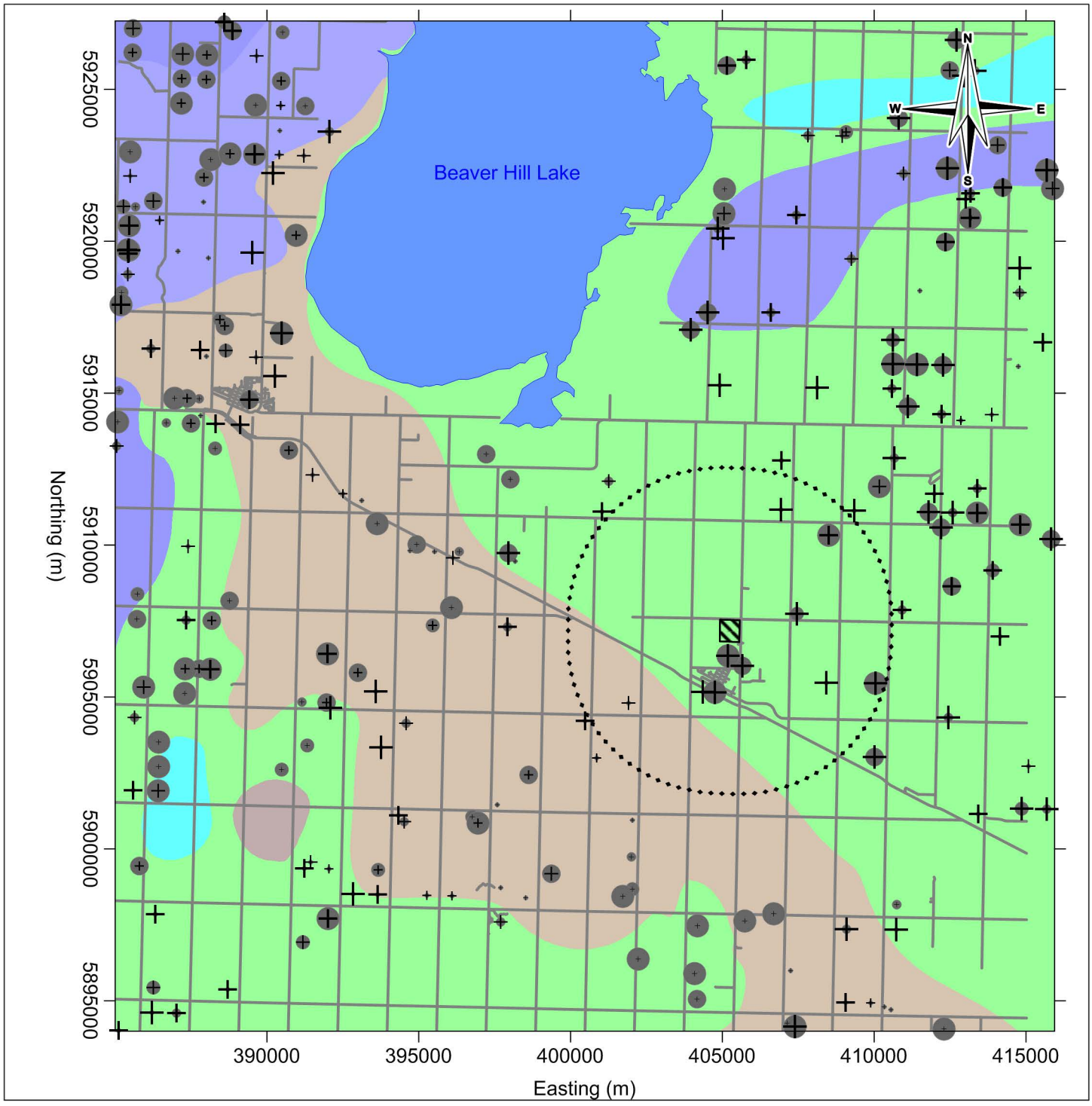

LEGEND

Well Depth (m)
- 184-470
- 141-184
- 105-141
- 75-105
- 19-75
- Roadway
- Water body
- Site Location
- 5 km Site Radius

Recomended Pump Rate (L/sec)
- 0.44 - 3.15
- 0.32 - 0.44
- 0.25 - 0.32
- 0.14 - 0.25
- 0.03 - 0.14

Expected Groundwater Yield (L/sec)
- < 0.1
- 0.1 - 0.4
- 0.4 - 2
- 2 - 8

NOTES
Hydrogeological data obtained from:
Hydrogeology of the Edmonton Area Southeast Segment, Alberta
R.Stein, 1982
AB Water Well Information Database June 28, 2016
NRC, CanVec+ Base Map

STATUS
Issued for Use

2018 GROUNDWATER MONITORING PROGRAM, RYLEY, AB

Regional Hydrogeology Water Wells

PROJECTION	DATUM	CLIENT
UTM Zone 12	NAD83	CleanHarbors

0 2 4 6
Kilometres

TETRA TECH

FILE NO. AppendixBc - Regional Hydrogeology.srf

PROJECT NO.	DWN	CKD	APVD	REV
SWPO03800-01	CF	BS	AS	0

OFFICE	DATE
TtEBA-CAL	September 2017

Appendix B Figure C

filepath:\\tt.local\eba\Projects\CGY\78070\SWOP03652\Data

APPENDIX C

BOREHOLE LOGS

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 01
NE 1/4, SEC. 10-50-17-W4M	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 683.67 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, organics, damp, very soft, dark brown, (100mm thick)			
	SAND - trace to some silt, trace of organics, fine to medium grained, unstratified, dry, dense, medium to dark brown			683.0
1	- clayey, clay occurs in random 5mm thick layers, medium to coarse grained, moist, compact, light to medium brown		random backfill -	
	SAND AND CLAY - trace of coal crystals, moist, soft, medium to dark brown			682.0
	CLAY - some silt and fine grained sand, bentonitic, moist, very soft			
2	- silty, 1-2mm thick black laminae, damp, stiff, light brown		bentonite -	
	SANDSTONE - silty, bentonitic, weathered, fine to medium grained, matrix supported, very dense, grey		slotted section -	681.0
3			pea gravel -	
	SILTSTONE - clayey, trace of fine to medium grained, sand, damp, dense, grey			680.0
4			bentonite -	
	CLAY SHALE - silty, plated, damp, hard, dark grey to brown			679.0
5			random cuttings -	
	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 3.19 metres at 6 hrs. - 2.21 metres at 10 days Piezometer installed to 3.5 metres			678.0
6				
				677.0
7				
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-01	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 02
NE 1/4, SEC. 10-50-17-W4M	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 686.17 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	1	2	3	Elevation (m)
0	TOPSOIL - silty, organics, roots, damp, very soft, dark brown						686.0
	CLAY (TILL) - silty, sandy, trace of subangular gravel, salt inclusions, unstratified, damp, very stiff, low plastic, medium brown						
1			random backfill -				685.0
2							684.0
	- moist, firm						
3	- dry to damp, very stiff, dark brown to black		bentonite -				683.0
	SANDSTONE - silty, bentonitic, weathered, fine to medium grained, dry, very dense, grey		slotted section -				
4			pea gravel -				682.0
	SILTSTONE - clayey, trace of fine to medium grained sand, clay shale stringers, damp, dense, grey						
5			bentonite -				681.0
	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 3.99 metres at 4 hrs. - 3.92 metres at 10 days Piezometer installed to 4.6 metres						
6							680.0
7							679.0
7.5							

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-02	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 03
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 688.78 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL)		grout -	
1	GARBAGE		bentonite -	688.0
2	CLAY (FILL)			687.0
	GARBAGE		slotted section -	
3	CLAY (FILL)		sand filter -	686.0
	GARBAGE			
4	CLAY (TILL) - silty, sandy, gravel sizes, clay shale nodules, sandstone pockets, stiff, medium plastic, brown		random backfill -	685.0
5				684.0
6	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 5 hrs. - dry at 10 days - dry at 25 days Well installed to 3.8 metres Note: Backfilled to 3.8 metres.			683.0
7				682.0
7.5				

1 2 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-03	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 04
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 688.17 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL)		grout -	688.0
1	GARBAGE		bentonite -	687.0
2				686.0
3	CLAY (FILL)		slotted section - sand filter -	685.0
4	GARBAGE			684.0
5	END OF BOREHOLE (4.7 metres) slough - none at 0 hrs. water - dry at 3 hrs. - dry at 10 days - dry at 25 days Well installed to 4.7 metres			683.0
6				682.0
7				681.0
7.5				

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.72 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-04	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 05
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 688.21 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL) - silty, sandy, sandstone inclusions, brown		grout -	688.0
1	GARBAGE			687.0
2			bentonite -	686.0
3				685.0
4				684.0
5			slotted section - sand filter -	683.0
6	SANDSTONE - silty, medium to coarse grained, very dense, grey		slough -	682.0
7	END OF BOREHOLE (6.1 metres) slough - 5.93 metres at 0 hrs. water - 5.3 metres at 2 hrs. - 5.37 metres at 10 days - 5.31 metres at 25 days Well installed to 5.93 metres			681.0
7.5				

1 2 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 6.1 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-05	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 06
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 684.47 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL) - silty, sandy, dessicated, low plastic, brown		grout -	684.0
1				
	GARBAGE - metal, cable		bentonite -	683.0
2				682.0
3			sand filter - slotted section -	681.0
4				680.0
	SANDSTONE - silty, coarse grained, dense, grey			
5	CLAY SHALE - silty, hard, high plastic, grey/brown			679.0
	END OF BOREHOLE (5.2 metres) slough - none at 0 hrs. water - 2.55 metres at 1 hr. - 2.17 metres at 10 days Well installed to 5.15 metres			
6				678.0
7				
7.5				677.0

1 2 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 5.15 m
REVIEWED BY: RJM	COMPLETE: 92/11/13
DRAWING NO: 11099-06	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 08
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 685.53 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - organic silt, sandy, some clay, brown to black, frozen, (75mm thick)		grout -	685.0
	CLAY (TILL) - silty, sandy, occasional gravel sizes, low plastic, brown, frozen			
	- end of frost			
1			bentonite -	684.0
2	- coal pockets, moist, very stiff			
				683.0
	- sandstone and clay shale nodules, grey		slotted section -	
3	CLAY SHALE - carbonaceous, friable, very stiff, dark brown			
	SANDSTONE - silty, clayey, clay shale stringers and lenses, medium to coarse grained, moist, grey		sand filter -	682.0
4				
	END OF BOREHOLE (4.3 metres)			681.0
	slough - none at 0 hrs.			
	water - dry at 0 hrs.			
	- dry at 6 hrs.			
5	- 3.26 metres at 11 days			
	Well installed to 4.1 metres			680.0
6				
				679.0
7				
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-08	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 09
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 685.77 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - organic silt, sandy, some clay, frozen, (100mm thick)		grout -	685.0
	CLAY (TILL) - silty, sandy, occasional gravel sizes, brown, frozen - end of frost			
1				
			bentonite -	684.0
2				
	CLAY SHALE - silty, reworked, very stiff, high plastic, brown to grey			683.0
3			slotted section -	
	SANDSTONE AND CLAY SHALE - interbedded, sandstone - silty, clayey, dense, grey, clay shale - silty, very stiff, high plastic, grey/brown		sand filter -	
	SANDSTONE - silty, clayey, medium to coarse grained, damp, dense, grey			682.0
4				
	END OF BOREHOLE (4.4 metres) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 5 days - 3.33 metres at 11 days Well installed to 4.4 metres			681.0
5				
				680.0
6				
				679.0
7				
7.5				

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.41 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-09	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 10
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 683.96 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - (25mm thick)		grout -	
	CLAY - sandy, silty, white salt deposits, rust specks, dessicated, brown, frozen			
	- end of frost		bentonite -	
1	CLAY (TILL) - silty, sandy, gravel sizes, coal pockets, clay shale and sandstone nodules, damp, stiff, medium plastic, brown			683.0
	SANDSTONE - clayey, silty, clay shale stringers, weathered, medium to coarse grained, moist, brown to grey		slotted section -	
2				682.0
	- bentonitic, occasional clay shale stringers, dense, grey			
			sand filter -	
3				681.0
4				680.0
	END OF BOREHOLE (4.3 metres)			
	slough - none at 0 hrs.			
	water - dry at 0 hrs.			
	- dry at 4 hrs.			
	- dry at 11 days			
5	Well installed to 3.1 metres			679.0
6				678.0
7				677.0
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-10	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 11
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 683.85 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silt, sandy, frozen, (50mm thick)		grout -	
	CLAY - silty, sandy, white salt stains, dessicated, brown			
	CLAY (TILL) - silty, sandy, gravel sizes, moist, low plastic, brown			
1				683.0
	CLAY SHALE - silty, plated, very stiff, brown		bentonite -	
2				682.0
			slotted section -	
3	- blocky, high plastic, grey			681.0
			sand filter -	
4				680.0
	END OF BOREHOLE (4.3 metres) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 3 hrs. - dry at 11 days Well installed to 4.2 metres			
5				679.0
6				678.0
7				677.0
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-11	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 12
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 684.2 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - organic silt, sandy, frozen, (50mm thick)		grout -	684.0
	CLAY - sandy, silt, white salt stains, rust specks, dessicated, brown			
1	CLAY (TILL) - silty, sandy, gravel sizes, stiff to very stiff, low plastic			683.0
	SANDSTONE - silty, clayey, clay shale stringers, oxidized, weathered, medium to coarse grained, brown		bentonite -	
2	- grey			682.0
3	CLAY SHALE - silty, friable, damp, hard, high plastic, brown		slotted section -	681.0
	- grey/brown		sand filter -	
4				680.0
	END OF BOREHOLE (4.3 metres) slough - none at 0 hrs. water - dry at 0 hrs. - dry at 2 hrs. - 3.54 metres at 11 days Well installed to 4.32 metres			
5				679.0
6				678.0
7				677.0
7.5				

1 | 2 | 3

TETRA TECH EBA

LOGGED BY: RJM	COMPLETION DEPTH: 4.26 m
REVIEWED BY: RJM	COMPLETE: 92/11/27
DRAWING NO: 11099-12	Page 1 of 1

RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 13
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 686.66 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT (PLASTIC / M.C. / LIQUID)	STANDARD PENETRATION (N) / UNC. COMPRESSIVE STRENGTH (kPa) / POCKET PEN. (kPa)	MW13	Elevation (m)
0	TOPSOIL - clayey, silty, organic, peaty, black						686.0
1	CLAY (TILL) - silty, sandy, occasional gravel, damp, stiff to very stiff, low to medium plastic, medium brown		A1				685.0
2	SANDSTONE (BEDROCK) - silty, fine grained, homogeneous, damp, poorly cemented, very low strength, green grey, pale grey speckling, glauconitic, interbedded with shale horizons - clay shale horizons - silty, medium to high plastic, dark grey		A2				684.0
3	END OF BOREHOLE (2.4 metres) Notes: Stopped due to auger refusal (cemented sandstone band) Permanent Monitoring well installed to 2.4 metres						683.0
4							682.0
5							681.0
6							680.0
7							
7.5							

TETRA TECH EBA

LOGGED BY: VS/VJ	COMPLETION DEPTH: 2.4 m
REVIEWED BY:	COMPLETE: 91/02/19
DRAWING NO: 11099-12	Page 1 of 1

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RYLEY REGIONAL LANDFILL ASSESSMENT	LAIDLAW WASTE SYSTEMS LTD.	BOREHOLE NO: 14
NE 1/4, SEC. 10-50-17-W4M	DRILL: SOLID FLIGHT AUGER	PROJECT: 0105-11099
RYLEY, ALBERTA		ELEVATION: 686.52 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	Elevation (m)
0	TOPSOIL (FILL) - slightly organic, dark brown	686.0
	- clayey	
1	CLAY (TILL) - silty, sandy, stiff to very stiff, medium plastic, grey, pebbles	685.0
2	- free water	684.0
	SANDSTONE (BEDROCK) - silty, some clay, fine grained, moist, dense, light grey, occasional shaly inclusion	
3		683.0
4	- clay shale inclusions - grey to brown	682.0
5 ▼ 0 hrs.		681.0
	END OF BOREHOLE (5.4 metres) water - 5.0 metres at 0 hrs. Monitoring well installed to 5.4 metres	
6		680.0
7		
7.5		

SAMPLE TYPE | MOISTURE CONTENT | PLASTIC M.C. LIQUID (20 40 60 80) | STANDARD PENETRATION (N) (20 40 60 80) | UNC. COMPRESSIVE STRENGTH (kPa) (50 100 150 200) | POCKET PEN. (kPa) (100 200 300 400) | MW14 ▼ 0 hrs.

TETRA TECH EBA

LOGGED BY: VS/VJ	COMPLETION DEPTH: 5.4 m
REVIEWED BY:	COMPLETE: 92/07/22
DRAWING NO: 11099-12	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 01B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.85 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - sandy, roots, black, (150mm thick)		Pipe stickup = 0.91 metres	
1	CLAY - silty, some oxide stains, white salt and carbonate pockets, damp, very stiff, medium plastic, grey brown			687.0
	- occasional pebbles, coal pockets, no visible white pockets, olive grey brown			
2				686.0
	- moist, stiff			
3				685.0
	CLAY SHALE - silty, some sand, friable, damp, soft, low to medium plastic, dark grey			
4				684.0
	SANDSTONE - some silt and clay, fine to medium grained, friable, uncemented, blue green grey			
	- clay shale interbeds			683.0
5 ▼				
6				682.0
	CLAY SHALE - sandstone interbeds			
7				681.0
	- siltstone layer - some silt and clay, fine to medium grained, friable, uncemented, blue green grey			
8				680.0
9				679.0
10	END OF BOREHOLE (9.9 metres)			678.0
	slough - none at 0 hrs.			
	water - dry at 0 hrs.			
	- 5.2 metres at 1 day			
11	Monitoring well installed to 9.9 metres			677.0
12				676.0

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/09/30
DRAWING NO: 12416-04	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 05B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.41 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, moist, brown black, (150mm thick)		Pipe stickup = 0.91 metres	687.0
1	CLAY - silty, sandy, some salt inclusions, pebbles, coal pockets, oxide stains, very fine grained sand, damp, stiff, medium plastic, grey brown			686.0
2	- more silty, less sand, moist			685.0
3	- harder			684.0
4	CLAY SHALE - silty, some sand, damp, hard, high plastic, green grey with dark blue pockets			683.0
5	SANDSTONE - some clay, silt, fine to medium grained, friable, hard, low plastic, blue green grey			682.0
6	- clay shale lenses			681.0
7	SILTSTONE - pebbles, strongly cemented, dry, hard, light grey			680.0
8	CLAY SHALE - silty, some sand, damp, hard, high plastic, green grey with dark blue pockets			679.0
9	- less silt and sand, stronger, dry, dark grey			678.0
10	END OF BOREHOLE (9.8 metres) slough - none at 0 hrs. water - dry at 0 hrs. - 9.1 metres at 7 days Monitoring well installed to 9.8 metres			677.0
11				676.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.75 m
REVIEWED BY: SP	COMPLETE: 96/09/23
DRAWING NO: 12416-02	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 12B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.09 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, roots, black, (150mm thick)		Pipe stickup = 0.76 metres	687.0
1	CLAY (TILL) - silty, some sand, salt pockets, oxide stains, damp, very stiff, medium plastic, brown			686.0
2	- sand lense - silty, clay, fine to medium grained, firm, medium plastic, mottled brown grey - some pebbles, coal pockets, moist, stiff, green brown			685.0
3	CLAY SHALE - silty, dry to damp, hard, high plastic, dark grey			684.0
4				683.0
5	SANDSTONE - silty, some clay, fine to medium grained, friable, uncemented, damp, soft, low plastic, blue green grey - siltstone layer - strongly cemented, hard, light grey, (100mm thick) - sandier			682.0
6	SILTSTONE - strongly cemented, hard, light grey CLAY SHALE - silty, some sand, glauconitic sand layers, damp to moist, hard, medium plastic, blue green grey to brown grey			681.0
7				680.0
8				679.0
9	- brown grey			678.0
10	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.9 metres			677.0
11				676.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/09/30
DRAWING NO: 12416-03	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 18A
	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.16 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, soft, low plastic, grey black		Pipe stickup = 0.76 metres	687.0
1	SAND - silty, clayey, some pebbles, orange oxide stains, friable, loose, low plastic, grey brown			686.0
	CLAY (TILL) - silty, orange oxide stains, blocky, very stiff to hard, medium to high plastic, mottled grey brown			
2				685.0
3	CLAY SHALE AND SANDSTONE - interbedded, clay shale - silty, damp, hard, high plastic, mottled brown grey			684.0
4	sandstone - silty, glauconitic, fine to medium grained, friable, uncemented, damp, blue green grey			683.0
	SANDSTONE - with clay shale seams			
5				682.0
	SILTSTONE - some sand, cemented, friable, dry, light grey			
6	SANDSTONE - with clay shale seams 13-25mm thick			681.0
7	CLAY SHALE - with sandstone seams			680.0
8	- no visible sandstone seams			679.0
9	- sandstone seam			678.0
10	SILTSTONE - some clay, cemented, dry, hard, light brown			677.0
	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs.			
11	Monitoring well installed to 9.9 metres			676.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-05	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 18B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 687.15 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, soft, low plastic, grey black		Pipe stickup = 0.76 metres	687.0
1	SAND - silty, clayey, some pebbles, orange oxide stains, friable, loose, low plastic, grey brown			686.0
	CLAY (TILL) - silty, orange oxide stains, blocky, very stiff to hard, medium to high plastic, mottled grey brown			
2				685.0
3				684.0
4 ▼	CLAY SHALE AND SANDSTONE - interbedded, clay shale - silty, damp, hard, high plastic, mottled brown grey sandstone - silty, glauconitic, fine to medium grained, friable, uncemented, damp, blue green grey			683.0
	SANDSTONE - with clay shale seams			
5				682.0
	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 4.0 metres at 0 hrs. Monitoring well installed to 5.3 metres			
6				681.0
7				680.0
8				679.0
9				678.0
10				677.0
11				676.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 5.33 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-06	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 19A
	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 686.46 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL) - silty, sandy, moist, soft, medium plastic, yellow brown, (100mm thick)		Pipe stickup = 0.76 metres	686.0
1	CLAY - silty, some sand pockets, salt pockets, damp, stiff, medium plastic, mottled grey brown			685.0
	- moist, softer			
2	- clay layer - oxidized, blocky, (75mm thick)			684.0
3	SANDSTONE - clayey, silty, glauconitic, fine to medium grained, poorly cemented, friable, damp, very stiff, blue green grey			683.0
	- wet			
4	- clay shale seams			682.0
5	SANDSTONE AND CLAY SHALE - interbedded			681.0
6	CLAY SHALE - silty, some sand interbeds, damp, hard, high plastic, dark grey			680.0
	- more frequent sandstone layers			
7	- no visible sandstone layers			679.0
8	- 13-25mm thick sandstone seams			678.0
9				677.0
10	END OF BOREHOLE (9.9 metres) slough - 9.6 metres at 0 hrs. water - 2.1 metres at 0 hrs. Monitoring well installed to 9.9 metres			676.0
11				675.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-07	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 19B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 686.54 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY (FILL) - silty, sandy, moist, soft, medium plastic, yellow brown, (100mm thick)		Pipe stickup = 0.76 metres	686.0
1	CLAY - silty, some sand pockets, salt pockets, damp, stiff, medium plastic, mottled grey brown			685.0
	- moist, softer			
2	- clay layer - oxidized, blocky, (75mm thick)			684.0
3	SANDSTONE - clayey, silty, glauconitic, fine to medium grained, poorly cemented, friable, damp, very stiff, blue green grey			683.0
	- wet			
4	- clay shale seams			682.0
5	SANDSTONE AND CLAY SHALE - interbedded			681.0
6	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 2.1 metres at 0 hrs. Monitoring well installed to 5.3 metres			680.0
7				679.0
8				678.0
9				677.0
10				676.0
11				675.0
12				

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 5.33 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-08	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 20A
	DRILL: HOLLOW STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 688.94 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, brown black, (300mm thick)		Pipe stickup = 0.76 metres	
1	CLAY (TILL) - silty, sandy, some pebbles, abundant salt pockets, roots to 0.5 metres, dry, hard, medium plastic, grey brown			688.0
2	- 2-4mm thick white carbonate salt seams at 13mm spacing			687.0
3	- orange oxide stains, coal pockets, very stiff			686.0
4	CLAY SHALE - silty, some sand lenses, friable, damp, hard, high plastic, dark grey			685.0
5	SANDSTONE - silty, clay shale seams, medium grained, friable, uncemented, damp, blue green grey			684.0
6	CLAY SHALE AND SANDSTONE - interbedded SANDSTONE - with 25mm thick clay shale layers			683.0
7				682.0
8	SILTSTONE - clayey, very fine grained, cemented, dry, hard, light grey CLAY SHALE AND SANDSTONE - interbedded			681.0
9	CLAY SHALE - silty, some sand lenses, friable, damp, hard, high plastic, dark grey			680.0
10	END OF BOREHOLE (9.9 metres) slough - 9.7 metres at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.9 metres			679.0
11				678.0
12				677.0

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 9.9 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-09	Page 1 of 1

RYLEY - CELL 2 MONITORING WELLS	LAIDLAW ENVIRONMENTAL SERVICES LTD.	BOREHOLE NO: 20B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-96-12416
RYLEY, ALBERTA		ELEVATION: 688.99 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, roots, brown black, (300mm thick)		Pipe stickup = 0.76 metres	
	CLAY (TILL) - silty, sandy, some pebbles, abundant salt pockets, roots to 0.5 metres, dry, hard, medium plastic, grey brown			
1				688.0
2	- 2-4mm thick white carbonate salt seams at 13mm spacing			687.0
3	- orange oxide stains, coal pockets, very stiff			686.0
4				685.0
	CLAY SHALE - silty, some sand lenses, friable, damp, hard, high plastic, dark grey			
5	SANDSTONE - silty, clay shale seams, medium grained, friable, uncemented, damp, blue green grey			684.0
	CLAY SHALE AND SANDSTONE - interbedded			
6	END OF BOREHOLE (5.3 metres) slough - none at 0 hrs. water - 5.2 metres at 0 hrs. Monitoring well installed to 5.3 metres			683.0
7				682.0
8				681.0
9				680.0
10				679.0
11				678.0
12				677.0

TETRA TECH EBA

LOGGED BY: SP	COMPLETION DEPTH: 5.33 m
REVIEWED BY: SP	COMPLETE: 96/10/01
DRAWING NO: 12416-10	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 21A
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	628.02N; 1001.60E	ELEVATION: 687.65 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, rootlets, dark brown, (50mm thick)		Pipe stickup = 0.73 metres	687.0
	SILT AND CLAY - abundant salt deposits, friable, dry, loose, light brown			
1	CLAY (TILL) - silty, trace of sand, friable, damp to moist, very stiff, low to medium plastic, mottled brown			686.0
2				
	SANDSTONE - interbedded clay seams, silty, some 50mm angular rock, brown nodules, medium grained, uncemented, damp to moist, olive blue			685.0
3	- dry to moist, blue green			
	- free water			684.0
4				
	SILTSTONE - very fine grained, cemented, dry, hard, light grey			683.0
5	- trace of fine gravel to 5mm diameter			
	CLAY SHALE AND SANDSTONE - interbedded, medium grained, uncemented, moist, stiff, medium plastic, grey brown clay shale, blue-green sandstone			682.0
6				
	CLAY SHALE - trace of gravel to 2mm diameter, friable, damp to moist, very stiff to hard, low to medium plastic, grey			681.0
7	SILTSTONE - friable, cemented, dry, grey			
	CLAY SHALE - silty, some sand lenses and brown lenses, friable, damp, hard, low to medium plastic, grey			680.0
8	CLAY SHALE AND SILTSTONE - interbedded			
9				679.0
				678.0
10	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.9 metres			
11				677.0
				676.0
12				

TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 9.9 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-01	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 21B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	626.61N; 1001.58E	ELEVATION: 687.55 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - silty, sandy, organics, rootlets, dark brown, (50mm thick)		Pipe stickup = 1.04 metres	687.0
	SILT AND CLAY - abundant salt deposits, friable, dry, loose, light brown			
1	CLAY (TILL) - silty, trace of sand, friable, damp to moist, very stiff, low to medium plastic, mottled brown			686.0
2				
	SANDSTONE - interbedded clay seams, silty, some 50mm angular rock, brown nodules, medium grained, uncemented, damp to moist, olive blue			685.0
3	- dry to moist, blue green			
	- free water			684.0
4				
	SILTSTONE - very fine grained, cemented, dry, hard, light grey			683.0
5	- trace of fine gravel to 5mm diameter			
	END OF BOREHOLE (5.0 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 4.9 metres			682.0
6				
				681.0
7				
				680.0
8				
				679.0
9				
				678.0
10				
				677.0
11				
				676.0
12				

TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 5.02 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-02	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 22A
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	591.82N; 1069.20E	ELEVATION: 687.86 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	SILT AND CLAY - salt deposits, friable, damp, soft, low plastic, brown		Pipe stickup = 0.88 metres	
1	CLAY (TILL) - silty, moist, stiff, medium plastic, mottled brown - salt streaks			687.0
2	- gypsum, oxide stains			686.0
3	SANDSTONE - some clay, trace of pebbles, medium grained, uncemented, damp to moist, brown - oxide stains, very moist - interbedded clay seams, silty, brown nodules, olive green			685.0
4	- 50mm angular rock			684.0
5	CLAY SHALE - trace of very hard siltstone, friable, cemented, dry to damp, hard, medium plastic, grey - trace of sand, medium grained			683.0
6				682.0
7	- brown nodules			681.0
8				680.0
9	CLAY SHALE AND SANDSTONE - interbedded, medium grained, damp to moist, hard, low to medium plastic, grey mottled brown			679.0
	SILTSTONE - trace of gravel to 5mm diameter, cemented, dry, very hard, light grey			
10	CLAY SHALE AND SILTSTONE - interbedded			678.0
	END OF BOREHOLE (10.1 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.8 metres			
11				677.0
12				676.0

TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 10.05 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-03	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 22B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	590.10N; 1069.07E	ELEVATION: 687.8 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	SILT AND CLAY - salt deposits, friable, damp, soft, low plastic, brown		Pipe stickup = 0.97 metres	
1	CLAY (TILL) - silty, moist, stiff, medium plastic, mottled brown - salt streaks			687.0
2	- gypsum, oxide stains			686.0
3	SANDSTONE - some clay, trace of pebbles, medium grained, uncemented, damp to moist, brown - oxide stains, very moist - interbedded clay seams, silty, brown nodules, olive green			685.0
4	- 50mm angular rock			684.0
5	CLAY SHALE - trace of very hard siltstone, friable, cemented, dry to damp, hard, medium plastic, grey			683.0
6	END OF BOREHOLE (5.0 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 4.9 metres			682.0
7				681.0
8				680.0
9				679.0
10				678.0
11				677.0
12				676.0

TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 5.02 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-04	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 23A
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	601.96N; 1114.83E	ELEVATION: 686.44 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY - very silty, disturbed, very moist, soft to firm, high plastic, brown		Pipe stickup = 0.72 metres	686.0
1	SAND - silty, some clay, fine grained, moist, rust colour - some clay and silt, oxide stains, moist to very moist, firm to dense			685.0
2	SANDSTONE - some clay, trace of gravel to 2mm diameter, brown nodules, uncemented, firm to very firm, olive green - free water			684.0
3	- clay shale interbedded, silty, medium grained, uncemented, friable, damp to moist, very stiff to hard, low to medium plastic, grey clay shale, olive green sandstone			683.0
4	- trace of siltstone, hard, medium plastic, brown			682.0
5				681.0
6	SILTSTONE - uncemented, dry to damp, hard, low plastic, brown			680.0
7	CLAY SHALE AND SANDSTONE - interbedded, friable, damp to moist, hard, mottled grey			679.0
8				678.0
9	CLAY SHALE AND SILTSTONE - trace of sand, damp, hard, mottled grey			677.0
10	END OF BOREHOLE (9.9 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.9 metres			676.0
11				675.0
12				

TETRA TECH EBA

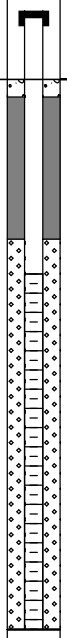
LOGGED BY: JSF	COMPLETION DEPTH: 9.9 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-05	Page 1 of 1

CELL 3 - CONSTRUCTION	SAFETY KLEEN INC.	BOREHOLE NO: 23B
	DRILL: SOLID STEM AUGER	PROJECT: 0105-98-12892.4
RYLEY, ALBERTA	601.22N; 1114.44E	ELEVATION: 686.49 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	CLAY - very silty, disturbed, very moist, soft to firm, high plastic, brown		Pipe stickup = 0.59 metres	686.0
1	SAND - silty, some clay, fine grained, moist, rust colour - some clay and silt, oxide stains, moist to very moist, firm to dense			685.0
2	SANDSTONE - some clay, trace of gravel to 2mm diameter, brown nodules, uncemented, firm to very firm, olive green - free water			684.0
3	- clay shale interbedded, silty, medium grained, uncemented, friable, damp to moist, very stiff to hard, low to medium plastic, grey clay shale, olive green sandstone			683.0
4	- trace of siltstone, hard, medium plastic, brown			682.0
5	END OF BOREHOLE (4.7 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 4.7 metres			681.0
6				680.0
7				679.0
8				678.0
9				677.0
10				676.0
11				675.0
12				



TETRA TECH EBA

LOGGED BY: JSF	COMPLETION DEPTH: 4.72 m
REVIEWED BY: RJM	COMPLETE: 98/10/01
DRAWING NO: 12892-06	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 24A
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 688.68 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	GRAVEL (FILL)		Pipe stickup = 1.04 metres	
1	CLAY (TILL) - silty, trace of oxides, moist, hard, brown			688.0
2				687.0
3				686.0
4	CLAY SHALE - silty, damp, hard, grey			685.0
5				684.0
6	SANDSTONE - silty, very moist, loose, blue grey			683.0
7				682.0
8	SILTSTONE - cemented, loose, light brown grey			681.0
9	SANDSTONE - trace of clay shale			680.0
10	END OF BOREHOLE (9.91 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.69m			679.0
11				678.0
12				677.0

TETRA TECH EBA

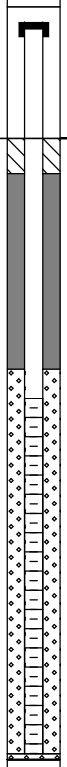
LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-01	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 24B
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 688.61 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	GRAVEL (FILL)		Pipe stickup = 1.00 metre	688.0
1	CLAY (TILL) - silty, trace of oxides, moist, hard, brown			687.0
2				686.0
3				685.0
4	CLAY SHALE - silty, damp, hard, grey			684.0
5				683.0
6	END OF BOREHOLE (5.33 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 5.28m			682.0
7				681.0
8				680.0
9				679.0
10				678.0
11				677.0
12				



TETRA TECH EBA

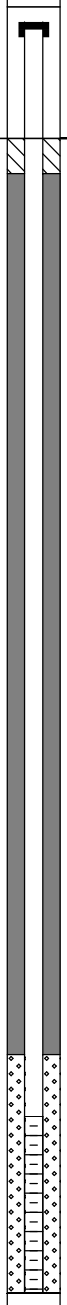
LOGGED BY: DM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-02	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 25A
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.55 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - rootlets, moist, soft, grey		Pipe stickup = 1.00 metre	686.0
1	CLAY SHALE - silty, loose, hard, brown			685.0
2	SANDSTONE - silty, moist, loose, blue grey			684.0
3	- wet			683.0
4	CLAY SHALE - moist, loose, brown			682.0
5				681.0
6				680.0
7				679.0
8				678.0
9	- very moist, grey			677.0
10	END OF BOREHOLE (9.91 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 9.91m			676.0
11				675.0
12				



TETRA TECH EBA

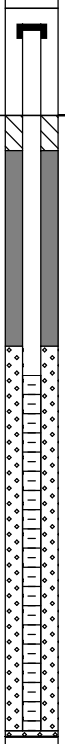
LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-03	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 25B
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.71 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - rootlets, moist, soft, dark		Pipe stickup = 0.79 metres	686.0
1	CLAY SHALE - silty, hard, loose, brown			685.0
2	SANDSTONE - silty, moist, loose, blue grey			684.0
3	- wet			683.0
4	CLAY SHALE - moist, loose, brown			682.0
5				681.0
6	END OF BOREHOLE (5.33 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 5.28m			680.0
7				679.0
8				678.0
9				677.0
10				676.0
11				675.0
12				



TETRA TECH EBA

LOGGED BY: DM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-04	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 26A
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.7 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - rootlets, moist, soft, grey		Pipe stickup = 0.92 metres	686.0
1	CLAY SHALE - silty, dry, loose, hard, brown			685.0
2				
3	SANDSTONE - silty, wet, loose, blue grey			684.0
4				683.0
5	SILTSTONE - cemented, loose, light brown			682.0
6	SANDSTONE - silty, moist, loose, blue grey			681.0
7				680.0
8	SILTSTONE - cemented, loose, light brown			679.0
9	CLAY SHALE - silty, hard, brown			678.0
10	END OF BOREHOLE (9.91 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 10.05m			677.0
11				676.0
12				675.0

TETRA TECH EBA

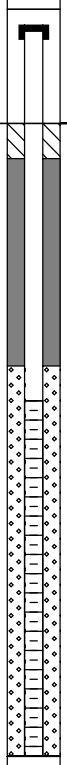
LOGGED BY: DM	COMPLETION DEPTH: 9.91 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-05	Page 1 of 1

WELL INSTALLATION	CLEAN HARBORS INC.	BOREHOLE NO: 26B
	DRILL: SOLID STEM AUGER	PROJECT: 5100812.001
RYLEY, ALBERTA		ELEVATION: 686.8 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - rootlets, moist, soft, dark		Pipe stickup = 0.85 metres	
1	CLAY SHALE - silty, dry, hard, brown			686.0
2				685.0
3	SANDSTONE - silty, wet, loose, blue grey			684.0
4				683.0
5	SILTSTONE - cemented, loose, light brown SANDSTONE - silty, moist, loose, blue grey			682.0
6	END OF BOREHOLE (5.33 metres) slough - none at 0 hrs. water - dry at 0 hrs. Monitoring well installed to 5.43m			681.0
7				680.0
8				679.0
9				678.0
10				677.0
11				676.0
12				675.0



TETRA TECH EBA

LOGGED BY: DM	COMPLETION DEPTH: 5.33 m
REVIEWED BY: PRM	COMPLETE: 04/08/13
DRAWING NO: 5100812-06	Page 1 of 1

CLEAN HARBORS 2007 GROUNDWATER MONITORING	CLEAN HARBORS CANADA INC.	BOREHOLE NO: 27A
	DRILL: SOLID STEM AUGER	PROJECT: E22101022
RYLEY, ALBERTA		ELEVATION: 686.91 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - clay, silty, dry, low plastic, black and grey, rootlets, (150mm thick) CLAY (TILL) - silty, moist, hard, medium plastic, brown, oxide staining		Pipe stickup = 0.82 metres	
1	SAND - silty, massive, medium grained, moist, loose, olive green to brown, iron oxide staining			686.0
2	- blue green			685.0
3	- wet, interbedded with siltstone - cemented, dry, hard, grey to light brown			684.0
4				683.0
5				682.0
6	SILTSTONE - cemented, dry, hard, grey to light brown			681.0
7				680.0
8				679.0
9				678.0
10				677.0
11 (0 hrs.)	END OF BOREHOLE (10.67 metres) water - 10.67 metres at 0 hrs. Monitoring well installed to 10.67 metres			676.0 (0 hrs.)
12				675.0

TETRA TECH EBA

LOGGED BY: AS	COMPLETION DEPTH: 10.67 m
REVIEWED BY: AS	COMPLETE: 07/10/01
DRAWING NO: 22101022-01	Page 1 of 1

CLEAN HARBORS 2007 GROUNDWATER MONITORING	CLEAN HARBORS CANADA INC.	BOREHOLE NO: 27B
	DRILL: SOLID STEM AUGER	PROJECT: E22101022
RYLEY, ALBERTA		ELEVATION: 687.01 m

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Elevation (m)
0	TOPSOIL - clay, silty, dry, low plastic, black and grey, rootlets, (150mm thick)		Pipe stickup = 0.80 metres	687.0
	CLAY (TILL) - silty, moist, hard, medium plastic, brown, oxide staining			
1	SAND - silty, massive, medium grained, moist, loose, olive green to brown, iron oxide staining			686.0
2	- blue green			685.0
3	- wet, interbedded with siltstone - cemented, dry, hard, grey to light brown			684.0
4				683.0
5	SILTSTONE - cemented, dry, hard, grey to light brown			682.0
6				681.0
7	END OF BOREHOLE (6.65 metres) water - 6.61 metres at 0 hrs. Monitoring well installed to 6.65 metres			680.0
8				679.0
9				678.0
10				677.0
11				676.0
12				

0 hrs.

TETRA TECH EBA

LOGGED BY: AS	COMPLETION DEPTH: 6.65 m
REVIEWED BY: AS	COMPLETE: 07/10/01
DRAWING NO: 22101022-02	Page 1 of 1

2011 GROUNDWATER MONITORING PROGRAM	CLEAN HARBOR	BOREHOLE NO: MW01C
	DRILL: SOLID STEM AUGER	PROJECT: E22101936
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	TOPSOIL - moist, loose, non plastic, black, trace of roots, (300 mm thick)			0
	CLAY - silty, moist, firm, high plastic, light brown			
1	- trace of cobbles, trace of iron			5
2				
2 hrs ▼	- trace of coal			2 hrs ▼ 10
3	CLAY SHALE - moist, hard, low plastic, grey, trace of white precipitates			
4	SANDSTONE - moist, hard, low plastic, dark greenish grey			15
5				
	END OF BOREHOLE (5.33 metres) water - 2.35 metres at 2 hrs. Monitoring well installed to 5.55 metres			
6				20
7				
8				25
9				30
10				33

TETRA TECH EBA

LOGGED BY: KF/MC	COMPLETION DEPTH: 5.33 m
REVIEWED BY: MH	COMPLETE: 11/06/14
DRAWING NO: 22101936-01	Page 1 of 1

2012 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS CANADA INC.	BOREHOLE NO: MW08A
CLASS I WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	PROJECT: E22103058-01
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	PAVEMENT - (100 mm thick)			0
	GRAVEL AND PEBBLE (FILL) - moist, soft, brown, (300 mm thick)			
	CLAY - some sand, moist, hard, medium plastic, black, some coal, silt inclusions			
1	- silty, brown, iron and silt inclusions			5
2	SAND - coarse grained, wet, soft, green grey			
3	- hard			10
4	SILTSTONE - some pebbles, dry, extremely weak, light grey			15
	SAND - some silt and clay, moist, hard, low plastic, grey blue			
5	- siltstone lens - dry, extremely weak, light grey			
6				20
7 ▼ 0 hrs.	- saturated, grey, water lenses			▼ 0 hrs.
	SILTSTONE - some clay, cemented, extremely weak, grey			25
8				
9	CLAY - some silt and sand, dry, hard, grey			30
10	END OF BOREHOLE (10.00 metres)			
	water - 6.91 metres at 0 hrs.			35
11	Monitoring well installed to 10.00 metres			
12				39

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 10 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-01	Page 1 of 1

2012 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS CANADA INC.	BOREHOLE NO: MW08B
CLASS I WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	PROJECT: E22103058-01
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	PAVEMENT - (100 mm thick)			0
	GRAVEL AND PEBBLE (FILL) - moist, soft, red brown, (300 mm thick)			
1	CLAY - some sand, moist, hard, medium plastic, black, some coal, white silt inclusions			5
	- silty, brown, iron, silt and coal inclusions			
2				
	SAND - some silt, coarse grained, wet, green blue, some silt inclusions			
3	0 hrs.			10 0 hrs.
4				
	END OF BOREHOLE (4.50 metres)			
5	water - 2.76 metres at 0 hrs.			15
	Monitoring well installed to 4.63 metres			
6				20
7				25
8				
9				30
10				
11				35
12				39

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-02	Page 1 of 1

2012 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS CANADA INC.	BOREHOLE NO: MW28A
CLASS I WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	PROJECT: E22103058-01
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (TILL) - silty, moist, hard, medium plastic, light brown, iron inclusions			0
1	- some sand, loose, brown, coal inclusions			5
2	SAND - coarse grained, moist, loose, brown, iron inclusions - blue green			10
3	SILTSTONE - cemented, dry, extremely weak, grey			15
4	SAND - coarse grained, wet, hard, blue green, some clay pockets, silt inclusions			20
5	- silty, dry, grey, silty inclusions			25
6	SILTSTONE - fine grained, moist, extremely weak, grey blue to light brown, silty inclusions			30
7				
8				
9				
10 (15 min.)	- dry, grey			35
11	END OF BOREHOLE (10.50 metres) water - 9.84 metres at 15 minutes Monitoring well installed to 10.86 metres			
12				39

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 10.5 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-03	Page 1 of 1

2012 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS CANADA INC.	BOREHOLE NO: MW28B
CLASS I WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	PROJECT: E22103058-01
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (TILL) - silty, sticky, moist, hard, medium plastic, iron inclusions			0
1				
				5
2	SAND - coarse grained, wet, light brown			
	- blue			
3				10
	SILTSTONE - cemented, dry, extremely weak, grey			
	SAND - silty, moist, hard, grey, some blue lenses, silty white inclusions			
4				
				15
5	- some clay			
6 (0 hrs.)				0 hrs. 20
	END OF BOREHOLE (6.00 metres) water - 5.83 metres at 0 hrs. Monitoring well installed to 6.19 metres			
7				
				25
8				
9				30
10				
				35
11				
12				39

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 6 m
REVIEWED BY: MH	COMPLETE: 12/10/04
DRAWING NO: 22103058-04	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW29A
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - moist, high plastic, brown, (300 mm thick)		Pipe stickup = 0.81 metres	0
1	SAND (TILL) - fine grained, moist, loose, dark brown - reddish brown			5
2	CLAY (TILL) - sandy, moist, firm, brown, silt, iron and coal inclusions - dry, reddish brown, white precipitates			10
3	SAND - medium grained, moist, firm, brown, iron and white precipitates throughout			15
4	- bluish grey, clay seams throughout			20
5	SANDSTONE - medium grained, very firm, grey, dark grey mottles throughout			25
6				30
7				35
8				40
9	END OF BOREHOLE (9.00 metres) water - 3.28 metres at 0 hrs. Monitoring well installed to 9.41 metres			45
10				
11				
12				
13				
14				
15				49

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/06
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW29B
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - moist, high plastic, brown, (300 mm thick)		Pipe stickup = 0.79 metres	0
1	SAND (TILL) - fine grained, moist, loose, dark brown - reddish brown			
	CLAY (TILL) - sandy, moist, firm, brown, silt, iron and coal inclusions			5
2	- dry, reddish brown, white precipitates			
3	SAND - medium grained, moist, firm, brown, iron and white precipitates throughout			10
4	- bluish grey, clay seams throughout			
	END OF BOREHOLE (4.50 metres) water - 3.89 metres at 0 hrs. Monitoring well installed to 4.64 metres Note: 1 m east of MW29A			15
5	- sandstone			
6				20
7				
8				25
9				
10				30
11				
12				40
13				
14				45
15				49

TETRA TECH EBA

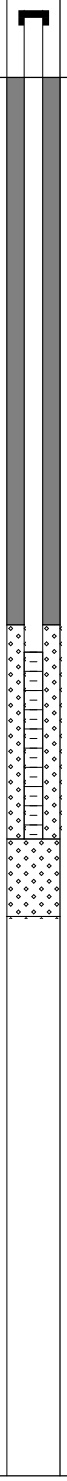
LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW30A
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - gravelly, moist, dark brown		Pipe stickup = 0.72 metres	0
1	CLAY (TILL) - sandy, moist, firm, brown, iron, coal and silt inclusions			5
2	SAND - silty, coarse grained, moist, loose, light brown, white lenses			
	CLAY (TILL) - sandy, moist, firm, brown, iron, coal and silt inclusions			
3	- iron inclusions			10
4	- greyish blue, brown mottles			
5	SANDSTONE - dry, extremely weak, light grey			15
6	- medium grained, moist, dark grey			20
7				
8	- light brown - dry, dark grey			25
9	END OF BOREHOLE (9.00 metres) water - dry at 0 hrs. Monitoring well installed to 8.17 metres			30
10				
11				35
12				40
13				
14				45
15				49



TETRA TECH EBA

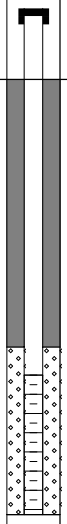
LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW30B
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - gravelly, moist, dark brown		Pipe stickup = 0.76 metres	0
1	CLAY (TILL) - sandy, moist, firm, brown, iron, coal and silt inclusions			5
2	SAND - silty, coarse grained, moist, loose, light brown, white lenses			
	CLAY (TILL) - sandy, moist, firm, brown, iron, coal and silt inclusions			10
3	- iron inclusions			
4	- greyish blue, brown mottles			15
5	END OF BOREHOLE (4.50 metres) water - dry at 0 hrs. Monitoring well installed to 4.67 metres Note: 1 m east of MW30A			20
6				
7				25
8				
9				30
10				
11				35
12				
13				40
14				45
15				49



TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW31A
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - gravelly, moist, dark brown, white and orange precipitates, (300 mm thick)		Pipe stickup = 0.71 metres	0
	SAND (TILL) - fine grained, dry, brown, white and red, coal and iron inclusions			
1	CLAY (TILL) - sandy, moist, soft, grey, iron inclusions			5
2	- bluish grey, brown mottles - dry			
	SANDSTONE - medium grained, dark grey clay inclusions throughout			10
3				
4	- 200 mm thick sandstone layer - dry, light brown - moist, dark grey, light grey and brown silt, shale and sand			15
5				
6				20
7	- bluish grey, dark brown inclusions - dark grey			25
8				
9	END OF BOREHOLE (9.00 metres) water - dry at 0 hrs. Monitoring well installed to 9.02 metres			30
10				
11				35
12				40
13				
14				45
15				49

TETRA TECH EBA

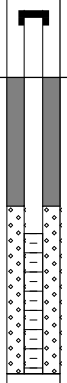
LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW31B
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - gravelly, moist, dark brown, white and orange precipitates, (300 mm thick)		Pipe stickup = 0.72 metres	0
	SAND (TILL) - fine grained, dry, brown, white and red, coal and iron inclusions			
1	CLAY (TILL) - sandy, moist, soft, grey, iron inclusions			5
2	- bluish grey, brown mottles - dry			
	SANDSTONE - medium grained, dark grey clay inclusions throughout			10
3	END OF BOREHOLE (3.00 metres) water - 3.00 metres at 0 hrs. Monitoring well installed to 3.18 metres Note: 1 m west of MW31A			
4				15
5				
6				20
7				
8				25
9				
10				30
11				
12				40
13				
14				45
15				49



TETRA TECH EBA

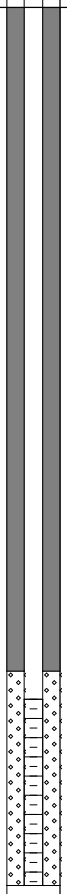
LOGGED BY: MC	COMPLETION DEPTH: 3 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW32A
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - sandy clay mix, bluish grey		Pipe stickup = 0.67 metres	0
1	CLAY (TILL) - sandy, moist, brown, iron inclusions			5
2	SAND - medium grained, dry, loose, light grey			
	CLAY (TILL) - sandy, moist, firm, medium plastic, dark grey			10
3	- loose, bluish grey			
4	SAND - medium grained, dry, light grey - grey, iron inclusions			15
5	CLAY - moist, firm, medium plastic, dark grey			
6	- dark brown			20
7	- sandy, soft, bluish grey, dark grey throughout			
8	- saturated			25
9	- moist			
	END OF BOREHOLE (9.00 metres) water - 8.04 metres at 0 hrs. Monitoring well installed to 9.42 metres			30
10				
11				35
12				40
13				
14				45
15				49



TETRA TECH EBA

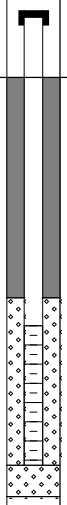
LOGGED BY: MC	COMPLETION DEPTH: 9 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW32B
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	CLAY (FILL) - sandy clay mix, bluish grey		Pipe stickup = 0.72 metres	0
1	CLAY (TILL) - sandy, moist, brown, iron inclusions			5
2	SAND - medium grained, dry, loose, light grey			10
3	CLAY (TILL) - sandy, moist, firm, medium plastic, dark grey - loose, bluish grey			15
4	SAND - medium grained, dry, light grey - grey, iron inclusions			20
5	END OF BOREHOLE (4.50 metres) water - 4.03 metres at 0 hrs. Monitoring well installed to 4.16 metres Note: 1 m east of MW32A			25
6				30
7				35
8				40
9				45
10				49
11				
12				
13				
14				
15				



TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/08
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW33A
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	SAND (FILL) - some pebbles and gravel, moist, loose, brown, (150 mm thick)		Pipe stickup = 0.94 metres	0
1	CLAY (TILL) - gravelly, some sand, subangular blocky, firm, medium plastic, dark grey, silt inclusions - massive, moist, very firm, high plastic, dark brown, coal, silt and iron inclusions			5
2	SAND - coarse grained, moist, loose, dark brown, iron inclusions - mottles - coarse grained, grey blue			10
3	- 200 mm thick clay layer - siltstone - saturated, silt mottled throughout			
4	SANDSTONE - fine grained, moist, grey blue, silt inclusions throughout			15
5				
6	- siltstone - saturated, water seam - grey, dark grey mottles			20
7	- moist			
8				25
9	- saturated, grey - medium grained, moist			
10	- wet - wet seam			30
11				35
12				40
13	- fractured bedrock, saturated, light grey			
14	END OF BOREHOLE (13.50 metres) water - 6.10 metres at 0 hrs. Monitoring well installed to 13.90 metres			45
15				49

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 13.5 m
REVIEWED BY: TD	COMPLETE: 14/10/06
DRAWING NO:	Page 1 of 1

2014 GROUNDWATER WELLS INSTALLATION	CLEAN HARBORS	PROJECT NO. - BOREHOLE NO.
CLASS 1 WASTE MANAGEMENT FACILITY	DRILL: SOLID STEM AUGER	ENVSWM03472-01-MW33B
RYLEY, ALBERTA		

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

BACKFILL TYPE: BENTONITE | PEA GRAVEL | SLOUGH | GROUT | DRILL CUTTINGS | SAND

Depth (m)	SOIL DESCRIPTION	SAMPLE TYPE	NOTES & COMMENTS	Depth (ft)
0	SAND (FILL) - some pebbles and gravel, moist, loose, brown, (150 mm thick)		Pipe stickup = 0.83 metres	0
1	CLAY (TILL) - gravelly, some sand, subangular blocky, firm, medium plastic, dark grey, silt inclusions - massive, moist, very firm, high plastic, dark brown, coal, silt and iron inclusions			5
2	SAND - coarse grained, moist, loose, dark brown, iron inclusions - mottles - coarse grained, grey blue			10
3	- 200 mm thick clay layer - siltstone - silt mottled throughout			15
4	SANDSTONE - fine grained, moist, grey blue, silt inclusions throughout			20
5	END OF BOREHOLE (4.50 metres) water - 0.93 metres at 0 hrs. Monitoring well installed to 4.68 metres Note: 1 m east of MW33A			25
6				30
7				35
8				40
9				45
10				49
11				
12				
13				
14				
15				

TETRA TECH EBA

LOGGED BY: MC	COMPLETION DEPTH: 4.5 m
REVIEWED BY: TD	COMPLETE: 14/10/06
DRAWING NO:	Page 1 of 1

Clean Harbors Canada Inc.

Borehole No: **15MW34A**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Pocket Pen. (kPa) 100 200 300 400 / Plastic Limit – Moisture Content – Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	Depth (ft)
0								0
1	Solid stem auger	CLAY (FILL) - some silt, some fine to coarse gravel, trace of fine to medium cobbles, trace of fine boulders, damp, hard, non to low plastic, brown, coal and iron stained inclusions		12				2
2		CLAY (TILL) - some silt, trace of gravel, damp, firm, medium plastic, brown, coal and iron stained inclusions		14				4
		- some fine grained brown sand, low plastic, grey blue						6
3		- silty, soft, medium to high plastic, brown		13				8
		- firm						10
4		- silty, firm to very stiff, grey						12
5				71				14
		SANDSTONE - silty, clayey, fine to medium grained, damp to moist, extremely weak, grey						16
		- some silt, some clay, moist to wet						18
6		- wet, grey blue		98		>100		20
7		- silty, clayey, moist to wet, grey		/225mm				22
		CLAY SHALE - trace of fine grained sand, trace of fine gravel, damp, extremely weak, high plastic, grey						24
8								26
								28
9								30
								32
10								34
								36
11								38
		- dark greyish brown						40
12		- some fine grained sand, light grey						42
								44
13								46
		- no visible sand, dark grey						48
14								50
								52
15		END OF BOREHOLE (15.00 metres)						54
		slough - 14.25 metres						56
16		Monitoring well installed to 11.80 metres						58
								60
17								62
								64
18								
19								
20								

TETRA TECH EBA

Contractor: Clean Harbors	Completion Depth: 15 m
Drilling Rig Type:	Start Date: 2015 July 21
Logged By: TH	Completion Date: 2015 July 21
Reviewed By: SS	Page 1 of 1

Clean Harbors Canada Inc.

Borehole No: **15MW34B**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Moisture Content (%)	Pocket Pen. (kPa) / Plastic Limit / Moisture Content / Liquid Limit	Fracture Frequency (#/m) / RQD (%) / Recovery (%)	Depth (ft)
0					100 200 300 400 / 20 40 60 80	2 4 6 8 / 40 60 80 100 / 40 60 80 100	0
1	Solid stem auger	CLAY (FILL) - some silt, some fine to coarse gravel, trace of fine to medium cobbles, trace of fine boulders, damp, hard, non to low plastic, brown, coal and iron stained inclusions					2
2		CLAY (TILL) - some silt, trace of gravel, damp, firm, medium plastic, brown, coal and iron stained inclusions					4
3		- gleying - sand pockets - fine grained sand, damp, very slight gleying - soft, low to medium plastic					6
4		- silty, some fine grained brown sand, medium to high plastic, - firm to very stiff, grey					8
5		SANDSTONE - silty, clayey, fine to medium grained, damp to moist, grey					10
6		END OF BOREHOLE (5.00 metres) Monitoring well installed to 4.80 metres					12
7							14
8							16
9							18
10							20
11							22
12							24
13							26
14							28
15							30
16							32
17							34
18							36
19							38
20							40
							42
							44
							46
							48
							50
							52
							54
							56
							58
							60
							62
							64

0 hrs

0 hrs

TETRA TECH EBA

Contractor: Clean Harbors	Completion Depth: 5 m
Drilling Rig Type:	Start Date: 2015 July 21
Logged By: TH	Completion Date: 2015 July 21
Reviewed By: SS	Page 1 of 1

GEO/ROCK ZONE12.GPJ EBA.GDT 16/3/2

Clean Harbors Canada Inc.

Borehole No: **15MW35A/B/C**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description
0		CLAY (TILL) - sandy, plastic, brown
3		CLAY - trace of sand, high plastic, brown
4		SANDSTONE - weathered, fine grained, blue grey, intermittent clay shale laminations, mechanical fractures
5		- at 4.24 m, 50 mm thick siltstone bed
6		- at 4.94 m, 50 mm thick siltstone bed
8		CLAY SHALE - extremely weak, dark brown
8		- at 8.10 m, 50 mm thick coal seam
9		SANDSTONE - blue green, grey clay shale laminations
11	Wet Rotary/HQ Coring	- at 10.80 m, increasing clay content
12		CLAY SHALE - moist, strong, dark brown, fracturing at interface
13		- at 13.27 m, 1 mm thick tan siltstone lamination
15		- at 15.10 m, minor slickensides, some fracturing, intermittent seashells
16		- at 15.40 m, dark grey
16		- at 16.00 m, 40 mm thick bentonite seam
20		

Sample Type: 14

Sample Number: 1, 2, 3, 4, 5, 6, 7

SPT (N): 20 40 60 80

Moisture Content (%): Plastic Limit | Moisture Content | Liquid Limit (20 40 60 80)

Fracture Frequency (#/m): 2 4 6 8

RQD (%): 40 60 80 100

Recovery (%): 40 60 80 100

15MW35A | 15MW35B | 15MW35C

Elevation (m): 625 624 623 622 621 620 619 618 617 616 615 614 613 612 611 610 609 608 607 606 605

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 1 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35A/B/C**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Plastic Limit Moisture Content Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	15MW35A	15MW35B	15MW35C	Elevation (m)
20												605
21		- at 21.20 m, increased fractures										604
22				8								603
23		- at 23.30 m, 100 mm thick tan siltstone bed										602
24												601
25												600
26				9								599
27												598
28		- at 27.50 m, intermittent 45-65° fractures										597
29				10								596
30	Wet Rotary/HQ Coring											595
31		SANDSTONE - fine grained, moist, strong, grey, coal laminations										594
32				11								593
33		- from 32.65 to 32.79 m, very fine grained sand, brown bed, 5 mm thick coal seam - at 33.30 m, intermittent siltstone										592
34		- at 34.06 m, 10 mm thick coal seam										591
35		- at 34.07 m, clay shale bed - at 34.15 m, dark grey clay shale laminations		12								590
36		- at 35.30 m, increasing clay content, dark brown - at 35.40 m, 20 mm thick coal seam MUDSTONE - very fine grained, friable, extremely weak, brown to light brownish grey										589
37												588
38				13								587
39		- light brownish grey, trace of coal fragments										586
40		- at 39.40 m, 10 mm thick clay layer - silty, wet, soft, sticky, high plastic, grey										585

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 2 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35A/B/C**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Plastic Limit Moisture Content Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	15MW35A	15MW35B	15MW35C	Elevation (m)
40												585
41		SANDSTONE - glauconitic, very fine grained, extremely weak, light grey, coal fragments CLAY SHALE - strong, dark brown - at 41.00 m, 10 mm thick coal seam MUDSTONE - very fine grained, brittle, grey grey		14								584
42												583
43		END OF BOREHOLE (42.40 metres) Monitoring well A installed to 12.80 metres Monitoring well B installed to 7.01 metres Monitoring well C installed to 3.05 metres										582
44												581
45												580
46												579
47												578
48												577
49												576
50												575
51												574
52												573
53												572
54												571
55												570
56												569
57												568
58												567
59												566
60												565

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 3 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)
0		CLAY (TILL) - sandy, plastic, brown			14	
1						
2		CLAY - trace of sand, high plastic, brown				
3		SANDSTONE - weathered, fine grained, blue grey, intermittent clay shale laminations, mechanical fractures		1		
4						
		- at 4.24 m, 50 mm thick siltstone bed				
5		- at 4.94 m, 50 mm thick siltstone bed				
6						
7						
		CLAY SHALE - strong, dark brown		2		
8		- at 8.10 m, 50 mm thick coal seam				
		SANDSTONE - blue green, grey clay shale laminations				
9						
10				3		
11		- at 10.80 m, increasing clay content				
		CLAY SHALE - moist, strong, dark brown, fracturing at interface		4		
12						
13						
		- at 13.27 m, 1 mm thick tan siltstone lamination		5		
14						
15						
		- at 15.10 m, minor slickensides, some fracturing, intermittent seashells				
16		- at 15.40 m, dark grey				
		- at 16.00 m, 40 mm thick bentonite seam		6		
17						
18						
19						
20				7		

Wet Rotary/HQ Coring

SPT (N) 20 40 60 80

Plastic Limit | Moisture Content | Liquid Limit

20 40 60 80

Fracture Frequency (#/m) 2 4 6 8

RQD (%) 40 60 80 100

Recovery (%) 40 60 80 100

15MW35

Elevation (m): 625, 624, 623, 622, 621, 620, 619, 618, 617, 616, 615, 614, 613, 612, 611, 610, 609, 608, 607, 606, 605

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 1 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Plastic Limit – Moisture Content – Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	15MW35	Elevation (m)
20										605
21		- at 21.20 m, increased fractures								604
22				8						603
23		- at 23.30 m, 100 mm thick tan siltstone bed								602
24										601
25				9						600
26										599
27		- at 27.50 m, intermittent 45-65° fractures								598
28				10						597
29										596
30	Wet Rotary/HQ Coring	SANDSTONE - fine grained, moist, strong, grey, coal laminations								595
31				11						594
32										593
33		- from 32.65 to 32.79 m, very fine grained sand, brown bed, 5 mm thick coal seam - at 33.30 m, intermittent siltstone								592
34		- at 34.06 m, 10 mm thick coal seam		12						591
35		- at 34.07 m, clay shale bed - at 34.15 m, dark grey clay shale laminations								590
36		- at 35.30 m, increasing clay content, dark brown - at 35.40 m, 20 mm thick coal seam MUDSTONE - very fine grained, friable, extremely weak, brown to light brownish grey								589
37				13						588
38										587
39		- light brownish grey, trace of coal fragments								586
40		- at 39.40 m, 10 mm thick clay layer - silty, wet, soft, sticky, high plastic, grey								585

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 2 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW35Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	Ground Elev: 625 m
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)	SPT (N) 20 40 60 80 / Plastic Limit Moisture Content Liquid Limit 20 40 60 80	Fracture Frequency (#/m) 2 4 6 8 / RQD (%) 40 60 80 100 / Recovery (%) 40 60 80 100	15MW35	Elevation (m)
40										585
		SANDSTONE - glauconitic, very fine grained, extremely weak, light grey, coal fragments		14						
41		CLAY SHALE - strong, dark brown - at 41.00 m, 10 mm thick coal seam								584
42		MUDSTONE - very fine grained, brittle, grey grey								583
		END OF BOREHOLE (42.40 metres) Monitoring well installed to 32.77 metres								
43										582
44										581
45										580
46										579
47										578
48										577
49										576
50										575
51										574
52										573
53										572
54										571
55										570
56										569
57										568
58										567
59										566
60										565

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 42.4 m
Drilling Rig Type:	Start Date: 2015 July 27
Logged By: BS	Completion Date: 2015 July 28
Reviewed By: TH	Page 3 of 3

Clean Harbors Canada Inc.

Borehole No: **15MW36A/Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)
0		CLAY (TILL) - some silt, moist, plastic, brown			24	
2		SAND - clayey, moist, brown				
3		SANDSTONE - medium grained, blue grey, clay shale interbeds				
5		CLAY SHALE - moist, strong, dark grey, mechanical fractures		1		
7		SANDSTONE - medium grained, strong, light grey, laminated clay shale throughout, mechanical fractures		2		
9	Wet Rotary/HQ Coring	CLAY SHALE - moist, strong, dark grey, mechanical fractures		3		
12		- at 1.220 mm, 200 mm thick siltstone layer - very fine grained, weak, light brown, mechanical fractures				
13		- at 12.80 m, 20 mm thick seashell layer		4		
15		- at 14.70 m, 10 mm thick bentonite lens				
16				5	19	
17		- at 17.00 m, intermittent shells throughout				
18				6		
19		- at 19.00 m, periodic 45-65° fractures				
20						

SPT (N) ■ 20 40 60 80

Plastic Limit — Moisture Content — Liquid Limit 20 40 60 80

● Fracture Frequency (#/m) ● 2 4 6 8

▲ RQD (%) ▲ 40 60 80 100

■ Recovery (%) ■ 40 60 80 100

15MW36 | 15MW36A | Depth (ft) 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 38.8 m
Drilling Rig Type:	Start Date: 2015 July 21
Logged By: BS	Completion Date: 2015 July 21
Reviewed By: TH	Page 1 of 2

Clean Harbors Canada Inc.

Borehole No: **15MW36A/Deep**

Project: Ryley Renewal Monitoring Well Installations	Project No: ENVSWM03011-04.003
Location: Ryley Facility	
Ryley, Alberta	

Depth (m)	Method	Soil Description	Sample Type	Sample Number	SPT (N)	Moisture Content (%)
20				7		
21	Wet Rotary/HQ Coring	- slight slickensides				
22				8		
23						
24		- at 24.13 m, 10 mm thick coal seam				
25				9		
26						
27						
28				10		
29		- from 28.90 to 29.20 m, transition to siltstone - very fine grained, light grey, coal inclusions - at 29.20 m, strong, light grey		11		
30						
31						
32		SANDSTONE - fine to medium grained, strong, grey - at 32.23 m, clay shale laminations, 20 mm thick clay shale bed		12		
33		SILTSTONE - clay shale interbeds				
34		SANDSTONE - fine grained, light grey, coal laminations - at 33.40 m, coal laminations at 140 mm intervals - at 33.80 m, coal laminations at 500 mm intervals		13		
35		- at 34.29 m, medium grained interbeds with light brown staining - at 34.76 m, coal inclusion				
36		- from 35.16 to 35.41 m, intermitted sandstone at 250 mm intervals - medium grained, light brown staining, coal inclusions, hydrocarbon odour				
37		- from 35.76 to 36.06 m, 300 mm thick sandstone layer - medium grained, coal inclusions, hydrocarbon odour - at 37.00 m, fine grained, intermittent light staining		14		
38		CLAY SHALE - strong, dark grey				
39		END OF BOREHOLE (38.80 metres) Monitoring well installed to 35.36 metres Monitoring well A installed to 14.33 metres				
40						

SPT (N) ■ 20 40 60 80

Plastic Limit — Moisture Content — Liquid Limit 20 40 60 80

● Fracture Frequency (#/m) ● 2 4 6 8

▲ RQD (%) ▲ 40 60 80 100

■ Recovery (%) ■ 40 60 80 100

15MW36 | 15MW36A

Depth (ft): 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130

TETRA TECH EBA

Contractor: Garritty and Baker	Completion Depth: 38.8 m
Drilling Rig Type:	Start Date: 2015 July 21
Logged By: BS	Completion Date: 2015 July 21
Reviewed By: TH	Page 2 of 2

GEO/ROCK ZONE12.GPJ EBA.GDT 16/3/2

APPENDIX D

LABORATORY ANALYTICAL REPORTS

Your Project #: SWM.SWOP03800-01

Attention: MICHELE CRAWFORD

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: 557643-01-01, 557643-02-01, 557643-03-01

Report Date: 2018/07/18
Report #: R2590847
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B851729
Received: 2018/06/26, 17:50

Sample Matrix: Water
Samples Received: 29

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH (1)	27	N/A	2018/06/28	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS/FID (1)	20	N/A	2018/06/29	AB SOP-00039	CCME CWS/EPA 8260d m
BTEX/F1 in Water by HS GC/MS/FID (1)	6	N/A	2018/06/30	AB SOP-00039	CCME CWS/EPA 8260d m
F1-BTEX (1)	26	N/A	2018/06/30	AB SOP-00039	Auto Calc
Cadmium - low level CCME - Dissolved (1)	26	N/A	2018/06/30	AB WI-00065	Auto Calc
Chloride by Automated Colourimetry (1)	16	N/A	2018/06/30	AB SOP-00020	SM 22 4500-Cl-E m
Chloride by Automated Colourimetry (1)	11	N/A	2018/07/01	AB SOP-00020	SM 22 4500-Cl-E m
Chemical Oxygen Demand (1)	25	N/A	2018/06/29	AB SOP-00016	SM 22 5220D m
Carbon (DOC) (1, 2)	26	N/A	2018/07/04	EENVSOP-00060	MMCW 119 1996 m
Conductivity @25C (1)	27	N/A	2018/06/28	AB SOP-00005	SM 22 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16) (1, 3)	9	2018/06/28	2018/06/29	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
CCME Hydrocarbons in Water (F2; C10-C16) (1, 3)	19	2018/06/29	2018/06/30	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Hardness (1)	2	N/A	2018/06/28	AB WI-00065	Auto Calc
Hardness (1)	25	N/A	2018/06/30	AB WI-00065	Auto Calc
Mercury - Low Level (Dissolved) (1, 4)	23	2018/06/29	2018/06/29	EENVSOP-00031	EPA 1631E/245.1 R3 m
Mercury - Low Level (Dissolved) (1, 4)	1	2018/06/30	2018/06/30	EENVSOP-00031	EPA 1631E/245.1 R3 m
Elements by ICP - Dissolved (1, 4)	24	N/A	2018/06/29	AB SOP-00042	EPA 6010d R4 m
Elements by ICP - Dissolved (1, 4)	2	N/A	2018/06/30	AB SOP-00042	EPA 6010d R4 m
Elements by ICP-Dissolved-Lab Filtered (1, 5)	2	N/A	2018/06/28	AB SOP-00042	EPA 6010d R4 m
Elements by ICPMS - Dissolved (1, 4)	24	N/A	2018/06/29	AB SOP-00043	EPA 6020b R2 m
Elements by ICPMS - Dissolved (1, 4)	2	N/A	2018/06/30	AB SOP-00043	EPA 6020b R2 m
Ion Balance (1)	27	N/A	2018/06/28	AB WI-00065	Auto Calc
Sum of cations, anions (1)	2	N/A	2018/06/28	AB WI-00065	Auto Calc
Sum of cations, anions (1)	25	N/A	2018/06/30	AB WI-00065	Auto Calc
Ammonia-N (Total) (1)	25	N/A	2018/07/03	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate and Nitrite (1)	27	N/A	2018/06/28	AB WI-00065	Auto Calc

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: SWM.SWOP03800-01

Attention: MICHELE CRAWFORD

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: 557643-01-01, 557643-02-01, 557643-03-01

Report Date: 2018/07/18
Report #: R2590847
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B851729
Received: 2018/06/26, 17:50

Sample Matrix: Water
Samples Received: 29

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrate (as N) (1)	27	2018/06/27	2018/06/28	AB WI-00065	Auto Calc
NO2 - NO2 + NO3 (N) by CFA (1)	27	N/A	2018/06/28	AB SOP-00082	IM 857-871m
pH @25°C (1, 6)	27	N/A	2018/06/28	AB SOP-00005	SM 22 4500 H+ B m
Phenols (4-AAP) (1)	29	N/A	2018/07/03	EENVSOP-00061	MMCW 154 1996 m
Sulphate by Automated Colourimetry (1)	16	N/A	2018/06/30	AB SOP-00018	SM 22 4500-SO4 E m
Sulphate by Automated Colourimetry (1)	11	N/A	2018/07/01	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated) (1)	16	N/A	2018/06/30	AB WI-00065	Auto Calc
Total Dissolved Solids (Calculated) (1)	11	N/A	2018/07/01	AB WI-00065	Auto Calc
Total Trihalomethanes Calculation (1)	20	N/A	2018/07/03	AB SOP-00056	Auto Calc
Total Trihalomethanes Calculation (1)	6	N/A	2018/07/04	AB SOP-00056	Auto Calc
Total Kjeldahl Nitrogen (1)	24	2018/06/29	2018/07/03	AB SOP-00008	EPA 351.1 R 1978 m
Total Kjeldahl Nitrogen (1)	1	2018/07/03	2018/07/04	AB SOP-00008	EPA 351.1 R 1978 m
VOCs in Water by HS GC/MS (Std List) (1)	9	N/A	2018/06/29	AB SOP-00056	EPA 5021a/8260d m
VOCs in Water by HS GC/MS (Std List) (1)	12	N/A	2018/06/30	AB SOP-00056	EPA 5021a/8260d m
VOCs in Water by HS GC/MS (Std List) (1)	5	N/A	2018/07/03	AB SOP-00056	EPA 5021a/8260d m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Your Project #: SWM.SWOP03800-01

Attention: MICHELE CRAWFORD

TETRA TECH CANADA INC.
14940-123 AVENUE
EDMONTON, AB
CANADA T5V 1B4

Your C.O.C. #: 557643-01-01, 557643-02-01, 557643-03-01

Report Date: 2018/07/18
Report #: R2590847
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B851729
Received: 2018/06/26, 17:50

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) This test was performed by Maxxam Edmonton Environmental
(2) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(3) Silica gel clean up employed.
(4) Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(5) Samples were filtered and preserved at the lab. Values may not reflect concentrations at the time of sampling. Dissolved > Total Imbalance: Whenever applicable, Dissolved >Total for any parameter that falls within method uncertainty for duplicates is likely equivalent. If RPD is >20% samples were reanalyzed and confirmed.
(6) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Maxxam endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ioana Stoica, Project Manager
Email: IStoica@maxxam.ca
Phone# (403)735-2227

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TS8452		TS8453			TS8454		TS8455			
Sampling Date		2018/06/26 14:20		2018/06/26 14:30			2018/06/26 15:50		2018/06/26 16:00			
COC Number		557643-01-01		557643-01-01			557643-01-01		557643-01-01			
	UNITS	MW 1B	MU	MW 1C	MU	QC Batch	MW 9	MU	MW 11	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon												
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	9042846	<0.10	N/A	<0.10	N/A	0.10	9042846
Volatiles												
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	9043140	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	9043140	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	9043140	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	9043140	<0.00080	N/A	<0.00080	N/A	0.00080	9043183
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	9043140	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	9041491	<0.00089	N/A	<0.00089	N/A	0.00089	9041491
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	9041491	<0.10	N/A	<0.10	N/A	0.10	9041491
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	9043140	<0.10	N/A	<0.10	N/A	0.10	9043183
Surrogate Recovery (%)												
1,4-Difluorobenzene (sur.)	%	97	N/A	97	N/A	9043140	101	N/A	102	N/A	N/A	9043183
4-Bromofluorobenzene (sur.)	%	100	N/A	100	N/A	9043140	104	N/A	103	N/A	N/A	9043183
D4-1,2-Dichloroethane (sur.)	%	103	N/A	101	N/A	9043140	96	N/A	95	N/A	N/A	9043183
O-TERPHENYL (sur.)	%	87	N/A	86	N/A	9042846	104	N/A	104	N/A	N/A	9042846

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TS8456		TS8457		TS8458		TS8459			
Sampling Date		2018/06/26 15:00		2018/06/26 14:50		2018/06/26 15:40		2018/06/26 14:15			
COC Number		557643-01-01		557643-01-01		557643-01-01		557643-01-01			
	UNITS	MW 12A	MU	MW 12B	MU	MW 14	MU	MW 18A	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9042846
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	9043183
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	9041491
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9041491
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9043183
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	98	N/A	101	N/A	102	N/A	101	N/A	N/A	9043183
4-Bromofluorobenzene (sur.)	%	102	N/A	103	N/A	102	N/A	101	N/A	N/A	9043183
D4-1,2-Dichloroethane (sur.)	%	98	N/A	97	N/A	99	N/A	96	N/A	N/A	9043183
O-TERPHENYL (sur.)	%	112	N/A	100	N/A	105	N/A	115	N/A	N/A	9042846

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TS8460		TS8461		TS8462		TS8463			
Sampling Date		2018/06/26 14:25		2018/06/26 13:20		2018/06/26 13:30		2018/06/26 14:00			
COC Number		557643-01-01		557643-01-01		557643-02-01		557643-02-01			
	UNITS	**MW 18B**	**MU**	**MW 19A**	**MU**	**MW 19B**	**MU**	**MW 20A**	**MU**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9042846
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043169
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043169
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043169
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	9043169
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043169
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	9041491
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9041491
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9043169
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	99	N/A	101	N/A	99	N/A	97	N/A	N/A	9043169
4-Bromofluorobenzene (sur.)	%	99	N/A	100	N/A	99	N/A	100	N/A	N/A	9043169
D4-1,2-Dichloroethane (sur.)	%	98	N/A	104	N/A	99	N/A	101	N/A	N/A	9043169
O-TERPHENYL (sur.)	%	109	N/A	96	N/A	98	N/A	97	N/A	N/A	9042846

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TS8464			TS8465		TS8466		TS8467			
Sampling Date		2018/06/26 13:50			2018/06/26 11:40		2018/06/26 11:50		2018/06/26 10:10			
COC Number		557643-02-01			557643-02-01		557643-02-01		557643-02-01			
	UNITS	**MW 20B**	**MU**	**QC Batch**	**MW 21A**	**MU**	**MW 21B**	**MU**	**MW 22A**	**MU**	**RDL**	**QC Batch**
Ext. Pet. Hydrocarbon												
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	9042846	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9042846
Volatiles												
Benzene	mg/L	<0.00040	N/A	9043183	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Toluene	mg/L	<0.00040	N/A	9043183	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Ethylbenzene	mg/L	<0.00040	N/A	9043183	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
m & p-Xylene	mg/L	<0.00080	N/A	9043183	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	9043183
o-Xylene	mg/L	<0.00040	N/A	9043183	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Xylenes (Total)	mg/L	<0.00089	N/A	9041491	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	9041772
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	9041491	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9041772
F1 (C6-C10)	mg/L	<0.10	N/A	9043183	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9043183
Surrogate Recovery (%)												
1,4-Difluorobenzene (sur.)	%	101	N/A	9043183	101	N/A	101	N/A	102	N/A	N/A	9043183
4-Bromofluorobenzene (sur.)	%	102	N/A	9043183	101	N/A	102	N/A	102	N/A	N/A	9043183
D4-1,2-Dichloroethane (sur.)	%	97	N/A	9043183	98	N/A	100	N/A	99	N/A	N/A	9043183
O-TERPHENYL (sur.)	%	97	N/A	9042846	102	N/A	100	N/A	103	N/A	N/A	9042846

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TS8468		TS8469		TS8470		TS8471			
Sampling Date		2018/06/26 09:50		2018/06/26 10:30		2018/06/26 10:20		2018/06/26 11:20			
COC Number		557643-02-01		557643-02-01		557643-02-01		557643-02-01			
	UNITS	MW 22B	MU	MW 23A	MU	MW 23B	MU	MW 25A	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon											
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9042833
Volatiles											
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	<0.00080	N/A	0.00080	9043183
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	<0.00089	N/A	0.00089	9041772
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9041772
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	<0.10	N/A	<0.10	N/A	0.10	9043183
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	102	N/A	103	N/A	103	N/A	99	N/A	N/A	9043183
4-Bromofluorobenzene (sur.)	%	101	N/A	102	N/A	102	N/A	101	N/A	N/A	9043183
D4-1,2-Dichloroethane (sur.)	%	97	N/A	97	N/A	97	N/A	98	N/A	N/A	9043183
O-TERPHENYL (sur.)	%	96	N/A	96	N/A	92	N/A	96	N/A	N/A	9042833

RDL = Reportable Detection Limit
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N/A = Not Applicable

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TS8475		TS8478			TS8479		TS8480			
Sampling Date		2018/06/26 11:00		2018/06/26 15:10			2018/06/26 15:20		2018/06/26			
COC Number		557643-03-01		557643-03-01			557643-03-01		557643-03-01			
	UNITS	MW 25B	MU	15MW34A	MU	QC Batch	15MW34B	MU	18DUP04	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon												
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	<0.10	N/A	9042846	<0.10	N/A	<0.10	N/A	0.10	9042833
Volatiles												
Benzene	mg/L	<0.00040	N/A	<0.00040	N/A	9043183	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Toluene	mg/L	<0.00040	N/A	<0.00040	N/A	9043183	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Ethylbenzene	mg/L	<0.00040	N/A	<0.00040	N/A	9043183	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
m & p-Xylene	mg/L	<0.00080	N/A	<0.00080	N/A	9043183	<0.00080	N/A	<0.00080	N/A	0.00080	9043183
o-Xylene	mg/L	<0.00040	N/A	<0.00040	N/A	9043183	<0.00040	N/A	<0.00040	N/A	0.00040	9043183
Xylenes (Total)	mg/L	<0.00089	N/A	<0.00089	N/A	9041772	<0.00089	N/A	<0.00089	N/A	0.00089	9041772
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	<0.10	N/A	9041772	<0.10	N/A	<0.10	N/A	0.10	9041772
F1 (C6-C10)	mg/L	<0.10	N/A	<0.10	N/A	9043183	<0.10	N/A	<0.10	N/A	0.10	9043183
Surrogate Recovery (%)												
1,4-Difluorobenzene (sur.)	%	102	N/A	104	N/A	9043183	103	N/A	101	N/A	N/A	9043183
4-Bromofluorobenzene (sur.)	%	101	N/A	102	N/A	9043183	102	N/A	100	N/A	N/A	9043183
D4-1,2-Dichloroethane (sur.)	%	98	N/A	98	N/A	9043183	99	N/A	100	N/A	N/A	9043183
O-TERPHENYL (sur.)	%	102	N/A	99	N/A	9042846	94	N/A	101	N/A	N/A	9042833

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

AT1 BTEX AND F1-F2 IN WATER (WATER)

Maxxam ID		TS8481			TS8482			
Sampling Date		2018/06/26			2018/06/26			
COC Number		557643-03-01			557643-03-01			
	UNITS	18DUP05	MU	QC Batch	18TRIPBLANK	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	9042833	<0.10	N/A	0.10	9042833
Volatiles								
Benzene	mg/L	<0.00040	N/A	9043183	<0.00040	N/A	0.00040	9043183
Toluene	mg/L	<0.00040	N/A	9043183	<0.00040	N/A	0.00040	9043183
Ethylbenzene	mg/L	<0.00040	N/A	9043183	<0.00040	N/A	0.00040	9043183
m & p-Xylene	mg/L	<0.00080	N/A	9043183	<0.00080	N/A	0.00080	9043183
o-Xylene	mg/L	<0.00040	N/A	9043183	<0.00040	N/A	0.00040	9043183
Xylenes (Total)	mg/L	<0.00089	N/A	9041772	<0.00089	N/A	0.00089	9041491
F1 (C6-C10) - BTEX	mg/L	<0.10	N/A	9041772	<0.10	N/A	0.10	9041491
F1 (C6-C10)	mg/L	<0.10	N/A	9043183	<0.10	N/A	0.10	9043183
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	102	N/A	9043183	101	N/A	N/A	9043183
4-Bromofluorobenzene (sur.)	%	101	N/A	9043183	101	N/A	N/A	9043183
D4-1,2-Dichloroethane (sur.)	%	99	N/A	9043183	101	N/A	N/A	9043183
O-TERPHENYL (sur.)	%	101	N/A	9042833	95	N/A	N/A	9042833

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER -LAB FILTERED (WATER)

Maxxam ID		TS8476				TS8477			
Sampling Date		2018/06/26 11:40				2018/06/26 12:10			
COC Number		557643-03-01				557643-03-01			
	UNITS	MW 26A	MU	RDL	QC Batch	MW 31A	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	29	N/A	N/A	9041434	20	N/A	N/A	9041434
Cation Sum	meq/L	28	N/A	N/A	9041434	19	N/A	N/A	9041434
Hardness (CaCO3)	mg/L	29	N/A	0.50	9041676	15	N/A	0.50	9041676
Ion Balance (% Difference)	%	0.78	N/A	N/A	9041677	2.0	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.92	N/A	0.020	9041498	1.5	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	4.1	N/A	0.089	9040998	6.8	N/A	0.089	9040998
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	0.033	9040998	<0.033	N/A	0.033	9040998
Calculated Total Dissolved Solids	mg/L	1700	N/A	0.022	9041679	1100	N/A	0.022	9041679
Misc. Inorganics									
Conductivity	uS/cm	2700	+/- 230	2.0	9043081	1700	+/- 150	2.0	9043081
pH	pH	8.51	+/- 0.123	N/A	9043077	8.48	+/- 0.123	N/A	9043077
Anions									
Alkalinity (PP as CaCO3)	mg/L	20	+/- 2.9	1.0	9043080	16	+/- 2.8	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	910	+/- 39	1.0	9043080	900	+/- 39	1.0	9043080
Bicarbonate (HCO3)	mg/L	1100	+/- 250	1.0	9043080	1100	+/- 250	1.0	9043080
Carbonate (CO3)	mg/L	24	N/A	1.0	9043080	19	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9043080	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	510 (1)	+/- 85	5.0	9043357	67	+/- 12	1.0	9045218
Dissolved Chloride (Cl)	mg/L	5.9	+/- <RDL	1.0	9043356	11	+/- <RDL	1.0	9045211
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	N/A	0.010	9042902	<0.010	N/A	0.010	9042922
Dissolved Nitrate plus Nitrite (N)	mg/L	0.92	N/A	0.020	9042902	1.5	N/A	0.020	9042922
Lab Filtered Elements									
Dissolved Calcium (Ca)	mg/L	9.5	+/- 0.64	0.30	9043079	4.7	+/- 0.34	0.30	9043079
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	9043079	0.84	+/- 0.10	0.060	9043079
Dissolved Magnesium (Mg)	mg/L	1.2	+/- <RDL	0.20	9043079	0.64	+/- <RDL	0.20	9043079
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	9043079	0.018	+/- <RDL	0.0040	9043079
Dissolved Potassium (K)	mg/L	2.4	+/- <RDL	0.30	9043079	1.8	+/- <RDL	0.30	9043079
Dissolved Sodium (Na)	mg/L	640 (1)	+/- 38	5.0	9043079	430	+/- 26	0.50	9043079

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
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ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8452				TS8453			
Sampling Date		2018/06/26 14:20				2018/06/26 14:30			
COC Number		557643-01-01				557643-01-01			
	UNITS	MW 1B	MU	RDL	QC Batch	MW 1C	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	27	N/A	N/A	9041434	70	N/A	N/A	9041778
Cation Sum	meq/L	28	N/A	N/A	9041434	71	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	27	N/A	0.50	9041676	510	N/A	0.50	9041676
Ion Balance (% Difference)	%	0.52	N/A	N/A	9041677	0.72	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	3.3	N/A	0.020	9041498	0.15	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	15	N/A	0.089	9040998	0.67	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	0.12	N/A	0.033	9040998	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	1600	N/A	0.022	9041679	4700	N/A	0.022	9041679
Misc. Inorganics									
Conductivity	uS/cm	2500	+/- 220	2.0	9043081	6100	+/- 540	2.0	9043081
pH	pH	8.29	+/- 0.120	N/A	9043077	8.10	+/- 0.117	N/A	9043077
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	9041571	<0.020	N/A	0.020	9041571
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	9043080	<1.0	N/A	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	940	+/- 40	1.0	9043080	620	+/- 27	1.0	9043080
Bicarbonate (HCO3)	mg/L	1100	+/- 270	1.0	9043080	760	+/- 180	1.0	9043080
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	9043080	<1.0	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9043080	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	390 (1)	+/- 66	5.0	9043354	2700 (1)	+/- 460	20	9043354
Dissolved Chloride (Cl)	mg/L	9.6	+/- <RDL	1.0	9043333	<1.0	N/A	1.0	9043333
Nutrients									
Dissolved Nitrite (N)	mg/L	0.037	N/A	0.010	9043005	<0.010	N/A	0.010	9043005
Dissolved Nitrate plus Nitrite (N)	mg/L	3.3	N/A	0.020	9043005	0.15	N/A	0.020	9043005
Elements									
Dissolved Aluminum (Al)	mg/L	0.0030	+/- <RDL	0.0030	9043723	<0.0030	N/A	0.0030	9043723
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9043723	<0.00060	N/A	0.00060	9043723
Dissolved Arsenic (As)	mg/L	0.0012	+/- <RDL	0.00020	9043723	0.00068	+/- <RDL	0.00020	9043723
Dissolved Barium (Ba)	mg/L	0.030	+/- <RDL	0.010	9044992	<0.10	N/A	0.10	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9043723	<0.0010	N/A	0.0010	9043723

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8452				TS8453			
Sampling Date		2018/06/26 14:20				2018/06/26 14:30			
COC Number		557643-01-01				557643-01-01			
	UNITS	MW 1B	MU	RDL	QC Batch	MW 1C	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.72	+/- 0.060	0.020	9044992	0.24	+/- <RDL	0.20	9044992
Dissolved Calcium (Ca)	mg/L	9.1	+/- 0.62	0.30	9044992	140	+/- 9.3	3.0	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9043723	<0.0010	N/A	0.0010	9043723
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	9043723	0.00069	+/- <RDL	0.00030	9043723
Dissolved Copper (Cu)	mg/L	0.0021	+/- 0.00047	0.00020	9043723	0.00043	+/- 0.00040	0.00020	9043723
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	9044992	<0.60	N/A	0.60	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	9043723	<0.00020	N/A	0.00020	9043723
Dissolved Lithium (Li)	mg/L	0.14	+/- <RDL	0.020	9044992	0.34	+/- <RDL	0.20	9044992
Dissolved Magnesium (Mg)	mg/L	1.1	+/- <RDL	0.20	9044992	37	+/- <RDL	2.0	9044992
Dissolved Manganese (Mn)	mg/L	0.027	+/- <RDL	0.0040	9044992	0.27	+/- <RDL	0.040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.0073	+/- 0.00072	0.00020	9043723	0.00082	+/- 0.00021	0.00020	9043723
Dissolved Nickel (Ni)	mg/L	0.0044	+/- <RDL	0.00050	9043723	0.0016	+/- <RDL	0.00050	9043723
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	9044992	<1.0	N/A	1.0	9044992
Dissolved Potassium (K)	mg/L	2.2	+/- <RDL	0.30	9044992	6.7	+/- <RDL	3.0	9044992
Dissolved Selenium (Se)	mg/L	0.00023	+/- <RDL	0.00020	9043723	<0.00020	N/A	0.00020	9043723
Dissolved Silicon (Si)	mg/L	2.8	+/- 0.29	0.10	9044992	4.0	+/- <RDL	1.0	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9043723	<0.00010	N/A	0.00010	9043723
Dissolved Sodium (Na)	mg/L	620 (1)	+/- 37	5.0	9044992	1400	+/- 82	5.0	9044992
Dissolved Strontium (Sr)	mg/L	0.19	+/- <RDL	0.020	9044992	2.3	+/- <RDL	0.20	9044992
Dissolved Sulphur (S)	mg/L	130	+/- 8.4	0.20	9044992	940	+/- 59	2.0	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9043723	<0.00020	N/A	0.00020	9043723
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9043723	<0.0010	N/A	0.0010	9043723
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	9043723	<0.0010	N/A	0.0010	9043723
Dissolved Uranium (U)	mg/L	0.0018	+/- 0.00018	0.00010	9043723	0.00018	+/- <RDL	0.00010	9043723
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	9043723	<0.0010	N/A	0.0010	9043723
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	9043723	<0.0030	N/A	0.0030	9043723

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8454			TS8455			
Sampling Date		2018/06/26 15:50			2018/06/26 16:00			
COC Number		557643-01-01			557643-01-01			
	UNITS	MW 9	MU	RDL	MW 11	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	88	N/A	N/A	110	N/A	N/A	9041778
Cation Sum	meq/L	88	N/A	N/A	120	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	510	N/A	0.50	1100	N/A	0.50	9041676
Ion Balance (% Difference)	%	0.019	N/A	N/A	3.8	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.46	N/A	0.020	0.33	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	2.0	N/A	0.089	1.5	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	0.042	N/A	0.033	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	5800	N/A	0.022	7800	N/A	0.022	9041679
Misc. Inorganics								
Conductivity	uS/cm	7500	+/- 660	2.0	9800	+/- 860	2.0	9043081
pH	pH	8.00	+/- 0.116	N/A	8.01	+/- 0.116	N/A	9043077
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	<0.020	N/A	0.020	9041571
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	860	+/- 37	1.0	830	+/- 36	1.0	9043080
Bicarbonate (HCO3)	mg/L	1000	+/- 250	1.0	1000	+/- 240	1.0	9043080
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	3400 (1)	+/- 570	20	4600 (1)	+/- 770	50	9043354
Dissolved Chloride (Cl)	mg/L	16	+/- 1.1	1.0	36	+/- 2.3	1.0	9043333
Nutrients								
Dissolved Nitrite (N)	mg/L	0.013	N/A	0.010	<0.010	N/A	0.010	9043005
Dissolved Nitrate plus Nitrite (N)	mg/L	0.47	N/A	0.020	0.33	N/A	0.020	9043005
Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	0.0055	+/- <RDL	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00063	+/- <RDL	0.00020	0.0011	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8454			TS8455			
Sampling Date		2018/06/26 15:50			2018/06/26 16:00			
COC Number		557643-01-01			557643-01-01			
	UNITS	MW 9	MU	RDL	MW 11	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.31	+/- <RDL	0.20	0.21	+/- <RDL	0.20	9044992
Dissolved Calcium (Ca)	mg/L	110	+/- 7.0	3.0	240	+/- 15	3.0	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	0.0011	+/- <RDL	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	0.00083	+/- <RDL	0.00030	<0.00030	N/A	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.0010	+/- 0.00042	0.00020	0.0026	+/- 0.00050	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.60	N/A	0.60	<0.60	N/A	0.60	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.33	+/- <RDL	0.20	0.59	+/- <RDL	0.20	9044992
Dissolved Magnesium (Mg)	mg/L	57	+/- 3.0	2.0	130	+/- 6.9	2.0	9044992
Dissolved Manganese (Mn)	mg/L	0.24	+/- <RDL	0.040	<0.040	N/A	0.040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.011	+/- 0.0010	0.00020	0.0011	+/- 0.00022	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0040	+/- <RDL	0.00050	0.0056	+/- 0.00057	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9044992
Dissolved Potassium (K)	mg/L	14	+/- <RDL	3.0	8.7	+/- <RDL	3.0	9044992
Dissolved Selenium (Se)	mg/L	0.00027	+/- <RDL	0.00020	0.00095	+/- <RDL	0.00020	9043727
Dissolved Silicon (Si)	mg/L	4.7	+/- <RDL	1.0	4.7	+/- <RDL	1.0	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	1800	+/- 110	5.0	2300	+/- 140	5.0	9044992
Dissolved Strontium (Sr)	mg/L	2.0	+/- <RDL	0.20	4.3	+/- 0.31	0.20	9044992
Dissolved Sulphur (S)	mg/L	1100	+/- 72	2.0	1700	+/- 110	2.0	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	0.0030	+/- <RDL	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.0032	+/- 0.00031	0.00010	0.030	+/- 0.0030	0.00010	9043727
Dissolved Vanadium (V)	mg/L	0.0025	+/- <RDL	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	0.0037	+/- <RDL	0.0030	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8456		TS8457			
Sampling Date		2018/06/26 15:00		2018/06/26 14:50			
COC Number		557643-01-01		557643-01-01			
	UNITS	MW 12A	MU	MW 12B	MU	RDL	QC Batch
Calculated Parameters							
Anion Sum	meq/L	120	N/A	120	N/A	N/A	9041778
Cation Sum	meq/L	130	N/A	130	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	630	N/A	780	N/A	0.50	9041676
Ion Balance (% Difference)	%	3.9	N/A	4.5	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.18	N/A	0.64	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	0.79	N/A	2.8	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	0.18	N/A	0.040	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	8200	N/A	8200	N/A	0.022	9041679
Misc. Inorganics							
Conductivity	uS/cm	10000	+/- 920	11000	+/- 930	2.0	9043081
pH	pH	8.02	+/- 0.116	8.01	+/- 0.116	N/A	9043077
Low Level Elements							
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	<0.020	N/A	0.020	9041571
Anions							
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	<1.0	N/A	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	790	+/- 34	670	+/- 29	1.0	9043080
Bicarbonate (HCO3)	mg/L	960	+/- 230	820	+/- 190	1.0	9043080
Carbonate (CO3)	mg/L	<1.0	N/A	<1.0	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	4900 (1)	+/- 830	4900 (1)	+/- 830	50	9043354
Dissolved Chloride (Cl)	mg/L	1.7	+/- <RDL	4.7	+/- <RDL	1.0	9043333
Nutrients							
Dissolved Nitrite (N)	mg/L	0.054	N/A	0.012	N/A	0.010	9043005
Dissolved Nitrate plus Nitrite (N)	mg/L	0.23	N/A	0.65	N/A	0.020	9043005
Elements							
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	<0.0030	N/A	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00054	+/- <RDL	0.00066	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	<0.10	N/A	<0.10	N/A	0.10	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	9043727

RDL = Reportable Detection Limit
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N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8456		TS8457			
Sampling Date		2018/06/26 15:00		2018/06/26 14:50			
COC Number		557643-01-01		557643-01-01			
	UNITS	MW 12A	MU	MW 12B	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.44	+/- <RDL	0.59	+/- <RDL	0.20	9044992
Dissolved Calcium (Ca)	mg/L	130	+/- 8.3	230	+/- 15	3.0	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00033	+/- <RDL	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.0019	+/- 0.00046	0.0027	+/- 0.00051	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.60	N/A	<0.60	N/A	0.60	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.61	+/- <RDL	0.56	+/- <RDL	0.20	9044992
Dissolved Magnesium (Mg)	mg/L	74	+/- 3.9	47	+/- 2.4	2.0	9044992
Dissolved Manganese (Mn)	mg/L	<0.040	N/A	0.30	+/- <RDL	0.040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.00041	+/- 0.00020	0.00081	+/- 0.00021	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0034	+/- <RDL	0.0022	+/- <RDL	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<1.0	N/A	<1.0	N/A	1.0	9044992
Dissolved Potassium (K)	mg/L	11	+/- <RDL	9.3	+/- <RDL	3.0	9044992
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00022	+/- <RDL	0.00020	9043727
Dissolved Silicon (Si)	mg/L	4.6	+/- <RDL	4.3	+/- <RDL	1.0	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	2600	+/- 160	2500	+/- 150	5.0	9044992
Dissolved Strontium (Sr)	mg/L	2.9	+/- 0.20	4.8	+/- 0.35	0.20	9044992
Dissolved Sulphur (S)	mg/L	1800	+/- 110	1900	+/- 120	2.0	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.0013	+/- 0.00013	0.018	+/- 0.0017	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	0.0050	+/- <RDL	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8458			TS8459			
Sampling Date		2018/06/26 15:40			2018/06/26 14:15			
COC Number		557643-01-01			557643-01-01			
	UNITS	MW 14	MU	RDL	MW 18A	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	66	N/A	N/A	17	N/A	N/A	9041778
Cation Sum	meq/L	67	N/A	N/A	17	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	1600	N/A	0.50	8.3	N/A	0.50	9041676
Ion Balance (% Difference)	%	0.13	N/A	N/A	1.1	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.19	N/A	0.020	<0.020	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	0.84	N/A	0.089	<0.089	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	0.084	N/A	0.033	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	4100	N/A	0.022	910	N/A	0.022	9041679
Misc. Inorganics								
Conductivity	uS/cm	5100	+/- 450	2.0	1500	+/- 130	2.0	9043081
pH	pH	8.00	+/- 0.116	N/A	8.45	+/- 0.123	N/A	9043077
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	0.027	+/- <RDL	0.020	<0.020	N/A	0.020	9041571
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	12	+/- 2.7	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	1000	+/- 44	1.0	850	+/- 37	1.0	9043080
Bicarbonate (HCO3)	mg/L	1200	+/- 290	1.0	1000	+/- 240	1.0	9043080
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	14	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	2200 (1)	+/- 370	20	<1.0	N/A	1.0	9043354
Dissolved Chloride (Cl)	mg/L	1.4	+/- <RDL	1.0	7.5	+/- <RDL	1.0	9043333
Nutrients								
Dissolved Nitrite (N)	mg/L	0.026	N/A	0.010	<0.010	N/A	0.010	9043005
Dissolved Nitrate plus Nitrite (N)	mg/L	0.22	N/A	0.020	<0.020	N/A	0.020	9043005
Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	0.0074	+/- <RDL	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00053	+/- <RDL	0.00020	0.0013	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	0.033	+/- <RDL	0.010	0.10	+/- 0.013	0.010	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727

RDL = Reportable Detection Limit
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N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8458			TS8459			
Sampling Date		2018/06/26 15:40			2018/06/26 14:15			
COC Number		557643-01-01			557643-01-01			
	UNITS	MW 14	MU	RDL	MW 18A	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.12	+/- <RDL	0.020	0.83	+/- 0.068	0.020	9044992
Dissolved Calcium (Ca)	mg/L	250	+/- 16	0.30	2.8	+/- <RDL	0.30	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	0.0018	+/- <RDL	0.00030	<0.00030	N/A	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.00080	+/- 0.00041	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	<0.060	N/A	0.060	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.42	+/- 0.020	0.020	0.077	+/- <RDL	0.020	9044992
Dissolved Magnesium (Mg)	mg/L	230	+/- 12	0.20	0.30	+/- <RDL	0.20	9044992
Dissolved Manganese (Mn)	mg/L	0.42	+/- 0.013	0.0040	0.049	+/- <RDL	0.0040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.00051	+/- 0.00021	0.00020	0.0063	+/- 0.00063	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0028	+/- <RDL	0.00050	0.0025	+/- <RDL	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	9044992
Dissolved Potassium (K)	mg/L	28	+/- 1.7	0.30	1.4	+/- <RDL	0.30	9044992
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Silicon (Si)	mg/L	7.1	+/- 0.69	0.10	3.7	+/- 0.37	0.10	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	800 (1)	+/- 47	5.0	380	+/- 23	0.50	9044992
Dissolved Strontium (Sr)	mg/L	3.8	+/- 0.28	0.020	0.064	+/- <RDL	0.020	9044992
Dissolved Sulphur (S)	mg/L	760 (1)	+/- 48	2.0	<0.20	N/A	0.20	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.00051	+/- <RDL	0.00010	0.00029	+/- <RDL	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8460			TS8461			
Sampling Date		2018/06/26 14:25			2018/06/26 13:20			
COC Number		557643-01-01			557643-01-01			
	UNITS	MW 18B	MU	RDL	MW 19A	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	38	N/A	N/A	80	N/A	N/A	9041778
Cation Sum	meq/L	39	N/A	N/A	81	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	740	N/A	0.50	250	N/A	0.50	9041676
Ion Balance (% Difference)	%	1.9	N/A	N/A	0.51	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.17	N/A	0.020	0.022	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	0.77	N/A	0.089	0.097	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	0.033	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	2400	N/A	0.022	5300	N/A	0.022	9041679
Misc. Inorganics								
Conductivity	uS/cm	3300	+/- 290	2.0	7000	+/- 610	2.0	9043081
pH	pH	7.89	+/- 0.114	N/A	8.22	+/- 0.119	N/A	9043077
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	<0.020	N/A	0.020	9041571
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	650	+/- 28	1.0	980	+/- 42	1.0	9043080
Bicarbonate (HCO3)	mg/L	800	+/- 190	1.0	1200	+/- 280	1.0	9043080
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	1100 (1)	+/- 190	10	2900 (1)	+/- 480	20	9043354
Dissolved Chloride (Cl)	mg/L	44	+/- 2.8	1.0	8.2	+/- <RDL	1.0	9043333
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.010	N/A	0.010	<0.010	N/A	0.010	9043005
Dissolved Nitrate plus Nitrite (N)	mg/L	0.17	N/A	0.020	0.022	N/A	0.020	9043005
Elements								
Dissolved Aluminum (Al)	mg/L	0.0040	+/- <RDL	0.0030	<0.0030	N/A	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00037	+/- <RDL	0.00020	0.00056	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	0.015	+/- <RDL	0.010	<0.10	N/A	0.10	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8460			TS8461			
Sampling Date		2018/06/26 14:25			2018/06/26 13:20			
COC Number		557643-01-01			557643-01-01			
	UNITS	MW 18B	MU	RDL	MW 19A	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.069	+/- <RDL	0.020	0.47	+/- <RDL	0.20	9044992
Dissolved Calcium (Ca)	mg/L	210	+/- 13	0.30	63	+/- 4.1	3.0	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	0.00090	+/- <RDL	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.0012	+/- 0.00043	0.00020	0.00022	+/- 0.00040	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	<0.60	N/A	0.60	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.17	+/- <RDL	0.020	0.53	+/- <RDL	0.20	9044992
Dissolved Magnesium (Mg)	mg/L	55	+/- 2.8	0.20	21	+/- <RDL	2.0	9044992
Dissolved Manganese (Mn)	mg/L	0.057	+/- <RDL	0.0040	0.71	+/- <RDL	0.040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.00056	+/- 0.00021	0.00020	0.0030	+/- 0.00035	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0037	+/- <RDL	0.00050	0.0029	+/- <RDL	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	<1.0	N/A	1.0	9044992
Dissolved Potassium (K)	mg/L	4.7	+/- 0.36	0.30	7.4	+/- <RDL	3.0	9044992
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Silicon (Si)	mg/L	5.5	+/- 0.55	0.10	4.0	+/- <RDL	1.0	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	560 (1)	+/- 33	5.0	1700	+/- 100	5.0	9044992
Dissolved Strontium (Sr)	mg/L	1.6	+/- 0.12	0.020	1.5	+/- <RDL	0.20	9044992
Dissolved Sulphur (S)	mg/L	390	+/- 24	0.20	970	+/- 61	2.0	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.0042	+/- 0.00041	0.00010	0.0060	+/- 0.00058	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8462			TS8463			
Sampling Date		2018/06/26 13:30			2018/06/26 14:00			
COC Number		557643-02-01			557643-02-01			
	UNITS	MW 19B	MU	RDL	MW 20A	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	65	N/A	N/A	38	N/A	N/A	9041778
Cation Sum	meq/L	65	N/A	N/A	38	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	150	N/A	0.50	64	N/A	0.50	9041676
Ion Balance (% Difference)	%	0.54	N/A	N/A	0.042	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.038	N/A	0.020	2.8	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	0.17	N/A	0.089	12	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	0.038	N/A	0.033	0.12	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	4300	N/A	0.022	2300	N/A	0.022	9041679
Misc. Inorganics								
Conductivity	uS/cm	5800	+/- 510	2.0	3400	+/- 300	2.0	9043076
pH	pH	8.30	+/- 0.120	N/A	8.08	+/- 0.117	N/A	9043074
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	<0.020	N/A	0.020	9041571
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043075
Alkalinity (Total as CaCO3)	mg/L	910	+/- 39	1.0	1000	+/- 45	1.0	9043075
Bicarbonate (HCO3)	mg/L	1100	+/- 260	1.0	1300	+/- 300	1.0	9043075
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043075
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043075
Dissolved Sulphate (SO4)	mg/L	2200 (1)	+/- 380	20	820 (1)	+/- 140	5.0	9043357
Dissolved Chloride (Cl)	mg/L	2.8	+/- <RDL	1.0	8.1	+/- <RDL	1.0	9043356
Nutrients								
Dissolved Nitrite (N)	mg/L	0.012	N/A	0.010	0.036	N/A	0.010	9042922
Dissolved Nitrate plus Nitrite (N)	mg/L	0.049	N/A	0.020	2.8	N/A	0.020	9042922
Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	0.0040	+/- <RDL	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.0017	+/- <RDL	0.00020	0.00040	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	<0.10	N/A	0.10	0.022	+/- <RDL	0.010	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727

RDL = Reportable Detection Limit
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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8462			TS8463			
Sampling Date		2018/06/26 13:30			2018/06/26 14:00			
COC Number		557643-02-01			557643-02-01			
	UNITS	MW 19B	MU	RDL	MW 20A	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.49	+/- <RDL	0.20	0.88	+/- 0.072	0.020	9044992
Dissolved Calcium (Ca)	mg/L	30	+/- <RDL	3.0	21	+/- 1.4	0.30	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	<0.00030	N/A	0.00030	9043727
Dissolved Copper (Cu)	mg/L	<0.00020	N/A	0.00020	0.00088	+/- 0.00041	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.60	N/A	0.60	<0.060	N/A	0.060	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.51	+/- <RDL	0.20	0.24	+/- <RDL	0.020	9044992
Dissolved Magnesium (Mg)	mg/L	17	+/- <RDL	2.0	2.8	+/- <RDL	0.20	9044992
Dissolved Manganese (Mn)	mg/L	0.17	+/- <RDL	0.040	0.016	+/- <RDL	0.0040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.0016	+/- 0.00025	0.00020	0.0013	+/- 0.00023	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.00082	+/- <RDL	0.00050	0.0012	+/- <RDL	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<1.0	N/A	1.0	<0.10	N/A	0.10	9044992
Dissolved Potassium (K)	mg/L	7.7	+/- <RDL	3.0	3.4	+/- <RDL	0.30	9044992
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Silicon (Si)	mg/L	4.5	+/- <RDL	1.0	3.2	+/- 0.32	0.10	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	1400	+/- 85	5.0	850 (1)	+/- 50	5.0	9044992
Dissolved Strontium (Sr)	mg/L	1.1	+/- <RDL	0.20	0.42	+/- 0.030	0.020	9044992
Dissolved Sulphur (S)	mg/L	740	+/- 47	2.0	260	+/- 16	0.20	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.00027	+/- <RDL	0.00010	0.0015	+/- 0.00015	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8464			TS8465			
Sampling Date		2018/06/26 13:50			2018/06/26 11:40			
COC Number		557643-02-01			557643-02-01			
	UNITS	MW 20B	MU	RDL	MW 21A	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	54	N/A	N/A	23	N/A	N/A	9041778
Cation Sum	meq/L	56	N/A	N/A	23	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	480	N/A	0.50	12	N/A	0.50	9041676
Ion Balance (% Difference)	%	1.2	N/A	N/A	0.25	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.079	N/A	0.020	0.62	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	0.35	N/A	0.089	2.7	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	0.033	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	3500	N/A	0.022	1300	N/A	0.022	9041679
Misc. Inorganics								
Conductivity	uS/cm	4800	+/- 420	2.0	2000	+/- 180	2.0	9043081
pH	pH	8.10	+/- 0.117	N/A	8.35	+/- 0.121	N/A	9043077
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	0.12	+/- 0.020	0.020	9041571
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	6.7	+/- 2.6	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	820	+/- 35	1.0	1100	+/- 46	1.0	9043080
Bicarbonate (HCO3)	mg/L	1000	+/- 240	1.0	1300	+/- 310	1.0	9043080
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	8.0	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	1800 (1)	+/- 310	20	63	+/- 11	1.0	9043357
Dissolved Chloride (Cl)	mg/L	<1.0	N/A	1.0	11	+/- <RDL	1.0	9043356
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.010	N/A	0.010	<0.010	N/A	0.010	9043005
Dissolved Nitrate plus Nitrite (N)	mg/L	0.079	N/A	0.020	0.62	N/A	0.020	9043005
Elements								
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00027	+/- <RDL	0.00020	0.0012	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	0.016	+/- <RDL	0.010	0.081	+/- 0.011	0.010	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727

RDL = Reportable Detection Limit
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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8464			TS8465			
Sampling Date		2018/06/26 13:50			2018/06/26 11:40			
COC Number		557643-02-01			557643-02-01			
	UNITS	MW 20B	MU	RDL	MW 21A	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.34	+/- 0.031	0.020	0.90	+/- 0.073	0.020	9044992
Dissolved Calcium (Ca)	mg/L	120	+/- 8.1	0.30	4.3	+/- 0.31	0.30	9044992
Dissolved Chromium (Cr)	mg/L	0.0016	+/- <RDL	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	<0.00030	N/A	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.00073	+/- 0.00041	0.00020	0.0021	+/- 0.00047	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	<0.060	N/A	0.060	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.49	+/- 0.023	0.020	0.12	+/- <RDL	0.020	9044992
Dissolved Magnesium (Mg)	mg/L	42	+/- 2.2	0.20	0.40	+/- <RDL	0.20	9044992
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	0.0048	+/- <RDL	0.0040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.00069	+/- 0.00021	0.00020	0.0059	+/- 0.00060	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0015	+/- <RDL	0.00050	0.0031	+/- <RDL	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	9044992
Dissolved Potassium (K)	mg/L	9.3	+/- 0.62	0.30	1.7	+/- <RDL	0.30	9044992
Dissolved Selenium (Se)	mg/L	0.00073	+/- <RDL	0.00020	0.00025	+/- <RDL	0.00020	9043727
Dissolved Silicon (Si)	mg/L	4.7	+/- 0.47	0.10	2.9	+/- 0.30	0.10	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	1100 (1)	+/- 62	5.0	530 (1)	+/- 31	5.0	9044992
Dissolved Strontium (Sr)	mg/L	1.7	+/- 0.12	0.020	0.10	+/- <RDL	0.020	9044992
Dissolved Sulphur (S)	mg/L	620 (1)	+/- 39	2.0	20	+/- 1.3	0.20	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.0034	+/- 0.00033	0.00010	0.0035	+/- 0.00034	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8466				TS8467			
Sampling Date		2018/06/26 11:50				2018/06/26 10:10			
COC Number		557643-02-01				557643-02-01			
	UNITS	MW 21B	MU	RDL	QC Batch	MW 22A	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	31	N/A	N/A	9041778	57	N/A	N/A	9041778
Cation Sum	meq/L	31	N/A	N/A	9041778	58	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	72	N/A	0.50	9041676	100	N/A	0.50	9041676
Ion Balance (% Difference)	%	0.26	N/A	N/A	9041677	1.1	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.10	N/A	0.020	9041498	14	N/A	0.20	9041498
Dissolved Nitrate (NO3)	mg/L	0.46	N/A	0.089	9041779	62	N/A	0.89	9041779
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	0.033	9041779	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	1900	N/A	0.022	9041679	3800	N/A	0.20	9041679
Misc. Inorganics									
Conductivity	uS/cm	2900	+/- 250	2.0	9043081	5300	+/- 460	2.0	9043076
pH	pH	8.29	+/- 0.120	N/A	9043077	8.08	+/- 0.117	N/A	9043074
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	9041571	0.047	+/- <RDL	0.020	9041571
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	9043080	<1.0	N/A	1.0	9043075
Alkalinity (Total as CaCO3)	mg/L	870	+/- 37	1.0	9043080	770	+/- 33	1.0	9043075
Bicarbonate (HCO3)	mg/L	1100	+/- 250	1.0	9043080	940	+/- 220	1.0	9043075
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	9043080	<1.0	N/A	1.0	9043075
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9043080	<1.0	N/A	1.0	9043075
Dissolved Sulphate (SO4)	mg/L	650 (1)	+/- 110	5.0	9043354	1900 (1)	+/- 320	20	9043357
Dissolved Chloride (Cl)	mg/L	1.3	+/- <RDL	1.0	9043333	13	+/- <RDL	1.0	9043356
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	N/A	0.010	9043005	<0.010	N/A	0.010	9042922
Dissolved Nitrate plus Nitrite (N)	mg/L	0.10	N/A	0.020	9043005	14 (1)	N/A	0.20	9042922
Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	9043727	<0.0030	N/A	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9043727	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00066	+/- <RDL	0.00020	9043727	0.00028	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	<0.010	N/A	0.010	9044992	<0.10	N/A	0.10	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8466				TS8467			
Sampling Date		2018/06/26 11:50				2018/06/26 10:10			
COC Number		557643-02-01				557643-02-01			
	UNITS	MW 21B	MU	RDL	QC Batch	MW 22A	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.23	+/- 0.023	0.020	9044992	0.84	+/- <RDL	0.20	9044992
Dissolved Calcium (Ca)	mg/L	19	+/- 1.3	0.30	9044992	36	+/- <RDL	3.0	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	9043727	<0.00030	N/A	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.00072	+/- 0.00041	0.00020	9043727	0.0012	+/- 0.00042	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	9044992	<0.60	N/A	0.60	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.27	+/- <RDL	0.020	9044992	0.31	+/- <RDL	0.20	9044992
Dissolved Magnesium (Mg)	mg/L	6.1	+/- 0.34	0.20	9044992	3.3	+/- <RDL	2.0	9044992
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	9044992	<0.040	N/A	0.040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.0015	+/- 0.00025	0.00020	9043727	0.0055	+/- 0.00056	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0012	+/- <RDL	0.00050	9043727	0.0022	+/- <RDL	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	9044992	<1.0	N/A	1.0	9044992
Dissolved Potassium (K)	mg/L	4.2	+/- 0.33	0.30	9044992	4.3	+/- <RDL	3.0	9044992
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Silicon (Si)	mg/L	4.0	+/- 0.40	0.10	9044992	2.6	+/- <RDL	1.0	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9043727	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	680 (1)	+/- 40	5.0	9044992	1300	+/- 76	5.0	9044992
Dissolved Strontium (Sr)	mg/L	0.30	+/- 0.022	0.020	9044992	0.88	+/- <RDL	0.20	9044992
Dissolved Sulphur (S)	mg/L	220	+/- 14	0.20	9044992	670	+/- 42	2.0	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.0019	+/- 0.00019	0.00010	9043727	0.0041	+/- 0.00040	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	9043727	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8468				TS8469			
Sampling Date		2018/06/26 09:50				2018/06/26 10:30			
COC Number		557643-02-01				557643-02-01			
	UNITS	MW 22B	MU	RDL	QC Batch	MW 23A	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	94	N/A	N/A	9041778	25	N/A	N/A	9041778
Cation Sum	meq/L	95	N/A	N/A	9041778	25	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	480	N/A	0.50	9041676	12	N/A	0.50	9041676
Ion Balance (% Difference)	%	0.19	N/A	N/A	9041677	0.13	N/A	N/A	9041677
Dissolved Nitrate (N)	mg/L	0.039	N/A	0.020	9041498	<0.020	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	0.17	N/A	0.089	9041779	<0.089	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	0.033	9041779	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	6300	N/A	0.022	9041679	1300	N/A	0.022	9041679
Misc. Inorganics									
Conductivity	uS/cm	8000	+/- 700	2.0	9043076	2200	+/- 190	2.0	9043081
pH	pH	7.98	+/- 0.116	N/A	9043074	8.51	+/- 0.123	N/A	9043077
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	0.021	+/- <RDL	0.020	9041571	0.026	+/- <RDL	0.020	9041571
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	9043075	26	+/- 3.0	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	1000	+/- 43	1.0	9043075	1100	+/- 48	1.0	9043080
Bicarbonate (HCO3)	mg/L	1200	+/- 290	1.0	9043075	1300	+/- 310	1.0	9043080
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	9043075	31	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9043075	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	3600 (1)	+/- 600	20	9043357	88	+/- 15	1.0	9043357
Dissolved Chloride (Cl)	mg/L	1.7	+/- <RDL	1.0	9043356	20	+/- 1.3	1.0	9043356
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	N/A	0.010	9042922	<0.010	N/A	0.010	9043005
Dissolved Nitrate plus Nitrite (N)	mg/L	0.039	N/A	0.020	9042922	<0.020	N/A	0.020	9043005
Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	9043727	<0.0030	N/A	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9043727	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00024	+/- <RDL	0.00020	9043727	0.0056	+/- 0.00040	0.00020	9043727
Dissolved Barium (Ba)	mg/L	<0.10	N/A	0.10	9044992	0.058	+/- <RDL	0.010	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727

RDL = Reportable Detection Limit
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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8468				TS8469			
Sampling Date		2018/06/26 09:50				2018/06/26 10:30			
COC Number		557643-02-01				557643-02-01			
	UNITS	MW 22B	MU	RDL	QC Batch	MW 23A	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.24	+/- <RDL	0.20	9044992	0.87	+/- 0.071	0.020	9044992
Dissolved Calcium (Ca)	mg/L	110	+/- 7.0	3.0	9044992	4.1	+/- 0.31	0.30	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	9043727	<0.00030	N/A	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.00072	+/- 0.00041	0.00020	9043727	0.00029	+/- 0.00040	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.60	N/A	0.60	9044992	<0.060	N/A	0.060	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.69	+/- <RDL	0.20	9044992	0.12	+/- <RDL	0.020	9044992
Dissolved Magnesium (Mg)	mg/L	53	+/- 2.7	2.0	9044992	0.49	+/- <RDL	0.20	9044992
Dissolved Manganese (Mn)	mg/L	<0.040	N/A	0.040	9044992	0.0084	+/- <RDL	0.0040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.00098	+/- 0.00022	0.00020	9043727	0.0042	+/- 0.00045	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0016	+/- <RDL	0.00050	9043727	0.0022	+/- <RDL	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<1.0	N/A	1.0	9044992	0.10	+/- <RDL	0.10	9044992
Dissolved Potassium (K)	mg/L	9.4	+/- <RDL	3.0	9044992	2.0	+/- <RDL	0.30	9044992
Dissolved Selenium (Se)	mg/L	0.00037	+/- <RDL	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Silicon (Si)	mg/L	4.4	+/- <RDL	1.0	9044992	3.5	+/- 0.35	0.10	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9043727	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	1900	+/- 120	5.0	9044992	560 (1)	+/- 33	5.0	9044992
Dissolved Strontium (Sr)	mg/L	2.3	+/- <RDL	0.20	9044992	0.12	+/- <RDL	0.020	9044992
Dissolved Sulphur (S)	mg/L	1200	+/- 76	2.0	9044992	27	+/- 1.7	0.20	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.0072	+/- 0.00070	0.00010	9043727	0.0024	+/- 0.00023	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	9043727	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8470				TS8471			
Sampling Date		2018/06/26 10:20				2018/06/26 11:20			
COC Number		557643-02-01				557643-02-01			
	UNITS	MW 23B	MU	RDL	QC Batch	MW 25A	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	120	N/A	N/A	9041778	24	N/A	N/A	9041778
Cation Sum	meq/L	120	N/A	N/A	9041778	24	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	710	N/A	0.50	9041676	14	N/A	0.50	9041676
Ion Balance (% Difference)	%	1.2	N/A	N/A	9041677	0.22	N/A	N/A	9041777
Dissolved Nitrate (N)	mg/L	0.068	N/A	0.020	9041498	<0.020	N/A	0.020	9041498
Dissolved Nitrate (NO3)	mg/L	0.30	N/A	0.089	9041779	<0.089	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	0.033	9041779	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	8000	N/A	0.022	9041679	1300	N/A	0.022	9041679
Misc. Inorganics									
Conductivity	uS/cm	10000	+/- 880	2.0	9043081	2100	+/- 180	2.0	9043081
pH	pH	7.95	+/- 0.115	N/A	9043077	8.51	+/- 0.123	N/A	9043077
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	0.035	+/- <RDL	0.020	9041571	<0.020	N/A	0.020	9041571
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	9043080	25	+/- 2.9	1.0	9043080
Alkalinity (Total as CaCO3)	mg/L	860	+/- 37	1.0	9043080	1200	+/- 52	1.0	9043080
Bicarbonate (HCO3)	mg/L	1100	+/- 250	1.0	9043080	1400	+/- 330	1.0	9043080
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	9043080	30	N/A	1.0	9043080
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9043080	<1.0	N/A	1.0	9043080
Dissolved Sulphate (SO4)	mg/L	4800 (1)	+/- 800	50	9043357	<1.0	N/A	1.0	9043357
Dissolved Chloride (Cl)	mg/L	3.2	+/- <RDL	1.0	9043356	9.4	+/- <RDL	1.0	9043356
Nutrients									
Dissolved Nitrite (N)	mg/L	<0.010	N/A	0.010	9043005	<0.010	N/A	0.010	9042922
Dissolved Nitrate plus Nitrite (N)	mg/L	0.068	N/A	0.020	9043005	<0.020	N/A	0.020	9042922
Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	9043727	0.0034	+/- <RDL	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9043727	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00022	+/- <RDL	0.00020	9043727	0.0024	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	<0.10	N/A	0.10	9044992	0.083	+/- 0.011	0.010	9044992
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727

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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8470				TS8471			
Sampling Date		2018/06/26 10:20				2018/06/26 11:20			
COC Number		557643-02-01				557643-02-01			
	UNITS	MW 23B	MU	RDL	QC Batch	MW 25A	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.35	+/- <RDL	0.20	9044992	0.89	+/- 0.072	0.020	9044992
Dissolved Calcium (Ca)	mg/L	170	+/- 11	3.0	9044992	4.7	+/- 0.34	0.30	9044992
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	0.00035	+/- <RDL	0.00030	9043727	0.00033	+/- <RDL	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.00030	+/- 0.00040	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.60	N/A	0.60	9044992	0.069	+/- <RDL	0.060	9044992
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.88	+/- <RDL	0.20	9044992	0.11	+/- <RDL	0.020	9044992
Dissolved Magnesium (Mg)	mg/L	68	+/- 3.5	2.0	9044992	0.45	+/- <RDL	0.20	9044992
Dissolved Manganese (Mn)	mg/L	0.12	+/- <RDL	0.040	9044992	0.13	+/- 0.0043	0.0040	9044992
Dissolved Molybdenum (Mo)	mg/L	0.00030	+/- 0.00020	0.00020	9043727	0.0076	+/- 0.00075	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0013	+/- <RDL	0.00050	9043727	0.0015	+/- <RDL	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<1.0	N/A	1.0	9044992	0.13	+/- <RDL	0.10	9044992
Dissolved Potassium (K)	mg/L	12	+/- <RDL	3.0	9044992	1.8	+/- <RDL	0.30	9044992
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Silicon (Si)	mg/L	5.3	+/- <RDL	1.0	9044992	3.7	+/- 0.37	0.10	9044992
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9043727	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	2400	+/- 140	5.0	9044992	550 (1)	+/- 33	5.0	9044992
Dissolved Strontium (Sr)	mg/L	3.7	+/- 0.27	0.20	9044992	0.11	+/- <RDL	0.020	9044992
Dissolved Sulphur (S)	mg/L	1700	+/- 100	2.0	9044992	0.54	+/- <RDL	0.20	9044992
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	9043727	0.0010	+/- <RDL	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.0032	+/- 0.00031	0.00010	9043727	0.00036	+/- <RDL	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	9043727	<0.0030	N/A	0.0030	9043727

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(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8475				TS8478			
Sampling Date		2018/06/26 11:00				2018/06/26 15:10			
COC Number		557643-03-01				557643-03-01			
	UNITS	MW 25B	MU	RDL	QC Batch	15MW34A	MU	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	110	N/A	N/A	9041778	27	N/A	N/A	9041778
Cation Sum	meq/L	120	N/A	N/A	9041778	27	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	710	N/A	0.50	9041776	37	N/A	0.50	9041776
Ion Balance (% Difference)	%	2.2	N/A	N/A	9041777	0.60	N/A	N/A	9041777
Dissolved Nitrate (N)	mg/L	0.60	N/A	0.020	9041498	<0.020	N/A	0.020	9041780
Dissolved Nitrate (NO3)	mg/L	2.7	N/A	0.089	9041779	<0.089	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	0.16	N/A	0.033	9041779	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	7800	N/A	0.022	9041679	1500	N/A	0.022	9041679
Misc. Inorganics									
Conductivity	uS/cm	9600	+/- 840	2.0	9043267	2400	+/- 210	2.0	9043076
pH	pH	7.85	+/- 0.114	N/A	9043264	8.34	+/- 0.121	N/A	9043074
Low Level Elements									
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	9041571	<0.020	N/A	0.020	9041773
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	9043265	6.5	+/- 2.6	1.0	9043075
Alkalinity (Total as CaCO3)	mg/L	840	+/- 36	1.0	9043265	1100	+/- 46	1.0	9043075
Bicarbonate (HCO3)	mg/L	1000	+/- 240	1.0	9043265	1300	+/- 300	1.0	9043075
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	9043265	7.8	N/A	1.0	9043075
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9043265	<1.0	N/A	1.0	9043075
Dissolved Sulphate (SO4)	mg/L	4600 (1)	+/- 780	50	9043357	250 (1)	+/- 42	5.0	9043357
Dissolved Chloride (Cl)	mg/L	2.3	+/- <RDL	1.0	9043356	18	+/- 1.3	1.0	9043356
Nutrients									
Dissolved Nitrite (N)	mg/L	0.050	N/A	0.010	9042922	<0.010	N/A	0.010	9042922
Dissolved Nitrate plus Nitrite (N)	mg/L	0.65	N/A	0.020	9042922	<0.020	N/A	0.020	9042922
Elements									
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	9043727	0.0050	+/- <RDL	0.0030	9043727
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9043727	<0.00060	N/A	0.00060	9043727
Dissolved Arsenic (As)	mg/L	0.00041	+/- <RDL	0.00020	9043727	0.0018	+/- <RDL	0.00020	9043727
Dissolved Barium (Ba)	mg/L	<0.10	N/A	0.10	9045064	0.025	+/- <RDL	0.010	9045064
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727

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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8475				TS8478			
Sampling Date		2018/06/26 11:00				2018/06/26 15:10			
COC Number		557643-03-01				557643-03-01			
	UNITS	MW 25B	MU	RDL	QC Batch	15MW34A	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.48	+/- <RDL	0.20	9045064	0.83	+/- 0.068	0.020	9045064
Dissolved Calcium (Ca)	mg/L	200	+/- 13	3.0	9045064	11	+/- 0.73	0.30	9045064
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Cobalt (Co)	mg/L	0.00051	+/- <RDL	0.00030	9043727	0.00092	+/- <RDL	0.00030	9043727
Dissolved Copper (Cu)	mg/L	0.00096	+/- 0.00042	0.00020	9043727	0.00052	+/- 0.00040	0.00020	9043727
Dissolved Iron (Fe)	mg/L	<0.60	N/A	0.60	9045064	<0.060	N/A	0.060	9045064
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Lithium (Li)	mg/L	0.75	+/- <RDL	0.20	9045064	0.14	+/- <RDL	0.020	9045064
Dissolved Magnesium (Mg)	mg/L	54	+/- 2.8	2.0	9045064	2.3	+/- <RDL	0.20	9045064
Dissolved Manganese (Mn)	mg/L	0.18	+/- <RDL	0.040	9045064	0.059	+/- <RDL	0.0040	9045064
Dissolved Molybdenum (Mo)	mg/L	0.00090	+/- 0.00022	0.00020	9043727	0.0081	+/- 0.00080	0.00020	9043727
Dissolved Nickel (Ni)	mg/L	0.0025	+/- <RDL	0.00050	9043727	0.0055	+/- 0.00056	0.00050	9043727
Dissolved Phosphorus (P)	mg/L	<1.0	N/A	1.0	9045064	<0.10	N/A	0.10	9045064
Dissolved Potassium (K)	mg/L	13	+/- <RDL	3.0	9045064	2.9	+/- <RDL	0.30	9045064
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	9043727	0.00036	+/- <RDL	0.00020	9043727
Dissolved Silicon (Si)	mg/L	4.6	+/- <RDL	1.0	9045064	3.7	+/- 0.37	0.10	9045064
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9043727	<0.00010	N/A	0.00010	9043727
Dissolved Sodium (Na)	mg/L	2400	+/- 140	5.0	9045064	590 (1)	+/- 35	5.0	9045064
Dissolved Strontium (Sr)	mg/L	4.3	+/- 0.31	0.20	9045064	0.22	+/- <RDL	0.020	9045064
Dissolved Sulphur (S)	mg/L	1600	+/- 100	2.0	9045064	78	+/- 4.9	0.20	9045064
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9043727	<0.00020	N/A	0.00020	9043727
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	9043727	<0.0010	N/A	0.0010	9043727
Dissolved Uranium (U)	mg/L	0.00027	+/- <RDL	0.00010	9043727	0.0051	+/- 0.00050	0.00010	9043727
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	9043727	0.0023	+/- <RDL	0.0010	9043727
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	9043727	<0.0030	N/A	0.0030	9043727

RDL = Reportable Detection Limit
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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8479			TS8480			
Sampling Date		2018/06/26 15:20			2018/06/26			
COC Number		557643-03-01			557643-03-01			
	UNITS	15MW34B	MU	RDL	18DUP04	MU	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	29	N/A	N/A	31	N/A	N/A	9041778
Cation Sum	meq/L	30	N/A	N/A	31	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	710	N/A	0.50	72	N/A	0.50	9041776
Ion Balance (% Difference)	%	0.38	N/A	N/A	0.012	N/A	N/A	9041777
Dissolved Nitrate (N)	mg/L	0.035	N/A	0.020	0.11	N/A	0.020	9041780
Dissolved Nitrate (NO3)	mg/L	0.15	N/A	0.089	0.47	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	<0.033	N/A	0.033	<0.033	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	1700	N/A	0.022	1900	N/A	0.022	9041781
Misc. Inorganics								
Conductivity	uS/cm	2500	+/- 220	2.0	2900	+/- 250	2.0	9043076
pH	pH	7.49	+/- 0.109	N/A	8.18	+/- 0.119	N/A	9043074
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	0.040	+/- <RDL	0.020	<0.020	N/A	0.020	9041773
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043075
Alkalinity (Total as CaCO3)	mg/L	890	+/- 38	1.0	870	+/- 38	1.0	9043075
Bicarbonate (HCO3)	mg/L	1100	+/- 260	1.0	1100	+/- 250	1.0	9043075
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043075
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	<1.0	N/A	1.0	9043075
Dissolved Sulphate (SO4)	mg/L	500 (1)	+/- 85	5.0	660 (1)	+/- 110	5.0	9043357
Dissolved Chloride (Cl)	mg/L	37	+/- 2.4	1.0	1.6	+/- <RDL	1.0	9043356
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.010	N/A	0.010	<0.010	N/A	0.010	9042922
Dissolved Nitrate plus Nitrite (N)	mg/L	0.035	N/A	0.020	0.11	N/A	0.020	9042922
Elements								
Dissolved Aluminum (Al)	mg/L	0.0046	+/- <RDL	0.0030	0.0075	+/- <RDL	0.0030	9043728
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	<0.00060	N/A	0.00060	9043728
Dissolved Arsenic (As)	mg/L	0.00036	+/- <RDL	0.00020	0.00067	+/- <RDL	0.00020	9043728
Dissolved Barium (Ba)	mg/L	0.051	+/- <RDL	0.010	<0.010	N/A	0.010	9045064
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043728

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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8479			TS8480			
Sampling Date		2018/06/26 15:20			2018/06/26			
COC Number		557643-03-01			557643-03-01			
	UNITS	15MW34B	MU	RDL	18DUP04	MU	RDL	QC Batch
Dissolved Boron (B)	mg/L	0.066	+/- <RDL	0.020	0.23	+/- 0.023	0.020	9045064
Dissolved Calcium (Ca)	mg/L	180	+/- 12	0.30	19	+/- 1.3	0.30	9045064
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043728
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	<0.00030	N/A	0.00030	9043728
Dissolved Copper (Cu)	mg/L	0.0033	+/- 0.00055	0.00020	0.00083	+/- 0.00041	0.00020	9043728
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	<0.060	N/A	0.060	9045064
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043728
Dissolved Lithium (Li)	mg/L	0.14	+/- <RDL	0.020	0.27	+/- <RDL	0.020	9045064
Dissolved Magnesium (Mg)	mg/L	61	+/- 3.2	0.20	5.9	+/- 0.33	0.20	9045064
Dissolved Manganese (Mn)	mg/L	0.045	+/- <RDL	0.0040	<0.0040	N/A	0.0040	9045064
Dissolved Molybdenum (Mo)	mg/L	0.00065	+/- 0.00021	0.00020	0.0015	+/- 0.00025	0.00020	9043728
Dissolved Nickel (Ni)	mg/L	0.0052	+/- 0.00053	0.00050	0.0011	+/- <RDL	0.00050	9043728
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	<0.10	N/A	0.10	9045064
Dissolved Potassium (K)	mg/L	11	+/- 0.70	0.30	4.1	+/- 0.32	0.30	9045064
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043728
Dissolved Silicon (Si)	mg/L	6.8	+/- 0.66	0.10	3.9	+/- 0.39	0.10	9045064
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	<0.00010	N/A	0.00010	9043728
Dissolved Sodium (Na)	mg/L	350	+/- 21	0.50	680 (1)	+/- 41	5.0	9045064
Dissolved Strontium (Sr)	mg/L	1.3	+/- 0.094	0.020	0.33	+/- 0.024	0.020	9045064
Dissolved Sulphur (S)	mg/L	170	+/- 10	0.20	220	+/- 14	0.20	9045064
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	<0.00020	N/A	0.00020	9043728
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043728
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043728
Dissolved Uranium (U)	mg/L	0.0038	+/- 0.00037	0.00010	0.0019	+/- 0.00019	0.00010	9043728
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	<0.0010	N/A	0.0010	9043728
Dissolved Zinc (Zn)	mg/L	0.0034	+/- <RDL	0.0030	<0.0030	N/A	0.0030	9043728

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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8481			
Sampling Date		2018/06/26			
COC Number		557643-03-01			
	UNITS	18DUP05	MU	RDL	QC Batch
Calculated Parameters					
Anion Sum	meq/L	67	N/A	N/A	9041778
Cation Sum	meq/L	70	N/A	N/A	9041778
Hardness (CaCO3)	mg/L	1600	N/A	0.50	9041776
Ion Balance (% Difference)	%	2.4	N/A	N/A	9041777
Dissolved Nitrate (N)	mg/L	0.21	N/A	0.020	9041780
Dissolved Nitrate (NO3)	mg/L	0.92	N/A	0.089	9041779
Dissolved Nitrite (NO2)	mg/L	0.083	N/A	0.033	9041779
Calculated Total Dissolved Solids	mg/L	4200	N/A	0.022	9041781
Misc. Inorganics					
Conductivity	uS/cm	5100	+/- 450	2.0	9043076
pH	pH	7.92	+/- 0.115	N/A	9043074
Low Level Elements					
Dissolved Cadmium (Cd)	ug/L	0.022	+/- <RDL	0.020	9041773
Anions					
Alkalinity (PP as CaCO3)	mg/L	<1.0	N/A	1.0	9043075
Alkalinity (Total as CaCO3)	mg/L	1000	+/- 44	1.0	9043075
Bicarbonate (HCO3)	mg/L	1200	+/- 290	1.0	9043075
Carbonate (CO3)	mg/L	<1.0	N/A	1.0	9043075
Hydroxide (OH)	mg/L	<1.0	N/A	1.0	9043075
Dissolved Sulphate (SO4)	mg/L	2200 (1)	+/- 370	20	9043357
Dissolved Chloride (Cl)	mg/L	1.3	+/- <RDL	1.0	9043356
Nutrients					
Dissolved Nitrite (N)	mg/L	0.025	N/A	0.010	9042922
Dissolved Nitrate plus Nitrite (N)	mg/L	0.23	N/A	0.020	9042922
Elements					
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	9043728
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9043728
Dissolved Arsenic (As)	mg/L	0.00055	+/- <RDL	0.00020	9043728
Dissolved Barium (Ba)	mg/L	<0.10	N/A	0.10	9045064

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Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		TS8481			
Sampling Date		2018/06/26			
COC Number		557643-03-01			
	UNITS	18DUP05	MU	RDL	QC Batch
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Boron (B)	mg/L	<0.20	N/A	0.20	9045064
Dissolved Calcium (Ca)	mg/L	260	+/- 17	3.0	9045064
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Cobalt (Co)	mg/L	0.0019	+/- <RDL	0.00030	9043728
Dissolved Copper (Cu)	mg/L	0.00066	+/- 0.00041	0.00020	9043728
Dissolved Iron (Fe)	mg/L	<0.60	N/A	0.60	9045064
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	9043728
Dissolved Lithium (Li)	mg/L	0.47	+/- <RDL	0.20	9045064
Dissolved Magnesium (Mg)	mg/L	230	+/- 12	2.0	9045064
Dissolved Manganese (Mn)	mg/L	0.43	+/- <RDL	0.040	9045064
Dissolved Molybdenum (Mo)	mg/L	0.00054	+/- 0.00021	0.00020	9043728
Dissolved Nickel (Ni)	mg/L	0.0031	+/- <RDL	0.00050	9043728
Dissolved Phosphorus (P)	mg/L	<1.0	N/A	1.0	9045064
Dissolved Potassium (K)	mg/L	29	+/- <RDL	3.0	9045064
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	9043728
Dissolved Silicon (Si)	mg/L	7.4	+/- <RDL	1.0	9045064
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9043728
Dissolved Sodium (Na)	mg/L	850	+/- 50	5.0	9045064
Dissolved Strontium (Sr)	mg/L	4.4	+/- 0.32	0.20	9045064
Dissolved Sulphur (S)	mg/L	750	+/- 47	2.0	9045064
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9043728
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Uranium (U)	mg/L	0.00054	+/- <RDL	0.00010	9043728
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	9043728

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		TS8483			
Sampling Date		2018/06/26 16:20			
COC Number		557643-03-01			
	UNITS	18FIELDBLANK	MU	RDL	QC Batch
Low Level Elements					
Dissolved Cadmium (Cd)	ug/L	<0.020	N/A	0.020	9041571
Elements					
Dissolved Aluminum (Al)	mg/L	<0.0030	N/A	0.0030	9043728
Dissolved Antimony (Sb)	mg/L	<0.00060	N/A	0.00060	9043728
Dissolved Arsenic (As)	mg/L	<0.00020	N/A	0.00020	9043728
Dissolved Barium (Ba)	mg/L	<0.010	N/A	0.010	9045064
Dissolved Beryllium (Be)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Boron (B)	mg/L	<0.020	N/A	0.020	9045064
Dissolved Calcium (Ca)	mg/L	<0.30	N/A	0.30	9045064
Dissolved Chromium (Cr)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Cobalt (Co)	mg/L	<0.00030	N/A	0.00030	9043728
Dissolved Copper (Cu)	mg/L	0.00058	+/- 0.00041	0.00020	9043728
Dissolved Iron (Fe)	mg/L	<0.060	N/A	0.060	9045064
Dissolved Lead (Pb)	mg/L	<0.00020	N/A	0.00020	9043728
Dissolved Lithium (Li)	mg/L	<0.020	N/A	0.020	9045064
Dissolved Magnesium (Mg)	mg/L	<0.20	N/A	0.20	9045064
Dissolved Manganese (Mn)	mg/L	<0.0040	N/A	0.0040	9045064
Dissolved Molybdenum (Mo)	mg/L	<0.00020	N/A	0.00020	9043728
Dissolved Nickel (Ni)	mg/L	<0.00050	N/A	0.00050	9043728
Dissolved Phosphorus (P)	mg/L	<0.10	N/A	0.10	9045064
Dissolved Potassium (K)	mg/L	<0.30	N/A	0.30	9045064
Dissolved Selenium (Se)	mg/L	<0.00020	N/A	0.00020	9043728
Dissolved Silicon (Si)	mg/L	<0.10	N/A	0.10	9045064
Dissolved Silver (Ag)	mg/L	<0.00010	N/A	0.00010	9043728
Dissolved Sodium (Na)	mg/L	<0.50	N/A	0.50	9045064
Dissolved Strontium (Sr)	mg/L	<0.020	N/A	0.020	9045064
Dissolved Sulphur (S)	mg/L	<0.20	N/A	0.20	9045064
Dissolved Thallium (Tl)	mg/L	<0.00020	N/A	0.00020	9043728
Dissolved Tin (Sn)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Titanium (Ti)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Uranium (U)	mg/L	<0.00010	N/A	0.00010	9043728

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

REGULATED METALS (CCME/AT1) - DISSOLVED

Maxxam ID		TS8483			
Sampling Date		2018/06/26 16:20			
COC Number		557643-03-01			
	UNITS	18FIELDBLANK	MU	RDL	QC Batch
Dissolved Vanadium (V)	mg/L	<0.0010	N/A	0.0010	9043728
Dissolved Zinc (Zn)	mg/L	<0.0030	N/A	0.0030	9043728

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		TS8452				TS8453			
Sampling Date		2018/06/26 14:20				2018/06/26 14:30			
COC Number		557643-01-01				557643-01-01			
	UNITS	MW 1B	MU	RDL	QC Batch	MW 1C	MU	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	130	+/- 9.6	5.0	9045011	30	+/- <RDL	5.0	9045011
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	9.3	+/- 1.7	0.50	9049270	11	+/- 2.0	0.50	9049270
Nutrients									
Total Ammonia (N)	mg/L	0.20	+/- 0.036	0.015	9043935	0.56	+/- 0.061	0.015	9043935
Total Total Kjeldahl Nitrogen	mg/L	3.2 (1)	+/- 0.42	0.25	9048285	1.1	+/- 0.17	0.050	9045019
Misc. Organics									
Phenols	mg/L	<0.0020	N/A	0.0020	9047816	<0.0020	N/A	0.0020	9047816

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		TS8454			TS8455			
Sampling Date		2018/06/26 15:50			2018/06/26 16:00			
COC Number		557643-01-01			557643-01-01			
	UNITS	MW 9	MU	RDL	MW 11	MU	RDL	QC Batch
Demand Parameters								
Total Chemical Oxygen Demand	mg/L	72	+/- 6.1	5.0	98	+/- 7.5	5.0	9045011
Misc. Inorganics								
Dissolved Organic Carbon (C)	mg/L	12	+/- 2.1	0.50	36 (1)	+/- 6.0	1.0	9049270
Nutrients								
Total Ammonia (N)	mg/L	0.32	+/- 0.044	0.015	0.063	+/- 0.031	0.015	9043935
Total Total Kjeldahl Nitrogen	mg/L	1.6	+/- 0.23	0.050	1.7	+/- 0.24	0.050	9045019
Misc. Organics								
Phenols	mg/L	0.0023	+/- <RDL	0.0020	0.0024	+/- <RDL	0.0020	9047816

RDL = Reportable Detection Limit
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(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		TS8456				TS8457			
Sampling Date		2018/06/26 15:00				2018/06/26 14:50			
COC Number		557643-01-01				557643-01-01			
	UNITS	MW 12A	MU	RDL	QC Batch	MW 12B	MU	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	53	+/- 5.1	5.0	9045011	53	+/- 5.1	5.0	9045011
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	17	+/- 2.9	0.50	9049270	19 (1)	+/- 3.3	1.0	9049270
Nutrients									
Total Ammonia (N)	mg/L	0.11	+/- 0.033	0.015	9043935	1.1	+/- 0.10	0.015	9043935
Total Total Kjeldahl Nitrogen	mg/L	0.80	+/- 0.13	0.050	9045019	2.1 (2)	+/- 0.29	0.25	9045058
Misc. Organics									
Phenols	mg/L	0.0020	+/- <RDL	0.0020	9047816	<0.0020	N/A	0.0020	9047816

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to matrix interference.
(2) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		TS8458		TS8459		TS8460			
Sampling Date		2018/06/26 15:40		2018/06/26 14:15		2018/06/26 14:25			
COC Number		557643-01-01		557643-01-01		557643-01-01			
	UNITS	MW 14	MU	MW 18A	MU	MW 18B	MU	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	37	+/- <RDL	35	+/- <RDL	49	+/- <RDL	5.0	9045011
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	11	+/- 2.0	7.4	+/- 1.4	12	+/- 2.1	0.50	9049270
Nutrients									
Total Ammonia (N)	mg/L	0.43	+/- 0.051	0.59	+/- 0.063	0.072	+/- 0.032	0.015	9043935
Total Total Kjeldahl Nitrogen	mg/L	1.1	+/- 0.16	0.92	+/- 0.15	1.1	+/- 0.17	0.050	9045058
Misc. Organics									
Phenols	mg/L	<0.0020	N/A	<0.0020	N/A	<0.0020	N/A	0.0020	9047816

RDL = Reportable Detection Limit
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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		TS8461		TS8462		TS8463			
Sampling Date		2018/06/26 13:20		2018/06/26 13:30		2018/06/26 14:00			
COC Number		557643-01-01		557643-02-01		557643-02-01			
	UNITS	MW 19A	MU	MW 19B	MU	MW 20A	MU	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	23	+/- <RDL	34	+/- <RDL	26	+/- <RDL	5.0	9045011
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	8.0	+/- 1.5	6.1	+/- 1.2	5.4	+/- 1.1	0.50	9049270
Nutrients									
Total Ammonia (N)	mg/L	1.2	+/- 0.11	0.63	+/- 0.066	0.28	+/- 0.041	0.015	9043935
Total Total Kjeldahl Nitrogen	mg/L	1.5	+/- 0.22	1.1	+/- 0.16	1.0	+/- 0.16	0.050	9045058
Misc. Organics									
Phenols	mg/L	<0.0020	N/A	<0.0020	N/A	<0.0020	N/A	0.0020	9048109

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam ID		TS8464		TS8465		TS8466			
Sampling Date		2018/06/26 13:50		2018/06/26 11:40		2018/06/26 11:50			
COC Number		557643-02-01		557643-02-01		557643-02-01			
	UNITS	MW 20B	MU	MW 21A	MU	MW 21B	MU	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	32	+/- <RDL	49	+/- <RDL	27	+/- <RDL	5.0	9045011
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	6.0	+/- 1.2	9.1	+/- 1.7	6.5	+/- 1.3	0.50	9049270
Nutrients									
Total Ammonia (N)	mg/L	<0.015	N/A	0.039	+/- 0.031	<0.015	N/A	0.015	9043935
Total Total Kjeldahl Nitrogen	mg/L	0.32	+/- 0.084	0.92	+/- 0.15	0.31	+/- 0.082	0.050	9045058
Misc. Organics									
Phenols	mg/L	<0.0020	N/A	0.0023	+/- <RDL	<0.0020	N/A	0.0020	9048109

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Maxxam Job #: B851729
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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		TS8467		TS8468		TS8469			
Sampling Date		2018/06/26 10:10		2018/06/26 09:50		2018/06/26 10:30			
COC Number		557643-02-01		557643-02-01		557643-02-01			
	UNITS	MW 22A	MU	MW 22B	MU	MW 23A	MU	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	67	+/- 5.8	23	+/- <RDL	67	+/- 5.8	5.0	9045011
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	6.8	+/- 1.3	5.9	+/- 1.2	17	+/- 3.0	0.50	9049270
Nutrients									
Total Ammonia (N)	mg/L	0.049	+/- 0.031	<0.015	N/A	0.79	+/- 0.078	0.015	9043935
Total Total Kjeldahl Nitrogen	mg/L	0.88	+/- 0.14	0.26	+/- 0.079	1.5	+/- 0.22	0.050	9045058
Misc. Organics									
Phenols	mg/L	0.0020	+/- <RDL	<0.0020	N/A	0.0021	+/- <RDL	0.0020	9048109

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam ID		TS8470			TS8471		TS8475			
Sampling Date		2018/06/26 10:20			2018/06/26 11:20		2018/06/26 11:00			
COC Number		557643-02-01			557643-02-01		557643-03-01			
	UNITS	MW 23B	MU	QC Batch	MW 25A	MU	MW 25B	MU	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	28	+/- <RDL	9045011	29	+/- <RDL	27	+/- <RDL	5.0	9045015
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	6.6	+/- 1.3	9049276	8.7	+/- 1.6	10	+/- 1.8	0.50	9049276
Nutrients										
Total Ammonia (N)	mg/L	0.33	+/- 0.044	9043935	0.76	+/- 0.076	<0.015	N/A	0.015	9043938
Total Total Kjeldahl Nitrogen	mg/L	0.71	+/- 0.12	9045058	1.2	+/- 0.18	0.55	+/- 0.11	0.050	9045058
Misc. Organics										
Phenols	mg/L	<0.0020	N/A	9048109	0.0023	+/- <RDL	<0.0020	N/A	0.0020	9048109

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		TS8476		TS8477			TS8478			
Sampling Date		2018/06/26 11:40		2018/06/26 12:10			2018/06/26 15:10			
COC Number		557643-03-01		557643-03-01			557643-03-01			
	UNITS	MW 26A	MU	MW 31A	MU	RDL	15MW34A	MU	RDL	QC Batch
Demand Parameters										
Total Chemical Oxygen Demand	mg/L	N/A	N/A	N/A	N/A	5.0	160	+/- 11	5.0	9045015
Misc. Inorganics										
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	N/A	N/A	0.50	40 (1)	+/- 6.6	1.0	9049276
Nutrients										
Total Ammonia (N)	mg/L	N/A	N/A	N/A	N/A	0.015	1.0	+/- 0.096	0.015	9043938
Total Total Kjeldahl Nitrogen	mg/L	N/A	N/A	N/A	N/A	0.050	1.7	+/- 0.24	0.050	9045058
Misc. Organics										
Phenols	mg/L	0.0020	+/- <RDL	<0.0020	N/A	0.0020	<0.0020	N/A	0.0020	9048109

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		TS8479		TS8480		TS8481			
Sampling Date		2018/06/26 15:20		2018/06/26		2018/06/26			
COC Number		557643-03-01		557643-03-01		557643-03-01			
	UNITS	15MW34B	MU	18DUP04	MU	18DUP05	MU	RDL	QC Batch
Demand Parameters									
Total Chemical Oxygen Demand	mg/L	35	+/- <RDL	27	+/- <RDL	24	+/- <RDL	5.0	9045015
Misc. Inorganics									
Dissolved Organic Carbon (C)	mg/L	13	+/- 2.2	6.5	+/- 1.3	9.5	+/- 1.7	0.50	9049276
Nutrients									
Total Ammonia (N)	mg/L	0.033	+/- 0.031	<0.015	N/A	0.36	+/- 0.046	0.015	9043938
Total Total Kjeldahl Nitrogen	mg/L	0.86	+/- 0.14	0.32	+/- 0.083	0.95	+/- 0.15	0.050	9045058
Misc. Organics									
Phenols	mg/L	0.0028	+/- <RDL	<0.0020	N/A	<0.0020	N/A	0.0020	9048109

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TETRA TECH CANADA INC.
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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		TS8482		TS8483			
Sampling Date		2018/06/26		2018/06/26 16:20			
COC Number		557643-03-01		557643-03-01			
	UNITS	18TRIPBLANK	MU	18FIELDBLANK	MU	RDL	QC Batch
Misc. Inorganics							
Dissolved Organic Carbon (C)	mg/L	N/A	N/A	<0.50	N/A	0.50	9049276
Misc. Organics							
Phenols	mg/L	<0.0020	N/A	<0.0020	N/A	0.0020	9048109

RDL = Reportable Detection Limit
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N/A = Not Applicable

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PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		TS8476			TS8477			
Sampling Date		2018/06/26 11:40			2018/06/26 12:10			
COC Number		557643-03-01			557643-03-01			
	UNITS	MW 26A	MU	QC Batch	MW 31A	MU	RDL	QC Batch
Ext. Pet. Hydrocarbon								
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	N/A	9042833	<0.10	N/A	0.10	9042846
Surrogate Recovery (%)								
O-TERPHENYL (sur.)	%	94	N/A	9042833	98	N/A	N/A	9042846

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ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		TS8452		TS8453		TS8454		TS8455			
Sampling Date		2018/06/26 14:20		2018/06/26 14:30		2018/06/26 15:50		2018/06/26 16:00			
COC Number		557643-01-01		557643-01-01		557643-01-01		557643-01-01			
	UNITS	MW 1B	MU	MW 1C	MU	MW 9	MU	MW 11	MU	RDL	QC Batch
Low Level Elements											
Dissolved Mercury (Hg)	ug/L	0.0021	+/- <RDL	<0.0020	N/A	<0.0020	N/A	<0.0020	N/A	0.0020	9044847

RDL = Reportable Detection Limit
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N/A = Not Applicable

Maxxam ID		TS8456		TS8457		TS8458		TS8459			
Sampling Date		2018/06/26 15:00		2018/06/26 14:50		2018/06/26 15:40		2018/06/26 14:15			
COC Number		557643-01-01		557643-01-01		557643-01-01		557643-01-01			
	UNITS	MW 12A	MU	MW 12B	MU	MW 14	MU	MW 18A	MU	RDL	QC Batch
Low Level Elements											
Dissolved Mercury (Hg)	ug/L	<0.0020	N/A	<0.0020	N/A	<0.0020	N/A	<0.0020	N/A	0.0020	9044847

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam ID		TS8460		TS8461		TS8462		TS8463			
Sampling Date		2018/06/26 14:25		2018/06/26 13:20		2018/06/26 13:30		2018/06/26 14:00			
COC Number		557643-01-01		557643-01-01		557643-02-01		557643-02-01			
	UNITS	MW 18B	MU	MW 19A	MU	MW 19B	MU	MW 20A	MU	RDL	QC Batch
Low Level Elements											
Dissolved Mercury (Hg)	ug/L	0.0035	+/- <RDL	<0.0020	N/A	<0.0020	N/A	0.0020	+/- <RDL	0.0020	9044847

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam ID		TS8464		TS8466		TS8468		TS8469			
Sampling Date		2018/06/26 13:50		2018/06/26 11:50		2018/06/26 09:50		2018/06/26 10:30			
COC Number		557643-02-01		557643-02-01		557643-02-01		557643-02-01			
	UNITS	MW 20B	MU	MW 21B	MU	MW 22B	MU	MW 23A	MU	RDL	QC Batch
Low Level Elements											
Dissolved Mercury (Hg)	ug/L	<0.0020	N/A	<0.0020	N/A	<0.0020	N/A	<0.0020	N/A	0.0020	9044847

RDL = Reportable Detection Limit
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N/A = Not Applicable

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		TS8470			TS8471		TS8475			
Sampling Date		2018/06/26 10:20			2018/06/26 11:20		2018/06/26 11:00			
COC Number		557643-02-01			557643-02-01		557643-03-01			
	UNITS	MW 23B	MU	QC Batch	MW 25A	MU	MW 25B	MU	RDL	QC Batch
Low Level Elements										
Dissolved Mercury (Hg)	ug/L	<0.0020	N/A	9044847	<0.0020	N/A	<0.0020	N/A	0.0020	9044850

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam ID		TS8478		TS8479		TS8480		TS8481			
Sampling Date		2018/06/26 15:10		2018/06/26 15:20		2018/06/26		2018/06/26			
COC Number		557643-03-01		557643-03-01		557643-03-01		557643-03-01			
	UNITS	15MW34A	MU	15MW34B	MU	18DUP04	MU	18DUP05	MU	RDL	QC Batch
Low Level Elements											
Dissolved Mercury (Hg)	ug/L	0.0025	+/- <RDL	0.0030	+/- <RDL	<0.0020	N/A	<0.0020	N/A	0.0020	9044850

RDL = Reportable Detection Limit
MU = Measurement Uncertainty
N/A = Not Applicable

Maxxam ID		TS8483			
Sampling Date		2018/06/26 16:20			
COC Number		557643-03-01			
	UNITS	18FIELDBLANK	MU	RDL	QC Batch
Low Level Elements					
Dissolved Mercury (Hg)	ug/L	<0.0020	N/A	0.0020	9044850

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N/A = Not Applicable

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
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VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8452		TS8453		TS8454		TS8455			
Sampling Date		2018/06/26 14:20		2018/06/26 14:30		2018/06/26 15:50		2018/06/26 16:00			
COC Number		557643-01-01		557643-01-01		557643-01-01		557643-01-01			
	UNITS	MW 1B	MU	MW 1C	MU	MW 9	MU	MW 11	MU	RDL	QC Batch
Volatiles											
Total Trihalomethanes	ug/L	<1.3	N/A	<1.3	N/A	<1.3	N/A	<1.3	N/A	1.3	9041149
Bromodichloromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Bromoform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Bromomethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041976
Carbon tetrachloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Chlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Chlorodibromomethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041976
Chloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041976
Chloroform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Chloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041976
1,2-dibromoethane	ug/L	<0.20	N/A	<0.20	N/A	<0.20	N/A	<0.20	N/A	0.20	9041976
1,2-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,3-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,4-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,1-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,2-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,1-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
cis-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
trans-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Dichloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041976
1,2-dichloropropane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
cis-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
trans-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Methyl methacrylate	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Methyl-tert-butylether (MTBE)	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Styrene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,1,1,2-tetrachloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041976
1,1,2,2-tetrachloroethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041976
Tetrachloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,2,3-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041976
1,2,4-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041976

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Maxxam Job #: B851729
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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8452		TS8453		TS8454		TS8455			
Sampling Date		2018/06/26 14:20		2018/06/26 14:30		2018/06/26 15:50		2018/06/26 16:00			
COC Number		557643-01-01		557643-01-01		557643-01-01		557643-01-01			
	UNITS	MW 1B	MU	MW 1C	MU	MW 9	MU	MW 11	MU	RDL	QC Batch
1,3,5-trichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,1,1-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,1,2-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Trichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Trichlorofluoromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,2,4-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
1,3,5-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Vinyl chloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041976
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	100	N/A	101	N/A	98	N/A	101	N/A	N/A	9041976
4-Bromofluorobenzene (sur.)	%	92	N/A	84	N/A	103	N/A	100	N/A	N/A	9041976
D4-1,2-Dichloroethane (sur.)	%	104	N/A	85	N/A	71	N/A	110	N/A	N/A	9041976

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8456			TS8457		TS8458		TS8459			
Sampling Date		2018/06/26 15:00			2018/06/26 14:50		2018/06/26 15:40		2018/06/26 14:15			
COC Number		557643-01-01			557643-01-01		557643-01-01		557643-01-01			
	UNITS	MW 12A	MU	QC Batch	MW 12B	MU	MW 14	MU	MW 18A	MU	RDL	QC Batch
Volatiles												
Total Trihalomethanes	ug/L	<1.3	N/A	9041149	<1.3	N/A	<1.3	N/A	<1.3	N/A	1.3	9041149
Bromodichloromethane	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromoform	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromomethane	ug/L	<2.0	N/A	9041976	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Carbon tetrachloride	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorobenzene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorodibromomethane	ug/L	<1.0	N/A	9041976	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroethane	ug/L	<1.0	N/A	9041976	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroform	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chloromethane	ug/L	<2.0	N/A	9041976	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dibromoethane	ug/L	<0.20	N/A	9041976	<0.20	N/A	<0.20	N/A	<0.20	N/A	0.20	9041858
1,2-dichlorobenzene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3-dichlorobenzene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,4-dichlorobenzene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethane	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2-dichloroethane	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,2-dichloroethene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,2-dichloroethene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Dichloromethane	ug/L	<2.0	N/A	9041976	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dichloropropane	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,3-dichloropropene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,3-dichloropropene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl methacrylate	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl-tert-butylether (MTBE)	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Styrene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1,2-tetrachloroethane	ug/L	<1.0	N/A	9041976	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,1,2,2-tetrachloroethane	ug/L	<2.0	N/A	9041976	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Tetrachloroethene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,3-trichlorobenzene	ug/L	<1.0	N/A	9041976	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,2,4-trichlorobenzene	ug/L	<1.0	N/A	9041976	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8456			TS8457		TS8458		TS8459			
Sampling Date		2018/06/26 15:00			2018/06/26 14:50		2018/06/26 15:40		2018/06/26 14:15			
COC Number		557643-01-01			557643-01-01		557643-01-01		557643-01-01			
	UNITS	**MW 12A**	**MU**	**QC Batch**	**MW 12B**	**MU**	**MW 14**	**MU**	**MW 18A**	**MU**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1-trichloroethane	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,2-trichloroethane	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichloroethene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichlorofluoromethane	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,4-trimethylbenzene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3,5-trimethylbenzene	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Vinyl chloride	ug/L	<0.50	N/A	9041976	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Surrogate Recovery (%)												
1,4-Difluorobenzene (sur.)	%	99	N/A	9041976	100	N/A	101	N/A	100	N/A	N/A	9041858
4-Bromofluorobenzene (sur.)	%	100	N/A	9041976	107	N/A	100	N/A	102	N/A	N/A	9041858
D4-1,2-Dichloroethane (sur.)	%	104	N/A	9041976	88	N/A	90	N/A	71	N/A	N/A	9041858

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8460		TS8461		TS8462		TS8463			
Sampling Date		2018/06/26 14:25		2018/06/26 13:20		2018/06/26 13:30		2018/06/26 14:00			
COC Number		557643-01-01		557643-01-01		557643-02-01		557643-02-01			
	UNITS	MW 18B	MU	MW 19A	MU	MW 19B	MU	MW 20A	MU	RDL	QC Batch
Volatiles											
Total Trihalomethanes	ug/L	<1.3	N/A	<1.3	N/A	<1.3	N/A	<1.3	N/A	1.3	9041149
Bromodichloromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromoform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromomethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Carbon tetrachloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorodibromomethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dibromoethane	ug/L	<0.20	N/A	<0.20	N/A	<0.20	N/A	<0.20	N/A	0.20	9041858
1,2-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,4-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Dichloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dichloropropane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl methacrylate	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl-tert-butylether (MTBE)	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Styrene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1,2-tetrachloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,1,2,2-tetrachloroethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Tetrachloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,3-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,2,4-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858

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N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8460		TS8461		TS8462		TS8463			
Sampling Date		2018/06/26 14:25		2018/06/26 13:20		2018/06/26 13:30		2018/06/26 14:00			
COC Number		557643-01-01		557643-01-01		557643-02-01		557643-02-01			
	UNITS	**MW 18B**	**MU**	**MW 19A**	**MU**	**MW 19B**	**MU**	**MW 20A**	**MU**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,2-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichlorofluoromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,4-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3,5-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Vinyl chloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	101	N/A	101	N/A	100	N/A	101	N/A	N/A	9041858
4-Bromofluorobenzene (sur.)	%	101	N/A	101	N/A	103	N/A	102	N/A	N/A	9041858
D4-1,2-Dichloroethane (sur.)	%	87	N/A	93	N/A	89	N/A	74	N/A	N/A	9041858

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8464		TS8465		TS8466		TS8467			
Sampling Date		2018/06/26 13:50		2018/06/26 11:40		2018/06/26 11:50		2018/06/26 10:10			
COC Number		557643-02-01		557643-02-01		557643-02-01		557643-02-01			
	UNITS	MW 20B	MU	MW 21A	MU	MW 21B	MU	MW 22A	MU	RDL	QC Batch
Volatiles											
Total Trihalomethanes	ug/L	<1.3	N/A	<1.3	N/A	<1.3	N/A	<1.3	N/A	1.3	9041149
Bromodichloromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromoform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromomethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Carbon tetrachloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorodibromomethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dibromoethane	ug/L	<0.20	N/A	<0.20	N/A	<0.20	N/A	<0.20	N/A	0.20	9041858
1,2-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,4-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Dichloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dichloropropane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl methacrylate	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl-tert-butylether (MTBE)	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Styrene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1,2-tetrachloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,1,2,2-tetrachloroethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Tetrachloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,3-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,2,4-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8464		TS8465		TS8466		TS8467			
Sampling Date		2018/06/26 13:50		2018/06/26 11:40		2018/06/26 11:50		2018/06/26 10:10			
COC Number		557643-02-01		557643-02-01		557643-02-01		557643-02-01			
	UNITS	**MW 20B**	**MU**	**MW 21A**	**MU**	**MW 21B**	**MU**	**MW 22A**	**MU**	**RDL**	**QC Batch**
1,3,5-trichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,2-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichlorofluoromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,4-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3,5-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Vinyl chloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	100	N/A	99	N/A	99	N/A	98	N/A	N/A	9041858
4-Bromofluorobenzene (sur.)	%	105	N/A	105	N/A	105	N/A	104	N/A	N/A	9041858
D4-1,2-Dichloroethane (sur.)	%	92	N/A	74	N/A	79	N/A	90	N/A	N/A	9041858

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8468		TS8469		TS8470		TS8471			
Sampling Date		2018/06/26 09:50		2018/06/26 10:30		2018/06/26 10:20		2018/06/26 11:20			
COC Number		557643-02-01		557643-02-01		557643-02-01		557643-02-01			
	UNITS	MW 22B	MU	MW 23A	MU	MW 23B	MU	MW 25A	MU	RDL	QC Batch
Volatiles											
Total Trihalomethanes	ug/L	<1.3	N/A	<1.3	N/A	<1.3	N/A	<1.3	N/A	1.3	9041149
Bromodichloromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromoform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromomethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Carbon tetrachloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorodibromomethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dibromoethane	ug/L	<0.20	N/A	<0.20	N/A	<0.20	N/A	<0.20	N/A	0.20	9041858
1,2-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,4-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Dichloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dichloropropane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl methacrylate	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl-tert-butylether (MTBE)	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Styrene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1,2-tetrachloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,1,2,2-tetrachloroethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Tetrachloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,3-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,2,4-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858

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Maxxam Job #: B851729
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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8468		TS8469		TS8470		TS8471			
Sampling Date		2018/06/26 09:50		2018/06/26 10:30		2018/06/26 10:20		2018/06/26 11:20			
COC Number		557643-02-01		557643-02-01		557643-02-01		557643-02-01			
	UNITS	MW 22B	MU	MW 23A	MU	MW 23B	MU	MW 25A	MU	RDL	QC Batch
1,3,5-trichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,2-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichlorofluoromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,4-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3,5-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Vinyl chloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	99	N/A	100	N/A	100	N/A	100	N/A	N/A	9041858
4-Bromofluorobenzene (sur.)	%	99	N/A	107	N/A	105	N/A	102	N/A	N/A	9041858
D4-1,2-Dichloroethane (sur.)	%	95	N/A	91	N/A	97	N/A	89	N/A	N/A	9041858

RDL = Reportable Detection Limit
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N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8475		TS8478		TS8479		TS8480			
Sampling Date		2018/06/26 11:00		2018/06/26 15:10		2018/06/26 15:20		2018/06/26			
COC Number		557643-03-01		557643-03-01		557643-03-01		557643-03-01			
	UNITS	MW 25B	MU	15MW34A	MU	15MW34B	MU	18DUP04	MU	RDL	QC Batch
Volatiles											
Total Trihalomethanes	ug/L	<1.3	N/A	<1.3	N/A	<1.3	N/A	<1.3	N/A	1.3	9041149
Bromodichloromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromoform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Bromomethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Carbon tetrachloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chlorodibromomethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
Chloroform	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Chloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dibromoethane	ug/L	<0.20	N/A	<0.20	N/A	<0.20	N/A	<0.20	N/A	0.20	9041858
1,2-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,4-dichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2-dichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,2-dichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Dichloromethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
1,2-dichloropropane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
cis-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
trans-1,3-dichloropropene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl methacrylate	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Methyl-tert-butylether (MTBE)	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Styrene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1,2-tetrachloroethane	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,1,2,2-tetrachloroethane	ug/L	<2.0	N/A	<2.0	N/A	<2.0	N/A	<2.0	N/A	2.0	9041858
Tetrachloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,3-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858
1,2,4-trichlorobenzene	ug/L	<1.0	N/A	<1.0	N/A	<1.0	N/A	<1.0	N/A	1.0	9041858

RDL = Reportable Detection Limit
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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8475		TS8478		TS8479		TS8480			
Sampling Date		2018/06/26 11:00		2018/06/26 15:10		2018/06/26 15:20		2018/06/26			
COC Number		557643-03-01		557643-03-01		557643-03-01		557643-03-01			
	UNITS	MW 25B	MU	15MW34A	MU	15MW34B	MU	18DUP04	MU	RDL	QC Batch
1,3,5-trichlorobenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,1-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,1,2-trichloroethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichloroethene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Trichlorofluoromethane	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,2,4-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
1,3,5-trimethylbenzene	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Vinyl chloride	ug/L	<0.50	N/A	<0.50	N/A	<0.50	N/A	<0.50	N/A	0.50	9041858
Surrogate Recovery (%)											
1,4-Difluorobenzene (sur.)	%	102	N/A	101	N/A	101	N/A	101	N/A	N/A	9041858
4-Bromofluorobenzene (sur.)	%	104	N/A	101	N/A	103	N/A	98	N/A	N/A	9041858
D4-1,2-Dichloroethane (sur.)	%	90	N/A	74	N/A	83	N/A	66	N/A	N/A	9041858

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8481			TS8482			
Sampling Date		2018/06/26			2018/06/26			
COC Number		557643-03-01			557643-03-01			
	UNITS	18DUP05	MU	QC Batch	18TRIPBLANK	MU	RDL	QC Batch
Volatiles								
Total Trihalomethanes	ug/L	<1.3	N/A	9041149	<1.3	N/A	1.3	9041149
Bromodichloromethane	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Bromoform	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Bromomethane	ug/L	<2.0	N/A	9041858	<2.0	N/A	2.0	9041976
Carbon tetrachloride	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Chlorobenzene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Chlorodibromomethane	ug/L	<1.0	N/A	9041858	<1.0	N/A	1.0	9041976
Chloroethane	ug/L	<1.0	N/A	9041858	<1.0	N/A	1.0	9041976
Chloroform	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Chloromethane	ug/L	<2.0	N/A	9041858	<2.0	N/A	2.0	9041976
1,2-dibromoethane	ug/L	<0.20	N/A	9041858	<0.20	N/A	0.20	9041976
1,2-dichlorobenzene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,3-dichlorobenzene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,4-dichlorobenzene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,1-dichloroethane	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,2-dichloroethane	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,1-dichloroethene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
cis-1,2-dichloroethene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
trans-1,2-dichloroethene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Dichloromethane	ug/L	<2.0	N/A	9041858	<2.0	N/A	2.0	9041976
1,2-dichloropropane	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
cis-1,3-dichloropropene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
trans-1,3-dichloropropene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Methyl methacrylate	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Methyl-tert-butylether (MTBE)	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Styrene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,1,1,2-tetrachloroethane	ug/L	<1.0	N/A	9041858	<1.0	N/A	1.0	9041976
1,1,2,2-tetrachloroethane	ug/L	<2.0	N/A	9041858	<2.0	N/A	2.0	9041976
Tetrachloroethene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,2,3-trichlorobenzene	ug/L	<1.0	N/A	9041858	<1.0	N/A	1.0	9041976
1,2,4-trichlorobenzene	ug/L	<1.0	N/A	9041858	<1.0	N/A	1.0	9041976

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		TS8481			TS8482			
Sampling Date		2018/06/26			2018/06/26			
COC Number		557643-03-01			557643-03-01			
	UNITS	18DUP05	MU	QC Batch	18TRIPBLANK	MU	RDL	QC Batch
1,3,5-trichlorobenzene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,1,1-trichloroethane	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,1,2-trichloroethane	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Trichloroethene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Trichlorofluoromethane	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,2,4-trimethylbenzene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
1,3,5-trimethylbenzene	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Vinyl chloride	ug/L	<0.50	N/A	9041858	<0.50	N/A	0.50	9041976
Surrogate Recovery (%)								
1,4-Difluorobenzene (sur.)	%	100	N/A	9041858	100	N/A	N/A	9041976
4-Bromofluorobenzene (sur.)	%	103	N/A	9041858	99	N/A	N/A	9041976
D4-1,2-Dichloroethane (sur.)	%	75	N/A	9041858	94	N/A	N/A	9041976

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	8.0°C
Package 2	13.3°C
Package 3	11.3°C
Package 4	7.3°C
Package 5	8.3°C

Report reissued with MU included
2018/07/18

Sample TS8453 [MW 1C] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8454 [MW 9] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8455 [MW 11] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8456 [MW 12A] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8457 [MW 12B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8461 [MW 19A] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8462 [MW 19B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8467 [MW 22A] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8468 [MW 22B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8470 [MW 23B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8475 [MW 25B] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr.

Sample TS8481 [18DUP05] : Detection limits raised due to sample matrix. Parameters affected are dissolved B, Ba, Ca, Fe, K, Li, Mg, Mn, Na, P, S, Si, Sr

The estimate of uncertainty has been reported as an expanded uncertainty and calculated using a coverage factor of 2, which gives a level of confidence of 95%.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9041858	RC6	Matrix Spike [TS8458-07]	1,4-Difluorobenzene (sur.)	2018/06/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		102	%	50 - 140
			Bromodichloromethane	2018/06/29		92	%	50 - 140
			Bromoform	2018/06/29		105	%	50 - 140
			Bromomethane	2018/06/29		105	%	50 - 140
			Carbon tetrachloride	2018/06/29		93	%	50 - 140
			Chlorobenzene	2018/06/29		100	%	50 - 140
			Chlorodibromomethane	2018/06/29		98	%	50 - 140
			Chloroethane	2018/06/29		98	%	50 - 140
			Chloroform	2018/06/29		99	%	50 - 140
			Chloromethane	2018/06/29		132	%	50 - 140
			1,2-dibromoethane	2018/06/29		106	%	50 - 140
			1,2-dichlorobenzene	2018/06/29		103	%	50 - 140
			1,3-dichlorobenzene	2018/06/29		103	%	50 - 140
			1,4-dichlorobenzene	2018/06/29		103	%	50 - 140
			1,1-dichloroethane	2018/06/29		86	%	50 - 140
			1,2-dichloroethane	2018/06/29		101	%	50 - 140
			1,1-dichloroethene	2018/06/29		92	%	50 - 140
			cis-1,2-dichloroethene	2018/06/29		92	%	50 - 140
			trans-1,2-dichloroethene	2018/06/29		91	%	50 - 140
			Dichloromethane	2018/06/29		86	%	50 - 140
			1,2-dichloropropane	2018/06/29		103	%	50 - 140
			cis-1,3-dichloropropene	2018/06/29		91	%	50 - 140
			trans-1,3-dichloropropene	2018/06/29		82	%	50 - 140
			Methyl methacrylate	2018/06/29		101	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/06/29		81	%	50 - 140
			Styrene	2018/06/29		98	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/06/29		98	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/06/29		115	%	50 - 140
			Tetrachloroethene	2018/06/29		99	%	50 - 140
			1,2,3-trichlorobenzene	2018/06/29		117	%	50 - 140
			1,2,4-trichlorobenzene	2018/06/29		109	%	50 - 140
			1,3,5-trichlorobenzene	2018/06/29		108	%	50 - 140
			1,1,1-trichloroethane	2018/06/29		96	%	50 - 140
			1,1,2-trichloroethane	2018/06/29		103	%	50 - 140
			Trichloroethene	2018/06/29		97	%	50 - 140
			Trichlorofluoromethane	2018/06/29		102	%	50 - 140
			1,2,4-trimethylbenzene	2018/06/29		100	%	50 - 140
			1,3,5-trimethylbenzene	2018/06/29		100	%	50 - 140
			Vinyl chloride	2018/06/29		114	%	50 - 140
9041858	RC6	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/06/29		99	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		105	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		113	%	50 - 140
			Bromodichloromethane	2018/06/29		99	%	60 - 130
			Bromoform	2018/06/29		107	%	60 - 130
			Bromomethane	2018/06/29		110	%	60 - 130
			Carbon tetrachloride	2018/06/29		94	%	60 - 130
			Chlorobenzene	2018/06/29		102	%	60 - 130
			Chlorodibromomethane	2018/06/29		97	%	60 - 130
			Chloroethane	2018/06/29		98	%	60 - 130
			Chloroform	2018/06/29		97	%	60 - 130
			Chloromethane	2018/06/29		124	%	60 - 130
			1,2-dibromoethane	2018/06/29		105	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-dichlorobenzene	2018/06/29		102	%	60 - 130
			1,3-dichlorobenzene	2018/06/29		100	%	60 - 130
			1,4-dichlorobenzene	2018/06/29		101	%	60 - 130
			1,1-dichloroethane	2018/06/29		88	%	60 - 130
			1,2-dichloroethane	2018/06/29		99	%	60 - 130
			1,1-dichloroethene	2018/06/29		95	%	60 - 130
			cis-1,2-dichloroethene	2018/06/29		91	%	60 - 130
			trans-1,2-dichloroethene	2018/06/29		92	%	60 - 130
			Dichloromethane	2018/06/29		90	%	60 - 130
			1,2-dichloropropane	2018/06/29		108	%	60 - 130
			cis-1,3-dichloropropene	2018/06/29		95	%	60 - 130
			trans-1,3-dichloropropene	2018/06/29		94	%	60 - 130
			Methyl methacrylate	2018/06/29		104	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/06/29		83	%	60 - 130
			Styrene	2018/06/29		99	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/06/29		99	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/06/29		116	%	60 - 130
			Tetrachloroethene	2018/06/29		99	%	60 - 130
			1,2,3-trichlorobenzene	2018/06/29		121	%	60 - 130
			1,2,4-trichlorobenzene	2018/06/29		110	%	60 - 130
			1,3,5-trichlorobenzene	2018/06/29		106	%	60 - 130
			1,1,1-trichloroethane	2018/06/29		97	%	60 - 130
			1,1,2-trichloroethane	2018/06/29		102	%	60 - 130
			Trichloroethene	2018/06/29		99	%	60 - 130
			Trichlorofluoromethane	2018/06/29		107	%	60 - 130
			1,2,4-trimethylbenzene	2018/06/29		99	%	60 - 130
			1,3,5-trimethylbenzene	2018/06/29		99	%	60 - 130
			Vinyl chloride	2018/06/29		114	%	60 - 130
9041858	RC6	Method Blank	1,4-Difluorobenzene (sur.)	2018/06/29		101	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		106	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		99	%	50 - 140
			Bromodichloromethane	2018/06/29	<0.50		ug/L	
			Bromoform	2018/06/29	<0.50		ug/L	
			Bromomethane	2018/06/29	<2.0		ug/L	
			Carbon tetrachloride	2018/06/29	<0.50		ug/L	
			Chlorobenzene	2018/06/29	<0.50		ug/L	
			Chlorodibromomethane	2018/06/29	<1.0		ug/L	
			Chloroethane	2018/06/29	<1.0		ug/L	
			Chloroform	2018/06/29	<0.50		ug/L	
			Chloromethane	2018/06/29	<2.0		ug/L	
			1,2-dibromoethane	2018/06/29	<0.20		ug/L	
			1,2-dichlorobenzene	2018/06/29	<0.50		ug/L	
			1,3-dichlorobenzene	2018/06/29	<0.50		ug/L	
			1,4-dichlorobenzene	2018/06/29	<0.50		ug/L	
			1,1-dichloroethane	2018/06/29	<0.50		ug/L	
			1,2-dichloroethane	2018/06/29	<0.50		ug/L	
			1,1-dichloroethene	2018/06/29	<0.50		ug/L	
			cis-1,2-dichloroethene	2018/06/29	<0.50		ug/L	
			trans-1,2-dichloroethene	2018/06/29	<0.50		ug/L	
			Dichloromethane	2018/06/29	<2.6 (1)		ug/L	
			1,2-dichloropropane	2018/06/29	<0.50		ug/L	
			cis-1,3-dichloropropene	2018/06/29	<0.50		ug/L	
			trans-1,3-dichloropropene	2018/06/29	<0.50		ug/L	
			Methyl methacrylate	2018/06/29	<0.50		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl-tert-butylether (MTBE)	2018/06/29	<0.50		ug/L	
			Styrene	2018/06/29	<0.50		ug/L	
			1,1,1,2-tetrachloroethane	2018/06/29	<1.0		ug/L	
			1,1,2,2-tetrachloroethane	2018/06/29	<2.0		ug/L	
			Tetrachloroethene	2018/06/29	<0.50		ug/L	
			1,2,3-trichlorobenzene	2018/06/29	<1.0		ug/L	
			1,2,4-trichlorobenzene	2018/06/29	<1.0		ug/L	
			1,3,5-trichlorobenzene	2018/06/29	<0.50		ug/L	
			1,1,1-trichloroethane	2018/06/29	<0.50		ug/L	
			1,1,2-trichloroethane	2018/06/29	<0.50		ug/L	
			Trichloroethene	2018/06/29	<0.50		ug/L	
			Trichlorofluoromethane	2018/06/29	<0.50		ug/L	
			1,2,4-trimethylbenzene	2018/06/29	<0.50		ug/L	
			1,3,5-trimethylbenzene	2018/06/29	<0.50		ug/L	
			Vinyl chloride	2018/06/29	<0.50		ug/L	
9041858	RC6	RPD [TS8457-07]	Bromodichloromethane	2018/06/29	NC		%	30
			Bromoform	2018/06/29	NC		%	30
			Bromomethane	2018/06/29	NC		%	30
			Carbon tetrachloride	2018/06/29	NC		%	30
			Chlorobenzene	2018/06/29	NC		%	30
			Chlorodibromomethane	2018/06/29	NC		%	30
			Chloroethane	2018/06/29	NC		%	30
			Chloroform	2018/06/29	NC		%	30
			Chloromethane	2018/06/29	NC		%	30
			1,2-dibromoethane	2018/06/29	NC		%	30
			1,2-dichlorobenzene	2018/06/29	NC		%	30
			1,3-dichlorobenzene	2018/06/29	NC		%	30
			1,4-dichlorobenzene	2018/06/29	NC		%	30
			1,1-dichloroethane	2018/06/29	NC		%	30
			1,2-dichloroethane	2018/06/29	NC		%	30
			1,1-dichloroethene	2018/06/29	NC		%	30
			cis-1,2-dichloroethene	2018/06/29	NC		%	30
			trans-1,2-dichloroethene	2018/06/29	NC		%	30
			Dichloromethane	2018/06/29	NC		%	30
			1,2-dichloropropane	2018/06/29	NC		%	30
			cis-1,3-dichloropropene	2018/06/29	NC		%	30
			trans-1,3-dichloropropene	2018/06/29	NC		%	30
			Methyl methacrylate	2018/06/29	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/06/29	NC		%	30
			Styrene	2018/06/29	NC		%	30
			1,1,1,2-tetrachloroethane	2018/06/29	NC		%	30
			1,1,2,2-tetrachloroethane	2018/06/29	NC		%	30
			Tetrachloroethene	2018/06/29	NC		%	30
			1,2,3-trichlorobenzene	2018/06/29	NC		%	30
			1,2,4-trichlorobenzene	2018/06/29	NC		%	30
			1,3,5-trichlorobenzene	2018/06/29	NC		%	30
			1,1,1-trichloroethane	2018/06/29	NC		%	30
			1,1,2-trichloroethane	2018/06/29	NC		%	30
			Trichloroethene	2018/06/29	NC		%	30
			Trichlorofluoromethane	2018/06/29	NC		%	30
			1,2,4-trimethylbenzene	2018/06/29	NC		%	30
			1,3,5-trimethylbenzene	2018/06/29	NC		%	30
			Vinyl chloride	2018/06/29	NC		%	30
9041976	RC6	Matrix Spike [TS8453-07]	1,4-Difluorobenzene (sur.)	2018/06/30		100	%	50 - 140

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Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			4-Bromofluorobenzene (sur.)	2018/06/30		103	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/30		102	%	50 - 140
			Bromodichloromethane	2018/06/30		102	%	50 - 140
			Bromoform	2018/06/30		117	%	50 - 140
			Bromomethane	2018/06/30		109	%	50 - 140
			Carbon tetrachloride	2018/06/30		96	%	50 - 140
			Chlorobenzene	2018/06/30		109	%	50 - 140
			Chlorodibromomethane	2018/06/30		109	%	50 - 140
			Chloroethane	2018/06/30		102	%	50 - 140
			Chloroform	2018/06/30		94	%	50 - 140
			Chloromethane	2018/06/30		118	%	50 - 140
			1,2-dibromoethane	2018/06/30		112	%	50 - 140
			1,2-dichlorobenzene	2018/06/30		109	%	50 - 140
			1,3-dichlorobenzene	2018/06/30		102	%	50 - 140
			1,4-dichlorobenzene	2018/06/30		99	%	50 - 140
			1,1-dichloroethane	2018/06/30		82	%	50 - 140
			1,2-dichloroethane	2018/06/30		93	%	50 - 140
			1,1-dichloroethene	2018/06/30		95	%	50 - 140
			cis-1,2-dichloroethene	2018/06/30		87	%	50 - 140
			trans-1,2-dichloroethene	2018/06/30		80	%	50 - 140
			Dichloromethane	2018/06/30		79	%	50 - 140
			1,2-dichloropropane	2018/06/30		111	%	50 - 140
			cis-1,3-dichloropropene	2018/06/30		90	%	50 - 140
			trans-1,3-dichloropropene	2018/06/30		78	%	50 - 140
			Methyl methacrylate	2018/06/30		102	%	50 - 140
			Methyl-tert-butylether (MTBE)	2018/06/30		78	%	50 - 140
			Styrene	2018/06/30		106	%	50 - 140
			1,1,1,2-tetrachloroethane	2018/06/30		112	%	50 - 140
			1,1,2,2-tetrachloroethane	2018/06/30		128	%	50 - 140
			Tetrachloroethene	2018/06/30		104	%	50 - 140
			1,2,3-trichlorobenzene	2018/06/30		107	%	50 - 140
			1,2,4-trichlorobenzene	2018/06/30		99	%	50 - 140
			1,3,5-trichlorobenzene	2018/06/30		100	%	50 - 140
			1,1,1-trichloroethane	2018/06/30		100	%	50 - 140
			1,1,2-trichloroethane	2018/06/30		105	%	50 - 140
			Trichloroethene	2018/06/30		97	%	50 - 140
			Trichlorofluoromethane	2018/06/30		111	%	50 - 140
			1,2,4-trimethylbenzene	2018/06/30		102	%	50 - 140
			1,3,5-trimethylbenzene	2018/06/30		99	%	50 - 140
			Vinyl chloride	2018/06/30		114	%	50 - 140
9041976	RC6	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/06/30		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/30		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/30		111	%	50 - 140
			Bromodichloromethane	2018/06/30		102	%	60 - 130
			Bromoform	2018/06/30		134 (2)	%	60 - 130
			Bromomethane	2018/06/30		115	%	60 - 130
			Carbon tetrachloride	2018/06/30		98	%	60 - 130
			Chlorobenzene	2018/06/30		114	%	60 - 130
			Chlorodibromomethane	2018/06/30		118	%	60 - 130
			Chloroethane	2018/06/30		103	%	60 - 130
			Chloroform	2018/06/30		95	%	60 - 130
			Chloromethane	2018/06/30		122	%	60 - 130
			1,2-dibromoethane	2018/06/30		123	%	60 - 130
			1,2-dichlorobenzene	2018/06/30		113	%	60 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,3-dichlorobenzene	2018/06/30		107	%	60 - 130
			1,4-dichlorobenzene	2018/06/30		105	%	60 - 130
			1,1-dichloroethane	2018/06/30		81	%	60 - 130
			1,2-dichloroethane	2018/06/30		104	%	60 - 130
			1,1-dichloroethene	2018/06/30		97	%	60 - 130
			cis-1,2-dichloroethene	2018/06/30		89	%	60 - 130
			trans-1,2-dichloroethene	2018/06/30		81	%	60 - 130
			Dichloromethane	2018/06/30		82	%	60 - 130
			1,2-dichloropropane	2018/06/30		114	%	60 - 130
			cis-1,3-dichloropropene	2018/06/30		94	%	60 - 130
			trans-1,3-dichloropropene	2018/06/30		79	%	60 - 130
			Methyl methacrylate	2018/06/30		110	%	60 - 130
			Methyl-tert-butylether (MTBE)	2018/06/30		76	%	60 - 130
			Styrene	2018/06/30		114	%	60 - 130
			1,1,1,2-tetrachloroethane	2018/06/30		116	%	60 - 130
			1,1,2,2-tetrachloroethane	2018/06/30		140 (2)	%	60 - 130
			Tetrachloroethene	2018/06/30		112	%	60 - 130
			1,2,3-trichlorobenzene	2018/06/30		119	%	60 - 130
			1,2,4-trichlorobenzene	2018/06/30		109	%	60 - 130
			1,3,5-trichlorobenzene	2018/06/30		108	%	60 - 130
			1,1,1-trichloroethane	2018/06/30		102	%	60 - 130
			1,1,2-trichloroethane	2018/06/30		101	%	60 - 130
			Trichloroethene	2018/06/30		99	%	60 - 130
			Trichlorofluoromethane	2018/06/30		111	%	60 - 130
			1,2,4-trimethylbenzene	2018/06/30		106	%	60 - 130
			1,3,5-trimethylbenzene	2018/06/30		103	%	60 - 130
			Vinyl chloride	2018/06/30		115	%	60 - 130
9041976	RC6	Method Blank	1,4-Difluorobenzene (sur.)	2018/07/03		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/07/03		107	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/07/03		104	%	50 - 140
			Bromodichloromethane	2018/07/03	<0.50		ug/L	
			Bromoform	2018/07/03	<0.50		ug/L	
			Bromomethane	2018/07/03	<2.0		ug/L	
			Carbon tetrachloride	2018/07/03	<0.50		ug/L	
			Chlorobenzene	2018/07/03	<0.50		ug/L	
			Chlorodibromomethane	2018/07/03	<1.0		ug/L	
			Chloroethane	2018/07/03	<1.0		ug/L	
			Chloroform	2018/07/03	<0.50		ug/L	
			Chloromethane	2018/07/03	<2.0		ug/L	
			1,2-dibromoethane	2018/07/03	<0.20		ug/L	
			1,2-dichlorobenzene	2018/07/03	<0.50		ug/L	
			1,3-dichlorobenzene	2018/07/03	<0.50		ug/L	
			1,4-dichlorobenzene	2018/07/03	<0.50		ug/L	
			1,1-dichloroethane	2018/07/03	<0.50		ug/L	
			1,2-dichloroethane	2018/07/03	<0.50		ug/L	
			1,1-dichloroethene	2018/07/03	<0.50		ug/L	
			cis-1,2-dichloroethene	2018/07/03	<0.50		ug/L	
			trans-1,2-dichloroethene	2018/07/03	<0.50		ug/L	
			Dichloromethane	2018/07/03	<2.0		ug/L	
			1,2-dichloropropane	2018/07/03	<0.50		ug/L	
			cis-1,3-dichloropropene	2018/07/03	<0.50		ug/L	
			trans-1,3-dichloropropene	2018/07/03	<0.50		ug/L	
			Methyl methacrylate	2018/07/03	<0.50		ug/L	
			Methyl-tert-butylether (MTBE)	2018/07/03	<0.50		ug/L	

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Maxxam Job #: B851729
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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Styrene	2018/07/03	<0.50		ug/L	
			1,1,1,2-tetrachloroethane	2018/07/03	<1.0		ug/L	
			1,1,2,2-tetrachloroethane	2018/07/03	<2.0		ug/L	
			Tetrachloroethene	2018/07/03	<0.50		ug/L	
			1,2,3-trichlorobenzene	2018/07/03	<1.0		ug/L	
			1,2,4-trichlorobenzene	2018/07/03	<1.0		ug/L	
			1,3,5-trichlorobenzene	2018/07/03	<0.50		ug/L	
			1,1,1-trichloroethane	2018/07/03	<0.50		ug/L	
			1,1,2-trichloroethane	2018/07/03	<0.50		ug/L	
			Trichloroethene	2018/07/03	<0.50		ug/L	
			Trichlorofluoromethane	2018/07/03	<0.50		ug/L	
			1,2,4-trimethylbenzene	2018/07/03	<0.50		ug/L	
			1,3,5-trimethylbenzene	2018/07/03	<0.50		ug/L	
			Vinyl chloride	2018/07/03	<0.50		ug/L	
9041976	RC6	RPD [TS8452-07]	Bromodichloromethane	2018/06/30	NC		%	30
			Bromoform	2018/06/30	NC		%	30
			Bromomethane	2018/06/30	NC		%	30
			Carbon tetrachloride	2018/06/30	NC		%	30
			Chlorobenzene	2018/06/30	NC		%	30
			Chlorodibromomethane	2018/06/30	NC		%	30
			Chloroethane	2018/06/30	NC		%	30
			Chloroform	2018/06/30	NC		%	30
			Chloromethane	2018/06/30	NC		%	30
			1,2-dibromoethane	2018/06/30	NC		%	30
			1,2-dichlorobenzene	2018/06/30	NC		%	30
			1,3-dichlorobenzene	2018/06/30	NC		%	30
			1,4-dichlorobenzene	2018/06/30	NC		%	30
			1,1-dichloroethane	2018/06/30	NC		%	30
			1,2-dichloroethane	2018/06/30	NC		%	30
			1,1-dichloroethene	2018/06/30	NC		%	30
			cis-1,2-dichloroethene	2018/06/30	NC		%	30
			trans-1,2-dichloroethene	2018/06/30	NC		%	30
			Dichloromethane	2018/06/30	NC		%	30
			1,2-dichloropropane	2018/06/30	NC		%	30
			cis-1,3-dichloropropene	2018/06/30	NC		%	30
			trans-1,3-dichloropropene	2018/06/30	NC		%	30
			Methyl methacrylate	2018/06/30	NC		%	30
			Methyl-tert-butylether (MTBE)	2018/06/30	NC		%	30
			Styrene	2018/06/30	NC		%	30
			1,1,1,2-tetrachloroethane	2018/06/30	NC		%	30
			1,1,2,2-tetrachloroethane	2018/06/30	NC		%	30
			Tetrachloroethene	2018/06/30	NC		%	30
			1,2,3-trichlorobenzene	2018/06/30	NC		%	30
			1,2,4-trichlorobenzene	2018/06/30	NC		%	30
			1,3,5-trichlorobenzene	2018/06/30	NC		%	30
			1,1,1-trichloroethane	2018/06/30	NC		%	30
			1,1,2-trichloroethane	2018/06/30	NC		%	30
			Trichloroethene	2018/06/30	NC		%	30
			Trichlorofluoromethane	2018/06/30	NC		%	30
			1,2,4-trimethylbenzene	2018/06/30	NC		%	30
			1,3,5-trimethylbenzene	2018/06/30	NC		%	30
			Vinyl chloride	2018/06/30	NC		%	30
9042833	KHO	Matrix Spike	O-TERPHENYL (sur.)	2018/06/29		108	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/06/29		120	%	60 - 140

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9042833	KHO	Spiked Blank	O-TERPHENYL (sur.)	2018/06/29		95	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/06/29		103	%	60 - 140
9042833	KHO	Method Blank	O-TERPHENYL (sur.)	2018/06/29		97	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/06/29	<0.10		mg/L	
9042833	KHO	RPD	F2 (C10-C16 Hydrocarbons)	2018/06/29	NC		%	30
9042846	SKH	Matrix Spike [TS8453-03]	O-TERPHENYL (sur.)	2018/06/30		110	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/06/30		124	%	60 - 140
9042846	SKH	Spiked Blank	O-TERPHENYL (sur.)	2018/06/30		85	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/06/30		95	%	60 - 140
9042846	SKH	Method Blank	O-TERPHENYL (sur.)	2018/06/30		96	%	60 - 140
			F2 (C10-C16 Hydrocarbons)	2018/06/30	<0.10		mg/L	
9042846	SKH	RPD [TS8452-03]	F2 (C10-C16 Hydrocarbons)	2018/06/30	NC		%	30
9042902	AF6	Matrix Spike	Dissolved Nitrite (N)	2018/06/28		107	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/06/28		88	%	80 - 120
9042902	AF6	Spiked Blank	Dissolved Nitrite (N)	2018/06/28		105	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/06/28		93	%	80 - 120
9042902	AF6	Method Blank	Dissolved Nitrite (N)	2018/06/28	<0.010		mg/L	
			Dissolved Nitrate plus Nitrite (N)	2018/06/28	<0.020		mg/L	
9042902	AF6	RPD	Dissolved Nitrite (N)	2018/06/28	NC		%	20
			Dissolved Nitrate plus Nitrite (N)	2018/06/28	NC		%	20
9042922	AF6	Matrix Spike [TS8481-01]	Dissolved Nitrite (N)	2018/06/28		106	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/06/28		93	%	80 - 120
9042922	AF6	Spiked Blank	Dissolved Nitrite (N)	2018/06/28		102	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/06/28		91	%	80 - 120
9042922	AF6	Method Blank	Dissolved Nitrite (N)	2018/06/28	<0.010		mg/L	
			Dissolved Nitrate plus Nitrite (N)	2018/06/28	<0.020		mg/L	
9042922	AF6	RPD [TS8481-01]	Dissolved Nitrite (N)	2018/06/28	1.2		%	20
			Dissolved Nitrate plus Nitrite (N)	2018/06/28	0		%	20
9043005	AF6	Matrix Spike [TS8469-01]	Dissolved Nitrite (N)	2018/06/28		109	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/06/28		85	%	80 - 120
9043005	AF6	Spiked Blank	Dissolved Nitrite (N)	2018/06/28		102	%	80 - 120
			Dissolved Nitrate plus Nitrite (N)	2018/06/28		92	%	80 - 120
9043005	AF6	Method Blank	Dissolved Nitrite (N)	2018/06/28	<0.010		mg/L	
			Dissolved Nitrate plus Nitrite (N)	2018/06/28	<0.020		mg/L	
9043005	AF6	RPD [TS8469-01]	Dissolved Nitrite (N)	2018/06/28	NC		%	20
			Dissolved Nitrate plus Nitrite (N)	2018/06/28	NC		%	20
9043074	MA4	Spiked Blank	pH	2018/06/28		100	%	97 - 103
9043074	MA4	RPD	pH	2018/06/28	0.065		%	N/A
9043075	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2018/06/28		99	%	80 - 120
9043075	MA4	Method Blank	Alkalinity (PP as CaCO3)	2018/06/28	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2018/06/28	<1.0		mg/L	
			Bicarbonate (HCO3)	2018/06/28	<1.0		mg/L	
			Carbonate (CO3)	2018/06/28	<1.0		mg/L	
			Hydroxide (OH)	2018/06/28	<1.0		mg/L	
9043075	MA4	RPD	Alkalinity (PP as CaCO3)	2018/06/28	NC		%	20
			Alkalinity (Total as CaCO3)	2018/06/28	0.085		%	20
			Bicarbonate (HCO3)	2018/06/28	0.21		%	20
			Carbonate (CO3)	2018/06/28	NC		%	20
			Hydroxide (OH)	2018/06/28	NC		%	20
9043076	MA4	Spiked Blank	Conductivity	2018/06/28		100	%	90 - 110
9043076	MA4	Method Blank	Conductivity	2018/06/28	<2.0		uS/cm	
9043076	MA4	RPD	Conductivity	2018/06/28	0.10		%	10
9043077	MA4	Spiked Blank	pH	2018/06/28		100	%	97 - 103
9043077	MA4	RPD [TS8457-01]	pH	2018/06/28	0.40		%	N/A

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9043079	JK9	Matrix Spike	Dissolved Calcium (Ca)	2018/06/28		96	%	80 - 120
			Dissolved Iron (Fe)	2018/06/28		98	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/28		102	%	80 - 120
			Dissolved Manganese (Mn)	2018/06/28		98	%	80 - 120
			Dissolved Potassium (K)	2018/06/28		98	%	80 - 120
			Dissolved Sodium (Na)	2018/06/28		93	%	80 - 120
9043079	JK9	Spiked Blank	Dissolved Calcium (Ca)	2018/06/28		99	%	80 - 120
			Dissolved Iron (Fe)	2018/06/28		100	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/28		102	%	80 - 120
			Dissolved Manganese (Mn)	2018/06/28		100	%	80 - 120
			Dissolved Potassium (K)	2018/06/28		101	%	80 - 120
			Dissolved Sodium (Na)	2018/06/28		100	%	80 - 120
9043079	JK9	Method Blank	Dissolved Calcium (Ca)	2018/06/28	<0.30		mg/L	
			Dissolved Iron (Fe)	2018/06/28	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2018/06/28	<0.20		mg/L	
			Dissolved Manganese (Mn)	2018/06/28	<0.0040		mg/L	
			Dissolved Potassium (K)	2018/06/28	<0.30		mg/L	
			Dissolved Sodium (Na)	2018/06/28	<0.50		mg/L	
9043079	JK9	RPD	Dissolved Calcium (Ca)	2018/06/28	0.25		%	20
			Dissolved Iron (Fe)	2018/06/28	NC		%	20
			Dissolved Magnesium (Mg)	2018/06/28	0.97		%	20
			Dissolved Manganese (Mn)	2018/06/28	1.6		%	20
			Dissolved Potassium (K)	2018/06/28	0.51		%	20
			Dissolved Sodium (Na)	2018/06/28	0.48		%	20
9043080	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2018/06/28		100	%	80 - 120
9043080	MA4	Method Blank	Alkalinity (PP as CaCO3)	2018/06/28	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2018/06/28	<1.0		mg/L	
			Bicarbonate (HCO3)	2018/06/28	<1.0		mg/L	
			Carbonate (CO3)	2018/06/28	<1.0		mg/L	
			Hydroxide (OH)	2018/06/28	<1.0		mg/L	
9043080	MA4	RPD [TS8457-01]	Alkalinity (PP as CaCO3)	2018/06/28	NC		%	20
			Alkalinity (Total as CaCO3)	2018/06/28	0.35		%	20
			Bicarbonate (HCO3)	2018/06/28	0.35		%	20
			Carbonate (CO3)	2018/06/28	NC		%	20
			Hydroxide (OH)	2018/06/28	NC		%	20
9043081	MA4	Spiked Blank	Conductivity	2018/06/28		99	%	90 - 110
9043081	MA4	Method Blank	Conductivity	2018/06/28	<2.0		uS/cm	
9043081	MA4	RPD [TS8457-01]	Conductivity	2018/06/28	0.75		%	10
9043140	HP5	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/06/30		96	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/30		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/30		97	%	50 - 140
			Benzene	2018/06/30		88	%	50 - 140
			Toluene	2018/06/30		91	%	50 - 140
			Ethylbenzene	2018/06/30		96	%	50 - 140
			m & p-Xylene	2018/06/30		94	%	50 - 140
			o-Xylene	2018/06/30		94	%	50 - 140
			F1 (C6-C10)	2018/06/30		79	%	60 - 140
9043140	HP5	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/06/30		95	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/30		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/30		94	%	50 - 140
			Benzene	2018/06/30		84	%	60 - 130
			Toluene	2018/06/30		86	%	60 - 130
			Ethylbenzene	2018/06/30		92	%	60 - 130
			m & p-Xylene	2018/06/30		89	%	60 - 130

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			o-Xylene	2018/06/30		91	%	60 - 130
			F1 (C6-C10)	2018/06/30		102	%	60 - 140
9043140	HP5	Method Blank	1,4-Difluorobenzene (sur.)	2018/06/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		99	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		97	%	50 - 140
			Benzene	2018/06/29	<0.00040		mg/L	
			Toluene	2018/06/29	<0.00040		mg/L	
			Ethylbenzene	2018/06/29	<0.00040		mg/L	
			m & p-Xylene	2018/06/29	<0.00080		mg/L	
			o-Xylene	2018/06/29	<0.00040		mg/L	
			F1 (C6-C10)	2018/06/29	<0.10		mg/L	
9043140	HP5	RPD	Benzene	2018/06/29	NC		%	30
			Toluene	2018/06/29	NC		%	30
			Ethylbenzene	2018/06/29	NC		%	30
			m & p-Xylene	2018/06/29	NC		%	30
			o-Xylene	2018/06/29	NC		%	30
			F1 (C6-C10)	2018/06/29	NC		%	30
9043169	HP5	Matrix Spike	1,4-Difluorobenzene (sur.)	2018/06/29		95	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		103	%	50 - 140
			Benzene	2018/06/29		98	%	50 - 140
			Toluene	2018/06/29		84	%	50 - 140
			Ethylbenzene	2018/06/29		87	%	50 - 140
			m & p-Xylene	2018/06/29		84	%	50 - 140
			o-Xylene	2018/06/29		92	%	50 - 140
			F1 (C6-C10)	2018/06/29		61	%	60 - 140
9043169	HP5	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/06/29		93	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		98	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		105	%	50 - 140
			Benzene	2018/06/29		96	%	60 - 130
			Toluene	2018/06/29		82	%	60 - 130
			Ethylbenzene	2018/06/29		85	%	60 - 130
			m & p-Xylene	2018/06/29		82	%	60 - 130
			o-Xylene	2018/06/29		89	%	60 - 130
			F1 (C6-C10)	2018/06/29		102	%	60 - 140
9043169	HP5	Method Blank	1,4-Difluorobenzene (sur.)	2018/06/29		98	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		102	%	50 - 140
			Benzene	2018/06/29	<0.00040		mg/L	
			Toluene	2018/06/29	<0.00040		mg/L	
			Ethylbenzene	2018/06/29	<0.00040		mg/L	
			m & p-Xylene	2018/06/29	<0.00080		mg/L	
			o-Xylene	2018/06/29	<0.00040		mg/L	
			F1 (C6-C10)	2018/06/29	<0.10		mg/L	
9043169	HP5	RPD	Benzene	2018/06/29	NC		%	30
			Toluene	2018/06/29	NC		%	30
			Ethylbenzene	2018/06/29	NC		%	30
			m & p-Xylene	2018/06/29	NC		%	30
			o-Xylene	2018/06/29	NC		%	30
			F1 (C6-C10)	2018/06/29	NC		%	30
9043183	HP5	Matrix Spike [TS8466-07]	1,4-Difluorobenzene (sur.)	2018/06/30		94	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/30		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/30		104	%	50 - 140
			Benzene	2018/06/30		91	%	50 - 140

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			Toluene	2018/06/30		84	%	50 - 140
			Ethylbenzene	2018/06/30		94	%	50 - 140
			m & p-Xylene	2018/06/30		88	%	50 - 140
			o-Xylene	2018/06/30		92	%	50 - 140
			F1 (C6-C10)	2018/06/30		75	%	60 - 140
9043183	HP5	Spiked Blank	1,4-Difluorobenzene (sur.)	2018/06/29		97	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		100	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		105	%	50 - 140
			Benzene	2018/06/29		94	%	60 - 130
			Toluene	2018/06/29		84	%	60 - 130
			Ethylbenzene	2018/06/29		94	%	60 - 130
			m & p-Xylene	2018/06/29		88	%	60 - 130
			o-Xylene	2018/06/29		91	%	60 - 130
			F1 (C6-C10)	2018/06/29		103	%	60 - 140
9043183	HP5	Method Blank	1,4-Difluorobenzene (sur.)	2018/06/29		100	%	50 - 140
			4-Bromofluorobenzene (sur.)	2018/06/29		102	%	50 - 140
			D4-1,2-Dichloroethane (sur.)	2018/06/29		97	%	50 - 140
			Benzene	2018/06/29	<0.00040		mg/L	
			Toluene	2018/06/29	<0.00040		mg/L	
			Ethylbenzene	2018/06/29	<0.00040		mg/L	
			m & p-Xylene	2018/06/29	<0.00080		mg/L	
			o-Xylene	2018/06/29	<0.00040		mg/L	
			F1 (C6-C10)	2018/06/29	<0.10		mg/L	
9043183	HP5	RPD [TS8467-07]	Benzene	2018/06/29	NC		%	30
			Toluene	2018/06/29	NC		%	30
			Ethylbenzene	2018/06/29	NC		%	30
			m & p-Xylene	2018/06/29	NC		%	30
			o-Xylene	2018/06/29	NC		%	30
			F1 (C6-C10)	2018/06/29	NC		%	30
9043264	MA4	Spiked Blank	pH	2018/06/28		100	%	97 - 103
9043264	MA4	RPD	pH	2018/06/28	0.084		%	N/A
9043265	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2018/06/28		99	%	80 - 120
9043265	MA4	Method Blank	Alkalinity (PP as CaCO3)	2018/06/28	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2018/06/28	<1.0		mg/L	
			Bicarbonate (HCO3)	2018/06/28	<1.0		mg/L	
			Carbonate (CO3)	2018/06/28	<1.0		mg/L	
			Hydroxide (OH)	2018/06/28	<1.0		mg/L	
9043265	MA4	RPD	Alkalinity (PP as CaCO3)	2018/06/28	NC		%	20
			Alkalinity (Total as CaCO3)	2018/06/28	0.95		%	20
			Bicarbonate (HCO3)	2018/06/28	0.95		%	20
			Carbonate (CO3)	2018/06/28	NC		%	20
			Hydroxide (OH)	2018/06/28	NC		%	20
9043267	MA4	Spiked Blank	Conductivity	2018/06/28		98	%	90 - 110
9043267	MA4	Method Blank	Conductivity	2018/06/28	<2.0		uS/cm	
9043267	MA4	RPD	Conductivity	2018/06/28	2.3		%	10
9043333	MRD	Matrix Spike [TS8457-01]	Dissolved Chloride (Cl)	2018/07/01		105	%	80 - 120
9043333	MRD	Spiked Blank	Dissolved Chloride (Cl)	2018/07/01		106	%	80 - 120
9043333	MRD	Method Blank	Dissolved Chloride (Cl)	2018/07/01	<1.0		mg/L	
9043333	MRD	RPD [TS8457-01]	Dissolved Chloride (Cl)	2018/07/01	2.9		%	20
9043354	MRD	Matrix Spike [TS8457-01]	Dissolved Sulphate (SO4)	2018/07/01		NC	%	80 - 120
9043354	MRD	Spiked Blank	Dissolved Sulphate (SO4)	2018/07/01		104	%	80 - 120
9043354	MRD	Method Blank	Dissolved Sulphate (SO4)	2018/07/01	<1.0		mg/L	
9043354	MRD	RPD [TS8457-01]	Dissolved Sulphate (SO4)	2018/07/01	6.4		%	20
9043356	CH7	Matrix Spike	Dissolved Chloride (Cl)	2018/06/30		102	%	80 - 120

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9043356	CH7	Spiked Blank	Dissolved Chloride (Cl)	2018/06/30		105	%	80 - 120
9043356	CH7	Method Blank	Dissolved Chloride (Cl)	2018/06/30	<1.0		mg/L	
9043356	CH7	RPD	Dissolved Chloride (Cl)	2018/06/30	NC		%	20
9043357	CH7	Matrix Spike	Dissolved Sulphate (SO4)	2018/06/30		106	%	80 - 120
9043357	CH7	Spiked Blank	Dissolved Sulphate (SO4)	2018/06/30		105	%	80 - 120
9043357	CH7	Method Blank	Dissolved Sulphate (SO4)	2018/06/30	<1.0		mg/L	
9043357	CH7	RPD	Dissolved Sulphate (SO4)	2018/06/30	NC		%	20
9043723	JHS	Matrix Spike	Dissolved Aluminum (Al)	2018/06/29		94	%	80 - 120
			Dissolved Antimony (Sb)	2018/06/29		102	%	80 - 120
			Dissolved Arsenic (As)	2018/06/29		93	%	80 - 120
			Dissolved Beryllium (Be)	2018/06/29		101	%	80 - 120
			Dissolved Chromium (Cr)	2018/06/29		98	%	80 - 120
			Dissolved Cobalt (Co)	2018/06/29		96	%	80 - 120
			Dissolved Copper (Cu)	2018/06/29		95	%	80 - 120
			Dissolved Lead (Pb)	2018/06/29		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2018/06/29		94	%	80 - 120
			Dissolved Nickel (Ni)	2018/06/29		96	%	80 - 120
			Dissolved Selenium (Se)	2018/06/29		94	%	80 - 120
			Dissolved Silver (Ag)	2018/06/29		98	%	80 - 120
			Dissolved Thallium (Tl)	2018/06/29		98	%	80 - 120
			Dissolved Tin (Sn)	2018/06/29		109	%	80 - 120
			Dissolved Titanium (Ti)	2018/06/29		102	%	80 - 120
			Dissolved Uranium (U)	2018/06/29		97	%	80 - 120
			Dissolved Vanadium (V)	2018/06/29		101	%	80 - 120
			Dissolved Zinc (Zn)	2018/06/29		96	%	80 - 120
9043723	JHS	Spiked Blank	Dissolved Aluminum (Al)	2018/06/29		101	%	80 - 120
			Dissolved Antimony (Sb)	2018/06/29		97	%	80 - 120
			Dissolved Arsenic (As)	2018/06/29		96	%	80 - 120
			Dissolved Beryllium (Be)	2018/06/29		97	%	80 - 120
			Dissolved Chromium (Cr)	2018/06/29		103	%	80 - 120
			Dissolved Cobalt (Co)	2018/06/29		101	%	80 - 120
			Dissolved Copper (Cu)	2018/06/29		102	%	80 - 120
			Dissolved Lead (Pb)	2018/06/29		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2018/06/29		88	%	80 - 120
			Dissolved Nickel (Ni)	2018/06/29		100	%	80 - 120
			Dissolved Selenium (Se)	2018/06/29		91	%	80 - 120
			Dissolved Silver (Ag)	2018/06/29		97	%	80 - 120
			Dissolved Thallium (Tl)	2018/06/29		99	%	80 - 120
			Dissolved Tin (Sn)	2018/06/29		101	%	80 - 120
			Dissolved Titanium (Ti)	2018/06/29		103	%	80 - 120
			Dissolved Uranium (U)	2018/06/29		96	%	80 - 120
			Dissolved Vanadium (V)	2018/06/29		101	%	80 - 120
			Dissolved Zinc (Zn)	2018/06/29		101	%	80 - 120
9043723	JHS	Method Blank	Dissolved Aluminum (Al)	2018/06/29	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2018/06/29	<0.00060		mg/L	
			Dissolved Arsenic (As)	2018/06/29	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2018/06/29	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2018/06/29	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2018/06/29	<0.00030		mg/L	
			Dissolved Copper (Cu)	2018/06/29	<0.00020		mg/L	
			Dissolved Lead (Pb)	2018/06/29	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2018/06/29	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2018/06/29	<0.00050		mg/L	
			Dissolved Selenium (Se)	2018/06/29	<0.00020		mg/L	

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2018/06/29	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2018/06/29	<0.00020		mg/L	
			Dissolved Tin (Sn)	2018/06/29	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2018/06/29	<0.0010		mg/L	
			Dissolved Uranium (U)	2018/06/29	<0.00010		mg/L	
			Dissolved Vanadium (V)	2018/06/29	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2018/06/29	<0.0030		mg/L	
9043723	JHS	RPD	Dissolved Aluminum (Al)	2018/06/29	NC		%	20
			Dissolved Antimony (Sb)	2018/06/29	NC		%	20
			Dissolved Arsenic (As)	2018/06/29	8.0		%	20
			Dissolved Beryllium (Be)	2018/06/29	NC		%	20
			Dissolved Chromium (Cr)	2018/06/29	NC		%	20
			Dissolved Cobalt (Co)	2018/06/29	NC		%	20
			Dissolved Copper (Cu)	2018/06/29	0.92		%	20
			Dissolved Lead (Pb)	2018/06/29	NC		%	20
			Dissolved Molybdenum (Mo)	2018/06/29	0.76		%	20
			Dissolved Nickel (Ni)	2018/06/29	2.5		%	20
			Dissolved Selenium (Se)	2018/06/29	NC		%	20
			Dissolved Silver (Ag)	2018/06/29	NC		%	20
			Dissolved Thallium (Tl)	2018/06/29	NC		%	20
			Dissolved Tin (Sn)	2018/06/29	NC		%	20
			Dissolved Titanium (Ti)	2018/06/29	NC		%	20
			Dissolved Uranium (U)	2018/06/29	3.9		%	20
			Dissolved Vanadium (V)	2018/06/29	NC		%	20
			Dissolved Zinc (Zn)	2018/06/29	NC		%	20
9043727	APY	Matrix Spike [TS8454-06]	Dissolved Aluminum (Al)	2018/06/29		92	%	80 - 120
			Dissolved Antimony (Sb)	2018/06/29		103	%	80 - 120
			Dissolved Arsenic (As)	2018/06/29		95	%	80 - 120
			Dissolved Beryllium (Be)	2018/06/29		97	%	80 - 120
			Dissolved Chromium (Cr)	2018/06/29		93	%	80 - 120
			Dissolved Cobalt (Co)	2018/06/29		91	%	80 - 120
			Dissolved Copper (Cu)	2018/06/29		88	%	80 - 120
			Dissolved Lead (Pb)	2018/06/29		84	%	80 - 120
			Dissolved Molybdenum (Mo)	2018/06/29		92	%	80 - 120
			Dissolved Nickel (Ni)	2018/06/29		92	%	80 - 120
			Dissolved Selenium (Se)	2018/06/29		91	%	80 - 120
			Dissolved Silver (Ag)	2018/06/29		89	%	80 - 120
			Dissolved Thallium (Tl)	2018/06/29		87	%	80 - 120
			Dissolved Tin (Sn)	2018/06/29		87	%	80 - 120
			Dissolved Titanium (Ti)	2018/06/29		90	%	80 - 120
			Dissolved Uranium (U)	2018/06/29		92	%	80 - 120
			Dissolved Vanadium (V)	2018/06/29		101	%	80 - 120
			Dissolved Zinc (Zn)	2018/06/29		84	%	80 - 120
9043727	APY	Spiked Blank	Dissolved Aluminum (Al)	2018/06/29		99	%	80 - 120
			Dissolved Antimony (Sb)	2018/06/29		95	%	80 - 120
			Dissolved Arsenic (As)	2018/06/29		93	%	80 - 120
			Dissolved Beryllium (Be)	2018/06/29		95	%	80 - 120
			Dissolved Chromium (Cr)	2018/06/29		92	%	80 - 120
			Dissolved Cobalt (Co)	2018/06/29		94	%	80 - 120
			Dissolved Copper (Cu)	2018/06/29		97	%	80 - 120
			Dissolved Lead (Pb)	2018/06/29		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2018/06/29		83	%	80 - 120
			Dissolved Nickel (Ni)	2018/06/29		95	%	80 - 120
			Dissolved Selenium (Se)	2018/06/29		92	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2018/06/29		95	%	80 - 120
			Dissolved Thallium (Tl)	2018/06/29		94	%	80 - 120
			Dissolved Tin (Sn)	2018/06/29		94	%	80 - 120
			Dissolved Titanium (Ti)	2018/06/29		97	%	80 - 120
			Dissolved Uranium (U)	2018/06/29		92	%	80 - 120
			Dissolved Vanadium (V)	2018/06/29		97	%	80 - 120
			Dissolved Zinc (Zn)	2018/06/29		97	%	80 - 120
9043727	APY	Method Blank	Dissolved Aluminum (Al)	2018/06/29	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2018/06/29	<0.00060		mg/L	
			Dissolved Arsenic (As)	2018/06/29	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2018/06/29	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2018/06/29	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2018/06/29	<0.00030		mg/L	
			Dissolved Copper (Cu)	2018/06/29	<0.00020		mg/L	
			Dissolved Lead (Pb)	2018/06/29	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2018/06/29	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2018/06/29	<0.00050		mg/L	
			Dissolved Selenium (Se)	2018/06/29	<0.00020		mg/L	
			Dissolved Silver (Ag)	2018/06/29	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2018/06/29	<0.00020		mg/L	
			Dissolved Tin (Sn)	2018/06/29	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2018/06/29	<0.0010		mg/L	
			Dissolved Uranium (U)	2018/06/29	<0.00010		mg/L	
			Dissolved Vanadium (V)	2018/06/29	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2018/06/29	<0.0030		mg/L	
9043727	APY	RPD [TS8454-06]	Dissolved Aluminum (Al)	2018/06/30	NC		%	20
			Dissolved Antimony (Sb)	2018/06/30	NC		%	20
			Dissolved Arsenic (As)	2018/06/30	12		%	20
			Dissolved Beryllium (Be)	2018/06/30	NC		%	20
			Dissolved Chromium (Cr)	2018/06/30	NC		%	20
			Dissolved Cobalt (Co)	2018/06/30	1.8		%	20
			Dissolved Copper (Cu)	2018/06/30	1.4		%	20
			Dissolved Lead (Pb)	2018/06/30	NC		%	20
			Dissolved Molybdenum (Mo)	2018/06/30	0.62		%	20
			Dissolved Nickel (Ni)	2018/06/30	5.6		%	20
			Dissolved Selenium (Se)	2018/06/30	1.1		%	20
			Dissolved Silver (Ag)	2018/06/30	NC		%	20
			Dissolved Thallium (Tl)	2018/06/30	NC		%	20
			Dissolved Tin (Sn)	2018/06/30	NC		%	20
			Dissolved Titanium (Ti)	2018/06/30	NC		%	20
			Dissolved Uranium (U)	2018/06/30	2.4		%	20
			Dissolved Vanadium (V)	2018/06/30	6.1		%	20
			Dissolved Zinc (Zn)	2018/06/30	9.0		%	20
9043728	APY	Matrix Spike [TS8479-06]	Dissolved Aluminum (Al)	2018/06/29		101	%	80 - 120
			Dissolved Antimony (Sb)	2018/06/29		114	%	80 - 120
			Dissolved Arsenic (As)	2018/06/29		98	%	80 - 120
			Dissolved Beryllium (Be)	2018/06/29		96	%	80 - 120
			Dissolved Chromium (Cr)	2018/06/29		94	%	80 - 120
			Dissolved Cobalt (Co)	2018/06/29		94	%	80 - 120
			Dissolved Copper (Cu)	2018/06/29		92	%	80 - 120
			Dissolved Lead (Pb)	2018/06/29		88	%	80 - 120
			Dissolved Molybdenum (Mo)	2018/06/29		94	%	80 - 120
			Dissolved Nickel (Ni)	2018/06/29		95	%	80 - 120
			Dissolved Selenium (Se)	2018/06/29		93	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silver (Ag)	2018/06/29		95	%	80 - 120
			Dissolved Thallium (Tl)	2018/06/29		91	%	80 - 120
			Dissolved Tin (Sn)	2018/06/29		114	%	80 - 120
			Dissolved Titanium (Ti)	2018/06/29		102	%	80 - 120
			Dissolved Uranium (U)	2018/06/29		95	%	80 - 120
			Dissolved Vanadium (V)	2018/06/29		101	%	80 - 120
			Dissolved Zinc (Zn)	2018/06/29		96	%	80 - 120
9043728	APY	Spiked Blank	Dissolved Aluminum (Al)	2018/06/29		106	%	80 - 120
			Dissolved Antimony (Sb)	2018/06/29		106	%	80 - 120
			Dissolved Arsenic (As)	2018/06/29		96	%	80 - 120
			Dissolved Beryllium (Be)	2018/06/29		92	%	80 - 120
			Dissolved Chromium (Cr)	2018/06/29		94	%	80 - 120
			Dissolved Cobalt (Co)	2018/06/29		95	%	80 - 120
			Dissolved Copper (Cu)	2018/06/29		98	%	80 - 120
			Dissolved Lead (Pb)	2018/06/29		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2018/06/29		87	%	80 - 120
			Dissolved Nickel (Ni)	2018/06/29		98	%	80 - 120
			Dissolved Selenium (Se)	2018/06/29		96	%	80 - 120
			Dissolved Silver (Ag)	2018/06/29		97	%	80 - 120
			Dissolved Thallium (Tl)	2018/06/29		97	%	80 - 120
			Dissolved Tin (Sn)	2018/06/29		109	%	80 - 120
			Dissolved Titanium (Ti)	2018/06/29		97	%	80 - 120
			Dissolved Uranium (U)	2018/06/29		94	%	80 - 120
			Dissolved Vanadium (V)	2018/06/29		96	%	80 - 120
			Dissolved Zinc (Zn)	2018/06/29		101	%	80 - 120
9043728	APY	Method Blank	Dissolved Aluminum (Al)	2018/06/29	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2018/06/29	<0.00060		mg/L	
			Dissolved Arsenic (As)	2018/06/29	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2018/06/29	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2018/06/29	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2018/06/29	<0.00030		mg/L	
			Dissolved Copper (Cu)	2018/06/29	<0.00020		mg/L	
			Dissolved Lead (Pb)	2018/06/29	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2018/06/29	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2018/06/29	<0.00050		mg/L	
			Dissolved Selenium (Se)	2018/06/29	<0.00020		mg/L	
			Dissolved Silver (Ag)	2018/06/29	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2018/06/29	<0.00020		mg/L	
			Dissolved Tin (Sn)	2018/06/29	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2018/06/29	<0.0010		mg/L	
			Dissolved Uranium (U)	2018/06/29	<0.00010		mg/L	
			Dissolved Vanadium (V)	2018/06/29	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2018/06/29	<0.0030		mg/L	
9043728	APY	RPD [TS8479-06]	Dissolved Aluminum (Al)	2018/06/29	20		%	20
			Dissolved Antimony (Sb)	2018/06/29	NC		%	20
			Dissolved Arsenic (As)	2018/06/29	NC		%	20
			Dissolved Beryllium (Be)	2018/06/29	NC		%	20
			Dissolved Chromium (Cr)	2018/06/29	NC		%	20
			Dissolved Cobalt (Co)	2018/06/29	NC		%	20
			Dissolved Copper (Cu)	2018/06/29	4.0		%	20
			Dissolved Lead (Pb)	2018/06/29	NC		%	20
			Dissolved Molybdenum (Mo)	2018/06/29	15		%	20
			Dissolved Nickel (Ni)	2018/06/29	0.50		%	20
			Dissolved Selenium (Se)	2018/06/29	NC		%	20

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			Dissolved Silver (Ag)	2018/06/29	NC		%	20
			Dissolved Thallium (Tl)	2018/06/29	NC		%	20
			Dissolved Tin (Sn)	2018/06/29	NC		%	20
			Dissolved Titanium (Ti)	2018/06/29	NC		%	20
			Dissolved Uranium (U)	2018/06/29	3.6		%	20
			Dissolved Vanadium (V)	2018/06/29	NC		%	20
			Dissolved Zinc (Zn)	2018/06/29	5.2		%	20
9043935	AL2	Matrix Spike	Total Ammonia (N)	2018/07/03		104	%	80 - 120
9043935	AL2	Spiked Blank	Total Ammonia (N)	2018/07/03		104	%	80 - 120
9043935	AL2	Method Blank	Total Ammonia (N)	2018/07/03	<0.015		mg/L	
9043935	AL2	RPD	Total Ammonia (N)	2018/07/03	1.3		%	20
9043938	AL2	Matrix Spike	Total Ammonia (N)	2018/07/03		111	%	80 - 120
9043938	AL2	Spiked Blank	Total Ammonia (N)	2018/07/03		106	%	80 - 120
9043938	AL2	Method Blank	Total Ammonia (N)	2018/07/03	<0.015		mg/L	
9043938	AL2	RPD	Total Ammonia (N)	2018/07/03	3.3		%	20
9044847	BAH	Matrix Spike	Dissolved Mercury (Hg)	2018/06/29		98	%	80 - 120
9044847	BAH	QC Standard	Dissolved Mercury (Hg)	2018/06/29		94	%	80 - 120
9044847	BAH	Spiked Blank	Dissolved Mercury (Hg)	2018/06/29		98	%	80 - 120
9044847	BAH	Method Blank	Dissolved Mercury (Hg)	2018/06/29	<0.0020		ug/L	
9044847	BAH	RPD	Dissolved Mercury (Hg)	2018/06/29	NC		%	20
9044850	BAH	Matrix Spike [TS8471-08]	Dissolved Mercury (Hg)	2018/06/29		94	%	80 - 120
9044850	BAH	QC Standard	Dissolved Mercury (Hg)	2018/06/29		99	%	80 - 120
9044850	BAH	Spiked Blank	Dissolved Mercury (Hg)	2018/06/29		100	%	80 - 120
9044850	BAH	Method Blank	Dissolved Mercury (Hg)	2018/06/29	<0.0020		ug/L	
9044850	BAH	RPD [TS8471-08]	Dissolved Mercury (Hg)	2018/06/29	NC		%	20
9044992	JK9	Matrix Spike [TS8452-06]	Dissolved Barium (Ba)	2018/06/29		102	%	80 - 120
			Dissolved Boron (B)	2018/06/29		103	%	80 - 120
			Dissolved Calcium (Ca)	2018/06/29		100	%	80 - 120
			Dissolved Iron (Fe)	2018/06/29		99	%	80 - 120
			Dissolved Lithium (Li)	2018/06/29		97	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/29		101	%	80 - 120
			Dissolved Manganese (Mn)	2018/06/29		100	%	80 - 120
			Dissolved Phosphorus (P)	2018/06/29		106	%	80 - 120
			Dissolved Potassium (K)	2018/06/29		102	%	80 - 120
			Dissolved Silicon (Si)	2018/06/29		100	%	80 - 120
			Dissolved Sodium (Na)	2018/06/29		NC	%	80 - 120
			Dissolved Strontium (Sr)	2018/06/29		91	%	80 - 120
9044992	JK9	Spiked Blank	Dissolved Barium (Ba)	2018/06/29		103	%	80 - 120
			Dissolved Boron (B)	2018/06/29		103	%	80 - 120
			Dissolved Calcium (Ca)	2018/06/29		101	%	80 - 120
			Dissolved Iron (Fe)	2018/06/29		100	%	80 - 120
			Dissolved Lithium (Li)	2018/06/29		99	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/29		101	%	80 - 120
			Dissolved Manganese (Mn)	2018/06/29		101	%	80 - 120
			Dissolved Phosphorus (P)	2018/06/29		101	%	80 - 120
			Dissolved Potassium (K)	2018/06/29		102	%	80 - 120
			Dissolved Silicon (Si)	2018/06/29		95	%	80 - 120
			Dissolved Sodium (Na)	2018/06/29		101	%	80 - 120
			Dissolved Strontium (Sr)	2018/06/29		94	%	80 - 120
9044992	JK9	Method Blank	Dissolved Barium (Ba)	2018/06/29	<0.010		mg/L	
			Dissolved Boron (B)	2018/06/29	<0.020		mg/L	
			Dissolved Calcium (Ca)	2018/06/29	<0.30		mg/L	
			Dissolved Iron (Fe)	2018/06/29	<0.060		mg/L	
			Dissolved Lithium (Li)	2018/06/29	<0.020		mg/L	

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Sampler Initials: S+M

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Magnesium (Mg)	2018/06/29	<0.20		mg/L	
			Dissolved Manganese (Mn)	2018/06/29	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2018/06/29	<0.10		mg/L	
			Dissolved Potassium (K)	2018/06/29	<0.30		mg/L	
			Dissolved Silicon (Si)	2018/06/29	<0.10		mg/L	
			Dissolved Sodium (Na)	2018/06/29	<0.50		mg/L	
			Dissolved Strontium (Sr)	2018/06/29	<0.020		mg/L	
			Dissolved Sulphur (S)	2018/06/29	<0.20		mg/L	
9044992	JK9	RPD [TS8452-06]	Dissolved Barium (Ba)	2018/06/29	0.95		%	20
			Dissolved Boron (B)	2018/06/29	0.42		%	20
			Dissolved Calcium (Ca)	2018/06/29	0.58		%	20
			Dissolved Iron (Fe)	2018/06/29	NC		%	20
			Dissolved Lithium (Li)	2018/06/29	1.1		%	20
			Dissolved Magnesium (Mg)	2018/06/29	0.61		%	20
			Dissolved Manganese (Mn)	2018/06/29	0.55		%	20
			Dissolved Phosphorus (P)	2018/06/29	NC		%	20
			Dissolved Potassium (K)	2018/06/29	0.078		%	20
			Dissolved Silicon (Si)	2018/06/29	0.034		%	20
			Dissolved Sodium (Na)	2018/06/29	0.048		%	20
			Dissolved Strontium (Sr)	2018/06/29	0.67		%	20
			Dissolved Sulphur (S)	2018/06/29	0.29		%	20
9045011	KPG	Matrix Spike [TS8470-04]	Total Chemical Oxygen Demand	2018/06/29		102	%	80 - 120
9045011	KPG	Spiked Blank	Total Chemical Oxygen Demand	2018/06/29		101	%	80 - 120
9045011	KPG	Method Blank	Total Chemical Oxygen Demand	2018/06/29	<5.0		mg/L	
9045011	KPG	RPD [TS8470-04]	Total Chemical Oxygen Demand	2018/06/29	11		%	20
9045015	KPG	Matrix Spike	Total Chemical Oxygen Demand	2018/06/29		99	%	80 - 120
9045015	KPG	Spiked Blank	Total Chemical Oxygen Demand	2018/06/29		101	%	80 - 120
9045015	KPG	Method Blank	Total Chemical Oxygen Demand	2018/06/29	<5.0		mg/L	
9045015	KPG	RPD	Total Chemical Oxygen Demand	2018/06/29	7.8		%	20
9045019	AL2	Matrix Spike	Total Total Kjeldahl Nitrogen	2018/07/03		105	%	80 - 120
9045019	AL2	QC Standard	Total Total Kjeldahl Nitrogen	2018/07/03		106	%	80 - 120
9045019	AL2	Spiked Blank	Total Total Kjeldahl Nitrogen	2018/07/03		100	%	80 - 120
9045019	AL2	Method Blank	Total Total Kjeldahl Nitrogen	2018/07/03	<0.050		mg/L	
9045019	AL2	RPD	Total Total Kjeldahl Nitrogen	2018/07/03	1.2		%	20
			Total Total Kjeldahl Nitrogen	2018/07/03	1.6		%	20
			Total Total Kjeldahl Nitrogen	2018/07/03	20		%	20
9045058	AL2	Matrix Spike [TS8457-04]	Total Total Kjeldahl Nitrogen	2018/07/03		NC	%	80 - 120
9045058	AL2	QC Standard	Total Total Kjeldahl Nitrogen	2018/07/03		106	%	80 - 120
9045058	AL2	Spiked Blank	Total Total Kjeldahl Nitrogen	2018/07/03		105	%	80 - 120
9045058	AL2	Method Blank	Total Total Kjeldahl Nitrogen	2018/07/03	<0.050		mg/L	
9045058	AL2	RPD [TS8457-04]	Total Total Kjeldahl Nitrogen	2018/07/03	1.6		%	20
9045064	JK9	Matrix Spike [TS8480-06]	Dissolved Barium (Ba)	2018/06/30		97	%	80 - 120
			Dissolved Boron (B)	2018/06/30		101	%	80 - 120
			Dissolved Calcium (Ca)	2018/06/30		96	%	80 - 120
			Dissolved Iron (Fe)	2018/06/30		97	%	80 - 120
			Dissolved Lithium (Li)	2018/06/30		97	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/30		96	%	80 - 120
			Dissolved Manganese (Mn)	2018/06/30		97	%	80 - 120
			Dissolved Phosphorus (P)	2018/06/30		103	%	80 - 120
			Dissolved Potassium (K)	2018/06/30		98	%	80 - 120
			Dissolved Silicon (Si)	2018/06/30		98	%	80 - 120
			Dissolved Sodium (Na)	2018/06/30		NC	%	80 - 120
			Dissolved Strontium (Sr)	2018/06/30		95	%	80 - 120
9045064	JK9	Spiked Blank	Dissolved Barium (Ba)	2018/06/29		101	%	80 - 120

Maxxam Analytics International Corporation o/a Maxxam Analytics Calgary: 2021 - 41st Avenue N.E. T2E 6P2 Telephone (403) 291-3077 Fax (403) 291-9468

Maxxam Job #: B851729
Report Date: 2018/07/18

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Boron (B)	2018/06/29		104	%	80 - 120
			Dissolved Calcium (Ca)	2018/06/29		100	%	80 - 120
			Dissolved Iron (Fe)	2018/06/29		101	%	80 - 120
			Dissolved Lithium (Li)	2018/06/29		101	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/29		102	%	80 - 120
			Dissolved Manganese (Mn)	2018/06/29		101	%	80 - 120
			Dissolved Phosphorus (P)	2018/06/29		101	%	80 - 120
			Dissolved Potassium (K)	2018/06/29		102	%	80 - 120
			Dissolved Silicon (Si)	2018/06/29		96	%	80 - 120
			Dissolved Sodium (Na)	2018/06/29		104	%	80 - 120
			Dissolved Strontium (Sr)	2018/06/29		102	%	80 - 120
9045064	JK9	Method Blank	Dissolved Barium (Ba)	2018/06/29	<0.010		mg/L	
			Dissolved Boron (B)	2018/06/29	<0.020		mg/L	
			Dissolved Calcium (Ca)	2018/06/29	<0.30		mg/L	
			Dissolved Iron (Fe)	2018/06/29	<0.060		mg/L	
			Dissolved Lithium (Li)	2018/06/29	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2018/06/29	<0.20		mg/L	
			Dissolved Manganese (Mn)	2018/06/29	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2018/06/29	<0.10		mg/L	
			Dissolved Potassium (K)	2018/06/29	<0.30		mg/L	
			Dissolved Silicon (Si)	2018/06/29	<0.10		mg/L	
			Dissolved Sodium (Na)	2018/06/29	<0.50		mg/L	
			Dissolved Strontium (Sr)	2018/06/29	<0.020		mg/L	
			Dissolved Sulphur (S)	2018/06/29	<0.20		mg/L	
9045064	JK9	RPD [TS8480-06]	Dissolved Barium (Ba)	2018/06/30	NC		%	20
			Dissolved Boron (B)	2018/06/30	1.2		%	20
			Dissolved Calcium (Ca)	2018/06/30	0.12		%	20
			Dissolved Iron (Fe)	2018/06/30	NC		%	20
			Dissolved Lithium (Li)	2018/06/30	0.59		%	20
			Dissolved Magnesium (Mg)	2018/06/30	0.17		%	20
			Dissolved Manganese (Mn)	2018/06/30	NC		%	20
			Dissolved Phosphorus (P)	2018/06/30	NC		%	20
			Dissolved Potassium (K)	2018/06/30	0.37		%	20
			Dissolved Silicon (Si)	2018/06/30	0.22		%	20
			Dissolved Sodium (Na)	2018/06/30	1.1		%	20
			Dissolved Strontium (Sr)	2018/06/30	0.22		%	20
			Dissolved Sulphur (S)	2018/06/30	0.39		%	20
9045211	CH7	Matrix Spike	Dissolved Chloride (Cl)	2018/06/30		NC	%	80 - 120
9045211	CH7	Spiked Blank	Dissolved Chloride (Cl)	2018/06/30		107	%	80 - 120
9045211	CH7	Method Blank	Dissolved Chloride (Cl)	2018/06/30	<1.0		mg/L	
9045211	CH7	RPD	Dissolved Chloride (Cl)	2018/06/30	0.064		%	20
9045218	CH7	Matrix Spike	Dissolved Sulphate (SO4)	2018/06/30		107	%	80 - 120
9045218	CH7	Spiked Blank	Dissolved Sulphate (SO4)	2018/06/30		107	%	80 - 120
9045218	CH7	Method Blank	Dissolved Sulphate (SO4)	2018/06/30	<1.0		mg/L	
9045218	CH7	RPD	Dissolved Sulphate (SO4)	2018/06/30	8.4		%	20
9047816	YY	Matrix Spike [TS8452-02]	Phenols	2018/07/03		107	%	80 - 120
9047816	YY	Spiked Blank	Phenols	2018/07/03		93	%	80 - 120
9047816	YY	Method Blank	Phenols	2018/07/03	<0.0020		mg/L	
9047816	YY	RPD [TS8452-02]	Phenols	2018/07/03	9.5		%	20
9048109	YY	Matrix Spike [TS8461-02]	Phenols	2018/07/03		94	%	80 - 120
9048109	YY	Spiked Blank	Phenols	2018/07/03		92	%	80 - 120
9048109	YY	Method Blank	Phenols	2018/07/03	<0.0020		mg/L	
9048109	YY	RPD [TS8461-02]	Phenols	2018/07/03	NC		%	20
9048285	AL2	Matrix Spike	Total Total Kjeldahl Nitrogen	2018/07/04		NC	%	80 - 120

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TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
9048285	AL2	QC Standard	Total Total Kjeldahl Nitrogen	2018/07/04		106	%	80 - 120
9048285	AL2	Spiked Blank	Total Total Kjeldahl Nitrogen	2018/07/04		108	%	80 - 120
9048285	AL2	Method Blank	Total Total Kjeldahl Nitrogen	2018/07/04	<0.050		mg/L	
9048285	AL2	RPD	Total Total Kjeldahl Nitrogen	2018/07/04	0.96		%	20
9049270	YY	Matrix Spike	Dissolved Organic Carbon (C)	2018/07/04		100	%	80 - 120
9049270	YY	Spiked Blank	Dissolved Organic Carbon (C)	2018/07/04		106	%	80 - 120
9049270	YY	Method Blank	Dissolved Organic Carbon (C)	2018/07/04	<0.50		mg/L	
9049270	YY	RPD	Dissolved Organic Carbon (C)	2018/07/04	4.3		%	20
9049276	YY	Matrix Spike [TS8470-05]	Dissolved Organic Carbon (C)	2018/07/04		101	%	80 - 120
9049276	YY	Spiked Blank	Dissolved Organic Carbon (C)	2018/07/04		103	%	80 - 120
9049276	YY	Method Blank	Dissolved Organic Carbon (C)	2018/07/04	<0.50		mg/L	
9049276	YY	RPD [TS8470-05]	Dissolved Organic Carbon (C)	2018/07/04	3.7		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Detection limit raised due to interferent.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B851729
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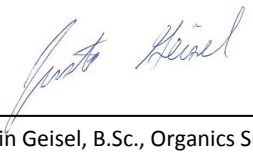
TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Sampler Initials: S+M

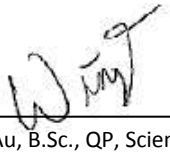
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Justin Geisel, B.Sc., Organics Supervisor

Poonam Sharma, cCT, Organics Supervisor



Winnie Au, B.Sc., QP, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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ADDITIONAL COOLER TEMPERATURE RECORD

CHAIN-OF-CUSTODY RECORD

CHAIN OF CUSTODY #	
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COOLER OBSERVATIONS:

MAXXAM JOB#: B851729

Cooler	Custody Seal Present	Custody Seal Intact	Ice Present	Temp 1	Temp 2	Temp 3
1	No	No	Yes	8	9	7
2	No	No	Yes	12	13	15
3	No	No	Yes	13	9	12
4	No	No	Yes	4	10	8
5	No	No	Yes	10	5	10

RECEIVED BY (SIGN & PRINT)		DATE (YYYY/MM/DD)	TIME (HH:MM)
[signature]	MICHAEL FABER	2018/06/26	17:50

GAN

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Maxxam Analytics International Corporation o/a Maxxam Analytics
9331 - 48th Street, Edmonton, Alberta Canada T6B 2R4 Tel:(780) 577-7100 Toll-free:800-563-6266 Fax:(780) 450-4187 www.maxxam.ca

CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#6702 TETRA TECH CANADA INC.	Company Name:		Quotation #:	B80718	Maxxam Job #: B851729	Bottle Order #: 557643
Attention:	MICHELE CRAWFORD	Attention:	same as Invoice	P.O. #:			
Address:	14940-123 AVENUE EDMONTON AB T5V 1B4	Address:		Project:	SWM.SWOP03800-01	COC #: C#557643-01-01	Project Manager: Ioana Stoica
Tel:	(780) 451-2121 Fax: (780) 454-5688	Tel:	Fax:	Project Name:			
Email:	Sabinus.Okafor@tetratech.com	Email:	Sabinus, Michelle, Brent	Site #:			
				Sampled By:	Sabinus + Michele		

Regulatory Criteria:
- [x] ATI
- [ ] CCME
- [ ] Other

Michele.Crawford

Special Instructions:

SAMPLES MUST BE KEPT COOL (< 10ºC) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y / N)	Routine Water	Ammonia-N (Total)	Total Kjeldahl Nitrogen	Regulated Metals (CCME/AT1) - Dissolved	Mercury - Low Level (Dissolved)	Carbon (DOC)	Chemical Oxygen Demand	AT1 BTEX and F1-F2 in Water	Phenols (4-AAP)	VOCs in Water by HS GC/MS (Std List)	# of Bottles	Comments
1	SID#211732	MW 1B	6/26/18	1420	water	Y	✓	✓	✓	✓							12	
2	SID#211733	MW 1C	✓	1430	✓	Y											✓	
3	SID#211734	MW 9	✓	1550	✓	Y											✓	
4	SID#211735	MW 11	✓	1600	✓	Y											✓	
5	SID#211736	MW12A	✓	~~1450~~ 1500	✓	Y											✓	
6	SID#211737	MW 12B	✓	1450	✓	Y											✓	
7	SID#211738	MW 14	✓	1540	✓	Y											✓	
8	SID#211739	MW 18A	✓	1445	✓	Y											✓	
9	SID#211740	MW 18B	✓	1425	✓	Y											✓	
10	SID#211741	MW 19A	✓	1320	✓	Y											✓	

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: [x]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests are > 5 days - contact your Project Manager for details

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ [ ]
Rush Confirmation Number: _____ *(call lab for #)*

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (ºC) on Receipt	Custody Seal Intact on Cooler?
~~Michele~~ Sabinus Okafor	18/06/26	17:40	MICHAEL FABER	2018/06/26	17:50		[ ]	SEEACTR	[ ] Yes [x] No

ICE-Y

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.
** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUESTS CONTACT YOUR PROJECT MANAGER

White: Maxxam Yellow: Client

1541 GAW

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CHAIN OF CUSTODY RECORD

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#6702 TETRA TECH CANADA INC.	Company Name:		Quotation #:	B80718	Maxxam Job #: B851729	Bottle Order #: 557643
Attention:	MICHELE CRAWFORD	Attention:	Same as Invoice	P.O. #:			
Address:	14940-123 AVENUE EDMONTON AB T5V 1B4	Address:		Project:	SWM.SWOP03800-01		
				Project Name:		COC #: C#557643-02-01	Project Manager: Ioana Stoica
Tel:	(780) 451-2121 Fax: (780) 454-5688	Tel:	Fax:	Site #:			
Email:	Sabinus.Okafor@tetratech.com	Email:	Sabinus, Michelle, Brent	Sampled By:	Sabinus + Michele		

Regulatory Criteria:
- [x] ATI
- [ ] CCME
- [ ] Other

Michele.Crawford

Special Instructions:

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: [x]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests are > 5 days - contact your Project Manager for details

Job Specific Rush TAT (if applies to entire submission)
Date Required:
Rush Confirmation Number: *(call lab for #)* [ ]

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y / N)	Routine Water	Ammonia-N (Total)	Total Kjeldahl Nitrogen	Regulated Metals (CCME/AT1) - Dissolved	Mercury - Low Level (Dissolved)	Carbon (DOC)	Chemical Oxygen Demand	AT1 BTEX and F1-F2 in Water	Phenols (4-AAP)	VOCs in Water by HS GC/MS (Std List)	# of Bottles	Comments
1	SID#211742	MW 19B	6/26/18	1330	Water	Y											12	
2	SID#211743	MW 20A	✓	1400	✓	Y											12	
3	SID#211744	MW 20B	✓	1350	✓	Y											12	
4	SID#211745	MW 21A	✓	1140	✓	Y	X	X	X	X		X	X	X	X	X	11	No mercury bottle
5	SID#211746	MW 21B	✓	1150	✓	Y	X	X	X	X	X	X	X	X	X	X	12	
6	SID#211747	MW 22A	✓	1010	✓	Y	X	X	X	X		X	X	X	X	X	11	No mercury bottle
7	SID#211748	MW 22B	✓	0950	✓	Y	X	X	X	X	X	X	X	X	X	X	12	
8	SID#211749	MW 23A	✓	1030	✓	Y											12	
9	SID#211750	MW 23B	✓	1020	✓	Y											12	
10	SID#211751	MW 25A	✓	1120	✓	Y	X	X	X	X	X	X	X	X	X	X	12	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Sabinus Okafor	18/06/26	17:40	MICHAEL FABER	2018/06/26	17:50		[ ]	SEE ACTR	[ ] Yes [x] No

ICE-Y

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

** ALL SAMPLES ARE HELD FOR 60 DAYS AFTER SAMPLE RECEIPT, FOR SPECIAL REQUESTS CONTACT YOUR PROJECT MANAGER

White: Maxxam Yellow: Client

Maxxam
A Bureau Veritas Group Company

Maxxam Analytics International Corporation o/a Maxxam Analytics
9331 - 48th Street, Edmonton, Alberta Canada T6B 2R4 Tel:(780) 577-7100 Toll-free:800-563-6266 Fax:(780) 450-4187 www.maxxam.ca

CHAIN OF CUSTODY RECORD

GAW

INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#6702 TETRA TECH CANADA INC.	Company Name:		Quotation #:	B80718	Maxxam Job #: B851729	Bottle Order #: 557643
Attention:	MICHELE CRAWFORD	Attention:		P.O. #:			
Address:	14940-123 AVENUE EDMONTON AB T5V 1B4	Address:	Same as INVOICE	Project:	SWM.SWOP03800-01	COC #: C#557643-03-01	Project Manager: Ioana Stoica
Tel:	(780) 451-2121 Fax: (780) 454-5688	Tel:	Fax:	Project Name:			
Email:	Sabinus.Okafor@tetratech.com	Email:	Sabinus, Michelle, Brent	Site #:			
				Sampled By:	Sabinus + Michele		

Regulatory Criteria:
- [X] ATI (Michele.Crawford)
- [ ] CCME
- [ ] Other

Special Instructions: Ignore

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

ANALYSIS REQUESTED (PLEASE BE SPECIFIC)

Turnaround Time (TAT) Required:

Please provide advance notice for rush projects

Regular (Standard) TAT: [X]
(will be applied if Rush TAT is not specified):
Standard TAT = 5-7 Working days for most tests..
Please note: Standard TAT for certain tests are > 5 days - contact your Project Manager for details

Job Specific Rush TAT (if applies to entire submission) [ ]
Date Required:
Rush Confirmation Number:
(call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Metals Field Filtered ? (Y / N)	Routine Water	Ammonia-N (Total)	Total Kjeldahl Nitrogen	Regulated Metals (CCME/AT1) - Dissolved	Mercury - Low Level (Dissolved)	Carbon (DOC)	Chemical Oxygen Demand	AT1 BTEX, F1-F2 in Water	Phenols (4-AAP)	VOCs in Water by HS GC/MS (Std List)	# of Bottles	Comments
1	SID#211752	MW 25B	6/26/18	1100	water	Y	X	X	X	X	X	X	X	X	X	X	12	
2	SID#211753	MW 26A	✓	1140	✓	N	X							X**	X		3	Only Routine + Phenol + F2
3	SID#211754	MW 31A	✓	1210	✓	N	X							X**	X		4	Routine + 2 F2 + Phenol
4	SID#211755	15MW34A	✓	1510	✓	Y	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	12	
5	SID#211756	15MW34B	✓	1520	✓	Y	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	12	
6	SID#211757	18DUP04	✓	—	✓	Y	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	12	
7	SID#211758	18DUP05	✓	—	✓	Y	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	12	
8	SID#211759	18Tripblank	✓	—	✓	N								X	X	X	7	
9	SID#211760	18Fieldblank	✓	1620	✓	Y				X	X	X			X		4	
10	SID#212413																	

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Laboratory Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Sabinus Okafor	18/06/26	17:40	MICHAEL FABER	2018/06/26	17:50		[ ]	SEE ACTR	[ ] Yes [X] No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO MAXXAM'S STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.MAXXAM.CA/TERMS.
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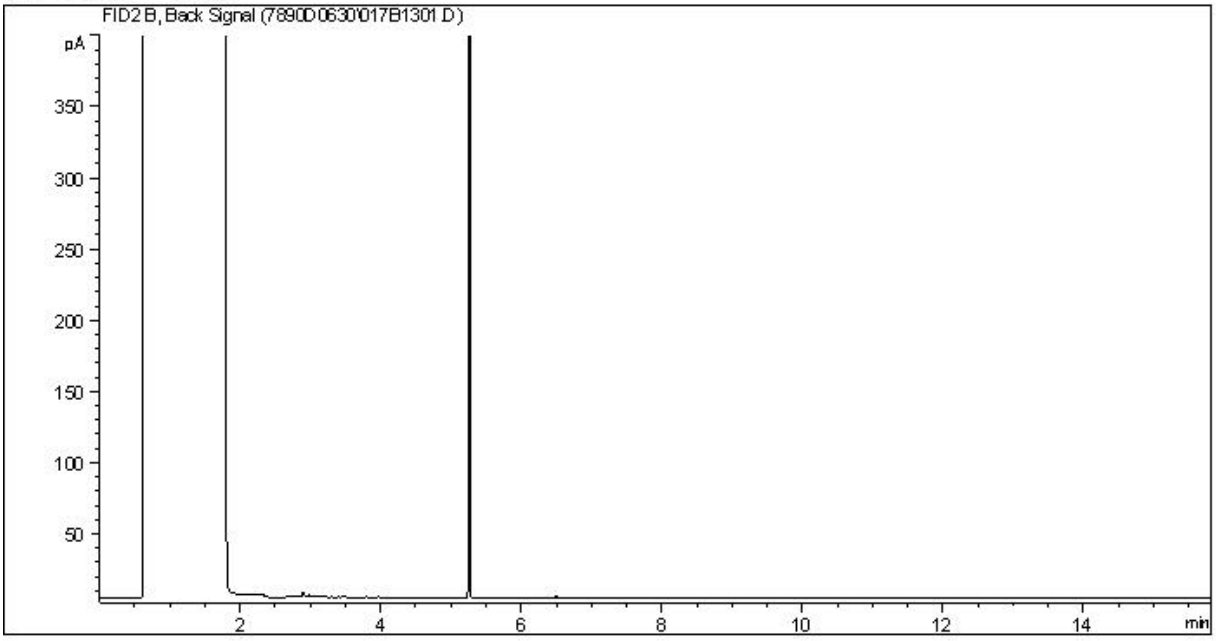
White: Maxxam Yellow: Client

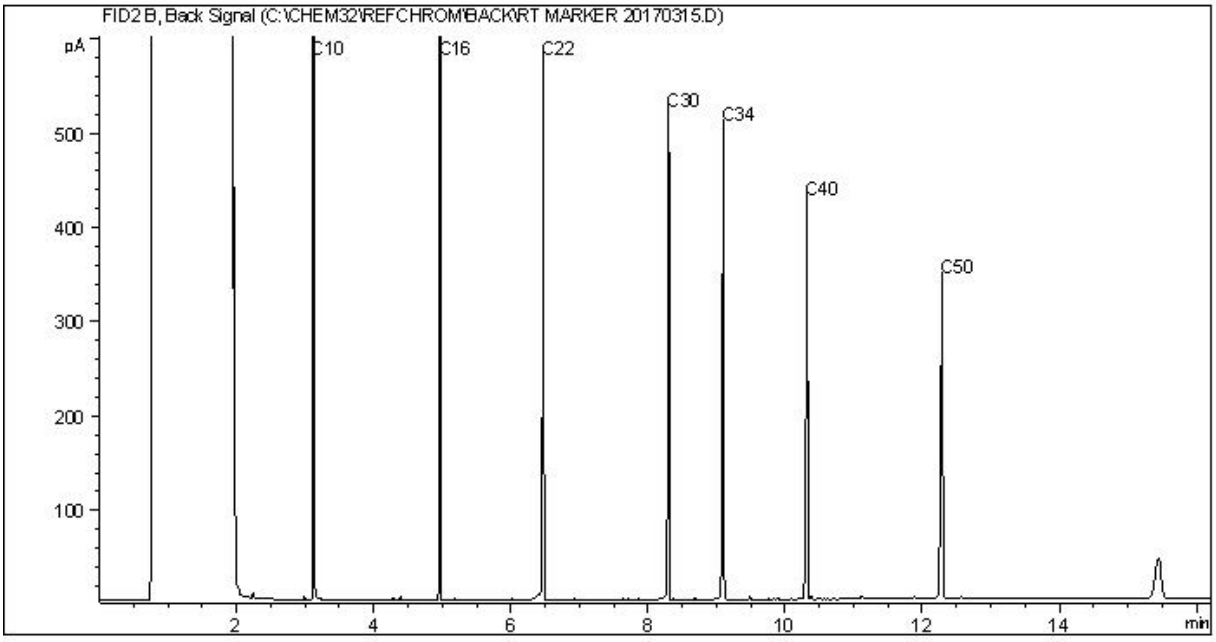
xx - Analyze only F2 ICE-Y

CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890D



Carbon Range Distribution - Reference Chromatogram



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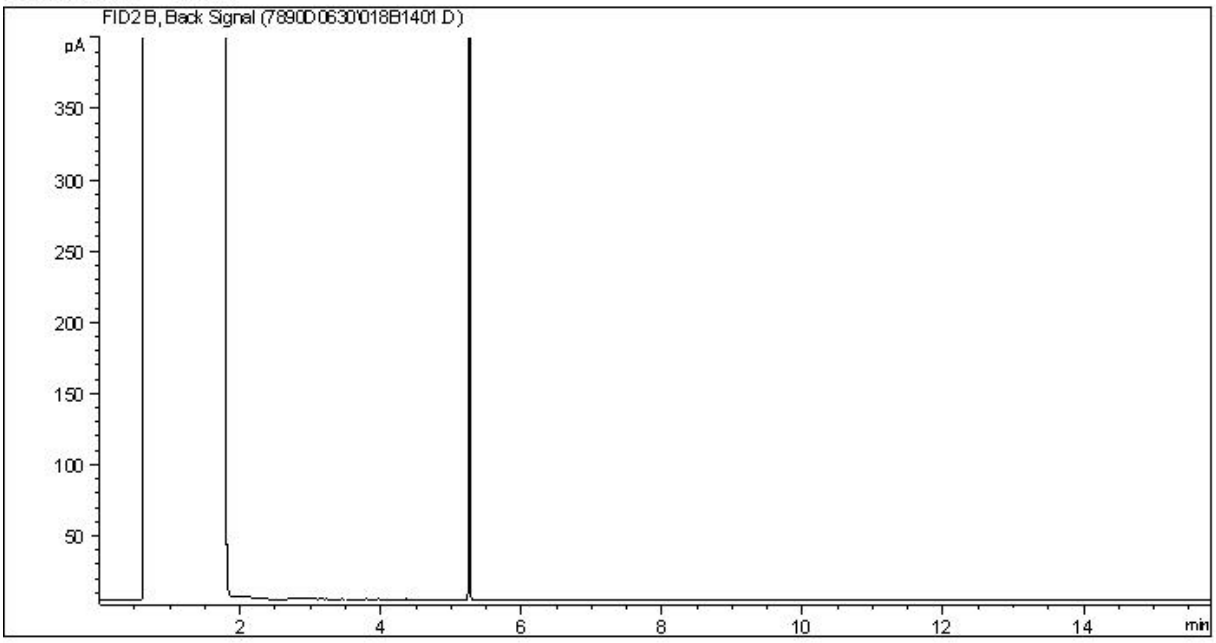

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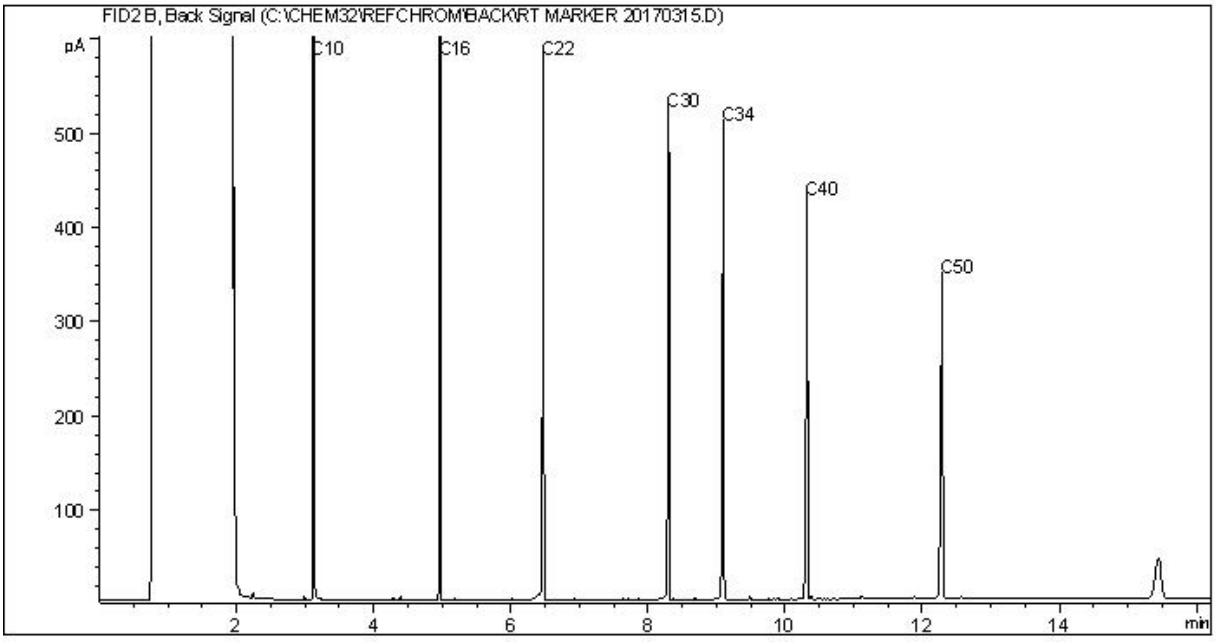

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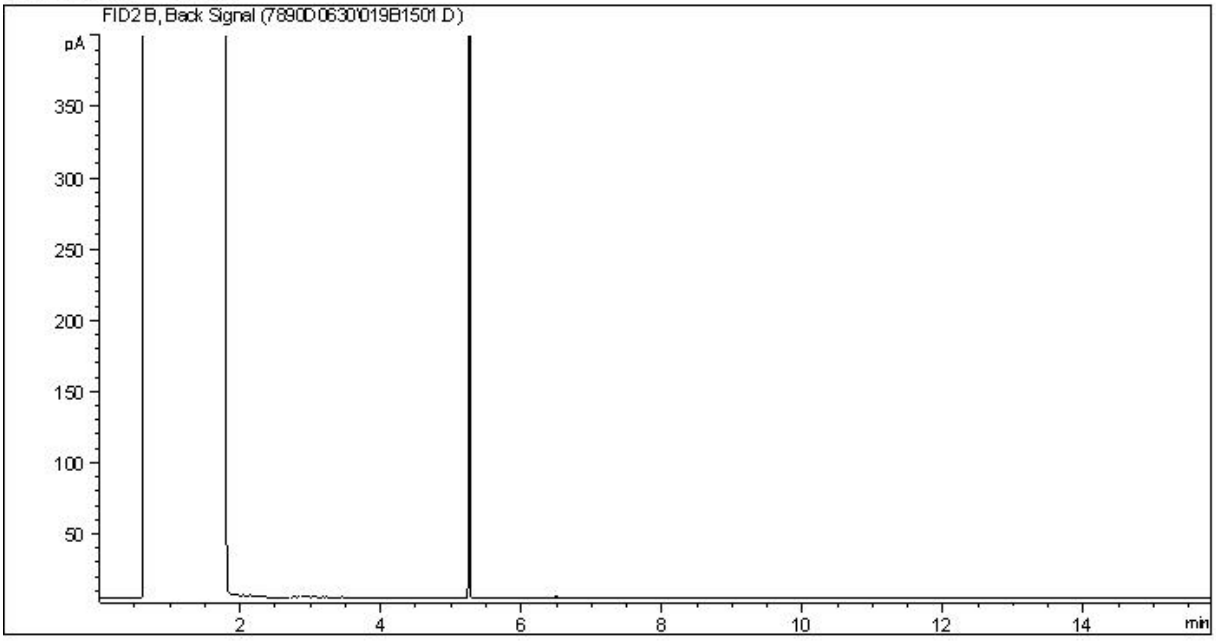

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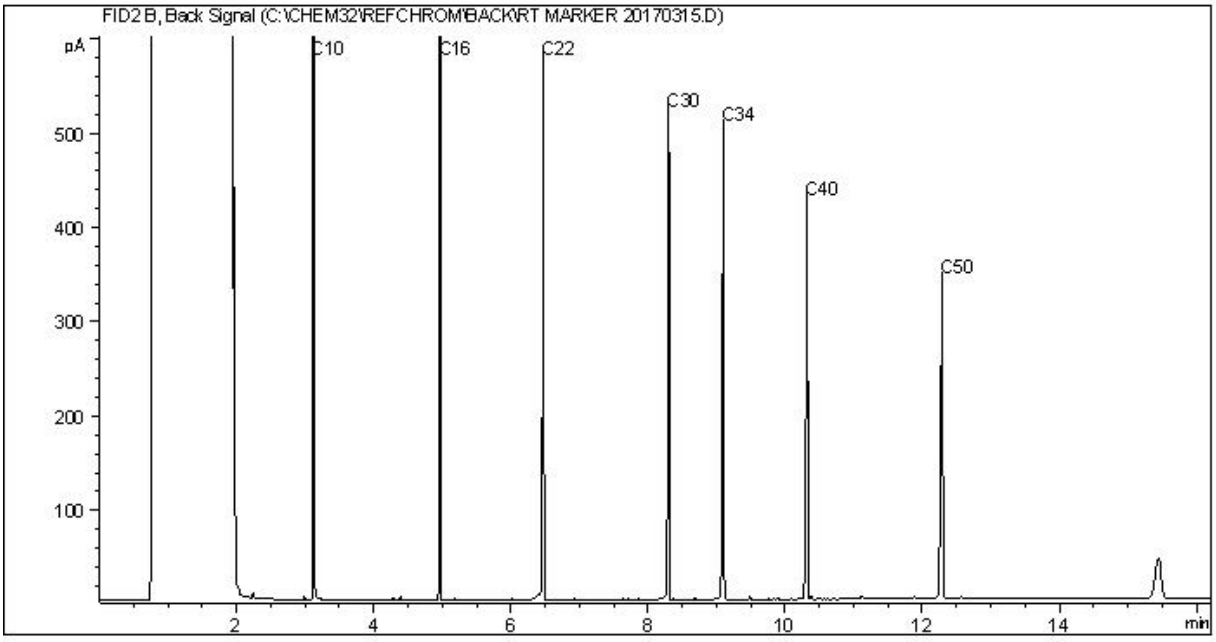

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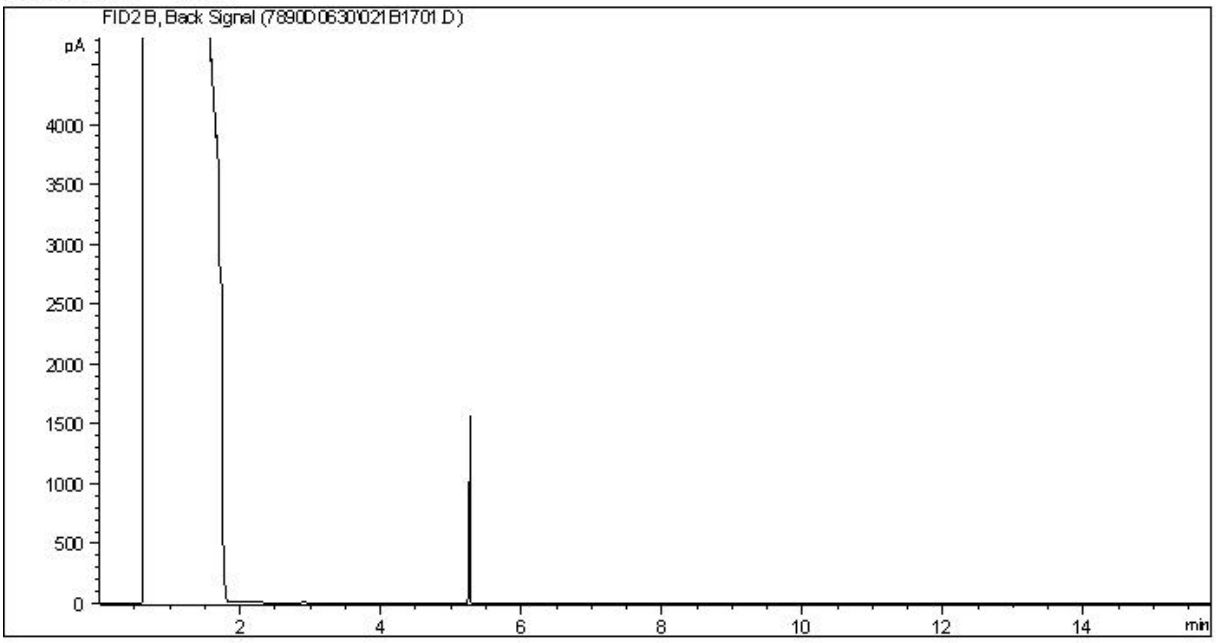

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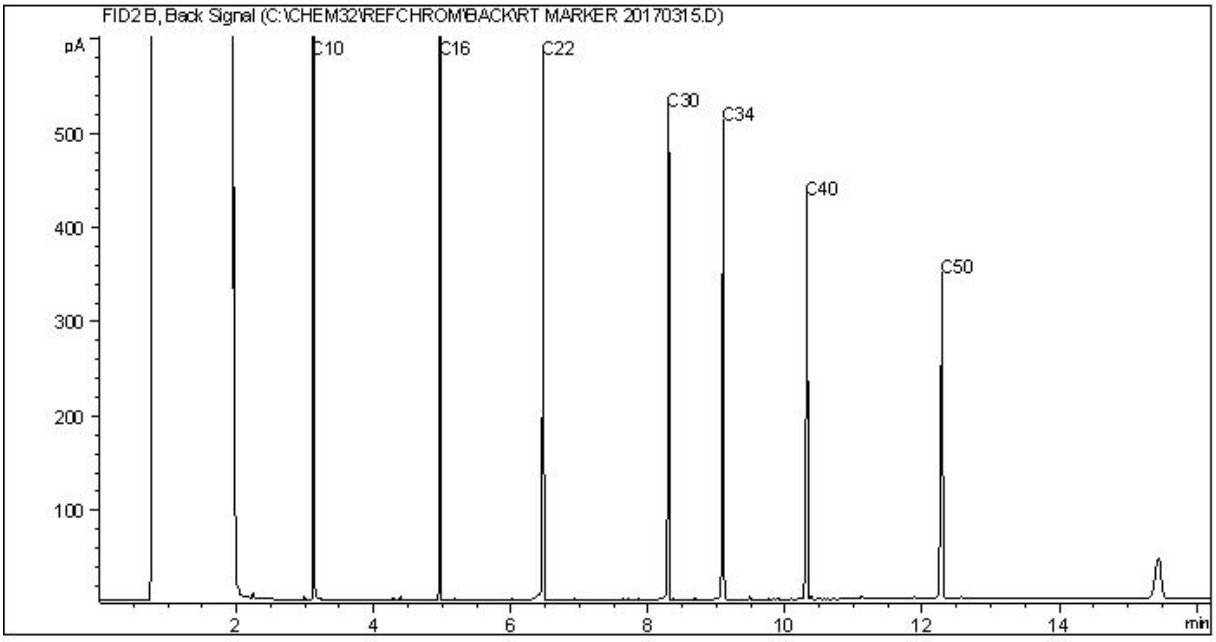

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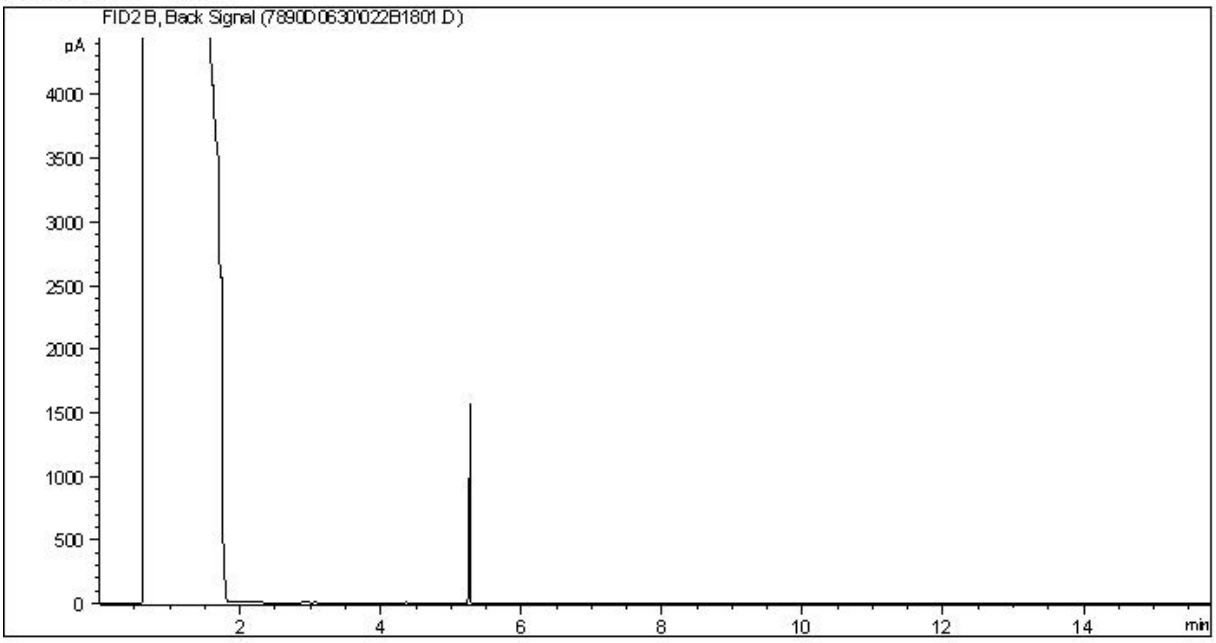

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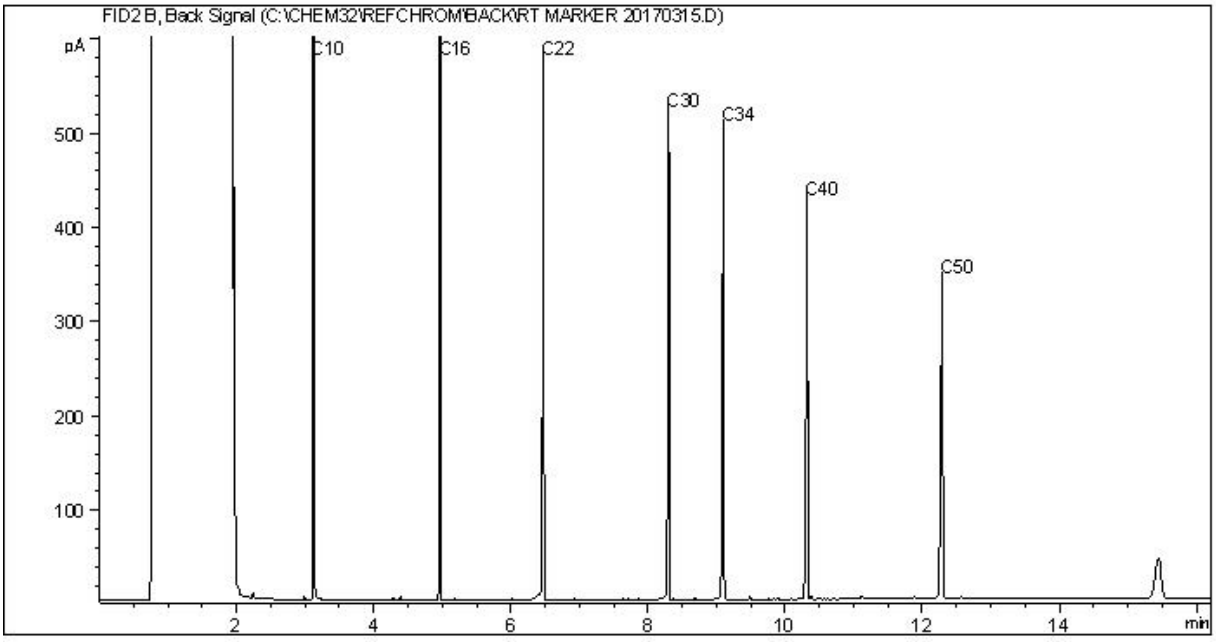

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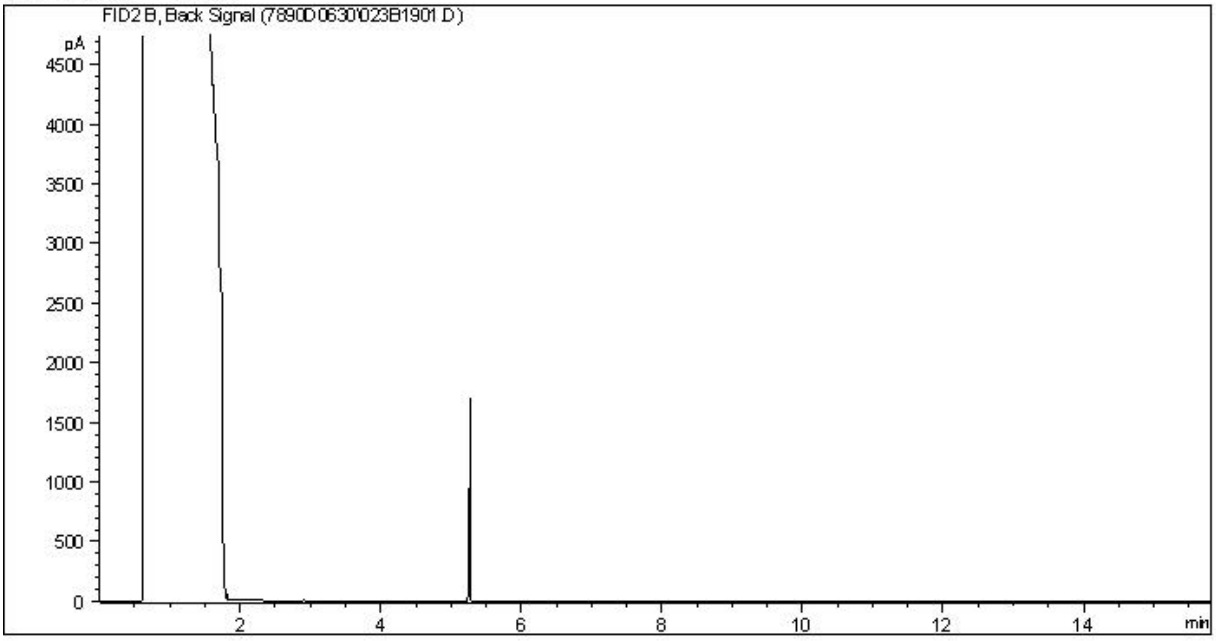

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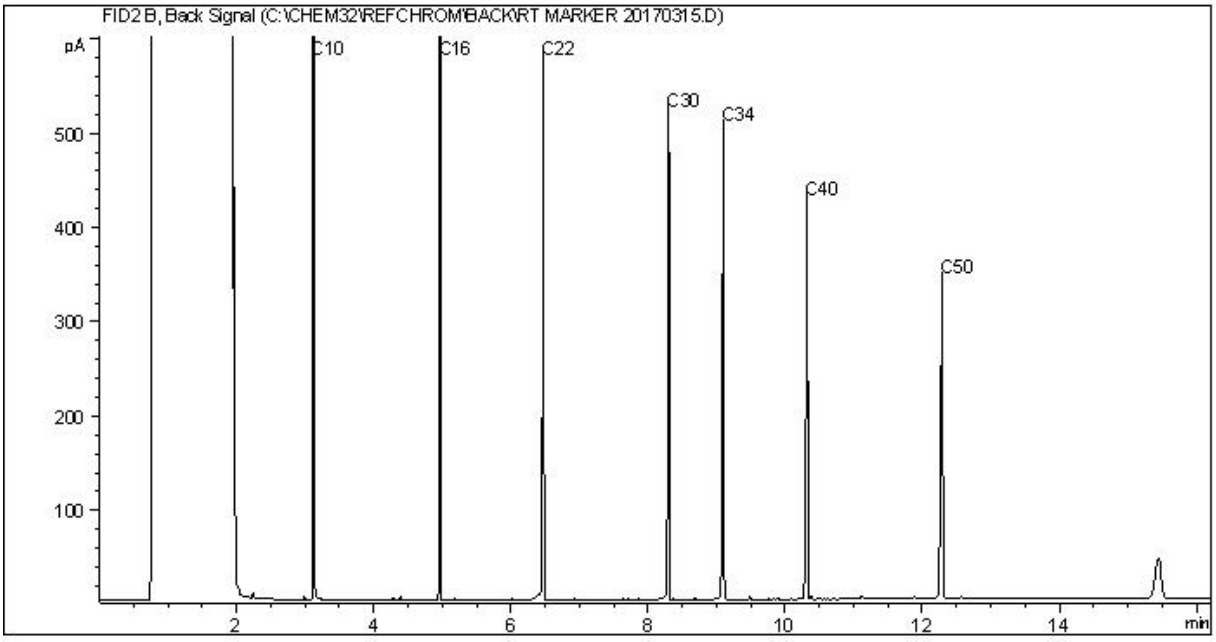

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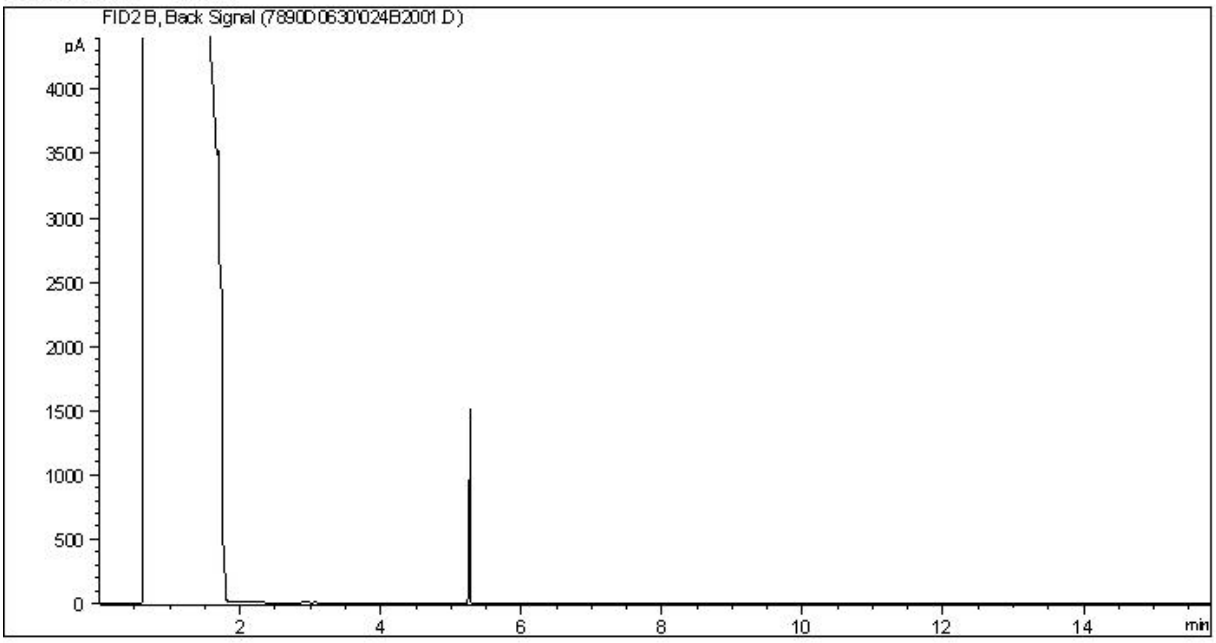

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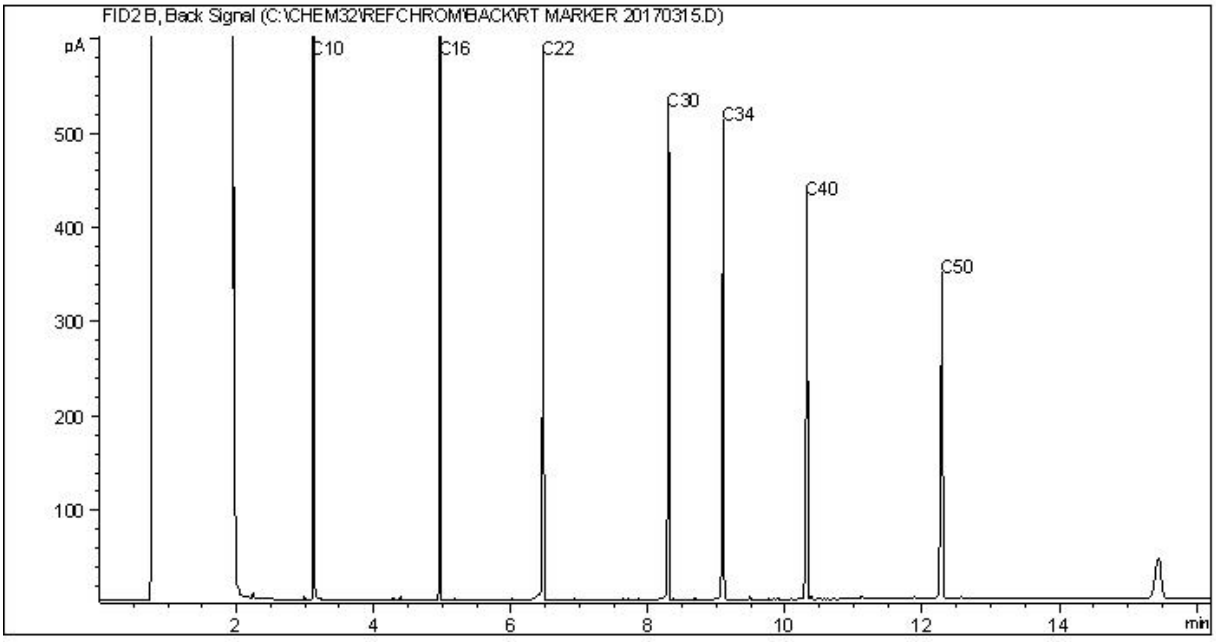

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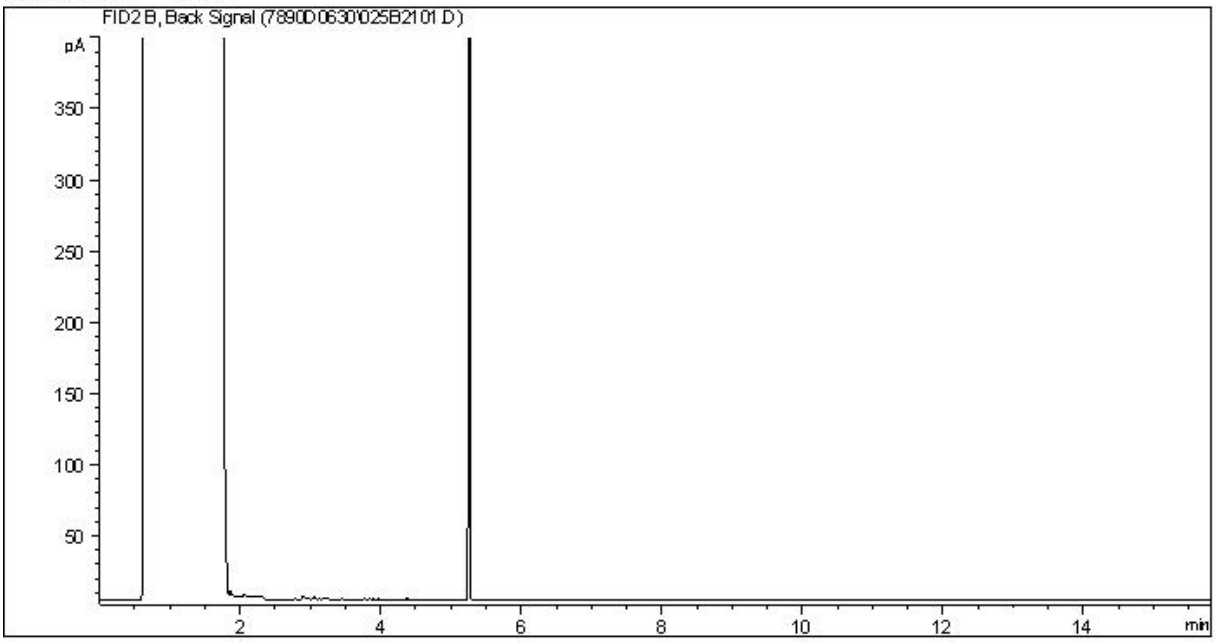

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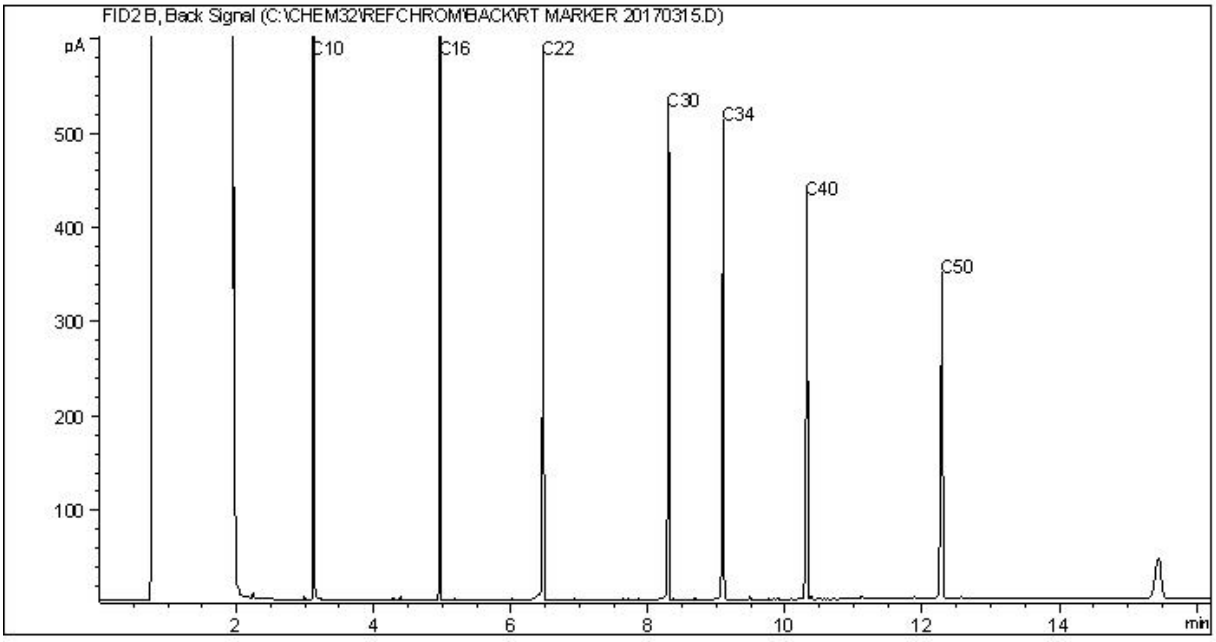

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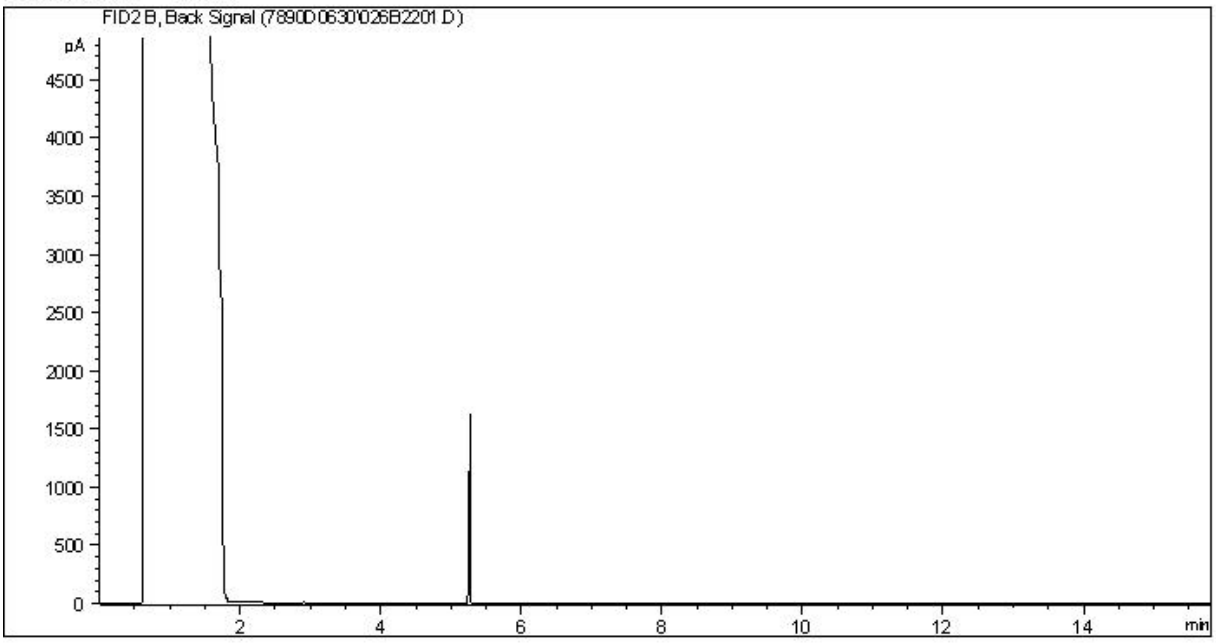

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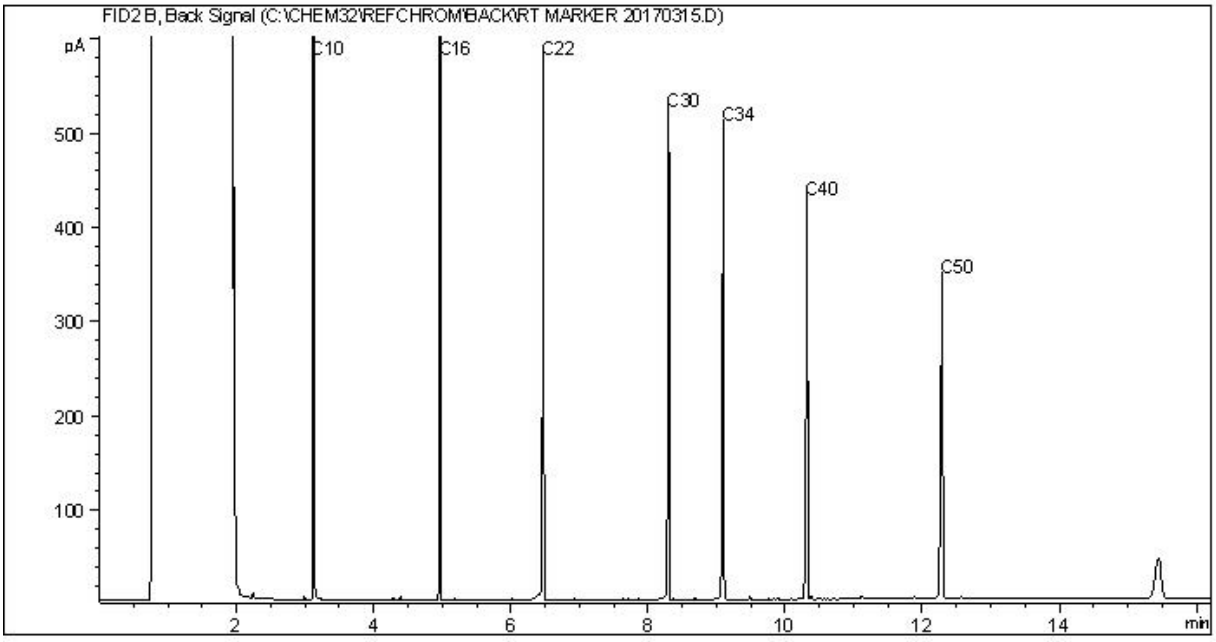

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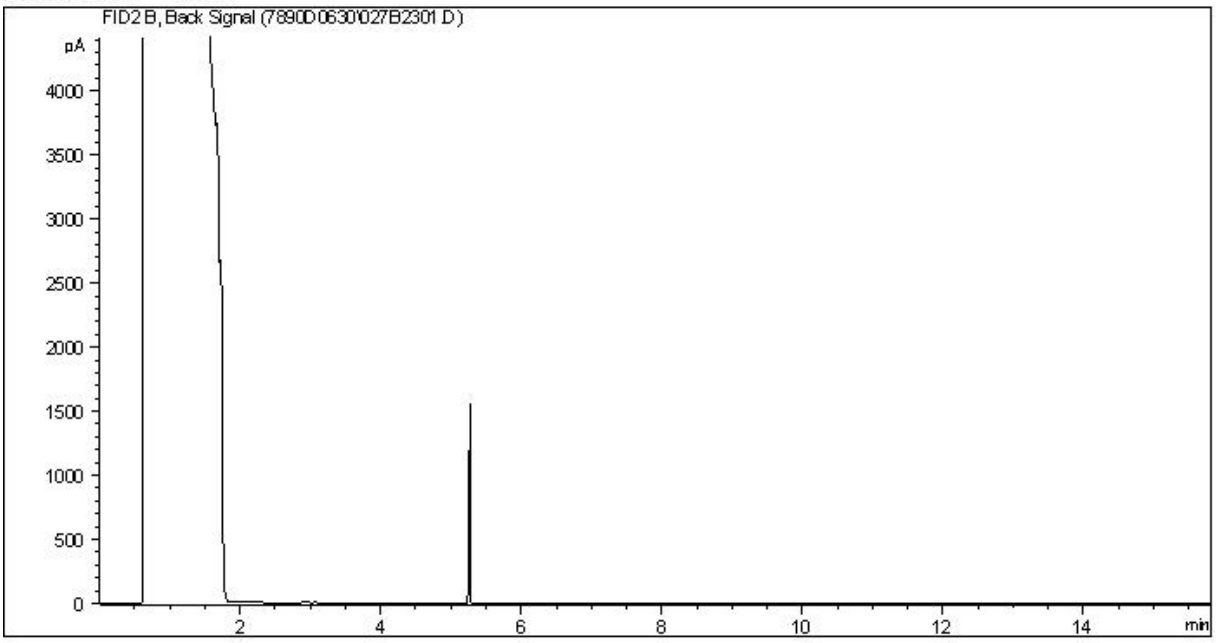

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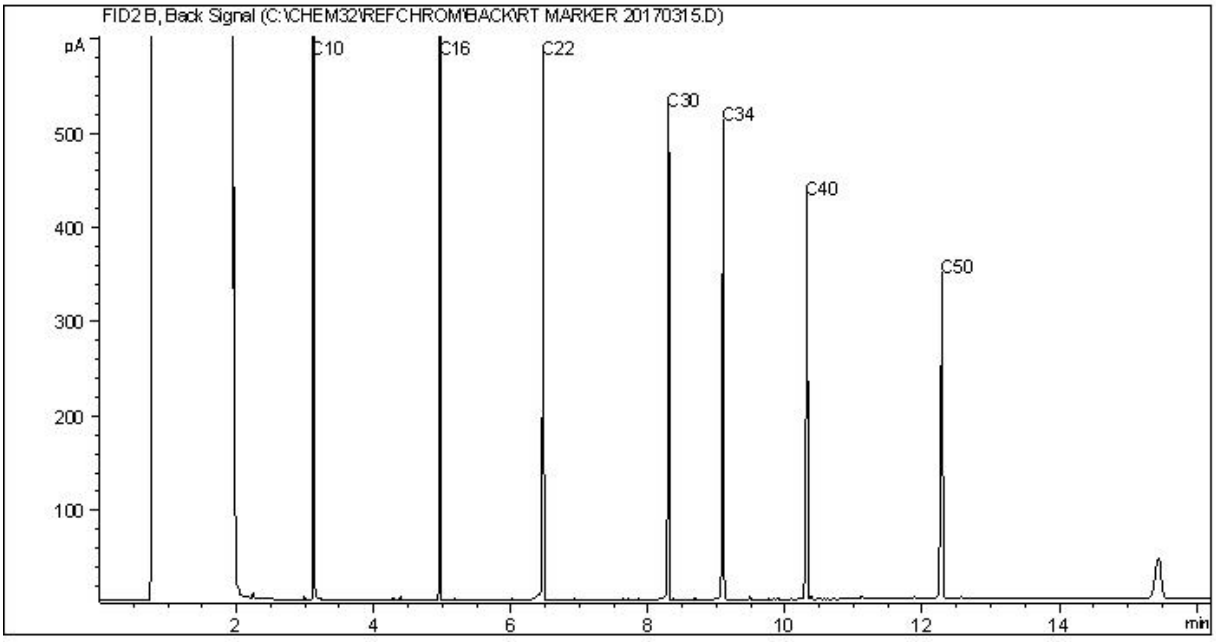

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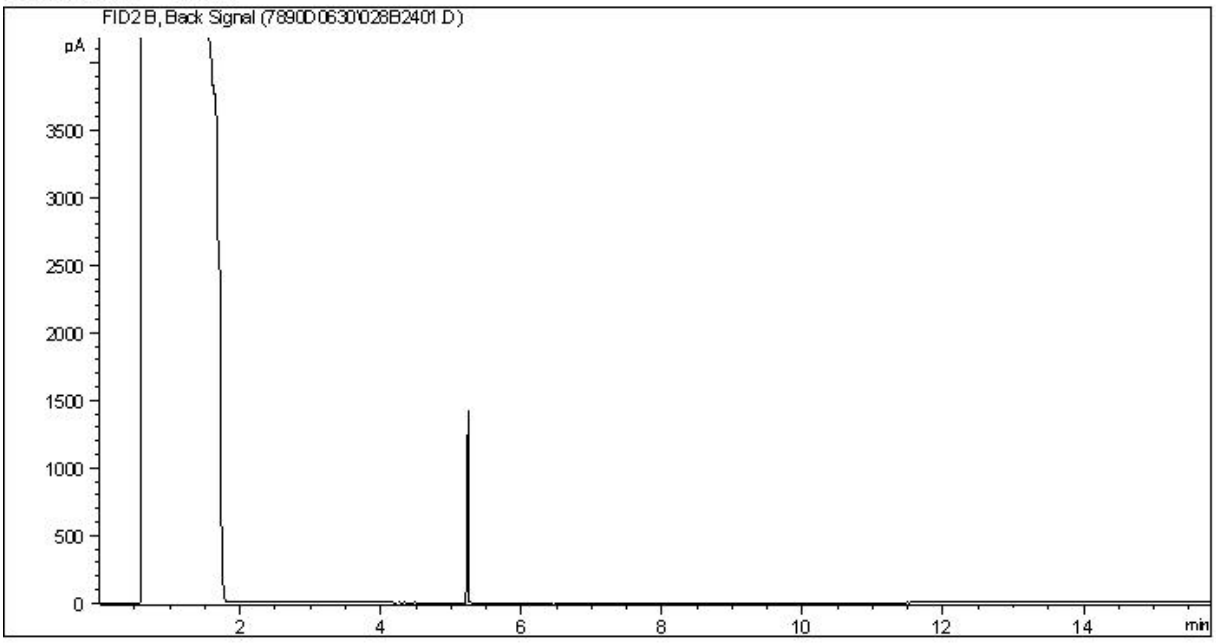

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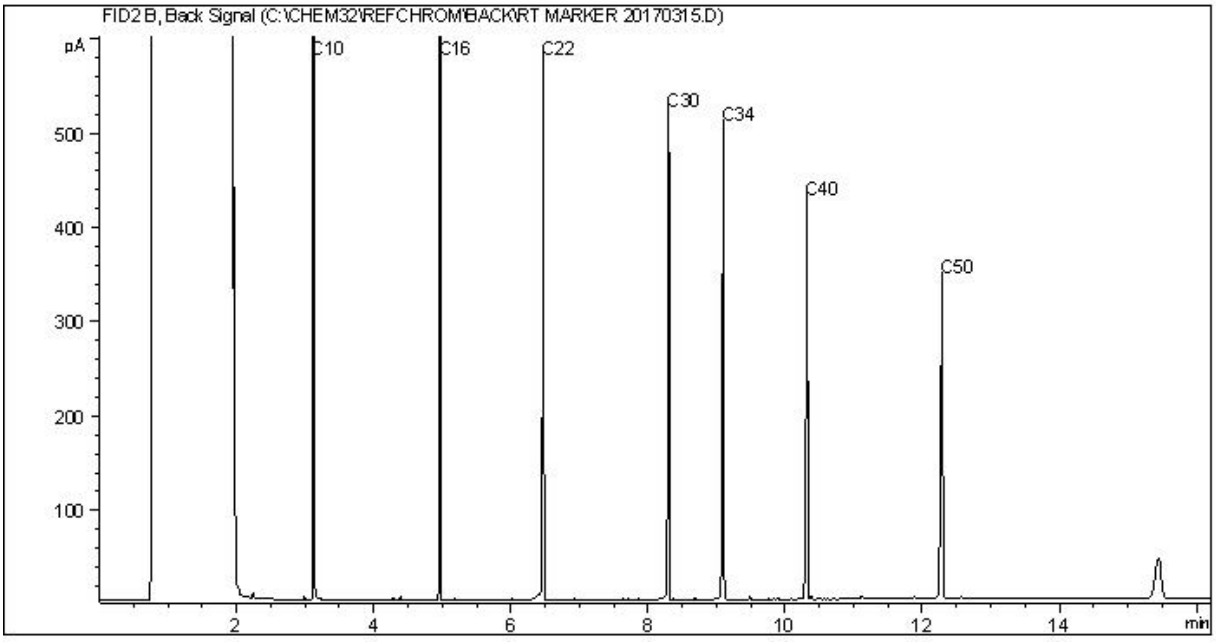

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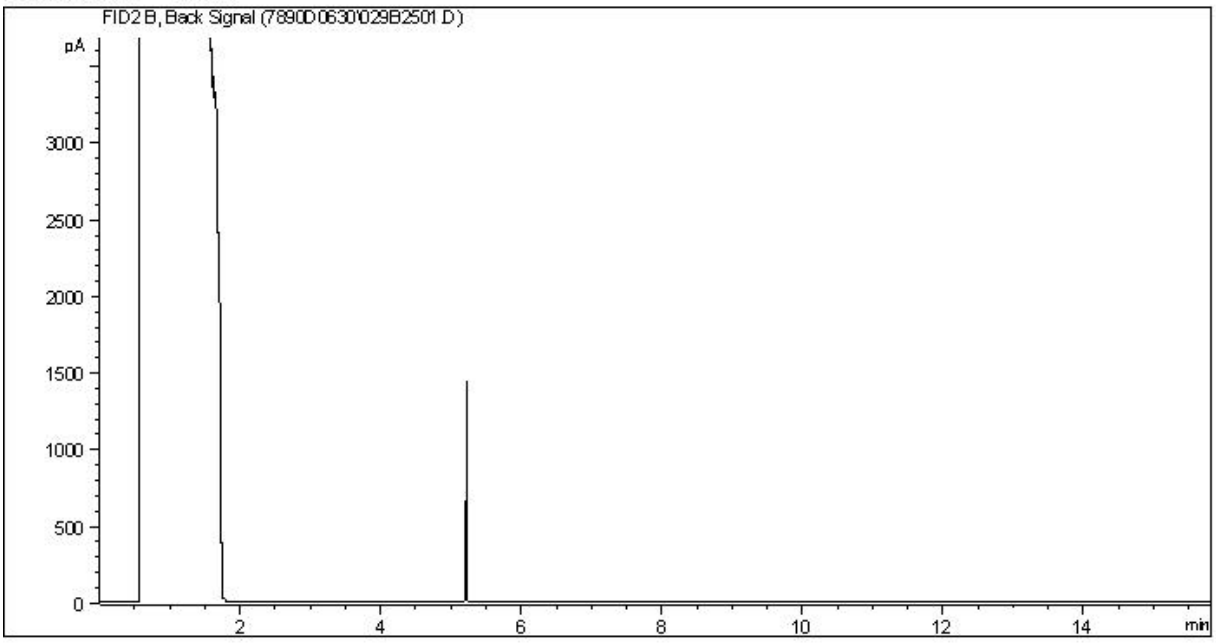

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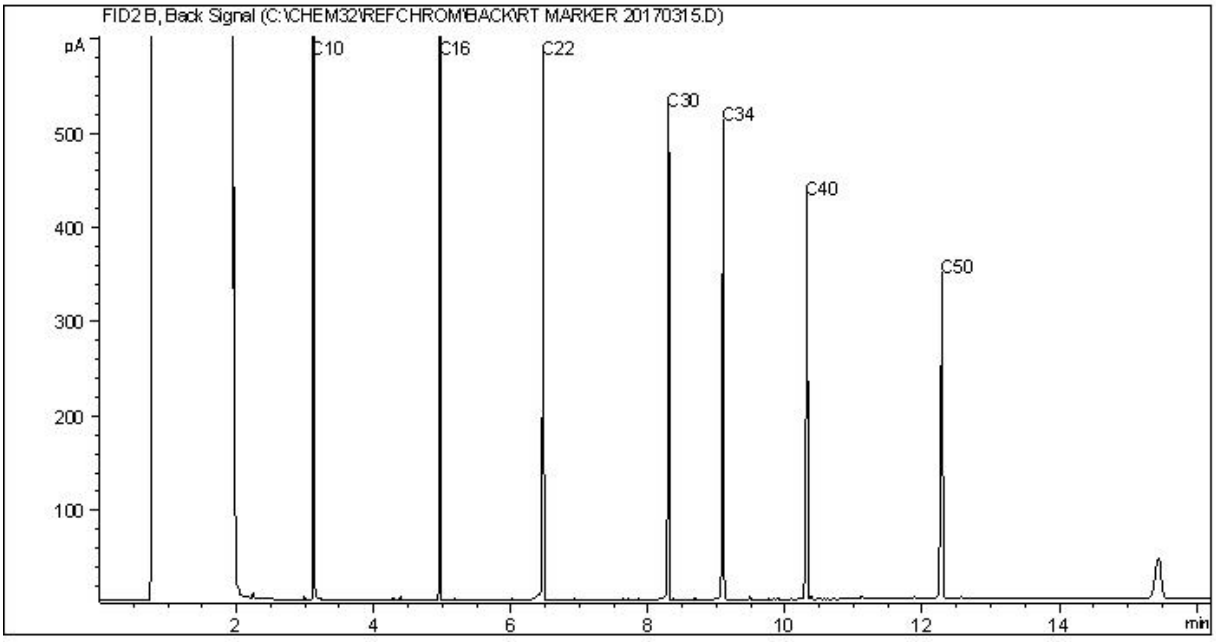

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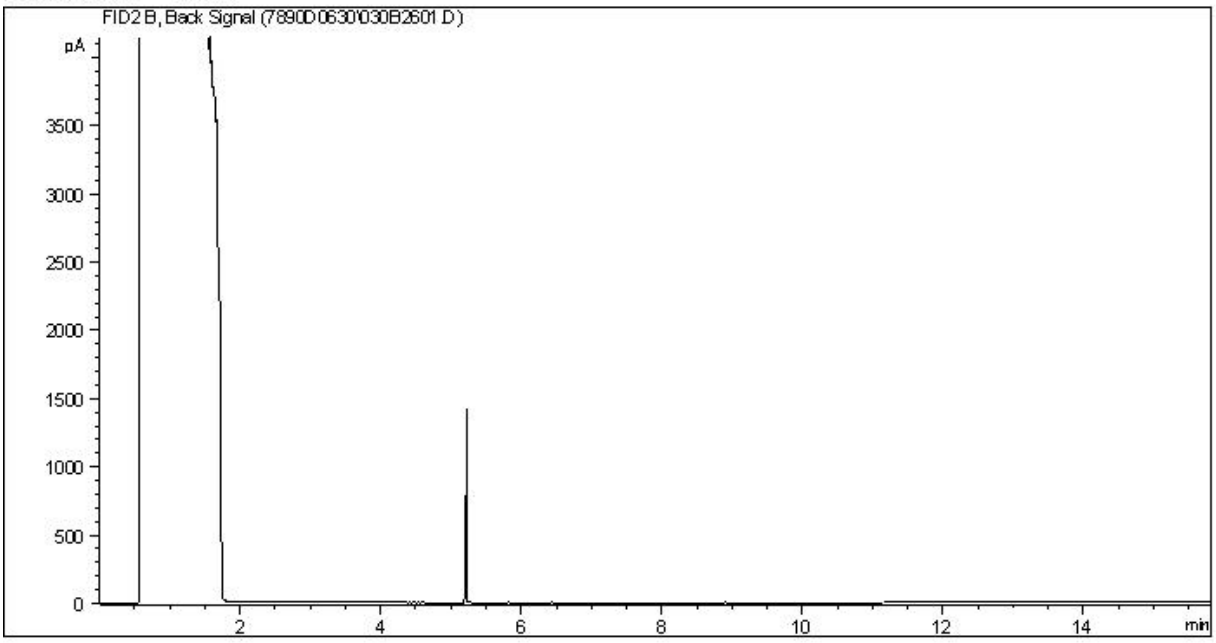

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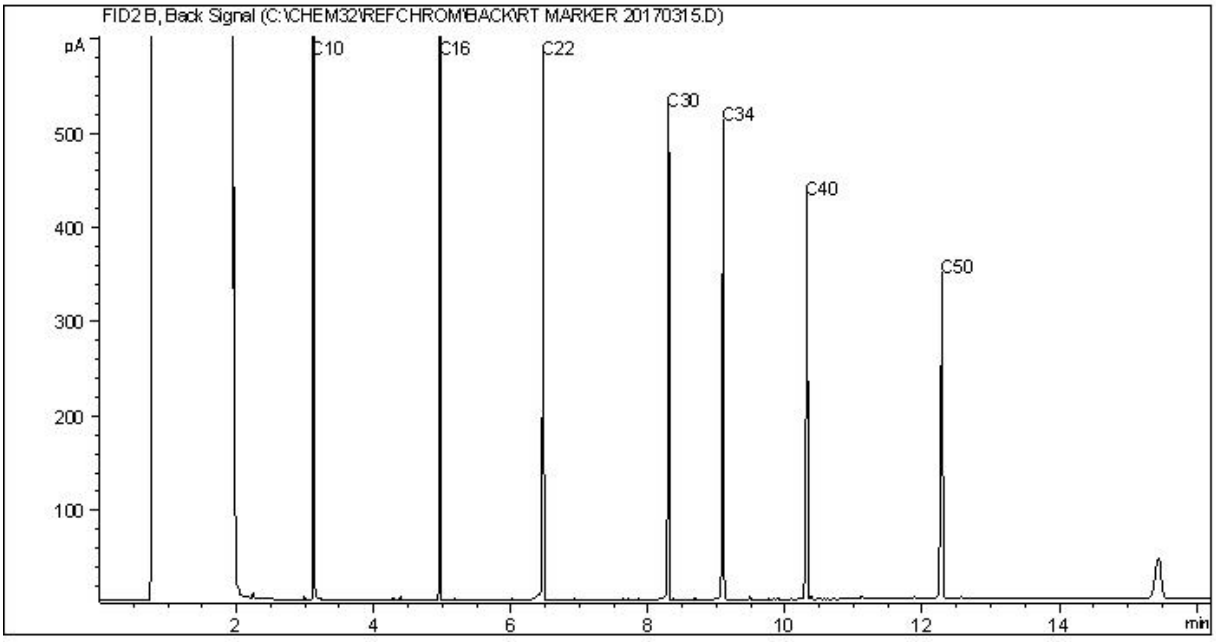

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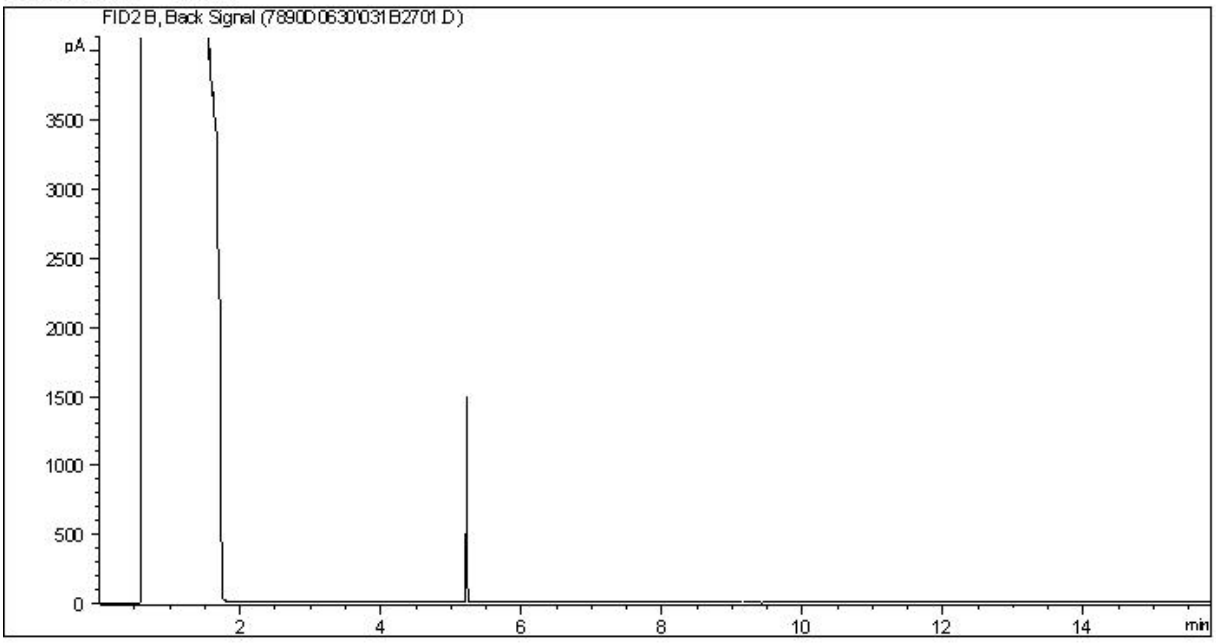

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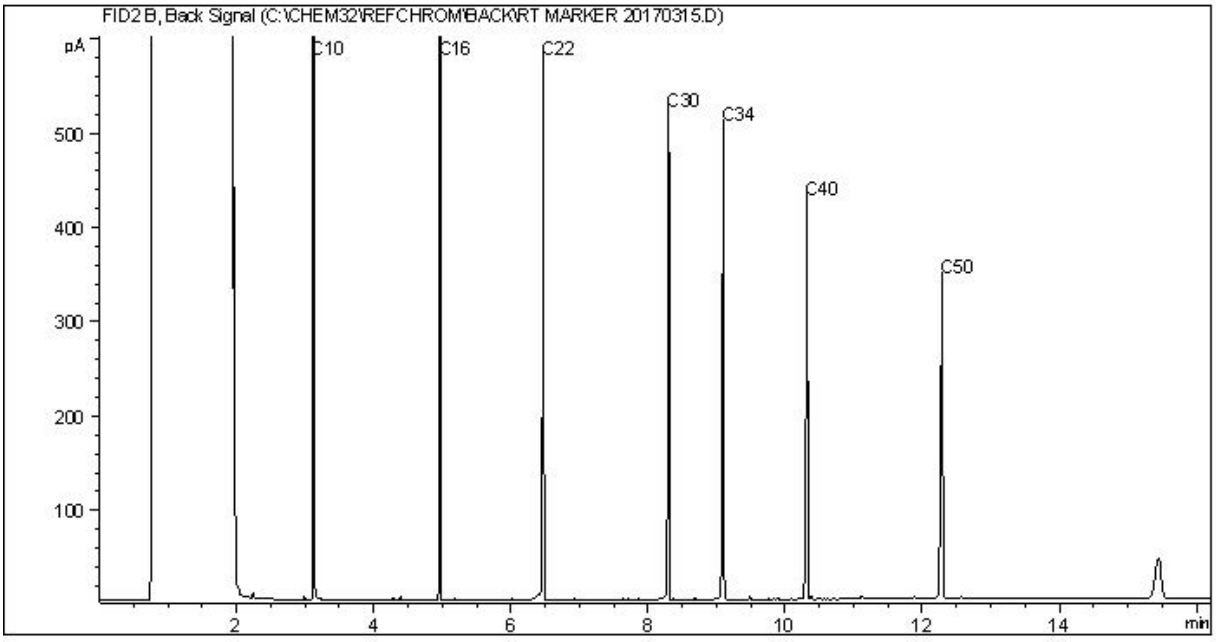

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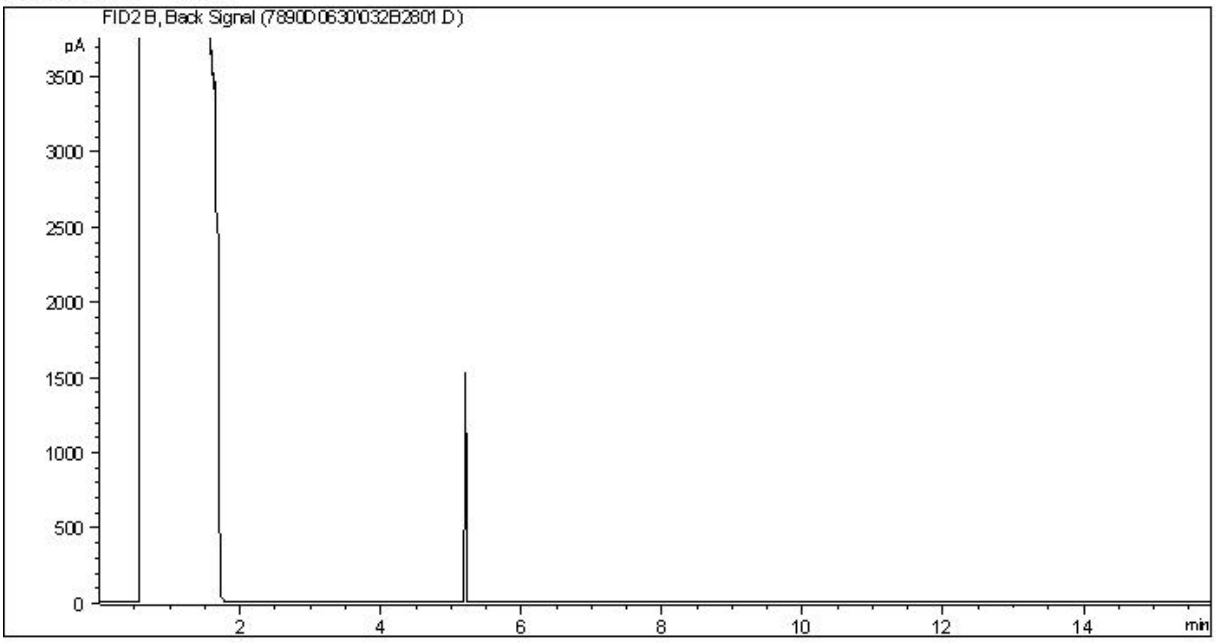

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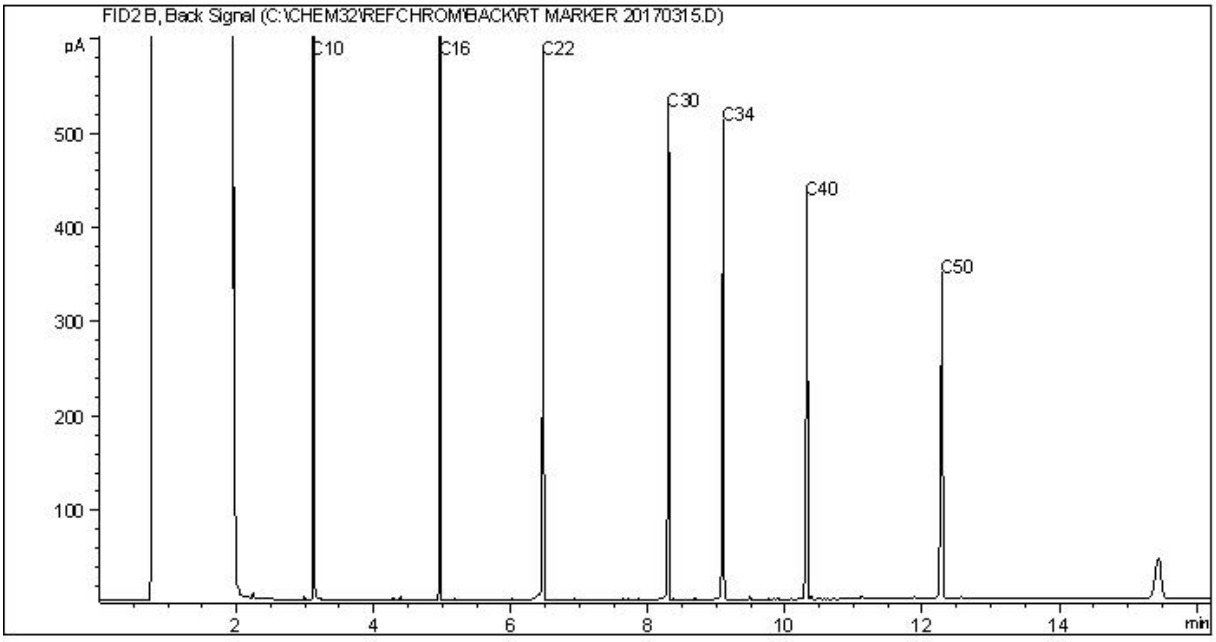

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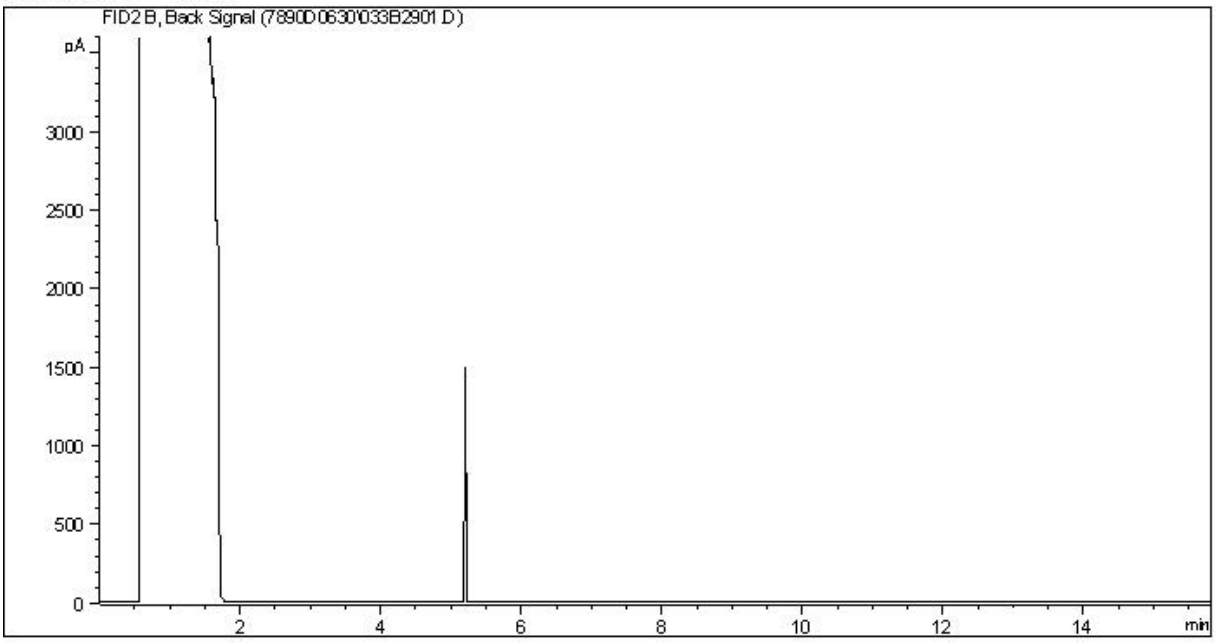

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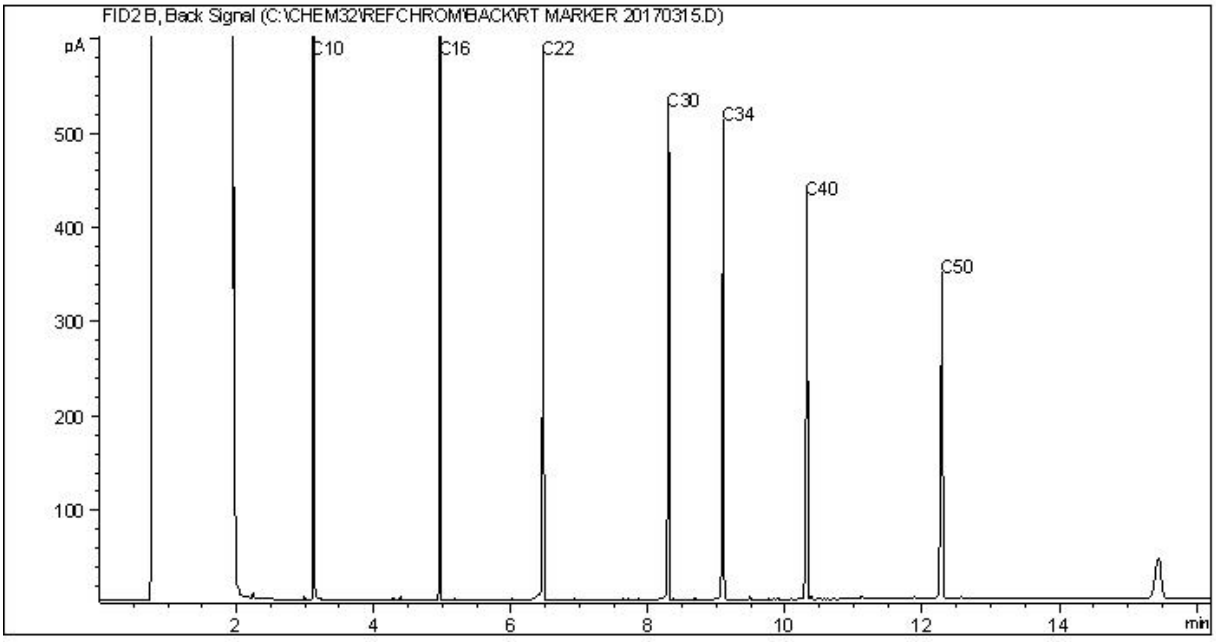

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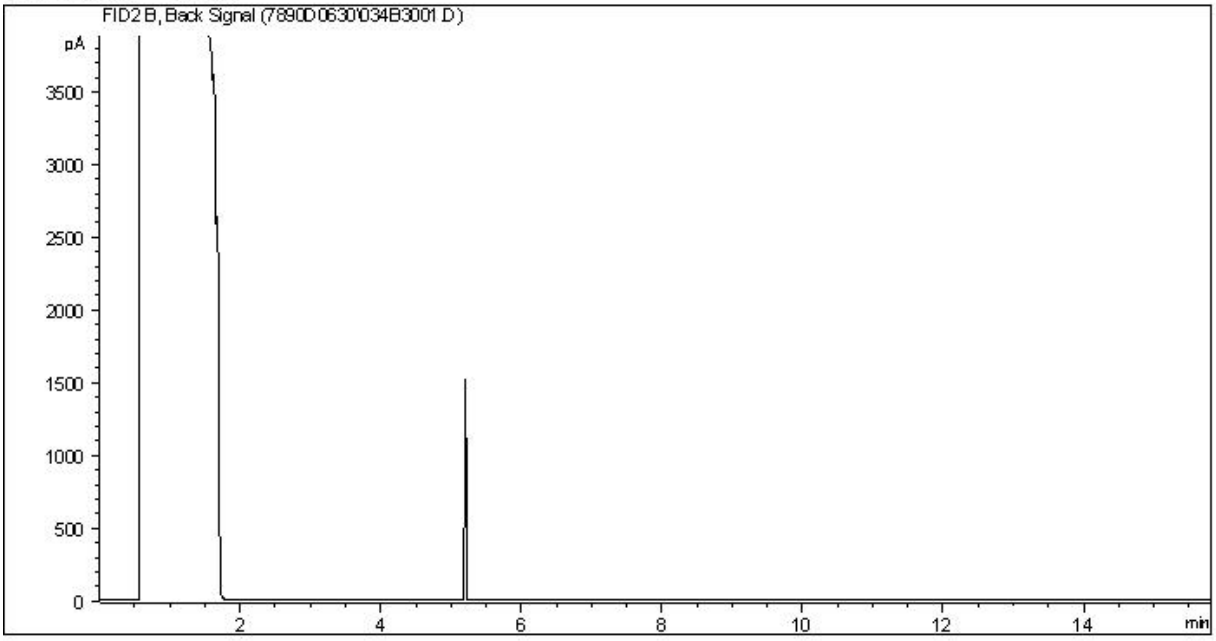
CCME Hydrocarbons in Water (F2; C10-C16) Chromatogram

Instrument: 7890D



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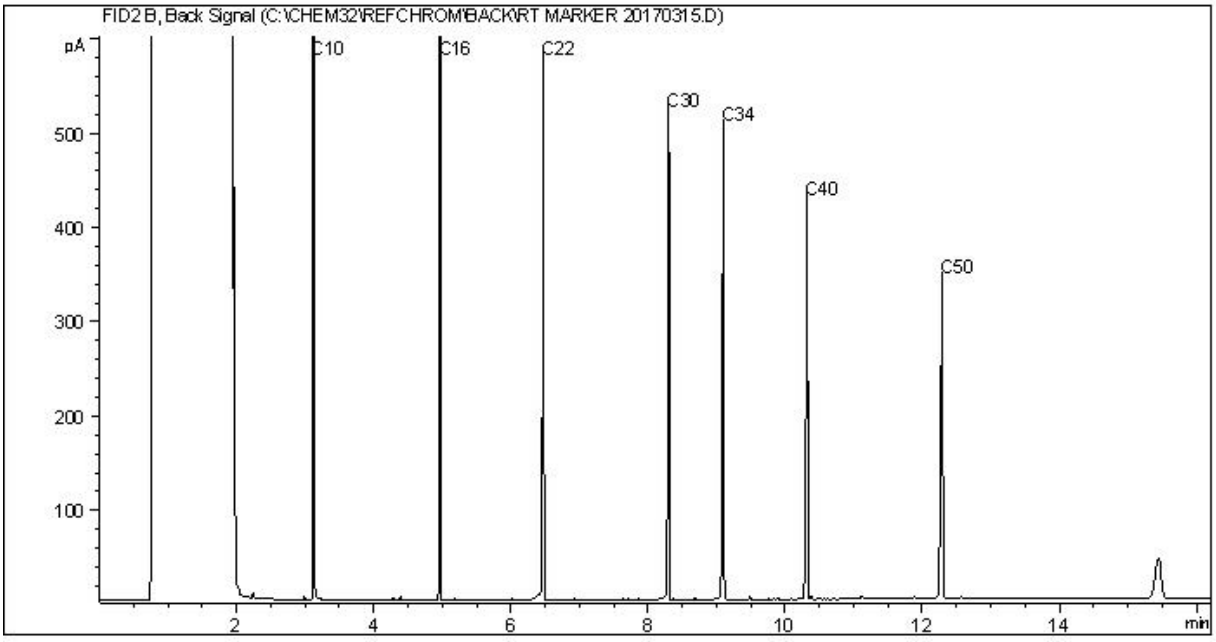

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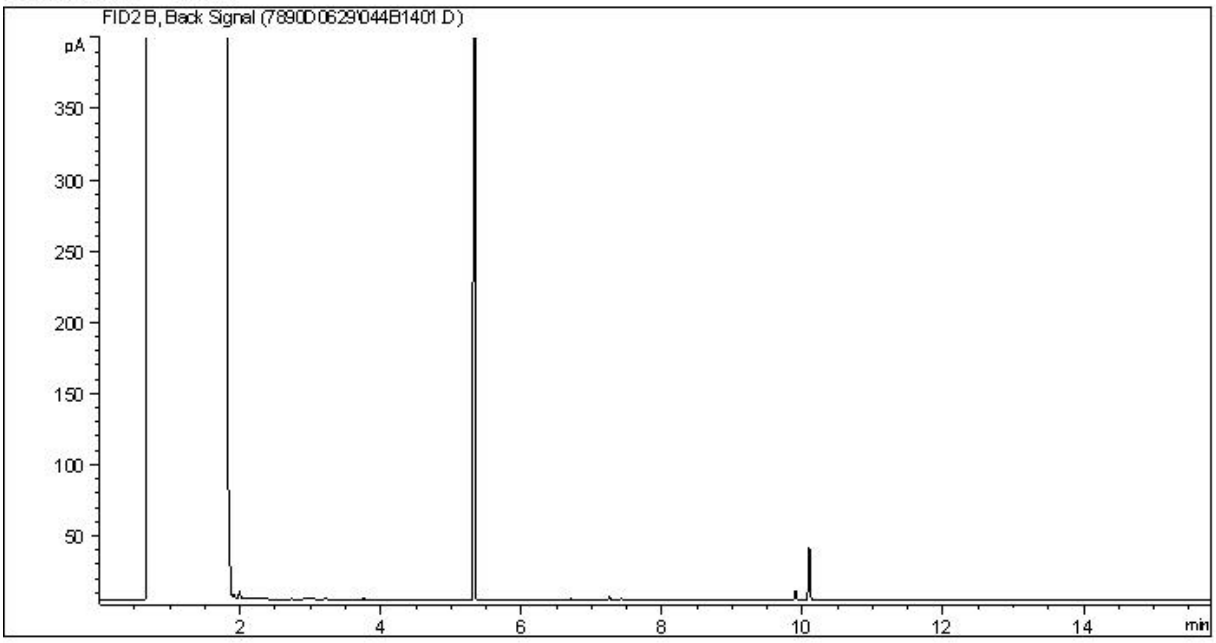

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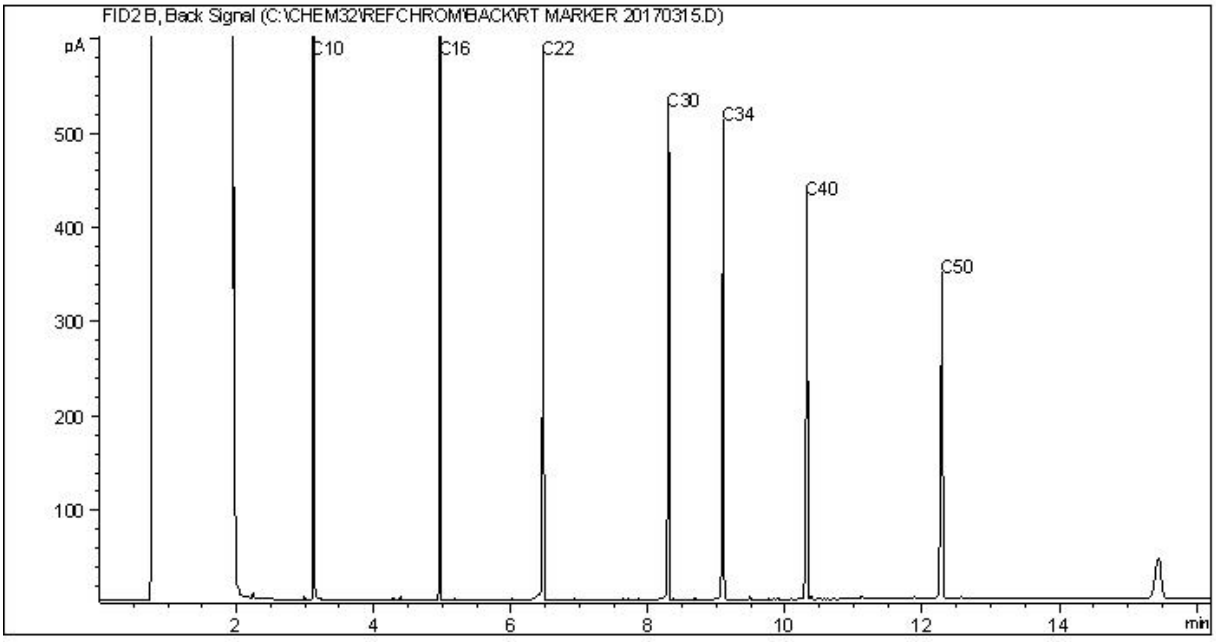

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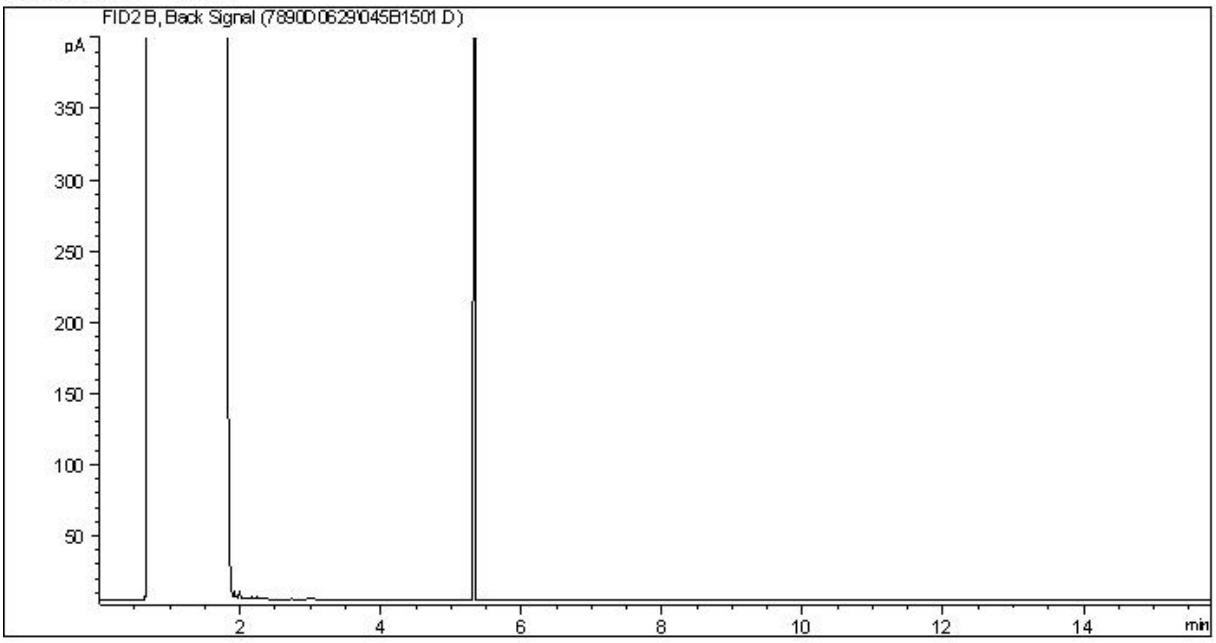

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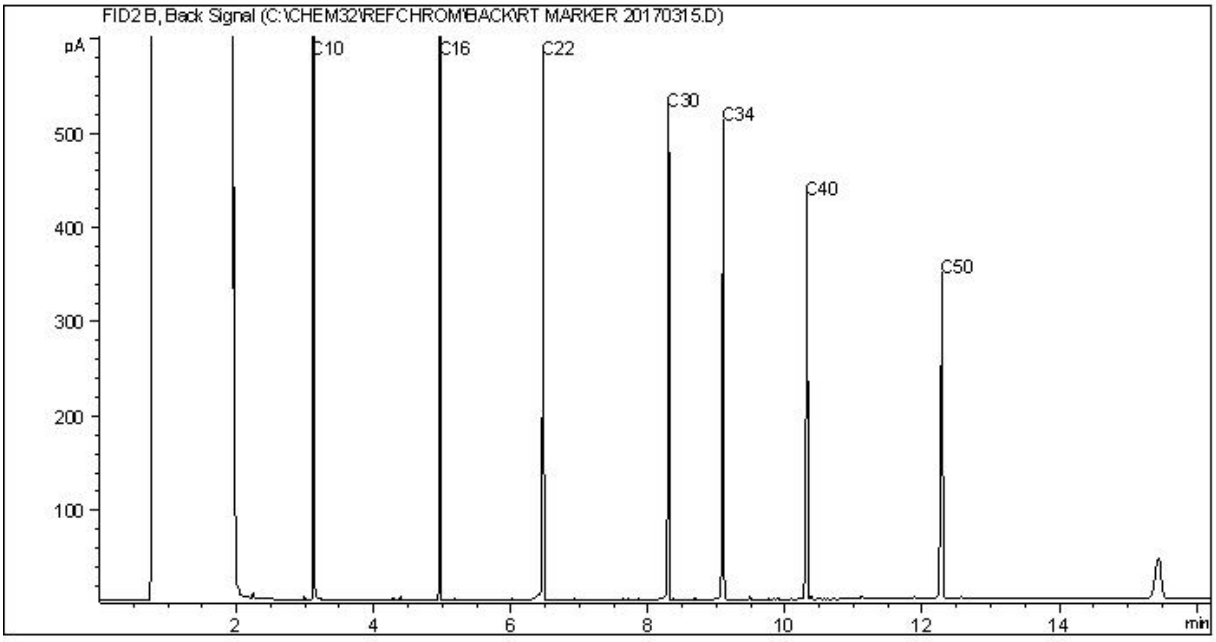

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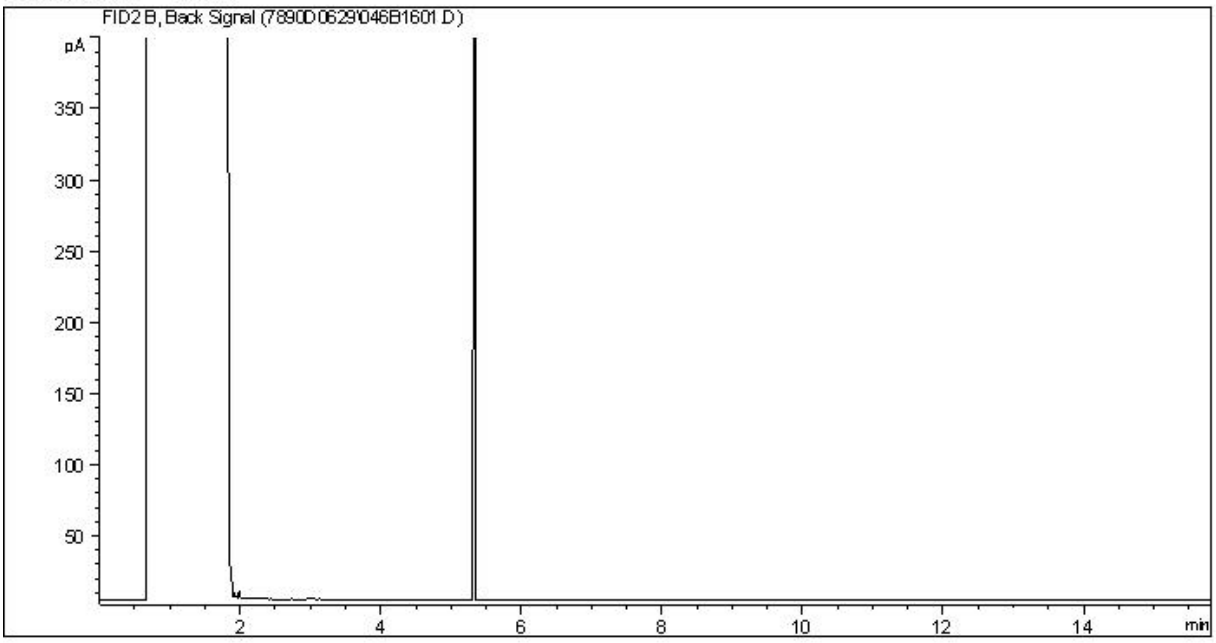

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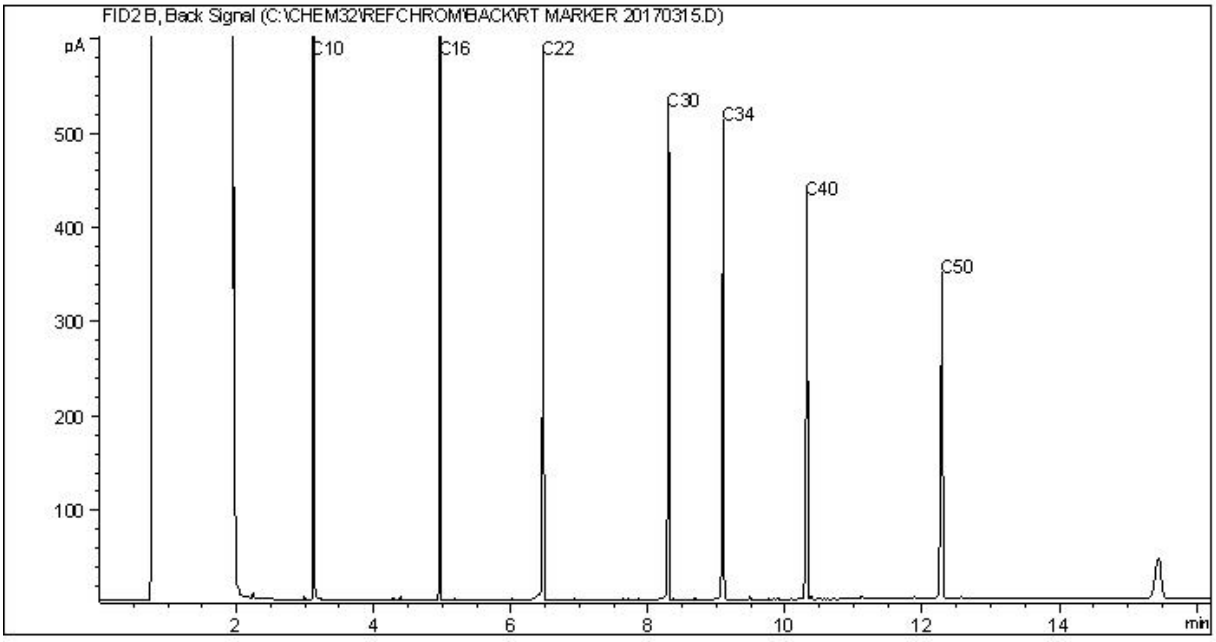

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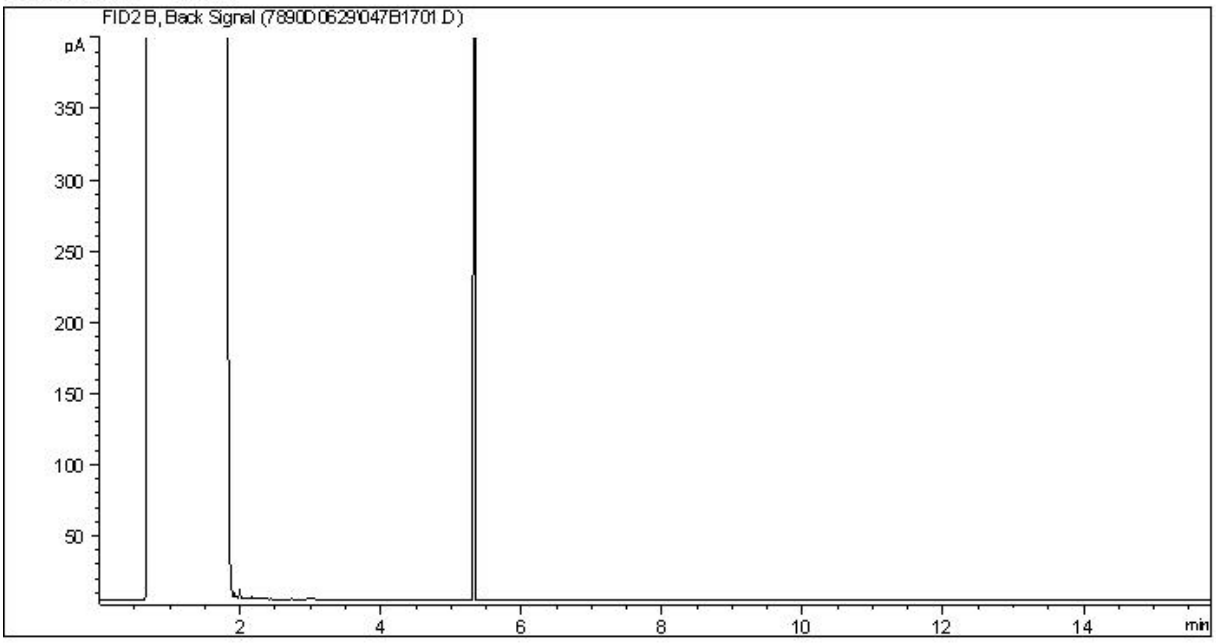

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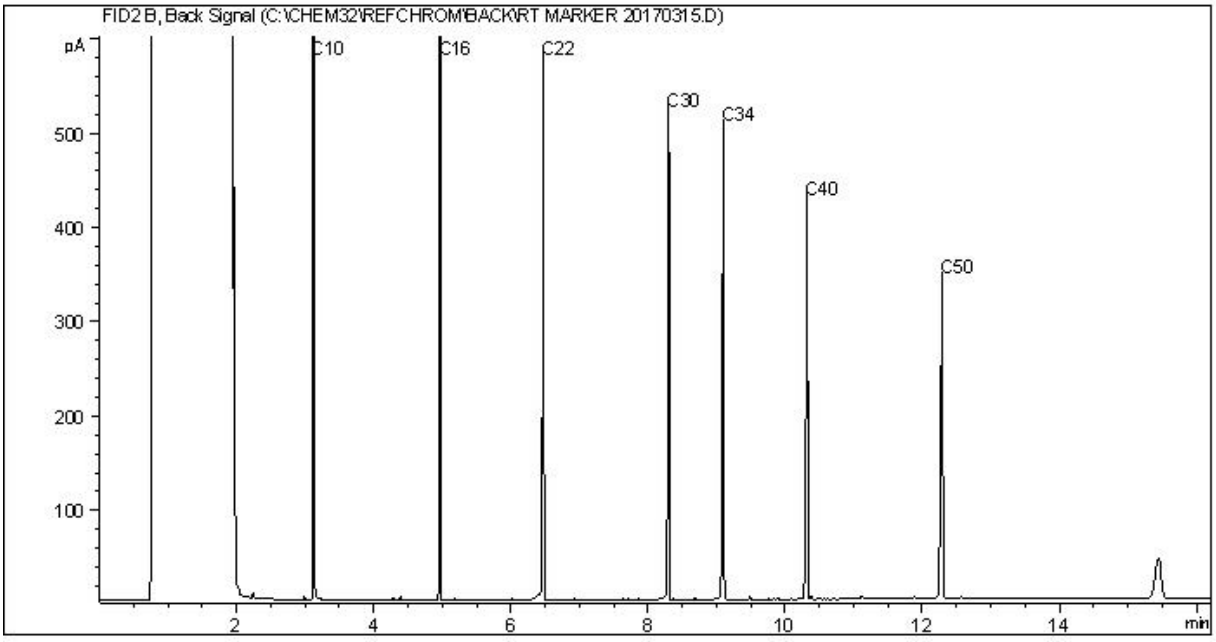

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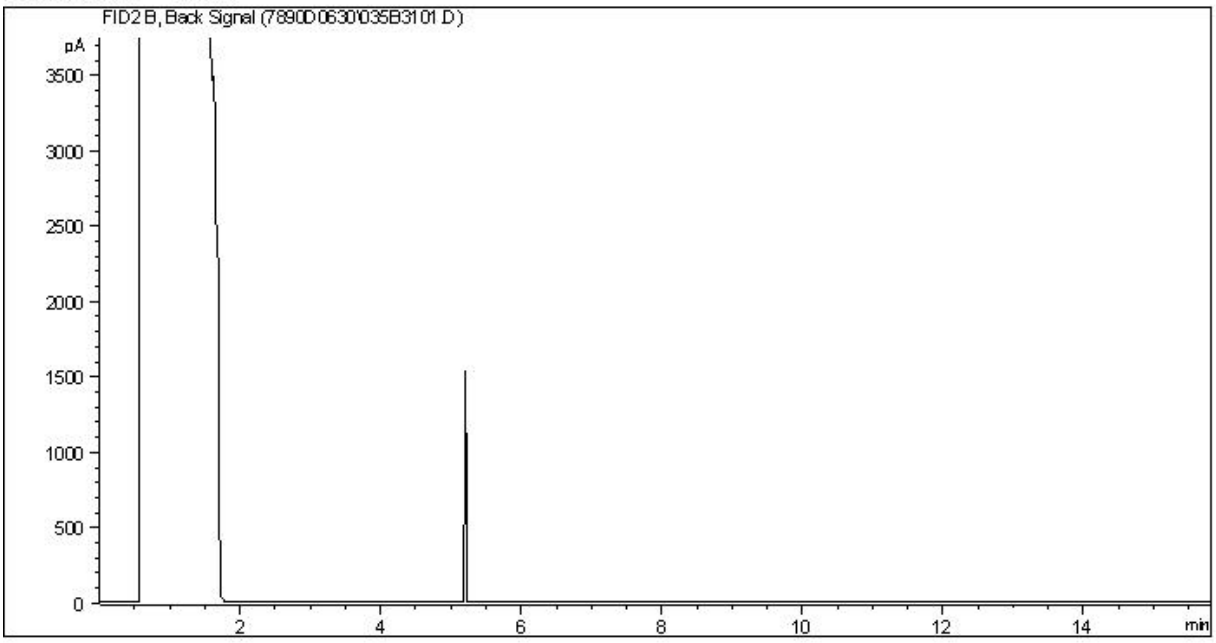

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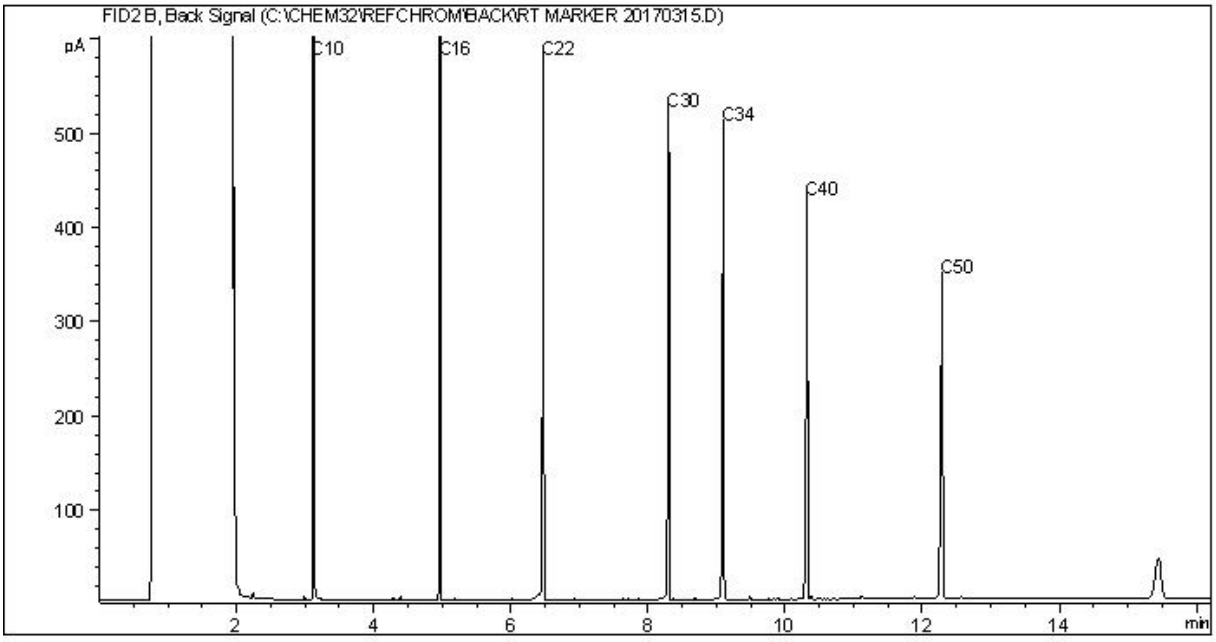

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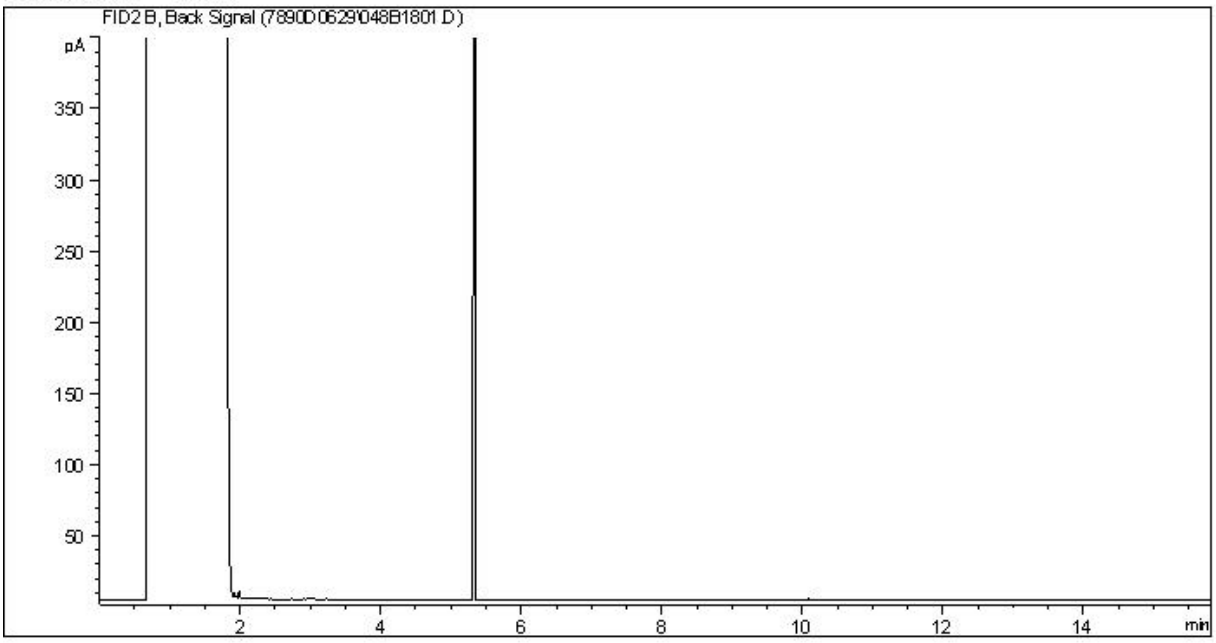

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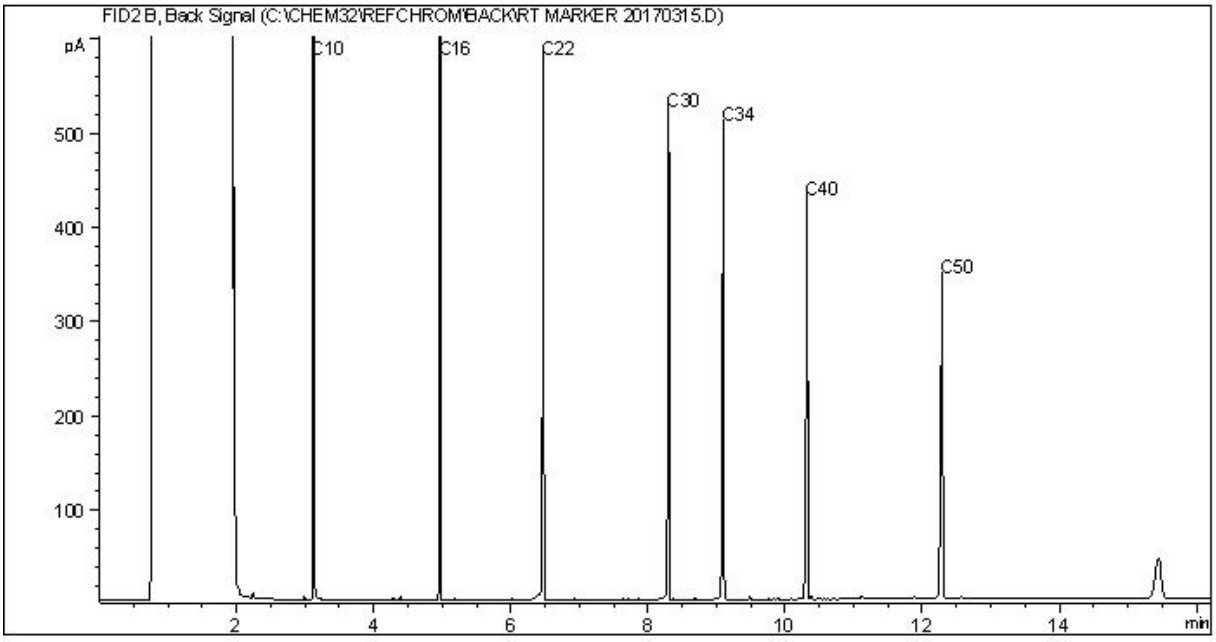

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Maxxam Job #: B851729
Report Date: 2018/07/18
Maxxam Sample: TS8477

TETRA TECH CANADA INC.
Client Project #: SWM.SWOP03800-01
Client ID: MW 31A

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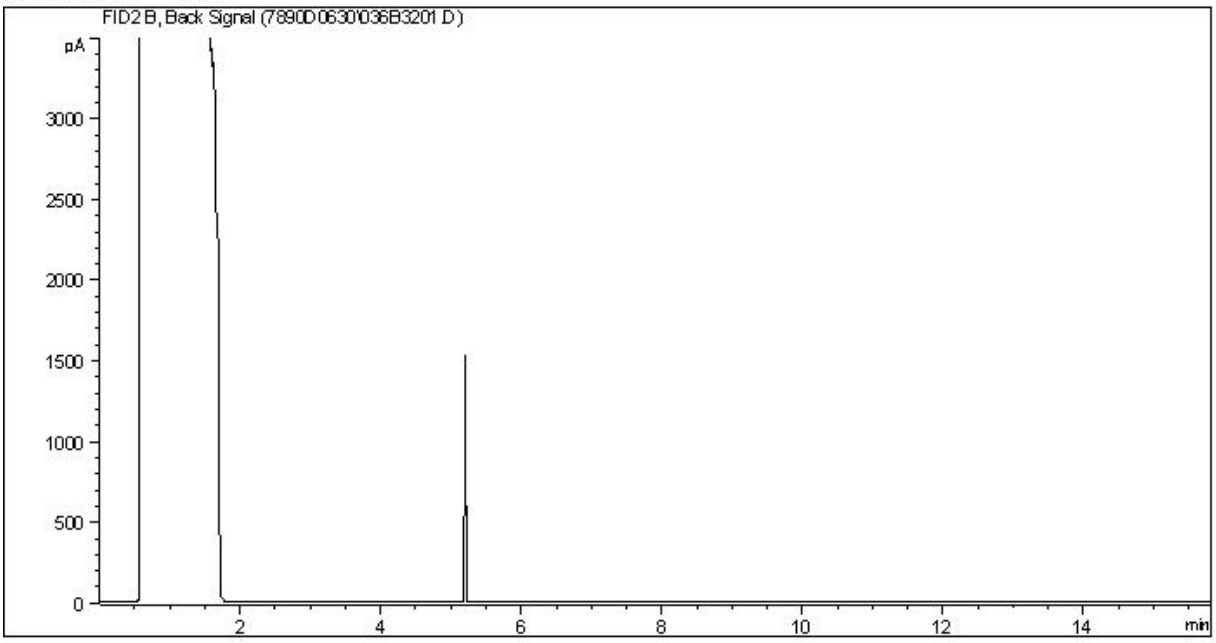

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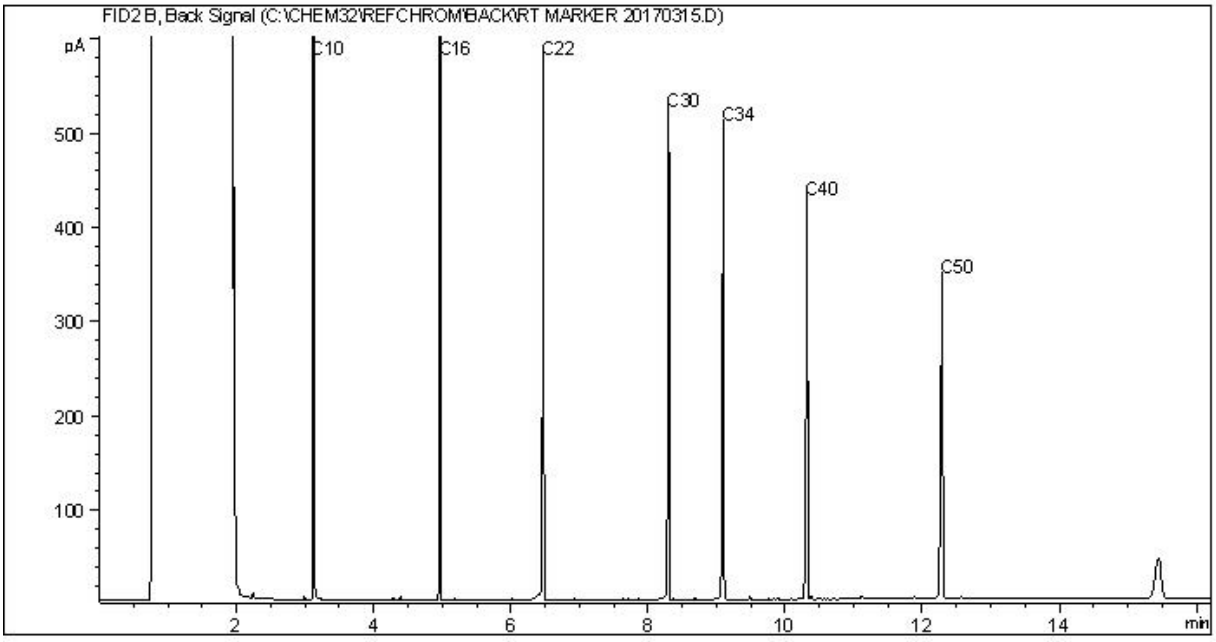

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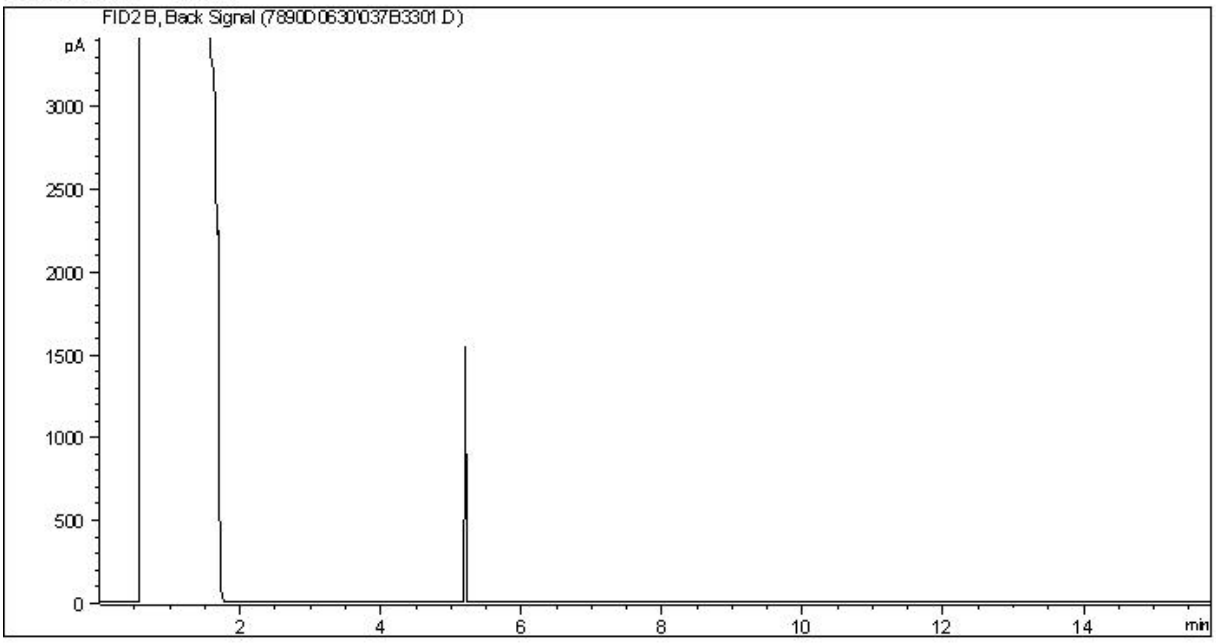

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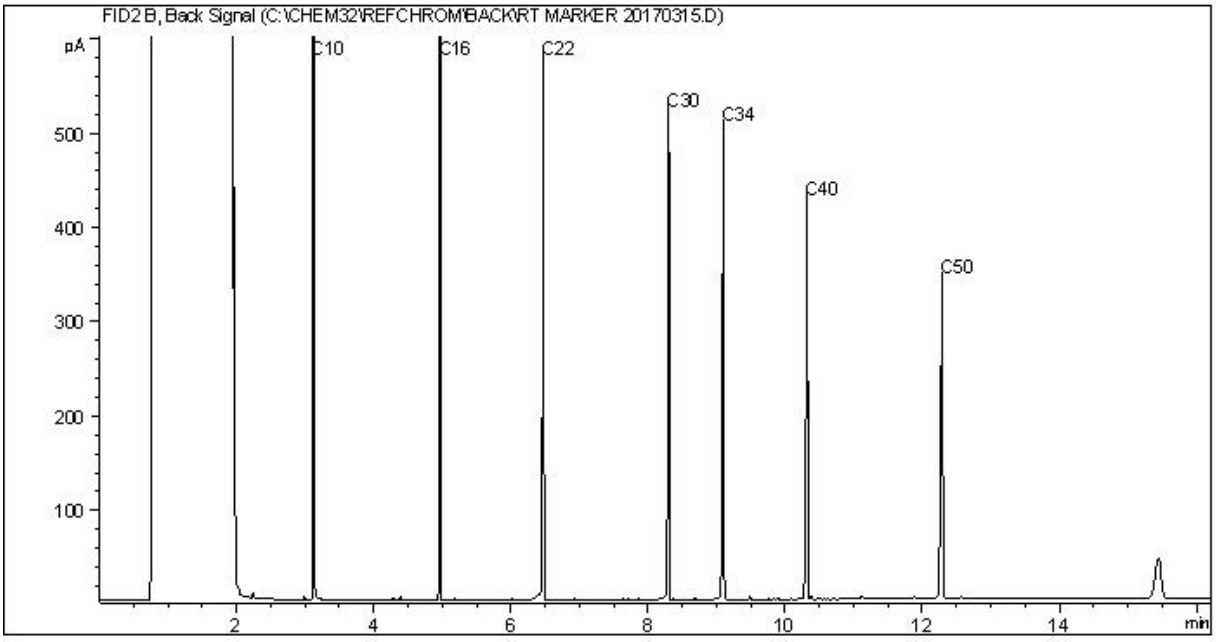

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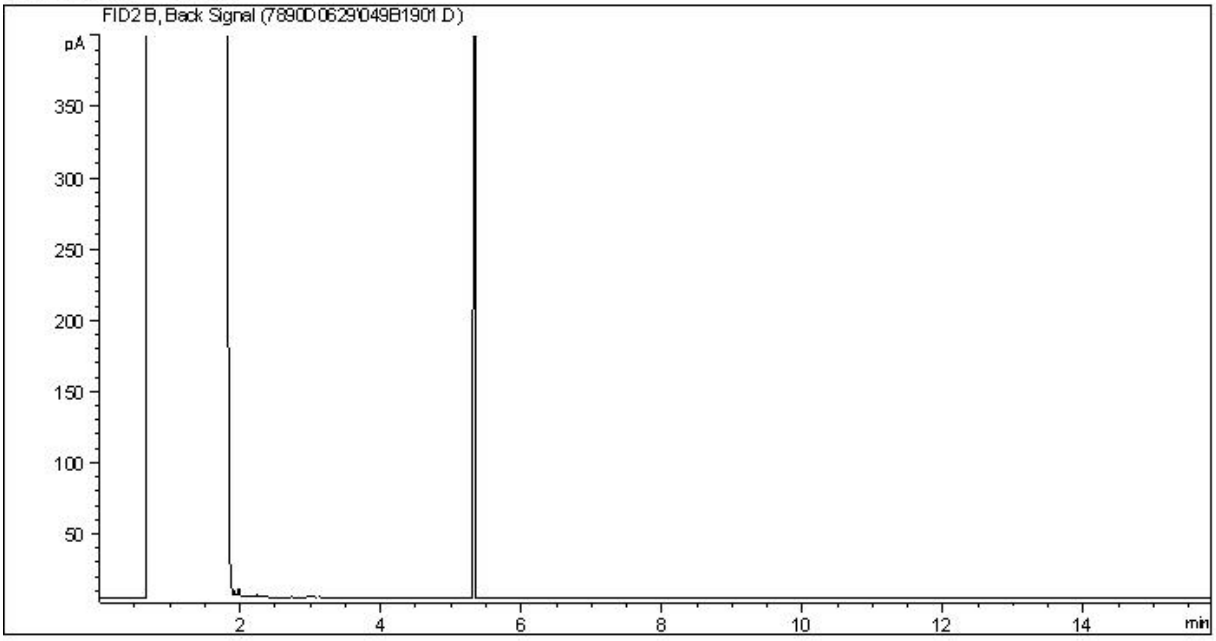

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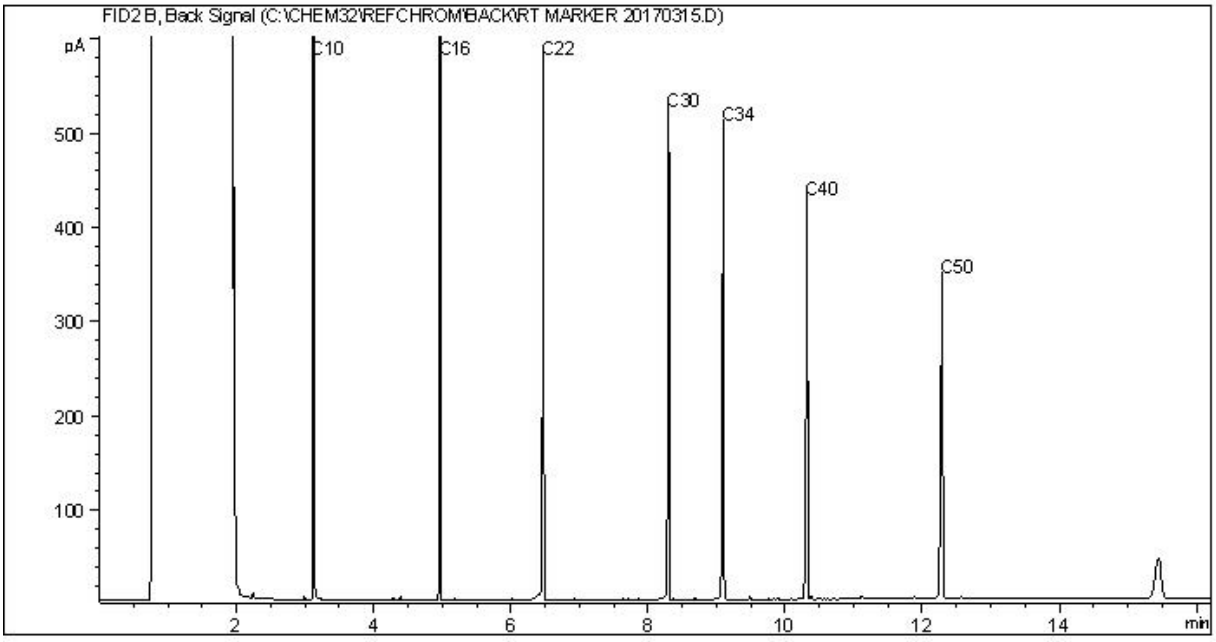

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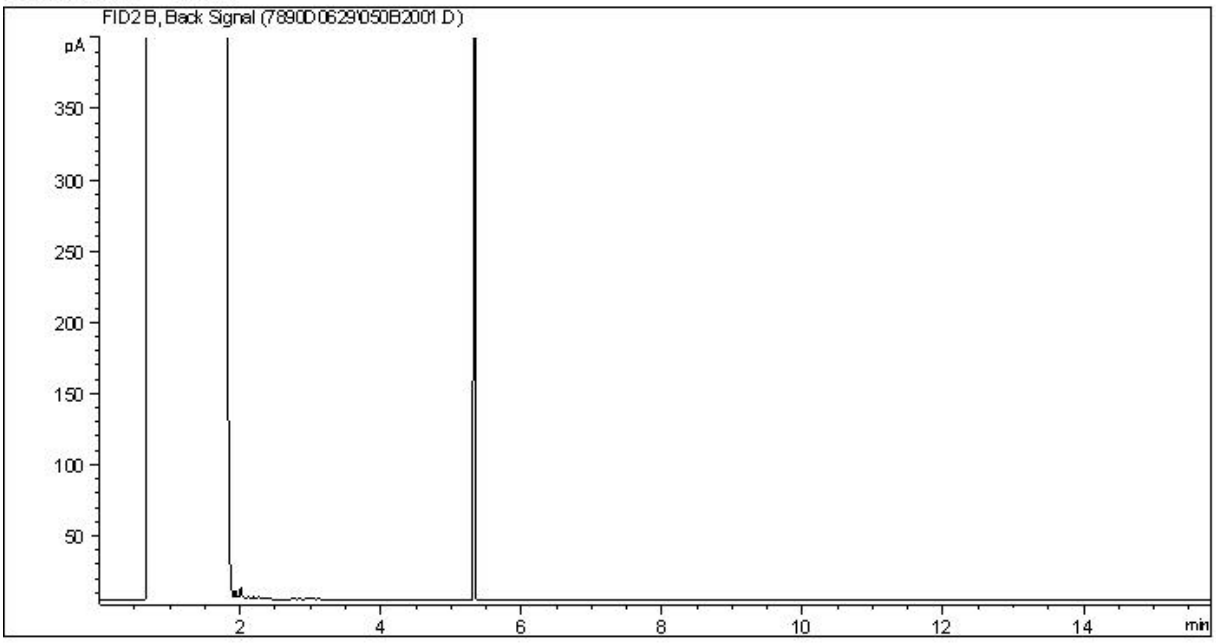

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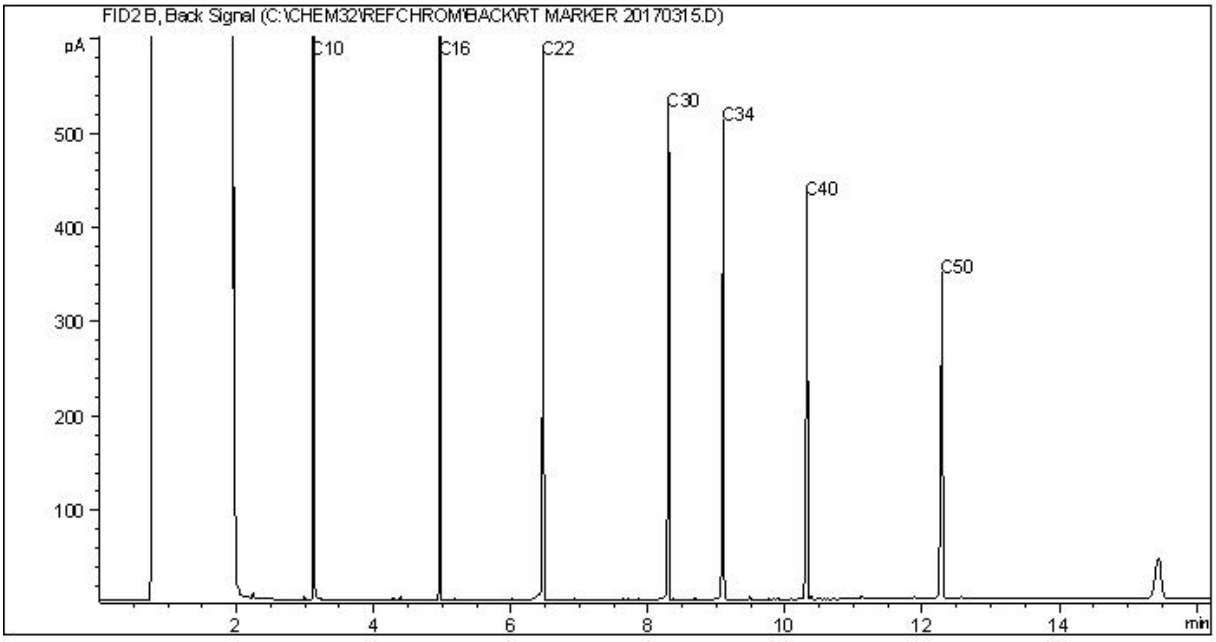

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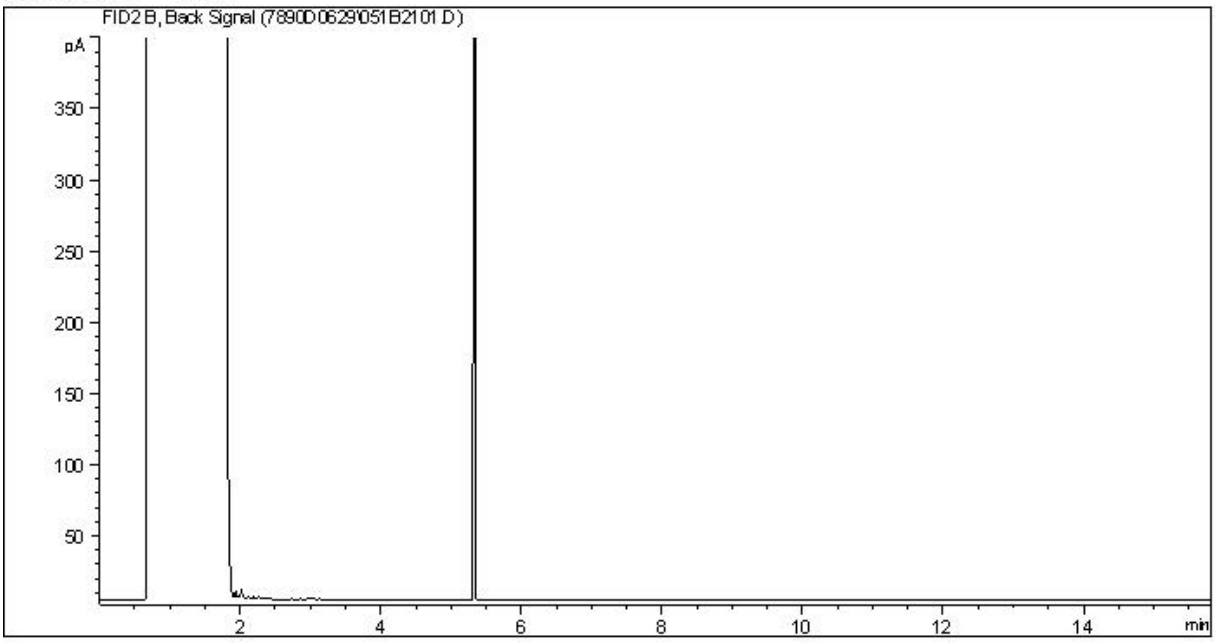

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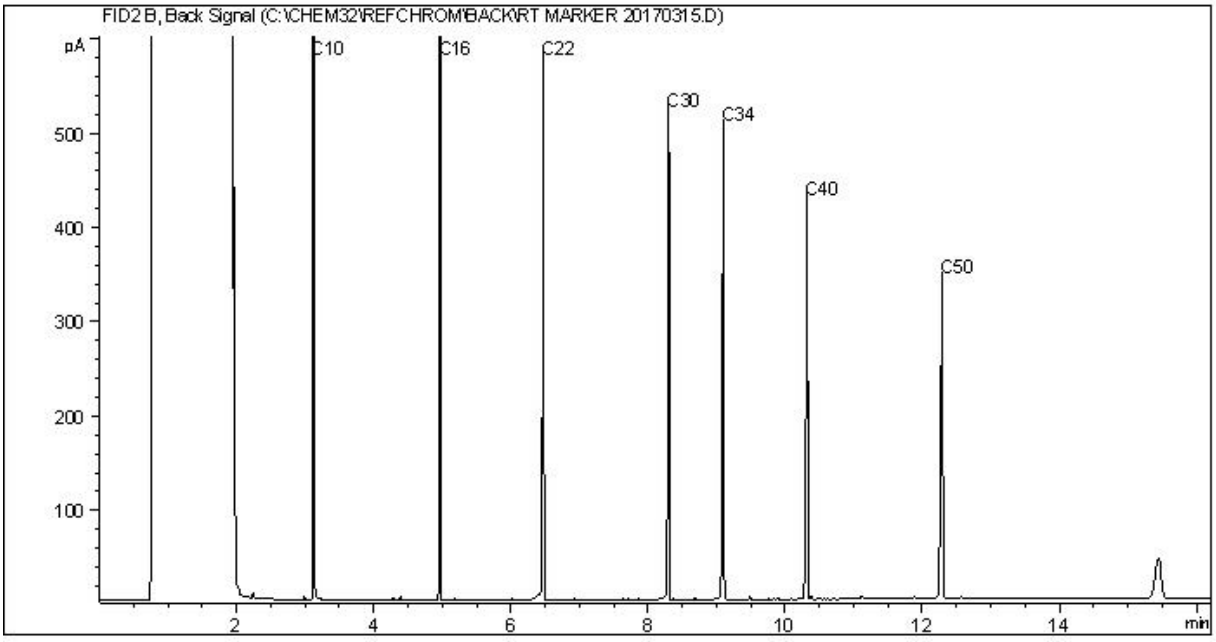

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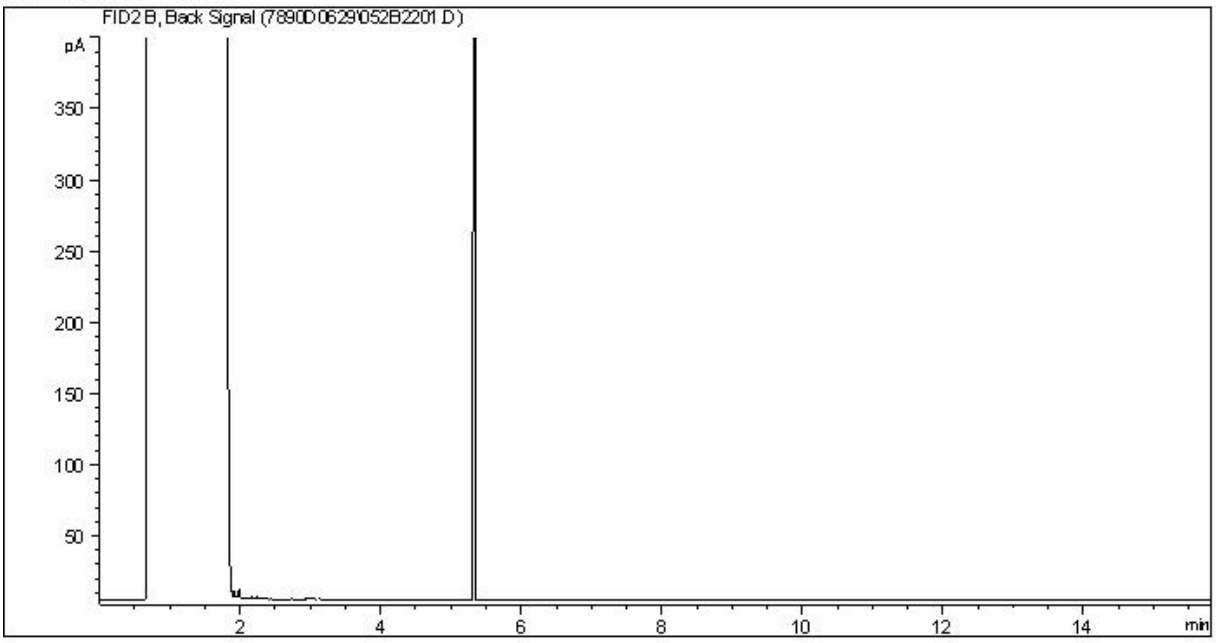

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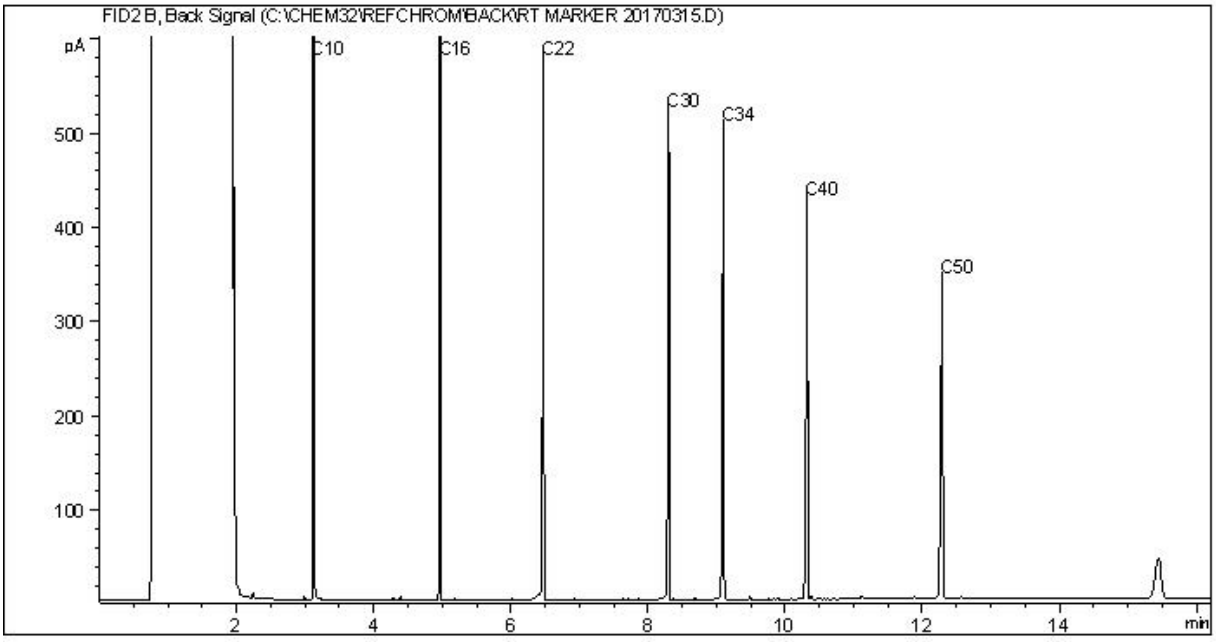

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APPENDIX E

HISTORICAL ANALYTICAL RESULTS

Table E1A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1A																		
			Apr-91	Oct-91	Apr-92	Oct-92	Apr-93	Oct-93	Apr-94	Oct-94	Apr-95	Oct-95	Apr-96	Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00
Field Measurements																						
Field pH	-	-	7.71	8.4	7.7	8.1	8.4	7.7	8.4	8.29	7.9	7.7	7.7	7.6	7.5	7.7	7.6	7.03	7.58	7.03	7.52	7.2
Routine Water																						
pH	-	6.5 - 8.5	8.0	7.8	7.9	7.5	7.7	7.6	8.2	8.0	7.9	7.7	7.86	7.92	7.68	7.94	7.79	7.72	7.66	7.76	7.80	7.71
Conductivity (EC)	µS/cm	-	4420	4500	5050	5450	5300	5630	5420	5840	5530	5960	5540	5710	5550	5240	5590	6230	5610	6520	6740	5790
Calcium	mg/L	-	96	104	97	115	108	114	109	131	120	134	121	127	101	122	122	75	141	132	169	389
Magnesium	mg/L	-	25	33	27	33.4	31.3	33.7	31.8	37.5	34.1	41	34.8	36.6	30.2	32.8	29.3	40.7	42.4	44.1	47.2	94.1
Sodium	mg/L	200	1150	1160	1140	1260	1240	1360	1260	1230	1360	1394	1350	1330	1360	1460	1360	1590	1360	1590	1570	1520
Potassium	mg/L	-	8.9	8.7	9.9	8.34	7.71	7.74	8.46	7.61	7.94	8	6.73	6.88	5.71	7.26	5.87	8.26	7.56	10.8	7.9	17.9
Iron	mg/L	0.3	0.02	<0.02	0.33	11.3	0.07	2.71	< 0.04	0.04	< 0.04	0.028	0.5	0.07	0.06	0.037	0.134	0.216	0.514	0.024	0.044	< 0.003
Sulphate	mg/L	500	2171	2030	2400	2460	2460	2450	2350	2420	2590	2681	2670	2570	2830	3010	2510	3330	2950	3460	3330	3490
Chloride	mg/L	250	1	10	3	0.6	0.5	0.9	0.8	<0.1	0.6	3	1.4	4.9	0.4	1.4	1.1	<0.5	1.4	0.7	<0.5	<0.5
Bicarbonate	mg/L	-	706	776	788	806	797	802	809	815	814	812	811	820	794	793	792	774	767	768	760	781
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<6	<6
Nitrate	mg/L	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.05	0.16	0.213	<0.04
TDS*	mg/L	500	3704	3760	4330	4270	4240	4360	4160	4220	4500	5075	4590	4480	4720	5020	4410	5430	4880	5620	5510	5700
Water Nutrients																						
Ammonia-N	mg/L	-	3	<1	<1	0.755	0.808	0.85	0.58	0.503	0.58	0.721	0.424	0.538	0.385	0.59	0.58	0.78	0.45	0.54	0.48	0.63
TKN	mg/L	-	3	<1	1.1	1.64	1.1	1.45	1.12	1.13	1.2	1.46	1.81	1.31	2.73	1.12	1.24	1.34	0.97	1.2	1.63	1.16
Organics																						
COD	mg/L	-	18	26	12	64	30	31	26	47	54	26	24	51	22	35	38	63	53	38	36	37
TOC	mg/L	-	9	19	9	11.8	8.3	10.8	9.9	8.5	10.2	8.9	8.9	10.2	12.1	11.4	14.3	14.5	18.2	15.2	14.4	15
Oil & Grease	mg/L	-	<1	<1	<1	<0.2	<0.2	6	0.9	0.4	0.3	<0.2	<0.2	0.4	<0.2	<1	1	1	2	<1	<1	7
Metals																						
Antimony	mg/L	0.006	0.001	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	0.0062	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.006	<0.006
Barium	mg/L	1	0.04	0.022	0.021	0.038	0.005	0.009	<0.004	<0.004	<0.004	0.0102	0.0148	0.0089	0.0093	0.0097	0.0105	0.0097	0.0128	0.008	0.0068	0.007
Cadmium	mg/L	0.005	<0.01	<0.003	<0.003	<0.003	<0.003	<0.005	<0.005	<0.003	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006
Chromium	mg/L	0.05	0.02	<0.006	<0.006	<0.006	0.012	<0.005	<0.005	<0.006	<0.006	0.0022	0.0015	0.0009	<0.0008	<0.0008	<0.0008	0.0014	<0.0008	<0.0008	<0.0009	<0.0009
Cobalt	mg/L	-	<0.01	<0.01	<0.01	<0.01	0.01	0.03	<0.01	<0.01	<0.01	0.0012	0.0013	0.0009	0.0009	0.0009	<0.0007	0.0035	0.0042	0.0038	0.0056	0.0048
Copper	mg/L	1	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.608	<0.001
Lead	mg/L	0.010	<0.03	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	0.034	<0.002
Mercury	mg/L	0.001	<0.0002	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	0.05	0.03	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.001	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.003	0.002	0.001	0.002	0.001	<0.001	0.003	0.001	0.007	0.006	0.002
Zinc	mg/L	5.0	0.04	0.019	0.04	0.071	0.021	0.014	< 0.005	< 0.005	< 0.005	0.0031	0.008	0.0282	0.001	0.0261	0.0065	0.0054	0.0088	0.0201	0.11	0.0203

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E1B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1B																					
			Apr-96	Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07
Field Measurements																										
Field pH	-	-	n/a	8.4	8.5	n/a	8.3	7.12	7.73	7.2	7.42	7.03	7.51	7.03	7.36	7.72	7.37	7.63	7.67	7.67	7.36	7.31	7.37	7.68	7.59	7.94
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.6	21.5 (EF)	7.93	6.86	13.04	10.24
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.4	3.2	6.8	6.2	8.3	9.11
Routine Water																										
pH	-	6.5 - 8.5	n/a	8.38	8.23	8.39	8.47	8.05	8.06	8.16	7.93	7.8	7.93	7.83	7.75	7.88	7.89	7.84	8.1	8.1	8.1	8.1	8.1	8.3	8.3	8.2
Conductivity (EC)	µS/cm	-	n/a	5160	3410	2790	2600	4620	4970	6340	6960	7420	7140	7860	7190	7960	7190	8450	9150	8840	8320	8430	6540	6840	5830	4900
Calcium	mg/L	-	n/a	72.7	15.3	17.7	10.6	44.2	49.5	72.9	99.9	149	109	152	115	143	124	208	249	172	186	149	105	99.2	67.1	46.4
Magnesium	mg/L	-	n/a	12.7	2.1	5.8	2.9	8.4	7.9	9.3	19.1	31.6	15.5	27.1	17.5	22.3	18	35.7	48.2	35.5	31.9	26.8	15.9	20.8	10.1	6.9
Sodium	mg/L	200	n/a	1300	819	843	685	1240	1390	1900	1800	2130	1970	2190	2100	2290	1850	2420	2420	2270	2180	2150	1730	1750	1470	1260
Potassium	mg/L	-	n/a	7.59	3.32	8.38	4.51	8.98	5.18	5.97	6	7.3	5.1	8.3	7	7.4	7.2	9.6	7.5	8.2	8.4	7.8	6.3	10.1	6.5	3
Iron	mg/L	0.3	n/a	0.08	0.15	5.04	0.268	3.9	0.387	n/a	0.378	0.022	0.067	< 0.02	0.079	< 0.1	< 0.1	< 0.1	0.009	0.061	<0.005	<0.005	0.094	0.010	<0.005	<0.005
Sulphate	mg/L	500	n/a	2420	1020	935	573	1950	2430	3620	3590	4410	3860	4480	4350	5050	4030	5240	5320	4880	4240	4540	3240	3220	2360	1830
Chloride	mg/L	250	n/a	4.5	8.2	9.4	12.9	7.5	4.8	8.5	1.5	0.9	< 0.5	0.9	0.5	1.7	1.9	1.3	1	2	1	2	4	4	4	6
Bicarbonate	mg/L	-	n/a	625	880	959	946	862	805	696	737	667	640	634	635	653	684	651	644	673	669	673	780	750	889	984
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	6	<5	<5
Nitrate (N)	mg/L	10	n/a	n/a	n/a	n/a	n/a	3.1	3.54	1.92	4.33	2.69	4.75	5.79	2.92	5.86	2.99	4.64	5.1	0.4	0.7	7.4	6.6	3.0	3.3	17.3
TDS*	mg/L	500	n/a	4120	2300	2300	1790	3680	4280	5950	5880	7700	6280	7160	6910	7840	6360	8230	8390	7700	6980	7240	5510	5490	4370	3710
Water Nutrients																										
Ammonia-N	mg/L	-	n/a	1.28	0.831	0.56	0.82	1.17	1.6	1.97	0.93	1.15	0.95	0.7	1.29	0.61	0.85	0.61	0.59	1.56	1.28	1.25	0.57	0.96	0.95	0.23
TKN	mg/L	-	n/a	9.09	5.77	2.92	2.74	2.44	2.54	3.68	2.65	2.5	2.94	2.53	4.05	2.66	3.79	3.52	2.4	3.2	2.9	4.2	3.0	2.4	2.1	1.6
Hydrocarbons																										
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10) - BTEX	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																										
COD	mg/L	-	n/a	295	421	156	147	102	65	17	15	74	83	82	235	84	239	114	100	80	95	73	76	90	49	38
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	n/a	< 0.005	< 0.005	n/a	< 0.005	n/a	< 0.005	n/a	< 0.006	< 0.006	< 0.03	< 0.02	< 0.005	0.0005	0.0027	0.0003	0.0008	0.0013	0.0011	<0.0004	0.0012	0.0008	0.0008	0.0011
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	n/a	0.0343	0.0524	n/a	0.0331	n/a	0.0351	n/a	0.0297	0.0173	0.0717	0.021	0.0147	0.019	0.016	0.016	0.014	0.013	0.015	0.011	0.041	0.011	0.012	0.016
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	n/a	< 0.0005	< 0.0005	n/a	< 0.0005	n/a	< 0.005	n/a	< 0.0006	< 0.0006	< 0.003	< 0.003	< 0.0005	< 0.00001	< 0.0001	0.00003	< 0.001	< 0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.05	n/a	0.0012	0.0015	n/a	0.0012	n/a	< 0.0008	n/a	< 0.0009	< 0.0009	< 0.0044	0.005	< 0.0008	0.0012	< 0.005	0.0008	< 0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	-	n/a	0.0035	0.0031	n/a	< 0.0007	n/a	0.0043	n/a	0.0046	0.0041	0.013	0.012	0.0032	0.0004	< 0.001	0.0007	< 0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	1	n/a	0.002	0.01	n/a	0.006	n/a	0.004	n/a	< 0.001	0.003	< 0.006	< 0.005	0.006	0.009	< 0.01	0.012	0.018	0.021	0.015	0.014	0.008	0.007	0.005	0.003
Lead	mg/L	0.010	n/a	< 0.002	0.003	n/a	0.003	n/a	< 0.002	n/a	0.005	< 0.002	< 0.01	< 0.01	< 0.002	0.0008	< 0.001	0.0004	< 0.005	< 0.005	<0.0001	<0.0001	0.0005	<0.0001	<0.0001	<0.0001
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	n/a	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	n/a	n/a	< 0.0001	< 0.0001	< 0.0001	< 0.0001	n/a	n/a	< 0.0001	< 0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	n/a	0.038	0.023	n/a	0.012	n/a	0.01	n/a	0.006	0.004	0.008	< 0.005	0.004	0.004	< 0.01	0.005	< 0.005	< 0.005	<0.005	<0.005	<0.005	0.005	0.006	0.006
Nickel	mg/L	-	n/a	0.017	0.007	n/a	0.004	n/a	0.005	n/a	0.006	0.006	< 0.006	0.01	0.006	0.0022	< 0.005	< 0.0005	< 0.002	0.005	0.005	0.005	0.007	0.006	0.003	0.004
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	n/a	0.0116	0.0013	n/a	0.0017	n/a	0.0018	n/a	0.0159	0.0222	0.017	0.147	0.0146	0.06	0.02	0.015	0.014	0.028	0.026	0.017	0.03	0.003	0.008	0.008

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E1B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	May-15	Jun-16	Jun-17
Field Measurements												
Field pH	-	-	7.664	7.800	8.11	7.67	7.61	6.17	9.9	8.4	6.33	-
Field EC	mS	-	5.480	3.096	3.3	3.08	2.47	4.11	2.95	3.05	3.67	-
Field Temperature	°C	-	5.1	11.7	21.9	8	7.7	8.2	7.5	8.3	n/a	-
Routine Water												
pH	-	6.5 - 8.5	8.2	8.29	8.23	8.32	8.44	8.41	8.05	8.24	8.44	8.54
Conductivity (EC)	µS/cm	-	4420	5000	4020	2900	3700	3,200	2800	2900	2700	2900
Calcium	mg/L	-	43.5	43.2	25.3	13	19	14	12	12	10	12
Magnesium	mg/L	-	7.9	6.26	3.61	1.9	2.8	2	1.7	1.6	1.3	1.6
Sodium	mg/L	200	1100	1170	941	750	890	730	740	740	680	670
Potassium	mg/L	-	2.4	3.82	3.51	2.2	3.6	2.6	2.5	2.4	2.1	2.2
Iron	mg/L	0.3	<0.005	<0.0050	0.024	<0.06	<0.060	<0.060	0.64	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1590	1960	1270 *	670	1200	860	680	680	540	610
Chloride	mg/L	250	6	3.8	<10 *	6	4.8	5.2	5.1	6.1	6.1	6.2
Bicarbonate	mg/L	-	1030	915	1010	1100	1000	1,000	1100	1100	1100	1000
Carbonate	mg/L	-	<5	<5.0	<5.0	8.4	15	16	<0.50	<0.50	13	21
Nitrate (N)	mg/L	10	4.9	3.81	4.7 *	2.2	5	5.3	3.7	0.89	1.1	13
TDS*	mg/L	500	3280	3650	2670	2000	2700	2,200	2000	2000	1800	1800
Water Nutrients												
Ammonia-N	mg/L	-	0.14	0.823	0.43	0.41	0.47	0.36	<0.050	0.26	0.36	-
TKN	mg/L	-	1.7	2.34	2.63	2.2	2.8	2.4	2.2*	1.6	0.96	-
Hydrocarbons												
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10) - BTEX	mg/L	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.05	<0.050	<0.25	<0.1	<0.75	<0.10	<0.10	<0.10	<0.10	<0.27
Organics												
COD	mg/L	-	33	44	32.7	33	120	270	98	120	47	-
DOC	mg/L	-	14	15.5	12.6	14	13	11	9.9	10	8.8	11
Metals												
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0044	0.061	0.059
Antimony	mg/L	0.006	n/a	n/a	0.00047	<0.006	<0.00060	0.00064	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0012	0.0015	0.00098
Barium	mg/L	1	0.016	0.0119	0.0225	0.017	0.015	0.017	0.039	0.017	0.021	0.024
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.63	0.62	0.64
Cadmium	mg/L	0.005	<0.001	<0.0010	<0.000050	<0.000050	0.000038	0.000057	<0.000025	0.000029	0.000029	0.000022
Chromium	mg/L	0.05	<0.005	<0.0050	<0.0050	<0.01	<0.0010	<0.0010	0.0034	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	0.00066	0.00068	0.001	0.00058	0.00083	0.00099
Copper	mg/L	1	0.004	0.005	0.0084	<0.002	0.0008	0.0032	0.0057	0.0020	0.0035	0.0018
Lead	mg/L	0.010	<0.005	<0.0050	0.0003	<0.002	<0.00020	<0.00020	0.00056	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.10	0.057	0.095
Mercury	mg/L	0.001	<0.0001	<0.00010	<0.00010	<0.000005	<3E n/a 06	<3E n/a 07	0.00003	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.019	0.0061	0.0062	0.011	0.0095	0.011	0.0085	0.0082	0.0084	0.0075
Nickel	mg/L	-	0.004	0.005	0.0072	<0.005	0.004	0.0053	0.0068	0.0038	0.0060	0.0056
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	0.00058	0.00035
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	0.0022	0.0020
Zinc	mg/L	5	0.01	0.0052	0.0068	<0.03	<0.0030	0.0078	0.0034	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E1C: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 1C						
			Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements									
Field pH	-	-	7.61	6.1	5.41	8.0	8.2	6.43	7.6
Field EC	mS	-	5.85	19.99	7.03	6.1	6.42	7.54	7270
Field Temperature	°C	-	11.3	10	6.4	6.7	6.6	8.1	9.7
Routine Water									
pH	-	6.5 - 8.5	8.05	8.11	8.26	8.08	7.98	8.18	8.23
Conductivity (EC)	µS/cm	-	5800	5800	5900	5900	6100	6100	6100
Calcium	mg/L	-	150	130	130	130	140	140	150
Magnesium	mg/L	-	37	34	34	33	34	36	38
Sodium	mg/L	200	1300	1400	1300	1300	1400	1300	1400
Potassium	mg/L	-	7.6	6.7	6.2	4.8	6.6	6.9	7.1
Iron	mg/L	0.3	<0.06	<0.060	0.095	<0.60	<0.060	<0.060	<0.6
Sulphate	mg/L	500	2700	2600	2800	3000	2900	2800	2600
Chloride	mg/L	250	2	1.8	1.3	1.1	1.7	1.4	<1
Bicarbonate	mg/L	-	740	760	760	770	750	710	760
Carbonate	mg/L	-	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.009	0.0078	0.25	0.093	0.080	0.22	0.41
TDS*	mg/L	500	4600	4600	4600	4800	4800	4700	4600
Water Nutrients									
Ammonia-N	mg/L	-	0.74	0.66	0.57	0.57	0.60	0.46	0.7
TKN	mg/L	-	1.6	1.3	1.2	1.2	1.2	0.58	1.1
Hydrocarbons									
Benzene	mg/L	0.005	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Toluene	mg/L	0.024	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Xylene	mg/L	0.02	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Organics									
COD	mg/L	-	78	56	46	39	42	51	28
DOC	mg/L	-	11	10	12	9.6	11	11	10
Metals									
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	<0.030	0.0079	0.0069
Antimony	mg/L	0.006	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	<0.0020	0.0011	0.00068
Barium	mg/L	1	0.06	0.037	0.035	<0.10	0.025	0.023	<0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	0.24	0.24	0.24
Cadmium	mg/L	0.005	0.00009	<0.050	0.000065	<0.000050	<0.00020	0.000036	<0.00002
Chromium	mg/L	0.05	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.001
Cobalt	mg/L	-	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00087	0.00067
Copper	mg/L	1	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00070	0.00039
Lead	mg/L	0.010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	0.27	0.28	0.28
Mercury	mg/L	0.001	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.003	<0.0020	0.002	<0.0020	<0.0020	0.0013	0.00068
Nickel	mg/L	-	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0021	0.0013
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	<0.0010	0.00036	0.00022
Zinc	mg/L	5	<0.03	<0.030	0.074	<0.030	<0.030	0.0037	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E5.5A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 5A																						
			Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																										
Field pH	-	-	7.11	7.56	7.11	7.55	7.52	7.48	7.44	7.56	7.42	7.21	7.55	7.31	7.36	7.14	7.21	7.48	7.6	8.65	7.63	7.35	6.41	7.8	7.8	6.15	8.4
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.13	18.13 (EF)	8.47	8.03	1.77	9.67	7.78	3.695	4.5	9.11	3.86	1.03	9.71	10.05	12.74	2.05
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.1	8.3	5.7	9.7	6.2	11.22	5.6	9.5	9.6	11.1	8.3	6.5	6.0	7.1	n/a	8.2
Routine Water																											
pH	-	6.5 - 8.5	7.66	7.57	7.65	7.7	7.53	7.93	7.72	8.1	8.0	8.0	8.2	8.0	8.3	8.1	7.9	8	8.17	8.05	7.94	7.97	8.11	8.18	7.83	8.00	7.99
Conductivity (EC)	µS/cm	-	7520	7400	8100	7880	8350	7660	8320	7730	8110	7830	7000	8050	8450	8240	8380	7770	7920	8850	8800	8800	9200	9200	9500	9600	9600
Calcium	mg/L	-	179	179	199	187	208	207	203	192	169	215	209	209	221	221	189	195	178	202	200	220	230	260	250	270	290
Magnesium	mg/L	-	62.9	56.7	70.5	58	66	70.5	67.8	61.5	70.1	71	82.2	66.9	81.8	80.8	71.2	67.7	58.4	70.6	65	73	77	95	100	95	100
Sodium	mg/L	200	2110	1900	2090	2080	2220	1900	1950	1900	2030	2010	2180	1930	2040	2070	2050	1890	1800	1990	2000	2300	2100	2400	2300	2100	2200
Potassium	mg/L	-	11.6	7.3	9.8	8.3	8.7	6.3	8.5	6.7	9.3	9.4	10.0	9.1	10.5	10.5	6.4	5.5	8.8	9.28	8.2	10	9.1	10	10	11	10
Iron	mg/L	0.3	0.011	0.11	<0.02	<0.02	<0.1	<0.1	<0.1	0.012	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.005	0.011	<0.005	<0.0050	<0.010	<0.06	<0.060	<0.06	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	5010	4220	4640	4580	5060	4480	4600	4060	4420	3960	4650	4100	4290	4220	4220	3890	3900	4540 *	4500	5000	5200	5500	5500	5200	4900
Chloride	mg/L	250	< 0.5	< 0.5	1.0	1.3	< 0.5	1.4	1.6	1.0	2.0	2.0	2.0	2.0	2.0	2.0	<1	3	3.09	<10 *	2	2.4	1.7	2.6	2.4	2.1	2.6
Bicarbonate	mg/L	-	863	855	852	829	836	782	819	816	816	809	829	805	767	790	786	837	815	787	750	730	740	740	730	660	720
Carbonate	mg/L	-	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.17	<0.04	0.22	0.046	<0.04	<0.04	0.29	0.7	0.4	0.4	0.2	0.3	0.4	0.5	0.3	0.7	0.56	<1.0 *	0.08	0.34	0.46	0.3	0.058	0.20	1.7
TDS*	mg/L	500	7650	6780	7430	7320	7980	7050	7230	6630	7100	6670	7540	6710	7030	6990	6920	6470	6350	7200	7200	7900	7900	8600	8500	8000	7900
Water Nutrients																											
Ammonia-N	mg/L		0.74	0.29	0.38	0.5	0.25	0.13	0.29	< 0.05	0.33	0.07	0.48	0.26	0.47	0.16	0.17	<0.05	0.053	<0.050	0.64	0.59	0.55	0.52	1.0	0.67	0.22
TKN	mg/L	-	1.52	1.31	1.44	1.66	1.39	1.14	1.57	0.9	1.0	1.0	1.6	1.2	1.8	1.3	1.0	1.7	1.77	1.61	1.8	1.7	1.5	1.6	2.2	1.3	1.2
Hydrocarbons																											
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																											
COD	mg/L	-	50	55	53	39	56	55	53	50	50	59	59	55	59	59	53	46	57	63.4	85	69	75	63	71	64	59
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	21	19.8	24.4	25	23	25	21	28	24	24
Metals																											
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	<0.0030	0.016
Antimony	mg/L	0.006	<0.006	<0.05	<0.02	<0.02	<0.002	<0.002	<0.002	0.001	0.0013	0.001	<0.0004	0.0009	0.0008	<0.0004	0.0007	n/a	n/a	<0.00040	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00058	0.00047
Barium	mg/L	1	0.0063	0.006	0.012	0.0075	<0.01	<0.01	<0.01	0.007	0.007	0.009	0.007	0.007	0.007	0.008	0.007	0.008	0.0065	0.0072	<0.01	<0.010	<0.010	<0.10	<0.10	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.60	0.56	0.57
Cadmium	mg/L	0.005	<0.0006	<0.005	<0.003	<0.003	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0010	<0.000050	<0.000050	<0.050	<0.000050	<0.000050	<0.00020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0009	<0.008	<0.004	<0.004	0.0055	<0.005	0.0082	<0.005	<0.005	<0.005	0.007	<0.0005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.0010
Cobalt	mg/L	-	0.006	0.016	0.012	0.015	0.0016	0.0015	0.0016	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00086	0.00059
Copper	mg/L	1	0.001	<0.01	<0.005	<0.005	<0.01	<0.01	0.011	0.02	0.016	0.012	0.013	0.008	0.01	0.005	0.005	0.008	0.0078	0.0105	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0057	0.0008
Lead	mg/L	0.010	<0.002	<0.02	0.016	0.01	<0.001	<0.001	<0.001	0.0008	<0.005	<0.0001	<0.0001	0.0002	<0.0001	0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.15	0.15	0.69
Mercury	mg/L	0.001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.000004	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.001	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00080	0.00088
Nickel	mg/L	-	0.004	<0.01	0.015	0.018	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.002	0.007	0.006	0.007	0.0089	<0.005	<0.0050	<0.0050	<0.0050	0.0065	0.0086	0.0045
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0010	0.00031	0.00046
Zinc	mg/L	5	0.0332	0.025	0.021	0.005	0.022	<0.01	0.018	0.031	0.028	0.025	0.018	0.015	0.003	0.041	0.013	0.013	0.007	0.0115	<0.03	<0.030	<0.030	<0.030	<0.030	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

TETRA TECH

Table E5.5B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 5B																		
			Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Jan-07	Apr-07	Oct-07	May-08	May-09	10-Jun	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																						
Field pH	-	-	7.95	7.47	7.96	7.56	7.64	7.73	8.10	n/a[1]	7.84	7.78	7.88	n/a[1]	7.93	8.45	7.91	6.9	8.3	8.3	-	-
Field EC	mS	-	n/a	n/a	n/a	3.9	6.99(EF)	3.36	9.47	n/a[1]	6.82	6.94	3.16	n/a[1]	11.6	1.25	2.65	2.53	2.43	2.89	-	-
Field Temperature	°C	-	n/a	n/a	n/a	10.1	3.3	9.6	5.9	n/a[1]	9.2	9.52	9	n/a[1]	6.1	11.4	12.5	10.7	10.0	9.3	-	-
Routine Water																						
pH	-	6.5 - 8.5	8.16	8.4	8.3	8.3	8.4	8.4	8.3	8.2	8.6	8.1	8.4	8.29	7.55	8.26	8.01	8.37	8.56	8.28	8.34	9.09
Conductivity (EC)	µS/cm	-	3720	3430	3430	3320	3310	3260	7760	3220	3260	3350	3190	2550	423	1000	2200	2200	2700	2700	3000	2300
Calcium	mg/L	-	25.2	17.9	8.2	18.3	16.4	16.9	191	16.3	15.8	16.4	14.8	13.3	55.3	23	67	61	23	13	13	8.2
Magnesium	mg/L	-	2.7	2.1	2.2	2.2	2.2	1.7	189	1.7	1.4	1.2	1.8	1.59	8.18	5.7	25	26	11	16	3.2	3.4
Sodium	mg/L	200	982	918	863	837	832	807	3780	822	826	839	736	594	17.6	210	430	390	570	600	750	520
Potassium	mg/L	-	3.7	3.2	3.1	2.7	3.2	3.5	12.3	3.2	4.1	2.3	2.4	3.48	2.59	2.4	2.8	2.6	3.7	3.6	4.2	13
Iron	mg/L	0.3	<0.05	0.019	0.008	0.037	<0.005	0.010	<0.005	n/a[1]	0.103	0.022	0.026	0.0802	<0.010	<0.06	<0.060	<0.060	0.13	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1260	1000	939	824	890	789	7040	744	745	779	675	527	158	270	600	560	630	600	650	440
Chloride	mg/L	250	7	8	9	9	9	10	241	8	8	9	12	10.5	2.05	17	61	45	30	24	16	17
Bicarbonate	mg/L	-	1030	1070	1100	1160	1150	1160	1440	1190	1160	1250	1210	972	41.9	290	660	690	950	1000	1200	790
Carbonate	mg/L	-	<6	19	14	7	20	26	7	<5	39	<5	27	<5.0	<5.0	<0.5	<0.50	9	36	<0.50	5	80
Nitrate (N)	mg/L	10	8.56	10	7.9	3.4	0.7	1.5	0.2	3.5	5.7	9.8	4.4	4.75	0.209	0.55	0.43	0.29	0.93	1.1	0.36	1.7
TDS*	mg/L	500	2780	2540	2420	2290	2340	2230	12200	2200	2230	2310	2090	1650	265	670	1500	1400	1800	1800	2000	1500
Water Nutrients																						
Ammonia-N	mg/L	-	0.49	0.54	0.43	0.09	0.81	0.24	<0.05	n/a	0.15	0.49	0.59	0.292	<0.050	0.19	0.29	0.2	0.36	0.50	0.10	0.32
TKN	mg/L	-	0.79	5.5	1.3	0.9	1.1	0.7	1.8	n/a	1.1	1.1	0.1	3.51	0.64	0.66	0.87	0.65	1.1	1.4	0.49	0.93
Hydrocarbons																						
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.1	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.05	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																						
COD	mg/L	-	47	30	20	35	19	26	70	n/a	25	45	24	25.6	12.4	37	39	25	52	56	23	48
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	7.9	2.2	6.7	4.7	3.9	5.2	6.1	7.2	7.7
Metals																						
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0049	0.0062	0.031
Antimony	mg/L	0.006	<0.002	0.0011	0.0014	0.0012	0.0006	0.0012	0.0008	n/a	0.0028	0.0010	n/a	n/a	0.00553	<0.006	0.00074	0.00075	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00068	0.00094	0.002
Barium	mg/L	1	0.02	0.026	0.026	0.024	0.034	0.027	0.014	n/a	0.106	0.024	0.062	0.0339	0.0369	0.025	0.034	0.022	0.027	0.016	0.018	0.035
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.53	0.84	0.44
Cadmium	mg/L	0.005	0.0004	<0.001	<0.001	<0.00001	<0.00001	<0.00001	<0.00001	n/a	<0.0001	<0.0001	<0.001	<0.0010	0.000078	<0.000050	0.000095	0.000053	<0.000025	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<005	< 0.005	<0.005	<0.005	<0.005	0.012	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0010	0.01	0.011	0.0082	0.010	0.0012
Cobalt	mg/L	-	<0.001	<0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	0.00065	0.0003	<0.0003	<0.00030	0.00040	<0.00030
Copper	mg/L	1	<0.01	0.008	0.01	0.008	0.006	0.005	0.02	n/a	0.009	0.002	0.002	0.006	0.0011	<0.002	0.0026	0.0051	0.0033	0.0015	0.0033	0.0034
Lead	mg/L	0.010	<0.001	<0.005	< 0.005	<0.0001	<0.0001	0.0004	<0.00001	n/a	0.0002	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.00020	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.024	0.026	<0.0040
Mercury	mg/L	0.001	<0.00001	<0.0002	< 0.0002	<0.00001	<0.00001	<0.00001	<0.00001	n/a	<0.0001	<0.0001	0.0001	<0.0001	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.01	0.006	0.005	0.006	0.005	0.005	<0.005	n/a	0.021	<0.005	0.014	0.0098	0.0233	0.02	0.0059	0.0037	0.0061	0.0059	0.010	0.011
Nickel	mg/L	-	<0.005	0.003	0.004	0.004	0.004	0.004	0.014	n/a	0.008	0.003	<0.002	0.0052	0.0165	<0.005	0.021	0.013	0.0077	0.0077	0.013	0.0073
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	0.00029
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.011	0.0041	0.0032
Zinc	mg/L	5	0.019	0.021	0.018	0.011	0.008	0.01	0.008	n/a	0.019	0.012	0.005	0.0168	0.0068	<0.03	0.01	0.01	0.0033	<0.0030	0.0033	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E8A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 8A				
			Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	7.14	8.5	8.5	8.51	8.5
Field EC	mS	-	4.92	2.56	2.91	2.51	2.67
Field Temperature	°C	-	6.1	5.4	6.0	8.7	8.4
Routine Water							
pH	-	6.5 - 8.5	8.45	8.67	8.32	8.49	8.49
Conductivity (EC)	µS/cm	-	4100	2400	2700	2400	2500
Calcium	mg/L	-	25	7.7	7.6	7.8	8.3
Magnesium	mg/L	-	7.3	1.7	1.5	1.3	1.3
Sodium	mg/L	200	930	610	670	600	630
Potassium	mg/L	-	3.7	2.2	2.1	2.3	2.4
Iron	mg/L	0.3	<0.060	0.31	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1300	300	450	290	360
Chloride	mg/L	250	9.8	8.0	7.6	7.4	7.1
Bicarbonate	mg/L	-	1200	1300	1300	1200	1300
Carbonate	mg/L	-	26	49	3.0	25	21
Nitrate (N)	mg/L	10	0.017	<0.010	<0.010	<0.010	<0.044
TDS*	mg/L	500	2900	1600	1800	1500	1700
Water Nutrients							
Ammonia-N	mg/L	-	1.1	0.89	0.96	0.81	0.63
TKN	mg/L	-	1.9	1.5	1.6	1.1	1.3
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	79	68	71	36	40
DOC	mg/L	-	11	9	10	11	12
Metals							
Aluminum	mg/L	0.1	n/a	n/a	0.0043	0.0093	0.0088
Antimony	mg/L	0.006	0.00081	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.0014	0.0021	0.0019
Barium	mg/L	1	0.04	0.041	0.025	0.045	0.049
Boron	mg/L	5	n/a	n/a	0.68	0.72	0.77
Cadmium	mg/L	0.005	0.000035	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0012	0.0014	0.00033	0.00046	0.00032
Copper	mg/L	1	0.0017	0.00047	0.00064	0.00042	<0.00020
Lead	mg/L	0.01	<0.00020	<0.0002	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.017	0.015	0.025
Mercury	mg/L	0.001	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.012	0.00036	0.0057	0.0070	0.0062
Nickel	mg/L	-	0.005	0.0023	0.0020	0.0023	0.0011
Selenium	mg/L	0.05	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	0.00071	0.00092	0.00074
Zinc	mg/L	5	0.012	0.007	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E8B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 8B				
			Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	6.57	7.6	8	7.73	7.8
Field EC	mS	-	10.05	8.96	9.28	8.94	9.25
Field Temperature	°C	-	7.4	4.0	6.6	6.8	5.8
Routine Water							
pH	-	6.5 - 8.5	8.31	8.37	7.95	8.19	8.17
Conductivity (EC)	µS/cm	-	8800	8500	8700	8700	8800
Calcium	mg/L	-	92	110	90	97	97
Magnesium	mg/L	-	48	62	56	54	57
Sodium	mg/L	200	2100	2300	2200	2000	2100
Potassium	mg/L	-	5.8	5.4	6.2	6.7	6.7
Iron	mg/L	0.3	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	4300	4500	4200	3900	3900
Chloride	mg/L	250	23	23	26	28	30
Bicarbonate	mg/L	-	1100	1100	1100	1100	1100
Carbonate	mg/L	-	7.2	18	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.022	0.074	0.12	0.10	1.5
TDS*	mg/L	500	7100	7600	7100	6600	6800
Water Nutrients							
Ammonia-N	mg/L	-	0.61	0.57	0.69	0.62	0.38
TKN	mg/L	-	1.7	1.4	1.6	1.3	1.3
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	75	39	48	47	44
DOC	mg/L	-	13	13	14	15	16
Metals							
Aluminum	mg/L	0.1	n/a	n/a	<0.030	0.0050	0.0600
Antimony	mg/L	0.006	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.0021	0.0015	0.0013
Barium	mg/L	1	0.025	<0.10	<0.10	0.013	<0.10
Boron	mg/L	5	n/a	n/a	0.41	0.41	0.40
Cadmium	mg/L	0.005	0.000096	<0.000050	<0.00020	0.00003	<0.000020
Chromium	mg/L	0.05	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0030	<0.0030	<0.0030	0.0011	0.00095
Copper	mg/L	1	<0.0020	0.0031	<0.0020	0.00034	0.00039
Lead	mg/L	0.01	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.18	0.18	0.180
Mercury	mg/L	0.001	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0021	0.0023	<0.0020	0.0016	0.0013
Nickel	mg/L	-	0.0052	0.006	<0.0050	0.0035	0.0027
Selenium	mg/L	0.05	n/a	n/a	<0.0020	<0.00020	0.00025
Uranium	mg/L	0.02	n/a	n/a	0.0022	0.0024	0.0022
Zinc	mg/L	5	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E9: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 9													
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08
Field Measurements																	
Field pH	-	-	8.16	8.4	7.64	7.63	7.66	7.52	7.14	7.48	6.84	7.44	7.35	7.5	7.68	7.86	8.051
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7.77	15.74 (EF)	7.30	6.91	18	9.4	5.780
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.4	7.0	5.9	9.3	4.1	10.54	4.6
Routine Water																	
pH	-	6.5 - 8.5	7.85	8.5	8.24	7.76	7.77	7.8	8.2	8.1	8.0	8.2	8.0	8.4	8.1	8.0	8.3
Conductivity (EC)	µS/cm	-	5730	2580	5460	6680	6880	7250	7110	7010	6940	6370	7160	7220	8020	4620	5880
Calcium	mg/L	-	66.2	21.7	61.4	90.3	107	93.3	101	66.1	99.9	86.9	101	98.2	297	60.2	92.8
Magnesium	mg/L	-	41.6	9.95	33.8	51.5	62.8	53.6	59.5	55	57.4	58.6	57.9	58	175	38.8	58.7
Sodium	mg/L	200	1440	570	1390	1800	1690	1710	1780	1760	1770	1850	1740	1790	1730	1060	1400
Potassium	mg/L	-	13	8.3	14	17	13	16	13	16.4	14.6	17	15.3	16.3	8.7	10.2	10.5
Iron	mg/L	0.3	0.08	0.711	0.019	<0.05	<0.1	<0.1	<5	<0.005	0.007	<0.005	<0.005	<0.005	0.076	0.029	0.011
Sulphate	mg/L	500	2820	947	2600	3620	3600	3420	3370	3280	3030	3360	3330	3110	3940	1750	2460
Chloride	mg/L	250	<0.5	2.5	0.9	<0.5	<0.5	1.2	1	2	2	5	2	2	114	52	48
Bicarbonate	mg/L	-	1050	502	966	1090	1150	1150	1140	1160	1160	1240	1170	1070	746	762	966
Carbonate	mg/L	-	<6	29	<6	<6	<6	<6	<5	<5	<5	<5	<5	20	<5	<5	<5
Nitrate (N)	mg/L	10	<0.04	0.205	0.237	<0.04	<0.04	<0.04	0.5	0.3	0.2	<0.1	0.3	0.2	0.2	0.1	<0.1
TDS*	mg/L	500	4900	1840	4570	6110	6030	5860	5890	5750	5540	5950	5820	5620	6630	3350	4550
Water Nutrients		-															
Ammonia-N	mg/L		0.5	0.27	0.45	0.31	0.47	0.31	0.44	0.52	0.42	0.41	0.54	0.59	0.07	0.16	0.61
TKN	mg/L	-	1.33	1.18	2.03	1.28	1.36	1.04	0.9	0.6	0.8	1.2	1.3	0.9	6.1	1.7	2.1
Hydrocarbons		-															
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05
Organics		-															
COD	mg/L	-	24	45	112	22	13	17	20	< 10	14	29	14	11	287	63	77
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	28
Metals		-															
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	<0.05	<0.02	<0.02	<0.001	< 0.002	<0.002	0.01	0.001	0.0006	<0.0004	0.0006	0.0006	<0.0004	0.0009	n/a
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	0.028	0.055	0.063	0.042	0.021	0.026	0.016	0.015	0.014	0.108	0.011	0.011	0.069	0.019	0.03
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	<0.005	<0.003	<0.003	<0.00005	< 0.0001	0.00014	0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001
Chromium	mg/L	0.05	<0.008	<0.004	<0.004	0.0055	0.0061	0.0069	0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	-	0.014	0.0055	0.01	0.0014	< 0.001	0.0016	<0.002	< 0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002
Copper	mg/L	1	<0.01	<0.005	0.005	0.007	< 0.01	0.014	0.033	0.024	0.015	0.004	0.006	0.007	0.013	0.003	0.006
Lead	mg/L	0.01	<0.002	0.018	0.01	<0.0005	< 0.001	<0.001	0.0003	<0.005	0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.0001	<0.005
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	<0.001	<0.0001	<0.0001	<0.0001	< 0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	<0.01	0.019	<0.005	<0.005	< 0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.010	0.016	0.014
Nickel	mg/L	-	<0.01	0.008	0.01	< 0.003	<0.005	0.0066	0.003	<0.002	<0.002	0.004	<0.002	0.003	0.029	0.013	0.016
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	0.015	0.01	0.008	0.013	<0.01	0.022	0.031	0.025	0.023	0.004	0.011	<0.002	0.044	0.030	0.011

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E9: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements											
Field pH	-	-	8.100	n/a	7.53	7.37	6.17	7.7	7.9	7.59	7.7
Field EC	mS	-	3.192	n/a	7.53	7.775	8.86	8.1	8.26	8.32	6.59
Field Temperature	°C	-	9.1	n/a	19.8	11.6	7.2	5.3	5.5	8.0	6.5
Routine Water											
pH	-	6.5 - 8.5	8.26	8.16	7.99	7.76	8.21	8.27	7.81	7.96	7.88
Conductivity (EC)	µS/cm	-	6900	7290	7600	7500	7700	7800	7800	7800	6400
Calcium	mg/L	-	102	108	98	110	110	120	110	120	79
Magnesium	mg/L	-	61.2	64.3	51	60	59	66	56	66	46
Sodium	mg/L	200	1590	1700	1800	1900	1800	1800	1900	1900	1200
Potassium	mg/L	-	12.4	15	13	15	14	15	15	15	12
Iron	mg/L	0.3	<0.0050	0.02	1.2	0.79	0.33	<0.60	<0.060	<0.60	<0.060
Sulphate	mg/L	500	3050	3280	3500	3700	3900	4000	3800	4000	2800
Chloride	mg/L	250	17.7	<10 *	3	2.6	1.9	2.1	1.6	1.2	69
Bicarbonate	mg/L	-	1070	1120	1100	1100	1100	1100	1100	1100	920
Carbonate	mg/L	-	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.050	<1.0 *	0.09	<0.0030	0.11	0.079	0.17	0.081	1.8
TDS*	mg/L	500	5360	5720	6100	6300	6400	6600	6400	6500	4700
Water Nutrients		-									
Ammonia-N	mg/L		0.826	0.812	0.86	1.4	0.85	0.81	0.53	0.32	0.23
TKN	mg/L	-	2.87	2.13	3.1	1.6	1.4	1.6	1.3	0.77	2.4
Hydrocarbons		-									
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics		-									
COD	mg/L	-	55.7	39.8	26	460	46	42	62	21	110
DOC	mg/L	-	18.3	14.2	9.8	8.3	7.8	5.5	6.9	5.9	23
Metals		-									
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.011	0.0038
Antimony	mg/L	0.006	n/a	<0.00040	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00036	0.00093
Barium	mg/L	1	0.019	0.0172	0.015	0.016	0.014	<0.10	0.010	<0.10	0.046
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	0.29	0.31	0.28
Cadmium	mg/L	0.005	<0.0010	<0.000050	<0.000050	0.000061	0.000051	<0.000050	<0.00020	<0.000020	0.000053
Chromium	mg/L	0.05	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	0.003	<0.0030	0.00069	0.0016
Copper	mg/L	1	0.0052	0.0076	<0.002	0.0054	<0.0020	<0.0020	<0.0020	0.0013	0.0042
Lead	mg/L	0.01	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00027	0.0003
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	0.22	0.21	0.37
Mercury	mg/L	0.001	<0.00010	<0.00010	<0.000005	0.0000042	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0050	<0.0050	0.004	<0.0020	0.0023	0.0033	0.0022	0.0017	0.072
Nickel	mg/L	-	0.0075	0.0061	<0.005	0.007	<0.0050	0.0061	<0.0050	0.0020	0.013
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00023	0.0021
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	0.0037	0.004	0.0056
Zinc	mg/L	5	0.0086	0.0061	<0.03	<0.030	<0.030	<0.030	<0.030	0.0034	0.0094

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E10: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 10															
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09
Field Measurements																		
Field pH	-	-	n/a	8.27	n/a	8.39	8.42	8.11	7.54	7.63	7.54	7.68	7.52	7.93	7.99	8.03	7.86	7.870
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.23	9.72 (EF)	4.39	3.79	9.20	9.06	3.98	4.250
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5.7	4.9	4.6	10.2	3.5	11.55	8	4.3
Routine Water																		
pH	-	6.5 - 8.5	n/a	8.31	n/a	8.43	8.57	8.25	8.4	8.3	8.2	8.4	8.2	8.4	8.3	8.1	8.2	8.16
Conductivity (EC)	µS/cm	-	n/a	2570	n/a	2640	2700	3090	3450	3330	3710	3370	3980	3910	4320	4300	4210	4440
Calcium	mg/L	-	n/a	28.3	n/a	25.8	29.7	34.8	52.8	34.9	65.3	62.5	72.3	65.2	86	78.4	79.6	82.2
Magnesium	mg/L	-	n/a	14.9	n/a	15.1	16.6	16.1	21.7	20.5	25.2	26.7	27.0	29.4	35.9	31.6	31.4	28.2
Sodium	mg/L	200	n/a	593	n/a	687	659	678	798	732	836	887	906	888	1010	1000	969	971
Potassium	mg/L	-	n/a	3	n/a	2.7	3.3	2.7	1.4	2.4	4.5	4.2	4.5	4.9	5.3	4.9	2.9	5.23
Iron	mg/L	0.3	n/a	<0.02	n/a	<0.05	0.19	<0.05	0.329	0.006	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.033
Sulphate	mg/L	500	n/a	915	n/a	1080	1130	1160	1440	1250	1450	1560	1690	1560	1830	1850	1750	1950
Chloride	mg/L	250	n/a	3.2	n/a	1.4	2.1	4.8	8	8	13	12	14	12	15	16	19	19.4
Bicarbonate	mg/L	-	n/a	640	n/a	539	467	614	571	578	579	581	579	559	591	595	613	599
Carbonate	mg/L	-	n/a	< 6	n/a	26	46	< 6	7	< 5	<5	6	<5	12	<5	<5	<5	<5.0
Nitrate (N)	mg/L	10	n/a	1.04	n/a	0.771	0.436	< 0.04	0.2	0.4	0.1	0.2	0.2	0.2	0.2	0.3	0.1	<0.050
TDS*	mg/L	500	n/a	1870	n/a	2100	2120	2200	2610	2340	2680	2840	3000	2850	3270	3280	3150	3350
Water Nutrients		-																
Ammonia-N	mg/L		n/a	<0.05	n/a	<0.05	<0.05	<0.05	0.07	0.1	<0.05	0.16	0.17	0.10	<0.05	0.13	0.06	0.111
TKN	mg/L	-	n/a	0.32	n/a	0.41	0.06	0.42	0.7	0.4	0.9	0.7	1.1	0.7	0.6	0.5	1.2	0.96
Hydrocarbons		-																
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050
Organics																		
COD	mg/L	-	n/a	5	n/a	13	18	14	20	20	24	24	23	22	26	26	23	25.6
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	8.3
Metals																		
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	n/a	<0.02	n/a	<0.001	n/a	<0.001	0.0209	0.0011	0.0007	<0.0004	0.0004	0.0008	<0.0004	0.0009	n/a	n/a
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	n/a	0.022	n/a	0.017	n/a	0.026	0.026	0.024	0.025	0.024	0.018	0.020	0.023	0.017	0.018	0.0121
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	n/a	<0.003	n/a	<0.00005	n/a	<0.00005	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0010
Chromium	mg/L	0.05	n/a	0.0075	n/a	0.015	n/a	0.011	0.008	0.006	<0.005	<0.005	<0.0005	<0.0005	<0.005	<0.005	<0.005	<0.0050
Cobalt	mg/L	-	n/a	0.0035	n/a	<0.0005	n/a	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Copper	mg/L	1	n/a	0.068	n/a	<0.005	n/a	0.005	0.029	0.012	0.011	0.005	0.004	0.005	0.003	0.003	0.005	0.004
Lead	mg/L	0.01	n/a	<0.01	n/a	<0.0005	n/a	<0.0005	0.0002	<0.005	0.0003	<0.0001	0.003	0.0001	0.0001	0.0002	<0.005	<0.0050
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	n/a	<0.0001	n/a	<0.0001	n/a	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.00010
Molybdenum	mg/L	-	n/a	<0.005	n/a	<0.005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050
Nickel	mg/L	-	n/a	0.007	n/a	<0.003	n/a	0.0051	0.005	0.003	0.004	0.003	0.003	0.005	0.003	0.010	0.005	0.0082
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	n/a	0.184	n/a	0.007	n/a	0.006	0.018	0.018	0.015	0.006	0.009	0.003	0.011	0.018	0.01	0.0111

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit

Table E10: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements										
Field pH	-	-	8.26	7.92	7.69	7.77	8.3	8.3	8.06	8.0
Field EC	mS	-	5.7	4.52	2.03	4.52	4.92	4.98	4.42	4.26
Field Temperature	℃	-	16.4	17	8.6	11.5	4.2	7.5	9.8	10.3
Routine Water										
pH	-	6.5 - 8.5	8.32	8.18	8.1	8.33	8.12	7.79	8.26	8.11
Conductivity (EC)	µS/cm	-	4460	4600	4900	4600	4600	4700	4500	4100
Calcium	mg/L	-	78.4	72	91	83	68	140	60	71
Magnesium	mg/L	-	34.1	34	33	34	35	44	31	32
Sodium	mg/L	200	929	990	1200	1100	990	910	840	870
Potassium	mg/L	-	4.72	4.2	5	4.4	4	4.5	4.4	4.2
Iron	mg/L	0.3	0.012	<0.06	<0.060	<0.060	<0.060	8.3	<0.060	<0.060
Sulphate	mg/L	500	1870	1900	2200	2200	2100	1900	1700	1600
Chloride	mg/L	250	16 *	23	25	23	26	140	60	59
Bicarbonate	mg/L	-	579	590	600	580	600	590	620	630
Carbonate	mg/L	-	5.7	<0.5	<0.50	4.6	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<1.0 *	0.14	0.019	0.13	0.079	0.014	0.04	3.0
TDS*	mg/L	500	3220	3300	3900	3700	3500	3400	3000	3000
Water Nutrients		-								
Ammonia-N	mg/L		<0.050	0.07	0.31	0.094	0.17	0.23	0.16	0.052
TKN	mg/L	-	1.09	0.61	0.86	0.69	0.68	0.68	0.57	0.49
Hydrocarbons		-								
Benzene	mg/L	0.005	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics										
COD	mg/L	-	15.5	32	33	43	33	35	32	24
DOC	mg/L	-	9.2	11	10	11	9.6	11	9.7	8
Metals										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	<0.0030	0.0091	<0.0030
Antimony	mg/L	0.006	<0.00040	<0.0006	<0.0030	0.00073	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	0.00049	0.0006	0.00042
Barium	mg/L	1	0.0184	0.018	0.015	0.015	0.016	0.087	0.023	0.023
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	0.11	0.12	0.13
Cadmium	mg/L	0.005	<0.000050	<0.000025	0.000047	0.000045	<0.000025	0.000049	0.000023	0.000021
Chromium	mg/L	0.05	<0.0050	0.002	<0.0050	<0.0010	0.0014	<0.0010	0.0021	0.0018
Cobalt	mg/L	-	<0.0020	<0.0003	<0.0015	0.00059	0.00042	0.014	0.00057	0.00045
Copper	mg/L	1	0.0055	0.0014	0.0012	0.0025	0.17	0.0079	0.0035	0.0033
Lead	mg/L	0.01	<0.00010	<0.0002	<0.0010	<0.00020	0.009	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	1.8	0.094	0.076
Mercury	mg/L	0.001	<0.00010	<0.000005	0.0000056	<0.000010	<0.0000050	<0.0000050	0.0000034	<0.0000020
Molybdenum	mg/L	-	<0.0050	0.0019	0.0012	0.0015	0.0022	0.0017	0.0038	0.0022
Nickel	mg/L	-	0.0081	0.0059	0.0094	0.0088	0.0078	1.5	0.059	0.033
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	0.0003	0.00052	0.00053
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	0.0048	0.0093	0.0086
Zinc	mg/L	5	0.0031	0.009	0.018	0.0063	0.11	0.0038	0.0065	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Equipment Failure, parameter not reported (EF)
Detection limit adjusted (*)
Exceeds Regulatory Limit

Table E11: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 11													
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07
Field Measurements																
Field pH	-	-	7.73	7.64	7.62	7.69	8.02	7.72	7.47	7.01	6.83	7.33	7.29	7.62	7.55	6.98
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8.65	27.2 (EF)	9.4	7.7	21.50	19.16
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.0	5.0	4.4	9.6	4.8	11.25
Routine Water																
pH	-	6.5 - 8.5	7.83	7.75	7.79	7.78	8.09	7.95	8.2	8.1	8.0	8.2	8.0	8.2	8.2	7.9
Conductivity (EC)	µS/cm	-	5900	7930	6680	7360	6040	8570	7770	8020	7710	8430	8900	10700 (EF)	8790	9370
Calcium	mg/L	-	104	152	114	146	105	175	165	151	169	231	218	271	201	219
Magnesium	mg/L	-	56.1	93.7	60.4	79.3	56.9	101	92.5	92.6	94.5	150	120	184	124	132
Sodium	mg/L	200	1560	1990	1710	2110	1440	2000	1930	2020	1960	2540	2180	2820 (EF)	2210	2320
Potassium	mg/L	-	4.6	8.4	6	8.8	< 4	6.6	5.5	8.2	7.3	9	8.3	11.1	9.2	6.1
Iron	mg/L	0.3	0.093	<0.02	0.019	<0.1	<0.1	<0.1	0.022	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.019
Sulphate	mg/L	500	3140	4390	3660	4720	3280	4720	4280	4380	3950	5550	4750	5710	4450	5190
Chloride	mg/L	250	1.7	4.3	2.7	2.7	2.4	5.4	5	5	5	9	7	17	8	16
Bicarbonate	mg/L	-	735	851	747	793	769	864	747	756	751	936	808	1170	913	870
Carbonate	mg/L	-	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5
Nitrate (N)	mg/L	10	0.583	0.488	0.345	<0.04	<0.04	0.36	0.5	0.4	0.3	0.4	0.5	0.5	0.4	0.4
TDS*	mg/L	500	5230	7060	5920	7450	5270	7430	6850	7030	6560	8950	7680	9590	7450	8310
Water Nutrients																
Ammonia-N	mg/L		0.11	0.28	0.13	0.14	0.12	0.09	<0.05	0.12	<0.05	0.17	<0.05	0.07	<0.05	0.06
TKN	mg/L	-	1.77	2.95	2.63	2.28	1.6	2.12	1.6	1.4	1.7	2	1.7	2.4	1.7	1.8
Hydrocarbons																
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																
COD	mg/L	-	103	116	167	108	84	104	100	100	99	118	105	119	92	98
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	<0.05	<0.02	<0.02	<0.002	<0.002	< 0.002	0.0474	0.0011	0.0009	<0.0004	0.0008	0.0012	<0.0004	0.001
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	0.01	0.0315	0.012	0.017	0.01	0.014	0.019	0.011	0.012	0.014	0.010	0.009	0.009	0.010
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	<0.005	<0.003	<0.003	0.00013	< 0.0001	0.00015	0.0002	<0.001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.05	<0.008	<0.004	<0.004	<0.005	< 0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	-	0.014	0.015	0.014	0.0019	0.0011	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	1	<0.01	<0.005	<0.005	<0.01	< 0.01	0.012	0.068	0.033	0.025	0.014	0.010	0.014	0.008	0.007
Lead	mg/L	0.01	<0.02	< 0.01	<0.01	<0.001	<0.001	<0.001	0.0004	<0.005	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	<.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Molybdenum	mg/L	-	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	mg/L	-	<0.01	0.026	0.021	<0.005	<0.005	<0.005	0.012	0.006	0.005	0.004	0.004	0.012	<0.002	0.012
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	0.018	0.017	0.007	0.03	<0.01	0.017	0.042	0.037	0.025	0.017	0.019	<0.002	0.035	0.015

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E11: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements												
Field pH	-	-	7.656	7.477	7.55	7.73	7.41	7.31	7.5	7.8	7.61	7.7
Field EC	mS	-	8.550	9.380	38.0	9.6	4.31	9.67	10.02	10.14	9.90	9.71
Field Temperature	°C	-	7.1	7.0	24.1	9.9	8.8	10.5	6.2	6.4	8.6	7.4
Routine Water												
pH	-	6.5 - 8.5	8.2	8.01	7.98	8.04	7.98	8.06	8.19	7.79	8.03	7.88
Conductivity (EC)	µS/cm	-	8760	9420	8760	9800	9900	9300	9500	9500	9600	9100
Calcium	mg/L	-	195	220	175	190	240	220	240	210	230	200
Magnesium	mg/L	-	117	120	94.5	110	130	110	130	110	120	120
Sodium	mg/L	200	2130	2220	1920	2200	2600	2100	2300	2200	2100	2100
Potassium	mg/L	-	3	9.25	7.69	7.1	9.1	7.1	7.6	8.4	9.1	8
Iron	mg/L	0.3	<0.005	<0.05	<0.010	<0.06	<0.060	<0.060	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	500	4440	5020	4170	5300	5600	5400	5600	5100	4800	4500
Chloride	mg/L	250	10	9.17	<10 *	16	14	14	14	20	32	37
Bicarbonate	mg/L	-	882	839	813	920	880	890	840	900	930	1000
Carbonate	mg/L	-	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.4	0.282	<1.0 *	0.49	0.27	0.37	0.27	0.19	0.23	0.71
TDS*	mg/L	500	7330	8010	6770	8300	9000	8300	8800	8200	7800	7500
Water Nutrients												
Ammonia-N	mg/L		<0.05	0.088	<0.050	<0.05	0.14	0.081	0.14	0.17	0.15	0.086
TKN	mg/L	-	1.4	2.31	2.08	1.8	1.8	1.5	1.7	1.7	0.81	1.5
Hydrocarbons				2.31								
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics												
COD	mg/L	-	80	101	90.7	110	100	95	96	100	100	84
DOC	mg/L	-	34	36.4	34.7	36	36	33	29	34	36	31
Metals												
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0060	<0.0030
Antimony	mg/L	0.006	n/a	n/a	0.00061	<0.006	<0.0060	0.001	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.0011	0.0011
Barium	mg/L	1	0.008	0.0074	0.0084	<0.01	<0.010	<0.010	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.19	0.20	<0.20
Cadmium	mg/L	0.005	<0.001	<0.0010	<0.000050	<0.000050	0.000055	0.000084	<0.000050	<0.00020	0.000024	0.000029
Chromium	mg/L	0.05	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.0010	<0.010	<0.010	0.0011	<0.0010
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.00030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	1	0.012	0.0097	0.011	0.003	0.0032	0.0031	0.0024	<0.0020	0.0025	0.0025
Lead	mg/L	0.01	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.00020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.015	0.0081	<0.040
Mercury	mg/L	0.001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000038	<0.000010	<0.0000050	<0.0000050	0.0000022	<0.0000020
Molybdenum	mg/L	-	<0.005	<0.0050	<0.0050	<0.002	<0.0020	0.0017	<0.0020	<0.0020	0.0009	0.0011
Nickel	mg/L	-	0.009	0.0103	0.0109	0.008	0.0064	0.0062	0.006	0.0058	0.0060	0.0055
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.0011	0.00079
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.024	0.030	0.030
Zinc	mg/L	5	0.014	0.0147	0.0113	<0.03	<0.030	0.0098	<0.030	<0.030	0.0077	0.0044

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E12A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 12A																					
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																										
Field pH	-	-	7.3	7.02	7.3	7.71	7.78	7.85	7.13	7.61	6.97	7.57	7.67	7.5	7.45	7.52	7.490	7.380	7.79	7.66	7.33	6	7.8	7.6	6.15	7.5
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	11.8	26.8 (EF)	9.81	6.98	26.5	27.02	10.670	10.780	2.4	10.84	4.75	13.32	11.38	11.13	15.40	11.64
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.2	7.6	4.3	6.5	6.5	9.95	5.5	5.8	14.1	9.7	6.1	6.2	8.7	5.7	n/a	7.7
Routine Water																										
pH	-	6.5 - 8.5	7.49	7.68	7.67	7.75	7.99	7.87	8.1	8.00	8.00	8.20	8.00	8.30	8.20	7.90	8.1	8.03	8	7.98	8	8.15	8.25	7.75	8.00	8.02
Conductivity (EC)	µS/cm	-	9630	10600	10600	11500	10400	11600	10500	11300	11000	9570	10500	10900	11400	10900	10900	10700	11300	11000	11000	11000	11,000	11,000	11,000	11,000
Calcium	mg/L	-	129	129	137	160	153	154	143	131	158	153	140	143	157	136	150	135	143 *	140	140	130	150	120	150	160
Magnesium	mg/L	-	72.9	80.1	77	94.4	86.5	90.3	84.6	98.7	99.9	95.3	78.8	87	98.5	81.8	91.3	76.7	81.8 *	75	71	72	86	64	82	90
Sodium	mg/L	200	2660	3060	2910	3410	2650	2940	2810	3210	3120	3090	2690	2810	3110	2820	2830	2750	2810 *	2700	3000	2700	3000	2600	2600	2800
Potassium	mg/L	-	8.6	12	9.5	12	8.4	11	8.7	12.8	11.6	11.6	10.7	12.2	13	8.6	5.6	11.6	10.4 *	11	11	9.7	10	10	11	10
Iron	mg/L	0.3	0.14	<0.02	0.02	<0.1	<0.1	<0.1	0.141	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.021	<0.005	<0.050	<0.050 *	<0.06	<0.060	<0.060	<0.60	0.75	<0.060	<0.6
Sulphate	mg/L	500	6020	6250	6580	7840	6360	6630	5970	5970	6350	6240	5690	5570	6010	5760	5700	5680	5470 *	5800	5900	6100	6700	5600	6300	5600
Chloride	mg/L	250	<0.5	0.6	0.8	<0.5	0.8	1.1	1	1	1	2	1	1	3	3	3	1.14	<10 *	3	1.8	1.8	1.9	2.2	1.6	1.3
Bicarbonate	mg/L	-	948	990	938	1020	969	1020	934	1020	976	958	881	904	981	893	965	919	906	850	860	910	900	900	880	950
Carbonate	mg/L	-	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.04	<0.04	0.08	<0.04	<0.08	<0.08	0.2	0.1	<0.1	<0.1	0.1	<0.1	0.3	<0.1	0.3	0.06	<1.0 *	0.067	0.095	0.15	0.11	0.082	0.082	0.87
Nitrite (N)	mg/L	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.05	0.04	<0.16
Nitrate and Nitrate (N)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.13	0.12	0.2
TDS*	mg/L	500	9360	10000	10200	12000	9730	10300	9480	9930	10200	10100	9040	9070	9880	9250	9260	9110	8960	9200	9500	9600	10,000	8900	9600	9200
Water Nutrients																										
Ammonia-N	mg/L	-	0.31	0.11	0.41	0.18	0.35	0.41	0.11	0.12	0.09	0.19	0.27	0.15	<0.05	0.29	<0.05	0.308	<0.050	0.37	0.46	0.27	0.26	0.38	0.21	0.067
TKN	mg/L	-	1.02	0.8	2.31	2.08	2.88	4.22	0.9	0.4	0.8	0.9	1.0	0.8	0.9	0.9	1.6	1.54	1.29	1.2	1.2	0.87	0.89	1.3	0.45	0.7
Hydrocarbons																										
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																										
COD	mg/L	-	44	35	161	98	305	421	30	40	38	39	41	43	39	43	30	35.6	39.8	78	61	53	41	68	48	40
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	14	13.8	14.8	14	15	14	15	16	17	16
Metals																										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.19	0.0087	<0.0030
Antimony	mg/L	0.006	<0.05	<0.02	<0.02	<0.002	<0.002	<0.002	0.0389	0.0008	0.0007	<0.0004	0.0007	0.0006	<0.0004	0.0010	n/a	n/a	<0.0016 *	<0.01	<0.012	0.00074	<0.0060	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00097	0.00078
Barium	mg/L	1	0.007	0.0095	0.01	0.014	0.0100	0.0160	0.0130	0.0110	0.0110	0.011	0.013	0.010	0.014	0.009	0.009	0.007	0.0096 *	<0.01	<0.010	<0.010	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.44	0.42	0.46
Cadmium	mg/L	0.005	<0.005	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.0002	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001	<0.0010	<0.00020 *	0.0001	<0.10	<0.0001	<0.000050	<0.00040	0.000042	0.000022
Chromium	mg/L	0.05	<0.008	<0.004	<0.004	0.0051	<0.005	<0.005	0.0090	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.02	<0.020	<0.020	<0.010	<0.020	<0.0010	<0.0010
Cobalt	mg/L	-	0.02	0.012	0.017	0.0042	0.0044	0.0077	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020 *	<0.006	<0.0060	<0.0060	<0.0030	<0.0060	0.00048	0.00072
Copper	mg/L	1	<0.01	<0.005	<0.005	0.013	0.0120	0.0140	0.0720	0.0440	0.0300	0.016	0.010	0.011	0.009	0.007	0.014	0.0111	0.0162 *	<0.004	<0.0040	<0.0040	<0.0020	<0.0040	0.0028	0.00074
Lead	mg/L	0.01	<0.02	0.012	<0.01	<0.001	<0.001	<0.001	0.0004	<0.005	0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	<0.00040 *	<0.004	<0.0040	<0.0040	<0.0020	<0.0040	0.00022	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.087	0.055	<0.040
Mercury	mg/L	0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.00010	<0.00010	<0.000005	0.0000062	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.004	<0.0040	<0.0040	<0.0020	<0.0040	0.00071	0.00076
Nickel	mg/L	-	<0.01	0.017	0.025	0.0066	<0.005	0.015	0.007	<0.002	<0.002	<0.002	0.003	0.006	<0.002	0.008	0.007	0.0067	0.0090 *	<0.01	<0.010	<0.010	<0.0050	<0.010	0.0035	0.007
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00023	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.0021	0.0023
Zinc	mg/L	5	0.034	0.024	<0.003	0.027	<0.01	0.023	0.059	0.051	0.039	0.034	0.020	0.016	0.042	0.031	0.033	0.0153	0.0176 *	<0.06	<0.060	<0.060	<0.030	<0.060	0.010	0.0042
Polycyclic Aromatic Hydrocarbons (PAHs)																										
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	n/a	n/a
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	n/a	n/a
Acenaphthene	mg/L						n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a											
Acenaphthylene	mg/L						n/a						n/a	n/a	n/a											
Acridine	mg/L						n/a						n/a	n/a	n/a											
Anthracene	mg/L						n/a						n/a	n/a	n/a											
Benz(a)anthracene	mg/L						n/a						n/a	n/a	n/a											
Benzo(a) pyrene	mg/L						n/a						n/a	n/a	n/a											
Benzo(b+j)fluoranthene	mg/L							n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	n/a	n/a
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	n/a	n/a
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	n/a	n/a
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	n/a	n/a
Perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	n/a	n/a
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000020	n/a	n/a
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	n/a	n/a

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E12B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 12B																		
			Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun -10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																						
Field pH	-	-	7.63	7.5	7.48	7.64	6.87	7.51	7.51	7.79	7.45	7.69	7.520	7.606	7.76	7.62	7.52	6.17	7.3	7.7	6.28	7.4
Field EC	mS	-	n/a	n/a	n/a	n/a	8.83	18.42 (EF)	7.64	7.78	17.93	18.76	7.600	7.830	3	10.85	4.29	11.9	11.87	11.50	13.83	11.5
Field Temperature	°C	-	n/a	n/a	n/a	n/a	9.4	3.0	8.1	6.7	5.7	10.94	6.4	9.6	8.9	10.2	7.5	7.1	6.9	7.5	n/a	6.3
Routine Water																						
pH	-	6.5 - 8.5	7.82	7.88	8.2	8.2	8.1	8.1	8.2	8.4	8.3	8.0	8.1	8.16	7.95	7.96	7.97	8.14	8.17	7.71	8.00	7.87
Conductivity (EC)	µS/cm	-	7820	8280	8090	7800	7650	7860	7760	7760	7850	7920	7720	7740	11200	11000	9700	10000	11,000	11,000	11,000	11000
Calcium	mg/L	-	138	139	142	99.4	129	118	113	114	123	120	123	103	248 *	250	160	210	380	260	270	280
Magnesium	mg/L	-	25.3	28	29.2	23.3	23.9	21.8	14.8	20.6	22	21.6	22.1	14.5	38.9 *	40	29	37	78	60	54	63
Sodium	mg/L	200	1920	1990	2040	2040	2010	2020	1970	1990	2030	2080	1980	1850	2970 *	2600	2500	2400	3400	2800	2500	2600
Potassium	mg/L	-	4.2	6.6	5.9	7.6	7.2	7.7	7.0	7.8	8.6	5.0	4.2	7.43	10.2 *	10	8	8.2	11	10	11	9.3
Iron	mg/L	0.3	<0.1	<0.1	0.008	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.050	<0.050 *	<0.06	<0.060	<0.060	<0.60	<0.60	0.13	<0.6
Sulphate	mg/L	500	4410	4390	4290	4030	3650	4020	3920	3720	3760	3850	3760	3730	5710 *	6100	5300	5600	6800	6100	5600	5300
Chloride	mg/L	250	1.1	1.6	2	2	2	3	3	3	2	3	3	1.93	<10 *	6	4	3.7	6.2	5.6	6.0	4.6
Bicarbonate	mg/L	-	755	756	739	750	740	741	739	696	748	786	762	738	808	770	760	790	870	850	820	860
Carbonate	mg/L	-	<6	<6	<5	<5	<6	<5	<5	9	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	1	< 0.04	1.3	0.3	0.8	3.4	2.5	1.8	1.8	0.8	2	2.53	1.3 *	1.4	1.8	0.58	0.2	0.12	0.19	<0.22
TDS*	mg/L	500	6880	6930	6880	6570	6190	6570	6400	6210	6320	6470	6280	6080	9380	9400	8400	8700	11,000	9700	8900	8600
Water Nutrients																						
Ammonia-N	mg/L	-	1.16	1.3	1.05	1.4	1.24	0.48	1.56	1.36	0.90	1.46	0.82	0.833	2.23	2.1	1.6	1.7	2.1	2.2	2.1	1.7
TKN	mg/L	-	1.77	2.12	1.4	1.7	1.7	1	2.2	1.5	1.3	1.6	2.1	1.66	3.9	3.5	2.2	2.7	3.3	3.4	2.8	2.8
Hydrocarbons																						
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																						
COD	mg/L	-	22	25	20	20	18	17	19	30	19	21	21	14.9	79.2	98	37	56	71	61	71	52
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7	6.5	25.4	26	14	20	21	22	24	21
Metals																						
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.060	<0.0030	0.0037
Antimony	mg/L	0.006	<0.002	<0.002	0.0094	0.0009	0.0007	<0.0004	0.0006	0.0007	n/a	0.0007	n/a	n/a	<0.0016 *	<0.01	<0.0060	0.00084	<0.0060	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00088	0.00067
Barium	mg/L	1	0.015	<0.01	0.011	0.012	0.009	0.013	0.018	0.011	0.015	0.011	0.015	0.0137	0.0199 *	0.01	<0.010	<0.010	<0.10	<0.10	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.56	0.57	0.55
Cadmium	mg/L	0.005	<0.0001	<0.0001	0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001	<0.0010	<0.00020 *	0.0001	<0.050	<0.00010	<0.000050	<0.00040	0.000027	<0.000020
Chromium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.02	<0.010	<0.020	<0.010	<0.020	<0.0010	<0.0010
Cobalt	mg/L	-	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020 *	<0.006	<0.0030	<0.0060	<0.0030	<0.0060	0.00050	0.00034
Copper	mg/L	1	<0.01	<0.01	0.038	0.033	0.024	0.013	0.009	0.007	0.006	0.005	0.009	0.0099	0.0210 *	<0.004	0.0028	<0.0040	<0.0020	<0.0040	0.0023	0.0015
Lead	mg/L	0.01	<0.001	<0.001	0.0025	<0.005	0.0002	0.0001	0.0004	0.0001	<0.0001	0.0004	<0.005	<0.0050	<0.00040 *	<0.004	<0.0020	<0.0040	<0.0020	<0.0040	0.00021	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.43	0.36	0.42
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0000021	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050 *	<0.004	<0.0020	<0.0040	<0.0020	<0.0040	0.00077	0.00052
Nickel	mg/L	-	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.004	0.004	0.0039	0.0089 *	<0.01	<0.0050	<0.010	<0.0050	<0.010	0.0030	0.0012
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00029	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.019	0.021	0.025
Zinc	mg/L	5	<0.01	0.017	0.029	0.025	0.025	0.018	0.017	0.003	0.032	0.049	0.008	0.014	0.0464 *	<0.06	0.037	<0.060	<0.030	<0.060	0.0061	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E14: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 14																					
			Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																										
Field pH	-	-	7.7	7.23	7.55	7.46	7.55	7.4	7.45	7.39	6.91	7.29	7.14	7.34	7.21	7.12	7.819	7.454	9.37	7.46	7.4	6	7.5	7.8	7.61	7.6
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.9	6.91 (EF)	2.68	2.79	1.25	6.03	2.650	2.770	5.1	3.08	1.47	4.05	3.81	4.30	4.73	4.8
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	6.2	7.3	4.5	6.1	4.6	10.88	6.5	5.6	13.5	12.3	7.5	9.4	5.6	7.0	8.5	7.4
Routine Water																										
pH	-	6.5 - 8.5	7.54	7.71	7.84	7.7	7.9	7.79	8.1	8.1	7.9	8.1	8.0	8.1	8.0	7.9	8.1	8.09	8.02	8.05	8.04	8.13	8.14	7.78	8.05	7.9
Conductivity (EC)	µS/cm	-	2610	2670	2820	2790	2640	2590	2630	2750	2460	2220	2560	2580	2720	2770	2670	2760	2710	3000	3300	3400	3500	4000	4600	4700
Calcium	mg/L	-	140	147	99.7	144	129	132	151	106	152	124	144	141	158	145	132	114	116	120	160	150	160	190	230	230
Magnesium	mg/L	-	104	110	81.6	105	86.6	92.2	106	97.6	85.5	101	103	109	120	115	107	86.7	92.4	86	130	130	130	140	190	200
Sodium	mg/L	200	414	408	555	479	470	428	426	419	383	403	390	404	422	435	436	454	413	400	580	490	550	630	690	730
Potassium	mg/L	-	18	24.6	18	23	17	20	17	22	14.6	19.8	19.4	21.7	20.7	21.2	16.3	16.8	18.9	17	22	22	21	22	25	25
Iron	mg/L	0.3	0.16	<0.02	0.04	<0.05	<0.05	<0.05	0.017	0.346	0.009	<0.005	<0.005	<0.0058	0.008	0.012	0.008	<0.0050	<0.010	0.11	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060
Sulphate	mg/L	500	622	674	626	771	755	730	698	661	553	578	546	566	607	664	635	612	601	790	1000	1100	1300	1500	1900	1900
Chloride	mg/L	250	8.4	7.2	7.2	8	10.4	8.1	8	8	9	5	5	4	4	3	4	2.74	2.64	5	2.5	2.1	2.7	1.7	1.6	1.5
Bicarbonate	mg/L	-	1320	1310	1340	1300	1090	1170	1220	1220	1180	1240	1270	1160	1290	1280	1310	1310	1240	1200	1200	1200	1200	1200	1100	1200
Carbonate	mg/L	-	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	<0.04	<0.02	0.052	<0.04	<0.02	<0.02	<0.1	<0.1	<0.5	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.050	0.072	0.024	0.082	0.09	0.091	0.19	7.8
TDS*	mg/L	500	1960	2020	2050	2170	2000	1990	2010	1910	1780	1840	1830	1820	1970	2010	1970	1930	1850	2000	2500	2500	2700	3100	3600	3700
Water Nutrients																										
Ammonia-N	mg/L	-	0.42	0.32	0.65	0.35	0.56	0.45	0.39	0.42	0.26	0.41	0.31	0.40	0.29	0.41	0.3	0.42	0.454	0.29	0.4	0.37	0.37	0.53	0.35	0.2
TKN	mg/L	-	1.3	1.13	1.88	1.14	2.93	2.34	1.2	0.8	1.1	1.2	1.1	1	0.9	1	1	1.39	1.58	1.7	1.1	1	1.1	1.1	0.91	0.8
Hydrocarbons																										
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																										
COD	mg/L	-	35	25	36	30	146	50	30	20	30	29	31	28	27	29	25	24.3	27.8	54	37	52	37	34	34	25
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10	9.2	10.5	11	9.8	9.7	8.6	9.6	11	8.2
Metals																										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.05	<0.02	<0.02	<0.001	0.0014	<0.001	0.0015	0.0014	0.0007	<0.0004	0.0010	0.0011	<0.0004	0.0008	n/a	n/a	<0.00040	<0.0006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00077	0.00069	0.00054
Barium	mg/L	1	0.064	0.0645	0.085	0.064	0.1	0.066	0.055	0.058	0.19	0.108	0.109	0.062	0.094	0.078	0.105	0.0664	0.0829	0.084	0.1	0.087	0.066	0.052	0.042	0.040
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.12	0.13	0.14
Cadmium	mg/L	0.005	<0.005	<0.003	<0.003	<0.00005	<0.00005	< 0.00005	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000025	<0.	0.000068	0.00003	<0.000020	0.000025	0.000029
Chromium	mg/L	0.05	<0.008	<0.004	<0.004	0.0049	0.006	< 0.002	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.025	<0.0010	<0.001	<0.0010	<0.0010	<0.001
Cobalt	mg/L	-	0.007	0.0045	0.006	0.0006	<0.0005	< 0.0005	<0.002	<0.002	0.003	<0.002	0.002	0.002	<0.002	<0.002	0.002	<0.0020	0.0032	0.003	0.0021	0.002	0.0018	0.0017	0.0019	0.0018
Copper	mg/L	1	<0.01	<0.005	0.008	<0.005	<0.005	< 0.005	0.004	0.013	0.005	0.004	0.003	0.003	0.001	0.002	0.002	0.0024	0.002	0.0003	<0.0010	0.0014	0.00087	<0.00020	0.00045	0.00084
Lead	mg/L	0.01	<0.02	<0.01	< 0.01	<0.0005	<0.0005	< 0.0005	<0.0001	<0.005	<0.0001	<0.0001	0.0005	<0.0001	<0.0001	0.0001	<0.005	<0.0050	<0.00010	<0.0002	<0.0010	0.0005	<0.0002	<0.00020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.62	0.63	0.57
Mercury	mg/L	0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000049	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.01	<0.005	0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.0050	<0.0050	0.0006	<0.0010	0.0008	0.0016	0.00068	0.00074	0.00059
Nickel	mg/L	-	<0.01	0.014	0.015	<0.003	<0.0025	< 0.0025	<0.002	0.002	0.005	0.004	0.005	0.006	0.005	0.007	0.007	0.0061	0.0084	0.0062	0.0042	0.0047	0.0044	0.0033	0.0031	0.0031
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0008	0.0011	0.00075
Zinc	mg/L	5	0.024	0.0315	<0.003	0.007	<0.005	< 0.005	0.006	0.012	0.011	0.004	0.009	<0.002	0.008	0.009	0.009	0.013	0.0048	0.005	<0.015	0.01	0.0059	<0.0030	<0.0030	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E18A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 18A									
			May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements												
Field pH	-	-	8.5	8.377	8.21	8.34	8.31	6.09	8.4	8.8	6.75	8.5
Field EC	mS	-	1.386	1.500	13.4	1.56	1.614	1.80	15.82	1.64	1.916	1517
Field Temperature	°C	-	6.6	8.0	14.1	10.9	7.6	6.79	6.4	6.6	8.3	8.7
Routine Water												
pH	-	6.5 - 8.5	8.5	8.51	8.39	8.45	8.52	8.58	8.61	8.39	8.44	8.5
Conductivity (EC)	µS/cm	-	1470	1500	1490	1500	1500	1,500	1500	1500	1500	1500
Calcium	mg/L	-	4.1	4	4.43	3.8	3.8	3.1	3	2.7	3.0	2.9
Magnesium	mg/L	-	0.9	0.52	0.58	0.4	0.39	0.36	<2.0	0.30	0.34	0.31
Sodium	mg/L	200	375	380	389	400	380	360	390	360	380	380
Potassium	mg/L	-	1.2	1.45	1.46	1.5	1.4	1.3	<3.0	1.3	1.5	1.4
Iron	mg/L	0.3	0.108	0.0364	0.045	<0.06	<0.060	<0.060	<0.60	<0.060	0.11	<0.060
Sulphate	mg/L	500	5.7	1.42	<0.50	2	<1.0	2.0	2.4	1.4	6.9	2.1
Chloride	mg/L	250	8	6.18	5.75	7	6.7	6.2	7.3	7.2	7.4	7.3
Bicarbonate	mg/L	-	1010	1000	991	960	960	980	970	1000	950	1000
Carbonate	mg/L	-	29	28.1	18.9	17	26	30	38	8.9	9.5	17
Nitrate (N)	mg/L	10	<0.1	<0.050	<0.050	0.12	<0.0030	<0.003	<0.010	<0.010	0.011	<0.044
TDS*	mg/L	500	922	914	908	910	900	890	920	880	870	910
Water Nutrients												
Ammonia-N	mg/L	-	0.54	0.598	0.231	0.64	0.64	0.62	0.62	0.64	0.66	0.72
TKN	mg/L	-	0.9	1.13	1.28	1.1	1	1.1	1.1	0.98	0.90	0.94
Hydrocarbons												
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics												
COD	mg/L	-	6	18.4	22.4	34	24	34	29	28	27	26
DOC	mg/L	-	8	6.7	8.5	7.9	7.2	6.5	5.2	6.9	6.9	7.2
Metals												
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0046	0.029	0.0045
Antimony	mg/L	0.006	n/a	n/a	0.0004	<0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0010	0.00092	0.001
Barium	mg/L	1	0.124	0.0834	0.117	0.1	0.095	0.098	<0.10	0.089	0.091	0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.78	0.81	0.83
Cadmium	mg/L	0.005	<0.001	<0.0010	0.00007	<0.00005	0.000024	<0.000025	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.0050	<0.0050	<0.01	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	0.00056	0.00045	0.00067	0.00031	0.00031	<0.00030
Copper	mg/L	1	<0.001	0.0015	0.0032	<0.002	0.00059	0.00039	0.00057	0.00025	0.00023	0.00038
Lead	mg/L	0.01	<0.005	<0.0050	0.00013	<0.002	<0.00020	<0.00020	0.00033	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.045	0.059	0.04
Mercury	mg/L	0.001	n/a	<0.00010	<0.00010	<0.000005	<0.002	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.026	0.0058	0.0088	0.004	0.0046	0.0047	0.0048	0.0043	0.0043	0.0043
Nickel	mg/L	-	0.003	0.01	0.0121	0.006	0.0043	0.0036	0.0044	0.0039	0.0035	0.0024
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00026	0.00013	0.00026
Zinc	mg/L	5	0.003	0.0111	0.0079	<0.03	0.0038	<0.0030	0.0033	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E18B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 18B									
			May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements												
Field pH	-	-	7.302	7.263	7.21	7.34	7.06	6.04	7.6	8.0	6.00	7.4
Field EC	mS	-	6.08	6.04	1.05	6.33	3.10	4.92	2.92	3.80	4.24	3160
Field Temperature	°C	-	5.7	6.9	7	7	7.2	11.6	8.9	5.9	8.3	8
Routine Water												
pH	-	6.5 - 8.5	8	7.9	7.93	7.8	7.92	8.11	8.27	7.79	7.96	8.05
Conductivity (EC)	µS/cm	-	6020	6270	6460	6200	6900	4200	2900	3600	3400	3000
Calcium	mg/L	-	511	524	519	450	540	230	120	190	180	180
Magnesium	mg/L	-	134	116	135	120	150	57	33	47	45	48
Sodium	mg/L	200	1110	1250	1020	1100	1300	690	510	670	570	530
Potassium	mg/L	-	3.6	8.42	7.08	7.4	8.4	4.9	3.7	4.6	4.5	4.4
Iron	mg/L	0.3	0.007	0.0177	0.021	<0.06	<0.060	<0.060	<0.060	<0.060	0.25	<0.060
Sulphate	mg/L	500	3230	3380	3420 *	3300	3700	2200	1400	1700	1500	1100
Chloride	mg/L	250	22	19.5	<10 *	48	3.5	17	14	17	22	29
Bicarbonate	mg/L	-	846	838	880	780	980	400	350	410	390	760
Carbonate	mg/L	-	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.1	<0.050	<1.0 *	0.23	0.016	0.2	0.2	0.13	0.089	0.36
TDS*	mg/L	500	5430	5710	5530	5400	6200	3400	2300	2800	2600	2200
Water Nutrients												
Ammonia-N	mg/L	-	0.16	0.507	0.052	0.63	0.48	0.23	0.09	0.14	0.10	0.17
TKN	mg/L	-	1.2	1.38	1.96	1.3	1.2	1.1	0.68	1.5	0.32	0.87
Hydrocarbons												
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics												
COD	mg/L	-	28	27.6	21.4	60	53	34	27	64	30	24
DOC	mg/L	-	11	11.3	9.3	11	8.9	9.3	7.3	9.2	8.2	11
Metals												
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0034	0.11	0.0062
Antimony	mg/L	0.006	n/a	n/a	<0.00040	<0.006	<0.0060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0004	0.00041	0.00037
Barium	mg/L	1	0.016	0.0117	0.0173	0.01	0.012	0.011	0.017	0.012	0.014	0.016
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.071	0.075	0.062
Cadmium	mg/L	0.005	<0.001	<0.0010	<0.000050	<0.000050	0.000053	0.00004	<0.000025	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	<0.0030	0.0005	0.00039	0.00041	0.00031	0.00039
Copper	mg/L	1	0.009	0.0072	0.009	0.003	<0.0020	0.0014	0.0012	0.0007	0.0013	0.00064
Lead	mg/L	0.01	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.00020	<0.0002	<0.00020	0.00037	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.15	0.046	0.15
Mercury	mg/L	0.001	n/a	<0.00010	<0.00010	<0.000005	0.0000033	<0.0000050	<0.0000050	<0.0000050	0.0000068	<0.0000020
Molybdenum	mg/L	-	<0.005	<0.0050	<0.0050	<0.002	<0.0020	0.0009	0.0011	0.00074	0.00072	0.00066
Nickel	mg/L	-	0.015	0.0136	0.0123	0.005	0.0053	0.0039	0.0035	0.0039	0.0044	0.004
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0011	0.00091	0.0044
Zinc	mg/L	5	0.011	0.0102	0.0041	<0.03	<0.030	0.005	<0.0030	<0.0030	0.0047	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E19A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 19A																						
			Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08
Field Measurements																									
Field pH	-	-	8.6	8.8	n/a	8.1	7.11	7.95	7.25	7.96	n/a	n/a	8	n/a	8.14	8.14	8.18	7.57	7.94	7.18	7.29	7.13	7.83	7.61	7.88	7.633
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5.83	13.76 (EF)	5.33	5.1	16.05	15.29	7.140
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.9	2.9	9.2	6.3	6.3	9.46	6.1
Routine Water																										
pH	-	6.5 - 8.5	8.46	8.42	8.42	8.44	8.13	7.99	8.51	8.65	n/a	n/a	8.12	n/a	8.13	8.19	8.17	8.3	8.3	8.2	8.2	8.2	8.5	8.4	8.1	8.2
Conductivity (EC)	µS/cm	-	4310	3060	2570	3120	5310	4470	4690	3320	n/a	n/a	4370	n/a	4700	3570	4880	5940	5640	5730	6080	5700	6240	7070	7250	7270
Calcium	mg/L	-	33.2	10.9	21	19	36.7	26.7	36.9	16.1	n/a	n/a	25.6	n/a	28	15	36.3	47.5	18.7	49.8	35.9	49.6	52.0	68.1	69.8	78.4
Magnesium	mg/L	-	17.5	1.5	19.8	12.4	12.5	6.4	19.2	8.27	n/a	n/a	4.31	n/a	4.2	2.4	5.6	16.9	7.4	13.2	10.5	8.2	17.9	27.2	30.0	32.8
Sodium	mg/L	200	1080	729	785	776	1470	1360	1390	839	n/a	n/a	1090	n/a	1200	1050	1320	1590	1440	1490	1500	1470	1530	1800	1830	1860
Potassium	mg/L	-	13.6	4.68	22.5	9.12	6.92	5.22	10.3	5.7	n/a	n/a	4.3	n/a	4	2.9	5.2	4.3	5.2	5.7	6.2	6.1	7.1	8.7	7.2	5.2
Iron	mg/L	0.3	37.3	0.26	20.5	66.9	1.76	0.166	n/a	n/a	n/a	n/a	0.057	n/a	<0.05	0.07	<0.1	0.105	<0.005	0.011	0.006	0.018	0.025	0.006	0.011	<0.005
Sulphate	mg/L	500	1660	867	655	633	2200	1750	1880	728	n/a	n/a	1480	n/a	1720	1060	1870	2470	2240	2170	2480	2340	2410	2930	3230	3150
Chloride	mg/L	250	11.8	10.9	9.9	36.5	1.8	10.8	5.4	7.8	n/a	n/a	4.7	n/a	3.4	5.5	4.1	6	6	7	8	7	8	7	9	9
Bicarbonate	mg/L	-	749	887	1150	1230	1250	1200	1100	1080	n/a	n/a	1250	n/a	1190	1300	1200	1160	1170	1170	1150	1190	1100	1160	1170	1210
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	57	79	n/a	n/a	<6	n/a	<6	<6	<6	<5	<5	<5	<5	<5	31	21	<5	<5
Nitrate (N)	mg/L	10	n/a	n/a	n/a	n/a	1.55	1.26	1.02	9.04	n/a	n/a	3.01	n/a	1.43	4.93	2.36	1.2	0.2	0.4	5.1	<0.1	0.2	0.6	0.9	0.9
TDS*	mg/L	500	3210	2070	2100	2140	4340	3740	3940	2220	n/a	n/a	3230	n/a	3540	2770	3840	4710	4290	4310	4630	4470	4600	5440	5760	5740
Water Nutrients																										
Ammonia-N	mg/L	-	1.62	1.58	0.23	0.78	0.88	1.1	1.39	0.71	n/a	n/a	0.32	n/a	0.8	0.22	0.18	0.57	0.88	0.86	0.43	1.25	1.11	0.78	0.69	0.46
TKN	mg/L	-	25.8	9.91	5.66	2.72	1.28	2.21	1.97	2.16	n/a	n/a	1.11	n/a	2.12	2.52	1.05	0.8	1.3	1.4	2.1	1.4	1.7	1.1	1.3	1.1
Hydrocarbons																										
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05
Organics																										
COD	mg/L	-	3580	1660	526	402	71	180	131	114	n/a	n/a	22	n/a	171	227	146	20	10	25	18	18	20	20	16	14
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7
Metals																										
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	<0.005	n/a	n/a	n/a	<0.005	<0.005	n/a	n/a	n/a	n/a	<0.02	n/a	0.001	0.0012	0.0012	0.001	0.0018	0.001	0.0008	0.0008	0.0007	0.0006	0.0012	n/a
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	0.0625	n/a	n/a	n/a	0.0858	0.0377	n/a	n/a	n/a	n/a	0.0225	n/a	0.023	0.019	0.021	0.031	0.029	0.026	0.026	0.027	0.021	0.037	0.023	0.035
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	<0.0005	n/a	n/a	n/a	<0.0005	<0.005	n/a	n/a	n/a	n/a	<0.003	n/a	<0.00005	<0.00005	0.0000	<0.001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.001
Chromium	mg/L	0.05	0.0024	n/a	n/a	n/a	0.0033	<0.0008	n/a	n/a	n/a	n/a	<0.004	n/a	0.0043	0.0065	0.0018	<0.005	<0.005	<0.005	0.007	<0.0005	<0.0005	<0.005	<0.005	<0.005
Cobalt	mg/L	-	0.0012	n/a	n/a	n/a	0.003	0.0059	n/a	n/a	n/a	n/a	0.0085	n/a	0.0009	<0.0005	0.0012	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002
Copper	mg/L	1	<0.001	n/a	n/a	n/a	0.002	0.001	n/a	n/a	n/a	n/a	<0.005	n/a	0.005	< 0.005	0.005	0.014	0.017	0.015	0.011	0.006	0.007	0.006	0.006	0.006
Lead	mg/L	0.01	<0.002	n/a	n/a	n/a	<0.002	<0.002	n/a	n/a	n/a	n/a	<0.01	n/a	<0.0005	<0.0005	0.0003	<0.005	<0.005	0.0002	<0.0001	<0.0001	0.0003	0.0001	<0.0001	<0.005
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	n/a	n/a	<0.0001	<0.0001	<0.0001	n/a	n/a	n/a	n/a	n/a	<0.0001	n/a	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	0.0016	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	0.082	n/a	n/a	n/a	0.005	0.005	n/a	n/a	n/a	n/a	0.005	n/a	0.007	0.009	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.021
Nickel	mg/L	-	0.008	n/a	n/a	n/a	0.004	0.002	n/a	n/a	n/a	n/a	0.008	n/a	0.0039	<0.0025	0.0072	<0.002	0.003	0.003	0.007	0.003	0.005	0.008	0.008	0.009
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	0.0013	n/a	n/a	n/a	0.0039	0.0021	n/a	n/a	n/a	n/a	0.022	n/a	0.008	0.007	0.009	0.02	0.018	0.019	0.012	0.019	0.023	0.014	0.019	0.006

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E19A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements											
Field pH	-	-	7.622	7.68	7.8	7.47	5.23	8.2	7.7	7.97	7.6
Field EC	mS	-	7.360	1.444	8.19	3.67	7.94	6.35	7.87	8.51	6000
Field Temperature	℃	-	8.1	9.8	9.3	7.5	8.2	8.7	6.3	n/a	7.7
Routine Water											
pH	-	6.5 - 8.5	8.18	8.26	8.07	8.11	8.45	8.09	7.99	8.25	8.31
Conductivity (EC)	µS/cm	-	7200	7750	8100	8300	6200	7900	7500	6900	6900
Calcium	mg/L	-	67.1	83.4	78	85	32	90	62	55	57
Magnesium	mg/L	-	34.2	25.4	44	46	20	42	37	32	32
Sodium	mg/L	200	1740	1810	2000	2300	1500	2200	1900	1500	1700
Potassium	mg/L	-	8.6	7.54	11	11	7.7	8.9	9.4	8.9	8.6
Iron	mg/L	0.3	<0.050	<0.030 *	<0.06	<0.060	0.13	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	500	3180	3360	3900	3900	2600	3700	3400	3000	2800
Chloride	mg/L	250	8.32	<10 *	11	10	3.1	8.8	8.9	6.7	7.4
Bicarbonate	mg/L	-	1190	1160	1100	1200	1100	1200	1200	1100	1200
Carbonate	mg/L	-	<5.0	<5.0	<0.5	<0.50	25	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.050	<1.0 *	0.15	0.2	0.02	0.15	0.023	<0.050	0.16
TDS*	mg/L	500	5620	5620	6600	6900	4700	6700	6000	5200	5200
Water Nutrients											
Ammonia-N	mg/L	-	0.736	0.982	0.66	0.69	0.82	0.98	0.43	0.49	0.76
TKN	mg/L	-	1.31	1.93	1.1	1.2	1	1.4	0.80	0.96	1.1
Hydrocarbons											
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics											
COD	mg/L	-	13.7	20	25	28	22	20	25	19	27
DOC	mg/L	-	6.8	7.7	8.1	7.3	6.8	6	7.5	7.1	7.1
Metals											
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0072	<0.0030
Antimony	mg/L	0.006	n/a	0.00068	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00065	0.00054
Barium	mg/L	1	0.0155	0.0387	0.02	0.013	0.028	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	0.40	0.41	0.43
Cadmium	mg/L	0.005	<0.0010	0.000115	0.00008	0.000092	<0.000050	0.000055	<0.00020	0.000039	<0.000020
Chromium	mg/L	0.05	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0020	0.0026	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00042	0.00043
Copper	mg/L	1	0.0056	0.0087	<0.002	0.0043	<0.0020	<0.0020	<0.0020	0.0014	0.00041
Lead	mg/L	0.01	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	0.39	0.36	0.4
Mercury	mg/L	0.001	<0.00010	<0.00010	<0.000005	<0.0020	0.0000082	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0050	<0.0050	<0.002	<0.0020	0.0037	0.0022	<0.0020	0.0016	0.0016
Nickel	mg/L	-	0.005	0.0111	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0028	0.0017
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	0.005	0.006	0.006
Zinc	mg/L	5	0.0078	0.017	<0.03	<0.030	<0.030	<0.030	<0.030	0.0082	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E19B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW19B									
			May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements												
Field pH	-	-	7.453	7.514	bent	7.65	7.75	5.32	7.5	8.4	8.09	8.2
Field EC	mS	-	6.390	6.480	bent	6.24	2.81	7.51	8.08	6.26	7.17	6430
Field Temperature	°C	-	6.2	7.9	bent	10.7	7.9	8	8.3	6.5	n/a	7
Routine Water												
pH	-	6.5 - 8.5	8.2	8.13	8.08	8.1	8.4	8.27	8.33	8.26	8.43	8.5
Conductivity (EC)	µS/cm	-	6290	6430	6370	6200	6500	8200	6000	5900	5700	5800
Calcium	mg/L	-	68.6	62.6	63.2	62	61	77	29	32	31	29
Magnesium	mg/L	-	27.7	25.1	23.3	23	25	35	20	17	17	18
Sodium	mg/L	200	1580	1470	1440	1500	1800	2000	1500	1500	1300	1400
Potassium	mg/L	-	6.3	8	8.35	8.9	8.8	8.7	6.7	7.4	7.6	7.5
Iron	mg/L	0.3	<0.005	<0.050	0.022	<0.06	0.26	<0.060	<0.60	0.36	0.21	<0.6
Sulphate	mg/L	500	2630	2700	2530	2600	2800	3700	2600	2400	2200	2000
Chloride	mg/L	250	5	3.64	<10 *	4	4.2	9.8	2.6	3.1	3.1	2.7
Bicarbonate	mg/L	-	1140	1130	1110	1100	1100	1200	1100	1100	1000	1100
Carbonate	mg/L	-	<5	<5.0	<5.0	<0.5	19	<0.50	5	<0.50	13	22
Nitrate (N)	mg/L	10	<0.1	0.279	<1.0 *	0.032	0.015	0.21	<0.010	<0.010	0.015	<0.044
TDS*	mg/L	500	4880	4830	4610	4800	5200	6500	4700	4500	4100	4100
Water Nutrients												
Ammonia-N	mg/L	-	0.64	0.382	0.569	0.64	0.73	1	0.76	0.76	0.73	0.84
TKN	mg/L	-	1	0.8	1.51	1.6	1.1	1.6	1.1	1.1	1.1	1.0
Hydrocarbons												
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.0006	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics												
COD	mg/L	-	n/a	13.7	10.8	86	22	27	28	17	17	17
DOC	mg/L	-	n/a	5.2	6.1	6.1	5.9	8.2	5	5.7	6.0	6.3
Metals												
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	<0.0030	0.0034
Antimony	mg/L	0.006	n/a	n/a	<0.00040	<0.006	<0.0060	<0.006	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0021	0.0025	0.0017
Barium	mg/L	1	n/a	0.0148	0.0188	0.02	0.019	0.02	<0.10	0.027	0.029	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.47	0.48	0.52
Cadmium	mg/L	0.005	<0.001	<0.0010	<0.000050	<0.00005	<0.050	0.00011	<0.000050	<0.00020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0010	<0.001
Cobalt	mg/L	-	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.0003	<0.00030
Copper	mg/L	1	0.005	0.0062	0.0071	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00023	<0.00020
Lead	mg/L	0.01	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.21	0.21	0.19
Mercury	mg/L	0.001	n/a	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.007	<0.0050	<0.0050	<0.002	<0.0020	0.0021	0.0029	<0.0020	0.0020	0.0016
Nickel	mg/L	-	0.005	0.0041	0.0057	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0025	<0.00050
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0010	0.00021	0.00024
Zinc	mg/L	5	0.012	0.0094	0.0046	<0.030	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Detection limit adjusted (*)

Pipe is bent and was unable to measure water elevation (bent)

Exceeds Regulatory Limit

Table E20A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 20A																			
			Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06
Field Measurements																							
Field pH	-	-	8.1	8.3	n/a	8.1	7.5	7.91	7.63	7.62	7.8	7.93	7.8	7.98	8.04	7.85	7.78	7.74	7.67	7.67	7.61	7.38	7.73
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.28	9.81 (EF)	4.27	3.62
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12.3	3.7	7.5	6.4
Routine Water																							
pH	-	6.5 - 8.5	8.26	8.07	8.24	8.43	8.36	8.25	8.17	8.46	8.12	7.96	8.1	7.95	8.08	8.11	8.28	8.3	8.3	8.2	8.2	8.3	8.4
Conductivity (EC)	µS/cm	-	3660	3730	2950	3210	3160	3510	3410	3250	3290	3320	3330	3210	3230	3480	3670	3880	3920	3840	3900	3480	3500
Calcium	mg/L	-	71.5	34.3	28.3	20.7	16.7	17.1	24.9	19.3	21.3	23.9	18.7	20.5	17	25.1	30.5	42.4	11.5	42	14.7	26.2	25.6
Magnesium	mg/L	-	13.8	8	6.6	5	2.6	2.9	7.3	6.29	3.44	4.25	3.2	3.49	2.9	3.5	5.2	8.4	6.3	6.8	10.2	4.0	4.4
Sodium	mg/L	200	870	924	912	773	797	798	908	775	753	933	714	903	748	879	934	984	934	944	966	862	870
Potassium	mg/L	-	8.93	8.67	8.88	8.35	4.39	5.29	8.73	7.3	3.5	4.8	3.6	3.9	2.6	3	4	4.3	4.7	4.5	6.1	3.9	4.4
Iron	mg/L	0.3	0.16	6.73	43.9	1.65	0.026	n/a	2.2	n/a	0.022	1.02	0.059	0.908	<0.05	0.06	<0.05	0.097	<0.005	0.011	<0.005	0.014	0.011
Sulphate	mg/L	500	1450	1360	1110	830	749	849	960	784	945	1030	804	957	784	1140	1290	1220	1150	1200	1300	1040	900
Chloride	mg/L	250	14	8.6	8.2	22.6	11.1	12.1	6.7	11.7	8.4	5.2	4.6	6.3	5.9	4.5	2.4	3	4	4	4	6	6
Bicarbonate	mg/L	-	612	797	997	1030	1090	1140	1120	1050	1140	1120	1150	1160	1190	1130	1100	1130	1130	1130	1110	1140	1120
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	17.9	n/a	n/a	46	<6	<6	<6	<6	<6	<6	<6	<5	7	<5	<5	<5	24
Nitrate (N)	mg/L	10	n/a	n/a	n/a	n/a	2.31	1.88	4.02	3.36	3.9	4.4	3.92	3.89	3.06	3.82	2.56	1.9	1.1	0.8	3	4.4	1.9
TDS*	mg/L	500	2720	2740	2560	2200	2130	2240	2470	2170	2270	2550	2110	2470	2150	2610	2800	2830	2680	2760	2860	2520	2400
Water Nutrients																							
Ammonia-N	mg/L	-	0.788	1.05	1.4	1.16	0.92	1.59	0.75	0.95	0.58	0.12	0.32	0.3	0.34	0.24	0.28	0.08	0.5	0.36	0.15	0.14	0.57
TKN	mg/L	-	5.53	6.08	2.34	4.22	1.71	2.44	1.92	2.8	1.87	1.09	0.19	1.18	2.24	1.29	1.28	< 0.2	0.7	0.7	0.4	0.4	0.6
Hydrocarbons																							
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																							
COD	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																							
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.006	<0.006	<0.05	<0.02	<0.02	<0.001	<0.001	<0.002	0.0007	0.0026	0.0009	<0.0004	0.0006	0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	0.0848	0.0465	0.0337	0.0642	0.0417	0.04	0.0309	0.0249	0.0243	0.024	0.0335	0.023	0.025	0.021	0.024	0.024	0.025	0.021	0.028	0.022	0.016
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	<0.0005	<0.0005	n/a	<0.0005	<0.0005	n/a	<0.0005	n/a	<0.0006	<0.003	<0.003	<0.0005	<0.00005	<0.00005	<0.00005	<0.001	< 0.001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.05	0.001	0.0009	n/a	0.0009	0.0017	n/a	0.0014	n/a	<0.0009	<0.004	<0.004	<0.0008	0.0044	0.0059	<0.002	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	-	0.0021	0.0018	n/a	0.0011	0.0029	n/a	0.0028	n/a	0.0032	0.0072	0.006	0.0027	0.0014	0.0018	0.0029	<0.002	< 0.002	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	1	0.001	0.004	n/a	0.003	0.004	n/a	0.005	n/a	0.002	<0.006	0.005	0.004	<0.005	<0.005	<0.005	0.008	0.012	0.009	0.005	0.006	0.003
Lead	mg/L	0.01	<0.002	<0.002	n/a	0.006	0.002	n/a	0.002	n/a	<0.002	<0.01	<0.01	<0.002	<0.0005	<0.0005	<0.0005	<0.005	< 0.005	0.0002	<0.0001	0.0062	<0.0001
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	n/a	<0.0001	n/a	<0.0001	<0.0001	<0.0001	n/a	<0.0001	<0.0001	<0.0001	<0.0002	< 0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	14.5	0.024	n/a	0.005	0.009	n/a	0.006	n/a	0.004	0.006	<0.005	0.003	<0.005	<0.005	<0.005	<0.005	< 0.005	<0.005	<0.005	<0.005	<0.005
Nickel	mg/L	-	0.011	0.011	n/a	0.008	0.004	n/a	0.006	n/a	0.003	<0.006	0.009	0.003	0.0041	<0.003	0.0097	<0.002	< 0.002	<0.002	<0.002	0.003	0.002
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	0.0068	0.0272	n/a	0.0131	0.0218	n/a	0.0249	n/a	0.0241	0.029	0.026	0.0128	0.008	<0.005	0.008	0.02	0.019	0.013	0.01	0.030	<0.002

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E20A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements														
Field pH	-	-	7.5	8.09	7.747	7.400	8.250	7.710	7.63	n/a	8.0	8.2	8.6	7.8
Field EC	mS	-	7.94	7.74	4.050	2	2.9	3.4	1.999	3.98	3.5	3.31	3.57	3
Field Temperature	°C	-	7.7	11.46	7.9	11.2	15.5	10	8.7	8.4	7.8	7.9	8.1	6.9
Routine Water														
pH	-	6.5 - 8.5	8.4	8.2	8.3	8.38	8.25	8.25	8.37	8.4	8.05	8.03	8.15	8.34
Conductivity (EC)	µS/cm	-	3310	3310	4110	3650	3440	3400	3400	3400	3300	3100	3300	3200
Calcium	mg/L	-	20.6	20.6	48.6	27.1	23.5	18	22	19	19	18	19	18
Magnesium	mg/L	-	2.6	2.2	13.8	5.01	3.66	2.5	2.9	2.6	2.7	2.4	2.5	2.4
Sodium	mg/L	200	824	866	980	841	792	850	930	800	800	750	830	780
Potassium	mg/L	-	4.7	3.4	3.8	2.86	3.71	3	3.8	3.3	3.3	3.5	3.3	2.9
Iron	mg/L	0.3	<0.005	0.006	<0.005	<0.0050	0.017	<0.06	<0.060	<0.060	0.44	<0.060	<0.060	<0.060
Sulphate	mg/L	500	772	789	1340	1040	835	830	830	800	800	680	740	660
Chloride	mg/L	250	7	8	8	6.22	5.6	8	6.9	6.7	6.9	8.3	7.0	7.9
Bicarbonate	mg/L	-	1210	1260	1110	1150	1180	1200	1200	1200	1300	1200	1300	1200
Carbonate	mg/L	-	16	<5	<5	17.5	<5.0	<0.5	15	18	<0.50	<0.50	<0.50	5.5
Nitrate (N)	mg/L	10	4.3	4.1	6.1	3.27	6.28	6.9	1.8	3.4	1.8	6.6	3.1	21
TDS*	mg/L	500	2260	2330	2970	2520	2270	2300	2400	2300	2300	2100	2200	2100
Water Nutrients														
Ammonia-N	mg/L	-	0.5	0.28	0.38	0.151	0.22	0.41	0.49	0.55	0.33	0.23	0.53	0.3
TKN	mg/L	-	1.2	0.8	1.1	n/a	0.87	1.1	1	1.3	1	0.93	1.2	1.0
Hydrocarbons														
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	<0.00050	<0.00050	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	<0.1	<0.10	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics														
COD	mg/L	-	n/a	n/a	n/a	n/a	<5.0	38	45	75	66	28	19	35
DOC	mg/L	-	n/a	n/a	n/a	n/a	5.5	9.6	5.9	5.2	4.4	5.7	4.3	6.4
Metals														
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0052	0.0040	0.0078
Antimony	mg/L	0.006	<0.0004	0.0007	n/a	n/a	<0.00040	<0.0006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00037	0.00051	0.0004
Barium	mg/L	1	0.017	0.018	0.045	0.0252	0.0245	0.018	0.022	0.021	0.025	0.015	0.018	0.027
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.80	0.92	0.79
Cadmium	mg/L	0.005	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	0.00005	0.000066	0.000031	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0050	<0.0010	0.0019	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.0015	<0.00030	0.00057	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.002	0.002	0.003	0.0043	0.0039	0.0023	0.0025	0.0016	0.0036	0.00075	0.00038	0.00031
Lead	mg/L	0.01	<0.0001	0.0002	<0.005	<0.0050	<0.00010	<0.0002	<0.0010	<0.00020	0.0003	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.026	0.026	0.031
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.005	<0.005	0.014	<0.0050	<0.0050	0.0017	0.0018	0.0018	0.0016	0.0016	0.0014	0.0015
Nickel	mg/L	-	<0.002	0.002	0.003	0.0047	<0.0020	0.0017	<0.0025	0.0016	0.0031	0.0015	0.0011	0.0014
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	0.0014	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	0.0016	0.0015
Zinc	mg/L	5	0.010	0.031	0.009	0.0496	0.0039	0.014	0.017	0.0084	0.0036	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E20B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 20B																	
			Oct-96	Apr-97	Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05
Field Measurements																					
Field pH	-	-	7.6	7.4	n/a	7.6	7.11	7.28	7.22	7.66	7.49	7.52	7.49	7.54	7.65	7.63	7.75	7.81	7.49	7.33	7.23
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.41	10.55 (EF)
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10.4	7.5
Routine Water																					
pH	-	6.5 - 8.5	7.79	7.8	7.87	7.71	7.71	7.63	7.8	7.84	7.78	7.76	7.8	7.68	7.81	7.84	7.99	8.2	8.2	8.1	8.2
Conductivity (EC)	µS/cm	-	4150	4220	3380	4130	4310	4000	4180	4420	4050	4050	4160	4260	4220	4150	4010	4270	4320	4160	3910
Calcium	mg/L	-	91.1	54.8	91.6	90.7	21.8	90.8	95.1	102	84.4	94.2	90.2	95.1	94.6	102	89.9	79.5	43.8	100	81.6
Magnesium	mg/L	-	29	29.9	27.9	27	33.7	29.5	30.8	31.1	29.5	31.1	31.2	32.5	31.4	34.7	27.6	34.4	32.3	31.5	35
Sodium	mg/L	200	975	1020	1080	975	1080	967	1030	1080	926	929	924	1020	1110	959	943	1010	1000	978	1060
Potassium	mg/L	-	9.34	8.43	8.9	7.43	9.86	8.08	12.8	8.7	9.8	7.1	8.7	8.7	9.2	7.6	7.6	6.9	9.3	7.6	9.5
Iron	mg/L	0.3	<0.04	0.15	0.004	0.387	0.088	0.623	0.019	0.047	<0.003	0.055	<0.02	0.072	<0.05	<0.05	<0.1	0.183	<0.005	0.007	<0.005
Sulphate	mg/L	500	1520	1580	1770	1450	1750	1570	1730	1720	1860	1590	1590	1720	1820	1710	1670	1630	1610	1560	1610
Chloride	mg/L	250	1.7	0.4	1	1.3	<0.5	0.7	<0.5	<0.5	1.7	<0.5	0.8	0.8	<0.5	0.8	<0.5	1	2	2	3
Bicarbonate	mg/L	-	1080	1060	1090	1080	1100	1090	1090	1080	1080	1080	1100	1060	1080	1070	1040	1030	1060	1060	1070
Carbonate	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5
Nitrate (N)	mg/L	10	n/a	n/a	n/a	n/a	<0.05	<0.05	<0.05	0.505	<0.04	<0.04	0.058	0.045	<0.04	<0.02	<0.02	0.1	0.2	<0.1	<0.1
TDS*	mg/L	500	3150	3220	3520	3090	3430	3200	3440	3460	3520	3180	3190	3400	3590	3340	3250	3270	3220	3200	3320
Water Nutrients																					
Ammonia-N	mg/L	-	0.183	0.163	0.23	0.15	0.26	0.27	0.15	< 0.05	0.09	0.1	< 0.05	0.12	< 0.05	< 0.05	0.06	< 0.05	0.08	<0.05	0.12
TKN	mg/L	-	0.97	0.43	0.32	1.01	0.47	0.35	0.52	0.89	0.46	0.55	0.44	1.91	2.22	1.7	0.85	< 0.2	< 0.2	<0.2	1.5
Hydrocarbons																					
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																					
COD	mg/L	-	45	33	48	43	102	12	18	< 5	13	16	< 5	127	119	138	32	< 10	< 10	16	17
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																					
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.006	<0.006	<0.05	<0.02	<0.02	<0.001	<0.001	<0.002	0.0007	0.0026	0.0009	<0.0004
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	0.0848	0.0465	0.0337	0.0642	0.0417	0.04	0.0309	0.0249	0.0243	0.024	0.0335	0.023	0.025	0.021	0.024	0.024	0.025	0.021	0.028
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006	<0.005	<0.003	<0.003	<0.00005	<0.00005	<0.0001	<0.001	<0.001	<0.0001	<0.0001
Chromium	mg/L	0.05	<0.0008	<0.0008	<0.0008	0.0012	<0.0008	<0.0008	<0.0008	<0.0009	<0.0009	<0.008	<0.004	<0.004	0.0046	0.0053	<0.005	<0.005	<0.005	<0.005	0.011
Cobalt	mg/L	-	0.0009	0.0007	0.0011	<0.0007	0.0032	0.0038	0.0029	0.0039	0.0036	0.009	0.007	0.008	<0.0005	0.0006	<0.001	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	1	<0.001	0.003	<0.001	0.002	<0.001	<0.001	0.001	0.001	0.002	<0.01	<0.005	0.006	<0.005	<0.005	<0.01	0.012	0.014	0.011	0.005
Lead	mg/L	0.01	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	0.005	<0.002	<0.002	<0.02	<0.01	<0.01	<0.0005	<0.0005	<0.001	<0.005	<0.005	<0.0001	<0.0001
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001
Molybdenum	mg/L	-	27.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0002	<0.0002	<0.005	<0.005
Nickel	mg/L	-	0.006	0.004	0.002	0.002	0.004	0.003	0.004	0.004	0.003	<0.01	0.006	0.009	<0.003	<0.0025	<0.005	<0.002	<0.002	<0.002	<0.002
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	0.0079	0.001	0.0105	0.002	0.0115	0.0065	0.0251	0.0144	0.023	0.016	<0.003	<0.003	0.007	<0.005	<0.01	0.021	0.016	0.011	0.006

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E20B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																
Field pH	-	-	7.33	7.47	7.56	7.55	7.631	7.487	8.9	7.54	7.41	5.32	7.9	7.9	7.64	7.6
Field EC	mS	-	4.51	4.29	10.49	10.94	4.570	4.400	2.7	4.59	1.97	5.35	5.32	5.03	4.97	5.18
Field Temperature	°C	-	5.80	8.90	6.0	11.60	6.8	8.7	12	10.1	6.9	7.1	7.9	5.5	7.3	6.2
Routine Water																
pH	-	6.5 - 8.5	8.1	8.2	8.1	8.0	8.2	8.13	8.22	8.13	8.14	8.19	8.02	8.04	8.04	8.17
Conductivity (EC)	µS/cm	-	4290	4370	4700	4480	4660	4450	4620	4700	4600	4600	4900	4700	4700	5000
Calcium	mg/L	-	105	104	130	109	138	108	116	100	110	110	130	120	110	140
Magnesium	mg/L	-	33.2	9.4	46.5	37.2	50.6	35.3	39.6	36	34	39	47	39	37	50
Sodium	mg/L	200	975	995	1050	1040	1030	1070	936	1000	1100	960	1000	1000	1000	1100
Potassium	mg/L	-	8.4	9.4	10.2	9.6	7.4	10.3	9.17	8	9.2	8.7	9.4	9.0	9.0	9.8
Iron	mg/L	0.3	<0.005	<0.005	<0.005	0.013	<0.005	0.0216	0.018	<0.06	<0.060	<0.060	0.24	<0.060	<0.60	<0.60
Sulphate	mg/L	500	1580	1600	1790	1710	1890	1680	1780 *	1800	1800	1900	2200	1900	1800	1900
Chloride	mg/L	250	2	2	2	2	4	0.82	<10 *	2	1.6	1.6	1.3	1.5	1.4	1.1
Bicarbonate	mg/L	-	1060	1030	962	1050	986	1060	976	990	1000	960	950	990	1100	960
Carbonate	mg/L	-	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.2	0.2	0.6	0.1	0.4	0.102	<1.0 *	0.11	0.052	0.28	0.27	0.17	0.14	0.86
TDS*	mg/L	500	3230	3250	3500	3420	3610	3430	3360	3400	3600	3500	3800	3600	3500	3700
Water Nutrients																
Ammonia-N	mg/L	-	0.10	0.11	<0.05	0.06	<0.05	<0.050	<0.050	<0.05	0.13	<0.05	0.058	<0.050	<0.050	0.035
TKN	mg/L	-	1.5	0.4	0.4	0.8	0.5	0.57	1.57	0.32	1.3	2.9	3	3.7	0.29	0.74
Hydrocarbons																
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																
COD	mg/L	-	14	14	24	11	13	10.6	9.4	58	91	63	96	120	15	81
DOC	mg/L	-	n/a	n/a	n/a	n/a	6	4.7	6	6.9	5.9	5.6	7.2	6.4	4.3	6
Metals																
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0035	<0.0030	0.0041
Antimony	mg/L	0.006	0.0006	0.0006	<0.0004	0.0007	n/a	n/a	<0.00040	<0.0006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00032	0.00030	0.00032
Barium	mg/L	1	0.022	0.016	0.017	0.018	0.021	0.0156	0.0223	0.018	0.015	0.017	0.022	0.014	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.33	0.38	0.35
Cadmium	mg/L	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000025	0.000051	0.00018	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.003	<0.0050	0.0033	0.0036	0.0029	0.0035	0.0011
Cobalt	mg/L	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.0015	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.005	0.003	0.003	0.003	0.004	0.0046	0.0052	0.0014	0.0025	0.0012	0.002	0.0013	0.00053	0.00059
Lead	mg/L	0.01	<0.0001	<0.0001	<0.0001	0.0002	<0.005	<0.0050	<0.00010	<0.0002	<0.0010	<0.00020	0.00036	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	<0.040	<0.040
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000032	<0.0000050	<0.0000050	<0.0000050	0.0000026	<0.0000020
Molybdenum	mg/L	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.0009	<0.0010	0.00096	0.00094	0.00083	0.00076	0.00078
Nickel	mg/L	-	<0.002	0.003	<0.002	0.004	0.003	0.0029	0.0026	0.0013	<0.0025	0.0013	0.0023	0.0011	0.0016	0.00067
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0031	<0.00020	0.013
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0033	0.0013	0.005
Zinc	mg/L	5	0.006	<0.002	0.006	0.004	0.004	0.0054	<0.0020	0.013	<0.015	0.0037	0.0045	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E21A: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 21														
				Oct-97	Apr-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05
Field Measurements																			
Field pH	-	6.5-8.5	-	7.7	n/a	8.17	7.86	7.52	7.81	8.06	8	8.06	7.98	8.16	8.07	8.09	7.76	7.04	7.69
Field EC	mS		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.15
Field Temperature	°C		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10.3
Routine Water																			
pH	-	6.5-8.5	6.5 - 8.5	8.07	n/a	8.81	8.45	8.29	8.56	8.29	8.28	8.14	7.99	8.27	8.19	8.2	8.3	8.4	8.3
Conductivity (EC)	µS/cm	1000	-	5630	n/a	3050	2240	2320	2310	2220	2090	2090	2180	2150	1970	2050	2110	2160	2030
Calcium	mg/L		-	70.2	n/a	28.1	6.4	14.4	7.7	6.2	4.6	5.3	5.1	4.9	2.6	5	5.8	5.1	5.4
Magnesium	mg/L		-	31	n/a	6.4	1.3	16	5.47	0.72	0.52	0.6	0.82	< 1	< 1	< 1	0.6	0.5	<0.1
Sodium	mg/L	200	200	1660	n/a	802	595	597	536	602	613	565	629	600	590	582	562	552	536
Potassium	mg/L		-	5.68	n/a	8.88	2.79	16.4	6.2	2.5	1.7	<2	2.4	<2	<2	<2	0.7	1.7	1.5
Iron	mg/L	0.3	0.3	0.028	n/a	86	n/a	34.2	n/a	n/a	0.02	0.024	n/a	<0.05	0.09	<0.05	1.06	0.021	0.041
Sulphate	mg/L	128|218|309|429	500	2960	n/a	1490	352	232	156	126	93.5	93.9	96.9	89.9	76.6	83.2	75.4	70.4	54.5
Chloride	mg/L	100	250	21.4	n/a	23.9	18.9	16.8	14.2	15.6	8.9	7.7	8.5	7.7	8.4	6.9	9	10	11
Bicarbonate	mg/L		-	1110	n/a	470	1050	1280	1150	1340	1360	1340	1340	1330	1330	1310	1270	1270	1320
Carbonate	mg/L		-	n/a	n/a	65.4	49.7	n/a	61	< 6	< 6	< 6	< 6	< 6	< 6	< 6	14	19	10
Nitrate (N)	mg/L	3	10	n/a	n/a	18.1	7.26	11.3	11.5	14.7	13.4	17.7	17	17	17.4	19.7	14.9	16.9	6.3
TDS*	mg/L	500	500	5300	n/a	2650	1540	1520	1360	1410	1390	1330	1400	1360	1330	1320	1360	1360	1300
Water Nutrients																			
Ammonia-N	mg/L		-	0.25	n/a	2.24	1.49	0.89	0.67	0.71	0.34	0.31	0.42	0.22	0.08	0.35	0.36	0.27	0.17
TKN	mg/L		-	0.7	n/a	20.1	5.62	2.32	2.43	2.31	1.76	2.65	1.96	1.91	1.63	3	2.2	<0.2	1.7
Hydrocarbons																			
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L		0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																			
COD	mg/L		-	34	n/a	1190	450	91	105	132	53	158	73	135	72	134	20	<10	27
DOC	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																			
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	0.006	<0.005	n/a	n/a	n/a	0.006	n/a	n/a	<0.006	<0.02	n/a	0.0022	0.0014	0.0015	0.0019	0.002	0.0022
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	1	0.0181	n/a	n/a	n/a	0.541	n/a	n/a	0.0533	0.054	n/a	0.105	0.058	0.07	0.081	0.073	0.059
Boron	mg/L	1	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.0005	n/a	n/a	n/a	0.002	n/a	n/a	<0.0006	<0.003	n/a	<0.00001	<0.00005	0.00012	<0.001	<0.001	<0.0001
Chromium	mg/L		0.05	0.002	n/a	n/a	n/a	0.0287	n/a	n/a	<0.0009	<0.004	n/a	0.0006	0.0031	0.0027	<.005	<0.005	<0.005
Cobalt	mg/L		-	<0.0007	n/a	n/a	n/a	0.0128	n/a	n/a	0.0031	0.0045	n/a	0.0013	<0.0005	0.0003	<0.002	<0.002	<0.002
Copper	mg/L	0.007	1	<0.001	n/a	n/a	n/a	0.059	n/a	n/a	0.004	0.006	n/a	0.011	0.023	0.003	0.004	0.005	0.004
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.002	n/a	n/a	n/a	0.019	n/a	n/a	<0.002	<0.01	n/a	0.0026	<0.0005	0.0001	< 0.005	<0.005	0.0001
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.00005	0.001	<0.0001	n/a	<0.0001	n/a	< 0.0001	n/a	n/a	<0.0001	<0.0001	n/a	n/a	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001
Molybdenum	mg/L		-	<0.001	n/a	n/a	n/a	0.035	n/a	n/a	0.018	0.02	n/a	0.023	0.017	0.018	0.016	0.014	0.012
Nickel	mg/L	054|0.057|0.059|0.0	-	0.002	n/a	n/a	n/a	0.038	n/a	n/a	0.002	0.005	n/a	0.0092	<0.0025	0.0026	0.003	0.003	0.003
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.01	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	0.03	5	0.0144	n/a	n/a	n/a	0.146	n/a	n/a	0.0299	0.023	n/a	0.061	0.012	0.007	0.015	0.007	0.009

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E21A: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	A														
			Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements																	
Field pH	-	6.5-8.5	7.73	7.56	7.42	7.5	7.72	7.847	8.400	8.17	7.94	8.2	7.79	9.9	8.3	7.88	7.9
Field EC	mS		4.4	2.40	2.25	4.59	4.44	1.959	2.760	2.4	2.16	1.5	2.38	2.12	2.11	2.14	2.03
Field Temperature	°C		4.1 (EF)	9.6	5.7	8.3	6.62	8.5	13.0	9.5	8.7	8.9	10.2	8.3	8.4	7.9	7.5
Routine Water																	
pH	-	6.5-8.5	8.4	8.3	8.5	8.6	8.3	8.3	8.38	8.47	8.28	8.59	8.33	8.18	8.19	8.29	8.41
Conductivity (EC)	µS/cm	1000	2110	2070	2100	2450	2110	2030	2070	2060	2100	2100	2000	2000	2000	2000	2000
Calcium	mg/L		5.7	5.4	5.3	6.9	4.8	6.2	4.24	4.85	4.6	4.1	4.8	4.4	4.4	4.7	4.3
Magnesium	mg/L		0.8	0.6	0.6	0.7	<0.1	1.4	0.36	0.54	0.5	0.47	0.53	0.47	0.44	0.45	0.4
Sodium	mg/L	200	547	553	534	630	581	527	496	514	440	540	460	470	490	490	480
Potassium	mg/L		2.2	2.1	2.2	3.2	1.5	2.4	1.28	1.95	1.5	2	1.6	1.8	1.9	1.7	1.5
Iron	mg/L	0.3	0.169	0.096	0.092	0.106	0.015	0.046	<0.0050	0.059	<0.06	<0.060	<0.060	0.22	<0.060	<0.060	<0.060
Sulphate	mg/L	128|218|309|429	77.4	79.9	68.5	258	75.9	59.5	62.1	83.1	81	91	82	90	72	71	65
Chloride	mg/L	100	15	10	10	16	11	15	8.35	7.95	9	8.9	8.4	9.3	9.4	8.7	11
Bicarbonate	mg/L		1260	1300	1210	1240	1350	1340	1310	1220	1300	1200	1300	1300	1300	1300	1300
Carbonate	mg/L		25	<5	31	43	<5	13	17.3	31.7	<0.5	38	8.5	<0.50	<0.50	<0.50	11
Nitrate (N)	mg/L	3	12.5	14.6	13.9	<0.1	30.1	9.6	6.84	9.3	1.8	1.8	1.8	2.3	1.2	1.3	4.1
TDS*	mg/L	500	1350	1360	1310	1570	1470	1330	1260	1280	1200	1300	1200	1200	1200	1200	1200
Water Nutrients																	
Ammonia-N	mg/L		0.16	0.34	0.37	0.32	0.35	0.34	0.352	0.275	0.13	0.065	0.24	0.068	0.12	0.12	0.071
TKN	mg/L		1.9	1.3	2	1.4	1.9	2.7	1.66	2.31	1.5	0.95	2.2	1.4	1.7	0.81	0.96
Hydrocarbons																	
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	0.00074	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	n/a	n/a	n/a	n/a	n/a	<0.05	0.156	<0.48 *	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																	
COD	mg/L		24	19	22	42	21	19	24.8	18.7	29	41	110	96	74	28	43
DOC	mg/L		n/a	n/a	n/a	n/a	n/a	8	7.7	8.6	9.5	9.8	10	7	8.4	7.1	9.2
Metals																	
Aluminum	mg/L	0.0007|0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0058	0.0047	0.0043
Antimony	mg/L	0.006	0.0011	0.0020	0.0016	0.0007	0.0014	n/a	n/a	0.00082	<0.0006	<0.00060	0.0011	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00093	0.0010	0.0011
Barium	mg/L	1	0.086	0.077	0.082	0.037	0.081	0.185	0.0849	0.103	0.084	0.085	0.084	0.073	0.062	0.073	0.096
Boron	mg/L	1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.83	0.93	0.82
Cadmium	mg/L	9|0.0002|0.00022|0	<0.0001	<0.0001	0.0002	0.0002	0.0002	<0.001	<0.0010	0.00009	0.00024	0.000062	0.0001	0.000034	0.000067	0.000079	0.000099
Chromium	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0010	<0.0010	0.0014	<0.0010	<0.0010	<0.0010
Cobalt	mg/L		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper	mg/L	0.007	0.003	0.003	0.002	0.001	0.002	0.001	0.0017	0.0022	0.002	0.0009	0.003	0.0015	0.0012	0.0025	0.0016
Lead	mg/L	38|0.004|0.0042|0.0	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.005	<0.0050	<0.00010	<0.0002	<0.00020	<0.00020	0.00024	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	<0.0040	0.0047
Mercury	mg/L	0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.000010	0.0000058	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L		0.010	0.010	0.010	0.008	0.009	0.019	0.0085	0.0075	0.0076	0.0071	0.0069	0.0065	0.0058	0.0062	0.0058
Nickel	mg/L	054|0.057|0.059|0.0	0.002	0.002	0.003	0.009	0.003	<0.002	0.0031	0.0023	0.0031	0.0025	0.0027	0.0027	0.0029	0.0031	0.0028
Selenium	mg/L	0.001	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00022	<0.00020	0.0002
Uranium	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0034	0.0033	0.0036
Zinc	mg/L	0.03	0.004	0.01	0.003	0.004	0.008	0.004	0.0061	0.0047	0.014	<0.0030	0.005	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E21B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 21B																
			Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07
Field Measurements																				
Field pH	-	-	7.37	7.47	7.44	7.37	8	7.75	8	8.15	8.24	8.22	8.1	8.21	7.75	7.73	7.54	7.55	7.64	7.59
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.79	5.99 (EF)	2.68	2.77	6.27
Field Temperature	ºC	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	10.8	8.9	6.5	9.3	4.6
Routine Water																				
pH	-	6.5 - 8.5	7.93	7.82	7.97	8.04	8.01	7.94	8.12	8.02	8.25	8.27	8.45	8.4	8.4	8.3	8.3	8.3	8.4	8.5
Conductivity (EC)	µS/cm	-	2490	2370	2510	2650	2380	2370	2440	2460	2500	2450	2470	2560	2660	2510	2490	2670	2770	2610
Calcium	mg/L	-	6.2	17.6	18.8	17.1	13.8	15	14.3	14.9	15.1	13.4	13.7	17.3	7.6	17.1	15	19	18.9	2.5
Magnesium	mg/L	-	5.2	5.3	5.8	5.04	4.58	5.13	4.67	3.96	4.1	3.2	3.6	5.1	5.2	4.2	5.0	5.8	6.2	1.0
Sodium	mg/L	200	643	587	665	710	557	587	573	692	720	603	632	624	627	625	638	648	670	131
Potassium	mg/L	-	6	4.46	1.17	4	4.4	< 4	3.6	3.7	3.5	2.3	3.2	3.9	4.4	3.8	3.2	4.4	4.7	0.8
Iron	mg/L	0.3	1.87	1.38	0.035	0.046	<0.003	0.056	<0.02	0.073	<0.05	<0.05	<0.05	0.408	<0.005	0.006	0.104	0.005	0.019	0.017
Sulphate	mg/L	500	563	561	644	618	600	545	549	606	630	592	604	566	590	550	524	619	613	123
Chloride	mg/L	250	0.9	0.9	<0.5	0.7	2.4	<0.5	0.6	0.5	<0.5	<0.5	<0.5	1	2	2	2	3	2	2
Bicarbonate	mg/L	-	995	1010	1020	1030	1020	1030	1030	1080	1070	1090	1000	994	1010	1010	1000	1030	1000	980
Carbonate	mg/L	-	n/a	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	33	17	13	<5	8	8	21	0.1
Nitrate (N)	mg/L	10	0.17	<0.05	0.12	0.17	0.14	<0.04	0.11	0.073	<0.02	0.284	<0.02	0.2	0.4	<0.1	<0.1	0.2	0.2	0.1
TDS*	mg/L	500	1710	1670	1830	1860	1810	1660	1650	1850	1900	1750	1780	1720	1750	1700	1690	1810	1830	773
Water Nutrients																				
Ammonia-N	mg/L	-	0.23	0.17	0.2	0.14	0.35	0.09	<0.05	0.28	<0.05	0.14	0.22	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
TKN	mg/L	-	0.56	0.46	0.54	0.67	0.48	0.35	0.19	0.86	0.5	0.86	0.87	0.4	<0.2	0.3	0.4	0.3	<0.2	0.3
Hydrocarbons																				
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																				
COD	mg/L	-	45	21	17	9	22	19	8	68	6	29	22	< 10	< 10	17	16	15	14	17
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																				
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	<0.005	<0.005	<0.005	<0.006	<0.006	<0.05	<0.02	<0.02	<0.001	<0.001	<0.001	0.0007	0.001	0.0008	<0.0004	0.0008	0.0006	0.0005
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	0.053	0.0369	0.0149	0.0118	0.0104	0.011	0.0125	0.013	0.011	0.012	0.015	0.011	0.011	0.011	0.011	0.017	0.01	0.01
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006	<0.005	<0.003	<0.003	<0.00005	<0.00005	<0.00005	<0.0001	<0.001	<0.0001	<0.0001	0.0001	0.0007	0.0002
Chromium	mg/L	0.05	0.0049	0.002	<0.0008	<0.0009	<0.0009	<0.008	< .004	<0.004	0.0043	0.0051	0.0026	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	-	0.0029	0.0029	0.0021	0.0023	0.0024	<0.007	0.0035	0.0085	<0.0005	< 0.0005	0.0006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	1	0.002	0.003	0.002	0.003	0.004	<0.01	<0.005	0.007	<0.005	<0.005	0.007	0.006	0.007	0.007	0.004	0.004	0.003	0.002
Lead	mg/L	0.01	0.002	< 0.002	0.003	<0.002	<0.002	<0.02	0.012	<0.01	<0.0005	<0.0005	<0.0005	0.0001	<0.005	0.0002	<0.0001	0.0007	0.0001	0.0001
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	0.001	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	mg/L	-	0.007	0.002	0.002	0.002	0.002	<0.01	<0.005	<0.005	<0.003	<0.0025	0.0028	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	0.0131	0.0075	0.0084	0.0087	0.0186	0.014	<0.003	<0.003	<0.005	<0.005	0.009	0.007	0.01	0.043	0.006	0.008	0.004	0.008

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E21B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements													
Field pH	-	-	8.66	7.851	7.803	8.08	7.83	7.68	5.6	8.0	8.3	7.89	7.8
Field EC	mS	-	6.12	2.420	2.640	15.3	2.78	1.18	2.99	2.87	2.82	2.84	2.78
Field Temperature	°C	-	10.87	5.2	6.2	15.7	12.3	6.9	n/a	6.6	6.9	6.5	6.5
Routine Water													
pH	-	6.5 - 8.5	8.3	8.4	8.35	8.38	8.27	8.33	8.43	8.21	8.16	8.25	8.39
Conductivity (EC)	µS/cm	-	2560	2530	2660	2700	2700	2700	2700	2700	2700	2600	2600
Calcium	mg/L	-	16.5	17.2	19.5	17.6	17	17	16	17	16	16	17
Magnesium	mg/L	-	4.3	5.6	6.3	5.41	5.4	5.6	5.4	5.6	4.9	5.0	5.3
Sodium	mg/L	200	641	603	679	600	650	700	620	610	630	630	640
Potassium	mg/L	-	5.7	3.2	4.4	4.12	4.2	4.3	3.9	4	4.2	3.9	4.1
Iron	mg/L	0.3	0.013	0.028	0.113	<0.010	<0.06	<0.060	<0.060	0.071	<0.060	<0.060	<0.060
Sulphate	mg/L	500	564	532	588	579	600	590	590	650	570	530	570
Chloride	mg/L	250	2	3	0.74	0.66	2	1.1	1.7	1.5	1.6	1.1	1.1
Bicarbonate	mg/L	-	1030	1040	1040	996	1000	1000	1000	1000	1000	1000	1000
Carbonate	mg/L	-	<5	14	11.9	24.5	<0.5	8.3	19	<0.50	<0.50	<0.50	9.2
Nitrate (N)	mg/L	10	<0.1	<0.1	<0.050	<0.050	0.052	0.022	0.045	<0.010	0.11	0.11	0.19
TDS*	mg/L	500	1740	1690	1820	1720	1800	1800	1800	1800	1800	1700	1800
Water Nutrients													
Ammonia-N	mg/L	-	<0.05	<0.05	<0.050	<0.050	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	0.016
TKN	mg/L	-	0.3	0.6	0.43	0.54	0.45	0.4	0.36	0.34	0.28	<0.05	0.31
Hydrocarbons													
Benzene	mg/L	0.005	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics													
COD	mg/L	-	9	12	45.7	11.8	32	34	23	31	20	20	20
DOC	mg/L	-	n/a	5	4.4	5.2	4.6	5.5	4.7	3.8	4.2	4.4	6.1
Metals													
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0042	<0.0030	0.0035
Antimony	mg/L	0.006	0.0006	n/a	n/a	<0.00040	<0.006	<0.0030	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00053	0.00064	0.00064
Barium	mg/L	1	0.009	0.018	0.009	0.0102	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.22	0.25	0.23
Cadmium	mg/L	0.005	0.0001	<0.001	<0.0010	0.000225	<0.00005	0.000057	0.000038	0.000042	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0050	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0015	<0.00030	<0.0003	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.002	0.001	0.003	0.0028	<0.002	0.0011	0.0014	0.0014	0.0008	0.00066	0.00033
Lead	mg/L	0.01	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0010	<0.00020	<0.0002	<0.00020	<0.00020	0.00034
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.004	<0.0040	0.0041
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.005	0.007	<0.0050	<0.0050	<0.002	0.0011	0.002	0.0063	0.0051	0.0027	0.0018
Nickel	mg/L	-	<0.002	<0.002	<0.0020	<0.0020	<0.005	<0.0025	0.001	0.0015	0.0013	0.0013	0.00086
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0016	0.0017	0.0017
Zinc	mg/L	5	0.005	0.005	0.007	<0.0020	<0.03	0.016	0.0051	0.003	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E22A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 22A																
			Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07
Field Measurements																				
Field pH	-	-	8.06	8.12	7.74	7.62	7.54	7.7	7.54	7.15	7.9	7.81	7.81	7.75	7.63	7.46	7.97	7.32	7.73	7.45
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5.47	12.89 (EF)	5.70	5.51	12.66
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12.2	4.2	10.4	6.1	7.5
Routine Water																				
pH	-	6.5 - 8.5	8.78	8.27	8.23	8.4	7.94	8.02	7.94	7.84	8.02	8.01	8.11	8.3	8.3	8.1	8.2	8.0	8.5	8.3
Conductivity (EC)	µS/cm	-	6260	5240	5510	5390	5440	5310	5290	5090	5480	5120	5280	5500	5530	7630	5540	7470	5600	5640
Calcium	mg/L	-	46.6	33.8	42.2	36.5	39.8	39.4	39.4	40	41.4	34.7	46.2	44.7	18.5	116	41.5	117	48.9	42.5
Magnesium	mg/L	-	10.6	5.4	6.2	4.18	4.43	4.3	4.31	4.62	4.3	3.4	4.3	4.5	4.6	55.5	5.3	56.5	6.7	4.3
Sodium	mg/L	200	1580	1450	1660	1460	1510	1450	1310	1460	1510	1190	1440	1320	1340	2020	1390	2000	1460	1390
Potassium	mg/L	-	10.6	5.75	6.07	4.5	4.1	4.7	4.7	4.3	4.8	3.7	4.9	4	4.9	8.9	4.8	9.0	5.3	5.6
Iron	mg/L	0.3	62.6	n/a	0.004	n/a	0.022	n/a	<0.02	2.42	<0.05	<0.05	<0.1	0.661	<0.005	0.013	<0.005	<0.005	0.212	0.061
Sulphate	mg/L	500	2950	2380	2750	2380	2450	2260	2190	2370	2560	2000	2360	2180	2170	3520	2340	3770	2250	2030
Chloride	mg/L	250	16.2	16.4	10.3	15.7	11.2	8.1	6.4	10.2	9.3	10.4	9.8	11	10	2	12	3	12	13
Bicarbonate	mg/L	-	492	841	908	832	939	937	935	927	957	974	959	948	963	1210	932	1210	867	956
Carbonate	mg/L	-	74.1	n/a	n/a	24	<6	<6	<6	<6	<6	<6	<6	7	<5	<5	<5	<5	20	<5
Nitrate (N)	mg/L	10	1.83	3.41	4.43	6.83	7.56	9.36	11.8	10.9	12.2	12.2	13.3	12.8	11.2	<0.1	12.5	0.1	11.8	13.3
TDS*	mg/L	500	4930	4300	4920	4330	4870	4220	4010	4350	4590	3720	4330	4090	4070	6320	4310	6550	4280	4020
Water Nutrients																				
Ammonia-N	mg/L	-	1.95	2.1	<0.05	1.5	1.32	0.23	0.39	0.42	0.4	0.36	0.17	0.32	0.39	<0.05	0.25	<0.05	0.12	0.15
TKN	mg/L	-	4.11	2.37	3.14	2.63	1.49	0.93	1.25	1.52	1.31	1.42	2.5	1.5	0.4	0.4	1.5	<0.2	1.2	1.1
Hydrocarbons																				
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																				
COD	mg/L	-	421	78	154	102	46	16	27	52	31	51	59	<10	<10	19	21	10	70	15
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																				
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	n/a	n/a	0.006	n/a	<0.006	n/a	n/a	<0.005	0.001	< 0.001	0.0008	0.0012	0.0014	0.0014	0.0004	0.0007	0.0010	0.0010
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	n/a	n/a	0.0173	n/a	0.0136	n/a	n/a	0.0182	0.015	0.015	0.016	0.018	0.011	0.013	0.02	0.011	0.020	0.015
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	n/a	n/a	<0.0005	n/a	<0.0006	n/a	n/a	0.0005	<0.00001	<0.00005	0.00021	0.0003	<0.001	0.0003	<0.0001	0.0001	0.0003	<0.0001
Chromium	mg/L	0.05	n/a	n/a	<0.0008	n/a	<0.0009	n/a	n/a	<0.0008	<0.0005	<0.003	0.0013	<0.005	0.015	<0.005	<0.005	0.005	<0.005	<0.005
Cobalt	mg/L	-	n/a	n/a	0.0029	n/a	0.0039	n/a	n/a	0.0033	0.0005	0.001	0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	1	n/a	n/a	0.006	n/a	0.003	n/a	n/a	0.012	0.005	<0.005	0.006	0.015	0.019	0.012	0.008	0.007	0.007	0.004
Lead	mg/L	0.01	n/a	n/a	<0.002	n/a	<0.002	n/a	n/a	0.003	0.0003	<0.0005	<0.0001	<0.0001	<0.005	0.00021	<0.0001	0.0002	<0.0001	<0.0001
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	<0.0001	n/a	<0.0001	n/a	<0.0001	n/a	n/a	n/a	n/a	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	n/a	n/a	0.023	n/a	0.015	n/a	n/a	0.011	0.013	0.01	0.01	0.008	0.008	0.007	0.006	<0.005	0.006	0.009
Nickel	mg/L	-	n/a	n/a	0.011	n/a	0.007	n/a	n/a	0.007	0.0039	<0.003	0.0032	0.004	0.004	0.004	0.004	<0.002	0.004	<0.002
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	n/a	n/a	0.0201	n/a	0.0298	n/a	n/a	0.0271	0.066	0.011	0.013	0.015	0.024	0.022	0.009	0.014	0.004	0.015

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E22A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	Oct-07	May-08	May-09	May-10	Jun-11	May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements													
Field pH	-	-	7.73	7.639	7.900	8.12	7.71	7.9	7.45	9.9	n/a	7.76	7.6
Field EC	mS	-	12.26	5.130	3.450	3	5.27	1.34	4.78	5.64	n/a	5.60	5290
Field Temperature	℃	-	8.0	8.8	10.0	11.4	11	9.6	10.9	7.4	n/a	10.0	9
Routine Water													
pH	-	6.5 - 8.5	8.2	8.2	8.2	8.26	8.19	8.33	8.18	7.83	8.08	8.09	8.33
Conductivity (EC)	µS/cm	-	5660	5320	5350	5360	5400	5500	5300	5300	5300	5300	5200
Calcium	mg/L	-	43.8	41.1	36.4	37	33	35	36	36	36	35	36
Magnesium	mg/L	-	4.0	4.6	3.73	3.98	3.5	3.8	3.6	3.7	3.6	3.4	3.6
Sodium	mg/L	200	1490	1330	1200	1220	1200	1300	1300	1300	1200	1200	1300
Potassium	mg/L	-	3.6	2.5	3.22	4.33	3.8	4.9	3.9	4.1	4.7	4.1	4.6
Iron	mg/L	0.3	<0.005	0.074	<0.0050	0.013	<0.06	0.083	<0.060	0.065	<0.060	<0.60	<0.60
Sulphate	mg/L	500	2180	2020	2040	2040 *	1900	2500	2200	2200	2000	2000	1900
Chloride	mg/L	250	11	11	10.6	<10 *	12	11	11	11	12	11	13
Bicarbonate	mg/L	-	957	973	986	951	950	940	950	940	960	960	950
Carbonate	mg/L	-	<5	<5	<5.0	<5.0	<0.5	4.8	<0.50	<0.50	<0.50	<0.50	2.4
Nitrate (N)	mg/L	10	27.5	16.2	11.1	6.4 *	7	16	15	16	16	17	70
TDS*	mg/L	500	4320	3960	3830	3800	3700	4400	4100	4100	3800	3800	3800
Water Nutrients													
Ammonia-N	mg/L	-	<0.05	0.31	0.196	0.224	0.1	0.34	0.18	<0.050	0.11	<0.050	0.15
TKN	mg/L	-	1.3	2.1	1.46	1.13	0.83	0.74	0.83	1.2	0.99	0.070	1
Hydrocarbons													
Benzene	mg/L	0.005	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	<0.05	<0.050	<0.25	<0.1	<0.75	<0.10	<0.10	<0.10	<0.10	<0.10
Organics													
COD	mg/L	-	14	21	17.3	11.8	100	56	49	92	49	21	36
DOC	mg/L	-	n/a	6	5.6	6.2	8.3	6.2	7.4	5.1	7.0	5.4	6.7
Metals													
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0047	0.0058
Antimony	mg/L	0.006	0.0008	n/a	n/a	0.00046	<0.006	<0.0060	0.00091	<0.00060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00033	0.0003
Barium	mg/L	1	0.011	0.014	0.0109	0.0105	0.011	0.011	0.01	0.014	<0.010	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.82	0.85	0.9
Cadmium	mg/L	0.005	0.0003	<0.001	<0.0010	0.000405	0.00012	0.00022	0.00012	0.000059	<0.00020	0.000026	0.000058
Chromium	mg/L	0.05	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.0010	<0.0010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.00030	<0.00030	<0.0030	<0.00030	<0.00030
Copper	mg/L	1	0.003	0.007	0.0047	0.0057	<0.002	<0.0020	0.0024	0.00084	<0.0020	0.0024	0.002
Lead	mg/L	0.01	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.00020	<0.00020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.018	<0.040	<0.040
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.008	0.007	0.0065	0.0072	0.01	0.006	0.0062	0.0054	0.0056	0.0057	0.006
Nickel	mg/L	-	0.004	0.004	0.0042	0.0037	<0.005	<0.0050	0.0028	0.0024	<0.0050	0.0051	0.0023
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.004	0.0042	0.0041
Zinc	mg/L	5	0.012	0.015	0.0064	0.0743	<0.03	<0.030	0.0052	<0.0030	<0.030	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E22B: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 22B															
				Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06
Field Measurements																				
Field pH	-	6.5-8.5	-	6.97	7.45	7.13	7.12	7.43	7.77	7.43	7.8	7.51	7.51	7.65	7.71	7.46	7.18	6.96	7.2	7.4
Field EC	mS		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7.96	18.78 (EF)	8.07	7.26
Field Temperature	℃		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.6	8.5	6.9	7.2
Routine Water																				
pH	-	6.5-8.5	6.5 - 8.5	7.97	7.5	7.64	7.7	7.66	7.61	7.76	7.69	7.72	7.81	8.06	8.2	8.1	8.2	8.1	8.1	8.2
Conductivity (EC)	µS/cm	1000	-	8110	7850	8400	8610	7590	7750	7870	7900	7940	7890	7420	7890	8010	5420	7460	8020	9950
Calcium	mg/L		-	42.5	119	140	127	98.4	119	106	125	123	128	105	118	70.8	44.9	71.9	126	187
Magnesium	mg/L		-	53	57.5	61.8	58.9	53.1	57.7	55.5	58.2	59.2	58.7	46.6	54.7	57.2	3.6	57.8	61.4	73.2
Sodium	mg/L	200	200	2180	1900	2250	2160	2150	1900	2020	2340	2450	1960	1910	2000	2010	1420	2120	2030	2530
Potassium	mg/L		-	13.5	9.97	17.1	10.1	12.8	8.2	11	11	11	7.4	9	7.3	10.7	4.6	10.2	9.5	13.9
Iron	mg/L	0.3	0.3	1.37	1.13	0.025	0.026	0.014	0.1	<0.02	0.018	<0.1	<0.1	<0.1	0.243	<0.005	0.005	<0.005	<0.005	0.005
Sulphate	mg/L	128|218|309|429	500	4140	4020	4540	4070	4480	4000	3880	4570	4890	4120	3800	3750	3800	2170	3590	3890	4970
Chloride	mg/L	100	250	1	1	<0.5	0.8	4.5	0.5	0.6	0.9	<0.5	3	<0.5	1	2	11	3	3	3
Bicarbonate	mg/L		-	1210	1230	1230	1230	1240	1230	1260	1190	1250	1220	1210	1180	1220	962	1230	1200	992
Carbonate	mg/L		-	n/a	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5
Nitrate (N)	mg/L	3	10	0.28	< 0.05	0.17	0.12	0.14	< 0.04	0.083	0.218	0.063	< 0.04	< 0.04	0.5	0.2	7.6	0.1	0.2	0.3
TDS*	mg/L	500	500	7030	6710	7620	7030	7430	6690	6700	7680	8150	6870	6470	6510	6550	4160	6460	6710	8270
Water Nutrients																				
Ammonia-N	mg/L		-	0.47	0.29	0.3	0.41	0.11	0.12	<0.05	0.34	<0.05	<0.05	0.23	<0.05	<0.05	0.1	<0.05	<0.05	0.27
TKN	mg/L		-	1	0.8	0.7	0.91	0.76	0.57	0.28	1.84	0.38	0.49	2.08	0.6	< 0.2	0.5	0.5	<0.2	0.6
Hydrocarbons																				
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L		0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																				
COD	mg/L		-	69	30	22	<5	28	24	12	98	12	14	74	10	< 10	18	20	14	20
DOC	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																				
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	0.006	<0.005	<0.005	<0.005	<0.006	<0.006	<0.05	<0.02	<0.02	<0.002	<0.002	<0.002	0.0007	0.0009	0.001	<0.0004	0.0008	0.006
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	1	0.0591	0.0293	0.0123	0.0074	0.0101	0.007	0.0125	0.0115	0.011	<0.01	0.014	0.009	0.012	0.01	0.012	0.01	0.013
Boron	mg/L	1	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0006	<0.005	<0.003	<0.003	<0.0001	<0.0001	<0.0001	0.0003	<0.001	0.0001	0.0004	0.0002	0.0002
Chromium	mg/L		0.05	0.0022	0.0016	<0.0008	<0.0009	<0.0009	<0.008	<0.004	<0.004	<0.005	0.0062	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L		-	0.0046	0.0044	0.0037	0.0048	0.0044	0.016	0.012	0.018	<0.001	<0.001	0.0022	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	0.007	1	0.007	0.005	0.003	0.002	0.003	<0.01	<0.005	0.008	<0.01	<0.01	<0.01	0.019	0.029	0.016	0.009	0.009	0.009
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.002	<0.002	0.005	0.003	<0.002	<0.02	0.017	<0.01	<0.001	<0.001	<0.001	<0.0001	<0.005	<0.0001	<0.0001	0.0002	<0.0001
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.00005	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L		-	0.001	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	mg/L	054|0.057|0.059|0.0	-	0.017	0.005	0.007	0.005	0.004	<0.01	0.014	0.029	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.0069
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Vanadium	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	0.03	5	0.0261	0.0165	0.0191	0.0136	0.0169	0.015	0.0045	0.013	0.016	< 0.01	0.018	0.022	0.031	0.025	0.011	0.013	0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E22B: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	Jan-07	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																
Field pH	-	6.5-8.5	-	n/a	7.44	7.56	7.569	7.300	7.84	7.71	7.35	5.5	7.7	7.8	7.57	7.5
Field EC	mS		-	n/a	17.20	19.83	7.270	>3.999	3.1	8.11	3.5	8.25	8.56	8.25	8.78	7870
Field Temperature	℃		-	n/a	4.8	10.08	14.9	11.5	11.6	9.6	6.8	10.3	6.4	8.4	9.7	7.8
Routine Water																
pH	-	6.5-8.5	6.5 - 8.5	8.0	8.2	8.1	8.1	8.18	8.14	8.03	8.18	8.24	8.07	7.86	7.97	8.23
Conductivity (EC)	µS/cm	1000	-	8280	8040	8240	7930	8320	8200	8100	8100	8200	8100	8200	8200	8000
Calcium	mg/L		-	135	109	117	113	112	109	110	120	100	110	120	110	110
Magnesium	mg/L		-	60.9	55.1	61.4	58	53.9	53.1	52	52	49	51	55	55	54
Sodium	mg/L	200	200	2230	2000	2100	2000	1910	1860	2000	2100	2000	2100	1900	2000	2000
Potassium	mg/L		-	12.0	10.7	9.2	5.8	9.61	8.79	9.9	9.8	9	8.5	10	10	9.8
Iron	mg/L	0.3	0.3		0.012	<0.005	<0.005	<0.0050	0.015	<0.06	<0.060	<0.060	0.075	<0.60	<0.60	<0.60
Sulphate	mg/L	128|218|309|429	500	3820	3440	3840	3470	3730	3590 *	3900	3800	3800	3900	3900	3900	3300
Chloride	mg/L	100	250	3	2	2	3	1.21	<10 *	3	1.5	1.8	1.3	1.8	1.4	1.9
Bicarbonate	mg/L		-	1180	1230	1240	1260	1240	1210	1200	1200	1200	1200	1200	1300	1200
Carbonate	mg/L		-	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	3	10	0.3	0.2	0.1	0.3	0.09	<1.0 *	0.14	0.18	0.11	0.11	0.16	<0.010	0.38
TDS*	mg/L	500	500	6840	6220	6740	6270	6430	6220	6600	6700	6600	6800	6600	6600	6000
Water Nutrients																
Ammonia-N	mg/L		-	n/a	<0.05	<0.05	<0.05	<0.050	<0.050	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	0.04
TKN	mg/L		-	n/a	0.5	0.3	0.4	0.58	0.88	0.51	0.36	0.46	0.36	0.52	0.27	0.32
Hydrocarbons																
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	<0.05	0.118	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																
COD	mg/L		-	n/a	15	17	22	20.8	12.9	41	19	37	15	51	18	20
DOC	mg/L		-	n/a	n/a	n/a	6	6.1	6.2	8	5.9	6	5.3	5.7	4.7	6.6
Metals																
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	<0.0030	0.0037
Antimony	mg/L	0.006	0.006	n/a	<0.0004	0.0009	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00035	0.00027
Barium	mg/L	1	1	n/a	0.01	0.008	0.008	0.0067	0.0101	<0.01	<0.010	<0.010	<0.010	<0.10	<0.10	<0.10
Boron	mg/L	1	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.25	0.25	0.25
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	n/a	<0.0001	0.0020	<0.001	<0.0010	0.00021	0.00013	0.000096	0.000082	0.00018	<0.00020	<0.000020	<0.000020
Chromium	mg/L		0.05	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0015	<0.0010
Cobalt	mg/L		-	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	0.007	1	n/a	0.006	0.005	0.009	0.0076	0.0093	<0.002	0.0046	<0.0020	<0.0020	<0.0020	0.0012	0.00037
Lead	mg/L	38|0.004|0.0042|0.0	0.01	n/a	<0.0001	0.0002	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.040	<0.040	<0.040
Mercury	mg/L	0.00005	0.001	n/a	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L		-	n/a	<0.005	,0.005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00081	0.00082
Nickel	mg/L	054|0.057|0.059|0.0	-	n/a	<0.002	0.005	0.004	0.0047	0.0044	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0020	0.0013
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00036	0.00028
Vanadium	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.010	<0.0010	<0.0010
Zinc	mg/L	0.03	5	n/a	0.005	0.020	0.024	0.006	0.0026	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E23A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 23A															
			Oct-97	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	Apr-06
Field Measurements																			
Field pH	-	-	n/a	7.11	8.54	7.69	8.26	9.07	8.78	9.07	8.46	8.81	8.75	8.73	7.76	8.49	8.04	8.19	8.05
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.9	6.04 (EF)	2.56
Field Temperature	℃	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	12.4	4.3	8.1
Routine Water																			
pH	-	6.5 - 8.5	8.22	8.35	8.54	8.67	8.72	8.73	8.61	8.7	8.48	8.72	8.57	8.63	8.5	8.5	8.5	8.5	8.5
Conductivity (EC)	µS/cm	-	3740	9620	5490	3820	3260	3160	2990	2750	2740	2640	2420	2590	2340	2610	2440	2430	2450
Calcium	mg/L	-	32.2	109	22.2	20.6	13.7	7.7	8.9	6.7	8	6.4	3.7	7.6	6.5	7.4	7.2	7.1	9
Magnesium	mg/L	-	9.2	30.1	5.5	14.8	7.32	1.81	1.88	1.4	1.16	<1	<1	1.1	1	1.2	<0.1	1.5	1.1
Sodium	mg/L	200	1260	2620	1400	978	897	830	840	685	762	706	678	730	631	672	628	631	633
Potassium	mg/L	-	6.71	13.8	6.24	14.6	8.7	3.2	3.2	2.5	2.3	<2	<2	2.3	1.8	1.4	1.7	2.3	2.4
Iron	mg/L	0.3	0.017	102	n/a	< 0.003	n/a	n/a	n/a	0.021	< 0.003	<0.05	0.09	<0.05	0.254	0.011	0.046	0.009	0.073
Sulphate	mg/L	500	1780	5540	2390	1510	1110	768	836	635	679	509	380	537	281	413	318	301	329
Chloride	mg/L	250	1.9	5.6	16.8	18.5	18.6	18.5	< 0.5	14.1	14.4	13.4	15.7	15.8	17	18	18	19	20
Bicarbonate	mg/L	-	1230	509	648	821	659	842	956	1020	1010	1020	1120	1080	1190	1170	1200	1220	1210
Carbonate	mg/L	-	n/a	8.12	54.3	67.7	60	91	56	50	56	87	58	65	32	32	33	34	28
Nitrate (N)	mg/L	10	n/a	<0.05	<0.05	0.09	0.055	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1
TDS*	mg/L	500	3700	8570	4210	3030	n/a	2140	2220	1900	2020	1830	1690	1890	1560	1720	1600	1590	1620
Water Nutrients																			
Ammonia-N	mg/L	-	0.63	2.75	2.04	0.84	3.21	1.66	0.81	1.03	0.85	0.76	0.69	0.98	0.79	0.7	0.42	0.68	1.03
TKN	mg/L	-	0.94	26.7	2.52	11.9	5.42	2.08	1.7	1.49	2.31	1.7	1.82	4.94	1.1	1.3	1.9	1.7	3.6
Hydrocarbons																			
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Organics																			
COD	mg/L	-	18	1650	95	937	65	85	62	50	99	67	72	187	40	10	48	51	42
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Metals																			
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	<0.005	n/a	n/a	0.008	n/a	n/a	n/a	n/a	<0.005	0.0015	0.007	0.0028	0.0007	0.0009	0.0015	<0.0004	0.0018
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	0.0463	n/a	n/a	0.0149	n/a	n/a	n/a	n/a	0.0227	0.057	0.017	0.032	0.027	0.022	0.023	0.029	0.033
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	<0.0005	n/a	n/a	<0.0005	n/a	n/a	n/a	n/a	<0.0005	0.00002	<0.0001	0.00009	<0.001	<0.001	<0.0001	<0.0001	0.0002
Chromium	mg/L	0.05	<0.0008	n/a	n/a	<0.0008	n/a	n/a	n/a	n/a	<0.0008	0.0024	<0.005	0.0029	0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	-	0.0015	n/a	n/a	0.0019	n/a	n/a	n/a	n/a	0.0023	0.0052	<0.001	0.0011	<0.002	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	1	<0.001	n/a	n/a	0.002	n/a	n/a	n/a	n/a	0.004	0.036	<0.01	0.004	0.004	0.004	0.004	0.003	0.005
Lead	mg/L	0.01	0.002	n/a	n/a	0.002	n/a	n/a	n/a	n/a	<0.002	0.0083	<0.001	0.0003	<0.005	<0.005	0.0002	<0.0001	0.0003
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	<0.0001	<0.0001	n/a	<0.0001	n/a	n/a	n/a	n/a	n/a	n/a	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	-	0.003	n/a	n/a	0.035	n/a	n/a	n/a	n/a	0.031	0.025	0.019	0.02	0.01	0.012	0.01	0.011	0.011
Nickel	mg/L	-	0.019	n/a	n/a	0.011	n/a	n/a	n/a	n/a	0.011	0.0276	0.015	0.0261	0.014	0.005	0.018	0.013	0.017
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	0.0096	n/a	n/a	0.0067	n/a	n/a	n/a	n/a	0.0107	0.053	<0.01	0.007	0.029	0.009	0.009	0.004	0.005

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E23A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements															
Field pH	-	-	8.36	8.15	7.89	8.529	7.5	8.3	8.63	7.85	6.08	8.5	8.8	8.65	8.8
Field EC	mS	-	2.73	5.78	5.73	2.190	2.632	1.935	2.52	3.5	2.81	2.25	2.24	2.24	2130
Field Temperature	℃	-	5.3	7.4	9.2	9.0	11.2	10.2	11.3	12	9.1	7.9	8.9	8.6	8.5
Routine Water															
pH	-	6.5 - 8.5	8.6	8.5	8.5	8.5	8.57	8.57	8.63	8.57	8.63	8.48	8.44	8.53	8.75
Conductivity (EC)	µS/cm	-	2440	2090	2450	2290	2320	2220	2400	2300	2200	2200	2100	2100	2100
Calcium	mg/L	-	7.6	4.8	6.5	6.6	5.7	5.5	6	4.7	4.8	5.4	4.1	4.1	4.4
Magnesium	mg/L	-	1.3	0.2	0.2	1.1	0.8	0.74	0.8	0.62	0.6	0.63	0.48	0.49	0.47
Sodium	mg/L	200	633	536	656	601	578	519	600	580	550	570	500	560	570
Potassium	mg/L	-	2.5	2.3	1.9	1.4	2	2.01	2.2	2.2	1.9	1.8	2.2	2.0	2
Iron	mg/L	0.3	0.260	0.098	0.029	0.032	0.0698	0.02	<0.06	<0.060	<0.060	0.38	<0.060	<0.060	<0.060
Sulphate	mg/L	500	280	60.6	284	232	193	155	190	190	160	110	90	85	77
Chloride	mg/L	250	19	9	18	18	16.7	16.1	18	19	19	17	20	18	21
Bicarbonate	mg/L	-	1190	1290	1260	1290	1250	1200	1200	1300	1200	1300	1300	1300	1300
Carbonate	mg/L	-	43	36	31	29	41.2	45.3	44	35	55	28	17	26	54
Nitrate (N)	mg/L	10	<0.1	9.7	<0.1	0.7	<0.050	<0.050	0.016	0.005	<0.003	<0.010	<0.010	<0.010	<0.044
TDS*	mg/L	500	1570	1330	1610	1520	1450	1330	1500	1500	1400	1400	1300	1300	1300
Water Nutrients															
Ammonia-N	mg/L	-	0.94	0.44	0.78	0.85	0.785	0.426	1.1	0.86	0.79	0.6	0.76	0.76	0.93
TKN	mg/L	-	2.7	2.9	1.5	1.5	1.71	2.01	3.2	1.7	2	1.5	1.4	1.5	1.6
Hydrocarbons															
Benzene	mg/L	0.005	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	0.12	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	<0.05	0.095	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics															
COD	mg/L	-	44	21	39	49	46.5	44.9	190	78	78	81	55	55	57
DOC	mg/L	-	n/a	n/a	n/a	14	15.2	16.8	16	19	18	16	16	16	21
Metals															
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0043	0.0049	0.01
Antimony	mg/L	0.006	0.0017	0.0016	0.0008	n/a	n/a	<0.00040	<0.006	<0.00060	0.0012	0.00082	<0.00060	<0.00060	0.0013
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0065	0.0058	0.009
Barium	mg/L	1	0.036	0.097	0.032	0.032	0.0331	0.0356	0.04	0.037	0.043	0.040	0.038	0.050	0.063
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.77	0.88	0.85
Cadmium	mg/L	0.005	0.0003	0.0002	0.0001	<0.001	<0.0010	0.000085	0.00006	0.00011	0.000066	0.000075	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	0.00036	0.0003	0.0007	<0.00030	<0.00030	<0.00030
Copper	mg/L	1	0.004	0.002	0.001	0.004	0.0016	0.0014	<0.002	0.00059	0.00026	0.0028	0.00042	0.00049	<0.00020
Lead	mg/L	0.01	0.0007	<0.0001	0.0003	<0.005	<0.0050	0.00016	<0.002	<0.00020	<0.00020	0.00088	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0071	0.0079	0.0064
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.009	0.01	0.009	0.006	0.0065	0.0059	0.006	0.0058	0.0055	0.0050	0.0042	0.0046	0.0045
Nickel	mg/L	-	0.019	0.002	0.009	0.01	0.0079	0.0054	0.011	0.0069	0.0069	0.0097	0.0032	0.0031	0.0095
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0032	0.0027	0.0049
Zinc	mg/L	5	0.005	0.005	0.036	0.016	0.0093	0.0033	<0.03	0.0071	<0.0030	0.0031	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E23B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 23B																	
			Oct-98	Oct-99	Apr-00	Oct-00	Apr-01	Oct-01	Apr-02	Oct-02	Apr-03	Oct-03	Apr-04	Oct-04	Apr-05	Oct-05	May-06	Oct-06	Apr-07	Oct-07	May-08
Field Measurements																					
Field pH	-	-	6.98	n/a	7.18	7.71	7.33	7.71	7.5	7.51	7.52	7.58	7.51	7.36	7.2	6.87	7.11	7.27	7.14	7.19	7.437
Field EC	mS	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.44	24.7 (EF)	11.1	7.19	23.8	21.1	8.730
Field Temperature	°C	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9.8	8.2	5.9	6.6	6.0	7.2	9.0
Routine Water																					
pH	-	6.5 - 8.5	7.69	7.68	7.67	7.67	7.54	7.67	7.59	7.8	7.75	7.95	8.1	8.1	8	8	8	8.3	8.2	8.0	8
Conductivity (EC)	µS/cm	-	8760	9560	10000	8950	9280	9590	9140	9480	9220	8970	9870	9580	9660	8940	10200	8250	10100	9790	9490
Calcium	mg/L	-	113	181	162	147	192	172	191	193	191	168	201	169	209	158	163	121	184	171	173
Magnesium	mg/L	-	49.4	51.7	48.2	39.9	51.8	50.3	43.3	41.6	45.1	35.6	64	54.6	71.2	63.7	66.1	64.8	71.5	65.3	65.9
Sodium	mg/L	200	2290	2540	2560	2560	2460	2610	2620	2730	2280	2330	2660	2610	2610	2690	2660	2070	2540	2490	2360
Potassium	mg/L	-	14.6	10.4	10.3	13.8	10	13	12	11	8.1	10	10.9	12.8	11.3	13.1	11.9	11.4	13	11.0	7.2
Iron	mg/L	0.3	0.46	0.02	0.064	<0.003	0.086	< 0.02	0.066	<0.1	<0.1	<0.1	0.69	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	0.035	<0.005
Sulphate	mg/L	500	4770	5520	4990	5880	5450	5410	5240	6280	5420	5000	5490	5370	5050	5450	4960	3730	4850	4970	4480
Chloride	mg/L	250	3.8	2.5	5.2	3.6	4	3.8	3.4	3.1	3.3	2.7	3	4	3	3	4	3	3	3	4
Bicarbonate	mg/L	-	842	930	938	926	933	939	897	930	917	910	915	963	968	977	969	1200	1040	1050	1080
Carbonate	mg/L	-	n/a	n/a	<6	<6	<6	<6	<6	<6	<6	<6	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nitrate (N)	mg/L	10	0.24	0.09	0.225	0.25	< 0.04	0.33	0.066	0.159	< 0.04	< 0.04	0.6	0.2	<0.5	0.2	0.2	0.2	0.3	0.1	<0.1
TDS*	mg/L	500	7650	8760	8230	9070	8630	8720	8550	9710	8410	7990	8880	8700	8430	8860	8340	6590	8170	8230	7620
Water Nutrients																					
Ammonia-N	mg/L	-	0.91	1.91	1.69	1.55	0.8	1.15	1.56	1.56	1.23	1.79	0.1	1.12	0.46	1.30	1.10	<0.05	0.32	0.52	0.56
TKN	mg/L	-	1.45	2.36	2.39	1.8	1.59	1.25	2.78	1.9	1.64	3.12	<0.2	1.2	0.7	1.6	1.3	0.4	0.6	0.9	1.2
Hydrocarbons																					
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05
Organics																					
COD	mg/L	-	69	30	17	20	19	16	71	14	19	46	< 10	< 10	19	20	23	19	19	18	27
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7
Metals																					
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Antimony	mg/L	0.006	<0.005	0.007	<0.006	<0.006	<0.05	<0.02	<0.02	<0.002	<0.002	<0.002	0.006	0.0011	0.0008	<0.0004	0.0007	0.0005	<0.0004	0.0007	n/a
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Barium	mg/L	1	0.0741	0.0184	0.0118	0.0121	0.01	0.02	0.0095	0.011	<0.01	0.012	0.012	0.012	0.012	0.014	0.011	0.011	0.012	0.009	0.012
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cadmium	mg/L	0.005	0.0007	<0.0005	<0.0006	<0.0006	<0.005	<0.003	<0.003	<0.0001	<0.0001	0.00011	<0.001	<0.001	0.0007	<0.0001	0.0001	<0.0001	<0.0001	0.0003	<0.001
Chromium	mg/L	0.05	0.0018	<0.0008	<0.0009	<0.0009	<0.008	<0.004	<0.004	<0.005	< 0.005	<0.005	<0.005	0.014	<0.005	0.010	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt	mg/L	-	0.0032	0.0041	0.0058	0.005	0.019	0.014	0.018	0.0019	<0.001	0.0013	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper	mg/L	1	0.005	0.009	0.006	0.005	<0.01	<0.005	0.006	0.011	<0.01	0.016	0.032	0.039	0.024	0.010	0.009	0.008	0.005	0.005	0.01
Lead	mg/L	0.01	<0.002	0.005	<0.002	<0.002	<0.02	0.012	<0.01	<0.001	<0.001	<0.001	<0.005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Molybdenum	mg/L	-	0.003	0.004	0.002	< 0.001	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	mg/L	-	0.016	0.042	0.014	0.009	<0.01	0.016	0.026	<0.005	<0.005	<0.005	<0.002	0.002	<0.002	<0.002	<0.002	0.004	<0.002	0.005	0.005
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	mg/L	5	0.0354	0.0314	0.016	0.0208	0.02	0.014	0.0035	0.02	<0.01	0.016	0.04	0.038	0.033	0.016	0.016	<0.002	0.034	0.023	0.016

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E23B: Chemical Analysis Results - Ryley Integrat

Parameter ID	Units	Regulatory Limits[1]	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements											
Field pH	-	-	8.3	n/a	7.43	7.17	5.77	7.5	7.8	7.45	7.3
Field EC	mS	-	1.816	n/a	9.39	4.38	10.67	9.8	9.75	10.17	9700
Field Temperature	℃	-	13.2	n/a	12.9	8.8	9.5	9.9	9.8	10.3	9.3
Routine Water											
pH	-	6.5 - 8.5	8.19	8.16	7.94	8.07	8.24	8.06	7.76	7.89	8.05
Conductivity (EC)	µS/cm	-	9710	9530	9400	9400	9700	9600	9700	9900	10000
Calcium	mg/L	-	160	178 *	160	160	150	170	170	170	170
Magnesium	mg/L	-	59.7	64.2 *	56	56	55	64	62	63	66
Sodium	mg/L	200	2200	2440 *	2300	2500	2300	2400	2300	2400	2400
Potassium	mg/L	-	11.7	11.4 *	12	11	11	11	13	12	12
Iron	mg/L	0.3	<0.0050	1.63 *	0.07	0.07	<0.060	<0.60	<0.60	<0.60	<0.60
Sulphate	mg/L	500	4700	4550 *	5000	4900	5400	5200	4900	4900	4700
Chloride	mg/L	250	2.33	<10 *	3	2.2	2.6	2.2	2.6	1.9	3.7
Bicarbonate	mg/L	-	1070	1040	1000	1000	1100	1100	1000	1100	1100
Carbonate	mg/L	-	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.147	<1.0 *	0.24	0.073	0.26	0.36	0.072	0.32	0.85
TDS*	mg/L	500	7660	7760	8100	8200	8500	8400	7900	8000	7900
Water Nutrients											
Ammonia-N	mg/L	-	0.652	0.311	0.42	0.3	0.39	0.18	0.42	<0.050	0.39
TKN	mg/L	-	1.37	1.37	0.91	0.76	1.1	0.56	0.76	0.46	0.67
Hydrocarbons											
Benzene	mg/L	0.005	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	0.061	<0.25	<0.1	0.23	<0.10	<0.10	<0.10	<0.10	<0.10
Organics											
COD	mg/L	-	18.8	12.6	37	30	45	47	23	22	22
DOC	mg/L	-	6.8	7.2	9.6	6.5	7.1	5.8	7.4	5.5	9.5
Metals											
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0081	<0.0030
Antimony	mg/L	0.006	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00024	0.0003
Barium	mg/L	1	0.0111	0.0159	<0.01	<0.010	<0.010	<0.10	<0.10	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	0.35	0.40	0.36
Cadmium	mg/L	0.005	<0.0010	0.000335	0.00014	0.000083	0.00062	0.00005	<0.00020	0.00028	0.000047
Chromium	mg/L	0.05	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.0020	0.0023	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	0.00033
Copper	mg/L	1	0.0092	0.0168	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0013	<0.00020
Lead	mg/L	0.01	<0.0050	0.00236	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	0.14	0.065	0.12
Mercury	mg/L	0.001	<0.00010	<0.00010	<0.000005	0.0000025	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0005	0.00025
Nickel	mg/L	-	0.0054	0.0072	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0028	0.0012
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	0.0023	0.0020	0.0035
Zinc	mg/L	5	0.0076	0.0099	<0.03	<0.030	<0.030	<0.030	<0.030	0.0039	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E24A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 24A															
			Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																			
Field pH	-	-	7.95	7.59	7.69	7.63	8.26	7.73	7.72	7.85	7.783	8.03	7.9	7.69	6.74	7.9	8.1	7.85	7.7
Field EC	mS	-	n/a	6.55	19.95 (EF)	6.32	2.22	14.86	14.62	5.8	6.040	15.4	6.5	2.66	7.17	6.24	6.57	6.91	12.15
Field Temperature	°C	-	n/a	9.5	8.4	8.0	6.0	4.3	10.83	5.10	6.40	18.3	9.3	8.7	10.1	9.9	8.0	8.5	7.6
Routine Water																			
pH	-	6.5 - 8.5	8.3	8.3	8.3	8.2	8.4	8.3	8.1	8.2	8.24	8.13	8.13	8.21	8.24	8.28	7.98	8.08	7.96
Conductivity (EC)	µS/cm	-	6110	6100	5600	6210	6210	6350	6310	5.97	6150	6140	6300	6200	6300	6200	6200	6100	12000
Calcium	mg/L	-	74.7	88.4	91.1	87.4	84.1	79.1	82.7	77.4	71.2	68.5	71	73	64	80	67	69	260
Magnesium	mg/L	-	12.6	10.3	11.6	10.3	11.2	9.7	9.5	9.9	8.59	8.37	8.7	8.1	7.3	9.7	7.5	7.9	180
Sodium	mg/L	200	1530	1520	1620	1520	1510	1520	1570	1490	1450	1410	1700	1600	1400	1500	1500	1400	3100
Potassium	mg/L	-	6.9	6.2	6.4	6.6	6.8	6.8	6.6	3.9	6.29	5.8	5.2	5.8	5.3	5.2	5.6	5.6	11
Iron	mg/L	0.3	<0.005	0.013	0.184	<0.005	<0.005	0.007	0.113	<0.005	<0.05	0.017	<0.06	<0.060	<0.060	1.1	<0.060	<0.60	<0.60
Sulphate	mg/L	500	2970	2720	3010	2910	2790	2730	2910	2670	2740	2730 *	2800	2900	3000	3100	2900	2800	6400
Chloride	mg/L	250	5	4	5	6	5	5	4	5	4.02	<10 *	4	4	3.9	4.3	5.0	4.0	16
Bicarbonate	mg/L	-	n/a	716	701	701	662	708	710	737	728	706	700	700	720	720	710	710	970
Carbonate	mg/L	-	<5	<5	5	<5	16	6	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.1	<0.1	<0.1	0.5	0.2	0.6	0.3	0.5	0.261	<1.0 *	1.8	0.91	1.5	1.1	1.2	1.2	9.2
TDS*	mg/L	500	4950	4700	5090	4890	4750	4710	4930	4620	4640	4570	4900	5000	4900	5100	4800	4700	10000
Water Nutrients																			
Ammonia-N	mg/L	-	1.65	0.09	2.15	1.91	1.96	1.67	1.88	1.7	1.59	0.815	1.5	1.5	1.2	0.84	1.1	0.061	1.3
TKN	mg/L	-	1.9	0.7	2.6	2.2	2.3	2.1	1.6	2.2	2.25	1.5	1.8	1.9	1.8	1.4	1.5	0.45	2.7
Hydrocarbons																			
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																			
COD	mg/L	-	<10	20	18	19	10	15	15	19	15.3	15.6	37	41	23	27	37	16	84
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5	4.9	5.5	5.7	5	5.2	4.5	5.3	4.3	38
Metals																			
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0049	0.0034
Antimony	mg/L	0.006	0.0012	0.0009	0.0005	0.0013	0.0010	0.0006	0.0009	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00045	0.0014
Barium	mg/L	1	0.045	0.04	0.043	0.041	0.033	0.032	0.027	0.028	0.0249	0.025	0.02	0.021	0.02	<0.10	0.018	<0.10	<0.10
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.79	0.84	0.62
Cadmium	mg/L	0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	<0.000050	<0.000050	<0.050	0.000076	<0.000050	<0.00020	<0.000020	0.00009
Chromium	mg/L	0.05	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	0.00084
Copper	mg/L	1	0.024	0.019	0.009	0.006	0.007	0.006	0.003	0.007	0.0066	0.0076	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00069	0.004
Lead	mg/L	0.01	<0.005	0.0003	0.0002	0.0009	0.0002	<0.0001	<0.0001	<0.005	<0.0050	0.00011	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.055	0.065	0.38
Mercury	mg/L	0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000022	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.003	0.0028	0.0027	<0.0020	0.0021	0.0025	0.0057
Nickel	mg/L	-	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.004	0.003	0.0027	0.0034	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0019	0.016
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	0.0027
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0010	0.00090	0.25
Zinc	mg/L	5	0.023	0.449	0.012	0.016	0.006	0.028	0.007	0.006	0.011	0.0075	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E24B: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 24B																
				Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Jan-07	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	May-15	Jun-16	Jun-17
Field Measurements																				
Field pH	-	6.5-8.5	-	7.64	7.35	7.58	7.22	7.4	n/a[1]	7.51	7.08	7.87	7.48	7.66	7.45	7.33	6.22	7.8	7.5	6.15	7.3
Field EC	mS		-	n/a	10.3	24.4 (EF)	9.35	8.31	n/a[1]	9.87	21.97	8680	9.570	19.2	9.21	3.89	9.92	10.01	9.48	11.85	9.59
Field Temperature	°C		-	n/a	7.2	7.6	5.4	7.7	n/a[1]	4.2	10.57	4.5	4	16.1	10.5	8.2	10.1	4.9	7.8	n/a	7.3
Routine Water																				
pH	-	6.5-8.5	6.5 - 8.5	8.2	8.1	8.2	8	8.2	8.0	8.2	7.9	8.1	8.08	7.94	8.02	8.07	8.1	8.15	7.74	7.96	7.86
Conductivity (EC)	µS/cm	1000	-	10300	9150	8200	8860	9860	9440	10000	9570	8860	9560	9390	9500	9200	9000	9100	9000	9100	9200
Calcium	mg/L		-	240	257	241	240	256	261	247	241	225	234	203 *	190	240	240	270	280	320	360
Magnesium	mg/L		-	151	125	139	113	154	135	135	130	128	127	126 *	110	130	130	160	140	170	200
Sodium	mg/L	200	200	2700	2420	2520	2120	2450	2460	2440	2270	2140	2140	200 *	2300	2300	1900	2000	2000	1900	1900
Potassium	mg/L		-	14.4	10.3	12.3	10.1	13.2	12.8	11.9	8.5	4.7	10.7	10.5 *	9	10	9.4	9.1	10	12	10
Iron	mg/L	0.3	0.3	<0.005	<0.005	<0.005	<0.005	<0.005	n/a[1]	<0.005	0.007	<0.005	<0.050	<0.050 *	<0.06	<0.060	<0.060	<0.60	<0.060	<0.060	<0.60
Sulphate	mg/L	128|218|309|429	500	6210	5210	5300	4590	4980	4920	4820	4730	4280	4720	4310 *	4200	4700	4700	5100	4700	4400	4600
Chloride	mg/L	100	250	6	9	35	40	76	77	70	108	99	115	125 *	n/a	100	93	82	81	72	54
Bicarbonate	mg/L		-	961	941	1070	1030	1080	1090	1080	1150	1170	1150	1170	1200	1200	1200	1100	1100	1000	970
Carbonate	mg/L		-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hydroxide	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	3	10	<0.1	<0.5	<0.1	<0.1	0.4	<0.1	0.2	<0.1	<0.1	<0.050	<1.0 *	0.09	0.0055	0.022	0.013	0.014	<0.010	<0.22
TDS*	mg/L	500	500	9790	8490	8770	7620	8460	8400	8250	8050	7450	7910	7500	7500	8000	7600	8100	7700	7300	7600
Water Nutrients																				
Ammonia-N	mg/L		-	0.05	<0.05	<0.05	<0.05	<0.05	n/a	<0.05	<0.05	<0.05	<0.050	<0.050	0.07	<0.050	<0.05	0.064	0.094	0.11	0.035
TKN	mg/L		-	1.2	1.4	1.3	1.4	1.8	n/a	1.4	1.2	2	2.21	1.81	1.4	1.3	1.3	1.2	1.1	0.75	0.85
Hydrocarbons																				
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																				
COD	mg/L		-	50	78	85	78	87	n/a	79	77	69	75.5	74.8	98	73	68	58	62	47	44
DOC	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	28	27.5	29	25	22	24	19	19	19	16
Metals																				
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	<0.0030	0.0039
Antimony	mg/L	0.006	0.006	0.0013	0.0008	<0.0004	0.0010	0.0008	n/a	<0.0004	0.0008	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00085	0.00071
Barium	mg/L	1	1	0.047	0.026	0.023	0.022	0.017	n/a	0.017	0.021	0.023	0.0109	0.0215	0.012	0.011	0.012	<0.10	<0.010	<0.010	<0.10
Boron	mg/L	1	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.24	0.26	0.24
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	n/a	<0.0001	<0.0001	0.001	<0.0010	<0.000050	<0.000050	<0.050	0.000066	0.000064	<0.00020	0.000047	0.000029
Chromium	mg/L		0.05	0.013	<0.005	0.008	<0.005	0.032	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	<0.0010	<0.0010
Cobalt	mg/L		-	<0.002	<0.002	<0.002	<0.002	<0.002	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.00030	<0.00030
Copper	mg/L	0.007	1	0.044	0.03	0.016	0.011	0.014	n/a	0.011	0.008	0.01	0.0121	0.013	0.004	0.0044	0.0036	0.0042	0.0036	0.0041	0.0022
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.005	<0.0001	<0.0001	0.0003	<0.0001	n/a	<0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0041	<0.0040	<0.040
Mercury	mg/L	0.00005	0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	n/a	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000024	<0.0000050	<0.0000050	<0.0000050	0.0000029	<0.0000020
Molybdenum	mg/L		-	<0.005	<0.005	<0.005	<0.005	<0.005	n/a	<0.005	<0.005	0.023	<0.0050	<0.0050	0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	0.0012
Nickel	mg/L	054|0.057|0.059|0.0	-	0.004	0.005	0.003	<0.002	0.032	n/a	0.009	0.017	0.014	0.0206	0.0358	0.05	0.049	0.055	0.06	0.06	0.071	0.068
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00035	0.00028
Uranium	mg/L	0.01	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.18	0.20	0.17
Zinc	mg/L	0.03	5	0.041	0.027	0.015	0.015	0.004	n/a	0.002	0.019	0.006	0.0041	0.0028	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Insufficient amount of water available during time of sampling (n/a[1])

Exceeds Regulatory Limit

Table E25A: Field Data and Chemical Analysis Results

Parameter ID	Units	Tier 1 Guideline	Regulatory Limits[1]	MW 25A															
				Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements																				
Field pH	-	6.5-8.5	-	7.95	7.82	8.13	7.62	8.02	8.21	7.71	8.274	8.900	8.41	8.4	8.42	8.02	10	8.6	8.39	8.4
Field EC	mS		-	n/a	2.54	5.33 (EF)	2.90	6.29	4.83	4.62	1.926	1.667	2.1	2.16	0.93	2.29	2.22	2.19	2.13	2.05
Field Temperature	ºC		-	n/a	11.1	3.8	9.2	7.1	8.8	9.88	7.7	13.1	11.7	10.7	8.6	10.1	7.1	8.3	9.4	8.2
Routine Water																				
pH	-	6.5-8.5	6.5 - 8.5	8.5	8.4	8.5	8.4	8.7	8.7	8.5	8.4	8.59	8.59	8.56	8.67	8.53	8.28	8.39	8.45	8.55
Conductivity (EC)	µS/cm	1000	-	4660	2380	2120	2110	2070	2070	2080	2000	2100	2050	2100	2200	2100	2000	2100	2100	2000
Calcium	mg/L		-	43	10.7	7.2	6.8	7.2	5.3	5.3	5.6	5.02	5.01	4.7	5.4	4.7	4.7	4.6	5.1	4.5
Magnesium	mg/L		-	21.8	0.4	1.1	0.9	1.1	0.2	<0.1	0.7	0.51	0.57	0.5	0.59	0.5	0.49	0.44	0.47	0.42
Sodium	mg/L	200	200	1270	625	558	557	539	553	585	543	511	436	450	490	570	480	490	540	490
Potassium	mg/L		-	9.3	2.7	2.5	1.9	2.5	2.9	1.7	1.3	1.74	1.9	1.8	2	1.9	1.9	2.3	1.8	1.7
Iron	mg/L	0.3	0.3	3.32	0.358	0.516	0.0186	0.112	0.175	0.057	0.068	0.0525	0.095	<0.06	<0.060	<0.060	<0.060	<0.060	<0.060	<0.06
Sulphate	mg/L	128|218|309|429	500	2090	323	60.7	102	52.1	36.2	21.3	24.7	19.8	13.2	n/a	3.2	7.1	14	13	4.3	3.1
Chloride	mg/L	100	250	30	14	11	3	10	9	10	10	7.74	7.24	10	8.3	8.5	8	9.2	8.4	8.9
Bicarbonate	mg/L		-	812	1220	1350	1350	1260	1330	1400	1430	1360	1320	1300	1300	1400	1400	1400	1400	1400
Carbonate	mg/L		-	31	25	42	25	53	55	38	26	50.7	49	38	62	39	<0.50	11	19	28
Nitrate (N)	mg/L	3	10	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.050	0.065	0.031	0.32	0.97	0.85	0.18	2
TDS*	mg/L	500	500	3900	1600	1340	1360	1280	1310	1350	1310	1270	1220	1200	1200	1300	1200	1200	1300	1200
Water Nutrients										y										
Ammonia-N	mg/L		-	0.68	0.42	0.54	0.83	0.85	0.62	0.68	0.68	0.68	0.281	0.67	1.2	0.59	0.42	0.41	0.62	0.55
TKN	mg/L		-	3.5	2.8	1.6	1.8	2.3	1	0.9	1.1	1.16	1.67	1.1	3.9	1.2	1.1	1.1	1.2	1.2
Hydrocarbons																				
Benzene	mg/L	0.005	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L		0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	1.1	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	n/a	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																				
COD	mg/L		-	40	35	15	24	21	23	18	28	21.7	19.6	40	190	29	32	35	29	25
DOC	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	7	9	9.7	14	9.8	9.3	7.9	8.1	7.9	9.6
Metals																				
Aluminum	mg/L	0.0007|0.05	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0051	0.0046	0.0043
Antimony	mg/L	0.006	0.006	0.001	0.0114	0.0012	0.0018	0.0015	0.0012	0.0011	n/a	n/a	0.00086	0.0011	0.0033	0.0012	0.00078	0.0011	<0.00060	0.00064
Arsenic	mg/L	0.005	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0021	0.0019	0.0023
Barium	mg/L	1	1	0.03	0.051	0.063	0.041	0.045	0.062	0.051	0.051	0.0547	0.0622	0.074	0.11	0.085	0.081	0.081	0.088	0.10
Boron	mg/L	1	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.81	0.94	0.83
Cadmium	mg/L	9|0.0002|0.00022|0	0.005	<0.001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001	<0.0010	0.000175	0.00011	0.000041	0.000033	<0.000025	0.000022	<0.000020	<0.000020
Chromium	mg/L		0.05	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L		-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	0.0006	0.00068	0.00037	0.00046	<0.00030	0.00034	0.00032
Copper	mg/L	0.007	1	0.012	0.01	0.003	0.003	0.003	0.001	0.002	0.004	<0.0010	0.0012	0.0018	0.0014	0.0022	0.0009	0.0009	0.00045	<0.00020
Lead	mg/L	38|0.004|0.0042|0.0	0.01	<0.005	0.0029	<0.0001	0.0003	0.0012	0.0004	0.0002	<0.005	<0.0050	0.0003	0.0002	0.00029	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.051	0.10	0.07
Mercury	mg/L	0.00005	0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000059	<0.0000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L		-	0.008	0.021	0.008	0.011	0.007	0.007	<0.005	<0.005	<0.0050	0.0052	0.005	0.013	0.0044	0.0039	0.0051	0.0064	0.006
Nickel	mg/L	054|0.057|0.059|0.0	-	0.003	0.01	0.003	0.007	0.005	0.003	0.003	0.003	0.0033	0.003	0.0041	0.0054	0.0025	0.0025	0.0032	0.0023	0.0022
Selenium	mg/L	0.001	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00041	<0.00020	<0.00020
Uranium	mg/L	0.01	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	0.00074	0.0012
Zinc	mg/L	0.03	5	0.022	0.064	0.004	0.023	0.011	0.005	0.017	0.026	0.0395	0.0048	0.011	0.005	0.0033	<0.0030	<0.0030	<0.0030	<0.0030
Polycyclic Aromatic Hydrocarbons (PAHs)																				
Benzo[a]pyrene equivalency	mg/L	0.00001	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	0.0058	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020
Anthracene	mg/L	0.000012	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	0.000018	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	0.000017	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	0.00004	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	0.003	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	0.001	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	0.0004	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	0.000025	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L		-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E25B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 25B															
			Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																			
Field pH	-	-	7.49	7.36	7.35	7.3	7.49	7.59	7.44	7.444	7.410	7.58	7.5	7.3	5.91	7.4	7.8	7.56	7.4
Field EC	mS	-	n/a	8.38	18.83 (EF)	7.66	9.12	19.39	20.36	8.560	8.880	2.4	9.03	3.98	10.59	9.91	10.02	9.51	9.72
Field Temperature	°C	-	n/a	6.9	5.9	6.1	9.9	6.8	10.09	8.8	7.9	11.6	11.9	8.3	10.1	7.2	8.2	8.6	7.5
Routine Water																			
pH	-	6.5 - 8.5	8.4	8.2	8.3	8.0	8.3	8.2	8.0	8.1	8.09	8.11	8.05	7.84	8.19	8.12	7.85	8.09	8.14
Conductivity (EC)	µS/cm	-	4860	8300	7490	8100	8660	8970	9120	8790	8900	9200	9200	9200	9400	9400	9500	9500	9500
Calcium	mg/L	-	52.7	172	145	172	168	172	175	174	175	181 *	180	190	170	190	190	190	190
Magnesium	mg/L	-	44.8	42.2	43.4	42.3	45.7	50.4	51.6	50.8	47.9	48.2 *	48	50	47	54	53	51	54
Sodium	mg/L	200	1520	2150	2310	2170	2190	2260	2300	2180	2160	2180 *	2200	2500	2200	2300	2200	2100	2300
Potassium	mg/L	-	7	10.1	11.8	10.1	12.1	12.2	10.9	7.6	11.8	10.8 *	12	12	11	11	12	12	12
Iron	mg/L	0.3	0.266	0.009	<0.005	0.010	<0.005	0.006	<0.005	<0.005	<0.050	<0.050 *	<0.06	<0.060	<0.060	<0.60	<0.60	<0.060	<0.6
Sulphate	mg/L	500	2720	3880	4420	4290	4210	4140	4480	4090	4350	4370 *	4800	4700	5100	5200	4600	4500	4100
Chloride	mg/L	250	2	2	3	10	2	3	2	3	1.69	<10 *	3	1.4	2	1.9	2.2	2.5	2.3
Bicarbonate	mg/L	-	973	1050	1060	1040	988	1030	1070	1080	1060	1040	1000	1000	1000	1100	1000	970	1000
Carbonate	mg/L	-	21	<5	<5	<5	<5	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	< 0.1	<0.5	<0.1	0.3	0.3	0.3	<0.1	0.8	0.187	<1.0 *	0.12	0.09	0.5	0.42	0.77	0.62	2.5
TDS*	mg/L	500	4850	6770	7450	7210	7120	7140	7550	7040	7270	7300	7800	8000	8000	8300	7600	7300	7100
Water Nutrients																			
Ammonia-N	mg/L	-	0.45	1.21	1.44	0.95	1.37	0.79	1.08	0.42	0.637	0.224	0.77	0.82	0.56	0.59	0.29	0.58	0.44
TKN	mg/L	-	1	1.6	1.9	1.4	1.8	1	1.3	0.8	1.43	1.44	1.3	1.2	0.53	0.84	0.86	1.2	0.87
Hydrocarbons																			
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.0004
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Organics																			
COD	mg/L	-	30	25	26	26	27	25	19	34	22.6	19	42	36	42	35	29	30	27
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	8.9	9.8	9.3	9.2	8.4	9	9.9	10	12
Metals																			
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0084	0.0053
Antimony	mg/L	0.006	0.0008	0.0014	0.0004	0.0008	0.0010	<0.0004	0.0006	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00055	0.00047
Barium	mg/L	1	0.056	0.038	0.031	0.025	0.027	0.018	0.019	0.02	0.0157	0.0217	0.01	0.012	0.015	<0.10	<0.10	0.011	<0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.46	0.46	0.47
Cadmium	mg/L	0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.001	<0.0010	<0.000050	0.00009	<0.050	0.000069	0.00021	<0.00020	<0.000020	<0.00002
Chromium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0016	<0.001
Cobalt	mg/L	-	0.004	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00075	0.00065
Copper	mg/L	1	0.01	0.021	0.01	0.007	0.009	0.005	0.005	0.01	0.0085	0.0098	<0.002	0.0036	<0.0020	<0.0020	<0.0020	0.00081	0.00041
Lead	mg/L	0.01	<0.005	0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	<0.00010	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.17	0.18	0.21
Mercury	mg/L	0.001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.002	<0.0020	<0.0020	<0.0020	<0.0020	0.00072	0.00067
Nickel	mg/L	-	0.006	0.005	0.004	0.002	0.008	<0.002	0.006	0.008	0.0058	0.0065	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0031	0.0028
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0010	0.00033	0.00028
Zinc	mg/L	5	0.016	0.028	0.013	0.024	0.005	0.264	0.016	0.018	0.0042	0.0074	<0.03	<0.030	<0.030	<0.030	<0.030	<0.0030	<0.003
Polycyclic Aromatic Hydrocarbons (PAHs)																			
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020
Anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E26A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 26A																
			Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Jan-07	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17
Field Measurements																				
Field pH	-	-	8.11	7.01	8.1	8.2	7.7	n/a	NM	8.62	n/a	8.4	8.51	8.48	8.1	8.31	9.9	n/a	n/a	-
Field EC	mS	-	n/a	n/a	8.18 (EF)	3.51	6.53	n/a	4.26	6.54	n/a	2.162	2.4	2.94	2.15	2.97	2.91	n/a	n/a	-
Field Temperature	°C	-	n/a	n/a	2.9	7.8	7.9	n/a	8.5	8.32	n/a	12.3	10.7	10.5	8.6	9.4	6.7	n/a	n/a	-
Routine Water																				
pH	-	6.5 - 8.5	8.5	8.5	8.5	8.6	8.4	8.4	8.4	8.5	8.5	8.61	8.57	8.58	8.68	8.58	8.45	8.38	8.53	8.56
Conductivity (EC)	µS/cm	-	2640	3930	3310	3010	6550	2980	2970	3020	2850	2900	2890	2900	2800	2,700	2700	2700	2600	2600
Calcium	mg/L	-	20.4	25.7	15.4	14.5	82.5	13.2	12.9	12.1	11.2	10	10.9	9.6	7.5	9.5	9.5	9.1	8.7	8.5 *
Magnesium	mg/L	-	3	9	5.0	3.5	52.9	3.0	2.6	1.8	2.3	1.84	1.88	1.6	1.1	1.4	1.4	1.2	1.1	1.2 *
Sodium	mg/L	200	769	938	798	750	1640	759	771	787	674	650	672	770	680	690	680	650	640	670 *
Potassium	mg/L	-	3.8	4.2	4.2	2.9	7.7	3.2	3.4	3.0	1.6	2.27	2.58	2.2	2.3	2.3	2.4	2.7	2.5	2.4 *
Iron	mg/L	0.3	3.77	0.09	0.239	0.043	0.011		0.083	0.059	0.017	<0.0050	0.026	<0.06	<0.060	<0.060	0.15	<0.060	0.084	<0.060 *
Sulphate	mg/L	500	812	1240	948	783	2970	720	731	756	629	633	651	680	730	610	610	520	490	510
Chloride	mg/L	250	15	5	9	6	2	6	6	6	5	4.89	3.75	6	5.4	5.8	5.9	5.3	5.0	5.4
Bicarbonate	mg/L	-	968	930	965	989	907	1010	1020	988	1030	999	967	1000	970	1,000	1000	1100	1100	1100
Carbonate	mg/L	-	31	22	38	32	20	16	12	31	24	43.4	40.3	29	41	34	15	8.6	23	23
Nitrate (N)	mg/L	10	0.2	1.2	0.4	1.1	0.1	1.2	1.6	1.5	1.7	1.29	1.01	3.4	1.5	1.8	1.6	0.94	1.0	5.7
TDS	mg/L	500	2130	2710	2290	2080	5220	2020	2050	2090	1860	1840	1860	2000	2000	1,900	1800	1700	1700	1700
Water Nutrients										.										
Ammonia-N	mg/L	-	0.75	0.2	0.96	0.27	0.58	n/a	<0.05	<0.05	<0.05	<0.050	0.209	<0.05	<0.050	<0.05	<0.050	<0.050	<0.050	<0.015
TKN	mg/L	-	1.8	4.4	2.3	1.0	0.9	n/a	0.8	0.6	0.7	0.49	1.34	0.58	0.89	1.2	0.78	1.7	1.2	0.77
Hydrocarbons																				
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	0.071	<0.25	<0.1	<0.10	<0.21	<0.10	<0.26	<0.10	<0.10
Organics																				
COD	mg/L	-	40	37	25	24	30	n/a	24	25	24	20.9	15.8	33	50	77	29	n/a	51	26
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	8	8.7	8.9	9.9	9.8	9.8	7.8	9.3	10	-
Metals																				
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0049	0.15	0.0099 *
Antimony	mg/L	0.006	0.002	0.0018	0.0013	0.0014	0.0005	n/a	0.0011	0.0008	n/a	n/a	<0.00040	<0.0006	<0.00060	0.00061	<0.00060	<0.00060	<0.00060	<0.00060 *
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0021	0.0024	0.0023 *
Barium	mg/L	1	0.096	0.018	0.015	0.029	0.017	n/a	0.034	0.029	0.031	0.036	0.0397	0.041	0.039	0.041	0.045	0.033	0.047	0.054 *
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.74	0.85	0.81 *
Cadmium	mg/L	0.005	< 0.001	<0.0001	<0.0001	0.0001	0.0001	n/a	<0.0001	<0.0001	<0.001	<0.0010	0.00005	0.000076	<0.050	0.00021	0.000034	<0.000020	<0.000020	<0.000020 *
Chromium	mg/L	0.05	0.006	0.007	<0.005	0.006	<0.005	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.001	<0.0010	0.0015	0.0012	<0.0010	<0.0010	<0.0010 *
Cobalt	mg/L	-	0.004	<0.002	<0.002	<0.002	<0.002	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	<0.0003	<0.00030	0.00032	0.00034	<0.00030	<0.00030	<0.00030 *
Copper	mg/L	1	0.011	0.006	0.007	0.007	0.006	n/a	0.003	0.002	0.016	0.0028	0.0031	0.0016	0.00068	0.0020	0.0018	0.0015	0.0058	0.004 *
Lead	mg/L	0.01	< 0.005	0.0004	<0.0001	0.0052	<0.0001	n/a	0.0004	0.0010	<0.005	<0.0050	0.00017	<0.0002	0.00022	<0.00020	0.0012	<0.00020	0.00083	<0.060 *
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0098	<0.0040	<0.0040 *
Mercury	mg/L	0.001	< 0.0002	<0.0001	<0.0001	<0.0001	<0.0001	n/a	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000021	<0.000010	<0.0000050	<0.0000050	<0.0000020	-
Molybdenum	mg/L	-	0.025	0.008	0.008	0.005	<0.005	n/a	<0.005	<0.005	<0.005	<0.0050	<0.0050	0.0034	0.0036	0.0034	0.0029	0.0020	0.0035	0.0026 *
Nickel	mg/L	-	0.016	0.004	0.010	0.003	0.004	n/a	<0.002	<0.002	<0.002	<0.0020	<0.0020	0.0015	0.0029	0.0019	0.0024	0.0017	0.0039	8.5 *
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	0.0019 *
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00063	0.00065	0.00063 *
Zinc	mg/L	5	0.013	0.011	0.005	0.010	0.008	n/a	0.015	0.037	0.022	0.0433	0.0079	0.014	0.0039	0.0064	0.013	<0.0030	<0.0030	0.0032 *

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Lab Filtered (*)

Not measured (NM)

Exceeds Regulatory Limit

Table E26B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 26B																
			Oct-03	Oct-04	Apr-05	Oct-05	Apr-06	Oct-06	Apr-07	Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements																				
Field pH	-	-	n/a	7.46	7.05	7.37	7.26	7.44	7.38	7.98	8.060	7.382	7.9	7.67	7.35	5.62	7.7	7.5	7.63	7.4
Field EC	mS	-	n/a	n/a	6.92	15.11 (EF)	6.48	6.35	15.33	15.28	6.520	6.530	2.3	6.54	2.79	7.14	5.28	7.45	6.45	7810
Field Temperature	°C	-	n/a	n/a	7.7	6.3	5.7	8.3	6.0	9.68	6.6	7.0	11.8	9.1	9.2	8.1	5.8	9.1	8.9	5.9
Routine Water																				
pH	-	6.5 - 8.5	n/a	8.3	8.1	8.3	8.1	8.4	8.3	8.1	8.1	8.11	8.16	8.1	8.05	8.37	8.09	7.93	8.15	8.19
Conductivity (EC)	µS/cm	-	n/a	5980	6130	5520	6360	6440	6710	6660	6510	6560	6470	6400	6300	6400	6100	7100	7400	7600
Calcium	mg/L	-	n/a	102	89.2	83.3	91.6	87.5	88.1	89.1	90.9	88.1	78.4	78	89	74	73	100	110	120
Magnesium	mg/L	-	n/a	41.6	47.1	48.4	50.1	52.3	50.7	50.6	53.2	48.2	43.2	41	44	40	36	56	58	66
Sodium	mg/L	200	n/a	2200	1560	1620	1560	1600	1610	1640	1540	1560	1370	1500	1700	1500	1400	1600	1600	1800
Potassium	mg/L	-	n/a	12.2	5.6	6.4	6.4	7.5	8.0	6.5	3.8	6.97	6.42	6.4	6.4	5.9	5	8.3	7.7	7.5
Iron	mg/L	0.3	n/a	0.113	0.029	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.050	<0.010	<0.06	<0.060	<0.060	<0.060	<0.60	<0.060	<0.6
Sulphate	mg/L	500	n/a	4180	2690	2820	2870	2810	2740	2960	2820	2890	2480 *	2600	2900	3000	3000	3300	3400	3200
Chloride	mg/L	250	n/a	4	2	2	2	1	2	2	2	0.62	<10 *	2	<1.0	1.6	1.7	3.5	3.9	4.5
Bicarbonate	mg/L	-	n/a	973	1000	998	993	926	1010	1010	1040	1030	1000	980	1000	1000	960	1000	990	1000
Carbonate	mg/L	-		11	<5	<5	<5	18	<5	<5	<5	<5.0	<5.0	<0.5	<0.50	15	<0.50	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	n/a	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.050	<1.0 *	0.081	0.043	0.14	0.052	0.23	0.19	0.42
TDS*	mg/L	500	n/a	7030	4890	5070	5070	5030	5000	5250	5020	5100	4470	4700	5200	5100	4900	5600	5600	5700
Water Nutrients																				
Ammonia-N	mg/L	-	n/a	1.03	0.54	0.66	0.60	0.62	0.59	0.67	0.45	0.535	0.552	0.6	0.54	0.51	0.52	0.43	0.43	0.66
TKN	mg/L	-	n/a	1.6	1.1	1.0	1.0	1.1	1.0	1.0	0.9	1.28	1.57	1.3	0.98	1.1	0.89	0.86	0.73	0.99
Hydrocarbons																				
Benzene	mg/L	0.005	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics																				
COD	mg/L	-	n/a	50	28	22	22	22	21	21	29	20.3	19.2	46	29	59	49	24	35	28
DOC	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	9	8.2	8.9	8.6	8.3	8.7	7.3	9.0	10	12
Metals																				
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.030	0.0095	0.0072
Antimony	mg/L	0.006	n/a	0.0012	0.0006	<0.0004	0.0010	0.0007	<0.0004	0.0007	n/a	n/a	<0.00040	<0.006	<0.0060	<0.0060	<0.0060	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	0.00081	0.00077
Barium	mg/L	1	n/a	0.071	0.031	0.025	0.019	0.018	0.015	0.013	0.011	0.0093	0.0146	0.01	0.01	0.01	0.01	<0.10	0.010	<0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.30	0.32	0.29
Cadmium	mg/L	0.005	n/a	< 0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0010	0.00005	0.00007	0.0037	0.000056	<0.000050	<0.00020	<0.000020	<0.00002
Chromium	mg/L	0.05	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.010	<0.010	<0.010	<0.010	0.0017	<0.001
Cobalt	mg/L	-	n/a	0.003	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020	0.0025	<0.003	<0.0030	<0.0030	<0.0030	<0.0030	0.00087	0.00081
Copper	mg/L	1	n/a	0.023	0.01	0.008	0.006	0.007	0.005	0.003	0.007	0.0063	0.0073	0.11	0.0049	<0.0020	<0.0020	<0.0020	0.0014	0.00039
Lead	mg/L	0.01	n/a	<0.005	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.005	<0.0050	<0.00010	0.004	<0.0020	<0.0020	<0.0020	<0.0020	<0.00020	<0.0002
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.20	0.20	0.22
Mercury	mg/L	0.001	n/a	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.00010	<0.00010	<0.000005	0.0000038	<0.0000050	<0.0000050	<0.0000050	0.0000040	<0.000002
Molybdenum	mg/L	-	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050	<0.002	0.0022	<0.0020	<0.0020	0.0024	0.0013	0.00087
Nickel	mg/L	-	n/a	0.012	0.003	0.002	<0.002	0.004	<0.002	0.003	0.004	0.0027	0.0056	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0029	0.0013
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0020	<0.00020	<0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.001	0.0012	0.00082
Zinc	mg/L	5	n/a	0.02	0.019	0.012	0.012	0.005	0.004	0.015	0.013	0.0105	0.0047	0.07	<0.030	<0.030	<0.030	<0.030	0.0084	<0.003
Polycyclic Aromatic Hydrocarbons (PAHs)																				
Benzo[a]pyrene equivalency	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0037	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.00010	<0.00010
Acenaphthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020
Anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L	-					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0026	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0017	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	<0.0000085	<0.0000085
Chrysene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.0000075	<0.0000075
Fluoranthene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0018	<0.000010	<0.000010
Fluorene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0018	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0014	<0.0000085	<0.0000085
Naphthalene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0020	<0.00010	<0.00010
Perylene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0015	<0.000050	<0.000050
Phenanthrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.000050	<0.000050
Pyrene	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.000020	<0.000020
Quinoline	mg/L	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0019	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E27A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 27A										
			Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements													
Field pH	-	-	8.09	8.479	8.3	8.5	8.52	8.35	6.03	8.3	8.9	8.62	8.5
Field EC	mS	-	15.95	2.890	1.125	2.8	2.98	1.3	3.66	2.89	2.88	2.86	2810
Field Temperature	℃	-	9.44	5.5	9.0	10.7	10.6	8.1	6.3	7.0	10.3	6.2	8.2
Routine Water													
pH	-	6.5 - 8.5	8.5	8.5	8.64	8.59	8.53	8.45	8.64	8.52	8.38	8.57	8.6
Conductivity (EC)	µS/cm	-	3960	2990	2940	2790	2800	2700	2800	2800	2900	2800	2900
Calcium	mg/L	-	18.1	9.9	8.43	8.19	8.5	9.7	8.2	9.0	8.5	8.5	8.7
Magnesium	mg/L	-	10.3	4.1	2.66	1.79	1.5	1.5	1.4	1.2	1.1	1.0	1
Sodium	mg/L	200	1030	756	678	668	700	740	670	730	690	620	700
Potassium	mg/L	-	2.9	2.1	2.98	2.52	2.3	2.3	2.3	2.1	2.5	2.2	2.3
Iron	mg/L	0.3	0.012	0.057	1.09	0.112	<0.06	1.1	<0.060	0.46	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1260	775	681	630	710	630	730	770	730	710	720
Chloride	mg/L	250	10	7	5.26	4.42	8	4.4	5.8	6.2	5.2	5.0	6.9
Bicarbonate	mg/L	-	1010	992	924	898	900	940	910	920	930	850	920
Carbonate	mg/L	-	35	24	48.2	37.6	24	14	35	27	7.5	21	26
Nitrate (N)	mg/L	10	<0.1	0.1	0.273	0.419	0.21	0.093	0.14	0.11	0.046	0.21	0.47
TDS*	mg/L	500	2860	2070	1880	1800	1900	1900	1900	2000	1900	1800	1900
Water Nutrients													
Ammonia-N	mg/L	-	0.50	0.89	0.499	0.456	0.89	0.87	0.85	0.97	0.63	0.86	0.86
TKN	mg/L	-	1.1	1.3	1.08	1.57	1.5	1.4	1.4	1.2	1.2	0.76	1.2
Hydrocarbons													
Benzene	mg/L	0.005	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics													
COD	mg/L	-	34	41	35.1	30.4	40	48	49	43	34	39	30
DOC	mg/L	-	n/a	11	201	11.5	12	9.5	10	11	11	11	14
Metals													
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0043	0.073	0.029
Antimony	mg/L	0.006	0.0014	n/a	n/a	<0.00040	<0.006	<0.0030	0.0017	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0024	0.0028	0.003
Barium	mg/L	1	0.014	0.01	0.0163	0.0132	0.01	0.044	0.013	0.025	0.011	0.014	0.016
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.77	0.75	0.83
Cadmium	mg/L	0.005	<0.0001	<0.001	<0.0010	<0.000050	<0.000050	0.000027	0.000026	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.0050	<0.0010	0.0031	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	<0.002	<0.002	<0.0020	<0.0020	<0.003	<0.0015	<0.00030	0.00066	<0.00030	0.00043	<0.00030
Copper	mg/L	1	0.002	0.004	0.0026	0.0027	<0.002	0.0038	0.0014	0.0019	0.00053	0.00098	0.0003
Lead	mg/L	0.01	<0.0001	<0.005	<0.0050	0.00012	<0.002	0.0015	<0.00020	0.00077	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.013	0.011	0.012
Mercury	mg/L	0.001	<0.0001	<0.0001	<0.00010	<0.00010	<0.000005	0.0000022	<0.0000050	<0.0000050	<0.0000050	0.0000021	<0.0000020
Molybdenum	mg/L	-	0.010	0.005	<0.0050	<0.0050	0.003	0.0031	0.0028	0.0019	0.0013	0.0023	0.0019
Nickel	mg/L	-	0.003	<0.002	0.0027	<0.0020	<0.005	0.0068	0.002	0.003	0.0012	0.0033	0.0014
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.00055	0.00065	0.00057
Zinc	mg/L	5	0.011	0.008	0.0217	0.0045	<0.03	<0.015	0.0057	0.0049	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E27B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 27B										
			Oct-07	May-08	May-09	Jun-10	Jun-11	May-12	Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements													
Field pH	-	-	7.23	7.818	7.6	7.96	7.86	7.62	6.2	7.5	8.1	7.74	7.6
Field EC	mS	-	20.75	8.250	>3.999	2.4	10.47	4.53	12.45	11.56	11.53	11.53	11.41
Field Temperature	ºC	-	9.66	4.7	10.5	13.4	13	10.9	10.1	9.8	9.1	7.8	8.3
Routine Water													
pH	-	6.5 - 8.5	8.2	8.2	8.4	8.33	8.15	8.07	8.38	8.14	7.97	8.19	8.1
Conductivity (EC)	µS/cm	-	9620	8440	8320	8240	10000	10000	11000	11,000	11,000	11,000	12,000
Calcium	mg/L	-	91.5	83.4	74.4	71.2	100	130	110	130	130	140	140
Magnesium	mg/L	-	85.6	53	45.8	40.7	82	96	96	110	100	100	130
Sodium	mg/L	200	2530	2170	1980	1930	2600	2900	2900	2800	2700	2700	3100
Potassium	mg/L	-	8.6	4.1	9.01	8.13	9.1	9.5	9.3	9.2	11	11	11
Iron	mg/L	0.3	<0.005	<0.005	<0.0050	0.048	<0.06	0.088	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	4520	3610	3580	3280 *	4700	5600	6000	6100	5100	5300	5100
Chloride	mg/L	250	41	41	35.6	28 *	37	36	37	40	35	42	51
Bicarbonate	mg/L	-	1420	1380	1270	1250	1400	1500	1600	1700	1700	1600	1900
Carbonate	mg/L	-	<5	<5	25.7	12.5	<0.5	<0.50	27	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.1	0.1	0.448	<1.0 *	0.11	0.11	0.35	0.29	1.1	0.91	1.5
TDS*	mg/L	500	7970	6640	6370	5990	8200	9500	9900	10,000	9000	9100	9400
Water Nutrients													
Ammonia-N	mg/L	-	0.63	0.98	0.571	0.625	0.72	0.6	0.53	0.51	0.15	0.42	0.67
TKN	mg/L	-	1.3	1.5	1.33	1.71	1.7	1.4	0.49	1.5	1.0	0.55	1.4
Hydrocarbons													
Benzene	mg/L	0.005	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	n/a	<0.00050	<0.00050	<0.00050	<0.0004	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	n/a	<0.00050	<0.00050	<0.0010	<0.0008	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	n/a	<0.1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	n/a	<0.05	<0.050	<0.25	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organics													
COD	mg/L	-	33	31	37.6	20.9	45	43	42	64	35	37	43
DOC	mg/L	-	n/a	11	253	10.2	12	12	14	13	13	15	18
Metals													
Aluminum	mg/L	0.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.060	0.0056	0.01
Antimony	mg/L	0.006	0.0013	n/a	n/a	0.00049	<0.006	<0.012	<0.012	<0.012	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.0020	0.0019
Barium	mg/L	1	0.040	0.02	0.019	0.0194	0.02	0.013	0.013	<0.10	<0.10	<0.010	<0.1
Boron	mg/L	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.42	0.43	0.46
Cadmium	mg/L	0.005	0.0001	<0.001	<0.0010	0.00013	0.00006	<0.10	0.00011	<0.0001	<0.00040	0.00004	0.000022
Chromium	mg/L	0.05	<0.005	<0.005	<0.0050	<0.0050	<0.01	<0.020	<0.020	<0.020	<0.020	0.0011	<0.0010
Cobalt	mg/L	-	0.006	<0.002	<0.0020	<0.0020	<0.003	<0.0060	<0.0060	<0.0060	<0.0060	0.0011	0.0012
Copper	mg/L	1	0.006	0.009	0.0079	0.0089	<0.002	0.0073	<0.0040	<0.0040	<0.0040	0.0010	<0.00020
Lead	mg/L	0.01	<0.0001	<0.005	<0.0050	0.00075	<0.002	<0.0040	<0.0040	<0.0040	<0.0040	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.052	0.052	0.062
Mercury	mg/L	0.001	0.0002	<0.0001	<0.00010	<0.00010	<0.000005	<0.0020	<0.0000050	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.005	0.007	0.0057	<0.0050	0.002	<0.0040	<0.0040	<0.0040	<0.0040	0.0022	0.0018
Nickel	mg/L	-	0.019	0.009	0.0068	0.006	<0.005	<0.010	<0.010	<0.010	<0.010	0.0077	0.0051
Selenium	mg/L	0.05	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.0040	0.00039	0.0002
Uranium	mg/L	0.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.0021	0.0025	0.0034
Zinc	mg/L	5	0.018	0.01	0.007	0.0096	<0.03	<0.060	<0.060	<0.060	<0.060	0.0048	<0.0030
Polycyclic Aromatic Hydrocarbons (PAHs)													
Benzo[a]pyrene equivalency	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
2-methylnaphthalene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acenaphthylene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Acridine	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.000050
Anthracene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Benz(a)anthracene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(a) pyrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Benzo(b+j)fluoranthene	mg/L					n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(c)phenanthrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(e)pyrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Benzo(g,h,i)perylene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Benzo(k)fluoranthene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Chrysene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Dibenz(a,h)anthracene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000075	<0.0000075
Fluoranthene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000010	<0.000010
Fluorene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Indeno(1,2,3-c,d)pyrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.0000085	<0.0000085
Naphthalene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00010	<0.00010
Perylene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Phenanthrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000050	<0.000050
Pyrene	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.000020	<0.000020
Quinoline	mg/L	-				n/a	n/a	n/a	n/a	n/a	n/a	<0.00020	<0.00020

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E28A: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 28A				
			Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	8.28	8.4	8.4	8.51	8.5
Field EC	mS	-	3.66	3.63	3.59	3.38	3490
Field Temperature	°C	-	10	6.2	8.5	7.7	6.7
Routine Water							
pH	-	6.5 - 8.5	8.48	8.46	8.34	8.54	8.47
Conductivity (EC)	µS/cm	-	3400	3400	3400	3300	3300
Calcium	mg/L	-	14	13	13	12	13
Magnesium	mg/L	-	1.5	1.4	1.3	1.1	1.2
Sodium	mg/L	200	820	850	870	800	810
Potassium	mg/L	-	2.6	2.5	3.1	2.6	2.7
Iron	mg/L	0.3	<0.060	0.29	<0.060	<0.060	<0.060
Sulphate	mg/L	500	1200	1200	1100	1000	1000
Chloride	mg/L	250	5	5.3	5.0	5.2	5
Bicarbonate	mg/L	-	820	830	850	780	850
Carbonate	mg/L	-	18	19	3.4	16	13
Nitrate (N)	mg/L	10	0.037	0.027	<0.010	0.066	0.044
TDS*	mg/L	500	2400	2500	2400	2200	2300
Water Nutrients							
Ammonia-N	mg/L	-	1.2	1.3	1.1	1.2	1.4
TKN	mg/L	-	1.6	1.6	1.6	1.7	1.6
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	47	42	39	31	28
DOC	mg/L	-	11	9.6	8.5	10	12
Metals							
Aluminum	mg/L	0.1	n/a	n/a	0.0046	0.012	0.005
Antimony	mg/L	0.006	0.00061	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	0.001	0.00084	0.00053
Barium	mg/L	1	0.013	0.015	<0.010	<0.010	<0.010
Boron	mg/L	5	n/a	n/a	0.74	0.77	0.82
Cadmium	mg/L	0.005	<0.000025	<0.000025	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00069	0.00062	<0.00030	0.00039	<0.00030
Copper	mg/L	1	0.0013	0.0021	0.00044	0.00085	<0.00020
Lead	mg/L	0.01	<0.00020	0.00022	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.029	<0.0040	0.019
Mercury	mg/L	0.001	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0035	0.0026	0.0021	0.0017	0.0016
Nickel	mg/L	-	0.0027	0.0024	0.0014	0.0018	0.00082
Selenium	mg/L	0.05	n/a	n/a	<0.00020	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	0.00056	0.00031	0.00025
Zinc	mg/L	5	<0.0030	0.0039	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E28B: Chemical Analysis Results - Ryley Integrated Waste Management Facility

Parameter ID	Units	Regulatory Limits[1]	MW 28B				
			Jun-13	May-14	Jun-15	Jun-16	Jun-17
Field Measurements							
Field pH	-	-	7.55	7.4	7.8	7.58	7.5
Field EC	mS	-	11.63	12.78	13.02	12.86	12,890
Field Temperature	°C	-	9.1	6.5	7.2	7.8	6.2
Routine Water							
pH	-	6.5 - 8.5	8.07	8.08	7.9	8.14	8.08
Conductivity (EC)	µS/cm	-	12000	12000	12,000	13,000	12,000
Calcium	mg/L	-	210	230	220	210	220
Magnesium	mg/L	-	60	89	95	93	100
Sodium	mg/L	200	2700	3200	3000	2800	3200
Potassium	mg/L	-	9.4	11	13	13	12
Iron	mg/L	0.3	<0.060	<0.60	<0.60	<0.060	<0.60
Sulphate	mg/L	500	6500	6900	6500	6700	5700
Chloride	mg/L	250	34	37	35	33	30
Bicarbonate	mg/L	-	1000	1100	1100	1000	1100
Carbonate	mg/L	-	<0.5	<0.50	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.16	0.075	0.24	0.31	<0.22
TDS*	mg/L	500	10,000	11,000	10,000	10,000	9,700
Water Nutrients							
Ammonia-N	mg/L	-	2	1.6	1.2	1.4	1.6
TKN	mg/L	-	2.8	2.5	2.0	2.1	2.1
Hydrocarbons							
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10	<0.10	<0.10
Organics							
COD	mg/L	-	45	61	45	48	35
DOC	mg/L	-	19	15	16	17	17
Metals							
Aluminum	mg/L	0.1	n/a	n/a	<0.060	0.011	0.0039
Antimony	mg/L	0.006	0.00091	<0.012	<0.012	<0.00060	<0.00060
Arsenic	mg/L	0.01	n/a	n/a	<0.0040	0.00044	0.0004
Barium	mg/L	1	0.033	<0.10	<0.10	0.010	<0.10
Boron	mg/L	5	n/a	n/a	0.44	0.45	0.44
Cadmium	mg/L	0.005	0.00027	<0.00010	<0.00040	0.000034	0.000022
Chromium	mg/L	0.05	<0.0010	<0.020	<0.020	0.0012	<0.0010
Cobalt	mg/L	-	0.0051	<0.0060	<0.0060	0.0019	0.0015
Copper	mg/L	1	0.0021	<0.0040	<0.0040	0.0015	0.00033
Lead	mg/L	0.01	<0.00020	<0.0040	<0.0040	<0.00020	<0.00020
Manganese	mg/L	0.05	n/a	n/a	0.27	0.25	0.25
Mercury	mg/L	0.001	<0.000010	<0.0000050	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0029	<0.0040	<0.0040	0.0009	0.00078
Nickel	mg/L	-	0.012	<0.010	<0.010	0.0049	0.0038
Selenium	mg/L	0.05	n/a	n/a	<0.0040	<0.00020	<0.00020
Uranium	mg/L	0.02	n/a	n/a	<0.0020	0.00062	0.00054
Zinc	mg/L	5	0.0037	<0.060	<0.060	0.0052	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Equipment Failure, parameter not reported (EF)

Detection limit adjusted (*)

Exceeds Regulatory Limit

Table E29A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.5	8.15	8.1
Field EC	mS	-	4.74	3.44	3740
Field Temperature	°C	-	6.7	7.0	6.5
Routine Water					
pH	-	6.5 - 8.5	8.28	8.41	8.34
Conductivity (EC)	µS/cm	-	4900	3400	3400
Calcium	mg/L	-	72	33	32
Magnesium	mg/L	-	9.9	5.1	5.2
Sodium	mg/L	200	1200	810	810
Potassium	mg/L	-	7.4	4.1	4.1
Iron	mg/L	0.3	<0.060	<0.060	<0.060
Sulphate	mg/L	500	2000	1200	1100
Chloride	mg/L	250	7.3	3.3	3.6
Bicarbonate	mg/L	-	680	710	760
Carbonate	mg/L	-	<0.50	7.7	3
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.054	0.063	0.33
Nitrite (N)	mg/L	-	0.084	0.014	1.1
Nitrate and Nitrate (N)	mg/L	-	0.14	0.077	-
TDS*	mg/L	500	3600	2400	2400
Hardness	mg/L	-	220	100	100
Alkalinity (total as CaCO3)	mg/L	-	560	590	630
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	6.4	2.5
Ionic Balance	N/A	-	1.0	1.0	2
Water Nutrients					
Ammonia-N	mg/L	-	4.3	1.2	1.4
TKN	mg/L	-	16	1.3	1.6
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	1100	55	25
DOC	mg/L	-	13	8.3	9.1
Metals					
Aluminum	mg/L	0.1	0.0048	0.0067	0.0079
Antimony	mg/L	0.006	0.0012	<0.00060	0.23
Arsenic	mg/L	0.01	0.0030	0.0011	0.00093
Barium	mg/L	1	0.021	0.015	0.018
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.50	0.75	0.74
Cadmium	mg/L	0.005	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.00044	0.00061	0.00046
Copper	mg/L	1	0.0012	0.0020	0.00093
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Manganese	mg/L	0.05	0.081	0.064	0.06
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.0091	0.0017	0.0019
Nickel	mg/L	-	0.0036	0.0020	0.0014
Phosphorus	mg/L	-	<0.10	<0.10	<0.10
Selenium	mg/L	0.05	0.00039	0.00022	0.00027
Silicon	mg/L	-	1.7	3.6	3.7
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	1.4	0.67	0.68
Sulphur	mg/L	-	740	400	390
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0093	0.0006	0.00055
Vanadium	mg/L	-	<0.0010	0.0011	<0.0010
Zinc	mg/L	5	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E29B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 29B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.4	7.21	7.2
Field EC	mS	-	8.67	8.80	9230
Field Temperature	°C	-	7.1	7.7	6
Routine Water					
pH	-	6.5 - 8.5	7.62	7.85	7.9
Conductivity (EC)	µS/cm	-	8200	8400	8500
Calcium	mg/L	-	520	560	530
Magnesium	mg/L	-	260	230	240
Sodium	mg/L	200	1400	1600	1600
Potassium	mg/L	-	12	11	11
Iron	mg/L	0.3	<0.60	0.54	<0.60
Sulphate	mg/L	500	4700	5100	4700
Chloride	mg/L	250	5.7	5.2	6
Bicarbonate	mg/L	-	570	520	550
Carbonate	mg/L	-	<0.50	<0.50	0<0.5
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.39	0.11	<0.22
Nitrite (N)	mg/L	-	0.027	0.025	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.42	0.13	-
TDS*	mg/L	500	7200	7700	7400
Hardness	mg/L	-	2300	2400	2300
Alkalinity (total as CaCO3)	mg/L	-	470	420	450
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	1.0	1.0	4.6
Water Nutrients					
Ammonia-N	mg/L	-	0.72	1.1	1.4
TKN	mg/L	-	4.5	0.96	1.8
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	150	41	45
DOC	mg/L	-	17	15	18
Metals					
Aluminum	mg/L	0.1	0.0041	0.022	0.01
Antimony	mg/L	0.006	0.0017	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0077	0.00054	0.00031
Barium	mg/L	1	<0.10	0.019	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	<0.20	0.20	0.21
Cadmium	mg/L	0.005	0.00017	0.000082	0.00006
Chromium	mg/L	0.05	<0.0010	0.0014	<0.0010
Cobalt	mg/L	-	0.018	0.0056	0.0044
Copper	mg/L	1	0.0019	0.0019	0.00098
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.55	0.65	0.67
Manganese	mg/L	0.05	0.77	0.85	0.88
Mercury	mg/L	0.001	<0.0000050	0.0000043	<0.0000020
Molybdenum	mg/L	-	0.016	0.00045	0.00057
Nickel	mg/L	-	0.048	0.0099	0.0075
Phosphorus	mg/L	-	<1.0	<0.10	<1.0
Selenium	mg/L	0.05	0.001	<0.00020	<0.00020
Silicon	mg/L	-	4.4	5.3	5.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	6.9	7.9	8
Sulphur	mg/L	-	1600	1800	1700
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.019	0.0042	0.0061
Vanadium	mg/L	-	<0.0010	0.0015	<0.0010
Zinc	mg/L	5	0.014	0.0051	<0.0030

Notes:
[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Total Dissolved Solids, not a measured value (TDS)
Exceeds Regulatory Limit

Table E30A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.5	8.29	8.2
Field EC	mS	-	2.40	2.32	2020
Field Temperature	°C	-	7.5	8.7	7
Routine Water					
pH	-	6.5 - 8.5	8.34	8.37	8.57
Conductivity (EC)	µS/cm	-	2300	2200	1900
Calcium	mg/L	-	16	12	8.9
Magnesium	mg/L	-	2.2	1.6	1.4
Sodium	mg/L	200	540	540	460
Potassium	mg/L	-	2.9	2.4	2.2
Iron	mg/L	0.3	0.44	0.63	<0.06
Sulphate	mg/L	500	510	510	360
Chloride	mg/L	250	5.3	3.0	1.3
Bicarbonate	mg/L	-	770	780	770
Carbonate	mg/L	-	3.5	5.3	17
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.013	0.16	0.19
Nitrite (N)	mg/L	-	<0.033	0.046	0.081
Nitrate and Nitrate (N)	mg/L	-	0.023	0.21	-
TDS*	mg/L	500	1500	1500	1200
Hardness	mg/L	-	48	36	28
Alkalinity (total as CaCO3)	mg/L	-	640	650	660
Alkalinity (pp as CaCO3)	mg/L	-	2.9	4.5	14
Ionic Balance	N/A	-	1.0	1.0	0.27
Water Nutrients					
Ammonia-N	mg/L	-	0.78	0.42	0.46
TKN	mg/L	-	2.6	1.1	0.8
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	130	43	23
DOC	mg/L	-	15	9.9	7.8
Metals					
Aluminum	mg/L	0.1	1.0	3.8	0.011
Antimony	mg/L	0.006	0.0008	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0037	0.0030	0.00089
Barium	mg/L	1	0.028	0.025	0.015
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.43	0.52	0.40
Cadmium	mg/L	0.005	0.00004	0.000026	<0.000020
Chromium	mg/L	0.05	0.0016	0.0045	<0.0010
Cobalt	mg/L	-	0.0012	0.0012	<0.00030
Copper	mg/L	1	0.0056	0.0075	0.00034
Lead	mg/L	0.01	0.00077	0.00054	<0.00020
Lithium	mg/L	-	0.11	0.13	0.16
Manganese	mg/L	0.05	0.081	0.059	0.018
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.013	0.0082	0.0015
Nickel	mg/L	-	0.013	0.010	0.0023
Phosphorus	mg/L	-	<0.10	0.11	0.1
Selenium	mg/L	0.05	0.0012	0.00064	<0.00020
Silicon	mg/L	-	3.4	3.7	3.9
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.15	0.13	0.14
Sulphur	mg/L	-	190	170	120
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	0.033	0.084	<0.0010
Uranium	mg/L	0.02	0.0063	0.0035	0.00018
Vanadium	mg/L	-	0.0034	0.0090	0.011
Zinc	mg/L	5	0.0034	0.0037	<0.0030

Notes:
[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Exceeds Regulatory Limit

Table E30B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 30B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.1	8.19	7.9
Field EC	mS	-	2.83	2.65	2680
Field Temperature	°C	-	6.5	7.4	5.6
Routine Water					
pH	-	6.5 - 8.5	8.06	8.44	8.32
Conductivity (EC)	µS/cm	-	2700	2600	2500
Calcium	mg/L	-	29	26	24
Magnesium	mg/L	-	9.1	9.5	8.9
Sodium	mg/L	200	680	610	560
Potassium	mg/L	-	3.3	3.2	2.9
Iron	mg/L	0.3	<0.060	<0.060	<0.060
Sulphate	mg/L	500	830	830	750
Chloride	mg/L	250	1.4	1.5	1.8
Bicarbonate	mg/L	-	670	610	680
Carbonate	mg/L	-	<0.50	8.0	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	1.3	0.12	1.5
Nitrite (N)	mg/L	-	<0.010	0.012	<0.033
Nitrate and Nitrate (N)	mg/L	-	1.3	0.13	-
TDS*	mg/L	500	1900	1800	1700
Hardness	mg/L	-	110	100	97
Alkalinity (total as CaCO3)	mg/L	-	550	520	560
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	6.7	<0.5
Ionic Balance	N/A	-	1.1	1.0	0.76
Water Nutrients					
Ammonia-N	mg/L	-	0.16	<0.050	<0.015
TKN	mg/L	-	0.49	0.40	0.6
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	110	44	38
DOC	mg/L	-	8.4	9.1	10
Metals					
Aluminum	mg/L	0.1	<0.030	0.011	0.0039
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.0006
Arsenic	mg/L	0.01	0.0024	0.0010	0.00068
Barium	mg/L	1	0.022	0.022	0.024
Beryllium	mg/L	-	<0.010	<0.0010	<0.001
Boron	mg/L	5	0.11	0.14	0.12
Cadmium	mg/L	0.005	<0.00020	<0.000020	<0.00002
Chromium	mg/L	0.05	<0.010	0.0012	<0.001
Cobalt	mg/L	-	<0.0030	<0.00030	<0.0003
Copper	mg/L	1	0.0035	0.0024	0.00083
Lead	mg/L	0.01	<0.0020	<0.00020	<0.0002
Lithium	mg/L	-	0.21	0.24	0.24
Manganese	mg/L	0.05	0.068	<0.0040	<0.004
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.000002
Molybdenum	mg/L	-	0.0028	0.0011	0.00092
Nickel	mg/L	-	0.0053	0.0023	0.001
Phosphorus	mg/L	-	<0.10	<0.10	0.13
Selenium	mg/L	0.05	<0.0020	0.00024	0.00046
Silicon	mg/L	-	4.6	4.7	4.8
Silver	mg/L	-	<0.0010	<0.00010	<0.0001
Strontium	mg/L	-	0.37	0.33	0.35
Sulphur	mg/L	-	260	290	250
Thallium	mg/L	-	<0.0020	<0.00020	<0.0002
Tin	mg/L	-	<0.010	<0.0010	<0.001
Titanium	mg/L	-	<0.010	<0.0010	<0.001
Uranium	mg/L	0.02	0.0053	0.0032	0.0038
Vanadium	mg/L	-	<0.010	0.0019	<0.001
Zinc	mg/L	5	<0.030	0.0064	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E31A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.6	8.53	-
Field EC	mS	-	1.98	1.72	-
Field Temperature	°C	-	10.5	9.5	-
Routine Water					
pH	-	6.5 - 8.5	8.57	8.53	8.57
Conductivity (EC)	µS/cm	-	1900	1800	1700
Calcium	mg/L	-	7.8	4.5	4.9 *
Magnesium	mg/L	-	3.1	<2.0	0.52 *
Sodium	mg/L	200	420	430	470
Potassium	mg/L	-	3.2	<3.0	1.9 *
Iron	mg/L	0.3	9.0	<0.60	0.18 *
Sulphate	mg/L	500	220	120	76
Chloride	mg/L	250	12	6.7	5.2
Bicarbonate	mg/L	-	920	940	1000
Carbonate	mg/L	-	22	18	23
Hydroxide	mg/L	-	<0.50	<0.50	<0.5
Nitrate (N)	mg/L	10	0.017	2.0	14
Nitrite (N)	mg/L	-	0.013	0.028	0.077
Nitrate and Nitrate (N)	mg/L	-	0.03	2.0	3.2
TDS*	mg/L	500	1100	1000	1100
Hardness	mg/L	-	32	11	15
Alkalinity (total as CaCO3)	mg/L	-	790	800	880
Alkalinity (pp as CaCO3)	mg/L	-	19	15	19
Ionic Balance	N/A	-	0.94	1.0	3.2
Water Nutrients					
Ammonia-N	mg/L	-	1.1	1.1	1.2
TKN	mg/L	-	5.2	1.0	7.4
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	560	380	300
DOC	mg/L	-	19	17	-
Metals					
Aluminum	mg/L	0.1	1.5	0.31	0.55 *
Antimony	mg/L	0.006	0.0013	<0.00060	0.00077 *
Arsenic	mg/L	0.01	0.0069	0.00088	0.0042 *
Barium	mg/L	1	0.097	<0.10	0.085 *
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010 *
Boron	mg/L	5	0.58	0.66	0.74 *
Cadmium	mg/L	0.005	0.000048	<0.000020	0.000025 *
Chromium	mg/L	0.05	0.0017	<0.0010	<0.0010 *
Cobalt	mg/L	-	0.0034	0.00039	0.0016 *
Copper	mg/L	1	0.0093	0.00093	0.0046 *
Lead	mg/L	0.01	0.0021	0.00043	0.00043 *
Lithium	mg/L	-	0.064	<0.20	0.086 *
Manganese	mg/L	0.05	0.068	<0.040	0.036 *
Mercury	mg/L	0.001	0.000008	0.000043	<0.0000020 *
Molybdenum	mg/L	-	0.023	0.0021	0.019 *
Nickel	mg/L	-	0.020	0.0026	0.012 *
Phosphorus	mg/L	-	0.12	<1.0	<0.10 *
Selenium	mg/L	0.05	0.0013	<0.00020	0.00078 *
Silicon	mg/L	-	55	2.7	3.1 *
Silver	mg/L	-	<0.00010	<0.00010	<0.00010 *
Strontium	mg/L	-	0.10	<0.20	0.11 *
Sulphur	mg/L	-	75	40	24 *
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020 *
Tin	mg/L	-	<0.0010	<0.0010	<0.0010 *
Titanium	mg/L	-	0.030	0.0032	0.0094 *
Uranium	mg/L	0.02	0.0095	0.00054	0.0041 *
Vanadium	mg/L	-	0.0028	<0.0010	0.0013 *
Zinc	mg/L	5	0.0051	<0.0030	<0.0030 *

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Laboratory filtered (*)

Table E31B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 31B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.4	8.33	8.1
Field EC	mS	-	2.53	2.50	2660
Field Temperature	°C	-	8.0	9.4	8.1
Routine Water					
pH	-	6.5 - 8.5	8.29	8.56	8.4
Conductivity (EC)	µS/cm	-	2400	2500	2500
Calcium	mg/L	-	15	15	14
Magnesium	mg/L	-	4.3	5.4	5.6
Sodium	mg/L	200	550	590	570
Potassium	mg/L	-	3.7	3.6	3.3
Iron	mg/L	0.3	0.75	0.26	<0.060
Sulphate	mg/L	500	670	750	780
Chloride	mg/L	250	1.1	1.4	1.4
Bicarbonate	mg/L	-	690	610	640
Carbonate	mg/L	-	<0.50	13	5.2
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	0.046	<0.010	0.8
Nitrite (N)	mg/L	-	<0.010	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	0.046	<0.020	-
TDS*	mg/L	500	1600	1700	1700
Hardness	mg/L	-	55	59	59
Alkalinity (total as CaCO3)	mg/L	-	570	520	530
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	11	4.3
Ionic Balance	N/A	-	0.99	1.0	1.7
Water Nutrients					
Ammonia-N	mg/L	-	0.59	0.13	0.034
TKN	mg/L	-	2.2	0.38	0.51
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	0.12	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	140	28	30
DOC	mg/L	-	9	8.2	8.8
Metals					
Aluminum	mg/L	0.1	0.70	0.084	0.011
Antimony	mg/L	0.006	0.00095	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0094	0.0017	0.0011
Barium	mg/L	1	0.024	0.023	0.022
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.16	0.20	0.17
Cadmium	mg/L	0.005	<0.00002	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0021	0.00053	<0.0003
Copper	mg/L	1	0.0022	0.0022	0.00027
Lead	mg/L	0.01	0.00048	<0.00020	<0.00020
Lithium	mg/L	-	0.12	0.16	0.15
Manganese	mg/L	0.05	0.061	0.041	0.017
Mercury	mg/L	0.001	<0.0000050	0.0000027	<0.0000020
Molybdenum	mg/L	-	0.0058	0.0015	0.0014
Nickel	mg/L	-	0.0086	0.0033	0.00081
Phosphorus	mg/L	-	<0.10	<0.10	0.13
Selenium	mg/L	0.05	0.00064	<0.00020	<0.00020
Silicon	mg/L	-	5.2	3.9	3.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	0.17	0.23	0.24
Sulphur	mg/L	-	220	270	250
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	0.018	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0034	0.00099	0.0012
Vanadium	mg/L	-	0.0024	0.0011	<0.0010
Zinc	mg/L	5	<0.0030	0.0078	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E32A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32A		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.2	7.79	7.6
Field EC	mS	-	8.66	7.91	8490
Field Temperature	°C	-	7.6	8.2	7.3
Routine Water					
pH	-	6.5 - 8.5	8.16	8.25	8.12
Conductivity (EC)	µS/cm	-	8200	8100	8000
Calcium	mg/L	-	120	120	120
Magnesium	mg/L	-	15	15	15
Sodium	mg/L	200	2000	2000	2000
Potassium	mg/L	-	11	8.4	7.7
Iron	mg/L	0.3	<0.60	0.12	<0.60
Sulphate	mg/L	500	4100	3900	3400
Chloride	mg/L	250	8.9	3.1	3.2
Bicarbonate	mg/L	-	960	980	1000
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.050	<0.22
Nitrite (N)	mg/L	-	0.013	<0.050	0.71
Nitrate and Nitrate (N)	mg/L	-	0.013	<0.020	-
TDS*	mg/L	500	6700	6500	6100
Hardness	mg/L	-	370	360	350
Alkalinity (total as CaCO3)	mg/L	-	790	800	850
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	0.92	1.0	4.4
Water Nutrients					
Ammonia-N	mg/L	-	3.5	2.9	3.2
TKN	mg/L	-	6.8	3.2	3.2
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	410	26	19
DOC	mg/L	-	12	7.9	7.2
Metals					
Aluminum	mg/L	0.1	<0.030	0.029	0.008
Antimony	mg/L	0.006	<0.0060	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0041	0.00051	0.00037
Barium	mg/L	1	<0.10	0.015	<0.10
Beryllium	mg/L	-	<0.010	<0.0010	<0.0010
Boron	mg/L	5	0.85	1.2	1.2
Cadmium	mg/L	0.005	<0.00020	<0.000020	0.000021
Chromium	mg/L	0.05	<0.010	0.0015	<0.0010
Cobalt	mg/L	-	<0.0030	0.00077	0.00062
Copper	mg/L	1	<0.0020	0.0031	0.00073
Lead	mg/L	0.01	<0.0020	<0.00020	<0.00020
Lithium	mg/L	-	0.36	0.47	0.49
Manganese	mg/L	0.05	0.15	0.12	0.14
Mercury	mg/L	0.001	<0.0000050	0.0000023	<0.0000020
Molybdenum	mg/L	-	0.014	0.00054	0.00068
Nickel	mg/L	-	0.011	0.0032	0.0016
Phosphorus	mg/L	-	<1.0	<0.10	<1.0
Selenium	mg/L	0.05	<0.0020	<0.00020	<0.00020
Silicon	mg/L	-	2.4	5.2	5.3
Silver	mg/L	-	<0.0010	<0.00010	<0.00010
Strontium	mg/L	-	2.6	2.9	3.0
Sulphur	mg/L	-	1300	1300	1300
Thallium	mg/L	-	<0.0020	<0.00020	<0.00020
Tin	mg/L	-	<0.010	<0.0010	<0.0010
Titanium	mg/L	-	<0.010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0080	0.00016	0.00014
Vanadium	mg/L	-	<0.010	<0.0010	<0.0010
Zinc	mg/L	5	<0.030	0.015	<0.0030

Notes:
[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Exceeds Regulatory Limit

Table E32B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 32B		
			Jun-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.7	7.69	7.4
Field EC	mS	-	12.55	13.26	13,010
Field Temperature	°C	-	7.6	9.1	6.8
Routine Water					
pH	-	6.5 - 8.5	7.73	7.97	7.98
Conductivity (EC)	µS/cm	-	12,000	13,000	12,000
Calcium	mg/L	-	210	230	210
Magnesium	mg/L	-	100	120	100
Sodium	mg/L	200	2800	3200	3000
Potassium	mg/L	-	18	17	15
Iron	mg/L	0.3	<0.60	<0.60	<0.60
Sulphate	mg/L	500	6300	6800	5700
Chloride	mg/L	250	110	120	120
Bicarbonate	mg/L	-	1300	1300	1300
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.050	<0.050	<0.22
Nitrite (N)	mg/L	-	<0.050	<0.050	<0.16
Nitrate and Nitrate (N)	mg/L	-	<0.050	<0.020	-
TDS*	mg/L	500	10,000	11,000	9,800
Hardness	mg/L	-	930	1100	950
Alkalinity (total as CaCO3)	mg/L	-	1100	1100	1000
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	0.91	0.97	1.9
Water Nutrients					
Ammonia-N	mg/L	-	1.3	1.5	1.5
TKN	mg/L	-	3.5	2.6	2.3
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	210	78	74
DOC	mg/L	-	18	15	17
Metals					
Aluminum	mg/L	0.1	0.0045	0.0038	0.016
Antimony	mg/L	0.006	0.0016	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.012	0.0016	0.00085
Barium	mg/L	1	<0.10	<0.10	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.40	0.48	0.46
Cadmium	mg/L	0.005	0.00011	0.00046	0.000083
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0093	0.0054	0.0028
Copper	mg/L	1	0.0012	0.0036	0.0022
Lead	mg/L	0.01	<0.00020	<0.00020	<0.00020
Lithium	mg/L	-	0.43	0.54	0.47
Manganese	mg/L	0.05	0.68	0.85	0.67
Mercury	mg/L	0.001	<0.0000050	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0089	0.0016	0.0012
Nickel	mg/L	-	0.031	0.013	0.0066
Phosphorus	mg/L	-	<1.0	<1.0	<1.0
Selenium	mg/L	0.05	0.00079	0.00046	<0.00020
Silicon	mg/L	-	3.9	4.7	4.7
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	4.3	5.1	4.7
Sulphur	mg/L	-	2000	2300	2000
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0027	0.00085	0.00084
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	5	0.0055	0.0040	<0.0030

Notes:
[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Exceeds Regulatory Limit

Table E33A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33A		
			May-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	8.6	8.66	-
Field EC	mS	-	2.54	2.01	-
Field Temperature	°C	-	6.9	7.0	-
Routine Water					
pH	-	6.5 - 8.5	8.32	8.52	8.52
Conductivity (EC)	µS/cm	-	3300	2100	1800
Calcium	mg/L	-	35	7.4	4.7
Magnesium	mg/L	-	10	1.4	0.7
Sodium	mg/L	200	930	480	390
Potassium	mg/L	-	5.8	2.2	1.4
Iron	mg/L	0.3	<0.060	0.60	<0.060
Sulphate	mg/L	500	860	230	130
Chloride	mg/L	250	28	27	24
Bicarbonate	mg/L	-	1100	990	990
Carbonate	mg/L	-	2.6	16	18
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.010	<0.020	<0.010
TDS*	mg/L	500	2400	1200	1100
Hardness	mg/L	-	130	24	15
Alkalinity (total as CaCO3)	mg/L	-	870	840	840
Alkalinity (pp as CaCO3)	mg/L	-	2.2	13	15
Ionic Balance	N/A	-	1.2	0.96	7.7
Water Nutrients					
Ammonia-N	mg/L	-	1.3	0.89	0.79
TKN	mg/L	-	8.0	2.6	2.4
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	460	140	130
DOC	mg/L	-	39	33	25
Metals					
Aluminum	mg/L	0.1	0.0044	0.66	0.005
Antimony	mg/L	0.006	0.00076	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0089	0.0042	0.0018
Barium	mg/L	1	0.070	0.080	0.053
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.50	0.71	0.68
Cadmium	mg/L	0.005	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	-	0.0032	0.0016	0.00057
Copper	mg/L	1	0.0017	0.028	<0.00020
Lead	mg/L	0.01	<0.00020	0.00094	<0.00020
Lithium	mg/L	-	0.20	0.089	0.07
Manganese	mg/L	0.05	0.13	0.058	0.027
Mercury	mg/L	0.001	<0.0000050	<0.0000060	<0.0000020
Molybdenum	mg/L	-	0.023	0.018	0.016
Nickel	mg/L	-	0.016	0.0083	0.0022
Phosphorus	mg/L	-	<0.10	0.17	<0.10
Selenium	mg/L	0.05	0.00058	<0.00020	<0.00020
Silicon	mg/L	-	3.5	3.9	3.3
Silver	mg/L	-	<0.00010	<0.00010	<0.0001
Strontium	mg/L	-	0.7	0.16	0.093
Sulphur	mg/L	-	360	64	35
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	0.0095	<0.0010
Uranium	mg/L	0.02	0.0096	0.0035	0.0012
Vanadium	mg/L	-	0.0015	0.0040	0.0014
Zinc	mg/L	5	<0.0030	<0.0030	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E33B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW 33B		
			May-15	Jun-16	Jun-17
Field Measurements					
Field pH	-	-	7.5	7.48	-
Field EC	mS	-	5.18	5.34	-
Field Temperature	°C	-	6.0	6.9	-
Routine Water					
pH	-	6.5 - 8.5	7.89	8.15	7.99
Conductivity (EC)	µS/cm	-	5000	5400	5600
Calcium	mg/L	-	91	110	130
Magnesium	mg/L	-	26	38	42
Sodium	mg/L	200	1200	1300	1200
Potassium	mg/L	-	6.9	6.9	6.1
Iron	mg/L	0.3	<0.060	0.35	<0.6
Sulphate	mg/L	500	1900	2000	2100
Chloride	mg/L	250	21	20	21
Bicarbonate	mg/L	-	1000	1100	1200
Carbonate	mg/L	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.050	0.68
Nitrite (N)	mg/L	-	<0.010	<0.050	0.2
Nitrate and Nitrate (N)	mg/L	-	<0.010	<0.020	0.21
TDS*	mg/L	500	3700	4000	4100
Hardness	mg/L	-	340	440	490
Alkalinity (total as CaCO3)	mg/L	-	850	920	1000
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50	<0.50
Ionic Balance	N/A	-	1.0	1.0	0.82
Water Nutrients					
Ammonia-N	mg/L	-	0.83	0.78	0.6
TKN	mg/L	-	5.3	2.6	2.7
Hydrocarbons					
Benzene	mg/L	0.005	<0.00040	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10	<0.10
Organics					
COD	mg/L	-	280	140	150
DOC	mg/L	-	45	44	49
Metals					
Aluminum	mg/L	0.1	0.0056	0.060	0.0049
Antimony	mg/L	0.006	0.0013	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0065	0.0013	0.0014
Barium	mg/L	1	0.038	0.031	<0.10
Beryllium	mg/L	-	<0.0010	<0.0010	<0.0010
Boron	mg/L	5	0.23	0.28	0.25
Cadmium	mg/L	0.005	<0.000020	<0.000020	0.000044
Chromium	mg/L	0.05	<0.0010	0.0020	<0.0010
Cobalt	mg/L	-	0.0030	0.0020	0.0024
Copper	mg/L	1	0.00037	0.0027	0.0028
Lead	mg/L	0.01	<0.00020	0.00024	<0.00020
Lithium	mg/L	-	0.30	0.35	0.37
Manganese	mg/L	0.05	0.19	0.24	0.25
Mercury	mg/L	0.001	<0.0000050	0.00023	0.0000076
Molybdenum	mg/L	-	0.0070	0.00038	0.0008
Nickel	mg/L	-	0.015	0.0096	0.011
Phosphorus	mg/L	-	<0.10	<0.10	<1.0
Selenium	mg/L	0.05	0.00064	0.00038	0.00043
Silicon	mg/L	-	3.9	5.0	4.6
Silver	mg/L	-	<0.00010	<0.00010	<0.00010
Strontium	mg/L	-	1.6	2.1	2.3
Sulphur	mg/L	-	610	720	690
Thallium	mg/L	-	<0.00020	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	0.0033	<0.0010
Uranium	mg/L	0.02	0.0021	0.00016	0.00026
Vanadium	mg/L	-	<0.0010	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	0.0056	<0.0030

Notes:
[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Exceeds Regulatory Limit

Table E34A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-34A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.66	6.9
Field EC	mS	-	3.02	2.46
Field Temperature	°C	-	8.1	6.2
Routine Water				
pH	-	6.5 - 8.5	8.57	8.43
Conductivity (EC)	µS/cm	-	3000	2500
Calcium	mg/L	-	19	12
Magnesium	mg/L	-	4.5	2.2
Sodium	mg/L	200	710	600
Potassium	mg/L	-	4.1	2.6
Iron	mg/L	0.3	0.13	0.31
Sulphate	mg/L	500	510	310
Chloride	mg/L	250	51	25
Bicarbonate	mg/L	-	1200	1200
Carbonate	mg/L	-	25	15
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.050	<0.044
Nitrite (N)	mg/L	-	<0.050	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	1900	1600
Hardness	mg/L	-	67	40
Alkalinity (total as CaCO3)	mg/L	-	990	1000
Alkalinity (pp as CaCO3)	mg/L	-	21	12
Ionic Balance	N/A	-	1.0	2.4
Water Nutrients				
Ammonia-N	mg/L	-	1.1	0.94
TKN	mg/L	-	2.6	1.8
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	470	190
DOC	mg/L	-	72	60
Metals				
Aluminum	mg/L	0.1	0.036	0.0049
Antimony	mg/L	0.006	0.00078	<0.00060
Arsenic	mg/L	0.01	0.0030	0.0028
Barium	mg/L	1	0.030	0.039
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.80	0.84
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	0.0010	<0.0010
Cobalt	mg/L	-	0.0010	0.00054
Copper	mg/L	1	0.0019	<0.00020
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.14	0.13
Manganese	mg/L	0.05	0.14	0.13
Mercury	mg/L	0.001	0.000044	<0.0000020
Molybdenum	mg/L	-	0.042	0.012
Nickel	mg/L	-	0.0074	0.0039
Phosphorus	mg/L	-	<0.10	<0.10
Selenium	mg/L	0.05	0.00029	<0.0002
Silicon	mg/L	-	3.2	4.1
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.30	0.24
Sulphur	mg/L	-	170	100
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.018	0.005
Vanadium	mg/L	-	0.0023	0.0011
Zinc	mg/L	5	0.011	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table 5.34B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-34B	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	7.05	6.9
Field EC	mS	-	2.49	2.46
Field Temperature	°C	-	7.9	6.2
Routine Water				
pH	-	6.5 - 8.5	7.65	7.51
Conductivity (EC)	µS/cm	-	2400	2400
Calcium	mg/L	-	180	180
Magnesium	mg/L	-	55	60
Sodium	mg/L	200	320	320
Potassium	mg/L	-	11	9.7
Iron	mg/L	0.3	<0.060	<0.06
Sulphate	mg/L	500	510	470
Chloride	mg/L	250	39	39
Bicarbonate	mg/L	-	1000	1100
Carbonate	mg/L	-	<0.50	<0.5
Hydroxide	mg/L	-	<0.50	<0.5
Nitrate (N)	mg/L	10	0.014	<0.22
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.05
TDS*	mg/L	500	1600	1600
Hardness	mg/L	-	670	690
Alkalinity (total as CaCO3)	mg/L	-	840	890
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.5
Ionic Balance	N/A	-	0.96	1.6
Water Nutrients				
Ammonia-N	mg/L	-	0.16	0.069
TKN	mg/L	-	0.89	0.85
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.0004
Toluene	mg/L	0.024	<0.00040	<0.0004
Ethylbenzene	mg/L	0.0016	<0.00040	<0.0004
Xylene	mg/L	0.02	<0.00080	<0.0008
F1 (C6-C10)	mg/L	-	<0.10	<0.1
F2 (>C10-C16)	mg/L	-	<0.10	<0.1
Organics				
COD	mg/L	-	81	35
DOC	mg/L	-	14	13
Metals				
Aluminum	mg/L	0.1	0.0064	<0.003
Antimony	mg/L	0.006	<0.00060	<0.0006
Arsenic	mg/L	0.01	0.00054	0.00034
Barium	mg/L	1	0.054	0.052
Beryllium	mg/L	-	<0.0010	<0.001
Boron	mg/L	5	0.060	0.06
Cadmium	mg/L	0.005	0.00010	0.000056
Chromium	mg/L	0.05	<0.0010	<0.001
Cobalt	mg/L	-	0.0015	<0.0003
Copper	mg/L	1	0.0041	0.002
Lead	mg/L	0.01	<0.00020	<0.0002
Lithium	mg/L	-	0.12	0.12
Manganese	mg/L	0.05	0.11	0.053
Mercury	mg/L	0.001	0.0000025	<0.000002
Molybdenum	mg/L	-	0.0012	0.00054
Nickel	mg/L	-	0.0096	0.0057
Phosphorus	mg/L	-	0.26	<0.1
Selenium	mg/L	0.05	<0.00020	<0.0002
Silicon	mg/L	-	5.6	6.5
Silver	mg/L	-	<0.00010	<0.0001
Strontium	mg/L	-	1.2	1.2
Sulphur	mg/L	-	140	150
Thallium	mg/L	-	<0.00020	<0.0002
Tin	mg/L	-	<0.0010	<0.001
Titanium	mg/L	-	<0.0010	<0.001
Uranium	mg/L	0.02	0.0050	0.0034
Vanadium	mg/L	-	0.0031	<0.001
Zinc	mg/L	5	0.0073	<0.003

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E35-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35-DEEP	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.22	8.1
Field EC	mS	-	4.90	3.92
Field Temperature	°C	-	8.9	10
Routine Water				
pH	-	6.5 - 8.5	8.19	8.13
Conductivity (EC)	µS/cm	-	4700	5300
Calcium	mg/L	-	18	20
Magnesium	mg/L	-	2.1	2.1
Sodium	mg/L	200	970	1100
Potassium	mg/L	-	3.3	3.8
Iron	mg/L	0.3	<0.060	<0.060
Sulphate	mg/L	500	25	13
Chloride	mg/L	250	1100	1400
Bicarbonate	mg/L	-	560	500
Carbonate	mg/L	-	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.25	<0.22
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.25	<0.050
TDS*	mg/L	500	2400	2800
Hardness	mg/L	-	53	58
Alkalinity (total as CaCO3)	mg/L	-	460	410
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50
Ionic Balance	N/A	-	1.0	2.3
Water Nutrients				
Ammonia-N	mg/L	-	1.1	1.2
TKN	mg/L	-	2.2	2.5
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	110	130
DOC	mg/L	-	18	-
Metals				
Aluminum	mg/L	0.1	0.017	0.0031
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0018	0.00081
Barium	mg/L	1	0.27	0.41
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.69	0.75
Cadmium	mg/L	0.005	0.000040	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00069	0.00052
Copper	mg/L	1	0.00094	0.00048
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.15	0.19
Manganese	mg/L	0.05	0.048	0.053
Mercury	mg/L	0.001	0.0000020	<0.0000020
Molybdenum	mg/L	-	0.021	0.017
Nickel	mg/L	-	0.0038	0.0013
Phosphorus	mg/L	-	<0.10	<0.10
Selenium	mg/L	0.05	0.00020	<0.00020
Silicon	mg/L	-	3.5	3.6
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.36	0.5
Sulphur	mg/L	-	9.2	4.6
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	0.0013
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0023	0.00064
Vanadium	mg/L	-	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	0.16

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E35A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	n/a	n/a
Field EC	mS	-	n/a	n/a
Field Temperature	°C	-	n/a	n/a
Routine Water				
pH	-	6.5 - 8.5	8.60	8.61
Conductivity (EC)	µS/cm	-	1500	1600
Calcium	mg/L	-	3.8	3.6
Magnesium	mg/L	-	0.36	0.34
Sodium	mg/L	200	370	390
Potassium	mg/L	-	2.2	3.1
Iron	mg/L	0.3	0.11	<0.060
Sulphate	mg/L	500	41	21
Chloride	mg/L	250	36	36
Bicarbonate	mg/L	-	900	960
Carbonate	mg/L	-	26	23
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	930	950
Hardness	mg/L	-	11	10
Alkalinity (total as CaCO3)	mg/L	-	780	830
Alkalinity (pp as CaCO3)	mg/L	-	22	19
Ionic Balance	N/A	-	0.95	2.4
Water Nutrients				
Ammonia-N	mg/L	-	0.83	-
TKN	mg/L	-	12	-
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	0.00049
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.27	<0.27
Organics				
COD	mg/L	-	1100	-
DOC	mg/L	-	15	-
Metals				
Aluminum	mg/L	0.1	0.092	0.055
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0035	0.0023
Barium	mg/L	1	0.080	0.13
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.75	0.74
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00042	0.00035
Copper	mg/L	1	0.0011	0.00065
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.068	0.069
Manganese	mg/L	0.05	0.012	0.013
Mercury	mg/L	0.001	<0.000020	<0.0000020
Molybdenum	mg/L	-	0.020	0.016
Nickel	mg/L	-	0.0053	0.0034
Phosphorus	mg/L	-	0.15	1.2
Selenium	mg/L	0.05	<0.00020	<0.00020
Silicon	mg/L	-	3.7	3.5
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.076	0.086
Sulphur	mg/L	-	11	5.9
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	0.0015	<0.0010
Uranium	mg/L	0.02	0.0013	0.00095
Vanadium	mg/L	-	0.0014	0.0012
Zinc	mg/L	5	0.0035	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E35B: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-35B	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	7.83	7.8
Field EC	mS	-	8.08	7270
Field Temperature	°C	-	7.6	8
Routine Water				
pH	-	6.5 - 8.5	8.16	8.22
Conductivity (EC)	µS/cm	-	7700	7600
Calcium	mg/L	-	99	98
Magnesium	mg/L	-	14	14
Sodium	mg/L	200	1800	1800
Potassium	mg/L	-	7.8	8.6
Iron	mg/L	0.3	<0.60	<0.60
Sulphate	mg/L	500	3700	3300
Chloride	mg/L	250	5.2	6.8
Bicarbonate	mg/L	-	790	780
Carbonate	mg/L	-	<0.50	<0.50
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.42	2.5
Nitrite (N)	mg/L	-	<0.010	<0.16
Nitrate and Nitrate (N)	mg/L	-	0.42	-
TDS*	mg/L	500	6000	5700
Hardness	mg/L	-	300	300
Alkalinity (total as CaCO3)	mg/L	-	650	640
Alkalinity (pp as CaCO3)	mg/L	-	<0.50	<0.50
Ionic Balance	N/A	-	0.95	2.3
Water Nutrients				
Ammonia-N	mg/L	-	1.9	2
TKN	mg/L	-	2.7	2.5
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	37	66
DOC	mg/L	-	8.2	12
Metals				
Aluminum	mg/L	0.1	0.012	0.0035
Antimony	mg/L	0.006	0.00069	<0.00060
Arsenic	mg/L	0.01	0.0019	0.0014
Barium	mg/L	1	<0.10	<0.1
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.70	0.71
Cadmium	mg/L	0.005	<0.000020	0.000022
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00065	0.00054
Copper	mg/L	1	0.0018	0.0032
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.50	0.52
Manganese	mg/L	0.05	0.066	0.074
Mercury	mg/L	0.001	<0.0000020	<0.0000020
Molybdenum	mg/L	-	0.0055	0.0041
Nickel	mg/L	-	0.0041	0.0036
Phosphorus	mg/L	-	<1.0	<1.0
Selenium	mg/L	0.05	0.00082	0.00053
Silicon	mg/L	-	3.1	3.1
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	2.2	2.3
Sulphur	mg/L	-	1200	1200
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.0023	0.0015
Vanadium	mg/L	-	<0.0010	<0.0010
Zinc	mg/L	5	<0.0030	<0.0030

Notes:
[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)
Information not available (n/a)
Total Dissolved Solids, not a measured value (TDS)
Exceeds Regulatory Limit

Table E36-Deep: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36-DEEP	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.52	8
Field EC	mS	-	3.83	4.84
Field Temperature	°C	-	7.7	10.3
Routine Water				
pH	-	6.5 - 8.5	8.51	8.33
Conductivity (EC)	µS/cm	-	3600	4800
Calcium	mg/L	-	17	18
Magnesium	mg/L	-	2.4	2.1
Sodium	mg/L	200	800	1100
Potassium	mg/L	-	5.4	3.9
Iron	mg/L	0.3	0.41	<0.060
Sulphate	mg/L	500	46	11
Chloride	mg/L	250	770	1100
Bicarbonate	mg/L	-	650	940
Carbonate	mg/L	-	13	3.1
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	0.018	<0.044
Nitrite (N)	mg/L	-	0.043	<0.033
Nitrate and Nitrate (N)	mg/L	-	0.061	<0.01
TDS*	mg/L	500	2000	2600
Hardness	mg/L	-	52	53
Alkalinity (total as CaCO3)	mg/L	-	550	770
Alkalinity (pp as CaCO3)	mg/L	-	11	2.6
Ionic Balance	N/A	-	1.1	2.3
Water Nutrients				
Ammonia-N	mg/L	-	0.92	1.3
TKN	mg/L	-	1.9	2.6
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	99	140
DOC	mg/L	-	12	-
Metals				
Aluminum	mg/L	0.1	0.19	0.0069
Antimony	mg/L	0.006	0.0030	<0.00060
Arsenic	mg/L	0.01	0.0088	0.0024
Barium	mg/L	1	0.23	0.32
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.71	0.97
Cadmium	mg/L	0.005	0.000070	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00082	0.0012
Copper	mg/L	1	0.011	0.0006
Lead	mg/L	0.01	0.00094	<0.00020
Lithium	mg/L	-	0.11	0.19
Manganese	mg/L	0.05	0.030	0.071
Mercury	mg/L	0.001	0.00019	<0.0000020
Molybdenum	mg/L	-	0.041	0.011
Nickel	mg/L	-	0.0086	0.0046
Phosphorus	mg/L	-	0.13	<0.10
Selenium	mg/L	0.05	0.00096	0.0003
Silicon	mg/L	-	2.6	3.6
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.34	0.46
Sulphur	mg/L	-	17	3.3
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	0.003
Titanium	mg/L	-	0.0030	<0.0010
Uranium	mg/L	0.02	0.0066	0.0016
Vanadium	mg/L	-	0.0078	<0.0010
Zinc	mg/L	5	0.0068	0.1

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

Table E36A: Field Data and Chemical Analysis Results

Parameter ID	Units	Regulatory Limits[1]	MW-36A	
			Jun-16	Jun-17
Field Measurements				
Field pH	-	-	8.87	8.8
Field EC	mS	-	1.588	1.633
Field Temperature	°C	-	9.1	6.5
Routine Water				
pH	-	6.5 - 8.5	8.66	8.52
Conductivity (EC)	µS/cm	-	1600	1600
Calcium	mg/L	-	3.9	3.3
Magnesium	mg/L	-	0.41	0.32
Sodium	mg/L	200	390	380
Potassium	mg/L	-	1.4	1.3
Iron	mg/L	0.3	<0.060	<0.060
Sulphate	mg/L	500	<1.0	2.9
Chloride	mg/L	250	7.4	7.1
Bicarbonate	mg/L	-	970	1000
Carbonate	mg/L	-	25	18
Hydroxide	mg/L	-	<0.50	<0.50
Nitrate (N)	mg/L	10	<0.010	<0.044
Nitrite (N)	mg/L	-	<0.010	<0.033
Nitrate and Nitrate (N)	mg/L	-	<0.020	<0.010
TDS*	mg/L	500	900	930
Hardness	mg/L	-	12	9.5
Alkalinity (total as CaCO3)	mg/L	-	830	880
Alkalinity (pp as CaCO3)	mg/L	-	21	15
Ionic Balance	N/A	-	1.0	2.7
Water Nutrients				
Ammonia-N	mg/L	-	0.60	0.52
TKN	mg/L	-	1.3	1.2
Hydrocarbons				
Benzene	mg/L	0.005	<0.00040	<0.00040
Toluene	mg/L	0.024	<0.00040	<0.00040
Ethylbenzene	mg/L	0.0016	<0.00040	<0.00040
Xylene	mg/L	0.02	<0.00080	<0.00080
F1 (C6-C10)	mg/L	-	<0.10	<0.10
F2 (>C10-C16)	mg/L	-	<0.10	<0.10
Organics				
COD	mg/L	-	55	42
DOC	mg/L	-	13	14
Metals				
Aluminum	mg/L	0.1	0.015	0.0093
Antimony	mg/L	0.006	<0.00060	<0.00060
Arsenic	mg/L	0.01	0.0012	0.00075
Barium	mg/L	1	0.031	0.034
Beryllium	mg/L	-	<0.0010	<0.0010
Boron	mg/L	5	0.82	0.79
Cadmium	mg/L	0.005	<0.000020	<0.000020
Chromium	mg/L	0.05	<0.0010	<0.0010
Cobalt	mg/L	-	0.00056	0.00043
Copper	mg/L	1	0.0026	<0.00020
Lead	mg/L	0.01	<0.00020	<0.00020
Lithium	mg/L	-	0.064	0.067
Manganese	mg/L	0.05	0.022	0.032
Mercury	mg/L	0.001	0.000017	<0.0000020
Molybdenum	mg/L	-	0.010	0.0088
Nickel	mg/L	-	0.0019	0.00085
Phosphorus	mg/L	-	0.13	0.11
Selenium	mg/L	0.05	0.00023	<0.00020
Silicon	mg/L	-	3.4	3.5
Silver	mg/L	-	<0.00010	<0.00010
Strontium	mg/L	-	0.045	0.046
Sulphur	mg/L	-	1.0	0.72
Thallium	mg/L	-	<0.00020	<0.00020
Tin	mg/L	-	<0.0010	<0.0010
Titanium	mg/L	-	<0.0010	<0.0010
Uranium	mg/L	0.02	0.00037	0.00026
Vanadium	mg/L	-	0.0028	0.0021
Zinc	mg/L	5	0.0033	<0.0030

Notes:

[1] Guidelines for Canadian Drinking Water Quality Summary Table, Health Canada (October 2014)

Information not available (n/a)

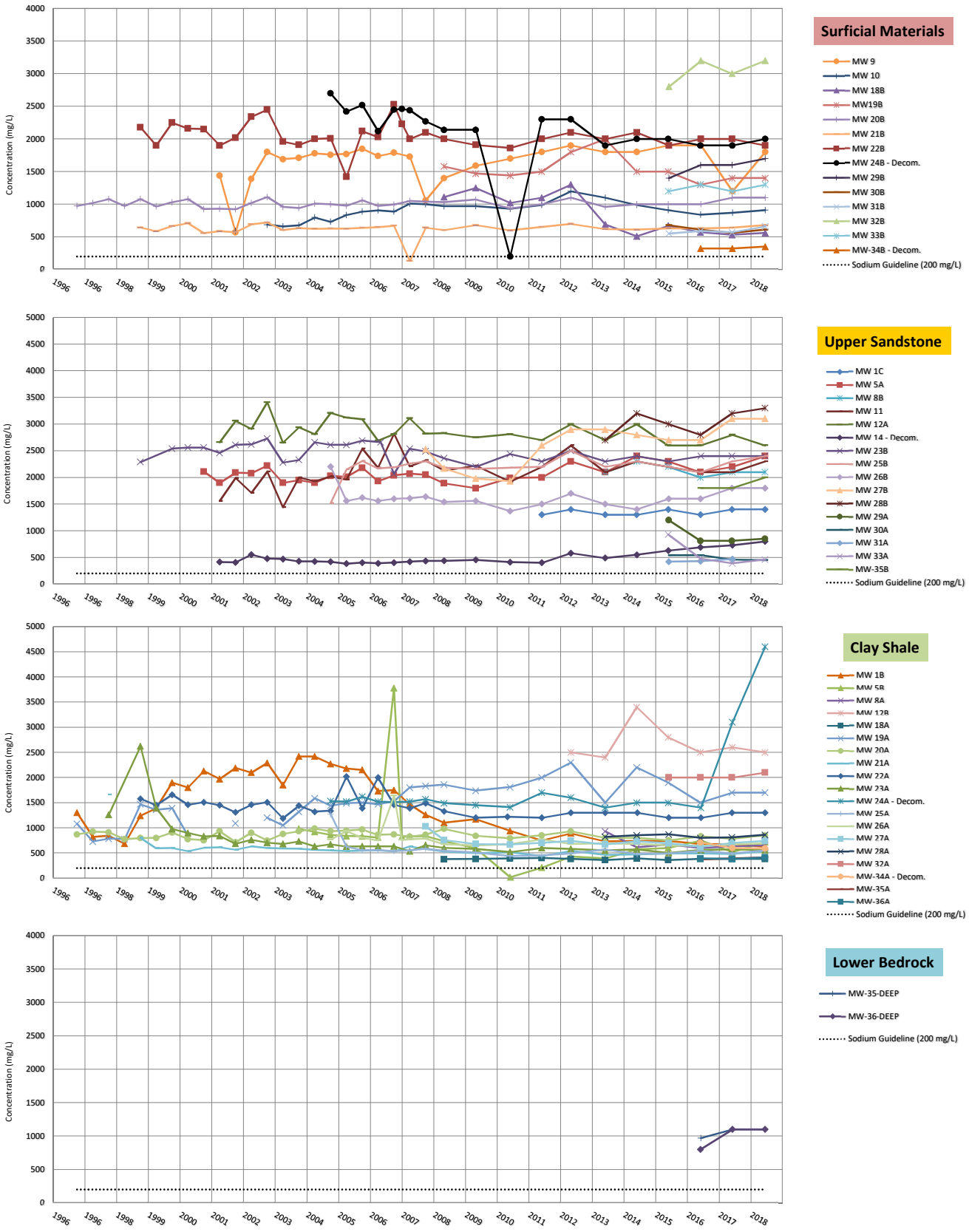
Total Dissolved Solids, not a measured value (TDS)

Exceeds Regulatory Limit

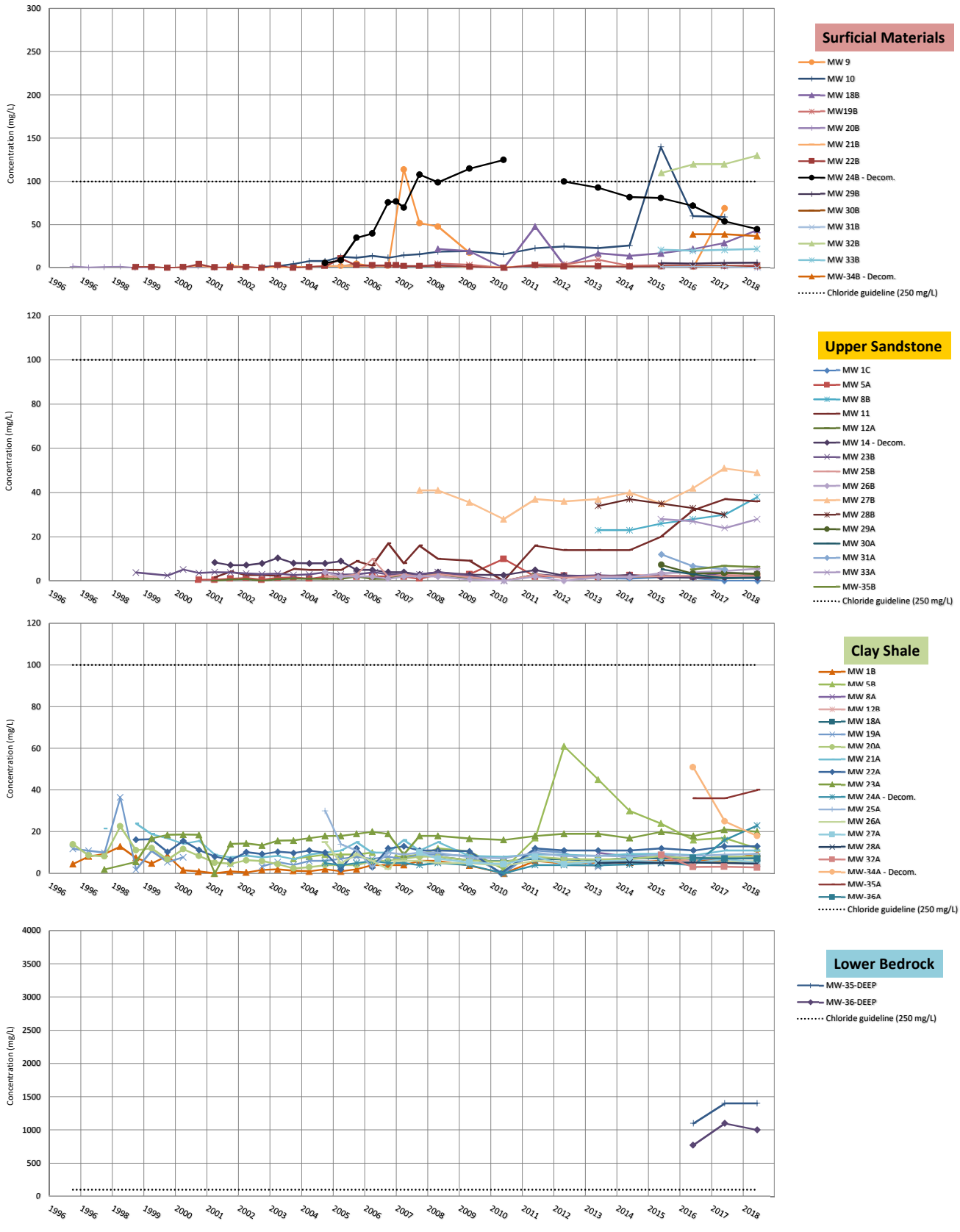
APPENDIX F

CONCENTRATION TRENDS

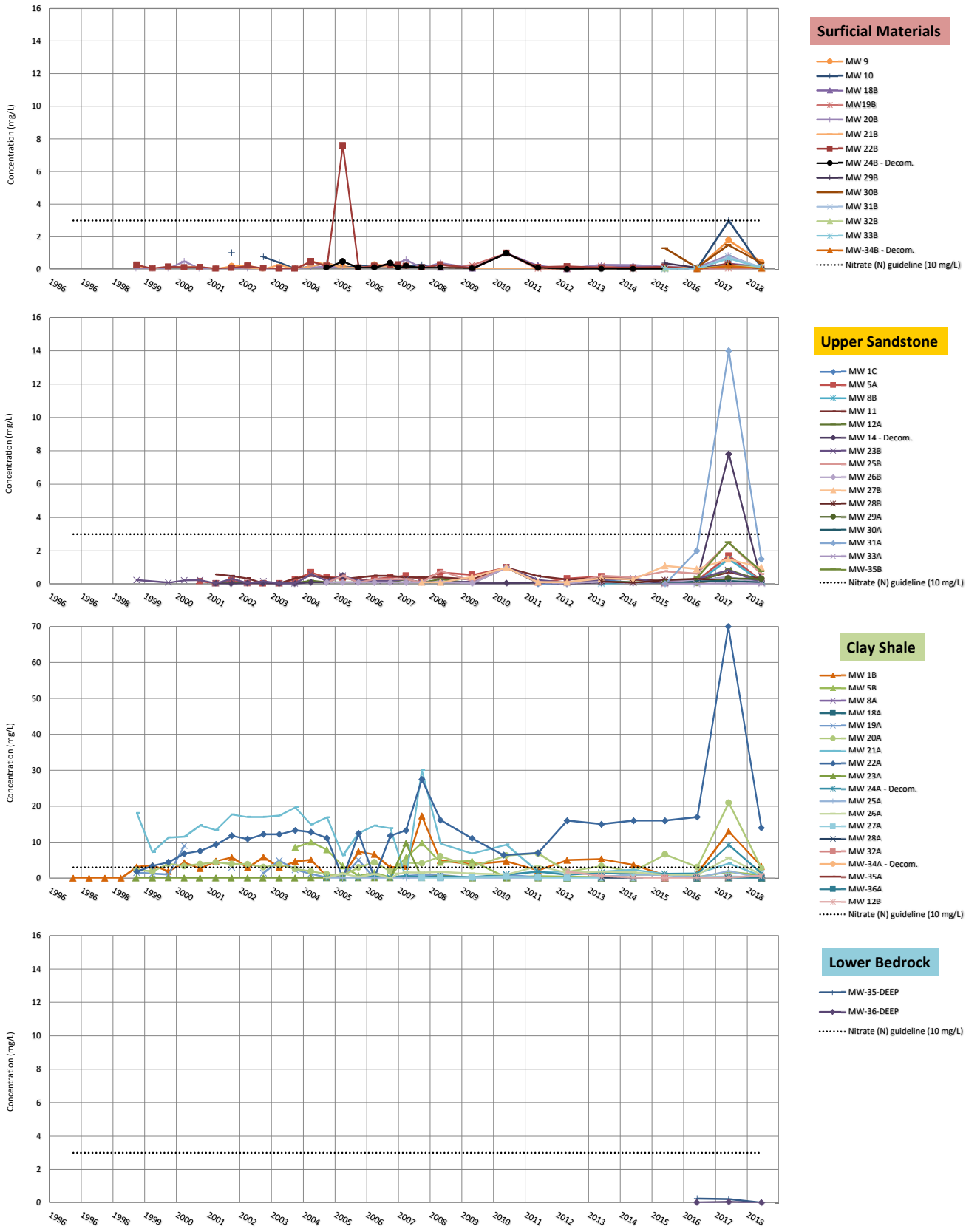
Appendix F1 - Sodium Concentration Trends



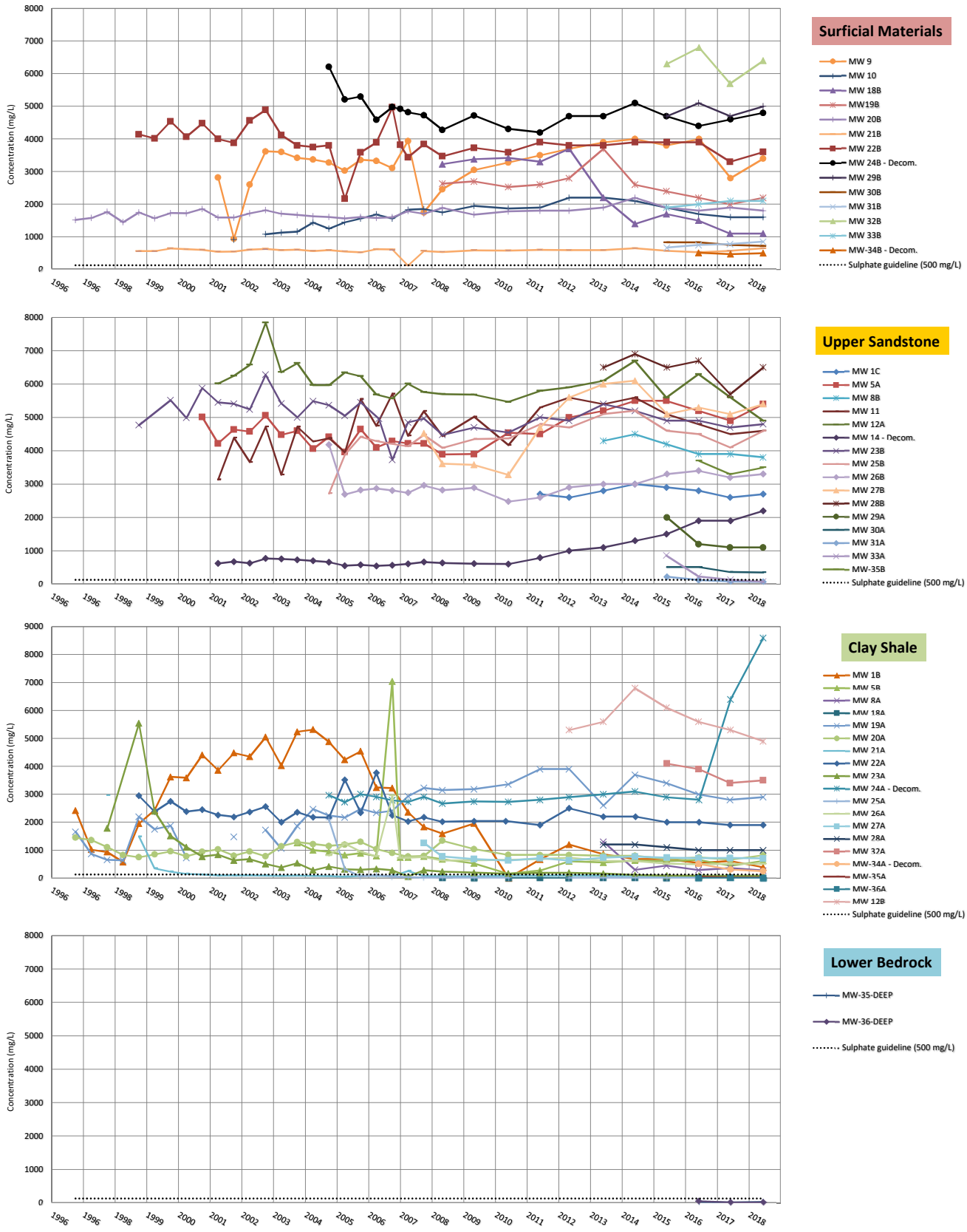
Appendix F2 - Chloride Concentration Trends



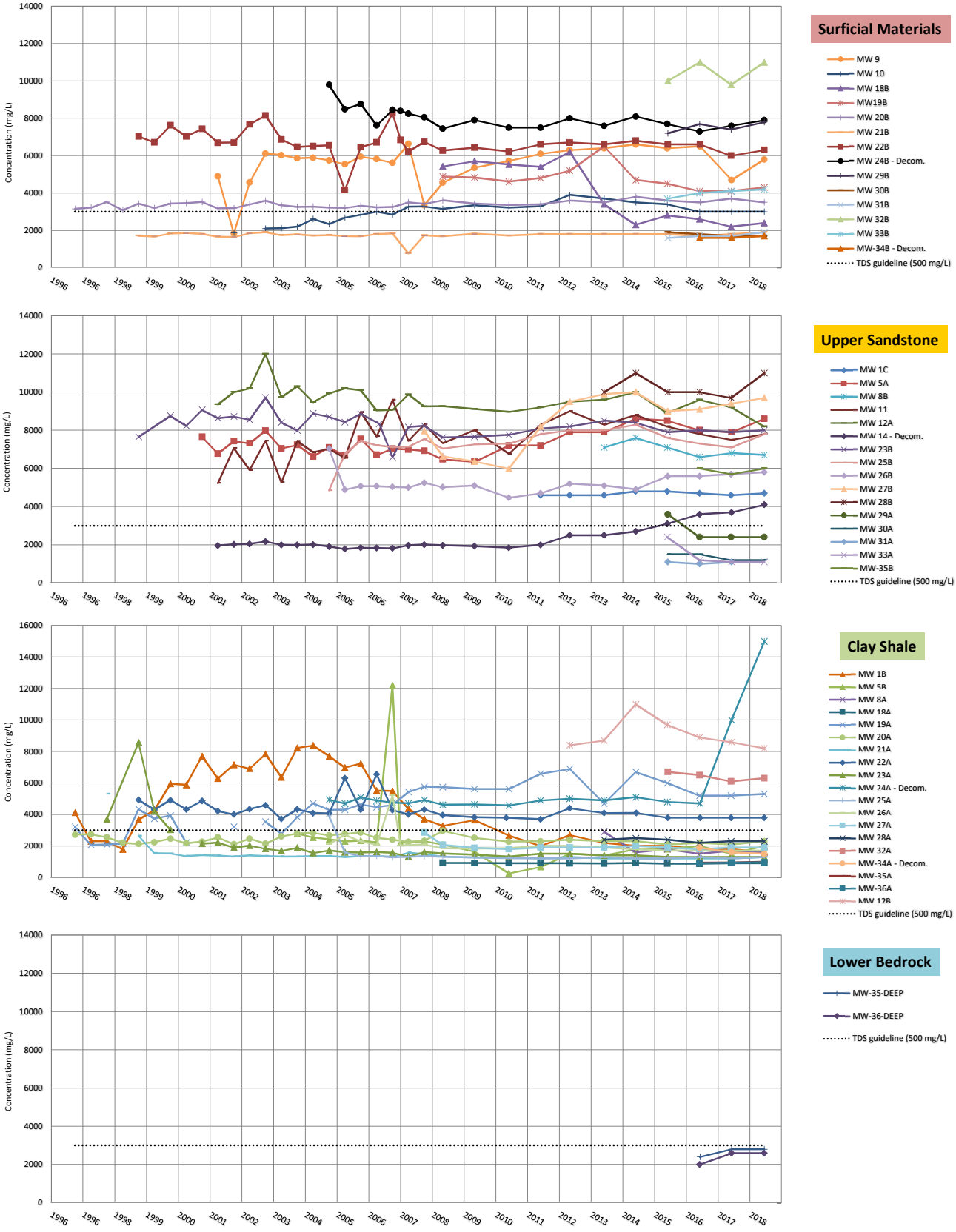
Appendix F3 - Nitrate Concentration Trends



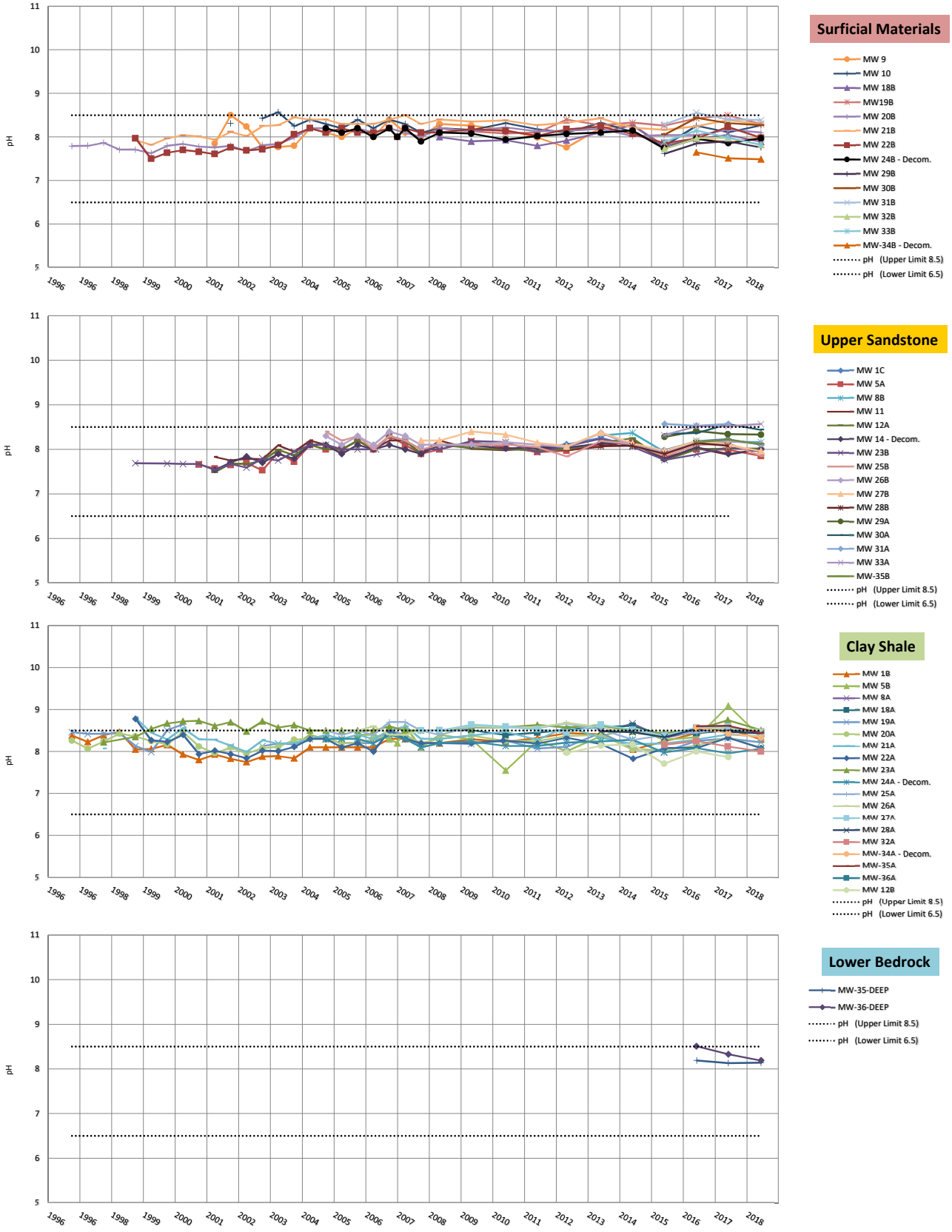
Appendix F4 - Sulphate Concentration Trends



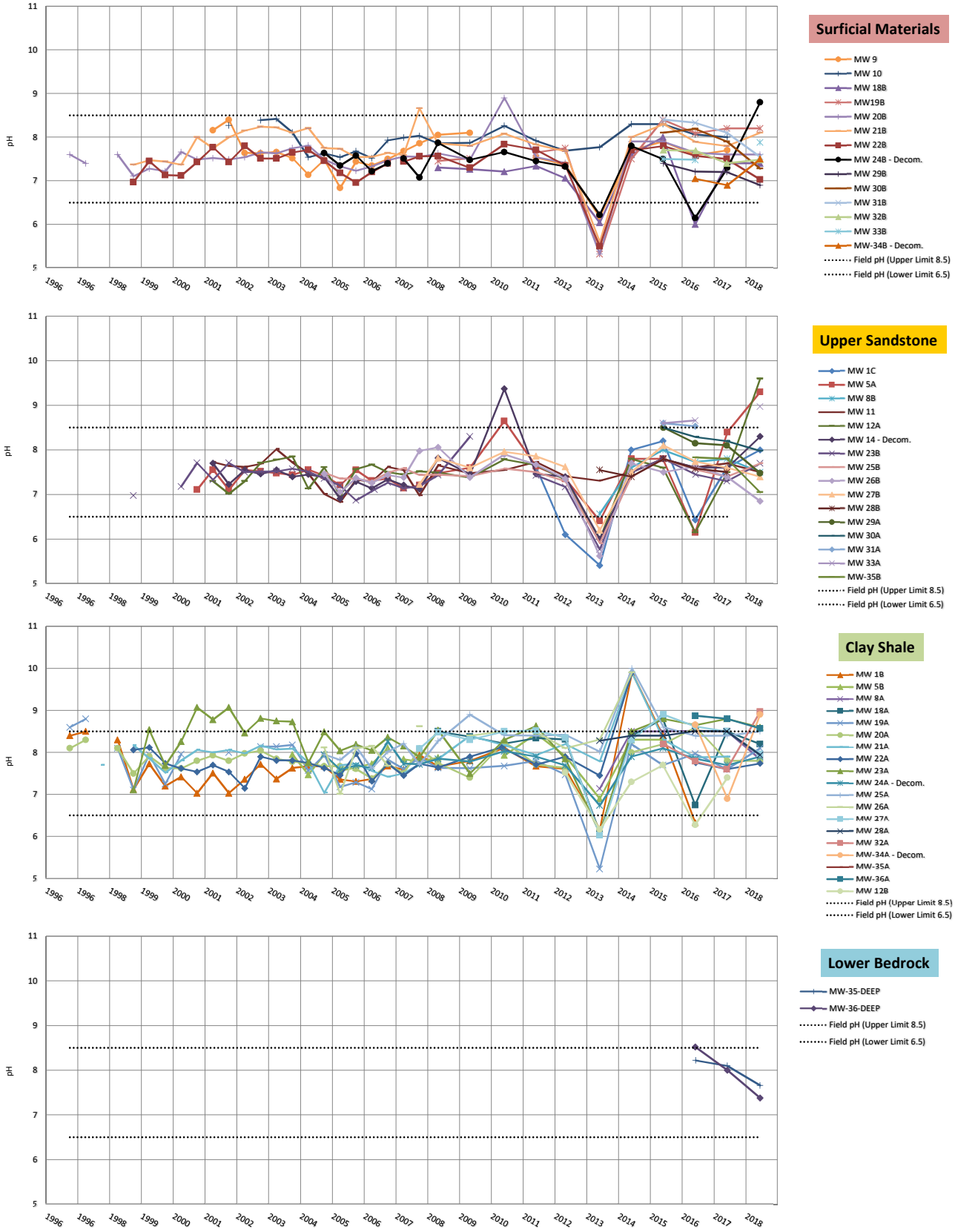
Appendix F5 - TDS Concentration Trends



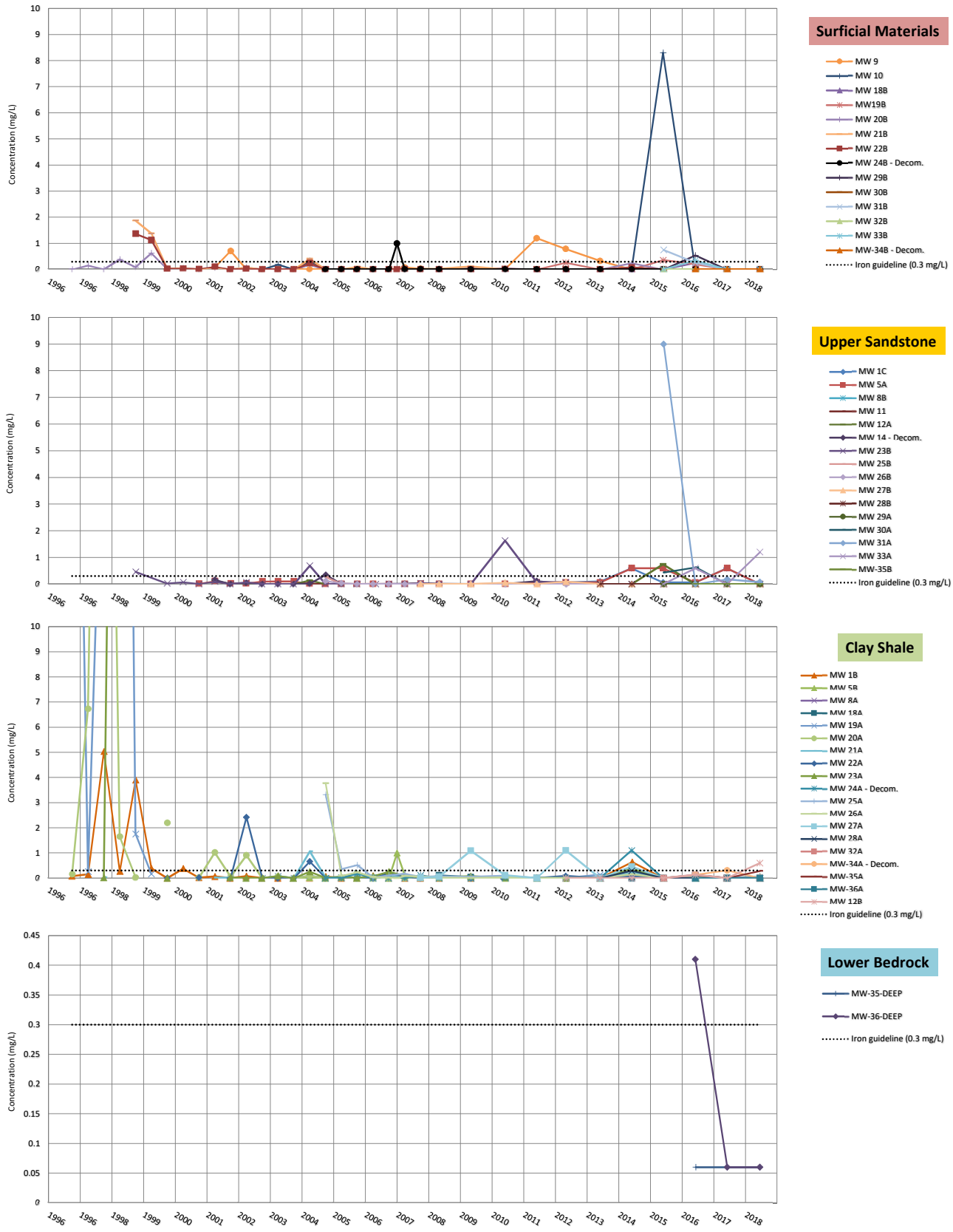
Appendix F6 - Lab pH Trends



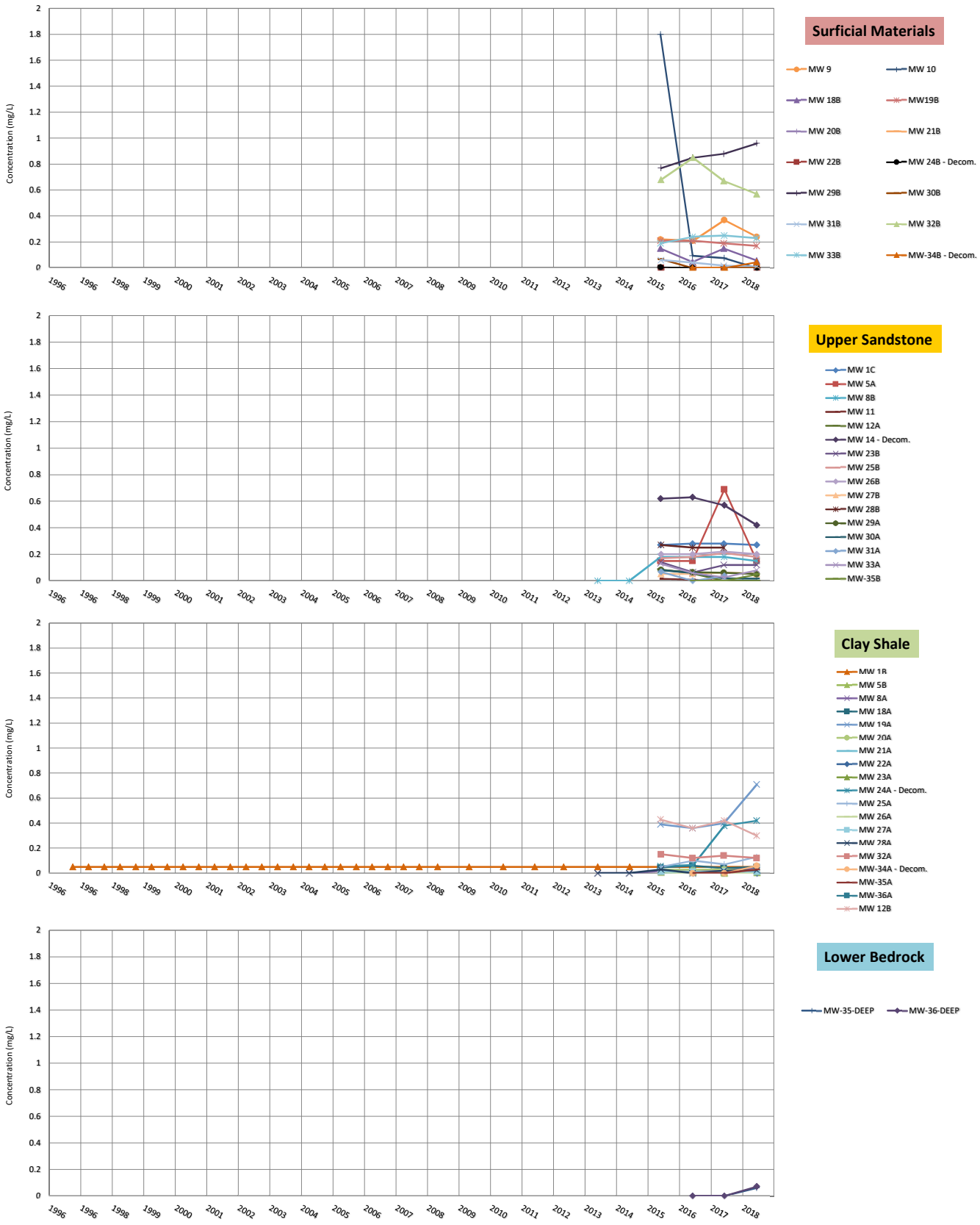
Appendix F7 - Field pH Trends



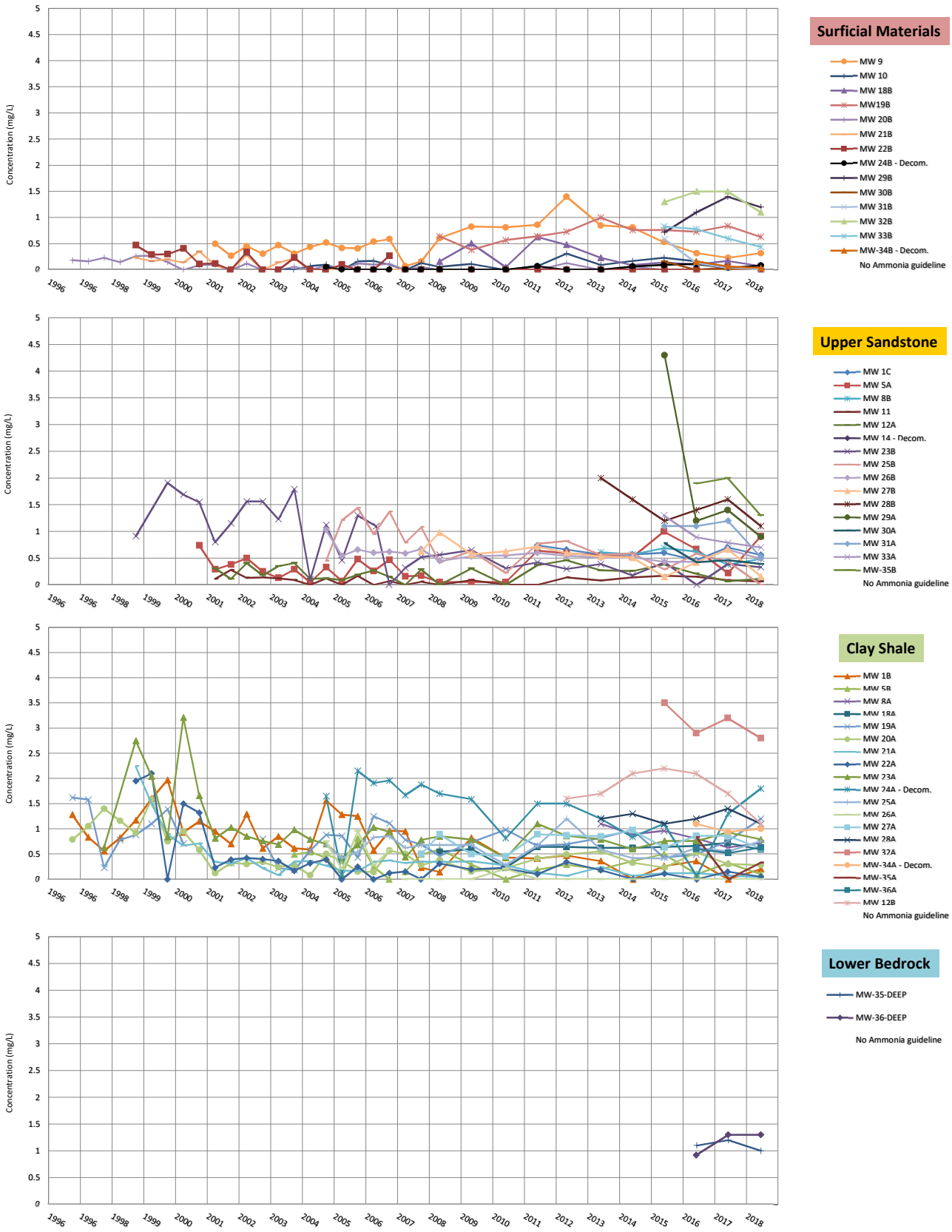
Appendix F8 - Iron Concentration Trends



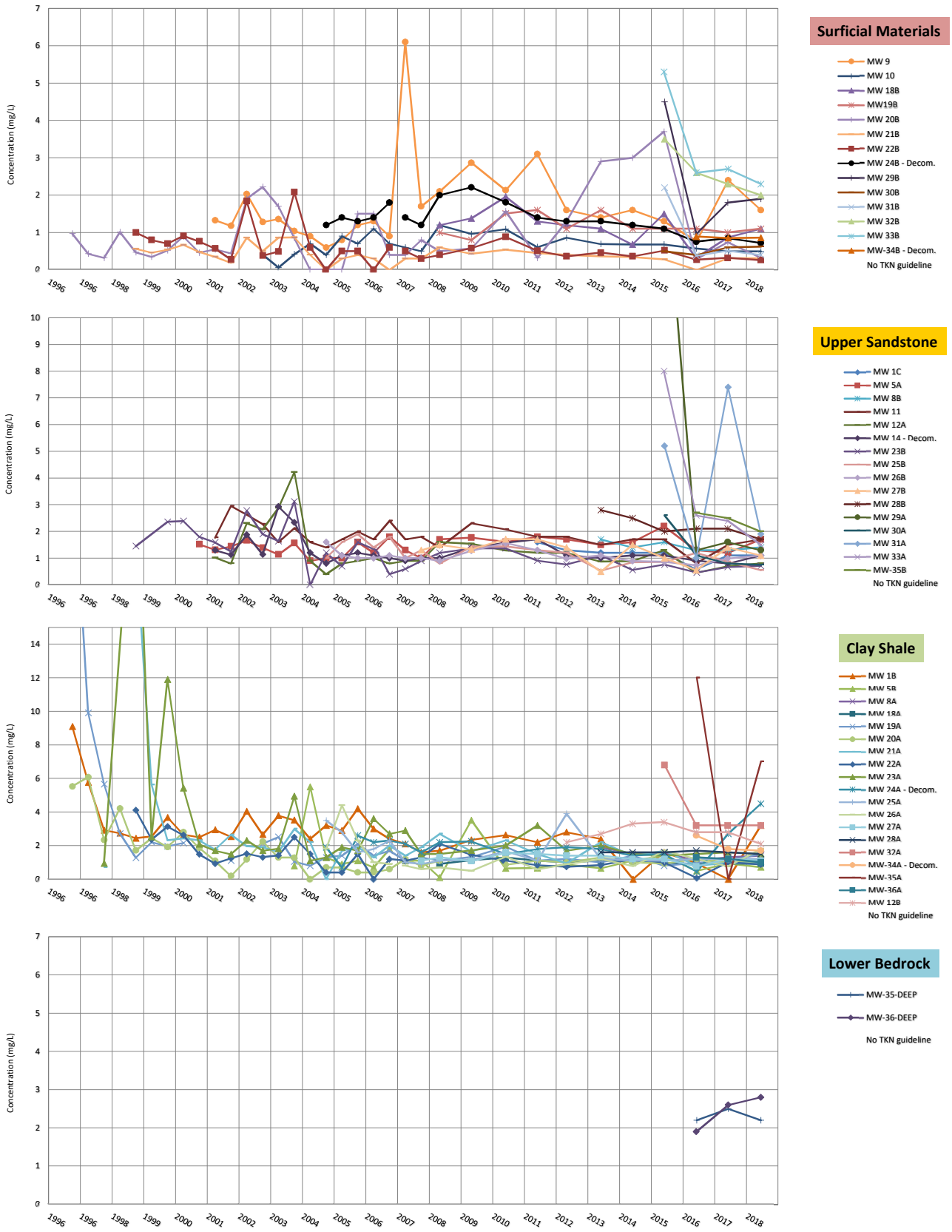
Appendix F9 - Manganese Concentration Trends



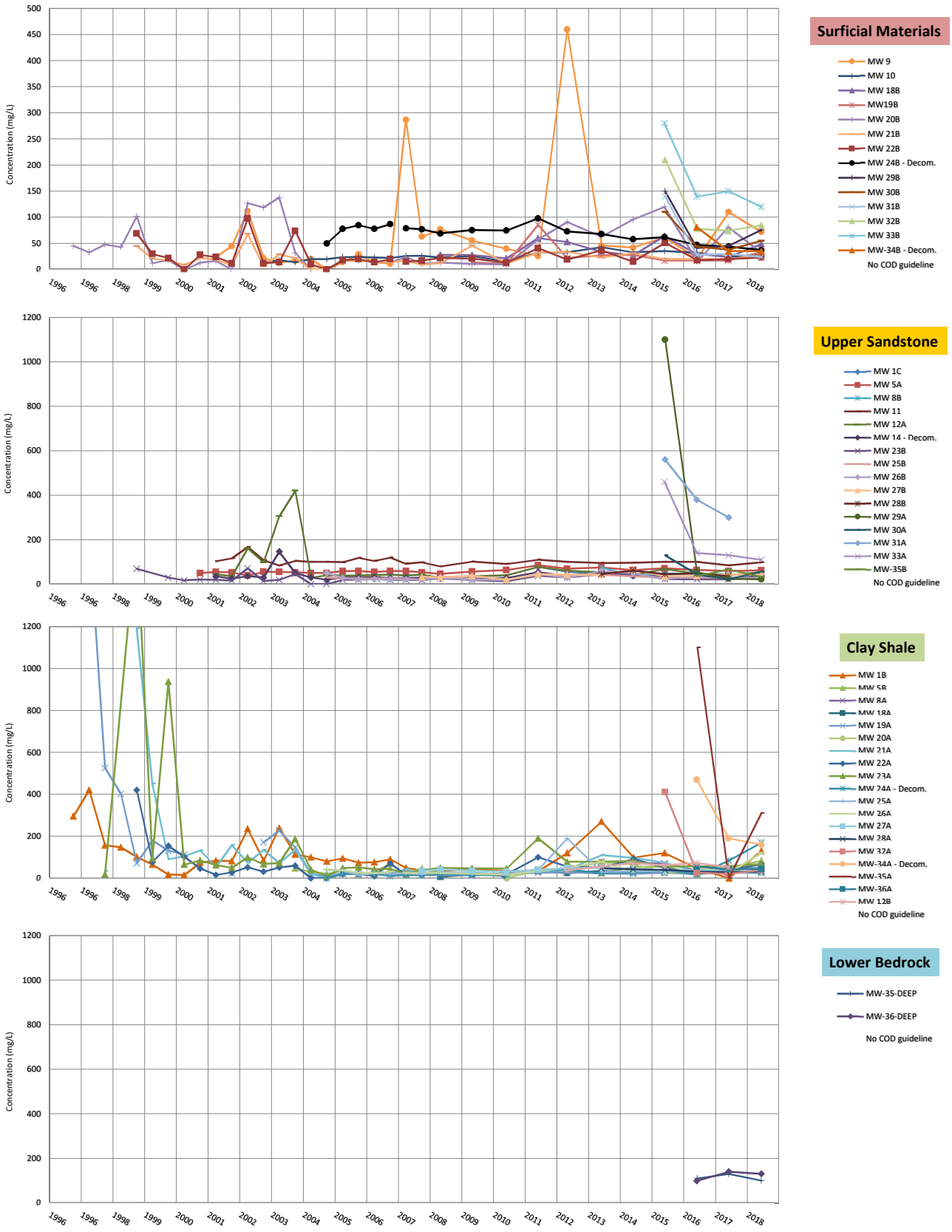
Appendix F10 - Ammonia Concentration Trends



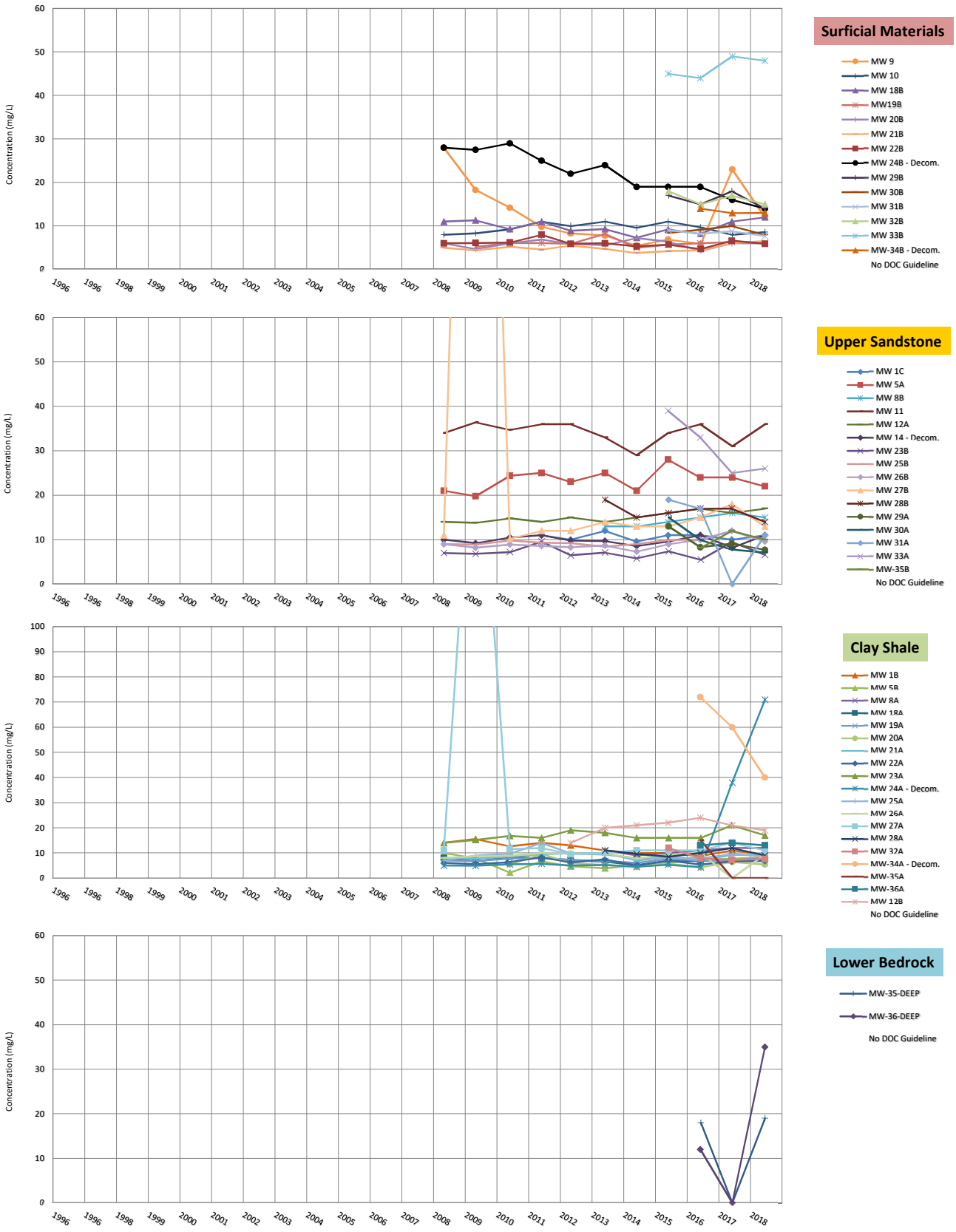
Appendix F11 - TKN Concentration Trends



Appendix F12 - COD Concentration Trends



Appendix F13 - DOC Concentration Trends



APPENDIX G

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LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

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