APPENDIX G:
HYDROGEOLOGY BASELINE DATA REPORT
PALMER ENVIRONMENTAL

Prepared for:
Canadian Environmental Assessment Agency

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AMBERSHAW PROJECT SITE

HYDROGEOLOGY BASELINE DATA REPORT
ADVANCED EXPLORATION PERMIT

PREPARED FOR:
AMBERSHAW METALLICS INC.

PREPARED BY:
PALMER ENVIRONMENTAL CONSULTING GROUP INC.

MARCH 20, 2019

Revision History

REV. NO.	DATE	AUTHOR	DESCRIPTION
1	March 19, 2019	SF, JC	Updated to most recent mine plan layout and minor revisions from PB

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1 INTRODUCTION

1.1 Background

Ambershaw Metallics Inc. ("AMI") is a Canadian DR-grade magnetite pellet developer company with interests in the Bending Lake Property ("Property" or "site") located approximately 35 km southwest of Ignace, Ontario and 80 km north of Atikokan, Ontario and accessed via a secondary access road from Highway 622 (**Figure 1-1**). This document is one of a series of environmental baseline reports prepared by Palmer Environmental Consulting Group Inc. (PECG) to describe the existing environmental conditions at the property to support an application to the Ministry of Energy, Northern Development and Mines (ENDM) to support the Bending Lake Advanced Exploration Project ("Project").

The Project consists of an open pit with the extraction of approximately up to 100,000 tonnes of iron mineralized rock to allow for an examination of potential development options with respect to the mineralized rocks present and process options to assess the potential of a commercially viable mine. To support this project PECG initiated an integrated baseline environmental program in May 2017 to expand upon the limited environmental information available near the site to provide a comprehensive understanding of the existing environmental conditions.

This introduction section is included in each environmental baseline document prepared by PECG such that each report can be read independently. This report presents the Baseline Hydrogeological Conditions for the Project. The other baseline reports in the series are those prepared for the following environmental disciplines:

- Hydrology;
- Fish and Aquatic Resources;
- Water Quality; and,
- Terrestrial Ecology.

While each baseline document has been prepared separately, it recognized that all physical, chemical and biological systems are interconnected. As such, PECG has focused on taking an ecosystem and watershed-based approach to understanding the integrated nature of the existing environmental conditions for the Project.

1.2 Project Setting

The Bending Lake property is situated at the southeasterly end of a 30 km long northwest-southeast trending belt of Achaean metamorphosed volcanic and sedimentary rocks which is part of a 70 km long belt of supracrustal rocks referred to as the Manitou-Stormy Lakes greenstone belt. The Project site is located at UTM Zone 15 N 5463800 m, E 559600 m.

Presently, the area is characterized by a wilderness, forestry and mineral exploration land use. Access to the site is along a series of historical mining and logging roads, accessed from Highway 622 (**Figure 1-2**). The Advanced Exploration site is located on a local topographic high between the Wabigoon Lake Subwatershed and the Bending Lake Subwatershed, with extraction activities focused in the Bending Lake Subwatershed (**Figure 1-3**). Page Lake is located south of the site and Bending Lake is located to the east. Page Lake drains into Bending Lake along a small first order stream located in the southern portion of the Project Development Area. Surface water flow at the site is towards the north towards a wetland and drainage features that ultimately discharges onto Bending Lake.

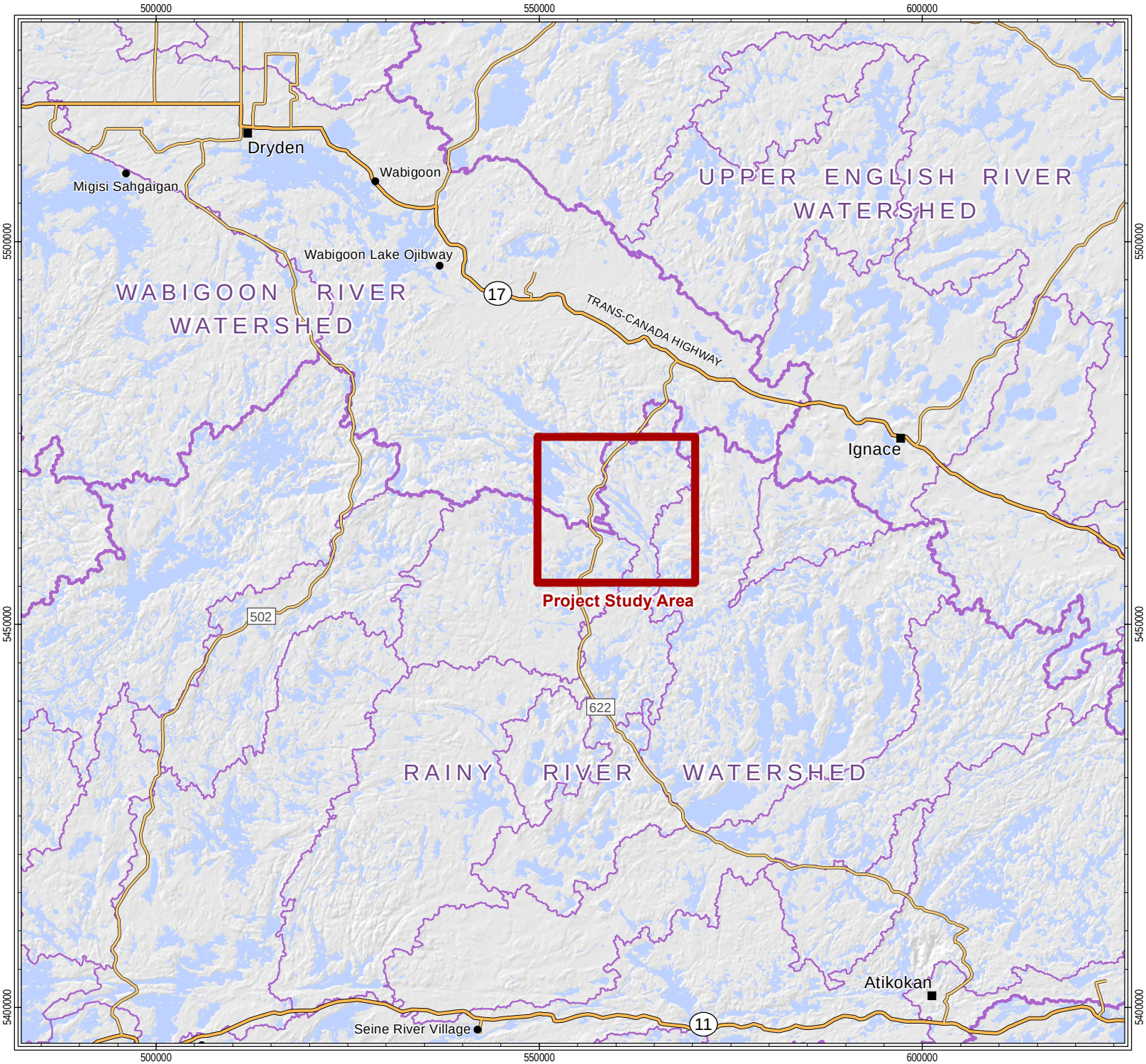
1.3 Overview of the Project

AMI proposes to complete a bulk sampling program as part of an Advanced Exploration Project for the Bending Lake Property. As part of this program, AMI proposes to complete earthworks and bedrock extraction from a small open pit for an up to 100,000 tonne bulk sampling program, with crushing and sampling completed on-site. The bulk sample will be trucked off-site for processing at an approved facility to test metallurgical recoveries to assess the commercial viability of the project. The Project Description prepared by AMI (October 2018) provides additional details on the proposed Project.

The proposed project site facilities layout is presented within the Project Development Area on **Figure 1-3**. Preference has been given to utilizing previously disturbed areas and existing access roads to complete the Project. The major proposed Project components are expected to include:

- Open Pit (104 m by 71 m by 10 m deep);
- Stockpiles;
- Portable Crusher;
- Administration and Parking Facilities;
- On-Site Power and Waste Facilities; and,
- Project Access Road.

The Project is proposed to be completed in three phases, with an overall project duration of 4 months. A monitoring and mitigation plan will be implemented based on the recommendations from each of the technical environmental disciplines.



Ambershaw Metallics, Inc.

LEGEND

- Major Highway
- Minor Highway
- Watershed Boundary
- Subwatershed Boundary

Data Sources: Ministry of Natural Resources and Forestry (Watersheds), Natural Resources Canada (Roads, Place Names), Esri basemap service (Imagery).

0 10 20
kilometres

N

DRAWN: B. Elder/S. Feist
CHECKED: J. Cole — Scale 1:700000
PROJECT: 17018 — UTM Zone 15N
DATE: Dec 16, 2018 — NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

Project Location

FIGURE 1-1

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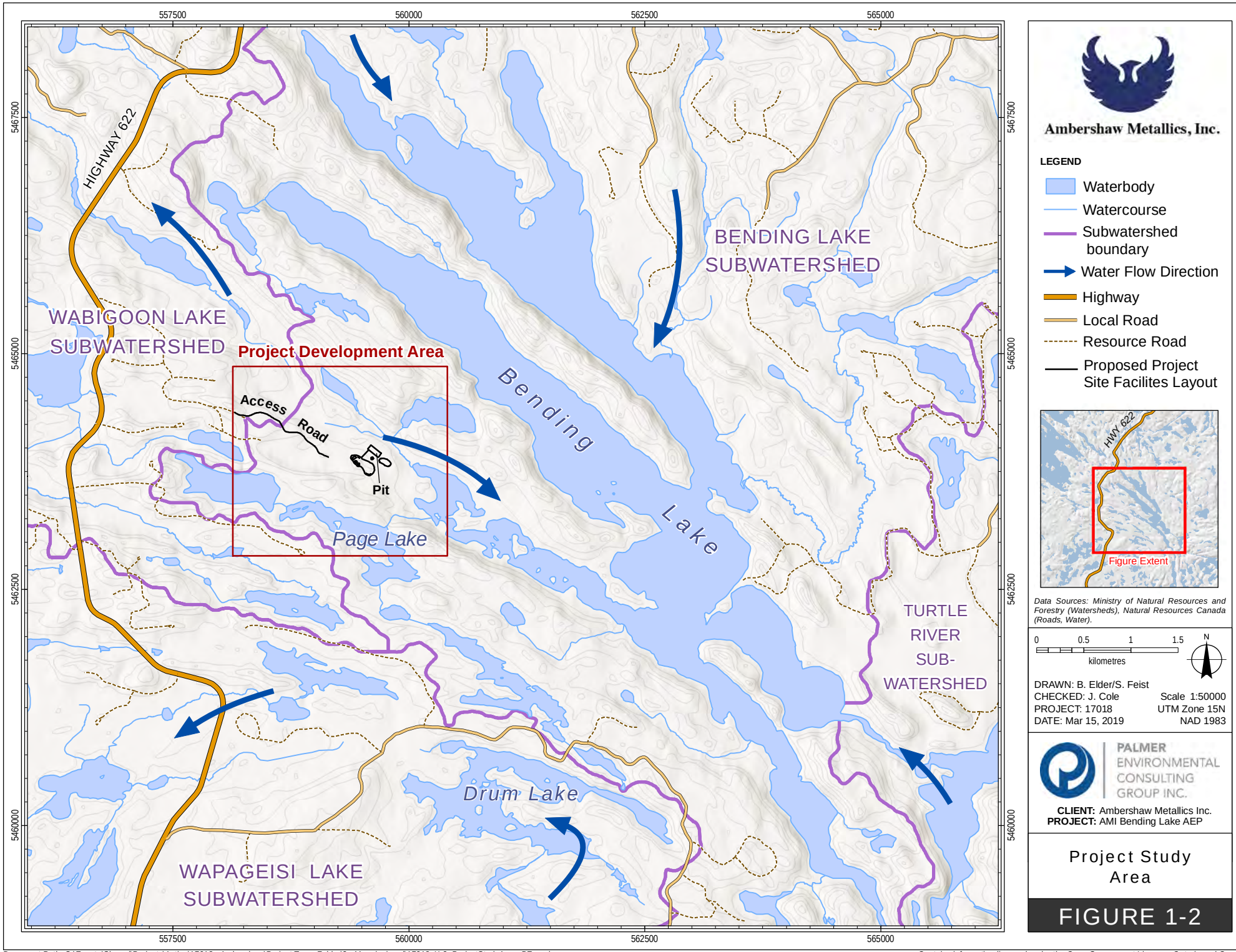

Ambershaw Metallics, Inc.

LEGEND

- Waterbody
- Watercourse
- Subwatershed boundary
- Water Flow Direction
- Highway
- Local Road
- Resource Road
- Proposed Project Site Facilites Layout

Data Sources: Ministry of Natural Resources and Forestry (Watersheds), Natural Resources Canada (Roads, Water).

0 0.5 1 1.5
kilometres

N

DRAWN: B. Elder/S. Feist
CHECKED: J. Cole
PROJECT: 17018
DATE: Mar 15, 2019

Scale 1:50000
UTM Zone 15N
NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

Project Study Area

FIGURE 1-2

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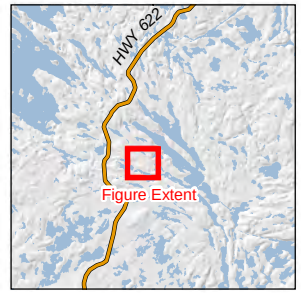
Ambershaw Metallics, Inc.

LEGEND

- Watercourse
- Proposed Project Site Facilities Layout
- Contour (10 m)



Data Sources: Natural Resources Canada (Roads, Water, Contours, DEM).

0 0.1 0.2 0.3
kilometres

N

DRAWN: S. Feist
CHECKED: J. Cole
PROJECT: 17018
DATE: Mar 14, 2019

Scale 1:10500
UTM Zone 15N
NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

Project Development Area

FIGURE 1-3

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2 HYDROGEOLOGY BASELINE PROGRAM OVERVIEW

2.1 Project Objective

The objective of this report is to present a conceptual understanding of the baseline groundwater conditions at the site and surrounding area to support the Advanced Exploration permitting (Bulk Sample Permit) for the AMI Project. The report is based on the results of geological, hydrogeological, and groundwater field investigations, as well as a review and compilation of historical site investigations. It should be noted that this hydrogeological investigation report is designed to complement and supplement the other technical disciplines to form an integrated characterization of baseline conditions for this Project.

2.2 Scope of Work

PECG's scope of work for the hydrogeological investigation the Project is as follows:

- Collection and interpretation of existing reports and background data;
- Installation of nine (9) drive point piezometers in wetlands, lakes and watercourse features to assess groundwater/ surface water interactions and to integrate hydrogeological and wetland ecology disciplines;
- Borehole drilling and the installation of ten (10) groundwater monitoring wells;
- Collection of representative soil and rock samples, and hydrogeological interpretation of aquifers and aquitards;
- Groundwater well development and location surveying;
- Single well response testing at each monitoring well location to determine the hydraulic conductivity of the surrounding geological material;
- Low flow water quality sampling at each groundwater monitoring well;
- Two (2) rounds of groundwater and surface water level monitoring;
- Installation of Solinst Dataloggers to continuously monitor groundwater levels in ten (10) locations;
- Groundwater field data analysis and interpretation; and,
- Hydrogeological investigation report preparation in support of Advanced Exploration Permitting.

Information from the following sources was reviewed as part of this study:

- Site reconnaissance by PECG Hydrogeologists;
- Available geology, hydrogeology, and physiography mapping (i.e., Ontario Geological Survey (OGS) Surficial Geology Mapping); and,
- Historical technical reports for the Ambershaw Project site, including:
    - Environmental Plan for the Bending Lake Project (Capper, 1978)
    - 2008 Diamond Drilling Report (Raoul, 2010); and,
    - Independent Technical Report (Fladgate Exploration, 2011).

2.3 Temporal Boundaries

Hydrogeological data specific to the Ambershaw Project site were collected from 1978 to 2017 for use in this baseline assessment. This includes the 1978 Environmental Assessment completed for the Bending Lake Project, prepared for Steep Rock Iron Mines Limited in Atikokan, Ontario (Capper, 1978), the 2008 Diamond Drilling Investigation completed by Bending Lake Iron Group Ltd (BLIG) to define the extent and composition of the Bending Lake Iron Ore Deposit (Raoul, 2010), and the 2011 preliminary technical report prepared by Fladgate Exploration Consulting Corporation for Bending Lake Iron Group Limited (Fladgate Exporation, 2011). The PECG hydrogeology study to support the Advanced Exploration Permitting (Bulk Sample Permit) has been ongoing since May 2017.

2.4 Spatial Boundaries

The extent of the spatial boundaries for the Hydrogeology Baseline Study for the Project include the following areas:

- Project Study Area – The Project Study Area boundaries have been delineated to coincide with the mapped watershed boundaries of the Bending Lake, Wabigoon Lake, Wapageisi Lake and Turtle River subwatersheds as shown on **Figure 1-2**. Discipline specific investigations may extend outside of the area shown on **Figure 1-2**, but are fully contained with the mapped subwatershed boundaries.

- Project Development Area – The Project Development Area boundary encompasses the area immediately affected by the proposed Advanced Exploration project site facilities as shown on **Figure 1-3**.

3 METHODOLOGY

Hydrogeological field investigations were designed to target the specified project components shown on the Project Development Area (**Figure 3-1**). Field investigations included borehole drilling and groundwater monitoring well installations, drive point piezometer installations, well development, hydraulic testing, and groundwater quality sampling. The drilling program and associated field work was completed across three site visits, occurring from August 10 – 17, 2017, October 18 – 22, 2017, and May 24 – 30, 2018. The following field activities were completed:

- Seven (7) boreholes were drilled at seven locations, and ten (10) monitoring wells were installed. Of the 10 monitoring wells, three (3) consist of two nested 1" diameter wells (for a total of 6 nested wells), and four (4) consist of a single 2" diameter well;
- Nine (9) drive point piezometers were installed at nine (9) locations to target wetlands, lakes, and watercourses in vicinity of the claim lands;
- Installation of pressure transducers at each of the ten (10) monitoring wells for continuous water level monitoring;
- Well development and hydraulic testing of each of the ten (10) monitoring wells; and,
- Groundwater quality sampling and monitoring of each of the ten (10) monitoring wells and nine (9) drive point piezometers.

3.1 Borehole Drilling

Borehole drilling investigations were completed in August 2017. The location and depth of the seven drilled boreholes (MW-1 to MW-7) were determined based on characterizing the hydrogeological conditions within the Study Area (**Figure 1-2**) and to target locations near the proposed project elements outlined within the Project Development Area (**Figure 1-3**). These elements include the proposed locations for the open pit (bulk sample location), stock piles, and crusher. MW-1, MW-2, MW-3s/d, and MW-4 encompass the proposed location of the Project Development Area, where MW-2 is along the access road upgradient of the project components, MW-3s/d is upgradient of the stockpile and crusher, and MW-1 and MW-4 are both downgradient from the proposed pit and stockpile (**Figure 3-1**). In addition, MW-1 and MW-4 were installed between the proposed open pit location and Bending Lake. This was done to establish the baseline groundwater conditions such that potential impacts from the bulk sample collection and open pit mining can be assessed.

Borehole drilling and monitoring well installations were completed by TBT Engineering Consulting Group (TBTE). Borehole drilling was completed using a Skidder Tire Mounted CME 750 all-terrain drill rig equipped for HQ diamond drilling and split spoon soil sampling methods.

Soil samples were collected from ground surface at 0.76 m intervals using a 0.61 m long, 0.05 m inner diameter (ID) split spoon. Standard penetration testing (SPT) was completed at each split spoon, where the number of blows required for a 63.5 kg safety hammer to drive the split spoon every 0.15 m over a total distance of 0.60 m were recorded. Split spoon sampling continued until the split spoon could no longer penetrate the soils and the casing advance slowed. Upon refusal, HQ drilling techniques were used to advance the casing to the target borehole depth. The HQ drilling system produced 0.61 m diameter

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LEGEND

- Monitoring Well
- DP
- Waterbody
- Watercourse
- Highway
- Local Road
- Resource Road
- Proposed Project Site Facilites Layout

Data Sources: Natural Resources Canada (Roads, Water, Contours, DEM).

0 0.5 1 1.5
kilometres

N

DRAWN: B. Elder
CHECKED: C. Hanlon
PROJECT: 17018
DATE: Mar 15, 2019

Scale 1:55000
UTM Zone 15N
NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

Site Instrumentation

FIGURE 3-1

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core, approximately 1.5 m in length. Completed boreholes ranged in depth from 7.77 meters below ground surface (mbgs) (MW-3) to 13.72 mbgs (MW-1).

Soil and core samples were logged in the field by qualified PECG staff. Soil samples were assessed for total recovery, colour, grain size and distribution, and water content. Core samples were assessed for solid core recovery, rock quality designation (RQD), and occurrence of fractures and/or joints.

A summary of the borehole completion details is provided in **Table 3-1**. The completed borehole logs are provided in **Appendix A**. Photographs of the recovered soil and core samples are provided in **Appendix B** and a field photograph log showing the drilling investigation and completed monitoring wells is provided in **Appendix C**.

Table 3-1. Borehole Completion Details

Borehole ID	UTM Coordinates (Zone 15 U)	Total Depth (mbgs)	Borehole Diameter (m)	Sampling Method	Sampling Depth (mbgs)
MW-1	559815.7 m E, 5463242.7 m N	13.72	0.096	Split Spoon	0 – 1.52 5.78 – 10.36 11.58 – 12.09
				HQ Coring	12.09 – 13.72
MW-2	558419.5 m E, 5464380.4 m N	7.92	0.096	Split Spoon	0 – 1.14
				HQ Coring	1.14 – 7.92
MW-3s/d	559422.7 m E, 5464090 m N	7.77	0.096	Split Spoon	0 – 1.83
				HQ Coring	1.83 – 7.77
MW-4	560124.3 m E, 5463313 m N	8.22	0.096	Split Spoon	0 – 7.09 7.62 – 8.22
				HQ Coring	7.09 – 7.62
MW-5s/d	556511 m E, 5463565.5 m N	9.35	0.096	Split Spoon	0 – 0.61 1.52 – 2.13
				HQ Coring	0.61 – 1.52 2.13 – 9.35
MW-6	555449.5 m E, 5463532.6 m N	10.90	0.096	Split Spoon	0 – 0.46
				HQ Coring	0.46 – 10.9
MW-7s/d	552488 m E, 5460183 m N	10.95	0.096	Split Spoon	0 – 0.38
				HQ Coring	0.38 – 10.95

3.2 Monitoring Well Installation and Development

Ten (10) monitoring wells were installed at 7 locations (3 locations with a nested well consisting of one shallow and one deep well, and 4 locations with a single well) as part of the hydrogeological field program. The locations of the monitoring wells are shown on **Figure 3-1**. The 3 nested monitoring wells were installed to assess the vertical hydraulic connection between the shallow weathered bedrock and

fractures within the deeper more competent rock. All monitoring wells installed as part of this investigation were completed in accordance with Ontario Regulation (O.Reg.) 903.

The well casings for the single monitoring wells were constructed using 0.051 mm ID Schedule 40 PVC, and the nested monitoring wells using 0.026 mm ID Schedule 40 PVC. The well screens were completed using No. 10 slot (0.01 inch) PVC and were either 1.52 m or 3.04 m in length. Silica sand was used to fill the space surrounding the well screen between 0.305 m to 0.61 m below the targeted screen depth and 0.305 m to 0.61 m above the screen. The remaining space above and below the silica sand was backfilled using bentonite chips (Holeplug™). Each well was completed using an above ground protective steel casing.

Following drilling completion, monitoring wells were developed on August 16, 2017. Development was completed by purging a minimum of three well volumes of water from the well. One well volume is equivalent to the water column height multiplied by a factor of 2.024 in the 0.051 m diameter wells, or by a factor of 0.509 in the 0.026 m diameter wells. Development was completed using 0.019 m ID high density polyethylene (HDPE) tubing and either a Waterra® foot valve or Mini-Monsoon® pump. A summary of the well purge volumes and methods is provided in **Table 3-2**.

Table 3-2. Monitoring Well Development Total Purge Volumes

Monitoring Well ID	Well Diameter (m)	Screen Length (m)	Water Column Height (m)	Target Purge Volume (L)	Total Purge Volume (L)
MW-1	0.051	1.52	0.68	4.10	10
MW-2	0.051	1.52	1.29	7.83	8
MW-3s	0.026	1.52	dry	-	-
MW-3d	0.026	1.52	1.01	1.56	13
MW-4	0.051	1.52	2.32	14.09	40
MW-5s	0.026	1.52	0.73	1.11	1.5
MW-5d	0.026	1.52	6.68	10.20	11
MW-6	0.051	1.52	6.23	37.83	39.5
MW-7s	0.026	1.52	1.45	2.21	10
MW-7d	0.026	3.04	5.36	8.18	11

3.3 Drive Point Piezometer Installation

Nine (9) drive point piezometers (DP1 – DP9) were installed in nine different locations along creek, lake or wetland areas (**Figure 3-1**). Drive point piezometers consist of a 0.019 mm ID, 0.43 m long steel drive point piezometer screen secured to a 0.019 m ID, galvanized steel pipe riser. A weighted post driver was used to drive each piezometer into the ground to the target depth. The depth to the top of the drive point piezometer screen ranged between 0.55 and 1.25 mbgs.

Upon installation, measurements were recorded of the stick-up height of the pipe above ground surface, the groundwater level (referred to as the “in” measurement) and surface water level (referred to as the “out” measurement) were made. Groundwater and surface water levels are measured as the distance to

the water surface relative to the top of the steel riser pipe. Water levels were measured with a Solinst® water level meter and recorded to the nearest centimeter. Installation details of each drive point piezometer is provided in **Table 3-3**.

Table 3-3. Drive Point Piezometer Completion Details

Drive Point Piezometer ID	UTM Coordinates (Zone 15 U)	Stick Up Height (m)	Depth to Top of Screen (mbgs)
DP-1	554476 m E, 5461281 m N	0.94	0.92
DP-2	554898 m E, 5463965 m N	0.61	1.25
DP-3	556952 m E, 5464574 m N	1.03	0.83
DP-4	559806 m E, 5463254 m N	1.31	0.55
DP-5	560223 m E, 5463595 m N	1.26	0.60
DP-6	556750 m E, 5464574 m N	1.14	0.72
DP-7	556660 m E, 5462293 m N	1.17	0.69
DP-8	561692 m E, 5460894 m N	0.98	0.88
DP-9	559362 m E, 5463965 m N	1.11	0.75

3.4 Single Well Response Testing

The hydraulic conductivity (K) of the geological material within the site area was estimated using single well response tests conducted at each monitoring well between October 18 – 22, 2017. Hydraulic testing was completed approximately two months following the installation and development of the monitoring wells to ensure that the measured static water level is representative of the formation. Response testing consisted of either a slug test or injection test. Slug tests were completed by instantaneously lowering a 0.925 m long slug into each well to create a change in hydraulic head. A 0.04 m outer diameter (OD) PVC slug was used in the 0.051 m ID monitoring wells, and a 0.025 m OD copper slug was used in the 0.026 m ID monitoring wells. An injection test was completed by instantaneously inserting an approximate volume of between 1 to 4 L of clean water into the monitoring well to create the change in hydraulic head.

Prior to the start of testing, the static water level was measured and recorded to the nearest centimeter, and a data logger set to record water levels at one (1) second intervals was installed at the bottom of the monitoring well. The appropriately sized slug was then instantaneously submerged to a height just below the static water level causing the water level in the well to rise, and the rate of change in the water level was monitored. This is type of test is also known as a Falling Head (FH) Test. Once the FH Test was complete, the slug was removed and the subsequent rate of change in recovery of the water level was again recorded. This portion of the test is referred to as a Rising Head (RH) Test.

Injection tests were completed in instances where the well screen was partially submerged to avoid complication with sand pack drainage and re-saturation (MW-1, MW-5d, and MW-7s). Prior to the start of the injection test, the static water level was measured and recorded to the nearest centimeter, and a data logger set to record water levels at one (1) second intervals was installed at the bottom of the monitoring well. In 0.026 m ID monitoring wells, the water column was raised approximately 1.96 m by the addition of 1 L of clean water, and in 0.051 m ID monitoring wells the water column was raised

approximately 1.98 m by the addition of 4 L of clean water. The water level recovery following injection was monitored using manual water level measurements until test termination.

Slug tests and injection tests were both terminated once 80% recovery in the water level had been attained, or 30-minutes had elapsed, whichever occurred first. Manual water level measurements were collected throughout each test to gauge recovery. A summary of the single well response tests performed, as well as the water level before and following each test, is provided in **Table 3-4**.

Values of hydraulic conductivity were then calculated from the displacement-time logger data using the Bouwer and Rice (1976) method for unconfined aquifers as modelled by Aqtesolv™ software. The calculated k-values are representative of the geological material immediately surrounding the well screen.

Table 3-4. Single Well Response Test Summary

Monitoring Well ID	Static Water Level (mbgs)	Date of Test	Test Type Performed	Test Number	Test Length (min:sec)
MW-1	11.46	October 19, 2017	Injection Test	1	30:42
				2	22:40
				3	17:51
				4	24:12
MW-2	4.31	October 21, 2017	Slug Test	FH 1	30:44
				RH 1	30:08
				FH 2	31:33
				RH 2	27:38
MW-3s	dry	-	-	-	-
MW-3d	5.77	October 21, 2017	Slug Test	FH 1	10:31
				RH 1	15:50
				FH 2	17:14
				RH 2	16:27
MW-4	4.06	October 18, 2017	Slug Test	FH 1	00:15
				RH 1	00:05
				FH 2	00:01
				RH 2	00:09
MW-5s	2.22	October 22, 2017	Slug Test	FH 1	09:13
				FH 2	09:30
				RH 1	16:08
MW-5d	2.32	October 22, 2017	Slug Test	FH 1	31:36
				RH 1	34:40
			Injection Test	1	35:44
				2	16:41
MW-6	3.29	October 21, 2017	Slug Test	FH 1	29:57
				RH 1	30:07
MW-7s	1.60	October 23, 2017	Injection Test	1	22:22
				2	31:07
MW-7d	2.11	October 22, 2017	Slug Test	FH 1	34:46
				RH 1	31:02

3.5 Groundwater Level Monitoring

Water levels at each well were monitored using a combination of manual and automated methods. Manual water levels were collected using a Solinst® water level meter and recorded to the nearest centimeter relative to the top of well casing. These measurements were collected once per site visit. Solinst® LT Levelogger Junior Edge data loggers were installed in each monitoring well and were set to record water levels in one (1) hour time intervals. This allowed for continual groundwater level monitoring at each well. Loggers were installed in MW-1, MW-2, MW-3d, MW-4, MW-5, and MW-6 in August 2017, and MW-3s, MW-7s, and MW-7d in October 2017.

Data recorded by leveloggers is representative of both static fluid pressure and atmospheric pressure. To correct for atmospheric pressure and determine the true height of the water column above each levelogger, air pressure readings were collected using a Solinst® Barologger® installed on site. Logger data was then corrected by subtracting the barometric readings from the levelogger readings.

3.6 Groundwater Sampling and Water Quality Testing

All monitoring wells were sampled for groundwater quality between October 18 – 23, 2017, and May 24 – 30, 2018. To ensure the quality of the sampling, a duplicate sample was collected from MW-7d in October 2017. The following documents guide groundwater sampling and testing:

- Low-Flow (Minimum Drawdown) Ground-Water Sampling Procedures. 1996. United States Environmental Protection Agency. EPA/540/S-95/504 (Puls, W. and Barcelona, M., 1996).
- Water and Air Baseline Monitoring Guidance for Mine Proponents and Operators. Prepared by the Ministry of Environment. October 9, 2012. (MOE, 2012).

The low-flow sampling techniques used in this Project have been employed to avoid disturbance to the surrounding aquifer, which results in elevated levels of turbidity which may not accurately represent groundwater conditions. Electric submersible and peristaltic pumps were utilized to minimize vibrations common in manual pumping methods and were adjusted to a pumping rate to allow for minimal drawdown. This method ensures samples are representative of in-situ groundwater conditions.

3.6.1 Low-Flow Sampling

The purging and sampling methodology used at each well was selected individually based on the observed drawdown rates at each well. Two different purging and sampling approaches were applied as the wells fall into two categories: wells which recover very quickly (i.e., a minimum drawdown can be maintained while purging), and wells which recover slowly to very slowly (i.e., a minimum drawdown cannot be maintained while purging, despite sustaining a pumping rate below 0.2 L/min). Both methods, described in detail in the following sub-sections, are considered low-flow methods.

Due to the depth of the water table (less than 10 m of gravity head), a peristaltic pump could be utilized for the low flow sampling. The peristaltic pump was set at a low pumping rate during purging and sampling to minimize turbulence in the well and surrounding formation. Target pumping rates ranged from 0.2 L/min to 0.5 L/min, though higher rates were used in cases where the turbidity was low and the water level in the well was maintained. The following pump systems were used for purging and sampling in the Project wells:

- Geotech Geopump™ Series II Peristaltic Pump
- Proactive Mini-Monsoon® 12 Volt Submersible Pump

Through the purging process, in-situ parameters were regularly monitored using a YSI 6600 V2-4 Multi-Parameter Water Quality Sonde. The recorded in-situ parameters include: pH, temperature, dissolved oxygen, conductivity, turbidity, and oxidation-reduction potential. Water level depth was also recorded throughout each sampling event using a water level meter to monitor drawdown. In-situ parameters were continually recorded throughout purging until both of the following occurred: 1) three well volumes had been purged, and 2) in-situ parameters stabilized over at least three consecutive recordings. Final in-situ parameters for each sampling event were recorded immediately prior to collecting the sample. Field data sheets of all recorded in-situ water quality parameters are provided in **Appendix F**.

Once the purging conditions were met and the final in-situ parameters were recorded, the water sample for laboratory analysis was collected. Samples for dissolved parameters were filtered in the field using a 0.45 µm in-line filter connected to the water line. Required preservatives were added to the appropriate sample bottles by the laboratory (ALS Environmental) in the appropriate concentrations and volumes. Groundwater generally exists in a reducing environment and efforts were made to preserve the samples in their original form.

3.6.1.1 Low-Flow Minimum Drawdown Purging and Sampling Approach

The low-flow minimum drawdown procedure was used to purge and sample the Project monitoring wells when the hydraulic conductivity of the formation was high enough to allow for minimal sample drawdown conditions during pumping. The primary objective of this sampling method is to match the pumping rate from the monitoring well with the groundwater flow rate in the formation. This was achieved by adjusting the pumping rate such that the water level in the well stabilized at an elevation relatively close to the pre-pumping water level. When a stable water level was attained, the water entering the pump was assumed to be directly from the formation around the screened interval below the pump intake, and not from the stagnant water within the overlying water column.

The following objectives were aimed to be met during the pumping process:

- Minimum purge volume within the well was removed (inclusive of the entire water column);
- Stable in-situ parameters (pH, temperature, conductivity, turbidity, oxidation-reduction potential, and dissolved oxygen); and,
- The water level was confirmed to be stable or rising.

Final in-situ parameters were recorded for the sampling event immediately prior to the collection of the sample. Sampling at each well occurred when the minimum purge volume and stable in-situ parameters were obtained. The monitoring wells at the site which were sampled using this technique include MW-3d, MW-4, and MW-6.

The key advantages of the low-flow groundwater quality sampling method are:

- Minimize the groundwater velocity (and thus turbulence) as the water enters the well during pumping;
- More representative samples due to reduced turbidity; and,
- Reduced purge volume.

3.6.1.2 Low Hydraulic Conductivity Well Purging and Sampling Approach

The low hydraulic conductivity sampling approach was used when water levels in the wells were slow to recover (low hydraulic conductivity) and the water level continued to drop during the purging process, despite pumping at the lowest possible rate (0.2 L/min). The stagnant water above the pump was purged completely, and the well was left to recover with the pump in place. The groundwater entering the well following a complete purge consists of fresh groundwater from the surrounding formation. This purging and sampling approach aims to fully purge a well one or more times prior to sample collection. This process often takes place over several days, with several visits to the wells to monitor water levels and to purge water.

The key disadvantages of this approach are:

- Potentially less representative samples due to mixing of stagnant water with formation water;
- Potential for turbulence as water enters well due to increased hydraulic gradient with the surrounding aquifer;
- Greater purge volume; and,
- Longer sampling time.

In-situ parameters were routinely monitored and recorded through the purging process and final values were recorded immediately prior to sampling. The monitoring wells at the site which were sampled using this technique include MW-2, MW-5s, MW-5d, MW-7s, and MW-7d.

3.7 Laboratory Analysis

Water samples were submitted to ALS Environmental in Thunder Bay, Ontario, for the following analyses:

- Physical Tests – Conductivity, hardness, pH, total suspended solids (TSS), and total dissolved solids (TDS);
- Anions – Acidity, alkalinity, bromide, chloride, and fluoride;
- Nutrients – Ammonia, nitrate, nitrite, total kjeldahl nitrogen (TKN), total nitrogen, orthophosphate, phosphorus, and sulfate;
- Organic Carbon – Dissolved organic carbon (DOC), total organic carbon (TOC); and,
- Total and Dissolved Metals (field filtered).

3.8 Quality Assurance and Quality Control

The quality assurance/quality control (QA/QC) analysis encompasses both field and laboratory activities for all groundwater samples collected in October 2017. The data quality objective (DQO) for the Project is such that the analytical data is reproducible and of an acceptable quality to allow for comparison with applicable guidelines and standards. DQOs allow for an assessment to determine if the data reported is precise, accurate, representative, and complete.

The QA/QC Protocol and DQOs reported are in reference to the following Canadian guidance documents:

- Guidance Document for Sampling and Analysis of Metal Mining Effluents (Environment Canada, 2011); and,
- Canadian Council of Ministers of the Environment (CCME) Protocols Manual for Water Quality Sampling in Canada (CCME, 2011).

The following field and laboratory DQO procedures were followed as a check on the field methodology, laboratory analytical methods, and on sample precision:

- Collection of samples following the procedures outlined in **Section 3.6**, and storage in supplied sterile laboratory sample jars and bottles containing appropriate preservative;
- Collection of duplicate groundwater samples;
- Storage of samples in ice-packed coolers for shipment to laboratory;
- Labelling protocol followed so each sample has a unique identifier, which is maintained through chain-of-custody forms;
- Samples are analyzed within recommended holding times; and,
- Sample temperatures are maintained within a range of 4°C to 10°C.

The procedures for the QA/QC followed during field data collection, laboratory analysis, and office data management are summarized in the following section.

3.8.1 Field Data Collection QA/QC Procedures

3.8.1.1 Equipment

The YSI 6600 V2-4 Multi-Parameter Water Quality Sonde used to measure in-situ parameters was rented from Hoskin Environmental, where the meter is maintained and calibrated between water sampling events.

The Proactive Mini-Monsoon® 12 Volt Submersible Pump, Geotech Geopump™ Series II Peristaltic Pump, and the YSI 6600 V2-4 Multi-Parameter Water Quality Sonde used for water quality sampling were rinsed or cleaned between sites. New Waterra® tubing, gloves, and filters were used for each sampled well. The YSI was rinsed with site groundwater between sites prior to recording in-situ parameters.

3.8.1.2 Field Procedures

Field notes and in-situ data were recorded on waterproof paper. At the end of each day, field notes and sample labels were checked to ensure completeness. In addition, field photographs were collected upon the completion of each datasheet.

Sample bottles were labeled and packaged in accordance with ALS Environmental protocols. Samples were returned to ALS with labels, chain of custody (COC) forms, and any additional instructions. Groundwater samples were labelled with the name of the monitoring well the sample was collected from using permanent marker.

3.8.1.3 QA/QC Samples

To evaluate the repeatability and reliability of the sample results, duplicate water samples were collected and analyzed for the same parameters as the primary samples. In doing so, this allows for the detection

of possible laboratory analysis errors. The QA/QC samples should conform to standard sampling methods, outlined by the CCME. Details regarding this type of QA/QC sample is outlined below:

Duplicate Sample: The purpose of a duplicate sample is to estimate sampling and laboratory analytical precision. A minimum of one duplicate sample is collected for every sample type (i.e., groundwater or surface water), and the total number of duplicate samples is maintained to at least 10% of the total number of samples. Duplicate samples are collected and handled the same as their primary sample and are collected at the same time or shortly after the primary sample.

3.8.2 Laboratory Analysis QA/QC Procedures

ALS Environmental was retained for sample analysis for this Project. ALS is an accredited laboratory for water quality analysis with rigorous internal QA/QC procedures. In the event of a failed internal QA/QC test, the laboratory re-runs all analyses affected by the same factors as the failed internal QA/QC sample.

3.8.3 Office Data Management QA/QC Procedures

The data is received from ALS Environmental as a Microsoft Excel spreadsheet and a PDF version of the Certificate of Analysis (COA). Upon receipt of the laboratory results, the data is reviewed to ensure the data reported in the COA and Excel file are identical. All original lab files are saved and stored for reference.

Any QA/QC issues present in the laboratory analysis are recorded in a tracking document, and any associated results are flagged for further inspection. If the issue with the QA/QC sample is determined to compromise the validity of the sample results associated with it, the data are rejected. Rejected results are not used in the statistical analysis of the data. The validation checks used to determine whether data should be flagged or rejected are outlined as follows:

Sample Holding Times: ALS Environmental specifies that the recommended sample holding time for each sample between collection and analysis is 96 hours to accurately test for pH and conductivity. All efforts were made to meet these criteria, however due to the remote location of the Project and the limited availability of a courier service, the recommended holding times were exceeded. For this reason, both the field results and lab results for pH and conductivity have been provided and flagged.

pH: High groundwater pH values (in-situ and laboratory values greater than 10) often indicate grout contamination of a well. Grout contamination may comprise the analysis of all parameters. Groundwater quality samples for which the measured pH is greater than 10 should be rejected and removed from the dataset.

Turbidity: The accepted methods for groundwater quality sampling (MOE, 2012) indicate low turbidity (i.e., less than 50 NTU) as a criterion for representative groundwater samples. Both in-situ and laboratory turbidity readings should be compared to the level of well and sampling integrity to determine the validity of the sample. Samples with unacceptable turbidity values may be rejected from the dataset or used to interpret parameters other than metals.

Duplicate Samples: Duplicate samples are used to estimate sampling and laboratory precision. Results are flagged if the relative percent difference (RPD) for between the sample and duplicate results are greater than 20%. The RPD is the absolute difference in concentrations of the two duplicate samples divided by

the average of the two values. Flagged results are reviewed to determine if the high RPD is a result of naturally variable conditions, or from sampling error. If sampling error is the suspected cause, efforts are made to prevent similar errors from occurring in the future, and results associated with the errors may be rejected. If naturally variable conditions are the suspected cause, flagged data are noted as a point of discussion, but not rejected.

3.8.4 QA/QC Results

QA/QC results have been used to verify data and identify possible data which should be rejected. Results have also been used to recognize areas where procedural improvements should be made. These results include procedural results, and results of the analysis of QA/QC samples. Procedural results summarize the detailed qualitative review of all data and of field, laboratory, or office procedures which could affect the validity of the data collected. As part of a standard QA/QC protocol, any results which appeared suspicious for any reason were flagged and evaluated in a QA/QC tracking document. Results of the QA/QC sample analysis are quantitative results and have been used to identify specific data which does not meet the DQOs.

4 GEOLOGICAL SETTING

4.1 Physiography

The Ambershaw Project site is located within the Severn Upland physiographic subdivision of the James Region of the Canadian Shield (Bostock, 1981). The Severn Upland primarily consists of Precambrian bedrock, with a shallow cover of Quaternary glacial deposits. Where present, the overburden comprises lacustrine clays or peat, the Sipiwesk moraine, and several esker chains. The Sipiwesk moraine is the main feature of the Severn Upland region and is located west of Sipiwesk Lake in Manitoba. The moraine is composed of clay with varying amounts of sands and till ground moraine deposits. The topography of the region is generally described as undulating to gently rolling.

The Project Development Area lies adjacent to the southwestern most arm of Bending Lake. Despite the occurrence of a southwesterly moving glacial ice sheet, the topography at the property consists of a northwesterly trending, sub-parallel series of glacially sculpted ridges and topographic depressions, controlled by underlying geology. A steep escarpment is present trending northwestwards along the southwest shore of Bending Lake, and through the center of the Project site (Fladgate Exploration, 2011).

4.2 Drainage

The Project falls within the Nelson River Basin, which is further subdivided into the tertiary watersheds of the Rainy River and Wabigoon watersheds (**Figure 1-1**). This region is abundant in lakes, which are interconnected by an intricate network of small and medium sized rivers, as well as subsurface bedrock fractures. Within the Project Development Area, the Project is within the Bending Lake, Wapageisi Lake and Wabigoon Lake Subwatersheds of the Nelson River Basin, shown on **Figure 1-2**. Surface water within

these watersheds generally flows to the northwest towards the Winnipeg River, then to the Nelson River basin, and eventually drains to Hudson Bay (Lake of the Woods Control Board, 2010).

4.3 Geology

4.3.1 Quaternary Geology

4.3.1.1 Project Location

The regional Quaternary geology over the Project Location was determined through a review of Ontario Geological Survey (OGS) surficial geology mapping. Where present, the overburden is typically in the range of 10 – 20 m thick, however has been found to exceed 40 m in some areas. The surficial geology of the Project Location is shown on **Figure 4-1**.

The Quaternary cover over the Project Location mostly comprises different types of glacial deposits which accumulated over the course of several glacial advances and retreats during the Late Wisconsinan. Much of the older till and glaciolacustrine deposits are uncommon, as they have been removed by subsequent glacial advances. The geological history and associated deposits present in the Project Location, in order from oldest to youngest, are described briefly as follows from Bajc (2001):

Whiteshell Till: This silty sand till was deposited through the advance of the Labradorean ice sheet from the northeast. The retreat of this ice sheet resulted in the deposition of glaciofluvial sediments of sand, gravel, and boulders in some areas. This till is generally only found in areas of topographic bedrock lows.

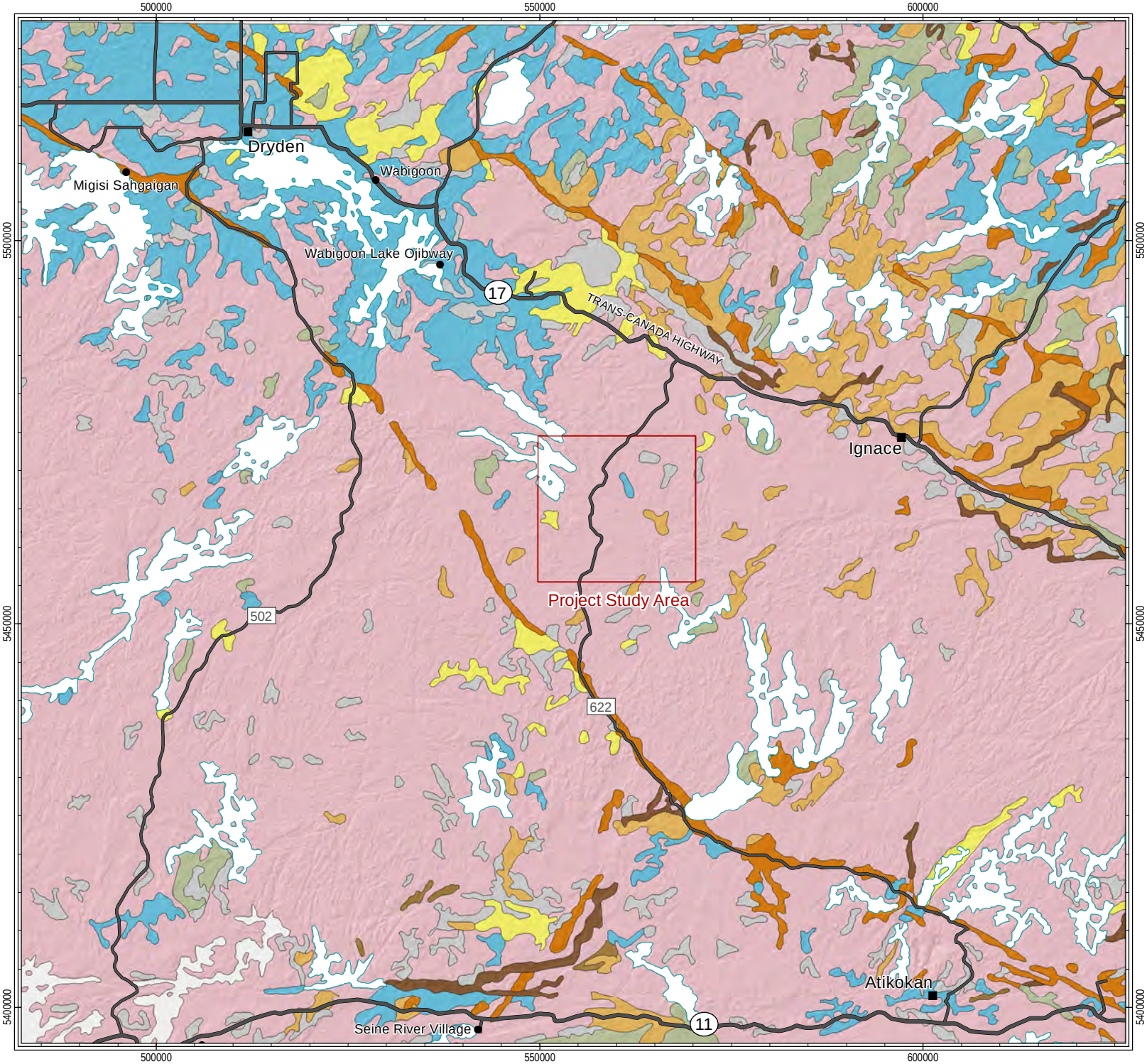
Wylie Formation: Glaciolacustrine clay, silt, and sand deposited by Glacial Lake Agassiz following the retreat of the Labradorean ice sheet. This formation is discontinuous, and likely contains material derived from both Labradorean and Keewatin sources. It is expected that this unit is thin and is generally less than 2.5 m thick.

Whitemouth Till: A silty clay till deposited through the advance of the Keewatin ice sheet from the west. This till is widespread and is thickest in low-lying areas. Both sub-glacial till and sub-aqueous flow till depositional facies have been identified. The sub-glacial till is massive, firm to stiff, and contains several features indicating deposition under grounded active ice, including strong pebble fabric and ice thrusts. The sub-aqueous flow till is softer and contains small clasts of glaciolacustrine clay.

Brenna Formation: Glaciofluvial and glaciolacustrine deposits from the later stage of Glacial Lake Agassiz. The deposits mainly consist of clay and silt sediments at the lake bottom, and sand, silt, and minor gravel near the shorelines and bars. This formation is widespread through low lying areas as it was deposited when the shoreline of Glacial Lake Agassiz was in the range of 370 to 375 masl.

Marchand Till: Sandy carbonate rich deposits from the re-advance of the Keewatin ice sheet. This till is typically thin, ranging between 2 – 6 m in thickness. In many areas the formation is absent due to post-depositional erosion exposing the underlying tills.

Sherack Formation: Glaciolacustrine deposits which resulted as the water levels in Lake Agassiz rose. These deposits are highly calcareous silt and clay, with minor sand, and includes a distinctive thin red clay bed in the region.



Ambershaw Metallics, Inc.

LEGEND

- Major Highway
- Minor Highway
- Lake
- **Organic deposits:** peat, muck and marl
- **Fluvial deposits:** gravel, sand, silt and clay deposited on modern flood plains
- **Fluvial deposits:** gravel, sand, silt and clay deposited on abandoned flood plains, terrace
- **Glaciolacustrine deposits:** sand, gravelly sand and gravel nearshore and beach deposits
- **Glaciolactustrine deposits:** silt and clay, minor sand basin and quiet water deposits
- **Glaciofluvial outwash deposits:** gravel and sand includes proglacial river and deltaic
- **Glaciofluvial ice-contact deposits:** gravel and sand minor till includes esker, kame, end
- **Till:** undifferentiated, predominantly sand to silty to silt matrix, commonly rich in clasts,
- **Bedrock:** undifferentiated igneous and metamorphic rock, exposed at surface or

Data Sources: Ontario Geological Survey 2000 (Quaternary geology, seamless coverage of the Province of Ontario; Ontario Geological Survey, Data Set 14---Revised). Natural Resources Canada (Roads, Place Names).

0 10 20
kilometres

N

DRAWN: B. Elder
CHECKED: C. Hanlon
PROJECT: 17018
DATE: Dec 17, 2018

Scale 1:700000
UTM Zone 15N
NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

Project Location Surficial Geology

FIGURE 4-1

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Recent Deposits: More recent deposits of Holocene age were deposited after Lake Agassiz had retreated from the area, approximately 9,000 years ago. These deposits include peat and organic deposits in low-lying wetland areas, and alluvial sand, silt and clay deposited by individual watercourses.

4.3.1.2 Project Study Area

Near the Ambershaw Project site, the surficial geology is primarily exposed bedrock, with minor amounts of heterogenous Quaternary overburden deposits. Most Quaternary deposits in the area, including glaciofluvial outwash deposits, glaciofluvial ice-contact deposits of gravel and sand, and glaciolacustrine deposits of till, are located north of the TransCanada Highway. This was confirmed during the 2008 and 2011 borehole drilling investigations by Bending Lake Iron Group, and the 2017 borehole drilling investigation by PECG, where the thickness of the overburden was found to range between 0.38 m to 9.0 m. The surficial geology of the Project Study Area, as mapped by OGS, is provided in **Figure 4-2**.

Where present, overburden units were associated with glaciofluvial or glaciolacustrine deposits of sand clay and gravels. A thick unit of fine to medium sand and silt with some gravel was encountered southeast of the proposed pit along the southern shoreline of Bending Lake. It is anticipated that alluvial deposits of sand, silt, and clay are present near watercourses, and that low-lying wetlands are lined with deposits of organics and peat. The thickness of these deposits is expected to be highly variable.

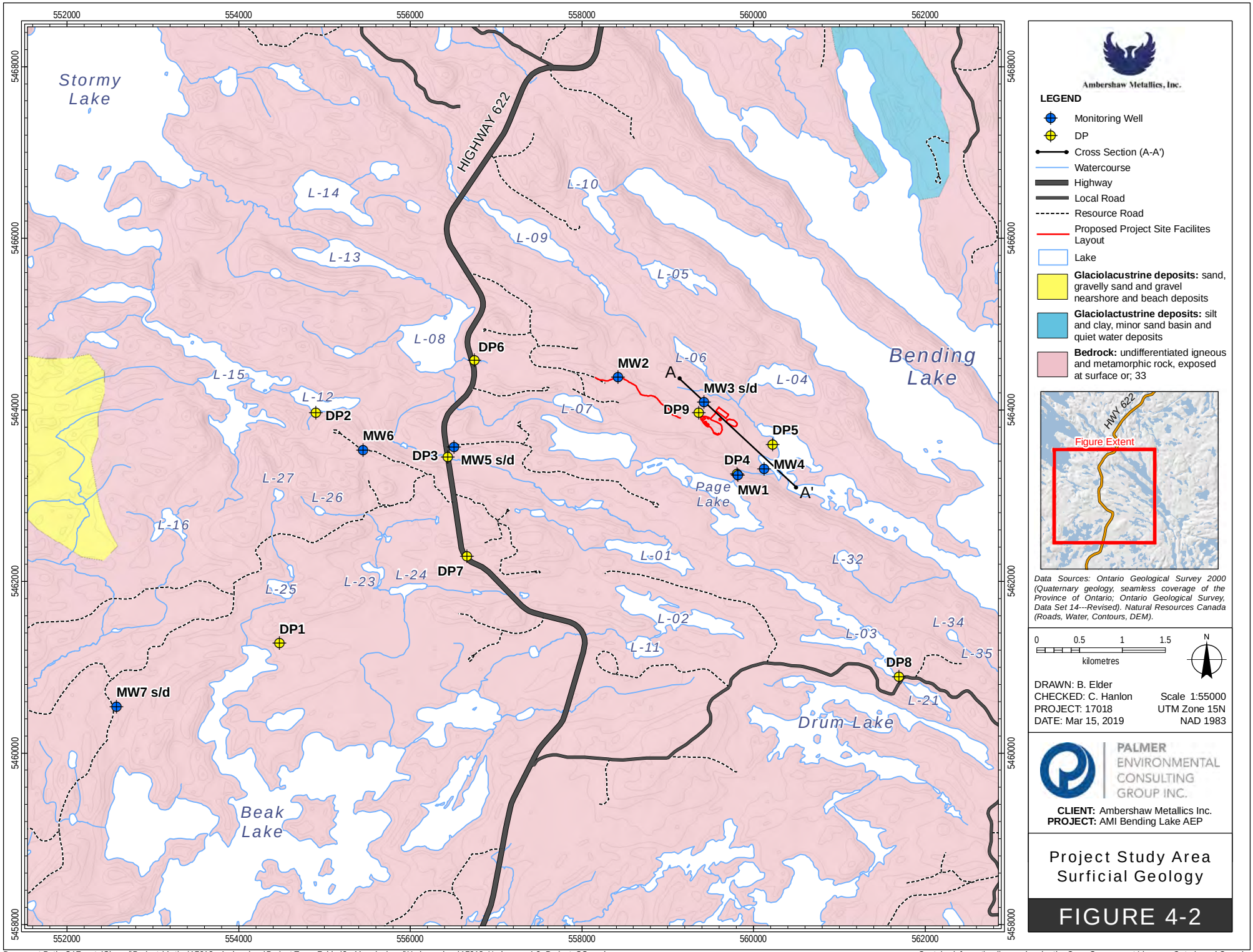
4.3.2 Precambrian Bedrock Geology

4.3.2.1 Project Location

The Project is located within the western region of the Wabigoon Subprovince of the Archaean Superior Province (**Appendix D**). The Wabigoon Subprovince is bounded on the north by Winnipeg River and English River subprovinces, and on the south by Quetico Subprovince. It is described by Blackburn et al. (1991) as an "*east trending granite-greenstone subprovince composed of metavolcanics and subordinate metasedimentary rocks which are surrounded and cut by granitoid batholiths.*"

The Wabigoon Subprovince is further divided into three regions (Western, Central, and Eastern) based on the geographic distribution of different lithological associations. The oldest rocks within the western part of the Wabigoon Subprovince, containing the Project site, are approximately 2,775 ± 1 million years old (Ma). These rocks are overlain by younger deformed sedimentary rocks that contain local intrusive bodies approximately 2,711 – 2,685 Ma (Blackburn et al., 1991).

Greenstone belts within this area are made up of between 60 – 80% ultramafic to felsic volcanic rocks, and 20 – 40% clastic and chemical sediments. These rocks have been extensively deformed, and intruded locally (Blackburn et al., 1991). The Site lies within the Eagle-Wabigoon-Manitou Lakes Greenstone Belt (EWMGB), one of six interconnected greenstone belts that make up the Wabigoon Subprovince (Blackburn et al, 1991) (**Appendix E**). The EWMGB extends approximately 80 km north-south, and approximately 30 to 50 km east-west. It is generally comprised of differentiated mafic to felsic volcanic rocks, with mafic to ultramafic intrusive units. The EWMGB is bounded by the Revell Batholith to the east, by the Atikwa and Dryberry Batholiths to the west, and by the Irene-Eltrut Lakes Batholitic Complex to the south. On the northern edge, the EWMGB is bounded by the Basket Lake Batholith, then connects with the Abram-Minitaki Lakes Greenstone Belt (Powers and Sears, 2012).



Ambershaw Metallics, Inc.

LEGEND

- Monitoring Well
- DP
- Cross Section (A-A')
- Watercourse
- Highway
- Local Road
- Resource Road
- Proposed Project Site Facilites Layout
- Lake
- **Glaciolacustrine deposits:** sand, gravelly sand and gravel nearshore and beach deposits
- **Glaciolactustrine deposits:** silt and clay, minor sand basin and quiet water deposits
- **Bedrock:** undifferentiated igneous and metamorphic rock, exposed at surface or; 33

Data Sources: Ontario Geological Survey 2000 (Quaternary geology, seamless coverage of the Province of Ontario; Ontario Geological Survey, Data Set 14---Revised). Natural Resources Canada (Roads, Water, Contours, DEM).

0 0.5 1 1.5
kilometres

N

DRAWN: B. Elder
CHECKED: C. Hanlon
PROJECT: 17018
DATE: Mar 15, 2019

Scale 1:55000
UTM Zone 15N
NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

Project Study Area Surficial Geology

FIGURE 4-2

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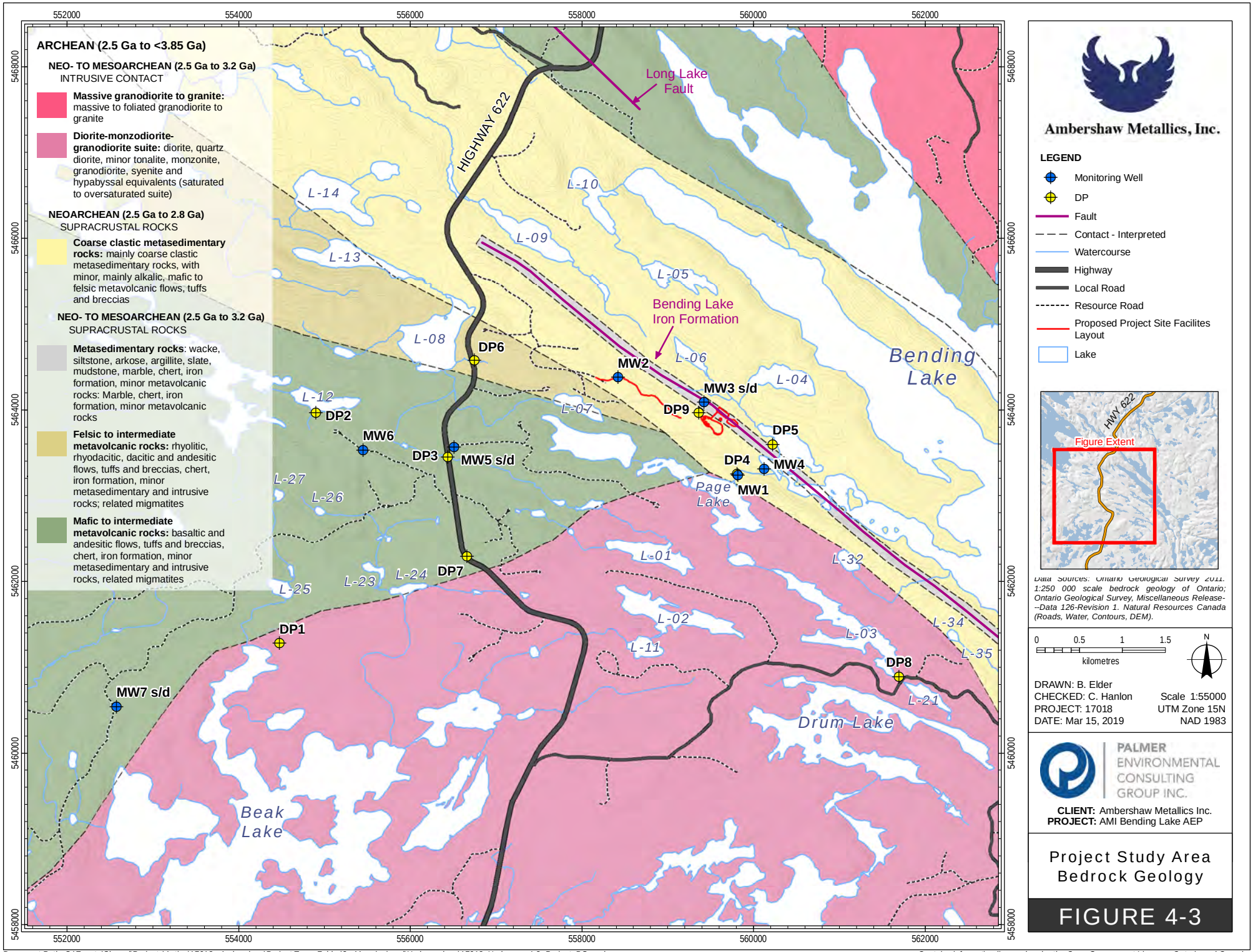
The central Wabigoon Subprovince represents a topographical highland which acts as a divide between the easterly and northerly flow systems. Generally topography of the subprovince slopes gently westward, with the exception of the very eastern border near Armistice Lane and Lac des Iles which slopes easterly (Stone, 2010).

4.3.2.2 Project Development Area and Deposit Geology

The Ambershaw Project site is situated within the southeasterly end of the EWMGB. The EWMGB is made up of several lower bedrock sequences of tholeitic to calc-alkaline ultramafic, mafic, and felsic volcanic rocks, and several overlying bedrock sequences of tholeitic mafic volcanic rocks. The lower sequences are referred to as the Lower Wabigoon, Pincher Lake, and Kawashegamuk Lake Groups, and the overlying sequences are known as the Upper Wabigoon, Eagle Lake, and Boyer Lake Groups. The Wapageisi Group, dominantly mafic volcanics, occupies the southern part of the greenstone belt. This group is separated by the east-west trending sedimentary and calc-alkaline felsic to intermediate volcanic rocks of the Stormy Lake/Manitou Lake Groups (Blackburn et al., 1991). The bedrock geology of the Project Study Area is shown on **Figure 4-3**.

Three major regional fault structures dominate the EWMGB and add complexity to the geological sequencing (Blackburn et al., 1991). The largest of these include the Manitou Straits Fault, which trends northeast and is located on the western side of the EWMGB. The northwest trending Kawashegamuk Lake Fault (also known as Long Lake Fault) is coincident with Long Lake in the east. This fault is thought to be a thrust fault along which the older Boyer Lake mafic volcanic rocks were driven over the Kawashegamuk Group felsic rocks. The third fault zone is the east-west trending Mosher Bay-Washeibemaga Lake Fault, which marks the contact between the Stormy Lake sedimentary rocks and the older Boyer Lake volcanic rocks.

The Bending Lake Iron Deposit is a classical Algoma-type iron ore deposit located adjacent to Bending Lake. It is described as a blue-grey to black, fine grained, well bedded unit of magnetite with minor hematite, specularite, biotite, amphibole, chlorite, garnet, and minor pyrite. It is interbedded with quartz-biotite garnet schist. The full length of the banded iron formation is about 9 km with an average thickness of 90-120 m, however extensive folding of the ore deposit has thickened the section within the site to approximately 330 m.



Ambershaw Metallics, Inc.

LEGEND

- Monitoring Well
- DP
- Fault
- Contact - Interpreted
- Watercourse
- Highway
- Local Road
- Resource Road
- Proposed Project Site Facilites Layout
- Lake

Data Sources: Ontario Geological Survey 2011. 1:250 000 scale bedrock geology of Ontario; Ontario Geological Survey, Miscellaneous Release--Data 126-Revision 1. Natural Resources Canada (Roads, Water, Contours, DEM).

0 0.5 1 1.5 kilometres

N

DRAWN: B. Elder
CHECKED: C. Hanlon
PROJECT: 17018
DATE: Mar 15, 2019

Scale 1:55000
UTM Zone 15N
NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

Project Study Area Bedrock Geology

FIGURE 4-3

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5 HYDROSTRATIGRAPHY

5.1 Glaciofluvial and Glaciolacustrine Deposits

Where present, overburden units at the site consist of glaciofluvial or glaciolacustrine sand, clay, and gravels. Typically, these deposits are found in areas of low-lying bedrock topography and are associated with lakebeds and wetland areas.

The glaciofluvial sediments are expected to have a high hydraulic conductivity, and act as an unconfined aquifer at the site permitting groundwater recharge to the underlying fractured bedrock aquifer. This unconfined aquifer likely has the capacity to support groundwater discharge to wetlands, streams, and lakes (such as Bending Lake). It is expected that this aquifer has limited extent and thickness, therefore limiting its potential to be affected by the Project. Based on the Water Well Records (WWR) from the Ministry of Environment, Conservation and Parks (MECP), reported groundwater yields from water wells near the Township of Ignace screened within the overburden vary between 9.5 L/min and 930 L/min. It should be noted that these rates do not necessarily reflect the maximum sustainable yield of the aquifer, but more so the purpose of the well (i.e., residential supply) (Golder, 2000).

Glaciolacustrine clay sediments are expected to have a low hydraulic conductivity, and act as a surficial confining layer (aquitard) restricting groundwater recharge and discharge to the underlying bedrock aquifer. It is expected these soils coincide with perched wetlands at the site, where the clay restricts infiltration leading to the formation of peat and organic deposits.

5.2 Shallow Bedrock

Weathered bedrock is generally located within the upper 10 – 20 m of the bedrock formation, and is typically more fractured and has a higher hydraulic conductivity than the deeper more competent bedrock. It is therefore expected that the majority of shallow groundwater at the Project site is contained within the shallow weathered and fractured bedrock. The shallow bedrock likely supports a shallow groundwater table where it is perched on the deeper more competent bedrock. Groundwater flow within the shallow weathered bedrock typically follows topography, and flows towards topographic lows, waterbodies, and wetlands.

Groundwater yield in the fractured bedrock depends on the number and size of fractures, their conductivity, transmissivity, storage, and on the recharge properties of the fractured network in the wider aquifer. Based on a review of the MOECC WWR, groundwater yields for water wells near the Township of Ignace screened within the fractured shallow bedrock (i.e., upper 10 – 20 m) range between 0 L/min and 206 L/min.

5.3 Deep Bedrock

Deep groundwater is contained within discrete bedding plane fractures within the more competent bedrock. The hydraulic conductivity tends to decrease with depth as fractures become less common and

less interconnected (Stevenson et al., 1996; McMurry et al., 2003). Increased vertical and horizontal stresses at depth tend to close or prevent fractures thereby reducing permeability and resulting in diffusion-dominated groundwater movement (Stevenson et al., 1996; McMurry et al., 2003).

6 BASELINE HYDROGEOLOGICAL CONDITIONS

6.1 Groundwater Level and Flow

Groundwater levels were collected from all monitoring wells (MW-1 to MW-7) following installation, and during the follow-up monitoring events in October 2017 and May 2018 (**Table 6-1**). Water level data from the dataloggers installed in all monitoring wells were downloaded in May 2018. **Figure 6-1** presents the groundwater level monitoring data collected between August 2017 and May 2018 at MW-1 to MW-7s/d. Daily precipitation as recorded at the Mine Center Southwest Climate Station is included on the plot. Of the installed monitoring wells, two are installed within glaciolacustrine and glaciofluvial sand (MW-1 and MW-4), and eight are screened within the shallow bedrock (MW-2, MW-3s/d, MW-5s/d, MW-6 and MW-7s/d) over the depth of the proposed bulk sample pit.

Table 6-1. Manual Groundwater Levels

Monitoring Well ID	Elevation (masl)	Water Level August 17, 2017		Water Level October 22, 2017		Water Level May 27, 2018	
		mbgs	masl	mbgs	masl	mbgs	masl
MW-1	416	11.45	404.55	11.45	404.55	11.02	404.98
MW-2	429	5.71	423.29	4.24	424.76	3.12	425.88
MW-3s	411	dry	dry	dry	dry	3.40	407.6
MW-3d	411	5.74	405.26	5.77	405.23	4.86	406.14
MW-4	399	4.14	394.86	4.06	394.94	3.93	395.07
MW-5s	426	2.69	423.31	2.11	423.89	1.46	424.54
MW-5d	426	2.66	423.34	2.07	423.93	1.59	424.41
MW-6	453	4.46	448.54	3.29	449.71	3.08	449.92
MW-7s	430	1.52	428.48	1.60	428.4	1.42	428.58
MW-7d	430	2.62	427.38	2.11	427.89	1.70	428.30

Based on the groundwater monitoring results, the groundwater level measured at wells screened within the glaciolacustrine and glaciofluvial sand unit ranged from 11.45 mbgs (MW-1) to 3.93 mbgs (MW-4), or between an elevation of approximately 397 masl and 405 masl. The groundwater level measured at wells screened within the bedrock ranged from 5.77 mbgs (MW-3d) to 1.42 mbgs (MW-7s), or between an elevation of approximately 404 masl to 452 masl.

The groundwater level within the shallow bedrock aquifer is interpreted to be interconnected with meteoric water from precipitation. Based on the climate data reported by the Mine Center Southwest Climate Station, a total of 106.2 mm of precipitation fell between September 14, 2017 and September 30,

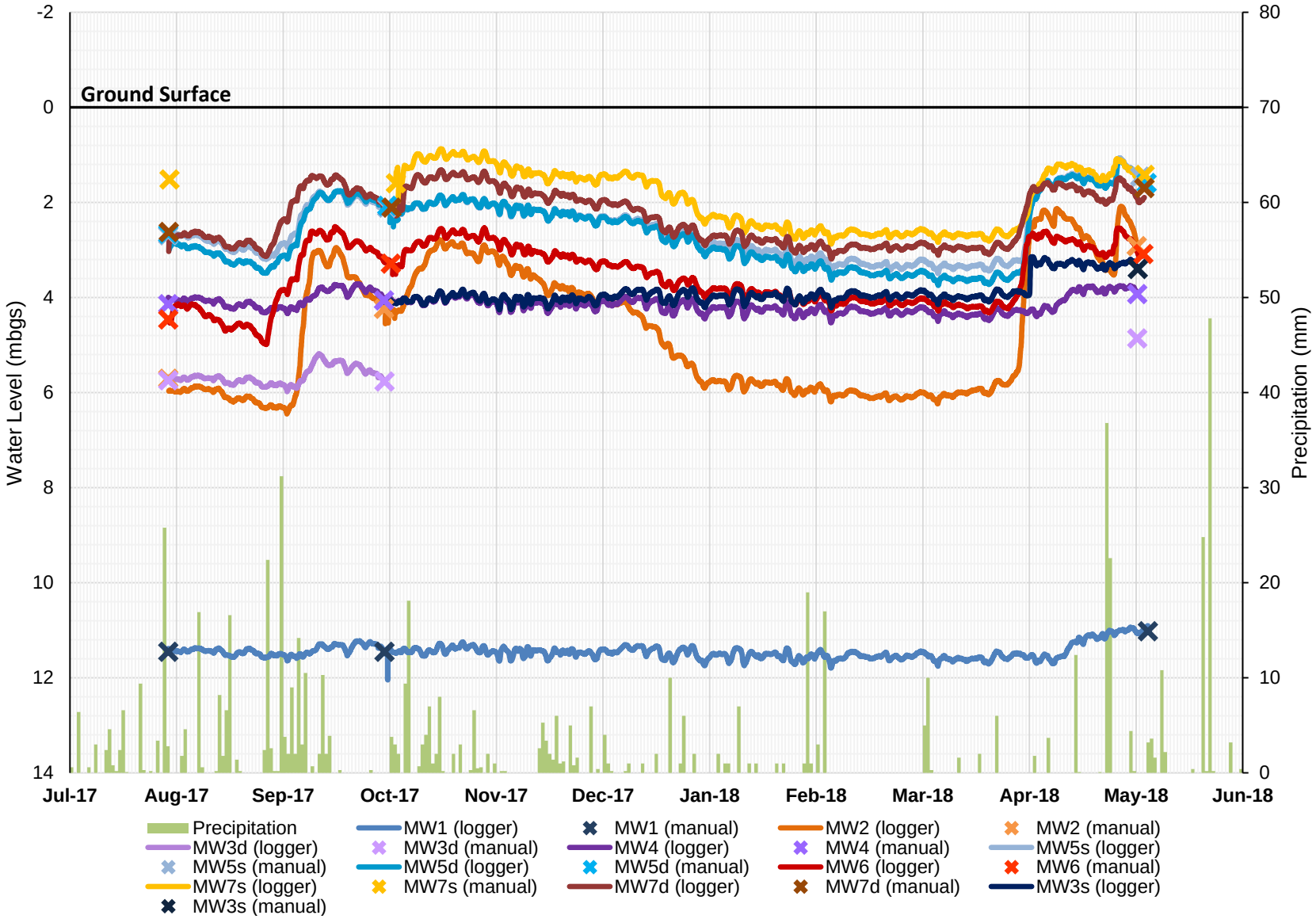


Figure 6-1. Groundwater Levels

2017. In response, all monitoring wells screened within the bedrock indicated a significant increase in water level (**Figure 6-1**). Similar occurrences are noted following the spring freshet in April 2018 in response to rapid snow melt, as well as on May 17 – 18, 2018 following a 59.4 mm precipitation event. Generally, the responses in the shallow bedrock aquifer are nearly immediate, indicating the weathered bedrock at surface is creating unconfined aquifer conditions. In comparison, the wells screened within the glaciolacustrine and glaciofluvial sands (MW-1, MW-4) showed little to no response to precipitation. This is likely due to a strong hydraulic connection with the surface water level of Bending Lake and Page Lake.

It is expected that local groundwater flow within the Project Study Area follows topography, and is directed from regions of high to low hydraulic head. The interaction between shallow and deep groundwater tables within bedrock is controlled by the interconnectedness of horizontally and vertically oriented fractures.

Near the proposed bulk sample location, horizontal groundwater flow is interpreted to follow topography and flow northwards and eastwards towards Bending Lake and a small intermittent tributary (**Figure 6-2**). While it is expected that horizontal groundwater flow will dominate over vertical flow, a hydraulic connection between the horizontal fractures may exist through the presence of vertical fractures. Three wells were installed as nested wells (MW-3s/d, MW-5s/d, and MW-7s/d) in order to investigate the direction and magnitude of vertical groundwater flow at the site.

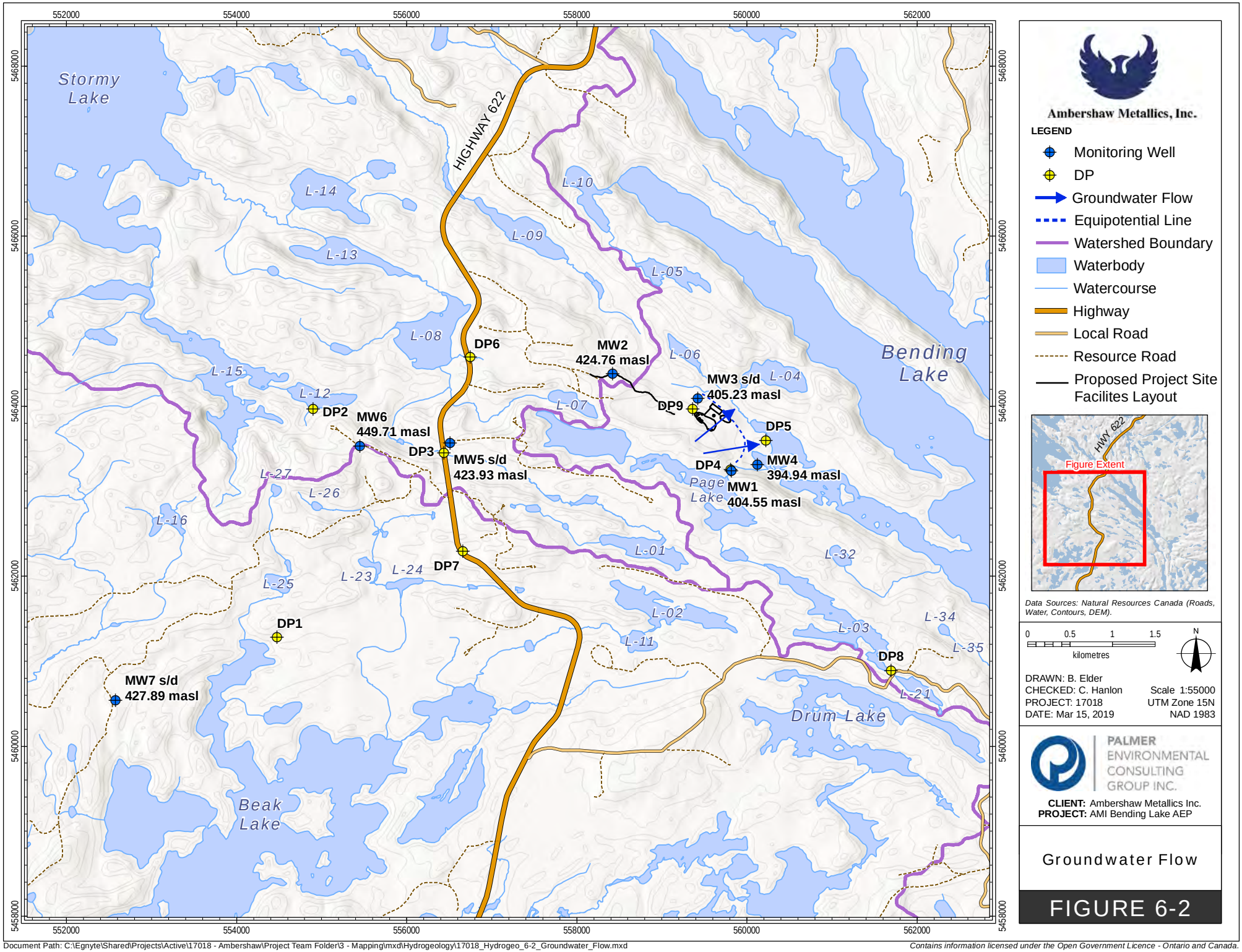
Based on groundwater monitoring data collected to date, the shallow and deep wells at MW-7s/d are hydraulically separated, and there was a minimum of 0.28 m of separation between the water levels measured in August and October 2017, and May 2018 (**Table 6-1**). In addition, it was noted in field observations that development and purging of MW-7d in October 2017 did not impact the water level in MW-7s, and vice versa. Vertical groundwater flow at MW-7 is therefore interpreted to be in a downwards direction, as the water level in the shallow well was measured higher than in the deep well during all monitoring events.

In contrast to this, monitoring data from MW-5s/d indicates that these wells are hydraulically connected through vertical fractures, as there was a small (between 0.03 and 0.13 m) difference in water level between the shallow and deep wells noted in August and October 2017, and May 2018 (**Table 6-1**). This is additionally observed in the logger data, which indicates a close relationship between the water levels. It was noted in field observations that the water level in MW-5d fell about 0.3 m following the purging of MW-5s.

The water level within MW-3s was dry in August and October 2017, however based on the difference in measurements collected in May 2018, a difference of 1.46 m was noted between the shallow and deep wells. It is therefore likely that these wells are hydraulically separated and that MW-3s only seasonally contains shallow perched groundwater.

6.2 Groundwater-Surface Water Interactions

Drive Point Piezometers (DP) were installed at specific wetlands, lakes or water bodies to characterize the direction and magnitude of groundwater/surface water interactions at these features (**Figure 3-1**). The direction of the hydraulic gradient (i.e., the difference between the surface water level and groundwater level) can be used as a measure to indicate if the feature is gaining (i.e., groundwater discharge) or losing (i.e., groundwater recharge) to the water table.



Ambershaw Metallics, Inc.

LEGEND

- Monitoring Well
- DP
- Groundwater Flow
- Equipotential Line
- Watershed Boundary
- Waterbody
- Watercourse
- Highway
- Local Road
- Resource Road
- Proposed Project Site Facilites Layout

Data Sources: Natural Resources Canada (Roads, Water, Contours, DEM).

0 0.5 1 1.5
kilometres

N

DRAWN: B. Elder
CHECKED: C. Hanlon
PROJECT: 17018
DATE: Mar 15, 2019

Scale 1:55000
UTM Zone 15N
NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

Groundwater Flow

FIGURE 6-2

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Initial groundwater and surface water measurements were collected from all drive point piezometers (DP-1 to DP-9) following their installation in either June or August 2017, and during the follow up site visits in August and October 2017, and May 2018. The water level results and calculated vertical hydraulic gradients are summarized in **Table 6-2**.

It is important to note that the water levels shown on **Table 6-2** are in metres *above* ground surface (mags). In addition, groundwater levels made immediately following the installation of each DP were not fully recovered, and therefore not representative of static conditions. This occurred on June 28, 2017 for DP-1, DP-3, DP-4, DP-5, DP-6, DP-7 and DP-8, and on August 17, 2017 for DP-2 and DP-9. Water level measurements for these dates are therefore not included in the analysis.

Table 6-2. Drive Point Piezometer Water Levels and Hydraulic Gradient

Drive Point Piezometer ID	Surface Water /Groundwater /Gradient	June 28, 2017 (mags)	August 17, 2017 (mags)	October 22, 2017 (mags)	May 27, 2018 (mags)
DP-1	SW	0.06	0.08	0.01	-0.01
	GW	-1.15	-0.01	0.01	0.05
	Gradient	***-1.32[1]***	***-0.10***	***0.00***	***0.07***
DP-2	SW	-	dry	0.01	0.16
	GW	-	-0.34	0.01	0.17
	Gradient	**-**	***-[1]***	***0.00***	***0.01***
DP-3	SW	0.08	0.06	0.06	0.25
	GW	-0.73	0.09	0.06	0.23
	Gradient	***-0.98[1]***	***0.04***	***0.00***	***-0.02***
DP-4	SW	0.14	0.15	0.1	0.23
	GW	-0.09	0.07	-0.12	0.18
	Gradient	***-0.42[1]***	***-0.15***	***-0.40***	***-0.08***
DP-5	SW	0.61	0.57	0.58	0.75
	GW	-0.31	0.60	0.58	0.79
	Gradient	***-1.53[1]***	***0.05***	***0.00***	***0.08***
DP-6	SW	0.02	0.03	0.01	dry
	GW	-0.43	0.05	0.03	dry
	Gradient	***-0.63[1]***	***0.03***	***0.03***	**-**
DP-7	SW	0.21	0.10	0.21	0.16
	GW	-0.42	0.12	0.19	0.17
	Gradient	***-0.91[1]***	***0.03***	***-0.03***	***0.01***
DP-8	SW	0.08	0.08	0.10	0.00
	GW	-0.69	0.11	0.14	0.05
	Gradient	***-0.88[1]***	***0.03***	***0.05***	***0.06***
DP-9	SW	-	0.01	0.12	0.17
	GW	-	-0.25	-0.12	0.16
	Gradient	**-**	***-0.35[1]***	***-0.19***	***-0.01***

[1]Measurement made immediately following installation of drive point piezometer and are not representative of static conditions.
mags – metres above ground surface

A short description of each DP location and the initial monitoring results to date are described below:

DP-1 is installed within a low-lying marsh located within the Wabigoon Lake Subwatershed. It is approximately 150 m from Beak Lake. Based on field observations and interpretations following the installation of the piezometer (i.e., relative ease of installation), it is expected that surficial soils in this area consist of thick (> 1 m) organic materials or unconsolidated overburden. The vertical hydraulic gradient at this location varies between slightly negative to slightly positive, indicating that at times this feature is supported through surface water runoff and precipitation, and other times is supported through groundwater discharge. However, this location is generally in equilibrium with the water table indicating neither significant recharge or discharge conditions.

DP-2 is installed within a small delta approximately 700 m northwest of MW-6, and is within the Wabigoon Lake Subwatershed. Based on field observations and interpretations following the installation of the piezometer (i.e., relative ease of installation to a depth of approximately 1 mbgs) it is expected that surficial soils in this area consist of thick (~1 m) organic materials. The vertical hydraulic gradient is neutral, indicating that this feature is in equilibrium with the water table.

DP-3 is installed within a small marsh located south of Page Lake Road, near MW-5s/d, and is within the Wabigoon Lake Subwatershed. Based on field observations and interpretations following the installation of the piezometer (i.e., relative ease of installation), it is expected that surficial soils in this area consist of thick (> 1 m) organic materials or unconsolidated materials. The vertical hydraulic gradient at this location varies between slightly negative to slightly positive, indicating that at times this feature is supported through surface water runoff and precipitation and other times is supported through groundwater discharge, however is generally in equilibrium with the water table.

DP-4 is installed within a small stream leading to Bending Lake, located approximately 15 m from MW-1. Based on field observations and interpretations following the installation of the piezometer (i.e., difficult installation), it is expected that the surficial soils in this stream are densely compacted soils. The vertical hydraulic gradient at this location is negative, indicating that this feature is supported through surface water runoff and precipitation, which is consistent with the deep water table measured at MW-1.

DP-5 is installed within Bending Lake, approximately 20 m from MW-4. Based on field observations and interpretations following the installation of the piezometer (i.e., difficult installation), it is expected that the piezometer is installed in an area of densely compacted soils. The vertical hydraulic gradient at this location is slightly positive to neutral, indicating that at times this feature is supported through groundwater discharge, however is generally in equilibrium with the water table.

DP-6 is installed within a stream that is hydraulically connected to a lake within the Wapigoon Lake Subwatershed. Based on field observations and interpretations following the installation of the piezometer (i.e., difficult installation), it is expected that the piezometer is installed within an area of densely compacted soils. The vertical hydraulic gradient at this location is slightly positive, indicating that this feature is supported through groundwater discharge, however is generally in equilibrium with the water table.

DP-7 is installed within a marsh wetland, located approximately 1,300 m south of Page Lake Road. DP-7 is within the Wapageisi Lake Subwatershed. Based on field observations and interpretations following the installation of the piezometer (i.e., relative ease of installation), it is expected that the piezometer is installed within an area of shallow organics (< 1 m). The vertical hydraulic gradient at this location varies between slightly negative to slightly positive, indicating that at times this feature is supported through

surface water runoff and precipitation and other times is supported through groundwater discharge, however is generally in equilibrium with the water table.

DP-8 is installed within a forested marsh area within the Wapageisi Lake Subwatershed. Based on field observations and interpretations following the installation of the piezometer (i.e., slightly difficult to install), it is expected that the piezometer is installed within an area of very shallow organics overlying the overburden soils. The vertical hydraulic gradient at this location is slightly positive, indicating that this feature is supported through groundwater discharge.

DP-9 is installed within a low-lying perched marsh wetland located approximately 150 m from MW-3s/d, and is within the Bending Lake Subwatershed. Based on field observations and interpretations following the installation of the piezometer (i.e., difficult to install), it is expected that the piezometer is installed with an area of densely compacted soils. The vertical hydraulic gradient at this location is negative, indicating that this feature is supported through surface water runoff and precipitation.

6.3 Hydraulic Conductivity

Calculated values of hydraulic conductivity (K) for wells screened within the glaciolacustrine and glaciofluvial sand ranged from $1.9x10^{-6}$ m/sec (MW-1) to $5.7x10^{-4}$ m/sec (MW-4), and have a geometric mean of $1.6x10^{-5}$ m/sec. The calculated hydraulic conductivity of the sand at MW-4 is two orders of magnitude greater than the sands identified at MW-1. The higher conductivity at MW-4 is interpreted to be a result of the combination of coarser sands in this area and the strong hydraulic influence of Bending Lake.

The K values of the tested bedrock ranged from $1.1x10^{-7}$ m/sec (MW-5d) to $6.0x10^{-6}$ m/sec (MW-3d), and have a geometric mean of $9.4x10^{-7}$ m/sec. These values provide a good representation of the hydraulic conductivity expected within the shallow fractured bedrock in the study area.

A summary of the completed slug tests and results is provided in **Table 6-3**, and the output analyses from Aqtesolv™ are provided in **Appendix F**.

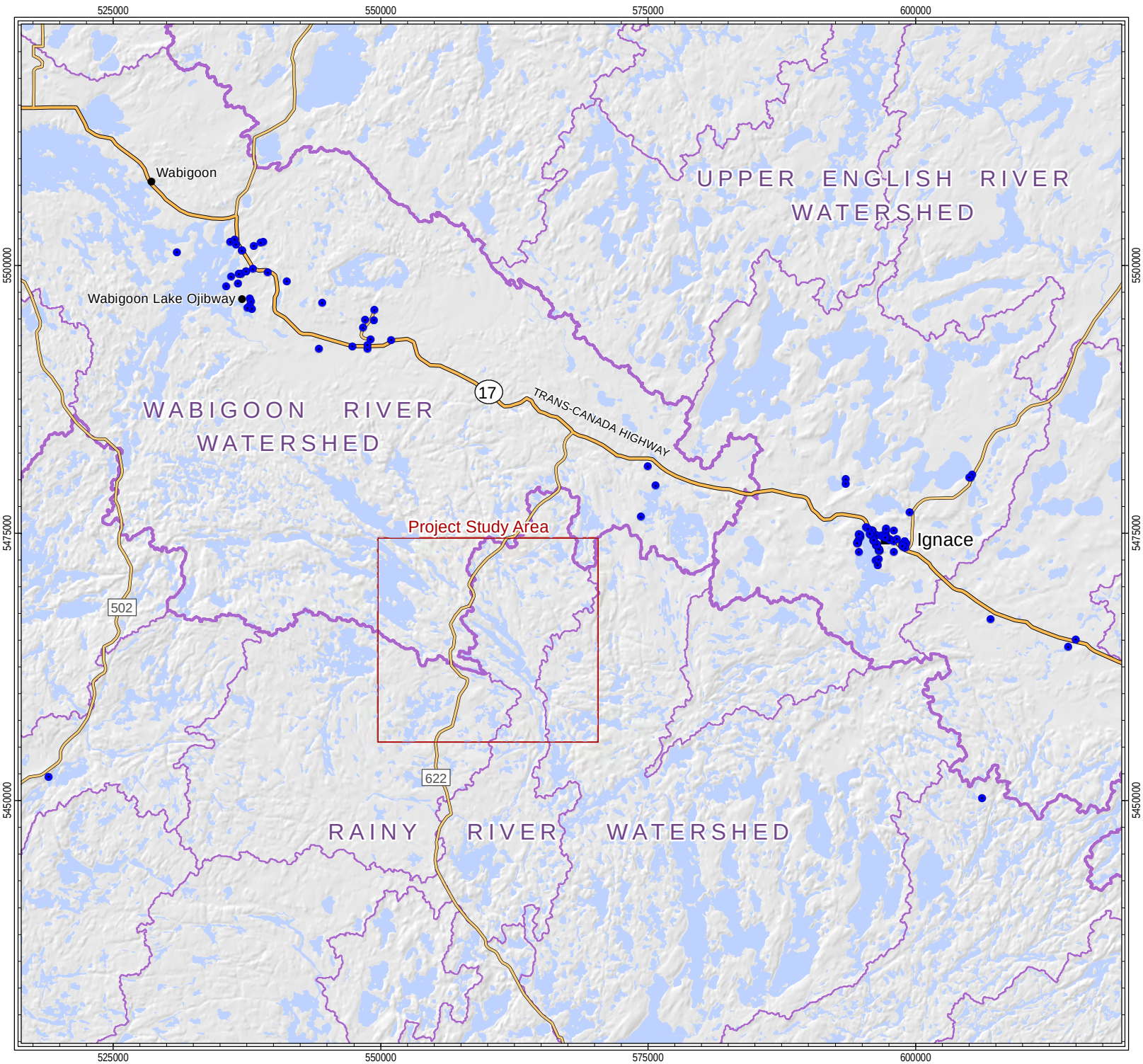
Table 6-3. Hydraulic Conductivity Summary Table

Geology	Borehole ID	Test Type	Hydraulic Conductivity (m/sec)	Geometric Mean (m/sec)	Range (m/sec)
Glaciofluvial/ Glaciolacustrine Sand	MW-1	Injection Test 1	$3.2x10^{-6}$	$1.6x10^{-5}$	$1.9x10^{-6}$ to $5.7x10^{-4}$
		Injection Test 2	$1.9x10^{-6}$		
		Injection Test 3	$3.4x10^{-6}$		
		Injection Test 4	$2.7x10^{-6}$		
	MW-4	Slug Test – RH 1	$5.7x10^{-4}$		
		Slug Test – RH 2	$5.1x10^{-4}$		
Bedrock	MW-2	Slug Test – FH 1	$4.7x10^{-7}$	$9.4x10^{-7}$	$1.1x10^{-7}$ to $6.0x10^{-6}$
		Slug Test – RH 1	$5.9x10^{-7}$		
		Slug Test – FH 2	$7.8x10^{-7}$		

Geology	Borehole ID	Test Type	Hydraulic Conductivity (m/sec)	Geometric Mean (m/sec)	Range (m/sec)
		Slug Test – RH 2	$6.8x10^{-7}$		
	MW-3d	Slug Test – FH 1	$6.0x10^{-6}$		
		Slug Test – RH 1	$5.0x10^{-6}$		
		Slug Test – FH 2	$4.6x10^{-6}$		
		Slug Test – RH 2	$5.1x10^{-6}$		
	MW-5s	Slug Test – FH 1	$7.2x10^{-7}$		
		Slug Test – FH 2	$3.4x10^{-7}$		
		Slug Test – RH 2	$6.6x10^{-7}$		
	MW-5d	Slug Test – FH 1	$3.6x10^{-7}$		
		Slug Test – RH 1	$1.1x10^{-7}$		
		Injection Test 1	$2.4x10^{-7}$		
		Injection Test 2	$3.3x10^{-7}$		
	MW-6	Slug Test – FH 1	$1.4x10^{-6}$		
		Slug Test – RH 1	$1.3x10^{-6}$		
	MW-7s	Injection Test 1	$1.5x10^{-6}$		
		Injection Test 2	$6.6x10^{-7}$		
	MW-7d	Slug Test – FH 1	$2.3x10^{-6}$		
		Slug Test – RH 1	$1.3x10^{-6}$		

6.4 MECP Water Well Records

Based on a review of the MECP WWR database, there are a total of 116 water well records within a 50-km radius of the site (**Figure 6-3**). Most of the wells are situated along the TransCanada Highway approximately 35 km northwest of the site, and within the Township of Ignace. Of the 116 water well records, 78 are used for domestic water supply, 7 are used for commercial water supply, 3 for industrial water supply, 8 for public water supply, and 20 are either abandoned or are used for monitoring or test well purposes. Based on the available data, wells range in depth from 4.50 m to 505 m deep, and 59 are screened within the bedrock aquifer, and 57 are screened within the overburden. The water well records are provided in **Appendix G** for reference.



Ambershaw Metallics, Inc.

LEGEND

- MECP Water Well Record
- Major Highway
- Minor Highway
- Watershed Boundary
- Subwatershed Boundary

Data Sources: Ministry of Natural Resources and Forestry (Watersheds), Natural Resources Canada (Roads, Place Names), Esri basemap service (Imagery).

0 5 10 15
kilometres

N

DRAWN: B. Elder
CHECKED: C. Hanlon
PROJECT: 17018
DATE: Dec 16, 2018

Scale 1:500000
UTM Zone 15N
NAD 1983

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

CLIENT: Ambershaw Metallics Inc.
PROJECT: AMI Bending Lake AEP

MECP Water Well Records

FIGURE 6-3

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7 GROUNDWATER QUALITY

7.1 Overall Project Study Area and Project Development Area Groundwater Quality

Groundwater quality sampling at the site was completed between October 18 – October 22, 2017, and between May 24 – 30, 2018. Eight of the ten installed groundwater wells (MW-2, MW-3d, MW-4, MW-5s, MW-5d, MW-6, MW-7s, and MW-7d) were sampled using the low flow methodology described in **Section 3.6**. A duplicate sample for QA/QC was collected from MW-7d immediately following the collection of the primary sample in October 2017. **Table 7-1** provides a summary of the water quality results at each well, including the in-situ parameters measured in the field immediately prior to each sampling event. The completed field data sheets indicating the measured parameters recorded during low-flow sampling are provided in **Appendix G**, and a summary of the QA/QC data management results are provided in **Appendix M**.

The electrical conductivity (EC) for all samples was relatively low, ranging between 72.0 µS/cm (MW-4) to 422 µS/cm (MW-6), and total dissolved solids (TDS) ranged between 51 mg/L (MW-4) to 243 mg/L (MW-6), indicating low mineralized groundwater. Major ion concentrations were also low, indicating short residence time and low water-rock interactions. The sample collected from MW-4 is representative of the clean sand aquifers and hydraulic connection to surface water in Bending Lake, and this is reflected in the low TDS and TSS compared with the other groundwater samples.

Based on the reported groundwater chemistry, groundwater at the site is classified as Ca^{2+}-HCO_3^- dominant (a Piper Diagram is presented on **Figure 7-1**). Of the major cations (Ca^{2+}, Mg^{2+}, Na^+, and K^+), calcium is the dominant cation, proportionally ranging from 49% - 85% of the total cations in each groundwater sample. Of the major anions (HCO_3^-, CO_3^{2-}, Cl^-, and SO_4^{2-}), HCO_3^- is dominant, proportionally ranging from 81% - 99% of the total anions in each groundwater sample. This classification is considered typical of groundwater chemistry found in igneous rocks. As groundwater flow takes place through fractures in the rock, there is little contact between the groundwater and the rock matrix. Silicate minerals, such as feldspars and micas, dissolve incongruently in water containing CO_2, causing a release of Ca^{2+}, Mg^{2+}, Na^+, and K^+. This leaves behind a clayey residue rich in aluminosilicates, accompanied by a rise in pH and concentration of HCO_3^- in water (Singhal and Gupta, 2010).

Table 7-1. Groundwater Quality Results

	Parameters	Units	MW2		MW3D		MW4		MW5S		MW5D		MW6		MW7S		MW7D		MW7D DUP
Sample	Date	dd/mm/yy	19-Oct-2017	26-May-2018	18-Oct-2017	25-May-2018	18-Oct-2017	25-May-2018	20-Oct-2017	28-May-2018	20-Oct-2017	28-May-2018	21-Oct-2017	27-May-2018	22-Oct-2017	27-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017
	Time	hh:mm	13:30	12:40	14:30	11:30	10:00	10:00	14:00	9:30	13:30	12:15	13:45	15:45	17:00	11:30	15:00	10:30	15:30
In-Situ	Temp	^{0}C	10.12	20.9	9.72	13.03	7.28	7.9	13.27	16.2	22.11	19.8	9.81	15	11.66	13.86	10.4	13.9	10.4
	Turbidity	NTU	10	2.6	4.2	6.7	0.5	0.8	20.3	5.4	45.4	4.4	14.2	2.4	49.2	16.7	22.9	24.7	22.9
	Conductivity	uS/cm	263	162	382	269	71	75	257	201	286	287	427	329	164	178	195	134	195
	Dissolved Oxygen	%	64	96	16.6	61.2	69.5	79.2	70.5	93.4	77.8	91.4	30.4	85.4	91.8	79.4	32.4	93	32.4
		mg/L	7.19	8.57	1.89	6.3	8.37	9.37	7.37	9.14	8.27	8.34	3.4	8.61	9.96	8.14	3.61	9.6	3.61
	pH	-	6.62	7.65	6.98	7.72	6.25	6.44	6.4	7.33	7.54	7.86	6.54	7.29	6.9	6.18	6.51	6.88	6.51
	Redox Potential	-	183.8	213.8	38.8	229.6	243.3	231.5	216.5	248.0	144	94.0	40.4	274.1	205.8	178	-2.9	150.2	-2.9
Physical Tests	Conductivity (EC)	uS/cm	250	153	373	268	72.9	72.0	250	197	294	278	422	321	179	180	179	133	177
	Hardness (as $CaCO_3$)	mg/L	112	76.6	171	112	29.4	27.8	107	86.5	142	128	210	159	68.5	82.2	75.9	59	76.7
	pH	pH	7.48	7.75	8.07	7.85	7.17	6.73	6.69	7.54	7.63	8.05	7.05	7.72	6.67	6.69	6.97	7.10	6.78
	Total Suspended Solids	mg/L	31.2	1.4	1.3	12.6	<1.0	<1.0	52.4	8.5	20.0	7.8	23.4	3.9	350	2	122	29	26.0
	Total Dissolved Solids	mg/L	154	103	231	163	57	51	162	115	184	154	243	214	114	131	109	92	113
Anions and Nutrients (Water)	Acidity (as $CaCO_3$)	mg/L	19.4	<2.0	5.3	2.3	7.3	5.2	30.4	6.6	5.4	2.2	45.3	3.5	28.0	13.3	17.2	4.4	24.3
	Alkalinity Total (as $CaCO_3$)	mg/L	133	74	242	112	31.3	29.1	121	93	173	159	235	165	87.8	79.6	87.1	60.6	85.3
	Ammonia, Total (as N)	mg/L	0.051	0.023	<0.020	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	0.024	<0.020	<0.020	0.027	0.035	0.027	0.091	0.038
	Bromide (Br)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
	Chloride (Cl)	mg/L	0.11	<0.10	0.18	0.22	0.20	0.30	0.81	0.46	0.54	0.51	0.29	0.14	0.17	0.27	0.22	0.21	0.22
	Fluoride (F)	mg/L	0.028	0.032	0.069	0.034	0.023	<0.020	<0.020	<0.020	0.030	<0.020	<0.020	0.023	0.024	0.026	0.023	0.024	0.023
	Nitrate (as N)	mg/L	0.130	0.072	<0.020	0.05	0.421	0.409	2.24	1.70	0.680	0.675	<0.020	<0.020	0.077	0.095	<0.020	0.053	<0.020
	Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Total Kjeldahl Nitrogen	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.75	0.39	<0.15	<0.15	0.32	0.19	<0.75	<0.15	<0.15	<0.15	<0.15
	Total Nitrogen	mg/L	<0.15	<0.15	<0.15	<0.15	0.42	0.41	2.24	2.08	0.68	0.67	0.32	0.19	<0.75	<0.15	<0.15	<0.15	<0.15
	Orthophosphate-Disslved (as P)	mg/L	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0057	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
	Phosphorus (P)-Total	mg/L	0.0115	0.0037	<0.0030	0.0032	0.0045	<0.0030	0.0079	<0.0030	0.0110	0.0057	0.0078	0.0063	0.0777	0.0036	0.0141	0.0098	0.0050
	Sulfate (SO_4)	mg/L	11.2	7.2	28.6	20.3	5.07	5.29	6.51	2.71	2.88	3.08	6.79	5.53	7.53	12.50	8.50	6.87	7.99
Carbo	Disslved Organic Carbon	mg/L	3.6	5.0	1.6	3.5	1.8	2.8	1.3	3.6	1.1	4.8	11.1	9.9	2.6	2.5	2.3	1.7	2.0
	Total Organic Carbon	mg/L	3.2	4.2	1.2	2.7	1.5	2.5	1.3	1.9	1.5	1.9	11.3	9.2	4.0	2.2	1.8	1.3	2.1
Total Metals (Water)	Aluminum (Al)-Total	mg/L	1.56	0.05	0.0224	0.1410	0.0182	0.0100	0.734	0.056	1.66	0.08	0.325	0.048	7.04	0.101	0.930	0.538	0.271
	Antimony (Sb)-Total	mg/L	<0.00010	<0.00010	0.00015	0.00018	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00023	0.00011	<0.00010	<0.00010	0.00040	<0.00010	0.00037
	Arsenic (As)-Total	mg/L	0.00099	0.00035	0.00022	0.00017	0.00011	<0.00010	0.00023	0.00011	0.00030	0.00014	0.00040	0.00017	0.00099	0.00014	0.00034	0.00017	0.00023
	Barium (Ba)-Total	mg/L	0.0885	0.0437	0.221	0.135	0.0148	0.0134	0.0475	0.0233	0.0644	0.0387	0.0504	0.0136	0.115	0.048	0.0524	0.0240	0.0462
	Beryllium (Be)-Total	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
	Boron (B)-Total	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	0.011	<0.010	0.015	<0.010	0.014
	Cadmium (Cd)-Total	µg/L	0.201	0.017	0.0124	0.0275	<0.0050	0.0059	0.0336	0.0106	0.0345	0.0130	0.254	0.027	0.116	0.037	0.0948	0.0232	0.0717
	Calcium (Ca)-Total	mg/L	39.1	26.7	58.8	40.4	9.87	9.82	36.5	32.3	49.8	47.4	75.6	57.3	21.9	22.1	23.1	17.7	22.3
	Cesium (Cs)-Total	mg/L	0.000059	<0.000010	0.000075	0.000280	0.000012	<0.000010	0.000029	<0.000010	0.000079	<0.000010	0.000061	0.000035	0.000501	0.000065	0.000127	0.000093	0.000052
	Chromium (Cr)-Total	mg/L	0.00093	0.00056	0.00016	0.00010	0.00021	0.00020	0.00127	0.00035	0.00414	0.00076	0.00072	0.00042	0.0158	0.0004	0.00255	0.00150	0.00072
	Cobalt (Co)-Total	mg/L	0.00244	0.00045	0.00134	0.00027	0.00041	0.00013	0.00065	<0.00010	0.00112	0.00023	0.0163	0.0005	0.0163	0.0076	0.0128	0.0014	0.0111

	Parameters	Units	MW2		MW3D		MW4		MW5S		MW5D		MW6		MW7S		MW7D		MW7D DUP
	Copper (Cu)-Total	mg/L	0.00842	0.00272	<0.00050	0.00241	0.00191	0.00215	0.00208	0.00164	0.00640	0.00509	0.0225	0.0166	0.0333	0.0254	0.0118	0.0145	0.00645
	Iron (Fe)-Total	mg/L	2.66	0.09	0.456	0.130	0.032	0.016	0.598	0.066	1.36	0.11	2.39	0.16	5.14	0.08	5.12	0.73	3.54
	Lead (Pb)-Total	mg/L	0.000435	<0.000050	<0.00005	0.000119	<0.00005	<0.000050	0.000267	<0.000050	0.000408	<0.000050	0.000212	<0.000050	0.00178	<0.000050	0.000575	0.000254	0.000298
	Lithium (Li)-Total	mg/L	0.0014	<0.0010	0.0029	0.0034	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0022	0.0020	0.0034	0.0038	0.0044	0.0028	0.0039
	Magnesium (Mg)-Total	mg/L	3.04	1.68	5.20	3.16	1.09	1.09	3.35	2.84	4.95	4.18	5.11	3.84	8.10	5.71	4.73	3.51	4.69
	Manganese (Mn)-Total	mg/L	0.140	0.028	0.288	0.161	0.0131	0.0032	0.0982	0.0176	0.115	0.043	1.62	0.28	0.579	0.139	0.696	0.031	0.624
	Mercury (Hg)-Total	µg/L	<0.0050	<0.0050	<0.0050	0.0052	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0100	0.0094	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Molybdenum (Mo)-Total	mg/L	0.000528	0.000247	0.00114	0.00022	0.000462	0.000182	0.000767	0.000226	0.000746	0.000717	0.000662	0.000208	0.00571	0.00309	0.00393	0.00235	0.00370
	Nickel (Ni)-Total	mg/L	0.00314	0.00130	0.00085	0.00084	0.00189	0.00113	0.00116	<0.00050	0.00203	<0.00050	0.0407	0.0131	0.0321	0.0389	0.00881	0.00663	0.00742
	Phosphorus (P)-Total	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.105	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total	mg/L	4.27	2.38	18.2	12.6	2.23	2.04	3.58	2.57	4.34	3.75	1.60	1.21	6.86	5.03	4.21	2.28	4.20
	Rubidium (Rb)-Total	mg/L	0.00632	0.00262	0.0214	0.0156	0.00143	0.00093	0.00301	0.00099	0.00462	0.00210	0.00405	0.00256	0.0139	0.0111	0.00690	0.00495	0.00645
	Selenium (Se)-Total	mg/L	0.000191	0.000152	<0.00005	0.000593	0.000066	0.000114	0.000099	0.000079	0.000294	0.000186	0.000093	0.000103	0.000325	0.000444	0.000635	0.000764	0.000588
	Silicon (Si)-Total	mg/L	11.0	6.6	6.88	5.46	7.33	7.01	10.5	7.6	9.98	6.73	13.4	12.2	23.5	13.2	11.5	9.1	10.1
	Silver (Ag)-Total	mg/L	0.000015	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	0.000033	0.000015	0.000031	<0.000010	0.000019	<0.000010	<0.00001
	Sodium (Na)-Total	mg/L	5.27	3.03	1.91	1.38	2.03	1.84	8.67	2.76	3.16	2.48	5.41	3.41	6.19	4.14	4.31	2.60	4.21
	Strontium (Sr)-Total	mg/L	0.105	0.060	0.299	0.161	0.0274	0.0269	0.0885	0.0604	0.132	0.097	0.0921	0.0627	0.100	0.086	0.0814	0.0412	0.0725
	Sulfur (S)-Total	mg/L	3.33	2.74	10.8	7.3	1.74	2.02	2.27	0.96	1.24	1.16	2.54	2.36	2.12	4.49	2.83	2.42	2.45
	Tellurium (Te)-Total	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Thallium (Tl)-Total	mg/L	0.000020	<0.000010	0.000019	0.000020	<0.00001	<0.000010	0.000011	<0.000010	0.000016	<0.000010	0.000027	<0.000010	0.000069	0.000043	0.000024	0.000016	0.000019
	Thorium (Th)-Total	mg/L	0.00051	<0.00010	<0.00010	0.00017	<0.00010	<0.00010	0.00054	<0.00010	0.00076	<0.00010	0.00038	<0.00010	0.00197	<0.00010	0.00040	0.00020	0.00013
	Tin (Sn)-Total	mg/L	0.00017	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	0.00059	0.00051	0.00017	<0.00010	0.00035	<0.00010	0.00019
	Titanium (Ti)-Total	mg/L	0.0413	0.0016	0.00094	0.00266	0.00085	<0.00030	0.0200	0.0022	0.0599	0.0038	0.00983	0.00175	0.282	0.004	0.0422	0.0214	0.0112
	Tungsten (W)-Total	mg/L	0.00920	0.00178	0.0110	0.0008	0.00338	0.00133	0.00156	0.00079	0.00588	0.00112	0.00308	0.00030	0.0534	0.0281	0.0210	0.0067	0.0142
	Uranium (U)-Total	mg/L	0.000809	0.000279	0.000844	0.000663	0.000099	0.000096	0.000649	0.000550	0.00151	0.00142	0.000693	0.000490	0.00113	0.00183	0.00167	0.00198	0.00177
	Vanadium (V)-Total	mg/L	0.00816	0.00063	<0.00050	<0.00050	<0.00050	<0.00050	0.00127	0.00053	0.00337	0.00097	0.00103	<0.00050	0.0119	<0.00050	0.00245	0.00144	0.00104
	Zinc (Zn)-Total	mg/L	0.0645	0.0046	0.0412	0.0031	<0.0030	<0.0030	0.0108	<0.0030	0.0272	0.0172	0.390	0.016	0.0158	0.0257	0.246	0.038	0.189
	Zirconium (Zr)-Total	mg/L	0.000436	0.000066	<0.00006	0.000163	<0.00006	<0.000060	0.000409	<0.000060	0.000469	<0.000060	0.000225	0.000108	0.000725	<0.000060	0.000186	0.000124	0.000079
Dissolved Metals (Water)	Aluminum (Al)-Dissolved	mg/L	0.0096	0.0104	0.0038	0.00350	0.0041	0.0046	0.0070	0.0033	0.0093	0.0051	0.0064	0.00500	0.0086	0.0134	0.0085	0.0042	0.0043
	Antimony (Sb)-Dissolved	mg/L	<0.00010	0.00012	0.00013	0.00016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved	mg/L	0.00047	0.0003	0.00017	0.000	<0.00010	<0.00010	0.00013	<0.00010	0.00012	<0.00010	0.00020	0.0001	0.00020	0.0001	0.00016	<0.00010	0.00015
	Barium (Ba)-Dissolved	mg/L	0.0807	0.0463	0.215	0.132	0.0142	0.0129	0.0434	0.0219	0.0501	0.0372	0.0446	0.0129	0.0713	0.0479	0.0432	0.0217	0.0438
	Beryllium (Be)-Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved	mg/L	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005
	Boron (B)-Dissolved	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	0.014	<0.010	0.014
	Cadmium (Cd)-Dissolved	µg/L	0.200	0.0	0.0131	0.0	<0.0050	0.0	0.653	0.0	0.0162	<0.0050	0.157	0.0	0.0729	0.0	0.0573	0.0	0.0501
	Calcium (Ca)-Dissolved	mg/L	40.4	27.8	59.3	39.7	9.95	9.45	37.3	30.4	48.9	45.1	75.9	57.2	18.8	22.9	22.8	18.1	23.1
	Cesium (Cs)-Dissolved	mg/L	0.000010	<0.000010	0.000068	0.00026	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	0.000044	0.00003	0.000020	0.00005	0.000020	0.000033	0.000022
	Chromium (Cr)-Dissolved	mg/L	0.00011	0.00023	0.00045	0.00182	0.00014	0.00033	0.00029	0.00018	0.00050	0.00077	0.00015	0.0003	0.00011	0.0003	<0.00010	0.0002	0.00021
	Cobalt (Co)-Dissolved	mg/L	0.00129	0.00044	0.00130	0.00026	0.00039	0.00012	0.00036	<0.00010	0.00040	0.00017	0.0146	<0.00010	0.0108	0.00763	0.0106	0.00099	0.0105
	Copper (Cu)-Dissolved	mg/L	0.00339	0.00268	0.00032	0.001	0.00163	0.00142	0.00796	0.00124	0.00234	0.00104	0.0223	0.010	0.00297	0.0242	0.00266	0.00	0.00237
	Iron (Fe)-Dissolved	mg/L	<0.010	<0.010	0.225	0.043	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	0.750	<0.010	<0.010	0.016	2.68	0.194	2.75
	Lead (Pb)-Dissolved	mg/L	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005	<0.000050	0.000225	<0.000050	<0.00005	<0.000050	0.000250	<0.000050	<0.00005	<0.000050	<0.00005	<0.000050	<0.00005
	Lithium (Li)-Dissolved	mg/L	<0.0010	<0.0010	0.0032	0.00	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0024	0.00	<0.0010	0.00	0.0045	0.00	0.0048
	Magnesium (Mg)-Dslvd	mg/L	2.72	1.720	5.53	3.060	1.10	1.0200	3.48	2.5900	4.87	3.8400	4.99	3.94	5.24	6.060	4.58	3.320	4.59
	Manganese (Mn)-Dslvd	mg/L	0.100	0.029	0.279	0.154	0.0122	0.0028	0.0848	0.0163	0.0903	0.0397	1.49	0.0449	0.476	0.137	0.596	0.0278	0.596

Parameters	Units	MW2		MW3D		MW4		MW5S		MW5D		MW6		MW7S		MW7D		MW7D DUP
Mercury (Hg)-Dissolved	µg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Molybdenum (Mo)- Dsvld	mg/L	0.000482	0.00025	0.00105	0.00058	0.000405	0.00019	0.000693	0.00022	0.000710	0.000668	0.000573	0.0002	0.00467	0.0032	0.00362	0.00234	0.00376
Nickel (Ni)-Dissolved	mg/L	0.00191	0.00099	0.00102	0.00064	0.00174	0.00087	0.00070	<0.00050	<0.00050	<0.00050	0.0363	0.00576	0.0183	0.0388	0.00661	0.00547	0.00665
Phosphorus (P)-Dissolved	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	4.34	2.63000	18.2	13.0000	2.17	2.04000	3.57	2.53000	4.22	3.67000	1.44	1.25000	5.29	5.12000	4.11	2.31000	4.17
Rubidium (Rb)-Dissolved	mg/L	0.00598	0.002690	0.0211	0.0147	0.00124	0.000880	0.00247	0.000890	0.00324	0.001750	0.00332	0.002630	0.00856	0.011100	0.00582	0.004490	0.00568
Selenium (Se)-Dissolved	mg/L	0.000187	0.00	<0.00005	0.00	0.000138	0.00	0.000112	0.00	0.000334	0.00	0.000096	0.0	0.000317	0.0	0.000756	0.0	0.000666
Silicon (Si)-Dissolved	mg/L	8.43	6.43	6.87	5.14	7.40	6.9	9.42	6.68	7.31	6.08	13.3	11.8	13.8	12.8	10.1	7.91	9.96
Silver (Ag)-Dissolved	mg/L	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001	<0.000010	<0.00001
Sodium (Na)-Dissolved	mg/L	5.35	3.250	1.84	1.240	2.01	1.8300	8.78	2.5300	3.09	2.310	4.92	3.3800	5.37	4.3000	4.10	2.5500	4.16
Strontium (Sr)-Dissolved	mg/L	0.100	0.06	0.292	0.2	0.0266	0.03	0.0825	0.06	0.121	0.10	0.0849	0.06	0.0876	0.09	0.0727	0.04	0.0746
Sulfur (S)-Dissolved	mg/L	3.63	2.43	10.3	6.98	1.87	1.8	2.13	0.58	1.12	0.87	2.29	2.03	1.93	4.87	2.45	2.24	2.62
Tellurium (Te)-Dissolved	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Dissolved	mg/L	0.000017	0.000014	0.000021	0.000018	<0.00001	<0.000010	0.000012	<0.000010	0.000011	<0.000010	0.000027	<0.000010	0.000028	0.000039	0.000021	<0.000010	0.000018
Thorium (Th)-Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)-Dissolved	mg/L	<0.00010	0.00016	<0.00010	<0.00010	<0.00010	<0.00010	0.00026	<0.00010	<0.00010	<0.00010	0.00045	0.00018	<0.00010	<0.00010	0.00012	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten (W)-Dissolved	mg/L	0.00837	0.001550	0.0101	0.000760	0.00298	0.001210	0.00119	0.000750	0.00512	0.00126	0.00052	<0.00010	0.0214	0.027400	0.0104	0.00359	0.0103
Uranium (U)-Dissolved	mg/L	0.000740	0.000272	0.000828	0.000612	0.000084	0.000086	0.000518	0.000537	0.00138	0.00148	0.000585	0.000453	0.000501	0.00174	0.00172	0.00178	0.00170
Vanadium (V)-Dissolved	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0006	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.0654	0.0042	0.0242	0.0014	0.0022	0.0055	0.0112	<0.0010	0.0130	0.0097	0.298	0.010000	0.0056	0.0241	0.158	0.0118	0.160
Zirconium (Zr)-Dissolved	mg/L	<0.00006	0.000064	<0.00006	<0.000060	<0.00006	<0.000060	0.000074	<0.000060	<0.00006	<0.000060	0.000077	0.000081	<0.00006	<0.000060	<0.00006	<0.000060	<0.00006

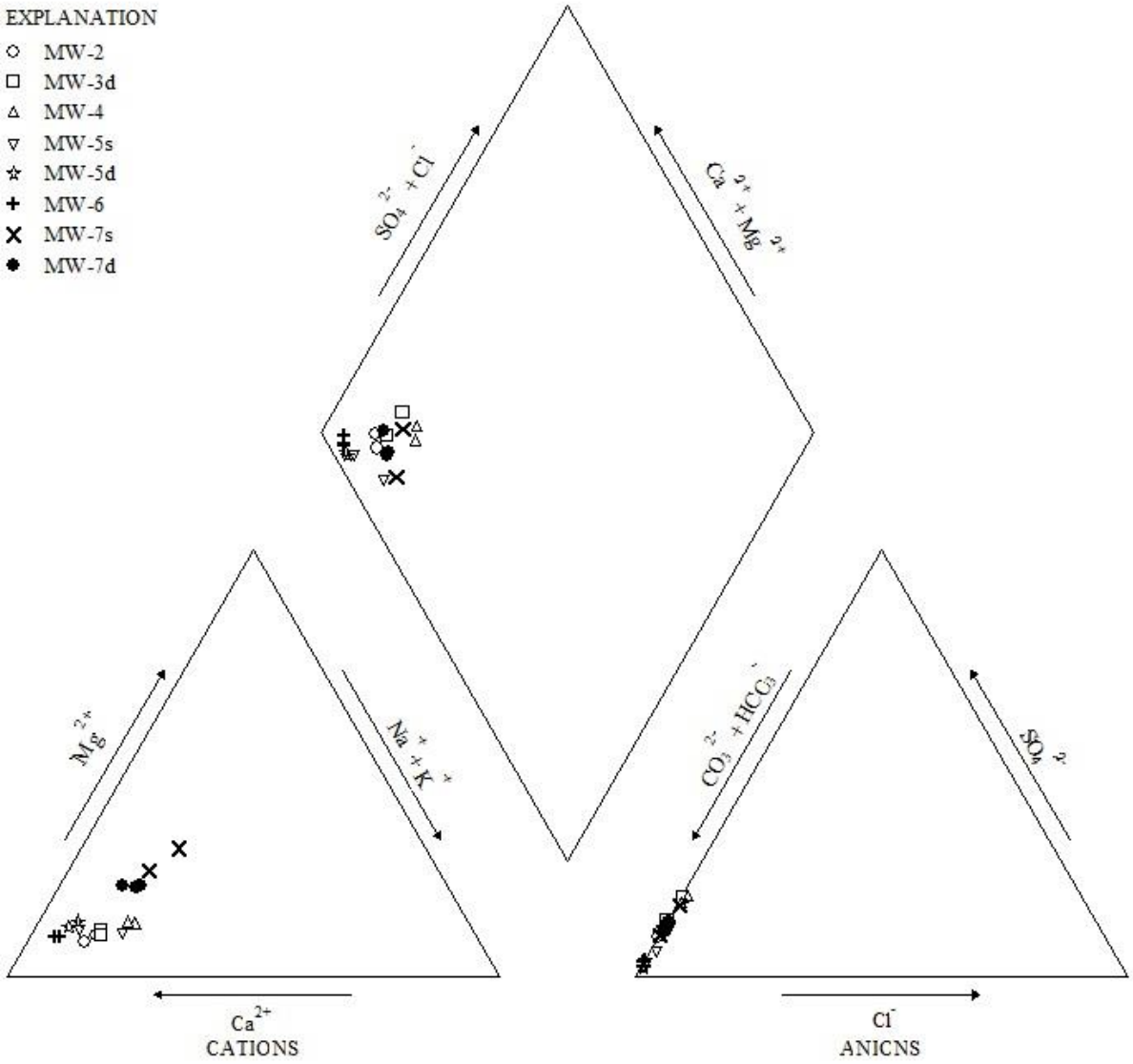

Figure 7-1. Groundwater Chemistry Piper Diagram

7.2 Regulatory Criteria Used for Comparison of Water Quality

The analytical results from groundwater quality sampling are compared against several regulatory criteria, including the Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life (CEQG-PAL) over short and long terms, the Provincial Water Quality Objectives (PWQO), and the Ontario Drinking Water Quality Standards (ODWS). Comparisons of the sampling to each of these criteria is described in detail in the following section. The Laboratory Certificate of Analysis (CoA) and Chain of Custody (CoC) is provided in **Appendix H**. It should be noted that initial groundwater sampling was completed to establish the natural baseline groundwater chemistry conditions at the site, and these comparisons are provided for reference purposes only.

In general, it is important to note that the results collected in October 2017 have a higher concentration of TSS and TDS compared with May 2018, potentially leading to an increased number of exceedances for dissolved metal parameters. It is possible that this is a result of sampling or development error, however this may also be reflective of the variability in natural conditions, as changes in infiltration from ground surface can seasonally change mineral concentration in the shallow groundwater system (Wallick, 1984).

In addition, the groundwater quality sample from MW-4 is representative of the surface water of Bending Lake. This was shown in the consistent water quality results between the October and May sampling periods, and the low TSS and TDS values in both the surface water and groundwater samples. For example, the median TSS in MW-4 is <1 mg/L and in Bending Lake is 1.7 mg/L, and the median TDS in MW-4 is 54 mg/L and in Bending Lake is 37.5 mg/L. The MW-4 sample was the only location which showed almost no exceedances in either the October 2017 or May 2018 sampling periods.

7.2.1 Ontario Drinking Water Quality Standards

The ODWS was put in place under the *Safe Drinking Water Act*, 2002. Groundwater samples collected at the Project site were compared with ODWS criteria. ODWS are reported in Aesthetic Objectives (AO), Operational Guidelines (OG), and Maximum Allowable Concentrations (MAC) or Interim MAC (IMAC). The applicable ODWS criteria is provided in **Table 7-2**.

Table 7-2. Applicable ODWS Criteria

Parameter	Units	ODWS Criteria		
		AO	OG	MAC/IMAC
Hardness	mg/L	-	80-100	-
Turbidity	NTU	5	-	-
pH	-	-	6.5-8	-
Total Dissolved Solids	mg/L	500	-	-
Alkalinity, Total (as $CaCO_3$)	mg/L	-	30-500	-
Chloride (Cl)	mg/L	250	-	-
Fluoride	mg/L	-	-	1.5
Nitrate (as N)	mg/L	10	-	-
Nitrite (as N)	mg/L	1	-	-
Total Nitrogen	mg/L	10	-	-
Sulfate (SO_4)	mg/L	-	500	-

Parameter	Units	ODWS Criteria		
		AO	OG	MAC/IMAC
Aluminum (Al)-Total	mg/L	-	0.1	-
Antimony (Sb)-Total	mg/L	-	-	0.006
Arsenic (As)-Total	mg/L	-	-	0.025
Barium (Ba)-Total	mg/L	-	-	1
Boron (B)-Total	mg/L	-	-	5
Cadmium (Cd)-Total	mg/L	-	-	0.005
Chromium (Cr)-Total	mg/L	-	-	0.05
Copper (Cu)-Total	mg/L	1	-	-
Iron (Fe)-Total	mg/L	0.3	-	-
Manganese (Mn)-Total	mg/L	0.05	-	-
Selenium (Se)-Total	mg/L	-	-	0.01
Sodium (Na)-Total	mg/L	200	-	20
Uranium (Ur)-Total	mg/L	-	-	0.02
Zinc (Zn)-Total	mg/L	5	-	-

The water quality results compared with ODWS are provided in **Appendix J**, and noted exceedances are identified in **Table 7-3** and **Table 7-4** below:

Table 7-3. Water Quality Exceedances of ODWS Operational Guidelines

	MW-2		MW-3d		MW-4		MW-5s		MW-5d		MW-6		MW-7s		MW-7d	
	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018
Hardness	●	●	●	●	●	●	●		●	●	●	●	●		●	●
Alkalinity						●										
Aluminum	●			●			●		●		●		●	●	●	●

Table 7-4. Water Quality Exceedances of ODWS Aesthetic Objectives

	MW-2		MW-3d		MW-4		MW-5s		MW-5d		MW-6		MW-7s		MW-7d	
	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018
Iron	●		●				●		●		●		●		●	●
Manganese	●		●	●			●		●		●	●	●	●	●	

7.2.2 Ontario Provincial Water Quality Objectives

Ontario's PWQO were implemented to ensure surface water quality is satisfactory for aquatic life and recreation, and that the water uses which require more stringent water quality are protected on a site-specific basis. While the criteria are designed as surface water quality criteria, it is possible that groundwater discharge to surface water may be required during bulk sample mining. It is therefore important to screen the groundwater quality with the PWQO standards.

Groundwater samples were analyzed for a suite of metals in both total and dissolved forms, apart from mercury which was tested for the dissolved analyte only. Typically, groundwater samples are only

analyzed for dissolved metals, as it is considered more appropriate for groundwater samples and is more representative of metals chemistry in the aquifer. This is because suspended solids are not transported through aquifer materials. However, as PWQO criteria utilizes total metals, this parameter is used for comparison. The applicable PWQO criteria is provided in **Table 7-5**.

Table 7-5. Applicable PWQO Criteria

Parameter	Units	PWQO Criteria
pH	-	6.5-8
Alkalinity, Total (as $CaCO_3$)	mg/L	Should not decrease by > 25% background concentration
Aluminum (Al)-Total	mg/L	pH 4.5-5.5: 0.015 pH 5.5-6.5: should not exceed 10% above background conditions pH 6.5-9: 0.075
Ammonia, Total (as N)	mg/L	0.02
Antimony (Sb)-Total	mg/L	0.02
Arsenic (As)-Total	mg/L	0.005
Beryllium (Be)-Total	mg/L	Hardness < 75: 0.011 Hardness > 75: 1.1
Boron (B)-Total	mg/L	0.2
Cadmium (Cd)-Total	mg/L	Hardness 0-100: 0.0001 Hardness > 100: 0.0005
Chromium (Cr)-Total	mg/L	CrVI: 0.001 CrIII: 0.0089
Cobalt (Co)-Total	mg/L	0.0009
Copper (Cu)-Total	mg/L	Hardness 0-20: 0.001 Hardness > 20: 0.005
Iron (Fe)-Total	mg/L	0.3
Lead (Pb)-Total	mg/L	Alkalinity < 30: 0.001 Alkalinity 30-80: 0.03 Alkalinity > 80: 0.005
Mercury (Hg)-Total	mg/L	0.0002
Molybdenum (Mo)-Total	mg/L	0.04
Nickel (Ni)-Total	mg/L	0.025
Phosphorus (P)-Total	mg/L	0.02 during ice free period, however can range from 0.01-0.03 depending on natural phosphorus level
Selenium (Se)-Total	mg/L	0.1
Silver (Ag)-Total	mg/L	0.0001
Thallium (Tl)-Total	mg/L	0.0003
Tungsten (W)-Total	mg/L	0.03
Uranium (U)-Total	mg/L	0.005
Vanadium (V)-Total	mg/L	0.006
Zinc (Zn)-Total	mg/L	0.02
Zirconium (Zr)-Total	mg/L	0.004

The water quality results compared with PWQO are provided in **Appendix K**, and noted exceedances are identified in **Table 7-6** below:

Table 7-6. Water Quality Exceedances of PWQO

	MW-2		MW-3d		MW-4		MW-5s		MW-5d		MW-6		MW-7s		MW-7d	
	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018
Ammonia	●	●		●						●			●	●	●	●
Aluminum	●			●			●		●	●	●		●	●	●	●
Cadmium													●			
Chromium							●		●						●	●
Copper	●								●	●	●	●			●	●
Iron	●		●				●		●		●		●		●	●
Nickel											●		●			
Phosphorous													●			
Tungsten													●			
Vanadium	●															
Zinc	●		●						●		●			●	●	●

7.2.3 Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life

This policy was released by the Canadian Council of Ministers of the Environment (CCME) in 1987, for the protection of freshwater life, agricultural water uses for irrigation and livestock, raw water drinking water supply, recreational water quality and aesthetics, and industrial water supplies. This policy was developed to provide a science-based benchmark for a nationally consistent level of protection for aquatic life in Canada. Guidelines are provided for short term (less than 24 hours) and long term (greater than 24 hours) parameters. The long-term and short-term parameters are provided in **Table 7-7**.

Table 7-7. Applicable CWQG-PAL Criteria

Parameter	Units	CWQG-PAL Criteria	
		Short Term (< 24 hrs)	Long Term (> 24 hours)
pH	-	6.5-9	6.5-9
Ammonia, Total (as N)	mg/L	-	[1]*refer to table*
Chloride (Cl)	mg/L	640	120
Nitrate (as N)	mg/L	550	13
Nitrite (as N)	mg/L	-	0.197
Aluminum (Al)-Total	mg/L	-	0.005-0.1
Arsenic (As)-Total	mg/L	-	0.005
Boron (B)-Total	mg/L	29	1.5
Cadmium (Cd)-Total	mg/L	$\frac{10^{(1.016\times(\log(H))-1.71)}}{1000}$	$\frac{10^{(0.83\times(\log(H))-2.46)}}{1000}$
Chromium (Cr)-Total	mg/L	-	0.0089

Parameter	Units	CWQG-PAL Criteria	
		Short Term (< 24 hrs)	Long Term (> 24 hours)
Copper (Cu)-Total	mg/L	-	$\frac{0.2 \times e^{(0.8545\times(\ln(H))-1.465)}}{1000}$
Iron (Fe)-Total	mg/L	-	0.3
Lead (Pb)-Total	mg/L	-	$\frac{e^{(1.273\times(\ln(H))-4.705)}}{1000}$
Mercury (Hg)-Total	mg/L	-	0.000026
Molybdenum (Mo)-Total	mg/L	-	0.073
Nickel (Ni)-Total	mg/L	-	$\frac{e^{(0.76\times(\ln(H))+1.06)}}{1000}$
Selenium (Se)-Total	mg/L	-	0.001
Silver (Ag)-Total	mg/L	-	0.0001
Thallium (Tl)-Total	mg/L	-	0.0008
Uranium (U)-Total	mg/L	33	0.015
Vanadium (V)-Total	mg/L	-	0.03

[1] *Ammonia Reference Table*

Ammonia Criteria (mg/L)	pH								
Temperature (°C)									
0	231.0	73.0	23.1	7.32	2.33	0.749	0.25	0.042
5	153.0	48.3	15.3	4.84	1.54	0.502	0.172	0.034
10	102.0	32.4	10.3	3.26	1.04	0.343	0.121	0.029
15	69.7	22.0	6.98	2.22	0.715	0.239	0.089	0.026
20	48.0	15.2	4.82	1.54	0.499	0.171	0.067	0.024
25	33.5	10.6	3.37	1.08	0.354	0.125	0.053	0.022
30	23.7	7.50	2.39	0.767	0.256	0.094	0.043	0.021

The water quality results compared with CWQG-PAL short and long-term criteria are provided in **Appendix L**. No exceedances were noted in groundwater samples compared with CWQG-PAL short-term criteria. The exceedances of the CWQG-PAL long term criteria are indicated in **Table 7-8** below:

Table 7-8. Water Quality Exceedances of CWQG-PAL Long-Term Criteria

	MW-2		MW-3d		MW-4		MW-5s		MW-5d		MW-6		MW-7s		MW-7d	
	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018	Oct-2017	May-2018
Aluminum	●			●			●		●		●		●	●	●	●
Cadmium	●												●			
Chromium													●			
Copper	●	●			●	●			●	●			●	●	●	●
Iron	●		●				●		●		●		●		●	●

7.3 Quality Assurance and Quality Control

The quality assurance/quality control (QA/QC) analysis encompasses both field and laboratory activities for the groundwater samples collected in October 2017 and May 2018. The data quality objective (DQO) for the Project is such that the analytical data is reproducible and of an acceptable quality to allow for comparison with applicable guidelines and standards. DQOs allow for an assessment to determine if the data reported is precise, accurate, representative, and complete. The protocols followed for the groundwater quality sampling for this stage of the Project is described in **Section 3.8**. A review of all parameters which have been flagged or rejected is provided in **Appendix K**.

Sample Holding Times: Due to the remote location of the Ambershaw Project site and limited access to a courier service, the recommended sample holding time of 96 hours was exceeded. For this reason, values for pH and conductivity measured and reported by ALS Environmental have been flagged.

pH: No samples returned a pH value greater than 10. Values greater than 10 indicate possible grout contamination and the water quality results should be rejected.

Turbidity: No samples were collected when the in-situ turbidity was greater than 50 NTU. High turbidity (>50 NTU) could indicate a disturbance to the aquifer, such that water quality results are not representative of natural conditions.

Duplicate Samples: A duplicate sample was collected in October 2017 from MW-7d. Based on the results of the relative percent difference (RPD) between the samples, half of the tested parameters exceeded the 20% RPD criteria. This is due to the decreased TSS in the duplicate sample, which was measured at 26 mg/L compared with 122 mg/L in the original sample. Based on these results, it is likely that the recharge of the bedrock aquifer was slower than the lowest pumping rate setting of the Geotech Geopump™ Series II Peristaltic Pump, causing increased turbulence overtime during sampling.

8 HYDROGEOLOGICAL CONCEPTUAL MODEL

A conceptual hydrostratigraphic cross section through the proposed bulk sample location was completed showing the location of the groundwater table, perched wetlands, and the interpreted direction of groundwater flow through the Project Development Area (**Figure 8-1**). Generally, it is expected that groundwater will enter the system through precipitation and snow melt events which infiltrate within areas of exposed fractured bedrock and high permeability overburden. It is expected that these fractures will fill quickly following these events, as groundwater monitoring results indicated quick responses following precipitation in wells screened within bedrock (**Figure 6-1**). Groundwater entering the system through lateral flow is expected to originate from topographical highs, and flow towards low-lying regions.

The components of groundwater outflow include discharge and evapotranspiration (ET). Total ET is defined as the combination of transpiration processes by plants, and evaporation from bare soils and free water surfaces. Groundwater ET is therefore the component of ET that is derived from groundwater, and generally occurs in areas where the water table is shallow, and is expected to be the primary source of groundwater outflow. The amount of groundwater ET is dependent on the type of vegetation, vegetation density, groundwater levels, soil characteristics, and micro climate (Masbruch et al., 2011).

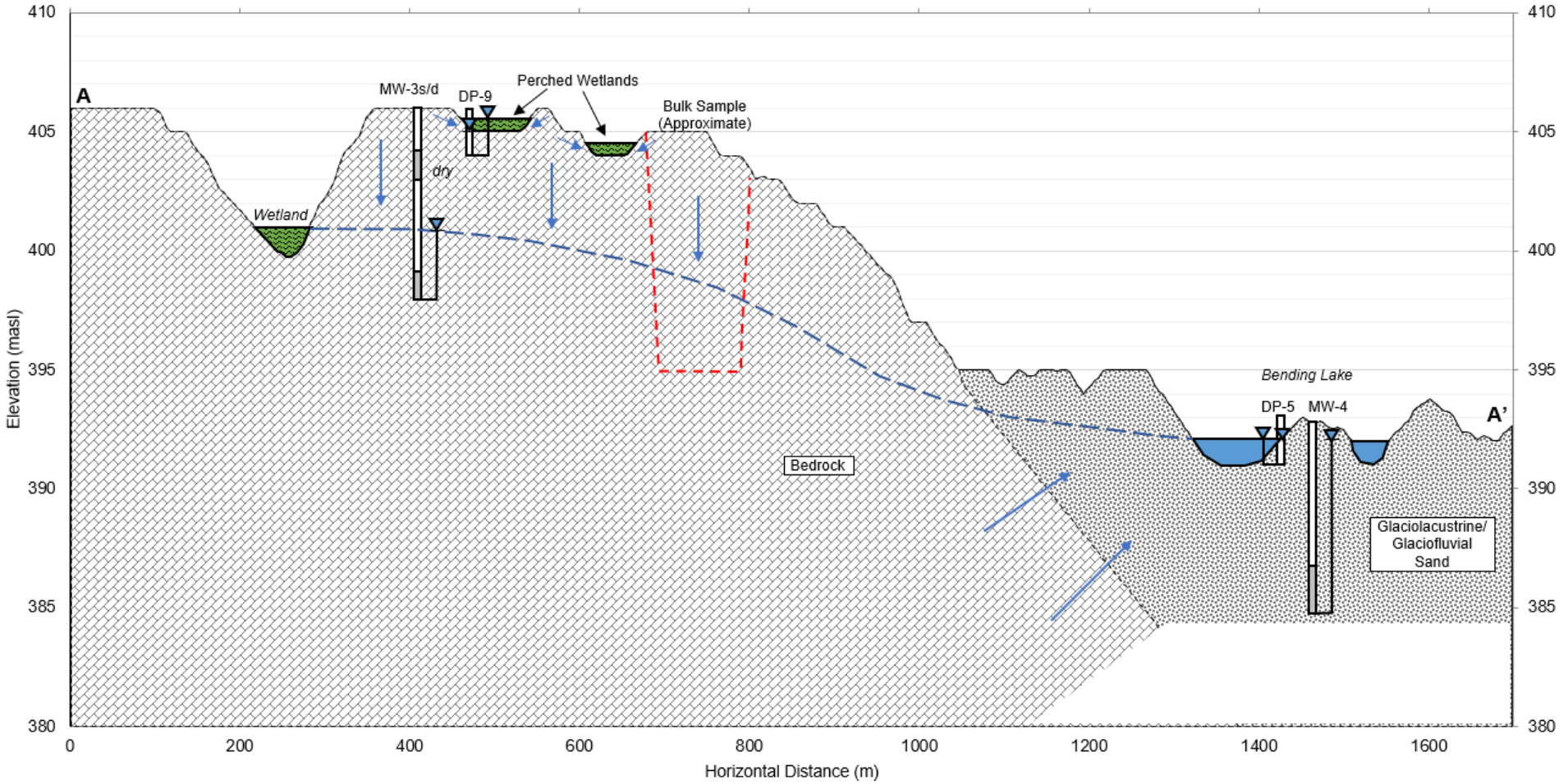

Figure 8-1. Conceptual Hydrostratigraphic Cross Section Through Proposed Bulk Sample Pit (A-A')

Lateral groundwater outflows across the study boundary is expected to be minimal, but should be taken into account. As groundwater flows from regions of high to low hydraulic head, it is expected that lateral groundwater will follow topography, and flow through the fractured bedrock towards the highly permeable glaciolacustrine and glaciofluvial sands (geometric mean k = 1.6×10^{-5} m/sec, calculated in **Section 6.3**), and will eventually discharge to low-lying areas such as Bending Lake, wetlands, and the watercourse north of the pit area (**Figure 1-3**). Perched water tables are expected to be present overlying areas of competent bedrock which have the capacity to support small wetland systems. The water table ranges by almost 20 m from along the access road near MW-2 through the proposed pit location to Bending Lake near MW-4, and there is a strong horizontal gradient of about 0.03 m/m to the east near MW-4 at Bending Lake.

8.1 Pit Dewatering

Dewatering rate estimates (Q) for the proposed open pit were calculated using the following equation from Powers et al., 2007, and Sichart and Kryieleis (1930):

$$Q = \frac{xK(H^2 - h^2)}{2\mathrm{L}} \times n \qquad m^3/s$$

Where K = hydraulic conductivity (m/sec) – geomean at MW-3d (5.1×10^{-6} m/sec)
H = saturated thickness before dewatering (m)
h = saturated thickness after dewatering (m)
L = line source distance (m), where L = 0.5R
x = pit length (m)
n = number of sides (equal = 4)

The radius of influence (R) from dewatering was calculated using the Sichardt equation:

$$R = R_0 + R_e \qquad m$$

Where R_0 = radius of influence, estimated by:
$R_0 = 3000 * (H\text{-}h) * \sqrt{K}$ (m)
r_e = equivalent radius of influence, estimated by:

$$r_e = \sqrt{\frac{a * x}{\pi}} \text{ (m)}$$

Dewatering rates for the pit were calculated using the proposed pit dimensions (71 m by 104 m and 10 m depth). Based on the results of borehole drilling within the Project Development Area, it is expected that dewatering of the pit will occur within the shallow weathered bedrock aquifer, estimated to be approximately 15 m thick across this site. The nearest borehole to the pit excavation (MW-3d) was utilized to estimate aquifer thickness, hydraulic conductivity, and water level elevation for the calculations.

The highest measured groundwater elevation at MW-3d between the 2017 and 2018 site visits, plus 1 m was used to conservatively account for seasonal fluctuations in the water table. Calculations also assume the lowering of the water table to 1 m below the base of the excavation. The geometric mean hydraulic conductivity value from the testing completed at MW-3d was used to conservatively estimate Q (k = 5.10×10^{-6} m/sec).

Based on these preliminary calculations, it is expected that dewatering for the open pit will require approximately 409,635 L/day (**Table 8-1**). However, there is a potential that perched water table conditions may exist within the more permeable overburden materials which could add an additional 25,000 L/day to an excavation. With this contingency, contractors should be prepared for dewatering rates of up to 434,635 L/day (5.03 L/sec).

Table 8-1. Dewatering Calculations

Hydraulic Conductivity (90^{th}) (m/sec)	Saturated Thickness before dewatering (m) (+1 m)	Saturated Thickness after dewatering (m) (-1 m)	Radius of Influence (R_o) (m)	Inflow Rate (Q) (L/day)	Contingency (L/day)	Total Q	
						(L/day)	(L/sec)
$5.10x10^{-6}$	11.14	4.00	48.4	409,635	25,000	434,635	5.03

It is not expected that dewatering for the Project will negatively impact groundwater users or nearby natural features, as the calculated radius of influence for dewatering is 48 m, and does not intercept any known groundwater users, or groundwater supported wetlands, watercourses, or waterbodies. Perched wetlands are not expected to be impacted as they are not hydraulically connected to the water table, and the nearest surface water feature to the excavation is 200 m to the northeast.

It is recommended that dewatering discharge is directed towards a nearby surface water feature following the removal of suspended sediment. Discharge water quality should not exceed the background water quality of the feature based on PWQO standards for discharge. Monitoring of discharge water quality should occur prior to discharge, and at regular intervals during mining works.

It is expected that these calculations should provide a reasonable estimate of the dewatering rates for the proposed pit, based on the results of the baseline hydrogeological study. However as subsurface geology is highly variable, these results will need to be updated with data specific to the hydrogeological conditions of the proposed pit as it becomes available following future phases.

9 RECOMMENDATIONS AND PROPOSED MONITORING AND MITIGATION PROGRAM

Based on the results of the baseline hydrogeological study, no adverse impacts to groundwater or groundwater supported ecosystems are anticipated from the proposed Bending Lake Advanced Exploration Project. The dewatering assessment shows that the radius of water table influence will be 48 m, which will not reach any groundwater supported natural features and only extend below perched wetlands. Through mitigation measures such as settling basins and mobile water treatment, discharge water quality from the open pit is expected to meet guideline criteria.

A Permit To Take Water (PTTW) from the MECP will be required for pit dewatering. As part of this PTTW, it is recommended that the hydrogeological monitoring program is expanded and additional monitoring wells are installed both upgradient and downgradient of the bulk sample location, as well as near the creek north of the project. These wells should extend to a depth that is greater than the proposed

elevation depth of the pit. This allows for effective groundwater level and quality monitoring before, during and following the bulk sample pit construction and operation.

At least one (1) monitoring well should be screened within the mineralized zone of the iron ore formation to characterize the groundwater quality directly within the deposit. This will allow for impactful baseline and mitigation monitoring of groundwater levels and groundwater quality as they are related to the mineralized zone.

It is apparent that groundwater level, groundwater flow and groundwater chemistry changes seasonally. To continue to establish long-term baseline conditions to support future permitting and approvals, it is recommended that at least quarterly monitoring of water quality and groundwater and surface water levels are completed for a period of 1-year at the monitoring wells and drive-point piezometers near the Project Development Area. The new monitoring wells installed as part of the PTTW can be added to this program for additional long-term monitoring.

10 CERTIFICATION

This report was prepared, reviewed and approved by the undersigned:

Prepared By:

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Principal, Senior Hydrogeologist

Approved By:

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Appendix A

BOREHOLE LOGS (PECG, 2017)

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF OVERBURDEN MW-1

PROJECT: Ambershaw

CLIENT: Ambershaw

Method: HQ Coring

PROJECT LOCATION: Ignace, Ontario

Diameter: 0.0635 m

REF. NO.: 17018

DATUM: Geodetic

Date: Aug-10-2017 to Aug-11-2017

ENCL NO.: 1

BH LOCATION: See Borehole Location Plan (UTM 15U) N 5463242.7 E 559815.7

SOIL PROFILE

(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT
416.0	Ground Surface	
0.0	**FINE SAND AND SILT:** gravel and cobbles common, brown, dry Note: Finer grained soils not recovered between 1.52 mbgs and 5.79 mbgs due to coring method	
408.7 7.3	**SAND:** fine and medium grained, gravel, and cobbles, brown to grey, dry to moist	
403.8 12.2	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**	
402.3 13.7	**END OF BOREHOLE** 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Water was at 10.5 mBGS upon completion of drilling.	

SAMPLES

NUMBER	TYPE	"N" BLOWS/0.3 m
1	SS	
2	SS	
3	RUN	
4	RUN	
5	RUN	
6	SS	
7	SS	
8	SS	
9	SS	
10	SS	
11	SS	
12	SS	
13	SS	
14	RUN	
15	SS	
16	SS	
17	RUN	

GROUND WATER LEVEL | ELEVATION | GROUND WATER LEVEL

ELEVATION: 415, 414, 413, 412, 410, 409, 408, 407, 406, 405, 404, 403

Well construction: Holeplug; Screen; Sand

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH (kPa): ○ UNCONFINED + FIELD VANE & Sensitivity; ● QUICK TRIAXIAL × LAB VANE: 20 40 60 80 100

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L

WATER CONTENT (%): 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m^3)

REMARKS AND GRAIN SIZE DISTRIBUTION (%): GR SA SI CL

SOIL-ROCK-AUG 14-2018_PM.GLB PALMER SOIL 2 SEPARATE WELLS 1DIG 2018 AMBERSHAW SOIL FINAL - COPY.GPJ 18-12-14

GROUNDWATER ELEVATIONS

Shallow/ Single Installation 1st 2nd; Deep/Dual Installation 1st 2nd

GRAPH NOTES: $+^3, \times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF ROCK CORE MW-1

PROJECT: Ambershaw
CLIENT: Ambershaw
LOCATION: Ignace, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan (UTM 15U) N 5463242.7 E 559815.7

Method: HQ Coring
Diameter: 0.0635 m
Date: Aug-10-2017 to Aug-11-2017

REF. NO.: 17018
ENCL NO.: 2

(m) ELEV / DEPTH	ROCK DESCRIPTION	GROUND WATER CONDITIONS	CORE SAMPLE		CORE RECOVERY/ TOTAL RECOVERY	TOTAL CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3 m)	DISCONTINUITIES	Weathering Index	HYDRAULIC CONDUCTIVITY (cm/sec)	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cm^3) E (GPa)
			NUMBER	SIZE												
403.8	Rock Surface															
12.2 – 402.3 / 13.7	**BEDROCK:** Argillite		17	HQ	1.04/ 1.52	68		68%	2							
13.7	**END OF ROCK CORE**															

SOIL-ROCK-AUG 14-2018_PM.GLB
PALMER ROCK - 2018 2WELL 1DIG AMBERSHAW ROCK FINAL.GPJ 18-12-14

Weathering Index: W1-Fresh, W2-Slightly weathered, W3-Moderately weathered, W4-Highly weathered, W5-Completely weathered θ = angle to the core axis

E = Modulus of Elasticity
*: UCS [Mpa] ≈ 24 $I_{S(50)}$

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF OVERBURDEN MW-2

PROJECT: Ambershaw

CLIENT: Ambershaw

PROJECT LOCATION: Ignace, Ontario

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan (UTM 15U) N 5464380.4 E 558419.5

Method: HQ Coring

Diameter: 0.0635 m

Date: Aug-12-2017 to Aug-12-2017

REF. NO.: 17018

ENCL NO.: 3

ELEV (m) / DEPTH	DESCRIPTION	SAMPLE NUMBER	TYPE	"N" BLOWS/0.3 m	ELEVATION / MONITORING WELL
430.0	Ground Surface				
0.0	**FINE SAND AND SILT:** some clay, some gravel, contains cobbles, brown, dry	1	SS		
428.9		2	SS		429
1.1	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**	3	RUN		
		4	RUN		428; Holeplug; 427
		5	RUN		426
		6	RUN		425; 424; Sand; Screen
		7	RUN		423
422.1 / 7.9	**END OF BOREHOLE** 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Water was at 1.5 mBGS upon completion of drilling.				

Other columns (no data recorded): STRATA PLOT; GROUND WATER LEVEL; DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); SHEAR STRENGTH (kPa) — O UNCONFINED, + FIELD VANE & Sensitivity, ● QUICK TRIAXIAL, × LAB VANE (20 40 60 80 100); PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L; WATER CONTENT (%) (10 20 30); POCKET PEN. (Cu) (kPa); NATURAL UNIT WT (kN/m^3); REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL.

GROUNDWATER ELEVATIONS

Shallow/ Single Installation 1st ▽ 2nd ▼ Deep/Dual Installation 1st ▽ 2nd ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; O ^{8}=3% Strain at Failure

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF ROCK CORE MW-2

PROJECT: Ambershaw

CLIENT: Ambershaw | Method: HQ Coring | REF. NO.: 17018

LOCATION: Ignace, Ontario | Diameter: 0.0635 m | ENCL NO.: 4

DATUM: Geodetic | Date: Aug-12-2017 to Aug-12-2017

BH LOCATION: See Borehole Location Plan (UTM 15U) N 5464380.4 E 558419.5

(m) ELEV / DEPTH	ROCK DESCRIPTION	GROUND WATER CONDITIONS	CORE SAMPLE NUMBER	CORE SAMPLE SIZE	CORE RECOVERY/ TOTAL RECOVERY	TOTAL CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3 m)	DISCONTINUITIES	Weathering Index	HYDRAULIC CONDUCTIVITY (cm/sec)	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cm³) E (GPa)
428.9	Rock Surface															
1.1	**BEDROCK:** argillite, vertical fractures common		3	HQ	0.75/ 0.79	95		63	8							
428.1 / 1.9			4	HQ	1.47/ 1.52	97		76	8							
426.5 / 3.5			5	HQ	1.52/ 1.52	100		95	5							
425.0 / 5.0			6	HQ	1.42/ 1.42	100		89	4							
423.6 / 6.4			7	HQ	1.52/ 1.52	100		93	14							
422.1 / 7.9	**END OF ROCK CORE**															

SOIL-ROCK-AUG 14-2018 PM.GLB PALMER ROCK - 2018 2WELL_TDG AMBERSHAW ROCK FINAL.GPJ 18-12-14

Weathering Index: W1-Fresh, W2-Slightly weathered, W3-Moderately weathered, W4-Highly weathered, W5-Completely weathered   θ = angle to the core axis

E = Modulus of Elasticity
*: UCS [Mpa] ≈ 24 $I_{S(50)}$

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF OVERBURDEN MW-3 s/d

PROJECT: Ambershaw

CLIENT: Ambershaw

PROJECT LOCATION: Ignace, Ontario

DATUM: Geodetic

BH LOCATION: See Borehole Location Plan (UTM 15U) N 5464090.5 E 559422.7

Method: HQ Coring

Diameter: 0.0635 m

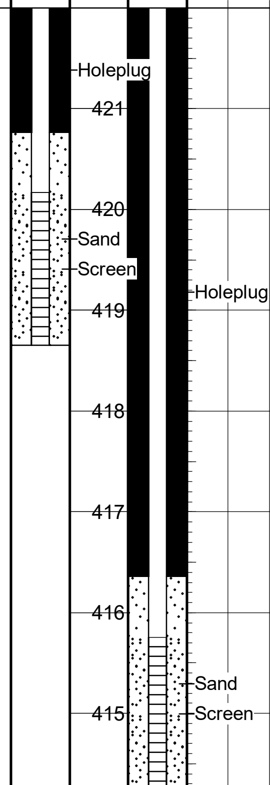
Date: Aug-11-2017 to Aug-12-2017

REF. NO.: 17018

ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	SAMPLE NUMBER	TYPE	"N" BLOWS / 0.3 m
422.0	Ground Surface			
0.0	**FINE SAND AND SILT:** some clay, some gravel, contains cobbles, brown, dry	1	SS	
		2	SS	
420.2 / 1.8	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**	3	SS	
414.2 / 7.8	**END OF BOREHOLE** 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Water was dry in the shallow well and at 4.5 mBGS upon completion in the deep well.			

Column headings: SOIL PROFILE; STRATA PLOT; SAMPLES; GROUND WATER LEVEL; ELEVATION; GROUND WATER LEVEL; DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); SHEAR STRENGTH (kPa): ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE (20 40 60 80 100); PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L; WATER CONTENT (%) (10 20 30); POCKET PEN. (Cu) (kPa); NATURAL UNIT WT (kN/m^3); REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL



GROUNDWATER ELEVATIONS

Shallow/ Single Installation 1st 2nd   Deep/Dual Installation 1st 2nd

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity   ○ ε=3% Strain at Failure

LOG OF ROCK CORE MW-3 s/d

PROJECT: Ambershaw
CLIENT: Ambershaw — Method: HQ Coring — REF. NO.: 17018
LOCATION: Ignace, Ontario — Diameter: 0.0635 m — ENCL NO.: 6
DATUM: Geodetic — Date: Aug-11-2017 to Aug-12-2017
BH LOCATION: See Borehole Location Plan (UTM 15U) N 5464090.5 E 559422.7

(m) ELEV DEPTH	ROCK DESCRIPTION	GROUND WATER CONDITIONS	CORE SAMPLE NUMBER	CORE SAMPLE SIZE	CORE RECOVERY/ TOTAL RECOVERY	TOTAL CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3 m)	DISCONTINUITIES	Weathering Index	HYDRAULIC CONDUCTIVITY (cm/sec)	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cm^3) E (GPa)
420.2	Rock Surface															
1.8	**BEDROCK:**Argillite		4	HQ	1.47/ 1.52	97		96	3	weathered rock at 2.3 mbgs (0.10 m thick); weathered rock at 3.0 mbgs (0.10 m thick)						
418.7 / 3.4			5	HQ	1.42/ 1.52	93		86	3	weathered rock at 3.53 mbgs (0.10 m thick)						
417.1 / 4.9			6	HQ	1.52/ 1.52	100		95	9	weathered rock at 6.05 mbgs (0.10 m thick)						
415.6 / 6.4			7	HQ	1.52/ 1.52	100		30	24							
414.2 / 7.8	**END OF ROCK CORE**															

Weathering Index: W1-Fresh, W2-Slightly weathered, W3-Moderately weathered, W4-Highly weathered, W5-Completely weathered θ = angle to the core axis

E = Modulus of Elasticity
*: UCS [Mpa] ≈ 24 $I_{S(50)}$

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF OVERBURDEN MW4

PROJECT: Ambershaw
CLIENT: Ambershaw
PROJECT LOCATION: Ignace, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan (UTM 15U) N 5463313.8 E 560124.3

Method: HQ Coring
Diameter: 0.0635 m
Date: Aug-13-2017 to Aug-13-2017

REF. NO.: 17018
ENCL NO.: 7

(m) ELEV DEPTH	SOIL PROFILE – DESCRIPTION	SAMPLE NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER LEVEL / WELL	ELEVATION
401.0	Ground Surface					
0.0	**SAND:** fine to medium grained, some silt, some gravel, contains cobbles, brown	1	SS			
		2	SS			400
	wet	3	SS		Holeplug	399
398.6 / 2.4	**CLAY:** cohesive, some silt, grey, wet	4	SS			
398.1 / 2.9	**SAND:** fine to medium grained, some silt, some gravel, contains cobbles, brown, moist; very fine sand lense at 3.45 mBGS - 3.59 mBGS, well sorted, brown, moist	5	SS			398
396.9 / 4.1	**SAND:** coarse grained, some gravel, contains cobbles, contains fine sand and silt matrix, brown/grey, wet					397
		6	SS		Sand	396
					Screen	395
		7	SS			
		8	Run			394
		9	SS			393
392.8 / 8.2	**END OF BOREHOLE** 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Water was at 4.1 mBGS upon completion of drilling.					

Other columns (no data recorded): GROUND WATER LEVEL; DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); SHEAR STRENGTH (kPa) – ○ UNCONFINED, + FIELD VANE & Sensitivity, ● QUICK TRIAXIAL, × LAB VANE (20 40 60 80 100); PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L – WATER CONTENT (%) (10 20 30); POCKET PEN. (Cu) (kPa); NATURAL UNIT WT (kN/m^3); REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

GROUNDWATER ELEVATIONS
Shallow/ Single Installation 1st ▽ 2nd ▼ Deep/Dual Installation 1st ▽ 2nd ▼

SOIL-ROCK-AUG 14-2018_PM.GLB PALMER SOIL 2 SEPARATE WELLS 1DIG 2018 AMBERSHAW SOIL FINAL - COPY.GPJ 18-12-14

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF OVERBURDEN MW-5 s/d

PROJECT: Ambershaw

CLIENT: Ambershaw | Method: HQ Coring

PROJECT LOCATION: Ignace, Ontario | Diameter: 0.0635 m | REF. NO.: 17018

DATUM: Geodetic | Date: Aug-13-2017 to Aug-14-2017 | ENCL NO.: 8

BH LOCATION: See Borehole Location Plan (UTM 15U) N 5463565.6 E 556511

(m) ELEV DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER LEVEL	ELEVATION	GROUND WATER LEVEL	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100; SHEAR STRENGTH (kPa) ○ UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L; WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m^3)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
429.0	Ground Surface												
428.9 0.1	**ORGANICS**												
	SILT AND CLAY: some gravel, brown, dry		1	SS		Holeplug							
			2	RUN			428						
427.0 2.0			3	SS			427						
	ROCK CORING STARTS, REFER TO ROCK CORE LOG					Sand							
						Screen	426	Holeplug					
							425						
							424						
							423						
							422						
							421	Sand					
419.7 9.4							420	Screen					
	END OF BOREHOLE 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Water was at 1.0 mbgs in the shallow well and at 1.3 mBGS upon completion in the deep well.												

SOIL-ROCK-AUG 14-2018_PM.GLB PALMER SOIL 2 SEPARATE WELLS 10GD 2018 AMBERSHAW SOIL FINAL - COPY.GPJ 18-12-14

GROUNDWATER ELEVATIONS

Shallow/ Single Installation 1st ▽ 2nd ▼ Deep/Dual Installation 1st ▼ 2nd ▽

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF ROCK CORE MW-5 s/d

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

PROJECT: Ambershaw
CLIENT: Ambershaw — Method: HQ Coring — REF. NO.: 17018
LOCATION: Ignace, Ontario — Diameter: 0.0635 m — ENCL NO.: 9
DATUM: Geodetic — Date: Aug-13-2017 to Aug-14-2017
BH LOCATION: See Borehole Location Plan (UTM 15U) N 5463565.6 E 556511

(m) ELEV / DEPTH	ROCK DESCRIPTION	GROUND WATER CONDITIONS	CORE SAMPLE NUMBER	CORE SAMPLE SIZE	CORE RECOVERY/ TOTAL RECOVERY	TOTAL CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3 m)	DISCONTINUITIES	Weathering Index	HYDRAULIC CONDUCTIVITY (cm/sec)	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cm^3) E (GPa)
427.0	Rock Surface															
2.0	**BEDROCK:**Argillite		4	HQ	0.73/ 0.91	80		100								
2.3			5	HQ	0.91/ 0.91	100		85	3 6							
425.8 / 3.3			6	HQ	1.52/ 1.52	100		96	7							
424.2 / 4.8			7	HQ	1.52/ 1.52	100		95	5	vertical fracture at 5.36 mbgs iron staining in joint at 5.82 mbgs						
422.7 / 6.3			8	HQ	1.45/ 1.45	100		96	4							
421.3 / 7.7																
420.9 / 8.1	**BEDROCK:**Mafic to felsic metavolcanic tuffs		9	HQ	1.61/ 1.61	100		91	8	vertical fracture at 8.86 mbgs						
419.7 / 9.4	**END OF ROCK CORE**															

SOIL-ROCK-AUG 14-2018_PM.GLB PALMER ROCK - 2018 2WELL (DG) AMBERSHAW ROCK FINAL.GPJ 18-12-14

Weathering Index: W1-Fresh, W2-Slightly weathered, W3-Moderately weathered, W4-Highly weathered, W5-Completely weathered
θ = angle to the core axis

E = Modulus of Elasticity
*: UCS [Mpa] ≈ 24 $I_{S(50)}$

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF OVERBURDEN MW-6

PROJECT: Ambershaw
CLIENT: Ambershaw
PROJECT LOCATION: Ignace, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan (UTM 15U) N 5463532.6 E 555449.5

Method: HQ Coring
Diameter: 0.0635 m
Date: Aug-14-2017 to Aug-15-2017

REF. NO.: 17018
ENCL NO.: 10

(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	"N" BLOWS / 0.3 m	GROUND WATER LEVEL	ELEVATION	GROUND WATER LEVEL	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100; SHEAR STRENGTH (kPa) O UNCONFINED + FIELD VANE & Sensitivity ● QUICK TRIAXIAL × LAB VANE	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L; WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
455.0	Ground Surface												
0.0 / 454.5	**FINE SAND AND SILT:** some gravel, contains cobbles, brown, dry		1	SS									
0.5	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**						454						
							453						
							452						
							451						
						Holeplug							
							450						
							449						
							448						
							447						
							446						
						Sand							
						Screen	445						
444.1 / 10.9	**END OF BOREHOLE** 1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole. 2. Water was at 4.0 mbgs upon completion in the deep well.												

Depth scale (m): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

GROUNDWATER ELEVATIONS
Shallow/ Single Installation 1st ▽ 2nd ▼ Deep/Dual Installation 1st ▽ 2nd ▼

GRAPH NOTES: + ³, × ³ : Numbers refer to Sensitivity; O ε=3% Strain at Failure

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF ROCK CORE MW-6

PROJECT: Ambershaw

CLIENT: Ambershaw | Method: HQ Coring | REF. NO.: 17018

LOCATION: Ignace, Ontario | Diameter: 0.0635 m | ENCL NO.: 11

DATUM: Geodetic | Date: Aug-14-2017 to Aug-15-2017

BH LOCATION: See Borehole Location Plan (UTM 15U) N 5463532.6 E 555449.5

(m) ELEV DEPTH	ROCK DESCRIPTION	GROUND WATER CONDITIONS	CORE SAMPLE NUMBER	CORE SAMPLE SIZE	CORE RECOVERY/ TOTAL RECOVERY	TOTAL CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3 m)	DISCONTINUITIES	Weathering Index	HYDRAULIC CONDUCTIVITY (cm/sec)	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cm³) E (GPa)
454.5	Rock Surface															
0.5	**BEDROCK:** Argillite		2	HQ	1.35/ 1.35	100		100	2	vertical fracture from 0.83 mbgs to 1.23 mbgs						
453.2 / 1.8			3	HQ	1.52/ 1.52	100		95	3	ertical fracture from 2.62 mbgs to 2.87 mbgs						
451.7 / 3.3			4	HQ	1.46/ 1.47	99		93	6	vertical fracture from 4.19 mbgs to 4.44 mbgs						
450.2 / 4.8			5	HQ	1.57/ 1.57	100		100	1							
448.6 / 6.4			6	HQ	1.45/ 1.45	100		100	0							
447.2 / 7.8			7	HQ	1.60/ 1.60	100		100	0							
445.6 / 9.4			8	HQ	1.35/ 1.45	93		89	25	rubble zone from 9.93 mbgs to 9.97 mbgs rubble zone from 10.13 mbgs to 10.17 mbgs						
444.1 / 10.9	**END OF ROCK CORE**															

SOIL-ROCK-AUG 14-2018_PM.GLB
PALMER ROCK - 2018 2WELL 1DIG AMBERSHAW ROCK FINAL.GPJ 18-12-14

Weathering Index: W1-Fresh, W2-Slightly weathered, W3-Moderately weathered, W4-Highly weathered, W5-Completely weathe θ = angle to the core axis

E = Modulus of Elasticity
*: UCS [Mpa] ≈ 24 $I_{S(50)}$

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF OVERBURDEN MW-7 s/d

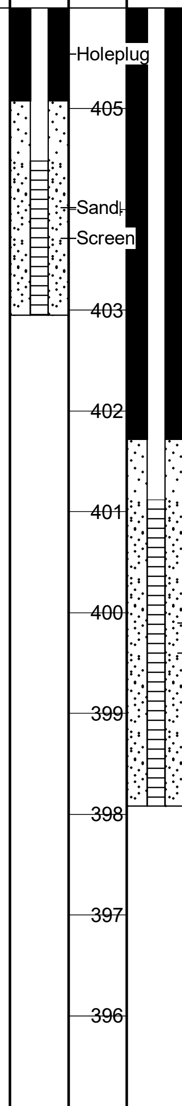
PROJECT: Ambershaw
CLIENT: Ambershaw
PROJECT LOCATION: Ignace, Ontario
DATUM: Geodetic
BH LOCATION: See Borehole Location Plan (UTM 15U) N 5460183 E 552488

Method: HQ Coring
Diameter: 0.0635 m
Date: Aug-15-2017 to Aug-15-2017

REF. NO.: 17018
ENCL NO.: 12

(m) ELEV DEPTH	SOIL PROFILE – DESCRIPTION	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m
406.0	Ground Surface			
0.0	**SAND AND SILT:** some gravel, contains cobbles, brown, dry	1	SS	
405.6 / 0.4	**ROCK CORING STARTS, REFER TO ROCK CORE LOG**			
395.1 / 11.0	**END OF BOREHOLE**			

1. Upon completion of drilling, a 50mm diameter monitoring well was installed in the borehole.
2. Water was at 2.0 mbgs in the shallow well and at 2.1 mBGS upon completion in the deep well.



Column headings: DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); SHEAR STRENGTH (kPa): O UNCONFINED, + FIELD VANE & Sensitivity, ● QUICK TRIAXIAL, × LAB VANE (20 40 60 80 100); PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT W_L; WATER CONTENT (%) (10 20 30); POCKET PEN. (Cu) (kPa); NATURAL UNIT WT (kN/m^3); REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

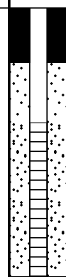
GROUNDWATER ELEVATIONS
Shallow/ Single Installation 1st 2nd Deep/Dual Installation 1st 2nd

GRAPH NOTES: $+^3, \times^3$: Numbers refer to Sensitivity; O ε=3% Strain at Failure

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

LOG OF ROCK CORE MW-7 s/d

PROJECT: Ambershaw
CLIENT: Ambershaw | Method: HQ Coring | REF. NO.: 17018
LOCATION: Ignace, Ontario | Diameter: 0.0635 m | ENCL NO.: 13
DATUM: Geodetic | Date: Aug-15-2017 to Aug-15-2017
BH LOCATION: See Borehole Location Plan (UTM 15U) N 5460183 E 552488

(m) ELEV / DEPTH	ROCK DESCRIPTION	GROUND WATER CONDITIONS	CORE SAMPLE NUMBER	CORE SAMPLE SIZE	CORE RECOVERY/ TOTAL RECOVERY	TOTAL CORE RECOVERY (%)	HARD LAYER (%)	RQD (%)	FRACTURE INDEX (per 0.3 m)	DISCONTINUITIES	Weathering Index	HYDRAULIC CONDUCTIVITY (cm/sec)	POINT LOAD TEST UCS AXIAL (MPa)*	POINT LOAD TEST UCS DIAMETRAL (MPa)*	UNIAXIAL COMPRESSION (MPa)	DENSITY (g/cm^3) E (GPa)
405.6	Rock Surface															
0.4	**BEDROCK:**Diorite		2	HQ	1.50/ 1.50	100		68	2	extremely fractured from 0.38 mbgs - 0.89 mbgs						
404.1 / 1.9			3	HQ	1.30/ 1.30	100		100	3	weathered fracture zone at 2.67 mbgs						
402.8 / 3.2			4	HQ	1.65/ 1.65	100		100	6							
401.2 / 4.8			5	HQ	1.65/ 1.65 1	100		100	1	fractured and rubbly from 5.36 mbgs to 5.46 mbgs						
399.5 / 6.5			6	HQ	1.52/ 1.52	100		93	0							
398.0 / 8.0			7	HQ	1.50/ 1.50	100		97	0							
396.5 / 9.5			8	HQ	1.45/ 1.45	100		100	25							
395.1 / 11.0	**END OF ROCK CORE**															

SOIL-ROCK-AUG 14-2018_PM.GLB PALMER ROCK - 2018 2WELL 1DIG AMBERSHAW ROCK FINAL.GPJ 18-12-14

Weathering Index: W1-Fresh, W2-Slightly weathered, W3-Moderately weathered, W4-Highly weathered, W5-Completely weathered θ = angle to the core axis

E = Modulus of Elasticity
*: UCS [Mpa] ≈ 24 $I_{S(50)}$

Appendix B

FIELD PHOTO LOG – CORE AND SOIL SAMPLES (PECG, 2017)

Photograph Log

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Client Name:	Project No.	Site Location:
Ambershaw Metallics	17018	AMI Project

Photo #:	Date.	Direction Photo Taken
1	8/10/2017	MW-1

Description

MW-1 Core Recovery

Photo #:	Date.	Direction Photo Taken
2	8/12/2017	MW-2

Description

MW-2 Core Recovery

Photograph Log

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Client Name:	Project No.	Site Location:
Ambershaw Metallics	17018	AMI Project

Photo #:	Date.	Direction Photo Taken
3	8/11/2017	MW-3s/d

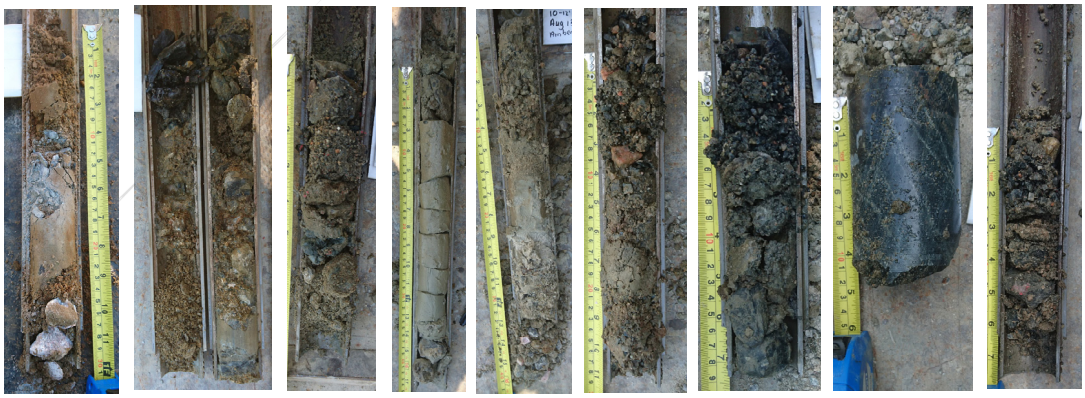
Description

MW-3s/d Core Recovery

Photo #:	Date.	Direction Photo Taken
4	8/13/2017	MW-4

Description

MW-4 Core Recovery



Photograph Log

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Client Name:	Project No.	Site Location:
Ambershaw Metallics	17018	AMI Project

Photo #:	Date.	Direction Photo Taken
5	8/13/2017	MW-5s/d

Description

MW-5s/d Core Recovery

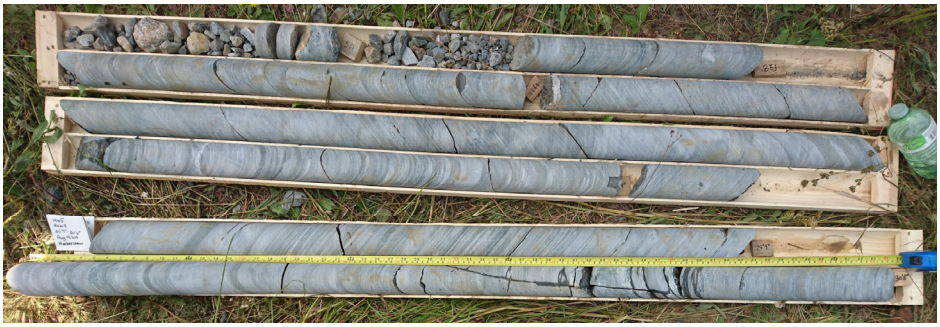
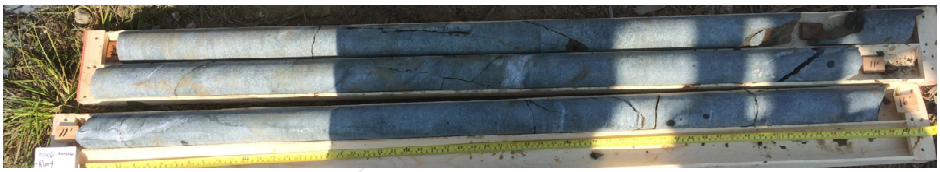
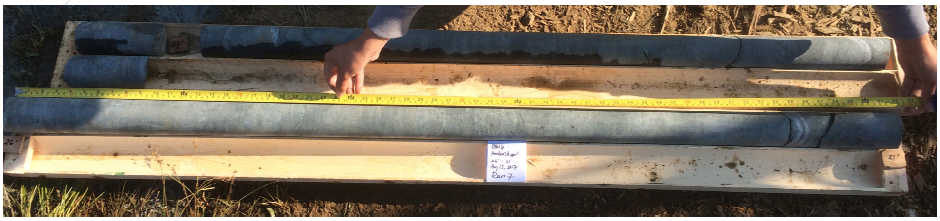


Photo #:	Date.	Direction Photo Taken
6	8/14/2017	MW-6

Description

MW-6 Core Recovery





Photograph Log

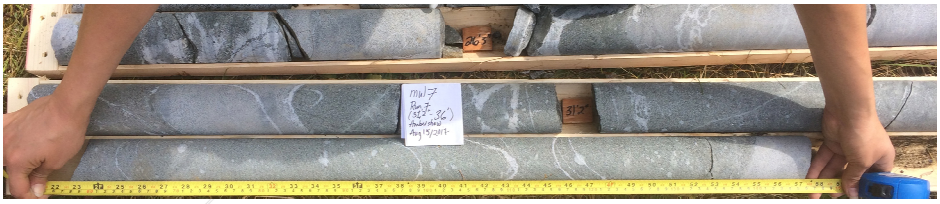
PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Client Name:	Project No.	Site Location:
Ambershaw Metallics	17018	AMI Project

Photo #:	Date.	Direction Photo Taken
7	8/15/2017	MW-7s/d

Description

MW-7s/d Core Recovery



Appendix C

FIELD PHOTO LOG – WELL INSTALLATION AND WATER QUALITY SAMPLING (PECG, 2017)

Photograph Log

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Client Name:	Project No.	Site Location:
Ambershaw Metallics	17018	Ambershaw

Photo #:	Date.	Direction Photo Taken
1	8/10/2017	MW-1

Description

MW-1: Drilling

Photo #:	Date.	Direction Photo Taken
2	8/12/2017	MW-2

Description

MW-2: Completed Well

Photograph Log

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Client Name:	Project No.	Site Location:
Ambershaw Metallics	17018	Ambershaw

Photo #:	Date.	Direction Photo Taken
3	8/11/2017	MW-3s/d

Description

MW-3s/d: Drilling

Photo #:	Date.	Direction Photo Taken
4	8/13/2017	MW-4

Description

MW-4: Drilling

Photograph Log

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Client Name:	Project No.	Site Location:
Ambershaw Metallics	17018	Ambershaw

Photo #:	Date.	Direction Photo Taken
5	8/13/2017	MW-5s/d

Description

MW-5s/d: Drilling

Photo #:	Date.	Direction Photo Taken
6	10/18/2017	MW-4

Description

MW-4 Low Flow Water Quality Sampling – Monsoon Pump

Photograph Log

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Client Name:	Project No.	Site Location:
Ambershaw Metallics	17018	Ambershaw

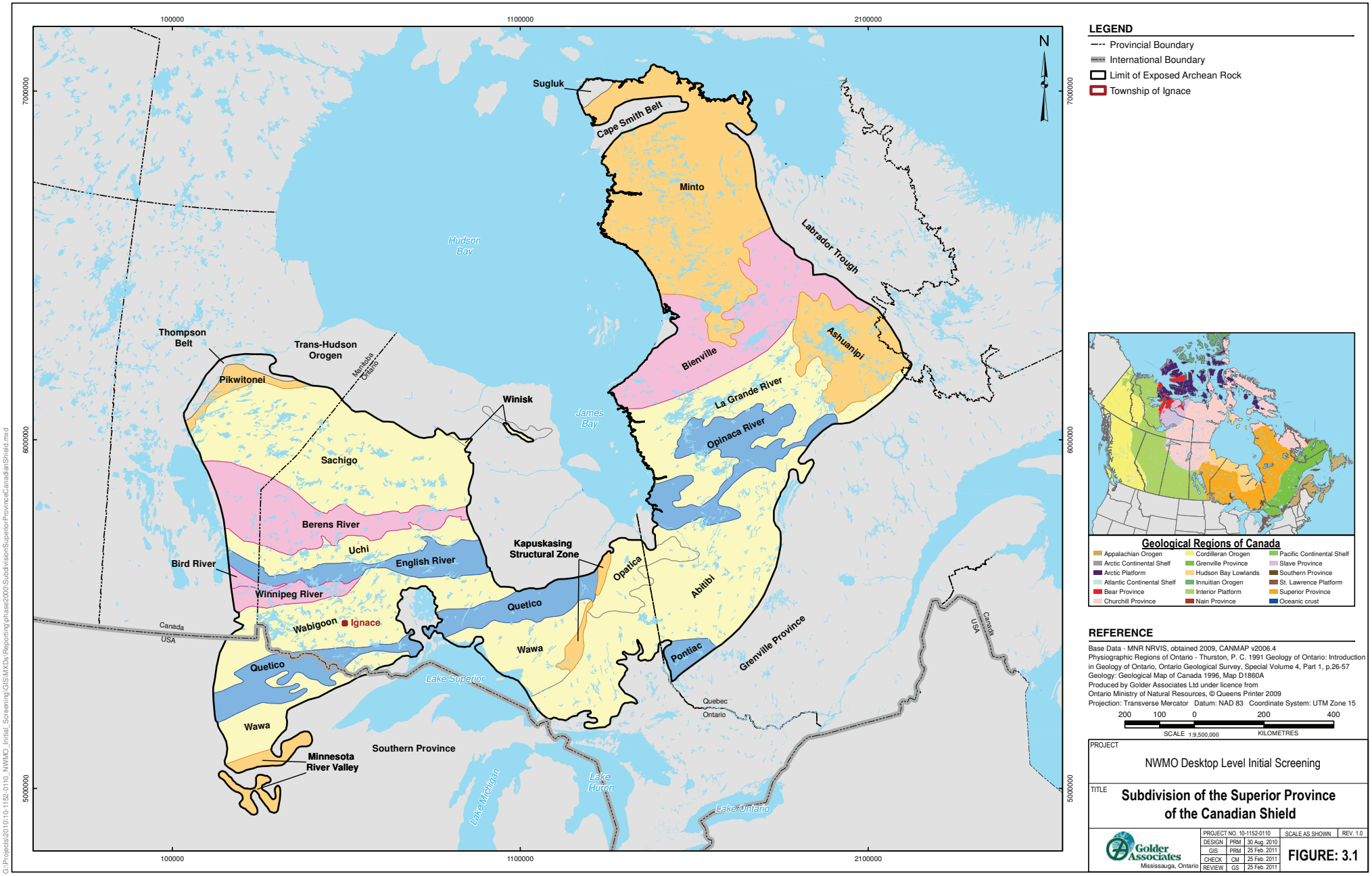
Photo #:	Date.	Direction Photo Taken
7	10/21/2017	MW-5s/d

Description

MW-5s/d Low Flow Water Quality Sample – Peristaltic Pump

Appendix D

SUBDIVISON OF THE SUPERIOR PROVINCE OF THE CANADIAN SHIELD (GOLDER, 2011)



LEGEND

- Provincial Boundary
- International Boundary
- Limit of Exposed Archean Rock
- Township of Ignace

Geological Regions of Canada

Appalachian Orogen	Cordilleran Orogen	Pacific Continental Shelf
Arctic Continental Shelf	Grenville Province	Slave Province
Arctic Platform	Hudson Bay Lowlands	Southern Province
Atlantic Continental Shelf	Innuitian Orogen	St. Lawrence Platform
Bear Province	Interior Platform	Superior Province
Churchill Province	Nain Province	Oceanic crust

REFERENCE

Base Data - MNR NRVIS, obtained 2009, CANMAP v2006.4
Physiographic Regions of Ontario - Thurston, P. C. 1991 Geology of Ontario: Introduction in Geology of Ontario, Ontario Geological Survey, Special Volume 4, Part 1, p.26-57
Geology: Geological Map of Canada 1996, Map D1860A
Produced by Golder Associates Ltd under licence from Ontario Ministry of Natural Resources, © Queens Printer 2009
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15

200 100 0 200 400
SCALE 1:9,500,000 KILOMETRES

PROJECT
NWMO Desktop Level Initial Screening

TITLE
Subdivision of the Superior Province of the Canadian Shield

Golder Associates
Mississauga, Ontario

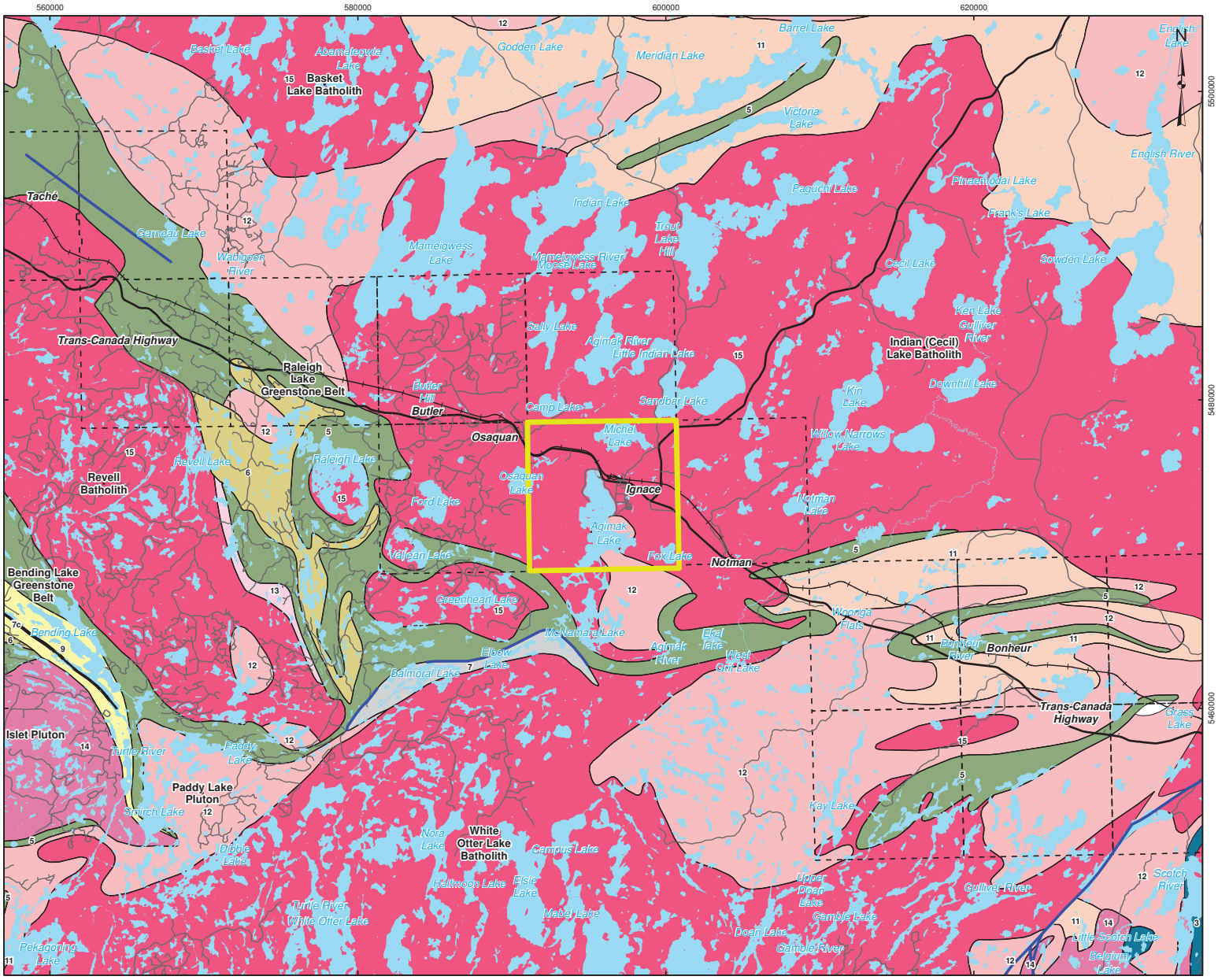
PROJECT NO. 10-1152-0110			SCALE AS SHOWN	REV. 1.0
DESIGN	PRM	30 Aug. 2010		
GIS	PRM	25 Feb. 2011		
CHECK	GM	25 Feb. 2011		
REVIEW	GS	25 Feb. 2011		

FIGURE: 3.1

G:\Projects\2010\10-1152-0110_NWMO_Initial_Screening\GIS\MXDs\Reporting\phase2000\Subdivision\SuperiorProvinceCanadianShield.mxd

Appendix E

BEDROCK GEOLOGY OF IGNACE AREA (GOLDER, 2011)



LEGEND

- Main Road
- Local Road
- Railway
- Water Area, Permanent
- Geographic Township
- Geological Fault
- Geological Contact
- Iron Formation
- 15 Massive granodiorite to granite
- 14-Diorite-monzodiorite-granodiorite suite
- 13 Muscovite-bearing granitic rock
- 12 Foliated tonalite suite
- 11 Gneissic tonalite suite
- 10 Mafic and ultramafic rocks
- 9 Coarse clastic metasedimentary rocks
- 7 Metasedimentary rocks
- 7c Marble, chert, iron formation, minor metavolcanic rocks
- 6 Felsic to intermediate metavolcanic rocks
- 5 Mafic to intermediate metavolcanic rocks
- 3 Mafic metavolcanic and metasedimentary rocks
- 2 Felsic to intermediate metavolcanic rocks
- 1 Metasedimentary rocks and mafic to ultramafic metavolcanic rocks
- Municipal Boundary (Township of Ignace)

REFERENCE

Base Data - MNR NRVIS, obtained 2009, CANMAP v2006.4
Geology: MRD126-Bedrock Geology of Ontario, 2007
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2009
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 15

5 2.5 0 5 10 15
SCALE 1:250,000 KILOMETRES

PROJECT
NWMO Desktop Level Initial Screening

TITLE
Bedrock Geology of the Ignace Area

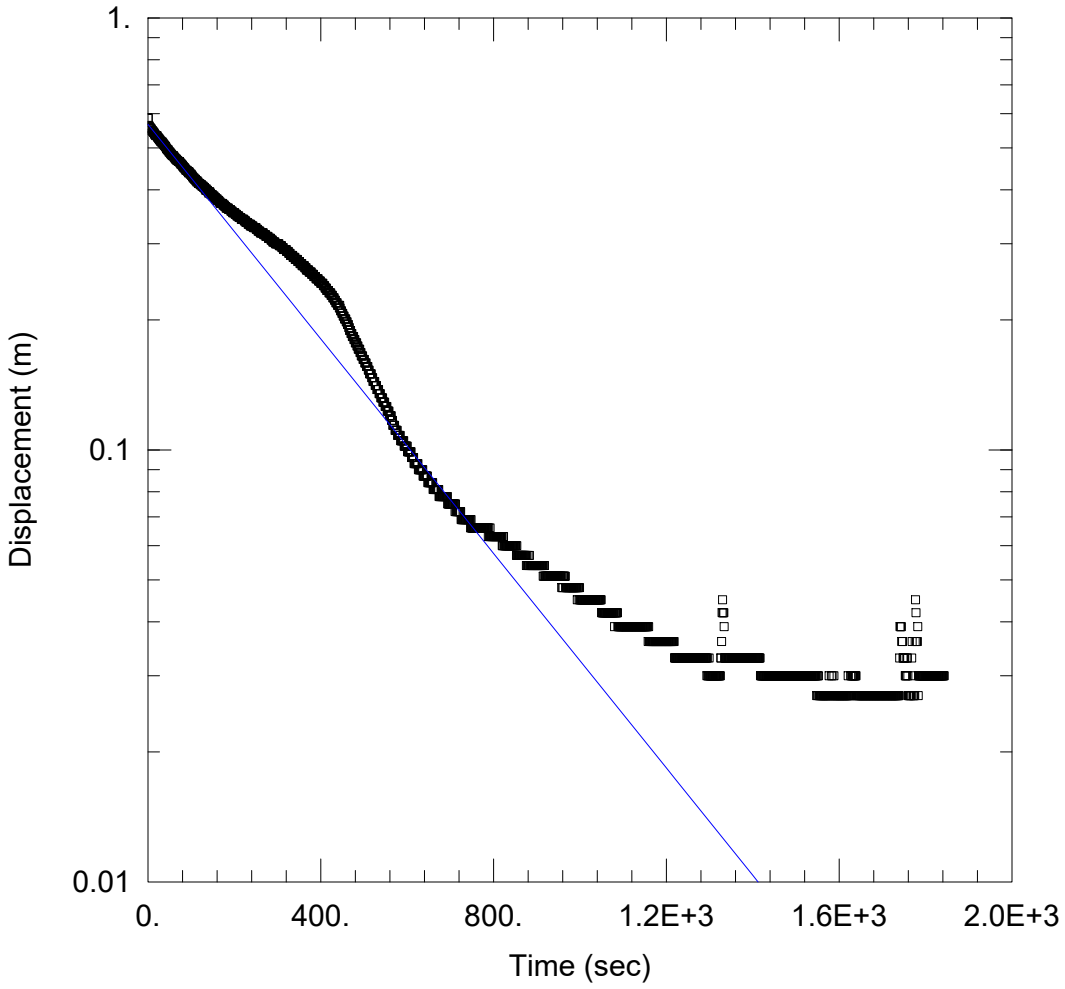
Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1152-0110			SCALE AS SHOWN	REV. 1.0
DESIGN	PB	30 Aug. 2010	FIGURE: 3.3
GIS	PRM	25 Feb. 2011	
CHECK	GM	25 Feb. 2011	
REVIEW	GS	25 Feb. 2011	

G:\Projects\2010\10-1152-0110_NWMO_Initial_Screening\GIS\MXDs\Reporting\phase2000\Bedrock Geology.mxd

Appendix F

SINGLE WELL IN-SITU RESPONSE TEST ANALYSES (AQTESOLV™, 2017)



RESPONSE TEST (MW1)

Data Set: C:\...\MW1 - Insertion Test 1.aqt
Date: 12/15/18 Time: 16:38:55

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 0.74 m Anisotropy Ratio (Kz/Kr): 1.

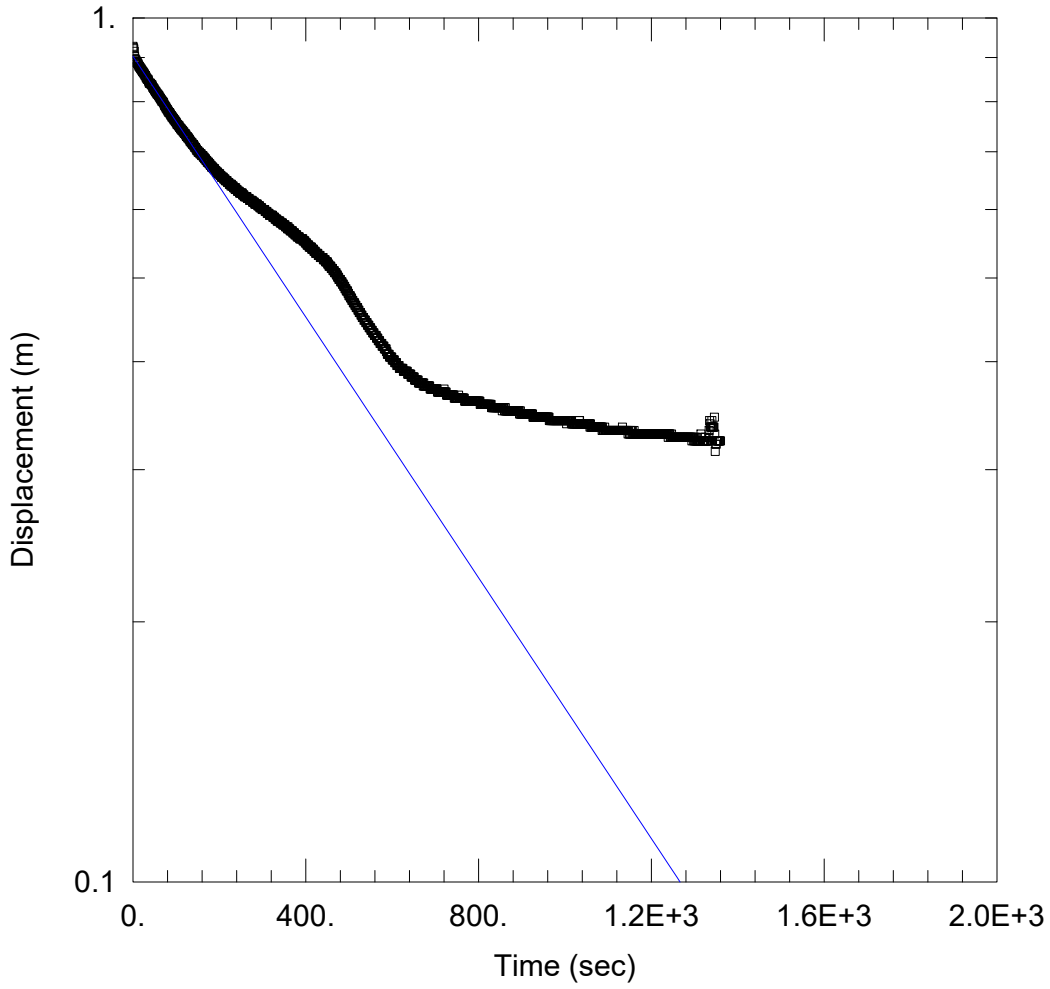
WELL DATA (MW1)

Initial Displacement: 0.588 m
Total Well Penetration Depth: 0.74 m
Casing Radius: 0.0254 m
Static Water Column Height: 0.74 m
Screen Length: 0.74 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 3.172E-6 m/sec y0 = 0.5671 m



RESPONSE TEST (MW1)

Data Set: C:\...\MW1 - Insertion Test 2.aqt
Date: 12/15/18 Time: 16:39:09

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 0.74 m Anisotropy Ratio (Kz/Kr): 1.

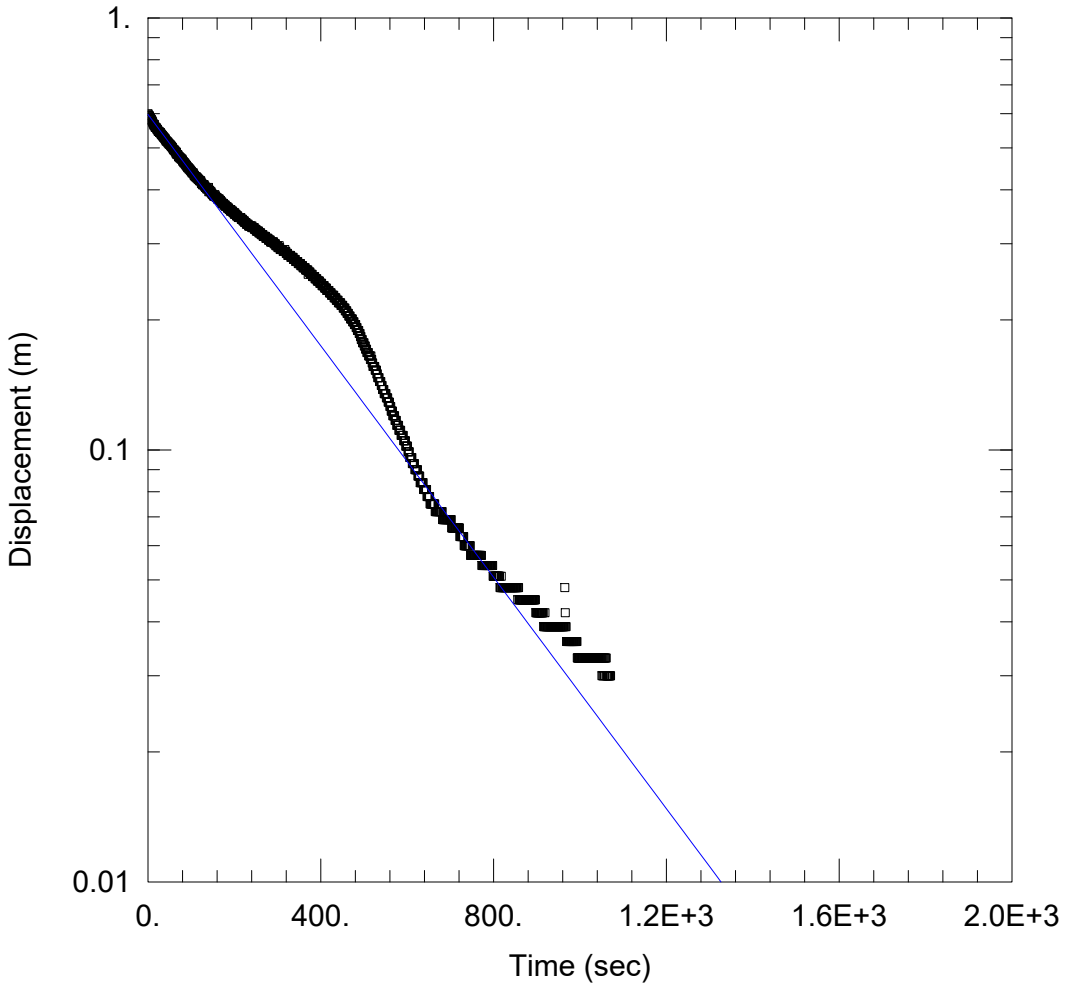
WELL DATA (MW1)

Initial Displacement: 0.927 m
Total Well Penetration Depth: 0.74 m
Casing Radius: 0.0254 m
Static Water Column Height: 0.74 m
Screen Length: 0.74 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.928E-6 m/sec y0 = 0.9028 m



RESPONSE TEST (MW1)

Data Set: C:\...\MW1 - Insertion Test 3.aqt
Date: 12/15/18 Time: 16:39:19

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 0.74 m Anisotropy Ratio (Kz/Kr): 1.

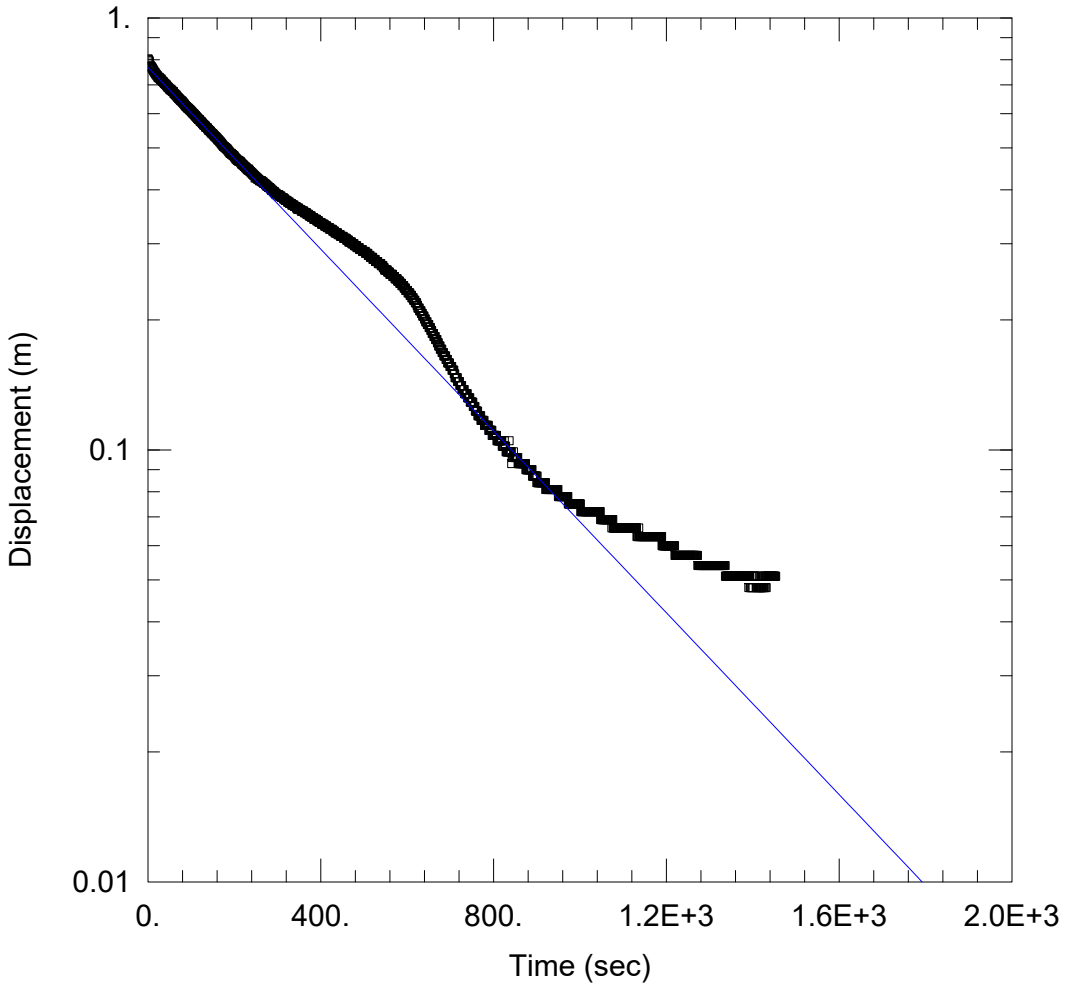
WELL DATA (MW1)

Initial Displacement: 0.6 m
Total Well Penetration Depth: 0.74 m
Casing Radius: 0.0254 m
Static Water Column Height: 0.74 m
Screen Length: 0.74 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 3.422E-6 m/sec y0 = 0.5978 m



RESPONSE TEST (MW1)

Data Set: C:\...\MW1 - Insertion Test 4.aqt
Date: 12/15/18 Time: 16:39:30

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 0.74 m Anisotropy Ratio (Kz/Kr): 1.

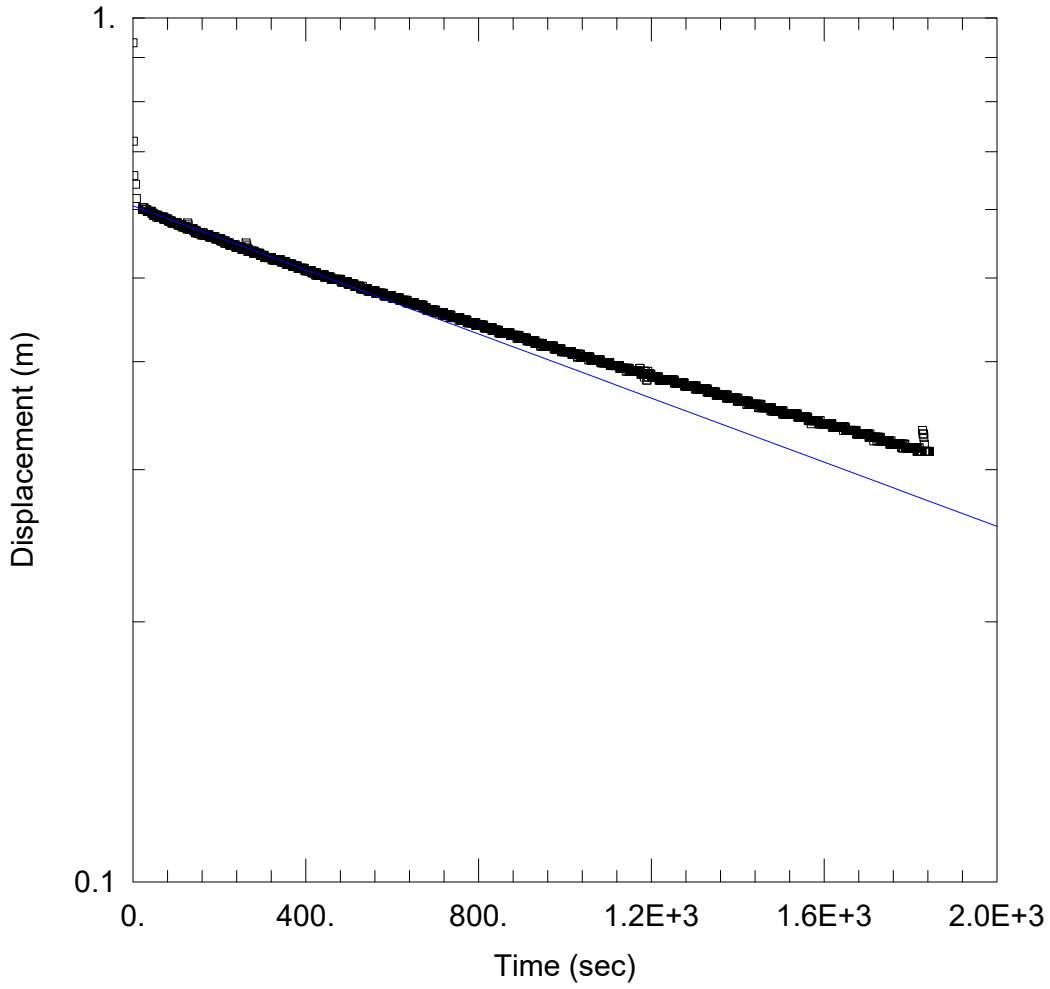
WELL DATA (MW1)

Initial Displacement: 0.804 m
Total Well Penetration Depth: 0.74 m
Casing Radius: 0.0254 m
Static Water Column Height: 0.74 m
Screen Length: 0.74 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 2.688E-6 m/sec y0 = 0.7684 m



WELL TEST ANALYSIS

Data Set: C:\...\MW2 - FH 1.aqt
Date: 12/15/18 Time: 16:39:50

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 3.68 m Anisotropy Ratio (Kz/Kr): 0.01

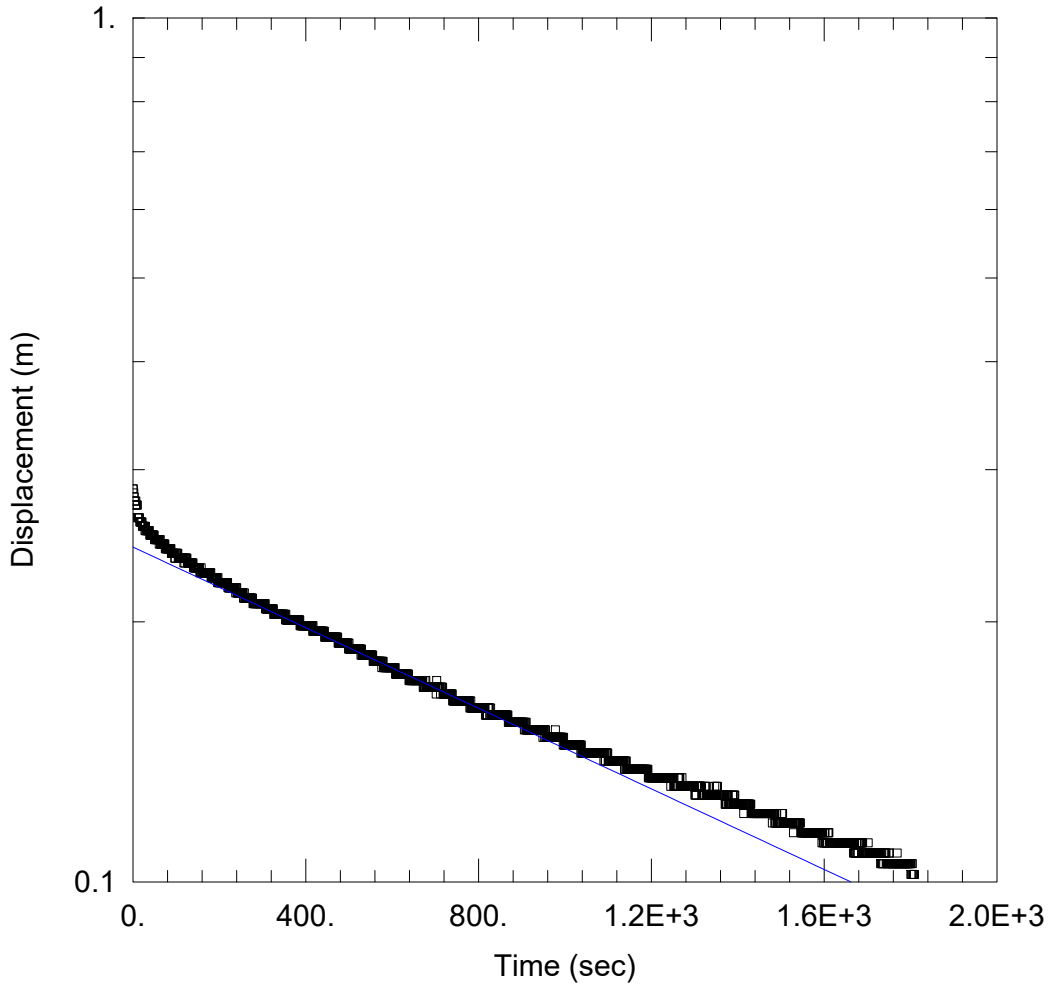
WELL DATA (MW2)

Initial Displacement: 0.936 m
Total Well Penetration Depth: 2.92 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.92 m
Screen Length: 1.52 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.715E-7 m/sec y0 = 0.6061 m



WELL TEST ANALYSIS

Data Set: C:\...\MW2 - RH 1.aqt
Date: 12/15/18 Time: 16:40:03

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 3.68 m Anisotropy Ratio (Kz/Kr): 0.01

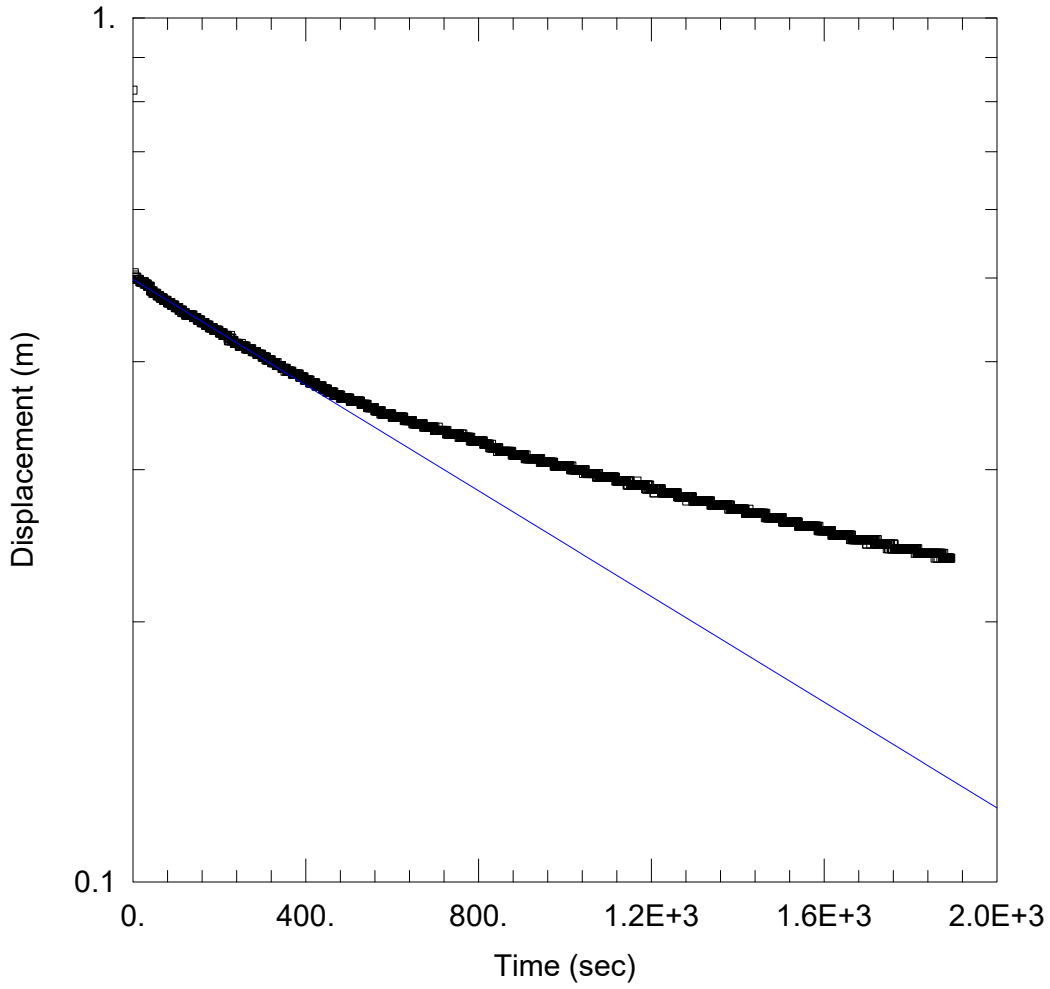
WELL DATA (MW2)

Initial Displacement: 0.285 m
Total Well Penetration Depth: 2.92 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.92 m
Screen Length: 1.52 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 5.929E-7 m/sec y0 = 0.2441 m



WELL TEST ANALYSIS

Data Set: C:\...\MW2 - FH 2.aqt
Date: 12/15/18 Time: 16:40:20

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 3.68 m Anisotropy Ratio (Kz/Kr): 0.01

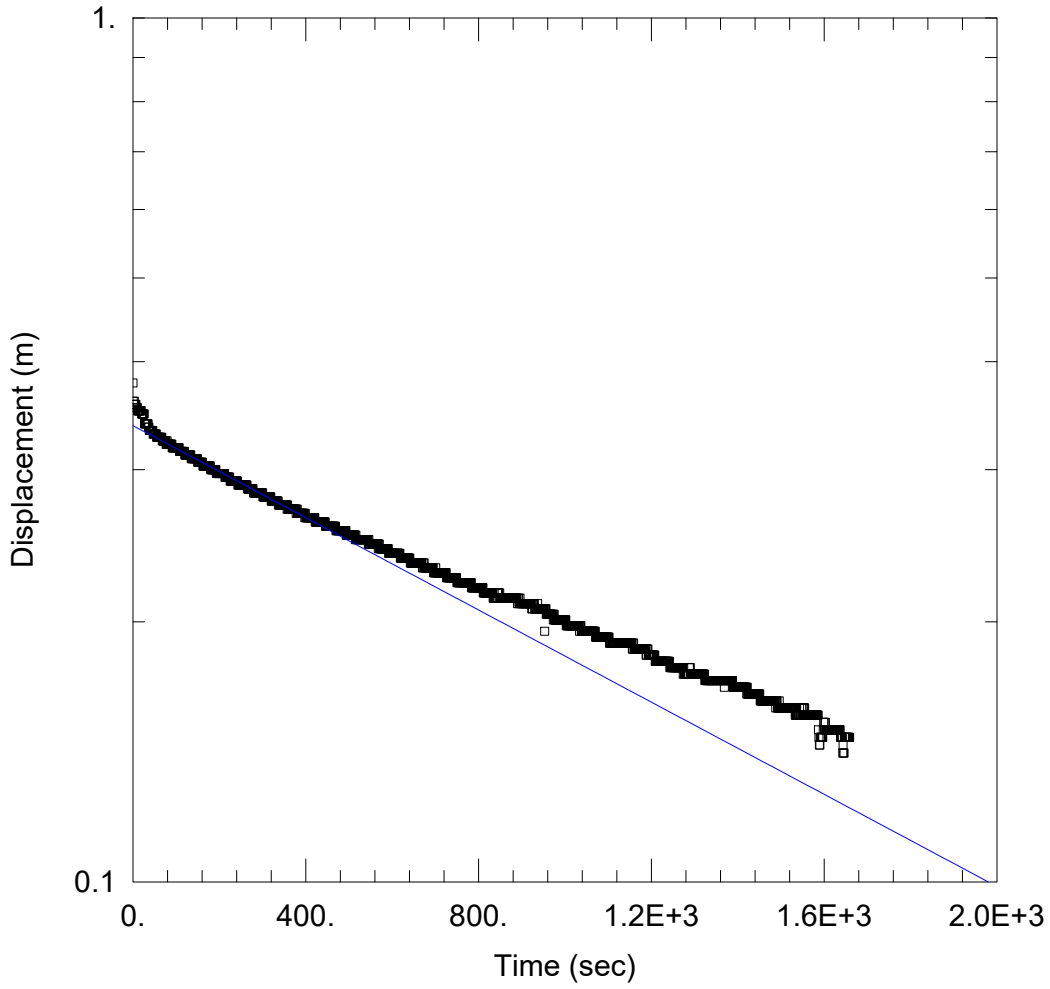
WELL DATA (MW2)

Initial Displacement: 0.825 m
Total Well Penetration Depth: 2.92 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.92 m
Screen Length: 1.52 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 7.774E-7 m/sec y0 = 0.4981 m



WELL TEST ANALYSIS

Data Set: C:\...\MW2 - RH 2.aqt
Date: 12/15/18 Time: 16:40:32

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 3.68 m Anisotropy Ratio (Kz/Kr): 0.01

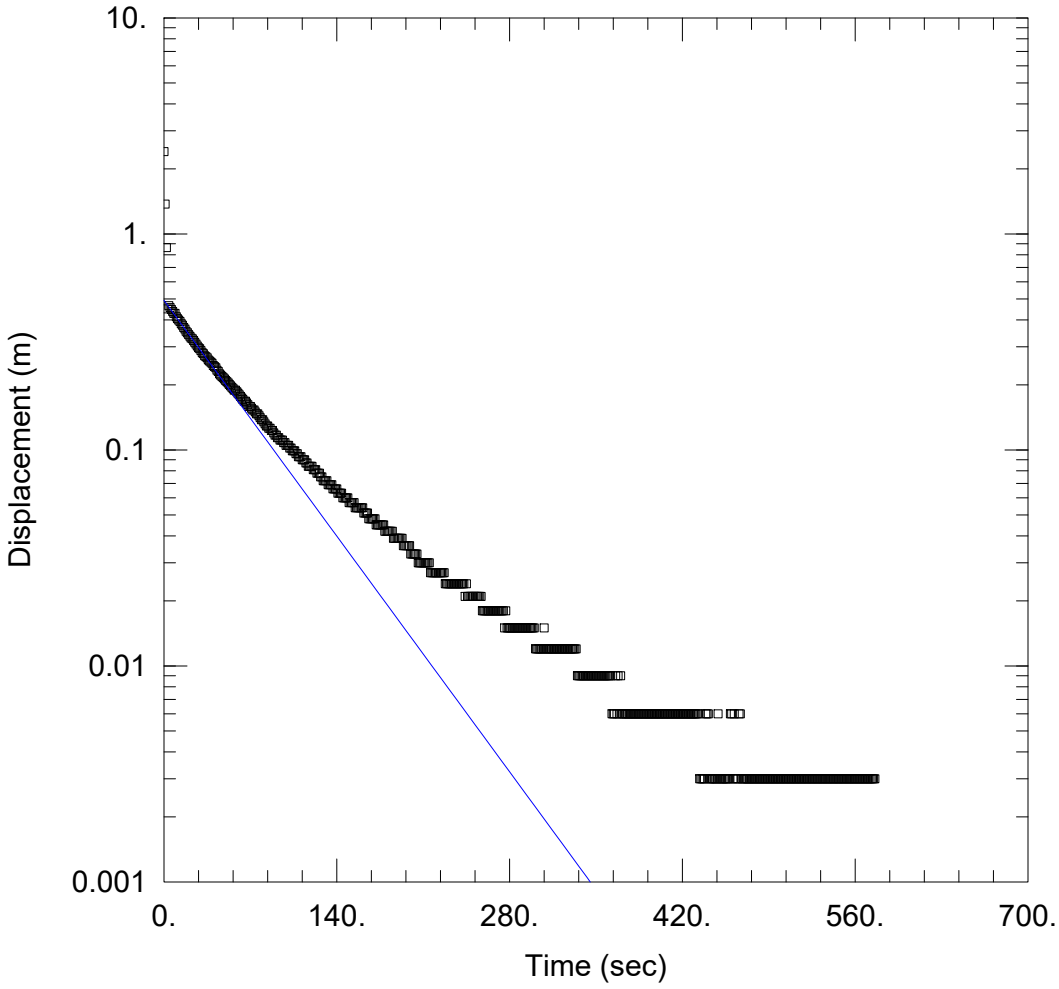
WELL DATA (MW2)

Initial Displacement: 0.378 m
Total Well Penetration Depth: 2.92 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.92 m
Screen Length: 1.52 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 6.781E-7 m/sec y0 = 0.3374 m



WELL TEST ANALYSIS

Data Set: C:\...\MW3d - FH 1.aqt
Date: 12/15/18 Time: 16:41:11

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-21

AQUIFER DATA

Saturated Thickness: 2. m Anisotropy Ratio (Kz/Kr): 0.01

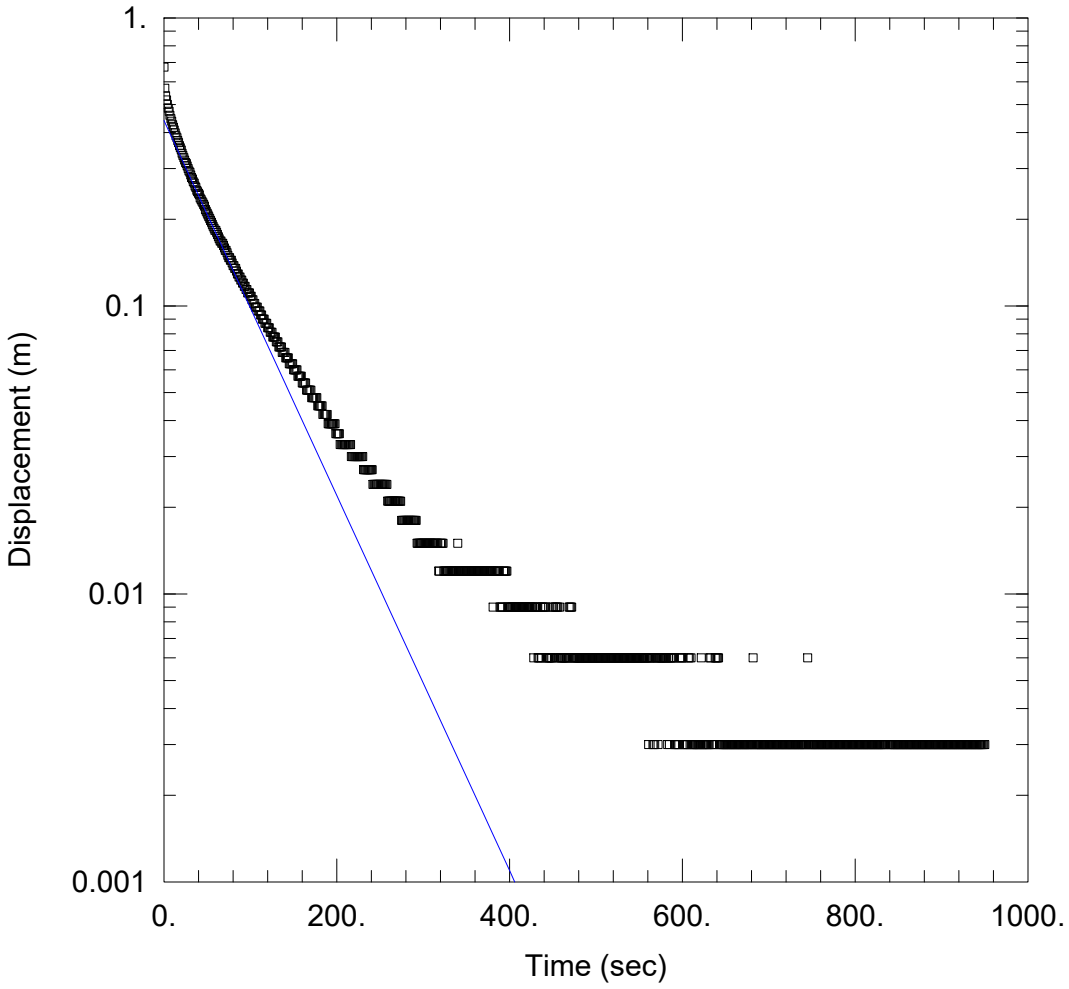
WELL DATA (MW3d)

Initial Displacement: 2.403 m
Total Well Penetration Depth: 2. m
Casing Radius: 0.0127 m
Static Water Column Height: 2. m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 5.952E-6 m/sec y0 = 0.4919 m



WELL TEST ANALYSIS

Data Set: C:\...\MW3d - RH 1.aqt
Date: 12/15/18 Time: 16:41:23

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-21

AQUIFER DATA

Saturated Thickness: 2. m Anisotropy Ratio (Kz/Kr): 0.01

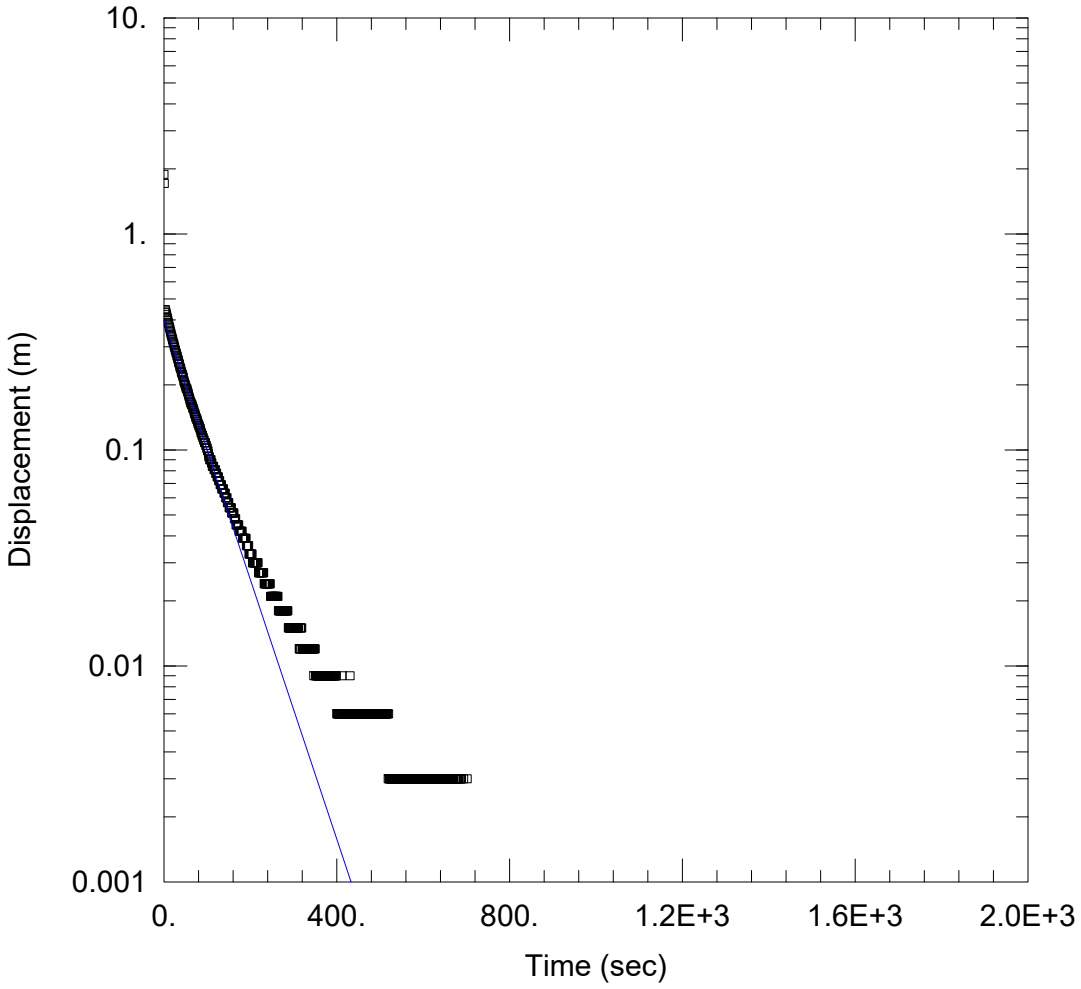
WELL DATA (MW3d)

Initial Displacement: 0.675 m
Total Well Penetration Depth: 2. m
Casing Radius: 0.0127 m
Static Water Column Height: 2. m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.971E-6 m/sec y0 = 0.4401 m



WELL TEST ANALYSIS

Data Set: C:\...\MW3d - FH 2.aqt
Date: 12/15/18 Time: 16:41:35

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-21

AQUIFER DATA

Saturated Thickness: 2. m Anisotropy Ratio (Kz/Kr): 0.01

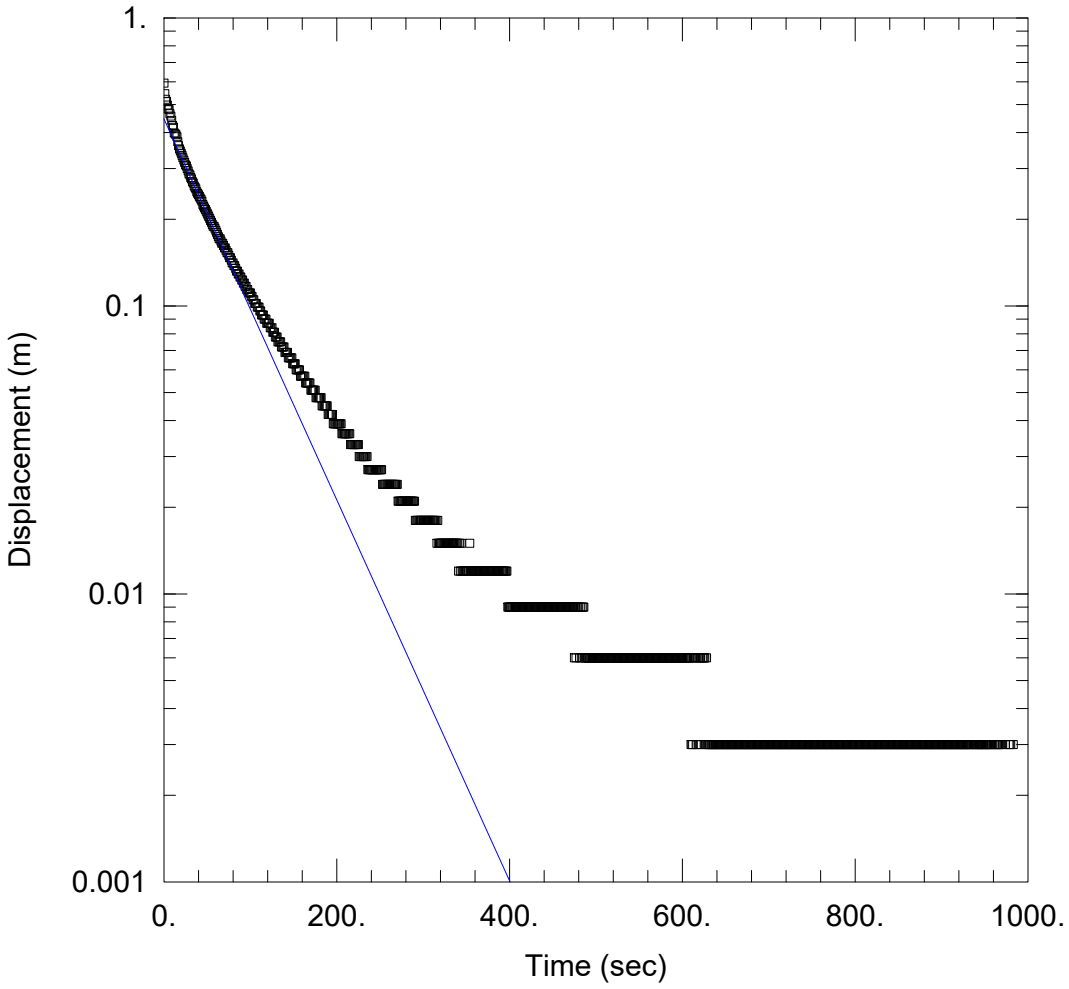
WELL DATA (MW3d)

Initial Displacement: 1.887 m
Total Well Penetration Depth: 2. m
Casing Radius: 0.0127 m
Static Water Column Height: 2. m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 4.583E-6 m/sec y0 = 0.397 m



WELL TEST ANALYSIS

Data Set: C:\...\MW3d - RH 2.aqt
Date: 12/15/18 Time: 16:41:48

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-21

AQUIFER DATA

Saturated Thickness: 2. m Anisotropy Ratio (Kz/Kr): 0.01

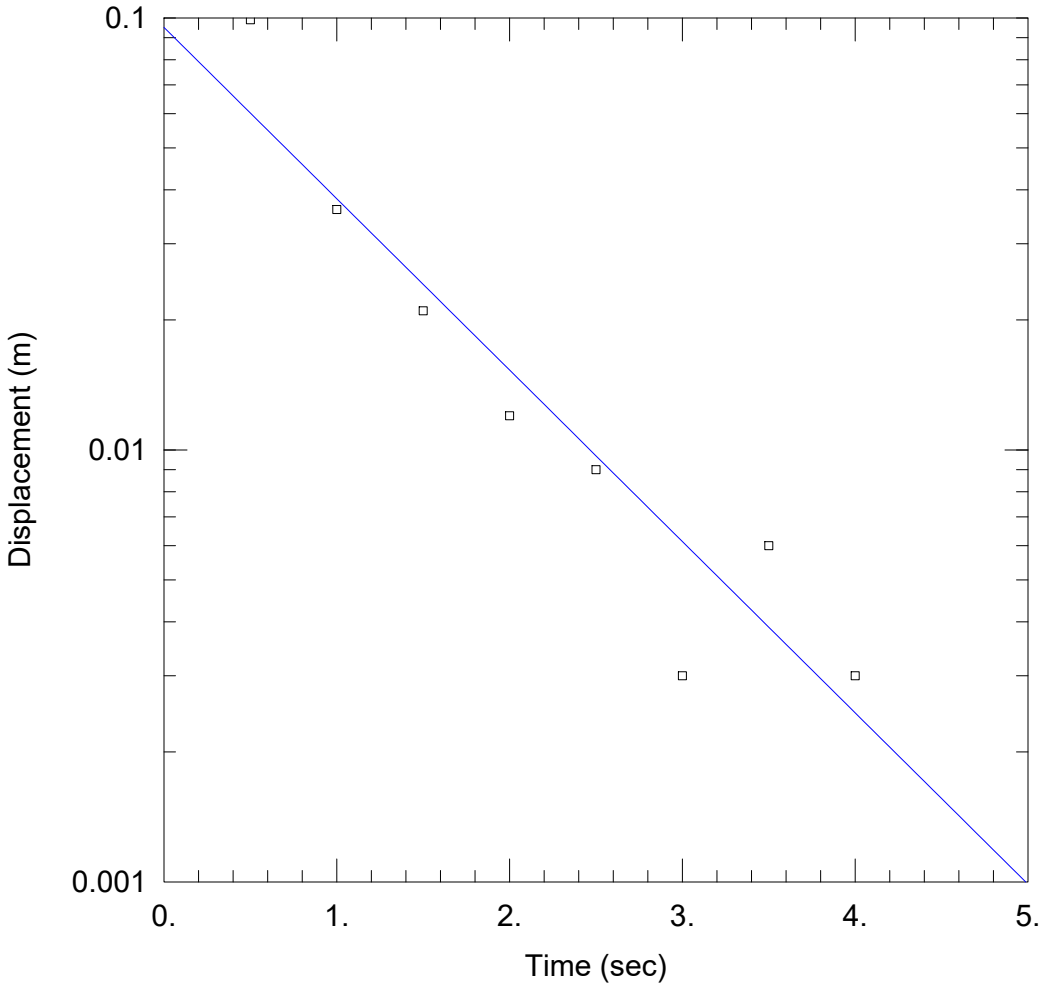
WELL DATA (MW3d)

Initial Displacement: 0.594 m
Total Well Penetration Depth: 2. m
Casing Radius: 0.0127 m
Static Water Column Height: 2. m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 5.051E-6 m/sec y0 = 0.4458 m



WELL TEST ANALYSIS

Data Set: C:\...\MW4 - RH 2.aqt
Date: 12/15/18 Time: 16:42:12

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 4.16 m Anisotropy Ratio (Kz/Kr): 1.

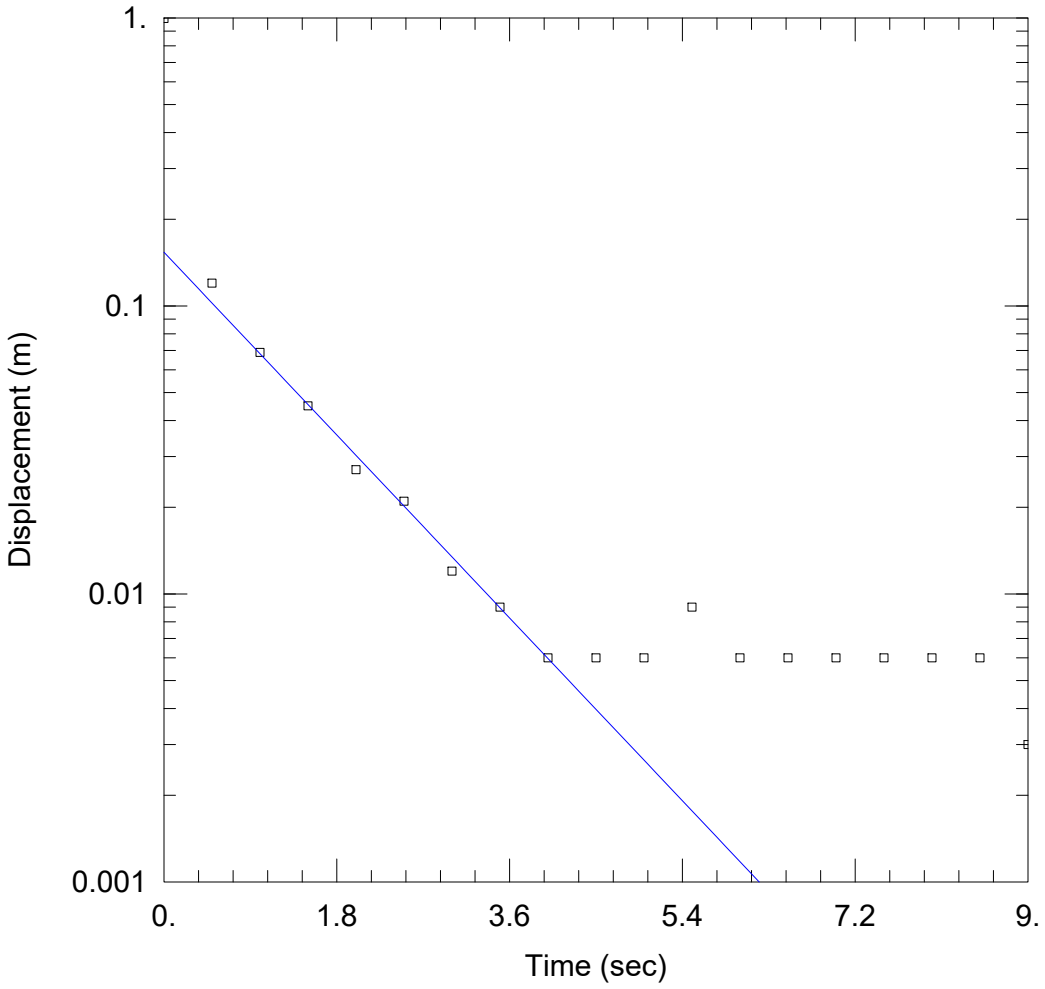
WELL DATA (MW4)

Initial Displacement: 1.452 m
Total Well Penetration Depth: 2.34 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.34 m
Screen Length: 1.52 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0005734 m/sec y0 = 0.09508 m



WELL TEST ANALYSIS

Data Set: C:\...\MW4 - RH 3.aqt
Date: 12/15/18 Time: 16:42:21

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-18

AQUIFER DATA

Saturated Thickness: 4.16 m Anisotropy Ratio (Kz/Kr): 1.

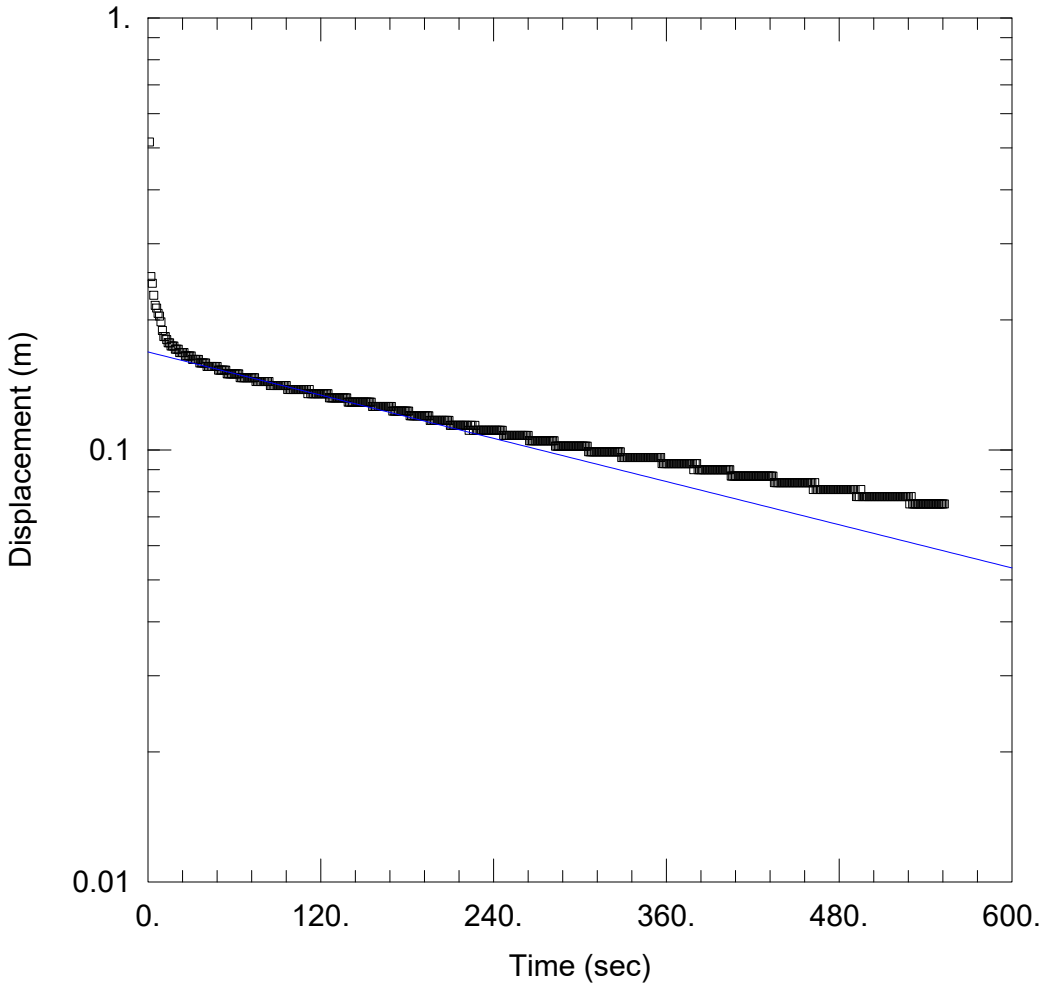
WELL DATA (MW4)

Initial Displacement: 0.996 m
Total Well Penetration Depth: 2.34 m
Casing Radius: 0.0254 m
Static Water Column Height: 2.34 m
Screen Length: 1.52 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 0.0005097 m/sec y0 = 0.1536 m



WELL TEST ANALYSIS

Data Set: C:\...\MW5s - FH 1.aqt
Date: 12/15/18 Time: 16:43:50

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.13 m Anisotropy Ratio (Kz/Kr): 0.01

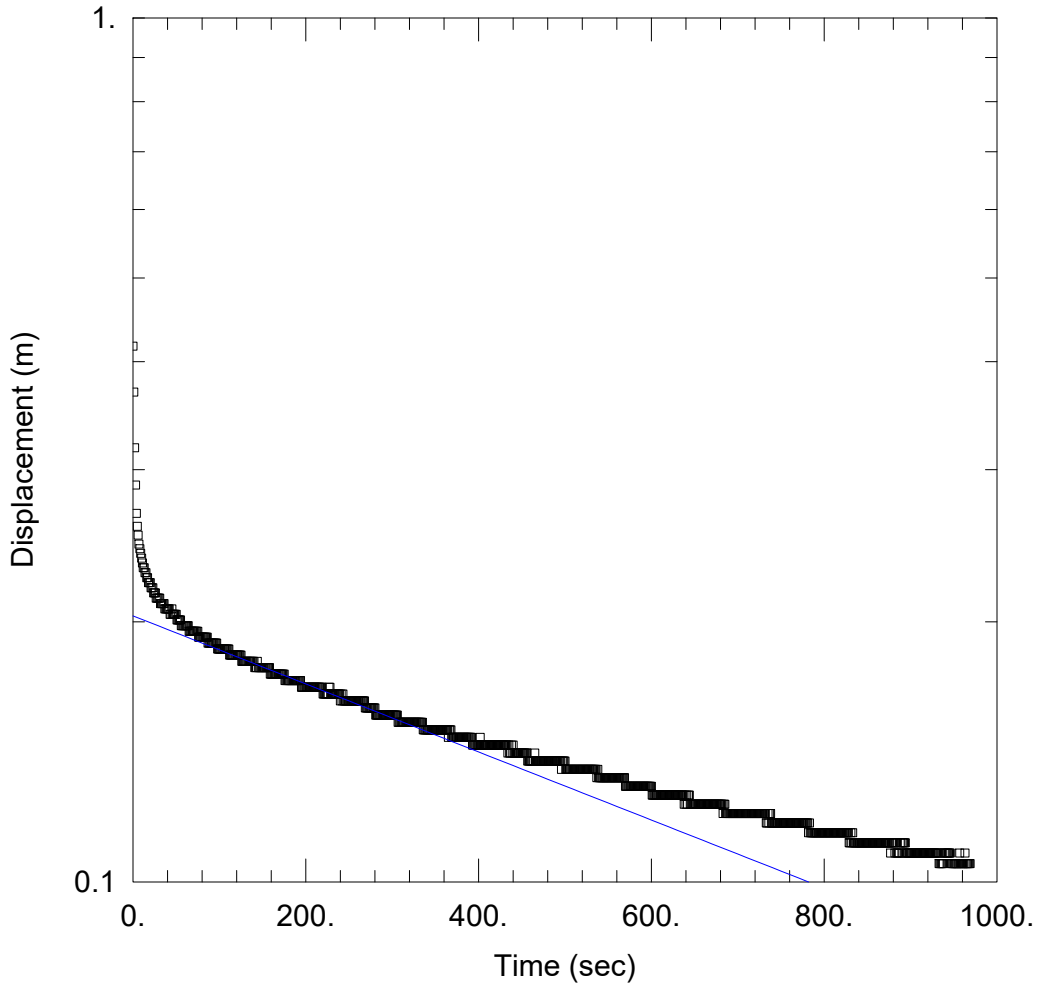
WELL DATA (MW5s)

Initial Displacement: 1.773 m
Total Well Penetration Depth: 1.13 m
Casing Radius: 0.0127 m
Static Water Column Height: 1.13 m
Screen Length: 1.13 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 7.188E-7 m/sec y0 = 0.1686 m



WELL TEST ANALYSIS

Data Set: C:\...\MW5s - RH 1.aqt
Date: 12/15/18 Time: 16:44:02

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.13 m Anisotropy Ratio (Kz/Kr): 0.01

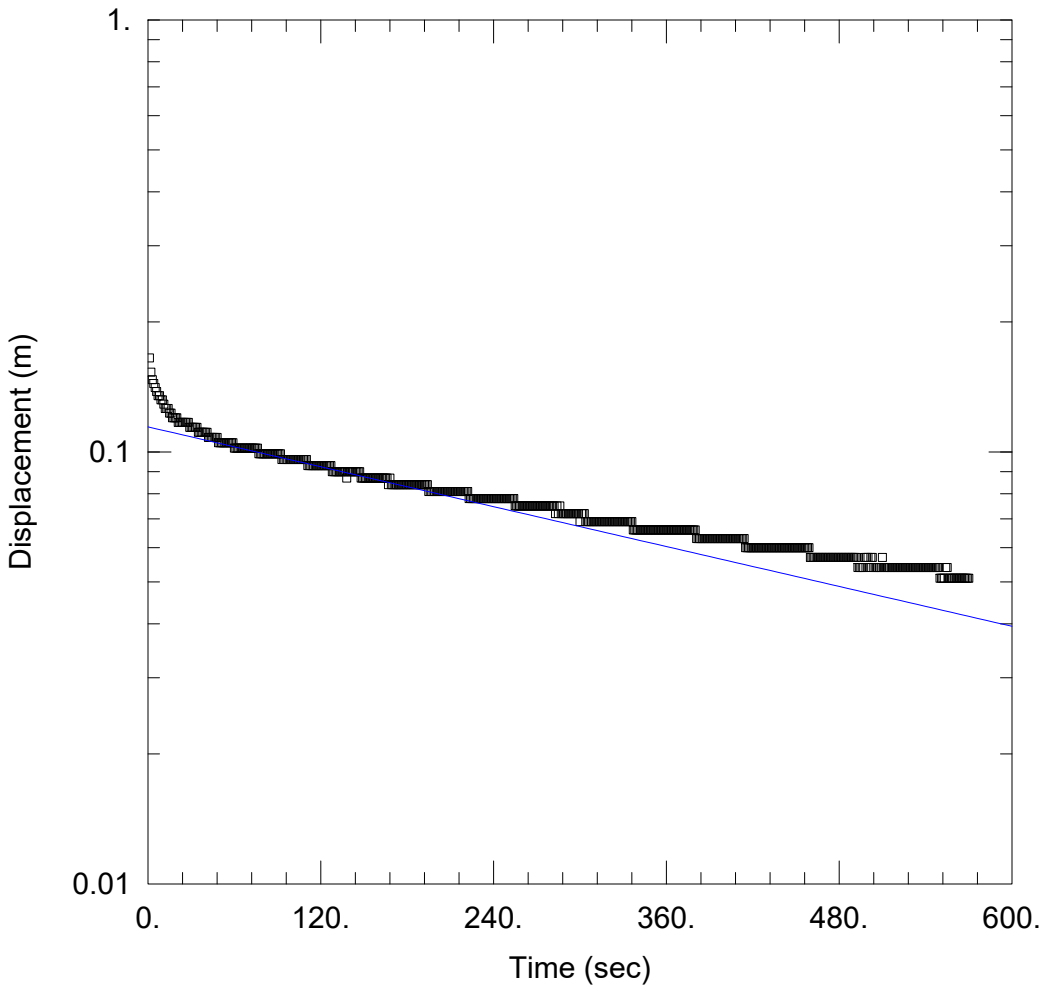
WELL DATA (MW5s)

Initial Displacement: 0.417 m
Total Well Penetration Depth: 1.13 m
Casing Radius: 0.0127 m
Static Water Column Height: 1.13 m
Screen Length: 1.13 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 3.396E-7 m/sec y0 = 0.2032 m



WELL TEST ANALYSIS

Data Set: C:\...\MW5s - FH 2.aqt
Date: 12/15/18 Time: 16:44:13

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.13 m Anisotropy Ratio (Kz/Kr): 0.01

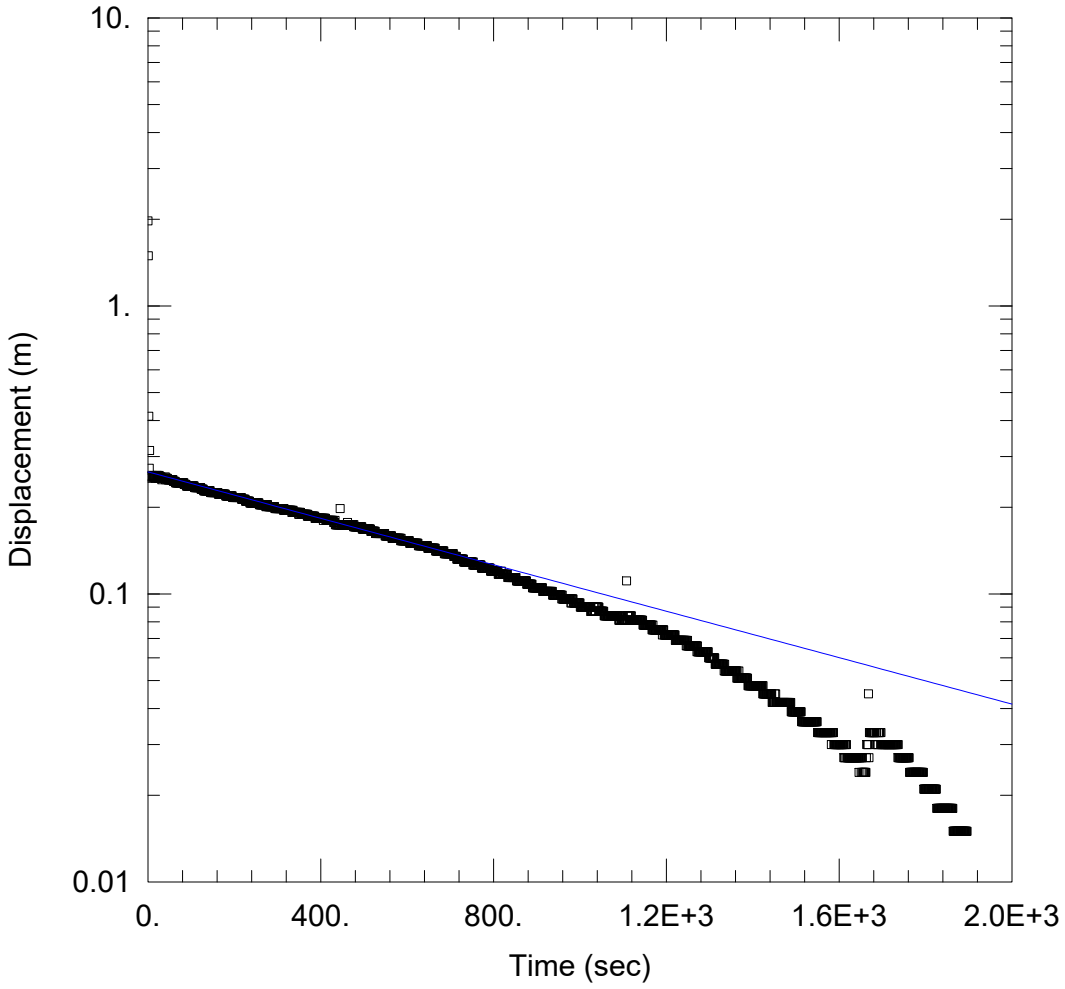
WELL DATA (MW5s)

Initial Displacement: 1.008 m
Total Well Penetration Depth: 1.13 m
Casing Radius: 0.0127 m
Static Water Column Height: 1.13 m
Screen Length: 1.13 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 6.635E-7 m/sec y0 = 0.1143 m



WELL TEST ANALYSIS

Data Set: C:\...\MW5d - FH 1.aqt
Date: 12/15/18 Time: 16:42:44

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.03 m Anisotropy Ratio (Kz/Kr): 0.01

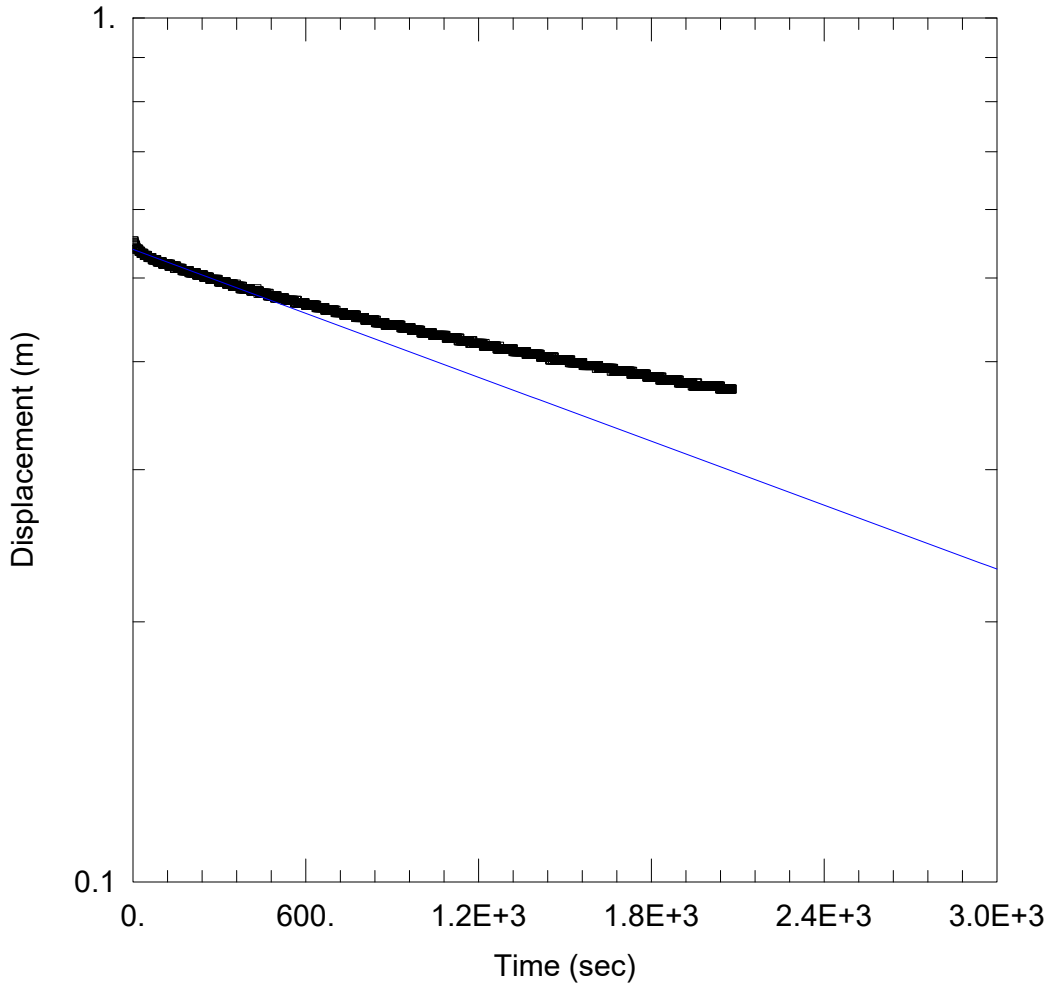
WELL DATA (MW5d)

Initial Displacement: 1.974 m
Total Well Penetration Depth: 7.12 m
Casing Radius: 0.0127 m
Static Water Column Height: 7.03 m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 3.57E-7 m/sec y0 = 0.2653 m



WELL TEST ANALYSIS

Data Set: C:\...\MW5d - RH 1.aqt
Date: 12/15/18 Time: 16:42:55

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.03 m Anisotropy Ratio (Kz/Kr): 0.01

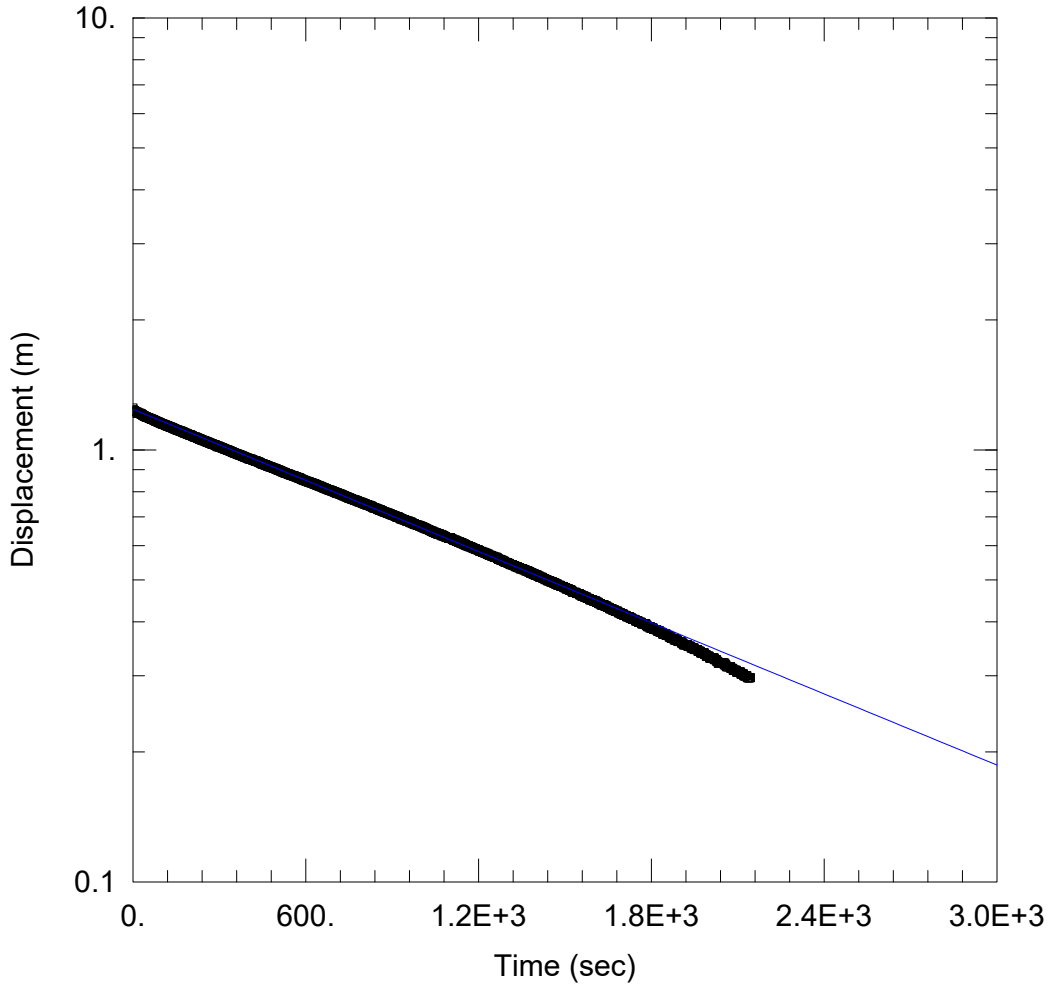
WELL DATA (MW5d)

Initial Displacement: 1.341 m
Total Well Penetration Depth: 7.12 m
Casing Radius: 0.0127 m
Static Water Column Height: 7.03 m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.092E-7 m/sec y0 = 0.5396 m



WELL TEST ANALYSIS

Data Set: C:\...\MW5d - Insertion Test 1.aqt
Date: 12/15/18 Time: 16:43:06

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.03 m Anisotropy Ratio (Kz/Kr): 0.01

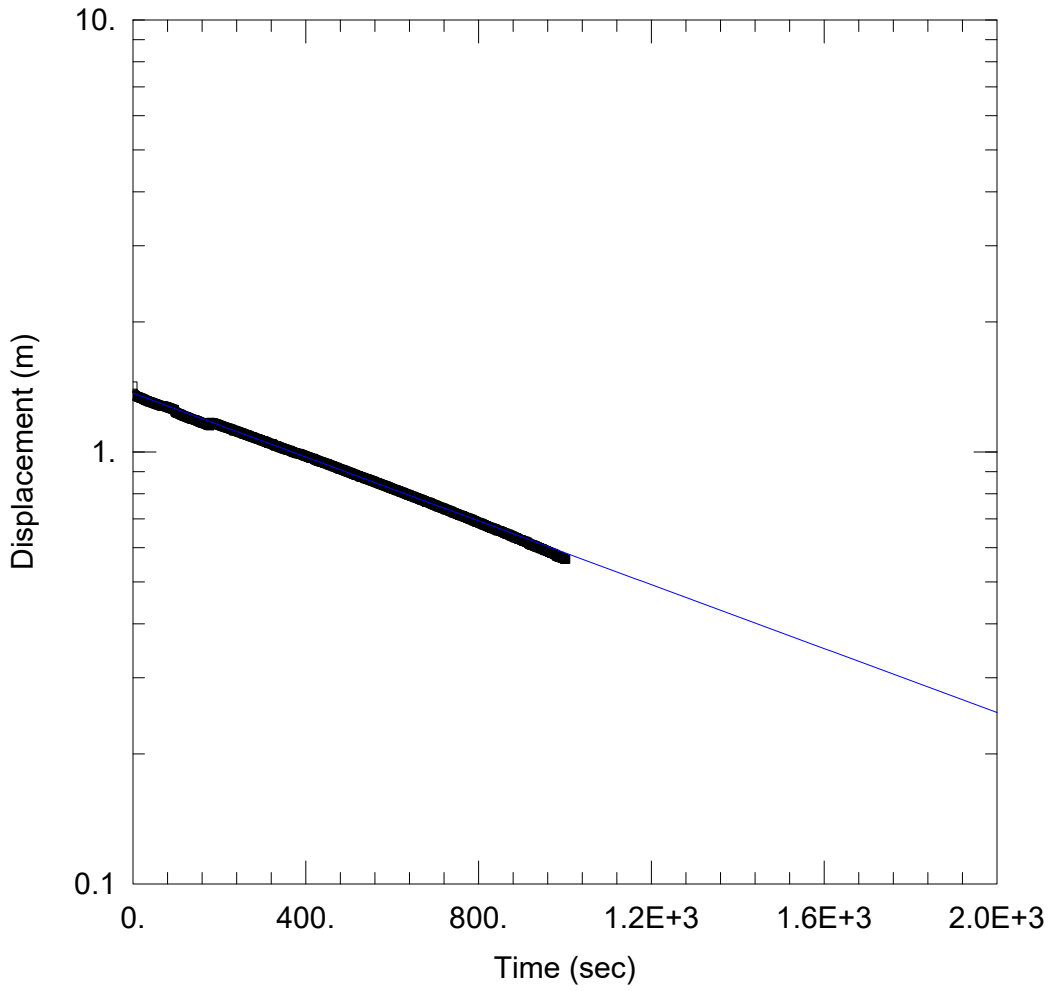
WELL DATA (MW5d)

Initial Displacement: 1.251 m
Total Well Penetration Depth: 7.12 m
Casing Radius: 0.0127 m
Static Water Column Height: 7.03 m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 2.431E-7 m/sec y0 = 1.242 m



WELL TEST ANALYSIS

Data Set: C:\...\MW5d - Insertion Test 2.aqt
Date: 12/15/18 Time: 16:43:16

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.03 m Anisotropy Ratio (Kz/Kr): 0.01

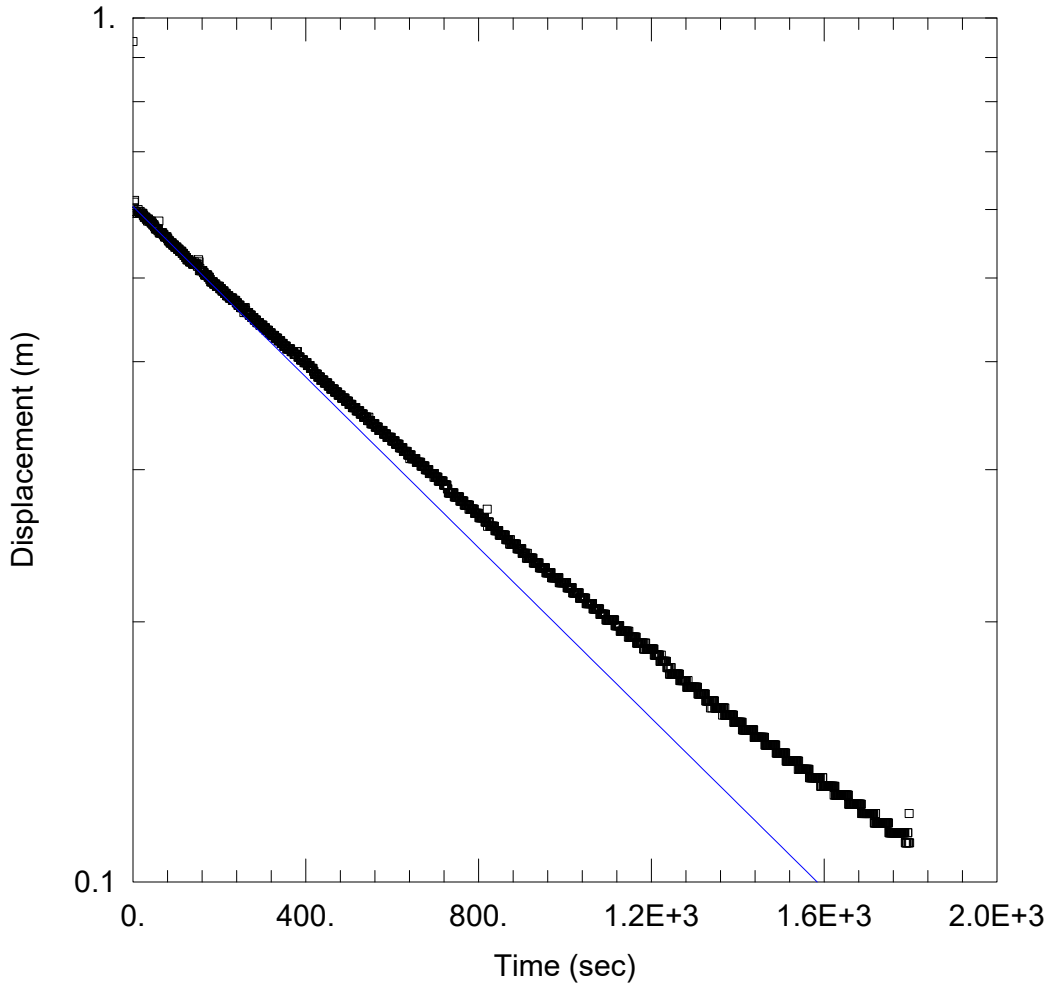
WELL DATA (MW5d)

Initial Displacement: 1.422 m
Total Well Penetration Depth: 7.12 m
Casing Radius: 0.0127 m
Static Water Column Height: 7.03 m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 3.272E-7 m/sec y0 = 1.368 m



WELL TEST ANALYSIS

Data Set: C:\...\MW6 - FH 1.aqt
Date: 12/15/18 Time: 16:44:33

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.61 m Anisotropy Ratio (Kz/Kr): 0.01

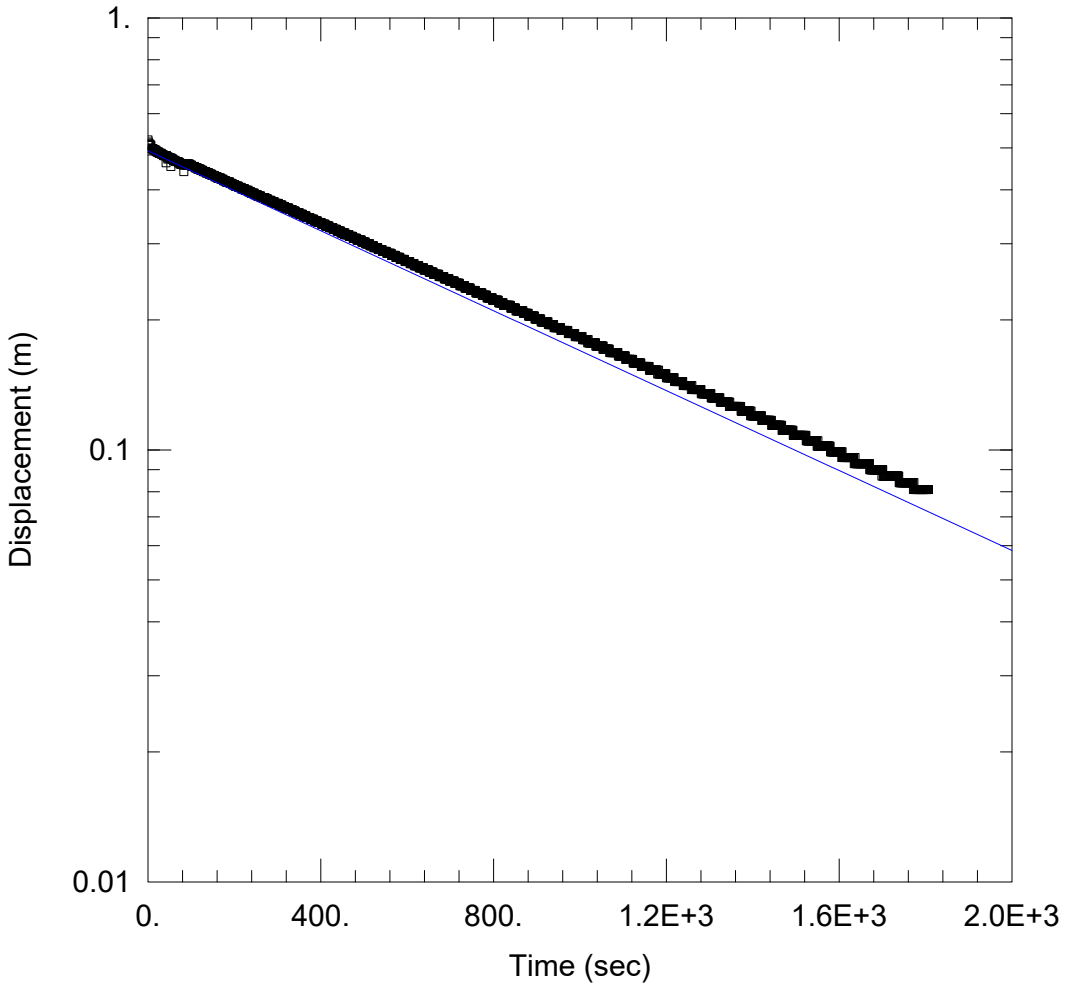
WELL DATA (MW6)

Initial Displacement: 0.939 m
Total Well Penetration Depth: 7.37 m
Casing Radius: 0.0254 m
Static Water Column Height: 7.38 m
Screen Length: 1.52 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.422E-6 m/sec y0 = 0.6049 m



WELL TEST ANALYSIS

Data Set: C:\...\MW6 - RH 1.aqt
Date: 12/15/18 Time: 16:44:44

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 7.61 m Anisotropy Ratio (Kz/Kr): 0.01

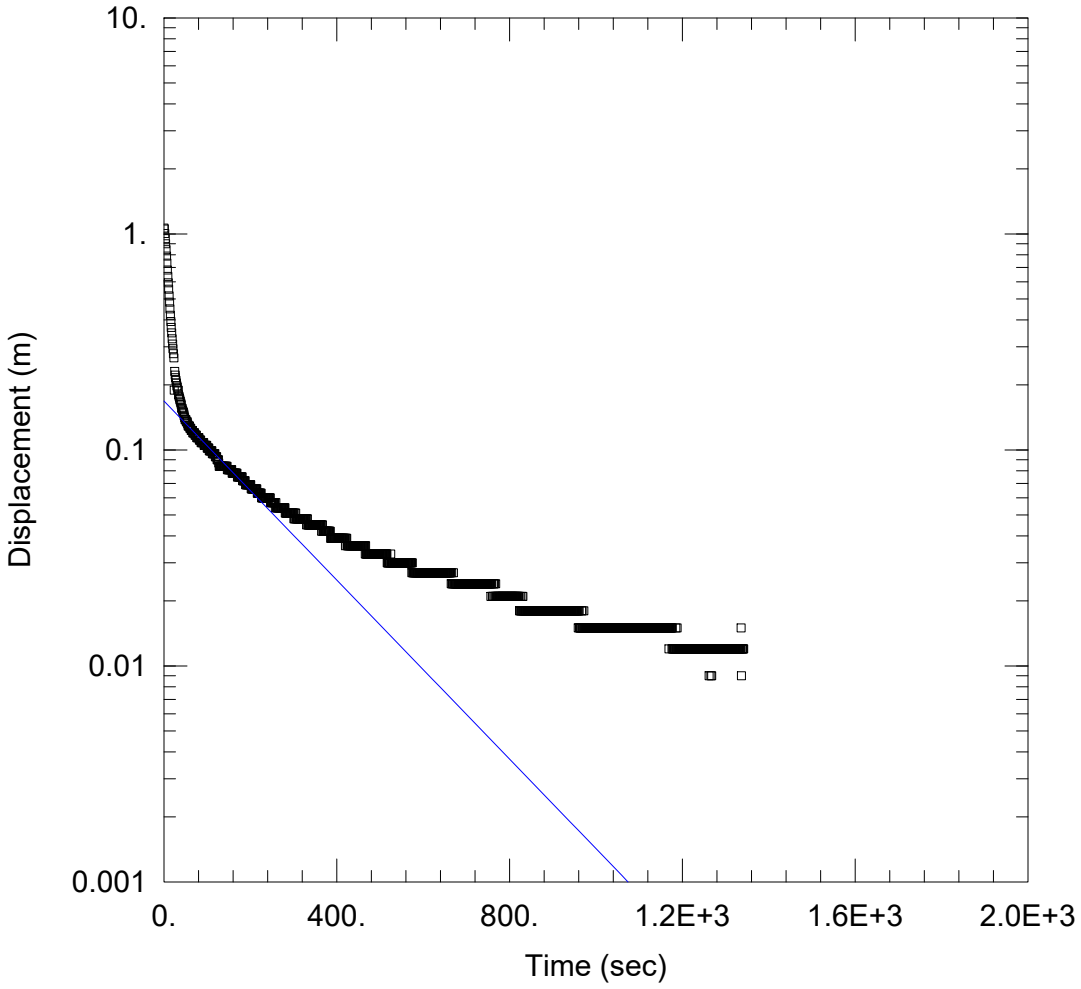
WELL DATA (MW6)

Initial Displacement: 0.522 m
Total Well Penetration Depth: 7.37 m
Casing Radius: 0.0254 m
Static Water Column Height: 7.38 m
Screen Length: 1.52 m
Well Radius: 0.0254 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.332E-6 m/sec y0 = 0.4922 m



WELL TEST ANALYSIS

Data Set: C:\...\MW7s - Insertion Test 1.aqt
Date: 12/15/18 Time: 16:45:04

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-23

AQUIFER DATA

Saturated Thickness: 9.35 m Anisotropy Ratio (Kz/Kr): 0.01

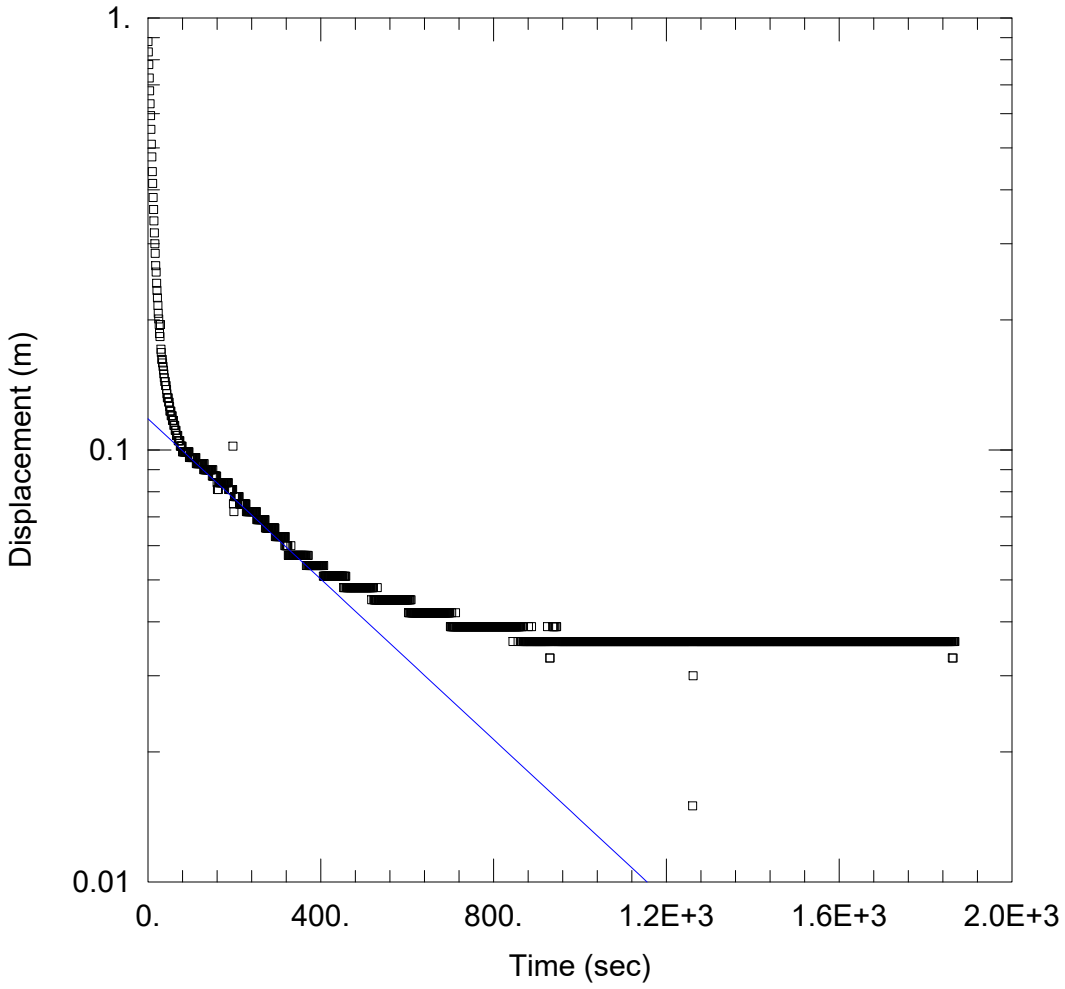
WELL DATA (MW7s)

Initial Displacement: 1.065 m
Total Well Penetration Depth: 1.44 m
Casing Radius: 0.0127 m
Static Water Column Height: 1.45 m
Screen Length: 1.44 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.483E-6 m/sec y0 = 0.1683 m



WELL TEST ANALYSIS

Data Set: C:\...\MW7s - Insertion Test 2.aqt
Date: 12/15/18 Time: 16:45:15

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-23

AQUIFER DATA

Saturated Thickness: 9.35 m Anisotropy Ratio (Kz/Kr): 0.01

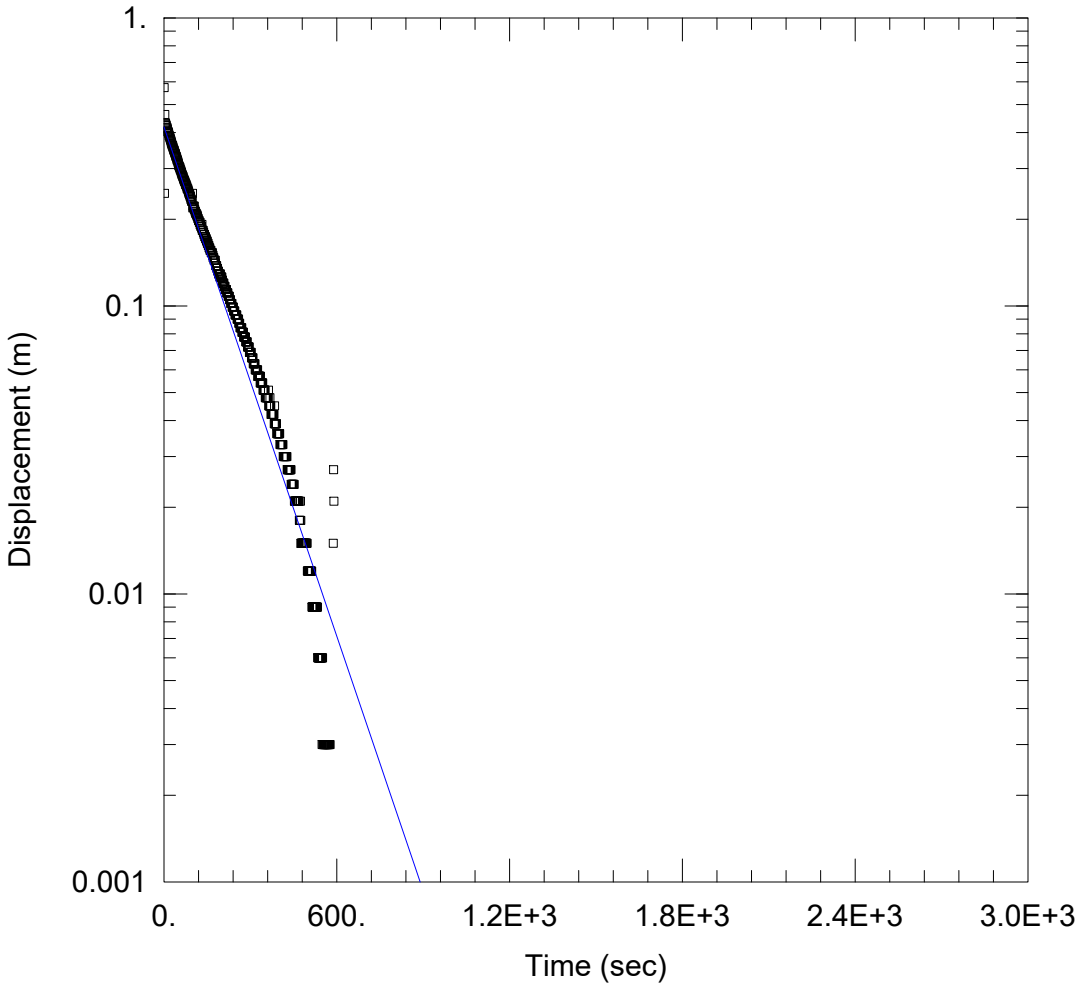
WELL DATA (MW7s)

Initial Displacement: 0.882 m
Total Well Penetration Depth: 1.44 m
Casing Radius: 0.0127 m
Static Water Column Height: 1.45 m
Screen Length: 1.44 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 6.641E-7 m/sec y0 = 0.118 m



WELL TEST ANALYSIS

Data Set: C:\...\MW7d - FH 1.aqt
Date: 12/15/18 Time: 16:45:28

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 8.84 m Anisotropy Ratio (Kz/Kr): 0.01

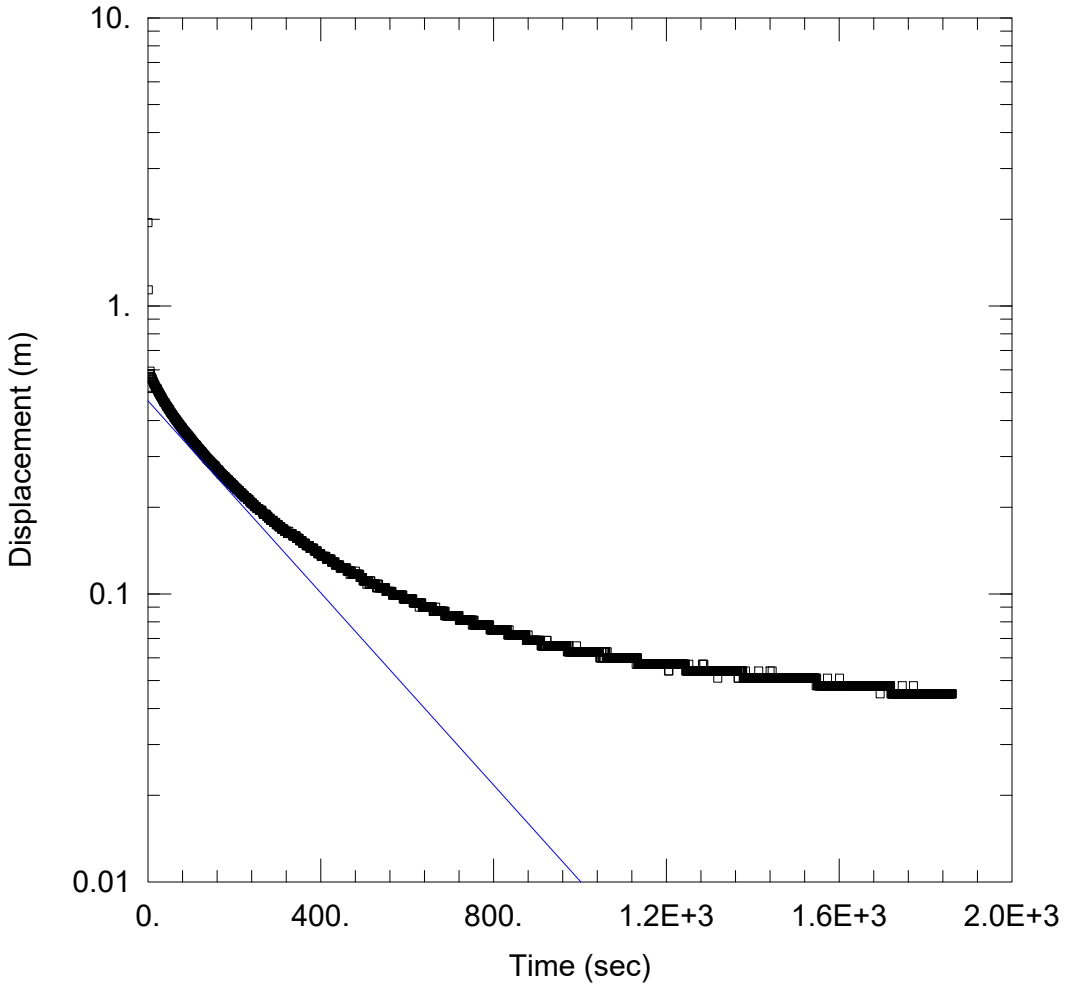
WELL DATA (MW7d)

Initial Displacement: 1.815 m
Total Well Penetration Depth: 4.29 m
Casing Radius: 0.0127 m
Static Water Column Height: 5.81 m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 2.276E-6 m/sec y0 = 0.4184 m



WELL TEST ANALYSIS

Data Set: C:\...\MW7d - RH 1.aqt
Date: 12/15/18 Time: 16:45:40

PROJECT INFORMATION

Company: Palmer Environmental
Client: AMI
Project: 17018
Location: Ambershaw
Test Date: 2017-10-22

AQUIFER DATA

Saturated Thickness: 8.84 m Anisotropy Ratio (Kz/Kr): 0.01

WELL DATA (MW7d)

Initial Displacement: 1.947 m
Total Well Penetration Depth: 4.29 m
Casing Radius: 0.0127 m
Static Water Column Height: 5.81 m
Screen Length: 1.52 m
Well Radius: 0.0127 m
Gravel Pack Porosity: 0.

SOLUTION

Aquifer Model: Unconfined Solution Method: Bouwer-Rice

K = 1.288E-6 m/sec y0 = 0.4681 m

Appendix G

MECP WATER WELL RECORDS (MECP, 2017)

WellID	Depth (m)	WaterLevel (m)	WaterYield (lps)	Water use	Water status	Screen depth (m)	Top (m)	Bottom (m)	GIN Lithology	Hydraulic conductivity	Consolidation	X UTM NAD83 z15	Y UTM NAD83 z15
3102132	121.92	N/A	N/A	Commercial	Abandoned-Supply	N/A	57.91	80.47	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	598279.3853835742	5474425.944558308
3102132	121.92	N/A	N/A	Commercial	Abandoned-Supply	N/A	80.47	121.92	Conglomerate Bedrock	N/A	Indurated	598279.3853835742	5474425.944558308
3102132	121.92	N/A	N/A	Commercial	Abandoned-Supply	N/A	0.00	9.14	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	598279.3853835742	5474425.944558308
3102132	121.92	N/A	N/A	Commercial	Abandoned-Supply	N/A	9.14	54.86	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	598279.3853835742	5474425.944558308
3102132	121.92	N/A	N/A	Commercial	Abandoned-Supply	N/A	54.86	57.91	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	598279.3853835742	5474425.944558308
3100043	21.34	15.24	13.64	Commercial	Water Supply	N/A	1.83	21.34	Granite	3E-14 to 2E-10m.s-1	Indurated	595579.4090076343	5475425.975368504
3100043	21.34	15.24	13.64	Commercial	Water Supply	N/A	0.00	1.83	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	595579.4090076343	5475425.975368504
3100171	7.92	0.91	N/A	Commercial	Water Supply	N/A	0.00	4.57	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	548789.6925171689	5492576.049140559
3100171	7.92	0.91	N/A	Commercial	Water Supply	N/A	4.57	7.62	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	548789.6925171689	5492576.049140559
3100171	7.92	0.91	N/A	Commercial	Water Supply	N/A	7.62	7.92	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	548789.6925171689	5492576.049140559
3100818	5.79	2.13	4.55	Commercial	Water Supply	N/A	4.57	5.79	Clay Sand	to 4.7E-9m.s-1; 2E-7 to 6E-	Unconsolidated	530979.5649252392	5501226.044118167
3100818	5.79	2.13	4.55	Commercial	Water Supply	N/A	0.00	2.13	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	530979.5649252392	5501226.044118167
3100818	5.79	2.13	4.55	Commercial	Water Supply	N/A	2.13	4.57	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	530979.5649252392	5501226.044118167
3100920	28.35	2.13	22.73	Commercial	Water Supply	N/A	0.00	3.66	Gravel Sand	to 3E-2m.s-1; 2E-7 to 6E-3r	Unconsolidated	597979.4104607906	5475226.01700958
3100920	28.35	2.13	22.73	Commercial	Water Supply	N/A	3.66	28.35	Granite	3E-14 to 2E-10m.s-1	Indurated	597979.4104607906	5475226.01700958
3101138	13.41	8.23	109.11	Commercial	Water Supply	N/A	0.00	4.27	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	597179.4209257339	5474575.993355698
3101138	13.41	8.23	109.11	Commercial	Water Supply	N/A	13.11	13.41	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	597179.4209257339	5474575.993355698
3101138	13.41	8.23	109.11	Commercial	Water Supply	N/A	4.27	4.88	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	597179.4209257339	5474575.993355698
3101138	13.41	8.23	109.11	Commercial	Water Supply	N/A	4.88	13.11	Clay Unknown material Sand	to 4.7E-9m.s-1; 2E-7 to 6E-	Unconsolidated	597179.4209257339	5474575.993355698
3102940	92.96	2.44	13.64	Commercial	Water Supply	N/A	39.62	39.93	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	537058.6110237682	5501400.0336022675
3102940	92.96	2.44	13.64	Commercial	Water Supply	N/A	0.00	0.91	Gravel Anthropogenic material	3E-4 to 3E-2m.s-1	Unconsolidated	537058.6110237682	5501400.0336022675
3102940	92.96	2.44	13.64	Commercial	Water Supply	N/A	50.29	92.96	Unknown material Unknown material	N/A	Indurated	537058.6110237682	5501400.0336022675
3102940	92.96	2.44	13.64	Commercial	Water Supply	N/A	39.93	50.29	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	537058.6110237682	5501400.0336022675
3102940	92.96	2.44	13.64	Commercial	Water Supply	N/A	32.00	39.62	Granite	3E-14 to 2E-10m.s-1	Indurated	537058.6110237682	5501400.0336022675
3102940	92.96	2.44	13.64	Commercial	Water Supply	N/A	0.91	9.14	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	537058.6110237682	5501400.0336022675
3102940	92.96	2.44	13.64	Commercial	Water Supply	N/A	9.14	32.00	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	537058.6110237682	5501400.0336022675
3102941	67.06	12.19	18.18	Commercial	Water Supply	N/A	0.00	4.88	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	537058.6110237682	5501400.0336022675
3102941	67.06	12.19	18.18	Commercial	Water Supply	N/A	4.88	67.06	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	537058.6110237682	5501400.0336022675
3100195	24.69	2.44	36.37	Domestic	Water Supply	N/A	0.00	1.22	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	538179.6206569776	5501827.968392738
3100195	24.69	2.44	36.37	Domestic	Water Supply	N/A	1.22	24.69	Bedrock	N/A	Indurated	538179.6206569776	5501827.968392738
3100196	21.03	5.18	9.09	Domestic	Water Supply	N/A	0.00	21.03	Bedrock	N/A	Indurated	539064.581166097	5502224.968135962
3100197	27.43	3.66	9.09	Domestic	Water Supply	N/A	0.00	2.74	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	538778.6000010594	5502136.970970136
3100197	27.43	3.66	9.09	Domestic	Water Supply	N/A	2.74	27.43	Gravel Bedrock	3E-4 to 3E-2m.s-1	Unconsolidated	538778.6000010594	5502136.970970136
3100462	10.67	0.61	4.55	Domestic	Water Supply	N/A	10.36	10.67	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	537781.6166813353	5496926.040587072
3100462	10.67	0.61	4.55	Domestic	Water Supply	N/A	0.00	10.36	Clay Sand	to 4.7E-9m.s-1; 2E-7 to 6E-	Unconsolidated	537781.6166813353	5496926.040587072
3100463	9.14	1.83	4.55	Domestic	Water Supply	N/A	0.00	7.92	Clay Sand	to 4.7E-9m.s-1; 2E-7 to 6E-	Unconsolidated	537889.6091720171	5496624.044341042
3100463	9.14	1.83	4.55	Domestic	Water Supply	N/A	7.92	9.14	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	537889.6091720171	5496624.044341042
3100464	14.02	3.66	4.55	Domestic	Water Supply	N/A	0.00	9.14	Clay Sand	to 4.7E-9m.s-1; 2E-7 to 6E-	Unconsolidated	537780.6341517867	5496226.032555513
3100464	14.02	3.66	4.55	Domestic	Water Supply	N/A	9.14	14.02	Granite	3E-14 to 2E-10m.s-1	Indurated	537780.6341517867	5496226.032555513
3100465	14.63	3.35	4.55	Domestic	Water Supply	N/A	0.00	6.71	Clay Sand	to 4.7E-9m.s-1; 2E-7 to 6E-	Unconsolidated	537979.603312778	5495943.016600366
3100465	14.63	3.35	4.55	Domestic	Water Supply	N/A	6.71	14.63	Granite	3E-14 to 2E-10m.s-1	Indurated	537979.603312778	5495943.016600366
3100736	38.40	4.88	9.09	Domestic	Water Supply	N/A	0.00	38.40	Bedrock	N/A	Indurated	536979.6059118315	5499225.990563934
3100737	23.47	12.19	9.09	Domestic	Water Supply	N/A	0.00	23.47	Bedrock	N/A	Indurated	535979.6310943434	5502225.969972341
3100740	41.15	4.57	9.09	Domestic	Water Supply	N/A	0.00	41.15	Bedrock	N/A	Indurated	536987.9354676914	5499222.044760282
3100832	74.07	3.66	13.64	Domestic	Water Supply	N/A	0.00	2.74	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	595979.4156959684	5475226.03114153
3100832	74.07	3.66	13.64	Domestic	Water Supply	N/A	2.74	22.86	Granite	3E-14 to 2E-10m.s-1	Indurated	595979.4156959684	5475226.03114153
3100832	74.07	3.66	13.64	Domestic	Water Supply	N/A	22.86	74.07	Granite	3E-14 to 2E-10m.s-1	Indurated	595979.4156959684	5475226.03114153
3100893	7.92	5.49	N/A	Domestic	Water Supply	N/A	0.00	4.88	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	548779.6752580279	5492225.951328302
3100893	7.92	5.49	N/A	Domestic	Water Supply	N/A	4.88	6.71	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	548779.6752580279	5492225.951328302
3100893	7.92	5.49	N/A	Domestic	Water Supply	N/A	6.71	7.92	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	548779.6752580279	5492225.951328302
3100897	5.49	N/A	9.09	Domestic	Water Supply	N/A	5.49	5.49	Bedrock	N/A	Indurated	550979.6706923273	5493025.974539529
3100897	5.49	N/A	9.09	Domestic	Water Supply	N/A	3.35	5.49	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	550979.6706923273	5493025.974539529
3100897	5.49	N/A	9.09	Domestic	Water Supply	N/A	0.00	3.35	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	550979.6706923273	5493025.974539529
3100911	10.67	N/A	N/A	Domestic	Water Supply	N/A	0.00	6.10	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	536779.6201533991	5499225.965963239
3100911	10.67	N/A	N/A	Domestic	Water Supply	N/A	6.10	10.67	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	536779.6201533991	5499225.965963239
3100940	11.28	0.30	4.55	Domestic	Water Supply	From 10.3632 to 11.58	0.00	1.22	Anthropogenic material	N/A	Unconsolidated	595979.4156959684	5475226.03114153
3100940	11.28	0.30	4.55	Domestic	Water Supply	From 10.3632 to 11.58	1.22	11.28	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	595979.4156959684	5475226.03114153
3100941	39.62	5.49	27.28	Domestic	Water Supply	From 13.716 to 14.94	0.00	5.49	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	597979.4016945296	5474225.956816246
3100941	39.62	5.49	27.28	Domestic	Water Supply	From 13.716 to 14.94	5.49	14.63	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	597979.4016945296	5474225.956816246
3100941	39.62	5.49	27.28	Domestic	Water Supply	From 13.716 to 14.94	14.63	39.62	Gravel Sand	to 3E-2m.s-1; 2E-7 to 6E-3r	Unconsolidated	597979.4016945296	5474225.956816246
3101032	67.67	3.05	45.46	Domestic	Water Supply	N/A	0.00	6.10	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	595979.4156959684	5475226.03114153
3101032	67.67	3.05	45.46	Domestic	Water Supply	N/A	10.36	67.67	Granite	3E-14 to 2E-10m.s-1	Indurated	595979.4156959684	5475226.03114153
3101032	67.67	3.05	45.46	Domestic	Water Supply	N/A	6.10	10.36	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	595979.4156959684	5475226.03114153
3101059	30.18	6.40	113.65	Domestic	Water Supply	N/A	4.88	25.60	Bedrock	N/A	Indurated	536379.626455117	5502425.987720173
3101059	30.18	6.40	113.65	Domestic	Water Supply	N/A	25.60	30.18	Bedrock	N/A	Indurated	536379.626455117	5502425.987720173
3101059	30.18	6.40	113.65	Domestic	Water Supply	N/A	0.00	4.88	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	536379.626455117	5502425.987720173
3101158	16.15	8.23	36.37	Domestic	Water Supply	N/A	0.00	14.02	Gravel Sand	to 3E-2m.s-1; 2E-7 to 6E-3r	Unconsolidated	597229.3913068976	5474825.977713348

WellID	Depth (m)	WaterLevel (m)	WaterYield (lps)	Water use	Water status	Screen depth (m)	Top (m)	Bottom (m)	GIN Lithology	Hydraulic conductivity	Consolidation	X UTM NAD83 z15	Y UTM NAD83 z15
3101158	16.15	8.23	36.37	Domestic	Water Supply	N/A	14.02	15.24	Diamicton	N/A	Unconsolidated	597229.3913068976	5474825.977713348
3101158	16.15	8.23	36.37	Domestic	Water Supply	N/A	15.24	16.15	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	597229.3913068976	5474825.977713348
3101159	42.67	22.56	36.37	Domestic	Water Supply	N/A	3.66	42.67	Granite	3E-14 to 2E-10m.s-1	Indurated	594829.3709993367	5474626.05172979
3101159	42.67	22.56	36.37	Domestic	Water Supply	N/A	0.00	3.66	Gravel Gravel	to 3E-2m.s-1; 3E-4 to 3E-2r	Unconsolidated	594829.3709993367	5474626.05172979
3101169	15.54	10.67	22.73	Domestic	Water Supply	N/A	0.00	0.61	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	597279.3941255739	5474776.046503625
3101169	15.54	10.67	22.73	Domestic	Water Supply	N/A	0.61	9.14	Gravel Gravel	to 3E-2m.s-1; 3E-4 to 3E-2r	Unconsolidated	597279.3941255739	5474776.046503625
3101169	15.54	10.67	22.73	Domestic	Water Supply	N/A	9.14	15.54	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	597279.3941255739	5474776.046503625
3101283	24.99	1.83	9.09	Domestic	Water Supply	N/A	0.00	4.88	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	595929.395076177	5474975.947573524
3101283	24.99	1.83	9.09	Domestic	Water Supply	N/A	4.88	24.99	Granite	3E-14 to 2E-10m.s-1	Indurated	595929.395076177	5474975.947573524
3101286	48.77	4.57	13.64	Domestic	Water Supply	N/A	0.91	48.77	Granite	3E-14 to 2E-10m.s-1	Indurated	595879.3934828648	5475125.9734509885
3101286	48.77	4.57	13.64	Domestic	Water Supply	N/A	0.00	0.91	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	595879.3934828648	5475125.9734509885
3101297	32.31	10.97	27.28	Domestic	Water Supply	N/A	0.00	1.83	Sand Anthropogenic material	2E-7 to 6E-3m.s-1	Unconsolidated	548379.6635943751	5494226.030676596
3101297	32.31	10.97	27.28	Domestic	Water Supply	N/A	1.83	21.03	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	548379.6635943751	5494226.030676596
3101297	32.31	10.97	27.28	Domestic	Water Supply	N/A	21.03	24.69	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	548379.6635943751	5494226.030676596
3101297	32.31	10.97	27.28	Domestic	Water Supply	N/A	24.69	31.39	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	548379.6635943751	5494226.030676596
3101297	32.31	10.97	27.28	Domestic	Water Supply	N/A	31.39	32.31	Gravel Bedrock	3E-4 to 3E-2m.s-1	Unconsolidated	548379.6635943751	5494226.030676596
3101400	15.24	7.62	18.18	Domestic	Water Supply	N/A	0.00	15.24	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	597279.4326151803	5474675.963735974
3101401	14.02	7.32	22.73	Domestic	Water Supply	N/A	0.00	14.02	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	597179.3680081249	5474726.00628711
3101402	15.24	7.01	22.73	Domestic	Water Supply	N/A	0.00	15.24	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	597079.434838196	5474825.983420181
3101403	15.24	5.79	22.73	Domestic	Water Supply	N/A	0.00	15.24	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	597229.3732008149	5474675.963453153
3101406	15.24	7.92	22.73	Domestic	Water Supply	N/A	0.00	15.24	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	597179.4058032247	5474825.979158964
3101564	68.58	4.57	4.55	Domestic	Water Supply	N/A	0.00	14.33	Unconsolidated material Sand	2E-7 to 6E-3m.s-1	Unconsolidated	594829.3874495026	5474825.993797034
3101564	68.58	4.57	4.55	Domestic	Water Supply	N/A	14.33	68.58	Granite	3E-14 to 2E-10m.s-1	Indurated	594829.3874495026	5474825.993797034
3101663	35.05	7.62	0.00	Domestic	Water Supply	N/A	0.00	35.05	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	614979.4004393592	5465026.011453322
3101770	25.60	4.57	9.09	Domestic	Water Supply	N/A	9.14	18.59	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	544279.5909349269	5492226.04202706
3101770	25.60	4.57	9.09	Domestic	Water Supply	N/A	18.59	25.60	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	544279.5909349269	5492226.04202706
3101770	25.60	4.57	9.09	Domestic	Water Supply	N/A	0.00	9.14	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	544279.5909349269	5492226.04202706
3101782	18.29	7.62	N/A	Domestic	Water Supply	N/A	0.00	13.72	Gravel Sand	to 3E-2m.s-1; 2E-7 to 6E-3r	Unconsolidated	599179.4144756421	5474025.945782929
3101782	18.29	7.62	N/A	Domestic	Water Supply	N/A	13.72	18.29	Granite Gravel	to 2E-10m.s-1; 3E-4 to 3E-2	Indurated	599179.4144756421	5474025.945782929
3101814	40.84	9.14	18.18	Domestic	Water Supply	N/A	0.00	12.19	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	549079.6683453436	5493126.018683935
3101814	40.84	9.14	18.18	Domestic	Water Supply	N/A	12.19	15.85	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	549079.6683453436	5493126.018683935
3101814	40.84	9.14	18.18	Domestic	Water Supply	N/A	15.85	40.84	l Unconsolidated material Unknown m	3E-4 to 3E-2m.s-1	Unconsolidated	549079.6683453436	5493126.018683935
3101815	21.64	4.57	13.64	Domestic	Water Supply	N/A	0.00	6.10	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	539479.5808095264	5499325.984685256
3101815	21.64	4.57	13.64	Domestic	Water Supply	N/A	6.10	21.64	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	539479.5808095264	5499325.984685256
3101857	60.96	2.13	22.73	Domestic	Water Supply	N/A	0.00	5.18	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	537579.6094070624	5496025.956578929
3101857	60.96	2.13	22.73	Domestic	Water Supply	N/A	5.18	11.89	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	537579.6094070624	5496025.956578929
3101857	60.96	2.13	22.73	Domestic	Water Supply	N/A	11.89	12.50	Gravel Gravel	to 3E-2m.s-1; 3E-4 to 3E-2r	Unconsolidated	537579.6094070624	5496025.956578929
3101857	60.96	2.13	22.73	Domestic	Water Supply	N/A	12.50	60.96	Granite	3E-14 to 2E-10m.s-1	Indurated	537579.6094070624	5496025.956578929
3101891	46.33	6.40	4.55	Domestic	Water Supply	N/A	0.00	24.99	Unknown material	N/A	Indurated	595914.9638396397	5475228.014259141
3101891	46.33	6.40	4.55	Domestic	Water Supply	N/A	24.99	46.33	Granite	3E-14 to 2E-10m.s-1	Indurated	595914.9638396397	5475228.014259141
3101911	23.16	7.92	27.28	Domestic	Water Supply	N/A	21.95	23.16	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	599079.4119159535	5473626.020936476
3101911	23.16	7.92	27.28	Domestic	Water Supply	N/A	0.00	4.57	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	599079.4119159535	5473626.020936476
3101911	23.16	7.92	27.28	Domestic	Water Supply	N/A	4.57	21.95	Gravel Gravel Sand	.s-1; 3E-4 to 3E-2m.s-1; 2E-	Unconsolidated	599079.4119159535	5473626.020936476
3101950	22.86	3.05	N/A	Domestic	Water Supply	N/A	0.00	13.11	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	547379.7075960616	5492426.050520904
3101950	22.86	3.05	N/A	Domestic	Water Supply	N/A	13.11	22.86	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	547379.7075960616	5492426.050520904
3102130	23.47	N/A	18.18	Domestic	Water Supply	N/A	0.00	1.22	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	596279.3723561243	5472425.9834470665
3102130	23.47	N/A	18.18	Domestic	Water Supply	N/A	1.22	23.47	Granite	3E-14 to 2E-10m.s-1	Indurated	596279.3723561243	5472425.9834470665
3102131	84.43	N/A	18.18	Domestic	Water Supply	N/A	0.00	0.61	Anthropogenic material	N/A	Unconsolidated	595379.415854303	5475526.013917817
3102131	84.43	N/A	18.18	Domestic	Water Supply	N/A	0.61	1.83	Peat	N/A	Unconsolidated	595379.415854303	5475526.013917817
3102131	84.43	N/A	18.18	Domestic	Water Supply	N/A	1.83	11.58	Clay Sand	to 4.7E-9m.s-1; 2E-7 to 6E-	Unconsolidated	595379.415854303	5475526.013917817
3102131	84.43	N/A	18.18	Domestic	Water Supply	N/A	11.58	84.43	Conglomerate	N/A	Indurated	595379.415854303	5475526.013917817
3102216	19.20	7.32	45.46	Domestic	Water Supply	N/A	0.00	4.88	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	537449.6031090694	5499478.0389136495
3102216	19.20	7.32	45.46	Domestic	Water Supply	N/A	4.88	19.20	Bedrock	N/A	Indurated	537449.6031090694	5499478.0389136495
3102480	22.86	N/A	181.84	Domestic	Water Supply	N/A	0.00	2.44	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	596479.3791933066	5472526.028636523
3102480	22.86	N/A	181.84	Domestic	Water Supply	N/A	2.44	22.86	Granite	3E-14 to 2E-10m.s-1	Indurated	596479.3791933066	5472526.028636523
3102485	70.41	7.62	4.55	Domestic	Water Supply	N/A	0.00	4.27	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	538075.5900557095	5499653.948892455
3102485	70.41	7.62	4.55	Domestic	Water Supply	N/A	4.27	8.53	Clay Silt Unknown material	to 4.7E-9m.s-1; 1E-9 to 2E-	Unconsolidated	538075.5900557095	5499653.948892455
3102485	70.41	7.62	4.55	Domestic	Water Supply	N/A	8.53	70.41	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	538075.5900557095	5499653.948892455
3102690	121.92	7.62	9.09	Domestic	Water Supply	N/A	0.00	1.83	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	518979.5143736069	5452225.999965399
3102690	121.92	7.62	9.09	Domestic	Water Supply	N/A	1.83	121.92	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	518979.5143736069	5452225.999965399
3102743	66.14	N/A	4.55	Domestic	Water Supply	N/A	0.00	66.14	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	544559.5978719791	5496481.979327515
3102953	38.10	0.91	90.92	Domestic	Water Supply	N/A	36.58	38.10	Gravel Unknown material	3E-4 to 3E-2m.s-1	Unconsolidated	596179.3649497353	5474226.046087798
3102953	38.10	0.91	90.92	Domestic	Water Supply	N/A	32.00	36.58	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	596179.3649497353	5474226.046087798
3102953	38.10	0.91	90.92	Domestic	Water Supply	N/A	0.00	24.38	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	596179.3649497353	5474226.046087798
3102953	38.10	0.91	90.92	Domestic	Water Supply	N/A	24.38	32.00	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	596179.3649497353	5474226.046087798
3103015	23.16	1.83	68.19	Domestic	Water Supply	N/A	0.00	0.61	Gravel Anthropogenic material	3E-4 to 3E-2m.s-1	Unconsolidated	595979.4120445697	5474725.950844818
3103015	23.16	1.83	68.19	Domestic	Water Supply	N/A	0.61	2.44	Soil	N/A	Unconsolidated	595979.4120445697	5474725.950844818

WellID	Depth (m)	WaterLevel (m)	WaterYield (lps)	Water use	Water status	Screen depth (m)	Top (m)	Bottom (m)	GIN Lithology	Hydraulic conductivity	Consolidation	X UTM NAD83 z15	Y UTM NAD83 z15
3103015	23.16	1.83	68.19	Domestic	Water Supply	N/A	16.46	16.76	Gravel Gravel	to 3E-2m.s-1; 3E-4 to 3E-2r	Unconsolidated	595979.4120445697	5474725.950844818
3103015	23.16	1.83	68.19	Domestic	Water Supply	N/A	16.76	23.16	Granite	3E-14 to 2E-10m.s-1	Indurated	595979.4120445697	5474725.950844818
3103015	23.16	1.83	68.19	Domestic	Water Supply	N/A	2.44	16.46	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	595979.4120445697	5474725.950844818
3103048	70.71	N/A	45.46	Domestic	Water Supply	N/A	0.00	2.44	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	548566.7303577568	5494909.037504579
3103048	70.71	N/A	45.46	Domestic	Water Supply	N/A	2.44	70.71	Unknown material Unknown material	N/A	Indurated	548566.7303577568	5494909.037504579
3103073	15.24	1.22	0.00	Domestic	Water Supply	N/A	12.80	15.24	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	596079.3693875391	5474326.040016704
3103073	15.24	1.22	0.00	Domestic	Water Supply	N/A	0.00	3.05	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596079.3693875391	5474326.040016704
3103073	15.24	1.22	0.00	Domestic	Water Supply	N/A	3.05	12.80	Sand Sand Unknown material	to 6E-3m.s-1; 2E-7 to 6E-3r	Unconsolidated	596079.3693875391	5474326.040016704
3103103	24.99	N/A	13.64	Domestic	Water Supply	N/A	6.10	11.89	Silt Unknown material	1E-9 to 2E-5m.s-1	Unconsolidated	536531.5880699656	5501954.038697652
3103103	24.99	N/A	13.64	Domestic	Water Supply	N/A	11.89	24.99	Bedrock Unknown material	N/A	Indurated	536531.5880699656	5501954.038697652
3103103	24.99	N/A	13.64	Domestic	Water Supply	N/A	0.00	6.10	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	536531.5880699656	5501954.038697652
3103135	28.35	4.57	18.18	Domestic	Water Supply	N/A	21.34	27.13	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	549386.696332461	5494902.97257336
3103135	28.35	4.57	18.18	Domestic	Water Supply	N/A	27.13	28.35	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	549386.696332461	5494902.97257336
3103135	28.35	4.57	18.18	Domestic	Water Supply	N/A	0.00	21.34	Clay Sand	to 4.7E-9m.s-1; 2E-7 to 6E-3	Unconsolidated	549386.696332461	5494902.97257336
3103264	37.49	1.52	18.18	Domestic	Water Supply	N/A	4.27	37.49	Granite	3E-14 to 2E-10m.s-1	Indurated	595879.4289348308	5474825.948339467
3103264	37.49	1.52	18.18	Domestic	Water Supply	N/A	3.35	4.27	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	595879.4289348308	5474825.948339467
3103264	37.49	1.52	18.18	Domestic	Water Supply	N/A	0.00	3.35	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	595879.4289348308	5474825.948339467
3103342	53.95	N/A	9.09	Domestic	Water Supply	N/A	0.00	7.32	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	594579.3648032633	5474026.014272256
3103342	53.95	N/A	9.09	Domestic	Water Supply	N/A	7.32	53.95	nite Unknown material Unknown mate	3E-14 to 2E-10m.s-1	Indurated	594579.3648032633	5474026.014272256
3103418	23.47	0.91	22.73	Domestic	Water Supply	N/A	0.00	22.25	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	596629.3912005037	5473476.013742902
3103418	23.47	0.91	22.73	Domestic	Water Supply	N/A	22.25	23.47	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596629.3912005037	5473476.013742902
3103426	31.09	N/A	418.24	Domestic	Water Supply	N/A	0.00	5.49	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596579.3799233272	5472576.054011758
3103426	31.09	N/A	418.24	Domestic	Water Supply	N/A	5.49	18.29	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	596579.3799233272	5472576.054011758
3103426	31.09	N/A	418.24	Domestic	Water Supply	N/A	18.29	31.09	nite Unknown material Unknown mate	3E-14 to 2E-10m.s-1	Indurated	596579.3799233272	5472576.054011758
3103427	46.33	N/A	4.55	Domestic	Water Supply	N/A	0.00	2.74	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	594729.4019473529	5473225.953186267
3103427	46.33	N/A	4.55	Domestic	Water Supply	N/A	2.74	4.88	Granite Gravel Unknown material	to 2E-10m.s-1; 3E-4 to 3E-2	Indurated	594729.4019473529	5473225.953186267
3103427	46.33	N/A	4.55	Domestic	Water Supply	N/A	4.88	46.33	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	594729.4019473529	5473225.953186267
3103428	53.95	9.14	22.73	Domestic	Water Supply	N/A	0.00	1.83	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	594629.3693240617	5474125.959870357
3103428	53.95	9.14	22.73	Domestic	Water Supply	N/A	3.96	53.95	nite Unknown material Unknown mate	3E-14 to 2E-10m.s-1	Indurated	594629.3693240617	5474125.959870357
3103428	53.95	9.14	22.73	Domestic	Water Supply	N/A	1.83	3.96	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	594629.3693240617	5474125.959870357
3103429	53.95	10.67	31.82	Domestic	Water Supply	N/A	0.00	7.62	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	594629.3745512859	5474176.000905041
3103429	53.95	10.67	31.82	Domestic	Water Supply	N/A	7.62	22.25	known material Granite Unknown mate	3E-14 to 2E-10m.s-1	Indurated	594629.3745512859	5474176.000905041
3103429	53.95	10.67	31.82	Domestic	Water Supply	N/A	22.25	53.95	Granite	3E-14 to 2E-10m.s-1	Indurated	594629.3745512859	5474176.000905041
3103430	24.69	7.62	45.46	Domestic	Water Supply	N/A	0.00	9.14	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	596129.4316776602	5474326.029737294
3103430	24.69	7.62	45.46	Domestic	Water Supply	N/A	9.14	24.69	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	596129.4316776602	5474326.029737294
3103431	53.95	N/A	4.55	Domestic	Water Supply	N/A	0.00	3.96	nd Unknown material Unknown mater	2E-7 to 6E-3m.s-1	Unconsolidated	594729.4178028508	5474826.040997143
3103431	53.95	N/A	4.55	Domestic	Water Supply	N/A	3.96	53.95	nite Unknown material Unknown mate	3E-14 to 2E-10m.s-1	Indurated	594729.4178028508	5474826.040997143
3103470	79.25	N/A	13.64	Domestic	Water Supply	N/A	0.00	3.05	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	594729.4277227047	5474926.0120302
3103470	79.25	N/A	13.64	Domestic	Water Supply	N/A	3.05	79.25	Granite	3E-14 to 2E-10m.s-1	Indurated	594729.4277227047	5474926.0120302
3103537	61.87	N/A	0.00	Domestic	Water Supply	N/A	0.00	3.96	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	595779.3805862971	5474876.01630434
3103537	61.87	N/A	0.00	Domestic	Water Supply	N/A	3.96	61.87	Granite	3E-14 to 2E-10m.s-1	Indurated	595779.3805862971	5474876.01630434
3103552	21.34	1.22	0.00	Domestic	Water Supply	N/A	6.10	13.72	Sand Sand Unknown material	to 6E-3m.s-1; 2E-7 to 6E-3r	Unconsolidated	574379.3241428508	5476525.9651330905
3103552	21.34	1.22	0.00	Domestic	Water Supply	N/A	13.72	19.81	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	574379.3241428508	5476525.9651330905
3103552	21.34	1.22	0.00	Domestic	Water Supply	N/A	19.81	21.34	Gravel Unknown material	3E-4 to 3E-2m.s-1	Unconsolidated	574379.3241428508	5476525.9651330905
3103552	21.34	1.22	0.00	Domestic	Water Supply	N/A	0.00	6.10	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	574379.3241428508	5476525.9651330905
3103553	12.19	N/A	0.00	Domestic	Water Supply	N/A	0.00	5.49	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	595729.392738408	5474925.961040971
3103553	12.19	N/A	0.00	Domestic	Water Supply	N/A	5.49	12.19	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	595729.392738408	5474925.961040971
3104359	23.47	4.57	18.18	Domestic	Water Supply	N/A	0.00	1.52	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	549441.9641115788	5495865.002654406
3104359	23.47	4.57	18.18	Domestic	Water Supply	N/A	9.75	21.64	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	549441.9641115788	5495865.002654406
3104359	23.47	4.57	18.18	Domestic	Water Supply	N/A	21.64	22.25	Silt	1E-9 to 2E-5m.s-1	Unconsolidated	549441.9641115788	5495865.002654406
3104359	23.47	4.57	18.18	Domestic	Water Supply	N/A	22.25	22.56	Clay Gravel	to 4.7E-9m.s-1; 3E-4 to 3E-2	Unconsolidated	549441.9641115788	5495865.002654406
3104359	23.47	4.57	18.18	Domestic	Water Supply	N/A	22.56	22.86	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	549441.9641115788	5495865.002654406
3104359	23.47	4.57	18.18	Domestic	Water Supply	N/A	1.52	9.75	Silt Sand	to 2E-5m.s-1; 2E-7 to 6E-3r	Unconsolidated	549441.9641115788	5495865.002654406
3104359	23.47	4.57	18.18	Domestic	Water Supply	N/A	22.86	23.47	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	549441.9641115788	5495865.002654406
3104429	85.34	6.70	N/A	Domestic	Water Supply	N/A	0.00	6.70	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	614286.0791154908	5464356.036422857
3104429	85.34	6.70	N/A	Domestic	Water Supply	N/A	6.70	85.34	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	614286.0791154908	5464356.036422857
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	15.24	32.00	Granite	3E-14 to 2E-10m.s-1	Indurated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	0.00	1.52	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	74.68	74.68	N/A	N/A	Unconsolidated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	65.53	74.68	Granite	3E-14 to 2E-10m.s-1	Indurated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	50.29	65.53	Granite	3E-14 to 2E-10m.s-1	Indurated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	32.00	50.29	Granite	3E-14 to 2E-10m.s-1	Indurated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	10.67	15.24	Granite	3E-14 to 2E-10m.s-1	Indurated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	10.36	10.67	Granite	3E-14 to 2E-10m.s-1	Indurated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	9.75	10.36	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	1.52	3.05	Silt	1E-9 to 2E-5m.s-1	Unconsolidated	594567.0223581637	5474060.0511794975
3104434	74.68	1.52	22.73	Domestic	Water Supply	N/A	3.05	9.75	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	594567.0223581637	5474060.0511794975

WellID	Depth (m)	WaterLevel (m)	WaterYield (lps)	Water use	Water status	Screen depth (m)	Top (m)	Bottom (m)	GIN Lithology	Hydraulic conductivity	Consolidation	X UTM NAD83 z15	Y UTM NAD83 z15
3104611	225.00	12.00	4.00	Domestic	Water Supply	N/A	0.00	5.00	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	535561.9833366731	5498052.000253027
3104611	225.00	12.00	4.00	Domestic	Water Supply	N/A	142.00	160.00	Granite	3E-14 to 2E-10m.s-1	Indurated	535561.9833366731	5498052.000253027
3104611	225.00	12.00	4.00	Domestic	Water Supply	N/A	160.00	225.00	Granite	3E-14 to 2E-10m.s-1	Indurated	535561.9833366731	5498052.000253027
3104611	225.00	12.00	4.00	Domestic	Water Supply	N/A	5.00	142.00	Granite	3E-14 to 2E-10m.s-1	Indurated	535561.9833366731	5498052.000253027
6102381	76.20	5.79	0.00	Domestic	Water Supply	N/A	0.00	3.35	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	597279.3692379686	5475426.032885679
6102381	76.20	5.79	0.00	Domestic	Water Supply	N/A	3.35	76.20	Granite Granite	o 2E-10m.s-1; 3E-14 to 2E-1	Indurated	597279.3692379686	5475426.032885679
7042179	18.00	N/A	N/A	Domestic	Water Supply	N/A	0.00	12.00	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	594670.0350395046	5474321.044643888
7042179	18.00	N/A	N/A	Domestic	Water Supply	N/A	12.00	214.00	nite Unknown material Unknown mate	3E-14 to 2E-10m.s-1	Indurated	594670.0350395046	5474321.044643888
7044968	50.29	6.00	20.00	Domestic	Water Supply	N/A	0.00	10.05	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	536049.0278210945	5498948.001852015
7044968	50.29	6.00	20.00	Domestic	Water Supply	N/A	10.05	50.29	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	536049.0278210945	5498948.001852015
7052838	80.77	2.40	22.75	Domestic	Water Supply	N/A	0.00	9.14	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	541246.987094108	5498514.037458538
7052838	80.77	2.40	22.75	Domestic	Water Supply	N/A	9.14	10.97	Sand Unknown material	2E-7 to 6E-3m.s-1	Unconsolidated	541246.987094108	5498514.037458538
7052838	80.77	2.40	22.75	Domestic	Water Supply	N/A	10.97	80.77	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	541246.987094108	5498514.037458538
3100868	10.06	3.05	227.30	Industrial	Water Supply	N/A	0.00	0.61	Unconsolidated material	N/A	Unconsolidated	597979.3819551643	5473226.009295601
3100868	10.06	3.05	227.30	Industrial	Water Supply	N/A	4.57	6.10	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	597979.3819551643	5473226.009295601
3100868	10.06	3.05	227.30	Industrial	Water Supply	N/A	6.10	10.06	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	597979.3819551643	5473226.009295601
3100868	10.06	3.05	227.30	Industrial	Water Supply	N/A	0.61	4.57	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	597979.3819551643	5473226.009295601
3101036	30.48	6.40	45.46	Industrial	Water Supply	N/A	7.01	25.60	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	574979.2965743988	5481226.028982295
3101036	30.48	6.40	45.46	Industrial	Water Supply	N/A	29.26	30.48	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	574979.2965743988	5481226.028982295
3101036	30.48	6.40	45.46	Industrial	Water Supply	N/A	25.60	29.26	nite Unknown material Unknown mate	3E-14 to 2E-10m.s-1	Indurated	574979.2965743988	5481226.028982295
3101036	30.48	6.40	45.46	Industrial	Water Supply	N/A	0.00	1.22	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	574979.2965743988	5481226.028982295
3101036	30.48	6.40	45.46	Industrial	Water Supply	N/A	6.40	7.01	Bedrock Unknown material	N/A	Indurated	574979.2965743988	5481226.028982295
3101036	30.48	6.40	45.46	Industrial	Water Supply	N/A	1.22	6.40	Granite Unknown material	3E-14 to 2E-10m.s-1	Indurated	574979.2965743988	5481226.028982295
3101810	17.68	4.57	45.46	Industrial	Water Supply	N/A	0.00	17.68	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	598779.3841446694	5473925.965103998
7107904	4.60	N/A	N/A	Monitoring	Test Hole	N/A	0.00	1.00	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596805.9989816927	5474776.990050296
7107904	4.60	N/A	N/A	Monitoring	Test Hole	N/A	1.00	4.60	Sand Gravel Unknown material	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596805.9989816927	5474776.990050296
3104433	85.00	N/A	N/A	N/A	Abandoned-Other	From 79.0 to 85.00	0.00	33.00	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	605159.9631982232	5480148.03766802
3104433	85.00	N/A	N/A	N/A	Abandoned-Other	From 79.0 to 85.00	70.00	85.00	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	605159.9631982232	5480148.03766802
3104433	85.00	N/A	N/A	N/A	Abandoned-Other	From 79.0 to 85.00	33.00	48.00	Till	1E-12 to 2E-6m.s-1	Unconsolidated	605159.9631982232	5480148.03766802
3104433	85.00	N/A	N/A	N/A	Abandoned-Other	From 79.0 to 85.00	48.00	70.00	Silt Clay	o 2E-5m.s-1; 1E-11 to 4.7E-9	Unconsolidated	605159.9631982232	5480148.03766802
3104435	11.58	N/A	N/A	N/A	Abandoned-Other	From 10.0584 to 11.58	8.84	10.06	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	605299.9754209813	5480434.98843171
3104435	11.58	N/A	N/A	N/A	Abandoned-Other	From 10.0584 to 11.58	10.36	11.58	Gravel Silt Sand	.s-1; 1E-9 to 2E-5m.s-1; 2E-	Unconsolidated	605299.9754209813	5480434.98843171
3104435	11.58	N/A	N/A	N/A	Abandoned-Other	From 10.0584 to 11.58	10.06	10.36	Clay Unknown material	1E-11 to 4.7E-9m.s-1	Unconsolidated	605299.9754209813	5480434.98843171
3104435	11.58	N/A	N/A	N/A	Abandoned-Other	From 10.0584 to 11.58	0.00	0.30	Soil	N/A	Unconsolidated	605299.9754209813	5480434.98843171
3104435	11.58	N/A	N/A	N/A	Abandoned-Other	From 10.0584 to 11.58	0.30	1.52	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	605299.9754209813	5480434.98843171
3104435	11.58	N/A	N/A	N/A	Abandoned-Other	From 10.0584 to 11.58	1.52	4.57	Silt	1E-9 to 2E-5m.s-1	Unconsolidated	605299.9754209813	5480434.98843171
3104435	11.58	N/A	N/A	N/A	Abandoned-Other	From 10.0584 to 11.58	4.57	8.84	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	605299.9754209813	5480434.98843171
3100715	21.34	12.19	N/A	N/A	Abandoned-Supply	N/A	7.62	13.72	Clay Gravel	to 4.7E-9m.s-1; 3E-4 to 3E-2	Unconsolidated	593479.4196465359	5480026.028457784
3100715	21.34	12.19	N/A	N/A	Abandoned-Supply	N/A	0.00	3.05	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	593479.4196465359	5480026.028457784
3100715	21.34	12.19	N/A	N/A	Abandoned-Supply	N/A	13.72	18.29	Diamicton Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	593479.4196465359	5480026.028457784
3100715	21.34	12.19	N/A	N/A	Abandoned-Supply	N/A	3.05	7.62	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	593479.4196465359	5480026.028457784
3100715	21.34	12.19	N/A	N/A	Abandoned-Supply	N/A	18.29	21.34	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	593479.4196465359	5480026.028457784
3101042	19.81	N/A	N/A	N/A	Abandoned-Supply	N/A	0.00	6.10	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	598979.375598634	5474226.050874986
3101042	19.81	N/A	N/A	N/A	Abandoned-Supply	N/A	6.10	12.50	Gravel Gravel	to 3E-2m.s-1; 3E-4 to 3E-2r	Unconsolidated	598979.375598634	5474226.050874986
3101042	19.81	N/A	N/A	N/A	Abandoned-Supply	N/A	12.50	19.81	Granite	3E-14 to 2E-10m.s-1	Indurated	598979.375598634	5474226.050874986
3101044	13.11	N/A	N/A	N/A	Abandoned-Supply	N/A	0.00	13.11	Gravel Gravel	to 3E-2m.s-1; 3E-4 to 3E-2r	Unconsolidated	598979.375598634	5474226.050874986
7133359	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	575721.0246793356	5479455.957260597
7133364	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	536681.030153288	5498313.050400956
7133365	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	596405.9832720065	5473894.97916237
7133366	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	596496.984105303	5471975.995812083
7103101	15.26	N/A	N/A	N/A	Observation Wells	N/A	0.00	15.26	Bedrock	N/A	Indurated	607037.034306529	5466965.970523867
3101804	56.39	12.19	68.19	N/A	Water Supply	N/A	0.00	10.06	Sand Gravel Silt	.s-1; 3E-4 to 3E-2m.s-1; 1E-	Unconsolidated	597279.3727824631	5475225.977048795
3101804	56.39	12.19	68.19	N/A	Water Supply	N/A	10.06	11.58	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	597279.3727824631	5475225.977048795
3101804	56.39	12.19	68.19	N/A	Water Supply	N/A	11.58	56.39	nite Unknown material Unknown mate	3E-14 to 2E-10m.s-1	Indurated	597279.3727824631	5475225.977048795
3100565	8.23	5.18	N/A	Not Used	Observation Wells	N/A	6.71	8.23	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	536779.6201533991	5499225.965963239
3100565	8.23	5.18	N/A	Not Used	Observation Wells	N/A	5.49	6.71	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	536779.6201533991	5499225.965963239
3100565	8.23	5.18	N/A	Not Used	Observation Wells	N/A	0.00	5.49	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	536779.6201533991	5499225.965963239
3100668	28.04	2.44	N/A	Not Used	Observation Wells	N/A	0.00	0.61	Clay Gravel	to 4.7E-9m.s-1; 3E-4 to 3E-2	Unconsolidated	596339.4171473384	5473876.014328809
3100668	28.04	2.44	N/A	Not Used	Observation Wells	N/A	0.61	5.49	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596339.4171473384	5473876.014328809
3100668	28.04	2.44	N/A	Not Used	Observation Wells	N/A	5.49	16.46	Gravel Sand	to 3E-2m.s-1; 2E-7 to 6E-3r	Unconsolidated	596339.4171473384	5473876.014328809
3100668	28.04	2.44	N/A	Not Used	Observation Wells	N/A	23.47	28.04	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-5	Unconsolidated	596339.4171473384	5473876.014328809
3100668	28.04	2.44	N/A	Not Used	Observation Wells	N/A	16.46	23.47	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-5	Unconsolidated	596339.4171473384	5473876.014328809
3100669	18.59	1.83	N/A	Not Used	Test Hole	From 13.716 to 16.76	16.46	18.59	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-5	Unconsolidated	596319.3649645008	5473860.982531196
3100669	18.59	1.83	N/A	Not Used	Test Hole	From 13.716 to 16.76	0.00	0.61	Clay Gravel	to 4.7E-9m.s-1; 3E-4 to 3E-2	Unconsolidated	596319.3649645008	5473860.982531196
3100669	18.59	1.83	N/A	Not Used	Test Hole	From 13.716 to 16.76	0.61	4.27	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596319.3649645008	5473860.982531196
3100669	18.59	1.83	N/A	Not Used	Test Hole	From 13.716 to 16.76	4.27	16.46	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596319.3649645008	5473860.982531196
3100670	31.70	0.91	N/A	Not Used	Observation Wells	From 13.4112 to 17.98	24.99	31.70	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-5	Unconsolidated	596394.4073348182	5473926.023314013

WellID	Depth (m)	WaterLevel (m)	WaterYield (lps)	Water use	Water status	Screen depth (m)	Top (m)	Bottom (m)	GIN Lithology	Hydraulic conductivity	Consolidation	X UTM NAD83 z15	Y UTM NAD83 z15
3100670	31.70	0.91	N/A	Not Used	Observation Wells	From 13.4112 to 17.98	17.68	24.99	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-	Unconsolidated	596394.4073348182	5473926.023314013
3100670	31.70	0.91	N/A	Not Used	Observation Wells	From 13.4112 to 17.98	7.92	17.68	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596394.4073348182	5473926.023314013
3100670	31.70	0.91	N/A	Not Used	Observation Wells	From 13.4112 to 17.98	4.88	7.92	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596394.4073348182	5473926.023314013
3100670	31.70	0.91	N/A	Not Used	Observation Wells	From 13.4112 to 17.98	0.91	4.88	Sand Silt	to 6E-3m.s-1; 1E-9 to 2E-5r	Unconsolidated	596394.4073348182	5473926.023314013
3100670	31.70	0.91	N/A	Not Used	Observation Wells	From 13.4112 to 17.98	0.00	0.91	Clay Gravel	to 4.7E-9m.s-1; 3E-4 to 3E-	Unconsolidated	596394.4073348182	5473926.023314013
3100671	12.50	1.83	N/A	Not Used	Test Hole	N/A	0.00	0.91	Clay Sand Gravel	m.s-1; 2E-7 to 6E-3m.s-1; 3E	Unconsolidated	597619.3856076517	5474375.985809945
3100671	12.50	1.83	N/A	Not Used	Test Hole	N/A	0.91	7.01	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	597619.3856076517	5474375.985809945
3100671	12.50	1.83	N/A	Not Used	Test Hole	N/A	7.01	11.58	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	597619.3856076517	5474375.985809945
3100671	12.50	1.83	N/A	Not Used	Test Hole	N/A	11.58	12.50	Clay Silt Sand	m.s-1; 1E-9 to 2E-5m.s-1; 2E	Unconsolidated	597619.3856076517	5474375.985809945
3100672	42.06	1.83	N/A	Not Used	Observation Wells	N/A	11.58	28.35	Clay Silt Gravel	m.s-1; 1E-9 to 2E-5m.s-1; 3E	Unconsolidated	597614.3789850355	5474376.00768731
3100672	42.06	1.83	N/A	Not Used	Observation Wells	N/A	0.91	11.58	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	597614.3789850355	5474376.00768731
3100672	42.06	1.83	N/A	Not Used	Observation Wells	N/A	0.00	0.91	Clay Sand Gravel	m.s-1; 2E-7 to 6E-3m.s-1; 3E	Unconsolidated	597614.3789850355	5474376.00768731
3100672	42.06	1.83	N/A	Not Used	Observation Wells	N/A	28.35	42.06	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-	Unconsolidated	597614.3789850355	5474376.00768731
3100673	24.08	1.22	N/A	Not Used	Observation Wells	From 17.0688 to 23.77	0.91	18.59	Sand Gravel Gravel	.s-1; 3E-4 to 3E-2m.s-1; 3E-	Unconsolidated	596674.3965159536	5473356.041856589
3100673	24.08	1.22	N/A	Not Used	Observation Wells	From 17.0688 to 23.77	18.59	24.08	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-	Unconsolidated	596674.3965159536	5473356.041856589
3100673	24.08	1.22	N/A	Not Used	Observation Wells	From 17.0688 to 23.77	0.00	0.91	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	596674.3965159536	5473356.041856589
3100674	24.38	1.22	N/A	Not Used	Observation Wells	N/A	0.00	0.91	Anthropogenic material Sand	2E-7 to 6E-3m.s-1	Unconsolidated	596619.4122965073	5473326.04687876
3100674	24.38	1.22	N/A	Not Used	Observation Wells	N/A	0.91	10.97	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596619.4122965073	5473326.04687876
3100674	24.38	1.22	N/A	Not Used	Observation Wells	N/A	10.97	18.59	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596619.4122965073	5473326.04687876
3100674	24.38	1.22	N/A	Not Used	Observation Wells	N/A	18.59	23.16	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-	Unconsolidated	596619.4122965073	5473326.04687876
3100674	24.38	1.22	N/A	Not Used	Observation Wells	N/A	23.16	24.38	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	596619.4122965073	5473326.04687876
3100675	22.86	0.91	N/A	Not Used	Test Hole	From 10.0584 to 16.76	0.91	11.28	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596579.4283689614	5473326.008386336
3100675	22.86	0.91	N/A	Not Used	Test Hole	From 10.0584 to 16.76	11.28	17.07	Gravel Sand	to 3E-2m.s-1; 2E-7 to 6E-3r	Unconsolidated	596579.4283689614	5473326.008386336
3100675	22.86	0.91	N/A	Not Used	Test Hole	From 10.0584 to 16.76	0.00	0.91	Clay Anthropogenic material	1E-11 to 4.7E-9m.s-1	Unconsolidated	596579.4283689614	5473326.008386336
3100675	22.86	0.91	N/A	Not Used	Test Hole	From 10.0584 to 16.76	17.07	22.86	Clay Silt	to 4.7E-9m.s-1; 1E-9 to 2E-	Unconsolidated	596579.4283689614	5473326.008386336
3101803	17.68	N/A	N/A	Not Used	Abandoned-Supply	N/A	0.00	17.68	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	593479.3801092356	5479626.032569907
3104489	4.50	N/A	N/A	Not Used	Test Hole	From 1.5 to 3.00	0.00	4.50	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	596908.0344044326	5474685.051956983
3100042	10.36	7.01	N/A	Public	Water Supply	N/A	0.00	0.30	Sand	2E-7 to 6E-3m.s-1	Unconsolidated	597579.3872856017	5474425.981307288
3100042	10.36	7.01	N/A	Public	Water Supply	N/A	0.30	10.36	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	597579.3872856017	5474425.981307288
3100410	11.28	6.71	113.65	Public	Water Supply	From 10.0584 to 11.28	0.00	0.30	Soil	N/A	Unconsolidated	596349.388980533	5474825.976331743
3100410	11.28	6.71	113.65	Public	Water Supply	From 10.0584 to 11.28	0.30	3.35	Gravel Gravel	to 3E-2m.s-1; 3E-4 to 3E-2r	Unconsolidated	596349.388980533	5474825.976331743
3100410	11.28	6.71	113.65	Public	Water Supply	From 10.0584 to 11.28	3.35	9.75	Gravel Clay	o 3E-2m.s-1; 1E-11 to 4.7E-	Unconsolidated	596349.388980533	5474825.976331743
3100410	11.28	6.71	113.65	Public	Water Supply	From 10.0584 to 11.28	9.75	11.28	Gravel	3E-4 to 3E-2m.s-1	Unconsolidated	596349.388980533	5474825.976331743
6102893	11.28	4.57	136.38	Public	Water Supply	N/A	0.00	11.28	Sand Clay Gravel	-1; 1E-11 to 4.7E-9m.s-1; 3E	Unconsolidated	599479.3674722003	5476925.9551316565
3100044	12.50	6.40	13.64	Public	Water Supply	From 8.5344 to 10.97	0.00	8.23	Clay Gravel Sand	m.s-1; 3E-4 to 3E-2m.s-1; 2E	Unconsolidated	598779.374749414	5473825.991979797
3100044	12.50	6.40	13.64	Public	Water Supply	From 8.5344 to 10.97	8.23	12.50	Gravel Sand Gravel	.s-1; 2E-7 to 6E-3m.s-1; 3E-	Unconsolidated	598779.374749414	5473825.991979797
7120799	24.38	6.78	15.91	Public	Water Supply	N/A	0.00	0.61	Anthropogenic material	N/A	Unconsolidated	606251.9911162241	5450220.995422966
7120799	24.38	6.78	15.91	Public	Water Supply	N/A	0.61	2.13	Granite Gravel Unknown material	to 2E-10m.s-1; 3E-4 to 3E-2	Indurated	606251.9911162241	5450220.995422966
7120799	24.38	6.78	15.91	Public	Water Supply	N/A	2.13	10.67	Clay Sand Gravel	m.s-1; 2E-7 to 6E-3m.s-1; 3E	Unconsolidated	606251.9911162241	5450220.995422966
7120799	24.38	6.78	15.91	Public	Water Supply	N/A	10.67	19.81	Clay Diamicton	1E-11 to 4.7E-9m.s-1	Unconsolidated	606251.9911162241	5450220.995422966
7120799	24.38	6.78	15.91	Public	Water Supply	N/A	19.81	24.69	Gravel Silt	to 3E-2m.s-1; 1E-9 to 2E-5r	Unconsolidated	606251.9911162241	5450220.995422966
3100323	39.62	6.71	4.55	Public	Water Supply	N/A	0.00	3.05	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	515990.49861741916	5485626.977919221
3100323	39.62	6.71	4.55	Public	Water Supply	N/A	3.05	39.62	Granite	3E-14 to 2E-10m.s-1	Indurated	515990.49861741916	5485626.977919221
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	20.12	25.60	Granite	3E-14 to 2E-10m.s-1	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	16.46	20.12	Bedrock Unknown material	N/A	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	36.88	37.19	Granite	3E-14 to 2E-10m.s-1	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	32.00	32.61	Bedrock	N/A	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	37.19	44.20	Granite	3E-14 to 2E-10m.s-1	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	26.21	32.00	Granite	3E-14 to 2E-10m.s-1	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	14.02	16.46	Granite	3E-14 to 2E-10m.s-1	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	0.00	8.84	Clay	1E-11 to 4.7E-9m.s-1	Unconsolidated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	25.60	26.21	Bedrock	N/A	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	32.61	36.88	Granite	3E-14 to 2E-10m.s-1	Indurated	537449.6031090694	5499478.0389136495
3103298	44.20	N/A	18.18	Public	Water Supply	N/A	8.84	14.02	Limestone	1E-9 to 6E-6m.s-1	Indurated	537449.6031090694	5499478.0389136495
3104436	505.00	33.00	1.00	Public	Water Supply	N/A	0.00	26.00	Sand Gravel	to 6E-3m.s-1; 3E-4 to 3E-2r	Unconsolidated	605063.0045638558	5480176.976699538
3104436	505.00	33.00	1.00	Public	Water Supply	N/A	26.00	38.00	Till	1E-12 to 2E-6m.s-1	Unconsolidated	605063.0045638558	5480176.976699538
3104436	505.00	33.00	1.00	Public	Water Supply	N/A	38.00	60.00	Silt Clay	o 2E-5m.s-1; 1E-11 to 4.7E-	Unconsolidated	605063.0045638558	5480176.976699538
3104436	505.00	33.00	1.00	Public	Water Supply	N/A	60.00	73.00	Till	1E-12 to 2E-6m.s-1	Unconsolidated	605063.0045638558	5480176.976699538
3104436	505.00	33.00	1.00	Public	Water Supply	N/A	73.00	90.00	Granite	3E-14 to 2E-10m.s-1	Indurated	605063.0045638558	5480176.976699538
3104436	505.00	33.00	1.00	Public	Water Supply	N/A	90.00	505.00	Granite	3E-14 to 2E-10m.s-1	Indurated	605063.0045638558	5480176.976699538
7042194	N/A	N/A	N/A	Public	Abandoned-Other	N/A	N/A	N/A	N/A	N/A	N/A	598857.9671366867	5473676.951324936

Appendix H

GROUNDWATER QUALITY – FIELD DATA SHEETS

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project	Ambershaw	Stick Up (m)	0.87	Water Col. Height	0.74 m	Notes:
Well ID	MW1	Well Depth(mbtoc)	13.06	Well Diameter	2"	2"D: 2.024L per m
Date	Oct 18, 2017	Water Lvl (mbtoc)	12.32	Min. Purge Vol.	2.024 x 0.74 = 2L	1"D: 0.509L per m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity	Temperature	Conductivity	pH	ORP	DO	
	NO SAMPLE – PUMP FAILURE									

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project	Ambersnow	Stick Up (m)	0.92 m	Water Col. Height	2.92	Notes:
Well ID	MW2	Well Depth(mbtoc)	8.08 mbtoc	Well Diameter	2"	2"D: 2.024L per m
Date	Oct 18, 2017	Water Lvl (mbtoc)	5.16 mbtoc	Min. Purge Vol.	2.92 x 2.024 = 6L	1"D: 0.509L per m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity	Temperature	Conductivity	pH	ORP	DO %/mg/L	
3:41		5.161								
3:57	SAF	6.69	4L							dropped wl, purged 9L
4:02	1L/min	7.00	6L	93.1	10.78	211	6.76	66	61.6/6.7	
4:08	1L/min	7.67	8.5L							
4:10		7.87	9.5L	28.8	9.13	237	5.96	108.2	47.3/5.44	well fully purged →
										7.79 - 17:13
										7.86 - 17:12:02

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project	Amherstview	Stick Up (m)		Water Col. Height			Notes:
Well ID	MW2	Well Depth(mbtoc)		Well Diameter			2"D: 2.024L per m
Date	Oct 19, 2017	Water Lvl (mbtoc)		Min. Purge Vol.	6L		1"D: 0.509L per m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity	Temperature	Conductivity	pH	ORP	DO % / mg/L	
8:57		5.23								
9:12		6.70	4L	21.2	8.71	216	6.69	192.2	60.1/6.97	
9:19	1L/3min 3c.22	7.22	6½L	100	8.9	222	6.56	187.1	59.8/6.93	
9:24		7.55	8L	87	8.63	235	6.58	202.5	76/8.74	
9:30		7.93	10L	210	8.41	255	6.53	192.2	58/6.76	well purged
12:40		5.54								re-visit well.
12:56	SAF.	6.14	2L							
1:00		6.26	2.5L	18.4	10.28	276	7.00	212.2	74.4/8.21	
1:07		6.45	3L	15.2	10.06	272	6.70	190.4	58.3/6.52	
1:12		6.65	4L	13.6	9.91	267	6.58	188.5	60.4/6.79	
1:18		6.77	5L	10.0	10.12	263	6.62	183.8	64/7.19	
1:26		6.92	6L	sample collected						

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project	AmberShaw	Stick Up (m)	0.91	Water Col. Height	2.06	Notes:
Well ID	MW3d	Well Depth(mbtoc)	8.68	Well Diameter	1"	2"D: 2.024L per m
Date	Oct 18, 2017	Water Lvl (mbtoc)	6.62	Min. Purge Vol.	0.509 x 2.06 = 1.05L	1"D: 0.509L per m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity	Temperature	Conductivity	pH	ORP	DO % / mg/L	
1:40		6.62								
1:44		6.97	1L	Parastaltic Pump on.						
1:46		6.965	1.5L							
pm 1:56		6.985	4L	10.9	10.26	381	7.05	27.7	25.2 / 2.75	
2:05		7.005	7L	6.2	9.42	383	7.06	14.4	19.2 / 2.16	
2:33		7.06	9L	4.2	9.72	382	6.98	38.8	16.6 / 1.89	
2:34		Sample collected.								

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project	Ambershaw	Stick Up (m)		Water Col. Height	2.34.	Notes:
Well ID	MW4	Well Depth(mbtoc)	7.32	Well Diameter	2"	2"D: 2.024L per m
Date	Oct 18/2017	Water Lvl (mbtoc)	4.94	Min. Purge Vol.	2.024L x 2.34m = 5	1"D: 0.509L per m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity (NTU)	Temperature	Conductivity us/cm	pH	ORP	DO % / mg	
9:43		4.94		(10)	(0.5)		(0.10)		5 / 1.0	Pumping on.
10:15	10L/57sec	4.94	15L							
10:17		4.94	40L	0.4	7.20	73	7.52	212.2	73.5 / 8.80	(pH Probe on NTU 45) Not working
10:27		4.94	120L	0.5	7.25	71	6.71	226.2	69.3 / 8.37	pH ~~out~~ of (0.10 range)
10:37		4.94	220L	0.5	7.26	71	6.31	236.1	69.4 / 8.39	
10:46		4.94	320L	0.5	7.27	71	6.26	240.0	69.4 / 8.37	Parameters stabilized
10:59		4.94	400L	0.5	7.28	71	6.25	243.3	69.5 / 8.37	
11:05		Sample collected.								

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project	Ambershaw	Stick Up (m)	0.70	Water Col. Height	1.29 m	Notes:
Well ID	MW55	Well Depth(mbtoc)	4.05	Well Diameter	1"	2"D: 2.024L per m
Date	Oct 19, 2017	Water Lvl (mbtoc)	2.81	Min. Purge Vol.	1.24×0.509 = 1L	1"D: 0.509L per m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters: Turbidity	Temperature	Conductivity	pH	ORP	DO % / mg/L	Notes
3:21	1L/4min	3.34	1L	227	12.07	472	6.92	51.3	56/5.92	
3:25		3.57	2L	187.3	11.73	474	6.88	54.9	66.3/7.18	
3:29		3.73	2½L	110	11.39	455	6.68	87.2	58.2/6.47	
3:35		3.95	4L	278.7	11.28	339	6.63	120.2	80.3/8.68	Fully Purged.
Oct 20, 2017										
11:48		2.90								
12:03	1L/3min	3.70	2½L	30	12.9	315	6.77	202	72.1/7.55	
12:09		3.93	4L	93	12.71	310	6.44	210	65.2/6.9	
12:17		4.12	5½L	192	12.62	247	6.4	189.4	72.3/7.67	
1:28	1L/4min	2.93								
1:40		3.31	1[illegible]L	27.7	14.35	259	6.4	216.9	69.8/7.12	
1:50		3.57	2L	20.3	13.27	257	6.4	216.5	70.5/7.37	
		Sample collected								

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

						Notes:
Project	Ambershaw	Stick Up (m)	0.73	Water Col. Height	7.28	2"D: 2.024L per m
Well ID	MW5d	Well Depth(mbtoc)	10.08 mbtoc	Well Diameter	1"	4"D: 0.509L per m
Date	Oct 19, 2017	Water Lvl (mbtoc)	2.80 mbtoc	Min. Purge Vol.	7.28 x 0.509 = 4L	

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity	Temperature	Conductivity	pH	ORP	DO % / mg/L	
3:42		3.10								Stopped + switched tubing
3:50	1L/3min	4.09	1.1/2L							new tubing
4:19		8.80	5.5L	43	11.88	299	7.66	63	52/5.52	
4:26		8.98	6L	89	10.60	300	7.70	31	71/7.89	
4:55		10.08	8L	145	10.80	289	7.18	93	34.3/3.78	
Oct 20, 2017										
11:48		3.14								
12:36	1L/4min	6.71	3L	28.4	11.8	295	7.36	173.7	69.4/7.49	
12:42		7.58	3 1/2L	16.6	11.35	300	7.67	165.5	78.1/8.33	
12:48		8.27	4L	10.7	11.79	300	7.76	123.5	81.7/8.76	
12:55		8.75	~~5~~ 4L	23.9	11.92	293	7.55	149.5	72.7/7.77	
13:13		9.21	~~6~~ 5L	65.4	12.43	286	7.54	144	77.8/8.27	
		sample collected								

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project	Ambershaw	Stick Up (m)	0.82	Water Col. Height	7.35 m	Notes:
Well ID	MW16	Well Depth(mbtoc)	11.49	Well Diameter	2"	2"D: 2.024L per m
Date	Oct 21, 2017	Water Lvl (mbtoc)	4.14	Min. Purge Vol.	7.35 x 2.024 = 15L	1"D: 0.509L per m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity	Temperature	Conductivity	pH	ORP	DO	
1:16		4.14								well fully purged on Oct 20, 2017 (17L.)
1:26		9.83		10.5	10.36	433	6.99	78.4	35.5/3.86	
1:29	1L/3:26	5.20	2L	11.4	9.95	427	6.55	54	28.4/3.1	
1:33		5.77	3½L	14.7	9.86	427	6.58	51	32.7/3.6	
1:37		6.02	5L	14.2	9.81	427	6.54	40.4	30.4/3.4	
1:40		Samples collected								

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

Project	Ambatsaw	Stick Up (m)		Water Col. Height	~1.40 m.	Notes:
Well ID	MW7s	Well Depth(mbtoc)	3.79	Well Diameter	1"	2"D: 2.024L per m
Date	Oct 21/2017.	Water Lvl (mbtoc)	2.31	Min. Purge Vol.	0.75L	1"D: 0.509L per m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity (NTU)	Temperature °C	Conductivity µS/cm.	pH	ORP	DO %/mg/L	
15:39		2.31								DO not in flow through cell
15:45		2.51	1L	605	11.59	132	5.96	157	33.3/3.55	
15:54		2.66	1.5L	70.9	11.21	139	5.80	176.5	24.7/2.70	1 well volume removed
16:00		2.70.	3.0L	46.1	11.09	175	5.93	177.	49.6/5.39	
16:07		2.95	4.0L	86.6	11.2	185	5.86	183.8	21.8/2.38	
16:13		3.16	5.0L	315.4	11.22	167	5.91	186.1	33.5/3.66	
4:18		3.48	6.5L	841.1	11.20	165	6.11	1785	62/6.81	
16:24		3.79	7L							End of well - too turbid to read
	Oct 22.		– static 2.43 mbtoc							
8:43		2.47	1L							
8:52		2.76	2L	85.0	9.69	126	5.94	202.8	57.7/6.14	
8:57.		2.89	2.5L	79.8	9.44	157	5.82	215.3	41.5/4.50	
9:08		3.24	4L	128.1	9.42	170	5.95	218.9	65.6/7.5	
10:19		3.71	6L	157.7	9.35	182	6.29	214.9	76.7/8.78	
4:49		3.71		49.2	11.66	164	6.90	205.8	91.8/9.96	
5:00		Sample collected								

Table 1. Water Quality

PALMER ENVIRONMENTAL CONSULTING GROUP INC.

						Notes:
Project	Ambershaw	Stick Up (m)		Water Col. Height	~6m.	2"D: 2.024L per m
Well ID	MW 7d	Well Depth (mbtoc)	8.79	Well Diameter	1"	1"D: 0.509L per m
Date	Oct 21/2017.	Water Lvl (mbtoc)	2.89	Min. Purge Vol.	3L.	

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters						Notes
				Turbidity	Temperature	Conductivity	pH	ORP	DO	
2:23	1L/4 min	3.39								
2:30		3.72	1½ L	262.2	11.06	228	6.79	-125.6	25.2/2.75	
2:37		3.87	3L	67.8	10.58	216	6.57	-52.4	33.4/3.9	
2:43		3.97	4L	43.3	10.49	206	6.47	-50.3	31.7/2.41	
2:49			5L	32.6	10.44	199	6.54	-8.1	39.0/3.43	
2:54			6L	26.4	10.32	196	6.53	-3.5	34.5/3.76	
2:59		4.14	7L	22.9	10.4	195	6.51	-2.9	32.4/3.61	
		sample collected								

Groundwater Quality Field Sheet

Project	Amherstview	Stick-Up (m)	0.87	Water Col. Height	1.17	Notes
Well ID	MW1	Well Depth (mbtoc)	13.06	Well Diameter	2"	2"D: 2.024 L/m
Date	May 28/18	Water Lvl (mbtoc)	11.89	Min Purge Vol	1.17 x 2.024 = 2.4	1"D: 0.509L/m

Time (hh:mm:ss)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters							NOTES
				Turbidity	Temp	EC	DO	ORP	pH	Vamps	
13:43		11.90									
		H_2O too deep to pump → no sample									

Groundwater Quality Field Sheet

Project	Ainsworth	Stick-Up (m)	0.92	Water Col. Height	4.24		Notes
Well ID	MW2	Well Depth (mbtoc)	8.08	Well Diameter	2"	8.6	2"D: 2.024 L/m
Date	May 25, 2018	Water Lvl (mbtoc)	3.84	Min Purge Vol	4.24 x 2.024 =		1"D: 0.509L/m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters							NOTES
				Turbidity >10	Temp 7 2	EC	pH 7.5	ORP	DO 2.0	Notes	
									mg/L %		
12:24		3.88									
12:26	SAF	3.93									water very clear
12:30		4.10									
12:36	~.03 L/min	4.31	1	0.4	19.92	154	7.47	185.9	8.32	96.7	
12:55		4.32	2.25	1.1	21.17	149	7.15	257.7	8.25	94.3	
13:29		4.325	3.25	1.1	21.05	153	6.98	253	7.7	98.6	
13:49		4.46	4.25	0.8	20.4	160	6.81	277.8	8.24	91.4	
14:16		4.47	5.25	1.1	24	149	6.98	269.1	8.16	97.3	
14:33		4.81	6.25	1.4	15.92	154	6.91	276.7	8.82	89.6	
14:38	.2 L/m	5.19	7.25	1.3	10.33	154	6.87	288.7	8.77	75.9	
14:45		5.36	8.25	2.5	12.42	153	6.84	281	8.72	81.8	Pump left on to purge full 8.6 L
						no Sample					

Groundwater Quality Field Sheet

Project	Aposhian	Stick-Up (m)	0.92	Water Col. Height	4.04	Notes
Well ID	MW 2	Well Depth (mbtoc)	8.08	Well Diameter	2"	2"D: 2.024 L/m
Date	May 26, 2018	Water Lvl (mbtoc)	4.04	Min Purge Vol	4.04 x 2.024 = 8.2	1"D: 0.508 L/m

Time (hr:min:sec)	Purging Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters							Notes
				Turbidity	Temp	EC	pH	ORP	DO	Notes	
10:23		4.065									Day 2 - purge 1 volume
10:30	1 L/min 0.4 L/s	4.45	1	3.4	11.2	161	7.49	131.5	8.88	80.9	- [redacted]
10:37		4.74	2.25	3.6	10.55	165	7.25	184.1	8.98	80.9	
10:59		4.745	3.5	1.4	14.91	167	7.29	213.6	9.1	90	
11:23		4.75	4.75	1.6	17.5	166	7.49	211.4	8.98	93.7	
11:45		4.75	6.0	2.8	19.16	160	7.59	192.6	9	97.5	
12:13		4.75	7.25	2.4	20.74	162	7.6	175.2	8.78	98.1	
12:40		4.75	8.50	2.6	20.9	162	7.65	213.8	8.9	96	
											Static → Sample taken

Groundwater Quality Field Sheet

Project	Ambesten	Stick-Up (m)	0.91	Water Col. Height	2.91	Notes
Well ID	MW3 D	Well Depth (mbtoc)	8.68	Well Diameter	1"	2"D: 2.024 L/m
Date	May 25, 2018	Water Lvl (mbtoc)	5.77	Min Purge Vol	2.91x 0.509L: 1.5L	1"D: 0.509L/m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters: Turbidity >10	Temp >2	EC	pH >0.5	ORP	DO >20	Notes	NOTES
11:07				Pump on							Water murky
11:10		5.82							mg. %		
11:15	1l/5min 0.2l/min	5.82	1	56	17.35	220	7.06	172.2	5.17 54.3		
11:23		5.83	2	22.6	14.35	269	7.48	153.6	6.9 58.4		
11:30		5.83	3	10.6	13.81	270	7.68	170.9	6.45 62.2		Water clearing up.
11:36		5.84	4	6.7	13.03	269	7.72	229.6	6.3 61.2		
											- sample taken

Groundwater Quality Field Sheet

Project	Anglesea	Stick-Up (m)		Water Col. Height	2.53	Notes
Well ID	HLA	Well Depth (mbtoc)	7.32	Well Diameter	2"	2"D: 2.024 l/m
Date	May 25/18	Water Lvl (mbtoc)	4.79	Min Purge Vol	2.024 L x 2.5 = 5	1"D: 0.509l/m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters							NOTES
				>10. Turbidity	°C Temp	EC	>0.5. pH	ORP	DO (2.0)	NOTES	
9:43	.54/m	4.78	1L						mg/%		
9:46.			1L	2.3	9.52	83	7.26	191	8.37 mg/L 78%		Very clear water
9:49			2L	1.5	8.3	75	6.63	225	9.04/77%		
9:54		4.79	3L	1.4	8.4	74	6.43	237	8.8/75		
9:57		4.80	4L	0.9	8.1	75	6.48	237	9.8/78.6		
10:00		4.80	5L	1.3	8.29	75	6.48	233	9.5/81.2		
10:03			6L	0.8	7.9	75	6.44	231.5	9.37/79.2		-
											- sample taken

Groundwater Quality Field Sheet

Project	Aubeshon	Stick-Up (m)	0.70	Water Col. Height	1.89	Notes
Well ID	MW55	Well Depth (mbtoc)	405	Well Diameter	1"	2"D: 2.027L/m
Date	May 26/18	Water Lvl (mbtoc)	2.16	Min Purge Vol	1.89 x 0.509 = .96	1"D: 0.509L/m

Time (hh:mm:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters							NOTES
				Turbidity	Temp	EC	pH	ORP	DO	Notes	
14:24		2.41									H2O pretty murky
14:28	1L/4min	2.7	1L	7.9	14.6	217	7.23	255	8 89.1		
14:37		2.71	2.25L	22.3	13.37	204	6.93	268.1	9.1 87.2		
14:47		2.725	3.25	9.9	10.85	206	7.18	288.6	9.15 83.1		Pump failure ~~Fully purged~~
14:57		2.72	4.5	13.6	10.19	207	7.05	292.8	9.22 82		Fully purged.
											Lo saple
May 28/18											
9:22		2.29									little murky.
9:32	1L/10min	2.615	1L	10.4	15.64	205	7.41	207.8	9.1 92.1		
9:41		2.615	2L	5.4	16.2	201	7.33	248.0	9.14 93.4		

— Sampled!

Groundwater Quality Field Sheet

Project	Anbaeshar	Stick-Up (m)	0.73	Water Col. Height	~~7.76~~	Notes
Well ID	MW5-D	Well Depth (mbtoc)	10.08	Well Diameter	1"	2"D: 2.024 L/m
Date	May 28/18	Water Lvl (mbtoc)	~~2.32~~ 2.32	Min Purge Vol	7.76 × 0.509 = 4L	1"D: 0.509L/m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters							NOTES
				Turbidity	Temp	EC	pH	ORP	DO	Notes	
10:40		~~2.55~~ 2.55			25.8	173	7.2		mg/L %		
11:13		3.02	1L	5.6	~~24.5~~	~~174~~	~~7.27~~	-21.7	6.4~~8~~ 80.~~9~~		Put large tube in
11:29		4.13	2L	5.7	12.2	201	7.19	-49.9	3.9 38.2		
11:42		4.67	3.25	3.~~8~~	16.6	258	7.3	-50.5	66 69		
11:59		4.675	4.5	8.8	20	282	7.6	-0.6	~~5.37~~ 92.2		Fully purged.
12:15		4.7	5.75	4.4	19.8	287	7.86	94.0	~~5.34~~ 91.4		
			Sampled.								

Groundwater Quality Field Sheet

Project	Ambersha	Stick-Up (m)	0.82	Water Col. Height	7.585	Notes
Well ID	MW6	Well Depth (mbtoc)	11.49	Well Diameter	2"	2"D: 2.024 L/m
Date	May 27/18	Water Lvl (mbtoc)	3.905	Min Purge Vol	7.585 x 2.024 = 15L	1"D: 0.509L/m

Time (hh:mm:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters: Turbidity	Temp	EC	pH	ORP	DO	Notes	NOTES
12:45		3.98									
12:53	1L/8min	4.34	1L	5.9	13.19	331	6.95	195.0	6.5 62.8		
13:03		4.38	2L	3.1	18.79	329	7.04	222.4	8.27 88.9		
13:22		4.38	3.25	3.5	18.12	330	7.37	233	8.7 92.2		
13:37		4.38	4.5	2.9	17.23	329	7.65	241.2	9.13 94.8		
13:52		4.38	5.75	2.3	17.20	328	7.82	234.6	8.95 92.5		
14:10		4.38	7.25	2.8	18.76	331	7.87	223.1	8.8 95		
14:28		4.38	8.5	2.4	18.43	329	7.91	232.8	8.78 93		
14:45		4.38	9.75	2.6	16.62	329	7.85	226	9.14 93.6		
14:59		4.395	11	1.8	16.02	329	7.73	229.9	8.8 90.5		
15:14		3.40	12.25	2.8	15.46	331	7.36	231.2	8.32 83.6		
15:28		3.40	13.5	2.1	15.02	329	7.36	234.5	8.55 84.6		
15:44		3.40	14.75	2.4	15.0	329	7.29	274.1	8.61 85.4		

Sample taken!

Groundwater Quality Field Sheet

Project:	Amberstone	Stick-Up (m)	0.68	Water Col. Height	1.55	Notes
Well ID:	MW15	Well Depth (mbtoc)	3.79	Well Diameter	1"	2"D: 2.024 L/m
Date	Nov 27/18	Water Lvl (mbtoc)	2.24	Min Purge Vol	1.55 x 0.509 = 1L	1"D: 0.509L/m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters							NOTES
				Turbidity	Temp	EC	pH	ORP	DO	Notes	
11:10		2.28 ~~2.87~~									
11:14	1L/4m	2.43	1L	15.7	14.09	142	6.35	268.9	5.37 52.8		
11:19		2.565	2L	~~14.98~~ 5.8	11.99	152	6.00	282.9	5.95 55.8		Fully purged
11:25		2.7	3L	10.0	11.58	168	6.03	292.5	5.5 48.1		
11:35		2.73	4L	16.7	13.86	178	6.18	299.2	8.4 79.4		
		Sample collected									

Groundwater Quality Field Sheet

Project	Amboslow	Stick-Up (m)	0.70	Water Col. Height	6.29	Notes
Well ID	MW 7D.	Well Depth (mbtoc)	8.79	Well Diameter	1"	2"D: 2.024 L/m
Date	May 27/18	Water Lvl (mbtoc)	2.50	Min Purge Vol	6.29 x . 509 = 3	1"D: 0.508L/m

Time (hr:min:sec)	Pumping Rate (L/min)	Water Level (mbtoc)	Total Volume Purged (L)	YSI Parameters							NOTES
				Turbidity	Temp	EC	pH	ORP	DO	Notes	
9:36		2.57									
9:44	1L/min	2.97	1L	8.6	12.62	125	7.13	143.9	7.35	73.1	water slightly murky
9:55	1L/min	2.99	2L	13.2	13.10	120	6.88	192.4 193	9.32	88.9	
10:07		2.995	3L	28.6	13.25	130	6.92	193.4	9.24	88.2	Full Purged
10:20		2.995	4L	24.7	13.9	134	6.88	150.2	9.6	93	
		Sample collected.									

Appendix I

GROUNDWATER QUALITY – LABORATORY CERTIFICATE OF ANALYSIS AND CHAIN OF CUSTODY (ALS, 2017; ALS, 2018)

PALMER ENVIRONMENTAL CONSULTING GROUP INC. TORONTO
ATTN: Jake McQueen
374 Wellington Street West
Suite 3
Toronto ON M5V 1E3

Date Received: 23-OCT-17
Report Date: 03-NOV-17 16:05 (MT)
Version: FINAL

Client Phone: 647-795-8153

Certificate of Analysis

Lab Work Order #: L2011542

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

<Original signed by>

Christine Paradis
Project Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-1 MW4 Sampled By: CLIENT on 18-OCT-17 @ 10:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	72.9		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	29.4		0.50	mg/L		31-OCT-17	
pH	7.17		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	<1.0		1.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	57		13	mg/L		25-OCT-17	R3865933
Anions and Nutrients							
Acidity (as CaCO3)	7.3		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	31.3		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	<0.020		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		24-OCT-17	R3865645
Chloride (Cl)	0.20		0.10	mg/L		24-OCT-17	R3865645
Fluoride (F)	0.023		0.020	mg/L		25-OCT-17	R3866721
Nitrate (as N)	0.421		0.020	mg/L		24-OCT-17	R3865645
Nitrite (as N)	<0.010		0.010	mg/L		24-OCT-17	R3865645
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	27-OCT-17	28-OCT-17	R3868784
Total Nitrogen	0.42		0.15	mg/L		29-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-OCT-17	R3865973
Phosphorus (P)-Total	0.0045		0.0030	mg/L	25-OCT-17	27-OCT-17	R3868807
Sulfate (SO4)	5.07		0.30	mg/L		24-OCT-17	R3865645
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	1.8		1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	1.5		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	0.0182		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Arsenic (As)-Total	0.00011		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Barium (Ba)-Total	0.0148		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Boron (B)-Total	<0.010		0.010	mg/L	24-OCT-17	28-OCT-17	R3869083
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Calcium (Ca)-Total	9.87		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Cesium (Cs)-Total	0.000012		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Chromium (Cr)-Total	0.00021		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cobalt (Co)-Total	0.00041		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Copper (Cu)-Total	0.00191		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Iron (Fe)-Total	0.032		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Lead (Pb)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Lithium (Li)-Total	<0.0010		0.0010	mg/L	24-OCT-17	27-OCT-17	R3868641
Magnesium (Mg)-Total	1.09		0.0050	mg/L	24-OCT-17	27-OCT-17	R3868641
Manganese (Mn)-Total	0.0131		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-1 MW4 Sampled By: CLIENT on 18-OCT-17 @ 10:00 Matrix: Surface Water							
Total Metals							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.000462		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Nickel (Ni)-Total	0.00189		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Potassium (K)-Total	2.23		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Rubidium (Rb)-Total	0.00143		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Selenium (Se)-Total	0.000066		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Silicon (Si)-Total	7.33		0.10	mg/L	24-OCT-17	27-OCT-17	R3868641
Silver (Ag)-Total	<0.000010		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Sodium (Na)-Total	2.03		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Strontium (Sr)-Total	0.0274		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Sulfur (S)-Total	1.74		0.50	mg/L	24-OCT-17	27-OCT-17	R3868641
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Thorium (Th)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Tin (Sn)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Titanium (Ti)-Total	0.00085		0.00030	mg/L	24-OCT-17	27-OCT-17	R3868641
Tungsten (W)-Total	0.00338		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Uranium (U)-Total	0.000099		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Vanadium (V)-Total	<0.00050		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	24-OCT-17	27-OCT-17	R3868641
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0041		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.0142		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	9.95		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	0.00014		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.00039		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.00163		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-1 MW4 Sampled By: CLIENT on 18-OCT-17 @ 10:00 Matrix: Surface Water							
Dissolved Metals							
Magnesium (Mg)-Dissolved	1.10		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	0.0122		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.000405		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	0.00174		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	2.17		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.00124		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	0.000138		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	7.40		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	2.01		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.0266		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Sulfur (S)-Dissolved	1.87		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.00298		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.000084		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.0022		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917
L2011542-2 MW3D Sampled By: CLIENT on 18-OCT-17 @ 14:30 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	373		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	171		0.50	mg/L		31-OCT-17	
pH	8.07		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	1.3		1.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	231		20	mg/L		25-OCT-17	R3865933
Anions and Nutrients							
Acidity (as CaCO3)	5.3		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	242		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	<0.020		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		24-OCT-17	R3865645
Chloride (Cl)	0.18		0.10	mg/L		24-OCT-17	R3865645
Fluoride (F)	0.069		0.020	mg/L		24-OCT-17	R3865645
Nitrate (as N)	<0.020		0.020	mg/L		24-OCT-17	R3865645
Nitrite (as N)	<0.010		0.010	mg/L		24-OCT-17	R3865645

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-2 MW3D Sampled By: CLIENT on 18-OCT-17 @ 14:30 Matrix: Surface Water							
Anions and Nutrients							
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	27-OCT-17	28-OCT-17	R3868784
Total Nitrogen	<0.15		0.15	mg/L		29-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-OCT-17	R3865973
Phosphorus (P)-Total	<0.0030		0.0030	mg/L	30-OCT-17	31-OCT-17	R3871129
Sulfate (SO4)	28.6		0.30	mg/L		24-OCT-17	R3865645
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	1.6	DTC	1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	1.2		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	0.0224		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Antimony (Sb)-Total	0.00015		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Arsenic (As)-Total	0.00022		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Barium (Ba)-Total	0.221		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Boron (B)-Total	<0.010		0.010	mg/L	24-OCT-17	28-OCT-17	R3869083
Cadmium (Cd)-Total	0.0000124		0.0000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Calcium (Ca)-Total	58.8		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Cesium (Cs)-Total	0.000075		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Chromium (Cr)-Total	0.00016		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cobalt (Co)-Total	0.00134		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Copper (Cu)-Total	<0.00050		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Iron (Fe)-Total	0.456		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Lead (Pb)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Lithium (Li)-Total	0.0029		0.0010	mg/L	24-OCT-17	27-OCT-17	R3868641
Magnesium (Mg)-Total	5.20		0.0050	mg/L	24-OCT-17	27-OCT-17	R3868641
Manganese (Mn)-Total	0.288		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.00114		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Nickel (Ni)-Total	0.00085		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Potassium (K)-Total	18.2		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Rubidium (Rb)-Total	0.0214		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Selenium (Se)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Silicon (Si)-Total	6.88		0.10	mg/L	24-OCT-17	27-OCT-17	R3868641
Silver (Ag)-Total	<0.000010		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Sodium (Na)-Total	1.91		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Strontium (Sr)-Total	0.299		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Sulfur (S)-Total	10.8		0.50	mg/L	24-OCT-17	27-OCT-17	R3868641
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-2 MW3D Sampled By: CLIENT on 18-OCT-17 @ 14:30 Matrix: Surface Water							
Total Metals							
Thallium (Tl)-Total	0.000019		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Thorium (Th)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Tin (Sn)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Titanium (Ti)-Total	0.00094		0.00030	mg/L	24-OCT-17	27-OCT-17	R3868641
Tungsten (W)-Total	0.0110		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Uranium (U)-Total	0.000844		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Vanadium (V)-Total	<0.00050		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Zinc (Zn)-Total	0.0412		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	24-OCT-17	27-OCT-17	R3868641
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0038		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917
Antimony (Sb)-Dissolved	0.00013		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	0.00017		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.215		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	0.0000131		0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	59.3		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	0.000068		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	0.00045	DTC	0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.00130		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.00032		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	0.225		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	0.0032		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Magnesium (Mg)-Dissolved	5.53		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	0.279		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.00105		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	0.00102		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	18.2		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.0211		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	6.87		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	1.84		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.292		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-2 MW3D Sampled By: CLIENT on 18-OCT-17 @ 14:30 Matrix: Surface Water							
Dissolved Metals							
Sulfur (S)-Dissolved	10.3		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	0.000021		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.0101		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.000828		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.0242		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917
L2011542-3 MW2 Sampled By: CLIENT on 19-OCT-17 @ 13:30 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	250		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	112		0.50	mg/L		31-OCT-17	
pH	7.48		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	31.2		1.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	154		13	mg/L		24-OCT-17	R3866078
Anions and Nutrients							
Acidity (as CaCO3)	19.4		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	133		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	0.051		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		24-OCT-17	R3865645
Chloride (Cl)	0.11		0.10	mg/L		24-OCT-17	R3865645
Fluoride (F)	0.028		0.020	mg/L		24-OCT-17	R3865645
Nitrate (as N)	0.130		0.020	mg/L		24-OCT-17	R3865645
Nitrite (as N)	<0.010		0.010	mg/L		24-OCT-17	R3865645
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	27-OCT-17	29-OCT-17	R3868784
Total Nitrogen	<0.15		0.15	mg/L		29-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-OCT-17	R3865973
Phosphorus (P)-Total	0.0115		0.0030	mg/L	25-OCT-17	27-OCT-17	R3868807
Sulfate (SO4)	11.2		0.30	mg/L		24-OCT-17	R3865645
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	3.6		1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	3.2		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	1.56		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Arsenic (As)-Total	0.00099		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-3 MW2 Sampled By: CLIENT on 19-OCT-17 @ 13:30 Matrix: Surface Water							
Total Metals							
Barium (Ba)-Total	0.0885		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Boron (B)-Total	<0.010		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cadmium (Cd)-Total	0.000201		0.0000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Calcium (Ca)-Total	39.1		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Cesium (Cs)-Total	0.000059		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Chromium (Cr)-Total	0.00093		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cobalt (Co)-Total	0.00244		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Copper (Cu)-Total	0.00842		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Iron (Fe)-Total	2.66		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Lead (Pb)-Total	0.000435		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Lithium (Li)-Total	0.0014		0.0010	mg/L	24-OCT-17	27-OCT-17	R3868641
Magnesium (Mg)-Total	3.04		0.0050	mg/L	24-OCT-17	27-OCT-17	R3868641
Manganese (Mn)-Total	0.140		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.000528		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Nickel (Ni)-Total	0.00314		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Potassium (K)-Total	4.27		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Rubidium (Rb)-Total	0.00632		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Selenium (Se)-Total	0.000191		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Silicon (Si)-Total	11.0		0.10	mg/L	24-OCT-17	27-OCT-17	R3868641
Silver (Ag)-Total	0.000015		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Sodium (Na)-Total	5.27		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Strontium (Sr)-Total	0.105		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Sulfur (S)-Total	3.33		0.50	mg/L	24-OCT-17	27-OCT-17	R3868641
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Thallium (Tl)-Total	0.000020		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Thorium (Th)-Total	0.00051		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Tin (Sn)-Total	0.00017		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Titanium (Ti)-Total	0.0413		0.00030	mg/L	24-OCT-17	27-OCT-17	R3868641
Tungsten (W)-Total	0.00920		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Uranium (U)-Total	0.000809		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Vanadium (V)-Total	0.00816		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Zinc (Zn)-Total	0.0645		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Zirconium (Zr)-Total	0.000436		0.000060	mg/L	24-OCT-17	27-OCT-17	R3868641
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0096		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-3 MW2 Sampled By: CLIENT on 19-OCT-17 @ 13:30 Matrix: Surface Water							
Dissolved Metals							
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	0.00047		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.0807		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	0.000200		0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	40.4		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	0.00011		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.00129		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.00339		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Magnesium (Mg)-Dissolved	2.72		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	0.100		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.000482		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	0.00191		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	4.34		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.00598		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	0.000187		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	8.43		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	5.35		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.100		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Sulfur (S)-Dissolved	3.63		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	0.000017		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.00837		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.000740		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.0654		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917
L2011542-4 MW5D Sampled By: CLIENT on 20-OCT-17 @ 13:30 Matrix: Surface Water							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-4 MW5D Sampled By: CLIENT on 20-OCT-17 @ 13:30 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	294		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	142		0.50	mg/L		31-OCT-17	
pH	7.63		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	20.0		1.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	184		20	mg/L		26-OCT-17	R3867707
Anions and Nutrients							
Acidity (as CaCO3)	5.4		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	173		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	<0.020		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		24-OCT-17	R3865645
Chloride (Cl)	0.54		0.10	mg/L		24-OCT-17	R3865645
Fluoride (F)	0.030		0.020	mg/L		24-OCT-17	R3865645
Nitrate (as N)	0.680		0.020	mg/L		24-OCT-17	R3865645
Nitrite (as N)	<0.010		0.010	mg/L		24-OCT-17	R3865645
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	27-OCT-17	28-OCT-17	R3868784
Total Nitrogen	0.68		0.15	mg/L		29-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-OCT-17	R3865973
Phosphorus (P)-Total	0.0110		0.0030	mg/L	25-OCT-17	27-OCT-17	R3868807
Sulfate (SO4)	2.88		0.30	mg/L		24-OCT-17	R3865645
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	1.1		1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	1.5		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	1.66		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Arsenic (As)-Total	0.00030		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Barium (Ba)-Total	0.0644		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Boron (B)-Total	<0.010		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cadmium (Cd)-Total	0.0000345		0.0000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Calcium (Ca)-Total	49.8		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Cesium (Cs)-Total	0.000079		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Chromium (Cr)-Total	0.00414		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cobalt (Co)-Total	0.00112		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Copper (Cu)-Total	0.00640		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Iron (Fe)-Total	1.36		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Lead (Pb)-Total	0.000408		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Lithium (Li)-Total	<0.0010		0.0010	mg/L	24-OCT-17	27-OCT-17	R3868641
Magnesium (Mg)-Total	4.95		0.0050	mg/L	24-OCT-17	27-OCT-17	R3868641
Manganese (Mn)-Total	0.115		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-4 MW5D Sampled By: CLIENT on 20-OCT-17 @ 13:30 Matrix: Surface Water							
Total Metals							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.000746		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Nickel (Ni)-Total	0.00203		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Potassium (K)-Total	4.34		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Rubidium (Rb)-Total	0.00462		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Selenium (Se)-Total	0.000294		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Silicon (Si)-Total	9.98		0.10	mg/L	24-OCT-17	27-OCT-17	R3868641
Silver (Ag)-Total	<0.000010		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Sodium (Na)-Total	3.16		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Strontium (Sr)-Total	0.132		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Sulfur (S)-Total	1.24		0.50	mg/L	24-OCT-17	27-OCT-17	R3868641
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Thallium (Tl)-Total	0.000016		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Thorium (Th)-Total	0.00076		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Tin (Sn)-Total	0.00012		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Titanium (Ti)-Total	0.0599		0.00030	mg/L	24-OCT-17	27-OCT-17	R3868641
Tungsten (W)-Total	0.00588		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Uranium (U)-Total	0.00151		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Vanadium (V)-Total	0.00337		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Zinc (Zn)-Total	0.0272		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Zirconium (Zr)-Total	0.000469		0.000060	mg/L	24-OCT-17	27-OCT-17	R3868641
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0093		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	0.00012		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.0501		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	0.0000162		0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	48.9		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	0.00050		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.00040		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.00234		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-4 MW5D Sampled By: CLIENT on 20-OCT-17 @ 13:30 Matrix: Surface Water							
Dissolved Metals							
Magnesium (Mg)-Dissolved	4.87		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	0.0903		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.000710		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	4.22		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.00324		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	0.000334		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	7.31		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	3.09		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.121		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Sulfur (S)-Dissolved	1.12		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	0.000011		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.00512		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.00138		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.0130		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917
L2011542-5 MW5S Sampled By: CLIENT on 20-OCT-17 @ 14:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	250		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	107		0.50	mg/L		31-OCT-17	
pH	6.69		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	52.4		1.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	162		13	mg/L		26-OCT-17	R3867707
Anions and Nutrients							
Acidity (as CaCO3)	30.4		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	121		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	<0.020		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		24-OCT-17	R3865645
Chloride (Cl)	0.81		0.10	mg/L		24-OCT-17	R3865645
Fluoride (F)	<0.020		0.020	mg/L		24-OCT-17	R3865645
Nitrate (as N)	2.24		0.020	mg/L		24-OCT-17	R3865645
Nitrite (as N)	<0.010		0.010	mg/L		24-OCT-17	R3865645

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-5 MW5S Sampled By: CLIENT on 20-OCT-17 @ 14:00 Matrix: Surface Water							
Anions and Nutrients							
Total Kjeldahl Nitrogen	<0.75	DLM	0.75	mg/L	30-OCT-17	31-OCT-17	R3870934
Total Nitrogen	2.24		0.75	mg/L		31-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-OCT-17	R3865973
Phosphorus (P)-Total	0.0079		0.0030	mg/L	26-OCT-17	30-OCT-17	R3869578
Sulfate (SO4)	6.51		0.30	mg/L		24-OCT-17	R3865645
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	1.3		1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	1.3		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	0.734		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Arsenic (As)-Total	0.00023		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Barium (Ba)-Total	0.0475		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Boron (B)-Total	<0.010		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cadmium (Cd)-Total	0.0000336		0.0000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Calcium (Ca)-Total	36.5		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Cesium (Cs)-Total	0.000029		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Chromium (Cr)-Total	0.00127		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cobalt (Co)-Total	0.00065		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Copper (Cu)-Total	0.00208		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Iron (Fe)-Total	0.598		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Lead (Pb)-Total	0.000267		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Lithium (Li)-Total	<0.0010		0.0010	mg/L	24-OCT-17	27-OCT-17	R3868641
Magnesium (Mg)-Total	3.35		0.0050	mg/L	24-OCT-17	27-OCT-17	R3868641
Manganese (Mn)-Total	0.0982		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.000767		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Nickel (Ni)-Total	0.00116		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Potassium (K)-Total	3.58		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Rubidium (Rb)-Total	0.00301		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Selenium (Se)-Total	0.000099		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Silicon (Si)-Total	10.5		0.10	mg/L	24-OCT-17	27-OCT-17	R3868641
Silver (Ag)-Total	<0.000010		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Sodium (Na)-Total	8.67		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Strontium (Sr)-Total	0.0885		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Sulfur (S)-Total	2.27		0.50	mg/L	24-OCT-17	27-OCT-17	R3868641
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-5 MW5S Sampled By: CLIENT on 20-OCT-17 @ 14:00 Matrix: Surface Water							
Total Metals							
Thallium (Tl)-Total	0.000011		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Thorium (Th)-Total	0.00054		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Tin (Sn)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Titanium (Ti)-Total	0.0200		0.00030	mg/L	24-OCT-17	27-OCT-17	R3868641
Tungsten (W)-Total	0.00156		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Uranium (U)-Total	0.000649		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Vanadium (V)-Total	0.00127		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Zinc (Zn)-Total	0.0108		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Zirconium (Zr)-Total	0.000409		0.000060	mg/L	24-OCT-17	27-OCT-17	R3868641
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0070		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	0.00013		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.0434		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	0.000653	DTC	0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	37.3		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	0.00029		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.00036		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.00796	DTC	0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	0.000225		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Magnesium (Mg)-Dissolved	3.48		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	0.0848		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.000693		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	0.00070		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	3.57		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.00247		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	0.000112		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	9.42		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	8.78		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.0825		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-5 MW5S Sampled By: CLIENT on 20-OCT-17 @ 14:00 Matrix: Surface Water							
Dissolved Metals							
Sulfur (S)-Dissolved	2.13		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	0.000012		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	0.00026		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.00119		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.000518		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.0112		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	0.000074		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917
L2011542-6 MW6 Sampled By: CLIENT on 21-OCT-17 @ 13:45 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	422		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	210		0.50	mg/L		31-OCT-17	
pH	7.05		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	23.4		1.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	243		13	mg/L		27-OCT-17	R3868475
Anions and Nutrients							
Acidity (as CaCO3)	45.3		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	235		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	<0.020		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		25-OCT-17	R3866721
Chloride (Cl)	0.29		0.10	mg/L		25-OCT-17	R3866721
Fluoride (F)	<0.020		0.020	mg/L		25-OCT-17	R3866721
Nitrate (as N)	<0.020		0.020	mg/L		25-OCT-17	R3866721
Nitrite (as N)	<0.010		0.010	mg/L		25-OCT-17	R3866721
Total Kjeldahl Nitrogen	0.32		0.15	mg/L	27-OCT-17	28-OCT-17	R3868784
Total Nitrogen	0.32		0.15	mg/L		29-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-OCT-17	R3865973
Phosphorus (P)-Total	0.0078		0.0030	mg/L	26-OCT-17	30-OCT-17	R3869578
Sulfate (SO4)	6.79		0.30	mg/L		25-OCT-17	R3866721
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	11.1		1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	11.3		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	0.325		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Antimony (Sb)-Total	0.00023		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Arsenic (As)-Total	0.00040		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-6 MW6 Sampled By: CLIENT on 21-OCT-17 @ 13:45 Matrix: Surface Water							
Total Metals							
Barium (Ba)-Total	0.0504		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Boron (B)-Total	0.011		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cadmium (Cd)-Total	0.000254		0.0000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Calcium (Ca)-Total	75.6		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Cesium (Cs)-Total	0.000061		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Chromium (Cr)-Total	0.00072		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cobalt (Co)-Total	0.0163		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Copper (Cu)-Total	0.0225		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Iron (Fe)-Total	2.39		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Lead (Pb)-Total	0.000212		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Lithium (Li)-Total	0.0022		0.0010	mg/L	24-OCT-17	27-OCT-17	R3868641
Magnesium (Mg)-Total	5.11		0.0050	mg/L	24-OCT-17	27-OCT-17	R3868641
Manganese (Mn)-Total	1.62		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Mercury (Hg)-Total	0.0000100		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.000662		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Nickel (Ni)-Total	0.0407		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Potassium (K)-Total	1.60		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Rubidium (Rb)-Total	0.00405		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Selenium (Se)-Total	0.000093		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Silicon (Si)-Total	13.4		0.10	mg/L	24-OCT-17	27-OCT-17	R3868641
Silver (Ag)-Total	0.000033		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Sodium (Na)-Total	5.41		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Strontium (Sr)-Total	0.0921		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Sulfur (S)-Total	2.54		0.50	mg/L	24-OCT-17	27-OCT-17	R3868641
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Thallium (Tl)-Total	0.000027		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Thorium (Th)-Total	0.00038		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Tin (Sn)-Total	0.00059		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Titanium (Ti)-Total	0.00983		0.00030	mg/L	24-OCT-17	27-OCT-17	R3868641
Tungsten (W)-Total	0.00308		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Uranium (U)-Total	0.000693		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Vanadium (V)-Total	0.00103		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Zinc (Zn)-Total	0.390		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Zirconium (Zr)-Total	0.000225		0.000060	mg/L	24-OCT-17	27-OCT-17	R3868641
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0064		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-6 MW6 Sampled By: CLIENT on 21-OCT-17 @ 13:45 Matrix: Surface Water							
Dissolved Metals							
Antimony (Sb)-Dissolved	0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	0.00020		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.0446		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	0.000157		0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	75.9		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	0.000044		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	0.00015		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.0146		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.0223		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	0.750		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	0.000250		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	0.0024		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Magnesium (Mg)-Dissolved	4.99		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	1.49		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.000573		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	0.0363		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	1.44		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.00332		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	0.000096		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	13.3		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	4.92		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.0849		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Sulfur (S)-Dissolved	2.29		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	0.000027		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	0.00045		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.00052		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.000585		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.298		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	0.000077		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917
L2011542-7 MW7D Sampled By: CLIENT on 21-OCT-17 @ 15:00 Matrix: Surface Water							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-7 MW7D Sampled By: CLIENT on 21-OCT-17 @ 15:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	179		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	75.9		0.50	mg/L		31-OCT-17	
pH	6.97		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	122		1.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	109		13	mg/L		27-OCT-17	R3868475
Anions and Nutrients							
Acidity (as CaCO3)	17.2		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	87.1		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	0.027		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		25-OCT-17	R3866721
Chloride (Cl)	0.22		0.10	mg/L		25-OCT-17	R3866721
Fluoride (F)	0.023		0.020	mg/L		25-OCT-17	R3866721
Nitrate (as N)	<0.020		0.020	mg/L		25-OCT-17	R3866721
Nitrite (as N)	<0.010		0.010	mg/L		25-OCT-17	R3866721
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	27-OCT-17	28-OCT-17	R3868784
Total Nitrogen	<0.15		0.15	mg/L		29-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		25-OCT-17	R3865973
Phosphorus (P)-Total	0.0141		0.0030	mg/L	26-OCT-17	30-OCT-17	R3869578
Sulfate (SO4)	8.50		0.30	mg/L		25-OCT-17	R3866721
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	2.3	DTC	1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	1.8		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	0.930		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Antimony (Sb)-Total	0.00040		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Arsenic (As)-Total	0.00034		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Barium (Ba)-Total	0.0524		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Boron (B)-Total	0.015		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cadmium (Cd)-Total	0.0000948		0.0000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Calcium (Ca)-Total	23.1		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Cesium (Cs)-Total	0.000127		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Chromium (Cr)-Total	0.00255		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Cobalt (Co)-Total	0.0128		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Copper (Cu)-Total	0.0118		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Iron (Fe)-Total	5.12		0.010	mg/L	24-OCT-17	27-OCT-17	R3868641
Lead (Pb)-Total	0.000575		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Lithium (Li)-Total	0.0044		0.0010	mg/L	24-OCT-17	27-OCT-17	R3868641
Magnesium (Mg)-Total	4.73		0.0050	mg/L	24-OCT-17	27-OCT-17	R3868641
Manganese (Mn)-Total	0.696		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-7 MW7D Sampled By: CLIENT on 21-OCT-17 @ 15:00 Matrix: Surface Water							
Total Metals							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.00393		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Nickel (Ni)-Total	0.00881		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Potassium (K)-Total	4.21		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Rubidium (Rb)-Total	0.00690		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Selenium (Se)-Total	0.000635		0.000050	mg/L	24-OCT-17	27-OCT-17	R3868641
Silicon (Si)-Total	11.5		0.10	mg/L	24-OCT-17	27-OCT-17	R3868641
Silver (Ag)-Total	0.000019		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Sodium (Na)-Total	4.31		0.050	mg/L	24-OCT-17	27-OCT-17	R3868641
Strontium (Sr)-Total	0.0814		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Sulfur (S)-Total	2.83		0.50	mg/L	24-OCT-17	27-OCT-17	R3868641
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-OCT-17	27-OCT-17	R3868641
Thallium (Tl)-Total	0.000024		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Thorium (Th)-Total	0.00040		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Tin (Sn)-Total	0.00035		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Titanium (Ti)-Total	0.0422		0.00030	mg/L	24-OCT-17	27-OCT-17	R3868641
Tungsten (W)-Total	0.0210		0.00010	mg/L	24-OCT-17	27-OCT-17	R3868641
Uranium (U)-Total	0.00167		0.000010	mg/L	24-OCT-17	27-OCT-17	R3868641
Vanadium (V)-Total	0.00245		0.00050	mg/L	24-OCT-17	27-OCT-17	R3868641
Zinc (Zn)-Total	0.246		0.0030	mg/L	24-OCT-17	27-OCT-17	R3868641
Zirconium (Zr)-Total	0.000186		0.000060	mg/L	24-OCT-17	27-OCT-17	R3868641
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0085		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	0.00016		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.0432		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	0.014		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	0.0000573		0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	22.8		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	0.000020		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.0106		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.00266		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	2.68		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	0.0045		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-7 MW7D Sampled By: CLIENT on 21-OCT-17 @ 15:00 Matrix: Surface Water							
Dissolved Metals							
Magnesium (Mg)-Dissolved	4.58		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	0.596		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.00362		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	0.00661		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	4.11		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.00582		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	0.000756		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	10.1		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	4.10		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.0727		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Sulfur (S)-Dissolved	2.45		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	0.000021		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	0.00012		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.0104		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.00172		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.158		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917
L2011542-8 MW7S Sampled By: CLIENT on 22-OCT-17 @ 17:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	179		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	68.5		0.50	mg/L		31-OCT-17	
pH	6.67		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	350		5.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	114		13	mg/L		27-OCT-17	R3868475
Anions and Nutrients							
Acidity (as CaCO3)	28.0		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	87.8		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	0.027		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		25-OCT-17	R3866721
Chloride (Cl)	0.17		0.10	mg/L		25-OCT-17	R3866721
Fluoride (F)	0.024		0.020	mg/L		25-OCT-17	R3866721
Nitrate (as N)	0.077		0.020	mg/L		25-OCT-17	R3866721
Nitrite (as N)	<0.010		0.010	mg/L		25-OCT-17	R3866721

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-8 MW7S Sampled By: CLIENT on 22-OCT-17 @ 17:00 Matrix: Surface Water							
Anions and Nutrients							
Total Kjeldahl Nitrogen	<0.75	DLM	0.75	mg/L	30-OCT-17	31-OCT-17	R3870934
Total Nitrogen	<0.75		0.75	mg/L		31-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		27-OCT-17	R3868845
Phosphorus (P)-Total	0.0777		0.0030	mg/L	26-OCT-17	30-OCT-17	R3869578
Sulfate (SO4)	7.53		0.30	mg/L		25-OCT-17	R3866721
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	2.6		1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	4.0		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	7.04		0.0030	mg/L	29-OCT-17	30-OCT-17	R3870609
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Arsenic (As)-Total	0.00099		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Barium (Ba)-Total	0.115		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Beryllium (Be)-Total	0.00011		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Boron (B)-Total	0.011		0.010	mg/L	29-OCT-17	30-OCT-17	R3870609
Cadmium (Cd)-Total	0.000116		0.0000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Calcium (Ca)-Total	21.9		0.050	mg/L	29-OCT-17	30-OCT-17	R3870609
Cesium (Cs)-Total	0.000501		0.000010	mg/L	29-OCT-17	30-OCT-17	R3870609
Chromium (Cr)-Total	0.0158		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Cobalt (Co)-Total	0.0163		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Copper (Cu)-Total	0.0333		0.00050	mg/L	29-OCT-17	30-OCT-17	R3870609
Iron (Fe)-Total	5.14		0.010	mg/L	29-OCT-17	30-OCT-17	R3870609
Lead (Pb)-Total	0.00178		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Lithium (Li)-Total	0.0034		0.0010	mg/L	29-OCT-17	30-OCT-17	R3870609
Magnesium (Mg)-Total	8.10		0.0050	mg/L	29-OCT-17	30-OCT-17	R3870609
Manganese (Mn)-Total	0.579		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.00571		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Nickel (Ni)-Total	0.0321		0.00050	mg/L	29-OCT-17	30-OCT-17	R3870609
Phosphorus (P)-Total	0.105		0.050	mg/L	29-OCT-17	30-OCT-17	R3870609
Potassium (K)-Total	6.86		0.050	mg/L	29-OCT-17	30-OCT-17	R3870609
Rubidium (Rb)-Total	0.0139		0.00020	mg/L	29-OCT-17	30-OCT-17	R3870609
Selenium (Se)-Total	0.000325		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Silicon (Si)-Total	23.5		0.10	mg/L	29-OCT-17	30-OCT-17	R3870609
Silver (Ag)-Total	0.000031		0.000010	mg/L	29-OCT-17	30-OCT-17	R3870609
Sodium (Na)-Total	6.19		0.050	mg/L	29-OCT-17	30-OCT-17	R3870609
Strontium (Sr)-Total	0.100		0.00020	mg/L	29-OCT-17	30-OCT-17	R3870609
Sulfur (S)-Total	2.12		0.50	mg/L	29-OCT-17	30-OCT-17	R3870609
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	29-OCT-17	30-OCT-17	R3870609

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-8 MW7S Sampled By: CLIENT on 22-OCT-17 @ 17:00 Matrix: Surface Water							
Total Metals							
Thallium (Tl)-Total	0.000069		0.000010	mg/L	29-OCT-17	30-OCT-17	R3870609
Thorium (Th)-Total	0.00197		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Tin (Sn)-Total	0.00017		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Titanium (Ti)-Total	0.282		0.00030	mg/L	29-OCT-17	30-OCT-17	R3870609
Tungsten (W)-Total	0.0534		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Uranium (U)-Total	0.00113		0.000010	mg/L	29-OCT-17	30-OCT-17	R3870609
Vanadium (V)-Total	0.0119		0.00050	mg/L	29-OCT-17	30-OCT-17	R3870609
Zinc (Zn)-Total	0.0158		0.0030	mg/L	29-OCT-17	30-OCT-17	R3870609
Zirconium (Zr)-Total	0.000725		0.000060	mg/L	29-OCT-17	30-OCT-17	R3870609
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0086		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	0.00020		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.0713		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	0.0000729		0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	18.8		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	0.000020		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	0.00011		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.0108		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.00297		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Magnesium (Mg)-Dissolved	5.24		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	0.476		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.00467		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	0.0183		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	5.29		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.00856		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	0.000317		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	13.8		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	5.37		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.0876		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-8 MW7S Sampled By: CLIENT on 22-OCT-17 @ 17:00 Matrix: Surface Water							
Dissolved Metals							
Sulfur (S)-Dissolved	1.93		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	0.000028		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.0214		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.000501		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.0056		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917
L2011542-9 MW7D DUP Sampled By: CLIENT on 21-OCT-17 @ 15:30 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	177		3.0	uS/cm		24-OCT-17	R3866051
Hardness (as CaCO3)	76.7		0.50	mg/L		31-OCT-17	
pH	6.78		0.10	pH		24-OCT-17	R3866051
Total Suspended Solids	26.0		1.0	mg/L		24-OCT-17	R3866267
Total Dissolved Solids	113		13	mg/L		27-OCT-17	R3868475
Anions and Nutrients							
Acidity (as CaCO3)	24.3		2.0	mg/L		25-OCT-17	R3866524
Alkalinity, Total (as CaCO3)	85.3		2.0	mg/L		24-OCT-17	R3866051
Ammonia, Total (as N)	0.038		0.020	mg/L		29-OCT-17	R3868901
Bromide (Br)	<0.10		0.10	mg/L		25-OCT-17	R3866721
Chloride (Cl)	0.22		0.10	mg/L		25-OCT-17	R3866721
Fluoride (F)	0.023		0.020	mg/L		25-OCT-17	R3866721
Nitrate (as N)	<0.020		0.020	mg/L		25-OCT-17	R3866721
Nitrite (as N)	<0.010		0.010	mg/L		25-OCT-17	R3866721
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	27-OCT-17	28-OCT-17	R3868784
Total Nitrogen	<0.15		0.15	mg/L		29-OCT-17	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		27-OCT-17	R3868845
Phosphorus (P)-Total	0.0050		0.0030	mg/L	26-OCT-17	30-OCT-17	R3869578
Sulfate (SO4)	7.99		0.30	mg/L		25-OCT-17	R3866721
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-OCT-17	R3868039
Dissolved Organic Carbon	2.0		1.0	mg/L	27-OCT-17	27-OCT-17	R3868572
Total Organic Carbon	2.1		1.0	mg/L		27-OCT-17	R3868525
Total Metals							
Aluminum (Al)-Total	0.271		0.0030	mg/L	29-OCT-17	30-OCT-17	R3870609
Antimony (Sb)-Total	0.00037		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Arsenic (As)-Total	0.00023		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-9 MW7D DUP Sampled By: CLIENT on 21-OCT-17 @ 15:30 Matrix: Surface Water							
Total Metals							
Barium (Ba)-Total	0.0462		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Boron (B)-Total	0.014		0.010	mg/L	29-OCT-17	30-OCT-17	R3870609
Cadmium (Cd)-Total	0.0000717		0.0000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Calcium (Ca)-Total	22.3		0.050	mg/L	29-OCT-17	30-OCT-17	R3870609
Cesium (Cs)-Total	0.000052		0.000010	mg/L	29-OCT-17	30-OCT-17	R3870609
Chromium (Cr)-Total	0.00072		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Cobalt (Co)-Total	0.0111		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Copper (Cu)-Total	0.00645		0.00050	mg/L	29-OCT-17	30-OCT-17	R3870609
Iron (Fe)-Total	3.54		0.010	mg/L	29-OCT-17	30-OCT-17	R3870609
Lead (Pb)-Total	0.000298		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Lithium (Li)-Total	0.0039		0.0010	mg/L	29-OCT-17	30-OCT-17	R3870609
Magnesium (Mg)-Total	4.69		0.0050	mg/L	29-OCT-17	30-OCT-17	R3870609
Manganese (Mn)-Total	0.624		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		25-OCT-17	R3865937
Molybdenum (Mo)-Total	0.00370		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Nickel (Ni)-Total	0.00742		0.00050	mg/L	29-OCT-17	30-OCT-17	R3870609
Phosphorus (P)-Total	<0.050		0.050	mg/L	29-OCT-17	30-OCT-17	R3870609
Potassium (K)-Total	4.20		0.050	mg/L	29-OCT-17	30-OCT-17	R3870609
Rubidium (Rb)-Total	0.00645		0.00020	mg/L	29-OCT-17	30-OCT-17	R3870609
Selenium (Se)-Total	0.000588		0.000050	mg/L	29-OCT-17	30-OCT-17	R3870609
Silicon (Si)-Total	10.1		0.10	mg/L	29-OCT-17	30-OCT-17	R3870609
Silver (Ag)-Total	<0.000010		0.000010	mg/L	29-OCT-17	30-OCT-17	R3870609
Sodium (Na)-Total	4.21		0.050	mg/L	29-OCT-17	30-OCT-17	R3870609
Strontium (Sr)-Total	0.0725		0.00020	mg/L	29-OCT-17	30-OCT-17	R3870609
Sulfur (S)-Total	2.45		0.50	mg/L	29-OCT-17	30-OCT-17	R3870609
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	29-OCT-17	30-OCT-17	R3870609
Thallium (Tl)-Total	0.000019		0.000010	mg/L	29-OCT-17	30-OCT-17	R3870609
Thorium (Th)-Total	0.00013		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Tin (Sn)-Total	0.00019		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Titanium (Ti)-Total	0.0112		0.00030	mg/L	29-OCT-17	30-OCT-17	R3870609
Tungsten (W)-Total	0.0142		0.00010	mg/L	29-OCT-17	30-OCT-17	R3870609
Uranium (U)-Total	0.00177		0.000010	mg/L	29-OCT-17	30-OCT-17	R3870609
Vanadium (V)-Total	0.00104		0.00050	mg/L	29-OCT-17	30-OCT-17	R3870609
Zinc (Zn)-Total	0.189		0.0030	mg/L	29-OCT-17	30-OCT-17	R3870609
Zirconium (Zr)-Total	0.000079		0.000060	mg/L	29-OCT-17	30-OCT-17	R3870609
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					25-OCT-17	R3866036
Dissolved Metals Filtration Location	FIELD					31-OCT-17	R3870881
Aluminum (Al)-Dissolved	0.0043		0.0020	mg/L	31-OCT-17	31-OCT-17	R3870917

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2011542-9 MW7D DUP Sampled By: CLIENT on 21-OCT-17 @ 15:30 Matrix: Surface Water							
Dissolved Metals							
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Arsenic (As)-Dissolved	0.00015		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Barium (Ba)-Dissolved	0.0438		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Boron (B)-Dissolved	0.014		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cadmium (Cd)-Dissolved	0.0000501		0.0000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Calcium (Ca)-Dissolved	23.1		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Cesium (Cs)-Dissolved	0.000022		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Chromium (Cr)-Dissolved	0.00021		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Cobalt (Co)-Dissolved	0.0105		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Copper (Cu)-Dissolved	0.00237		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Iron (Fe)-Dissolved	2.75		0.010	mg/L	31-OCT-17	31-OCT-17	R3870917
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Lithium (Li)-Dissolved	0.0048		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Magnesium (Mg)-Dissolved	4.59		0.0050	mg/L	31-OCT-17	31-OCT-17	R3870917
Manganese (Mn)-Dissolved	0.596		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	25-OCT-17	25-OCT-17	R3866098
Molybdenum (Mo)-Dissolved	0.00376		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Nickel (Ni)-Dissolved	0.00665		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Potassium (K)-Dissolved	4.17		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Rubidium (Rb)-Dissolved	0.00568		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Selenium (Se)-Dissolved	0.000666		0.000050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silicon (Si)-Dissolved	9.96		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Sodium (Na)-Dissolved	4.16		0.050	mg/L	31-OCT-17	31-OCT-17	R3870917
Strontium (Sr)-Dissolved	0.0746		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Sulfur (S)-Dissolved	2.62		0.50	mg/L	31-OCT-17	31-OCT-17	R3870917
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-OCT-17	31-OCT-17	R3870917
Thallium (Tl)-Dissolved	0.000018		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-OCT-17	31-OCT-17	R3870917
Tungsten (W)-Dissolved	0.0103		0.00010	mg/L	31-OCT-17	31-OCT-17	R3870917
Uranium (U)-Dissolved	0.00170		0.000010	mg/L	31-OCT-17	31-OCT-17	R3870917
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-OCT-17	31-OCT-17	R3870917
Zinc (Zn)-Dissolved	0.160		0.0010	mg/L	31-OCT-17	31-OCT-17	R3870917
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-OCT-17	31-OCT-17	R3870917

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Boron (B)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Cobalt (Co)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Copper (Cu)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Nickel (Ni)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Rubidium (Rb)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2011542-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Total	MS-B	L2011542-8, -9
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L2011542-8, -9

Sample Parameter Qualifier key listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-TITR-TB	Water	Acidity	APHA 2310 B modified

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-TITR-TB	Water	Alkalinity	APHA 2320B modified

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

BR-IC-N-TB	Water	Bromide in Water by IC	EPA 300.1 (mod)

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

CL-L-IC-N-TB	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

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

DOC-TB	Water	Dissolved Organic Carbon	APHA 5310 B modified

Water samples are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis. Analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

EC-TITR-TB	Water	Conductivity	APHA 2510 B

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

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

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

HARDNESS-CALC-TB	Water	Hardness (as CaCO3)	CALCULATION

HG-D-CVAF-TB	Water	Dissolved Mercury in Water by CVAFS	EPA 1631E (mod)

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

HG-T-CVAF-TB	Water	Total Mercury in Water by CVAFS	EPA 1631E (mod)

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

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

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

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

Reference Information

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

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

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

N-T-CALC-TB	Water	Total Nitrogen (Calculation)	APHA 4500 N-Calculated

Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen +[Nitrate and Nitrite (as N)]

NH3-COL-TB	Water	Ammonia by Discrete Analyzer	APHA 4500-NH3 G. (modified)

Ammonia in aqueous matrices is analyzed using discrete analyzer with colourimetric detection.

NO2-IC-N-TB	Water	Nitrite in Water by IC	EPA 300.1 (mod)

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

NO3-IC-N-TB	Water	Nitrate in Water by IC	EPA 300.1 (mod)

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

P-T-COL-TB	Water	Total Phosphorus by Discrete Analyzer	APHA 4500-P B, F, G (modified)

Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

PH-TITR-TB	Water	pH	APHA 4500-H

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

PO4-DO-COL-TB	Water	Dissolved Orthophosphate	APHA 4500-P B, F, G (modified)

Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

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

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

TDS-TB	Water	Total Dissolved Solids	APHA 2540 C (modified)

Aqueous matrices are analyzed using gravimetry and evaporation

TKN-COL-TB	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg (modified)

Total Kjeldahl Nitrogen in aqueous matrices is analyzed using a discrete analyzer with colourimetric detection.

TOC-TB	Water	Total Organic Carbon (TOC)	APHA 5310 B modified

Water samples are analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

TSS-L-TB	Water	Low Level Total Suspended Solids	APHA 2540 D (modified)

Aqueous matrices are analyzed using gravimetry.

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

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

Laboratory Definition Code	Laboratory Location
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. TORONTO
374 Wellington Street West Suite 3
Toronto ON M5V 1E3
Contact: Jake McQueen

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ACY-TITR-TB	**Water**							
Batch R3866524								
WG2648410-2 LCS								
Acidity (as CaCO3)			103.4		%		85-115	25-OCT-17
WG2648410-1 MB								
Acidity (as CaCO3)			<2.0		mg/L		2	25-OCT-17
ALK-TITR-TB	**Water**							
Batch R3866051								
WG2647463-11 LCS								
Alkalinity, Total (as CaCO3)			100.6		%		85-115	24-OCT-17
WG2647463-17 LCS								
Alkalinity, Total (as CaCO3)			109.0		%		85-115	24-OCT-17
WG2647463-2 LCS								
Alkalinity, Total (as CaCO3)			100.7		%		85-115	24-OCT-17
WG2647463-8 LCS								
Alkalinity, Total (as CaCO3)			99.7		%		85-115	24-OCT-17
WG2647463-1 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	24-OCT-17
WG2647463-10 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	24-OCT-17
WG2647463-16 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	24-OCT-17
WG2647463-7 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	24-OCT-17
BR-IC-N-TB	**Water**							
Batch R3865645								
WG2647308-3 DUP		**L2011542-1**						
Bromide (Br)		<0.10	<0.10	RPD-NA	mg/L	N/A	20	24-OCT-17
WG2647308-2 LCS								
Bromide (Br)			90.0		%		85-115	24-OCT-17
WG2647308-1 MB								
Bromide (Br)			<0.10		mg/L		0.1	24-OCT-17
WG2647308-4 MS		**L2011542-1**						
Bromide (Br)			80.0		%		75-125	24-OCT-17
Batch R3866721								
WG2648536-6 LCS								
Bromide (Br)			108.0		%		85-115	25-OCT-17
WG2648536-5 MB								
Bromide (Br)			<0.10		mg/L		0.1	25-OCT-17
CL-L-IC-N-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-L-IC-N-TB	**Water**							
Batch R3865645								
WG2647308-3 DUP		**L2011542-1**						
Chloride (Cl)		0.20	0.20		mg/L	1.4	20	24-OCT-17
WG2647308-2 LCS								
Chloride (Cl)			100.6		%		90-110	24-OCT-17
WG2647308-1 MB								
Chloride (Cl)			<0.10		mg/L		0.1	24-OCT-17
WG2647308-4 MS		**L2011542-1**						
Chloride (Cl)			97.7		%		75-125	24-OCT-17
Batch R3866721								
WG2648536-6 LCS								
Chloride (Cl)			100.1		%		90-110	25-OCT-17
WG2648536-5 MB								
Chloride (Cl)			<0.10		mg/L		0.1	25-OCT-17
DOC-TB	**Water**							
Batch R3868572								
WG2650655-3 DUP		**L2011542-3**						
Dissolved Organic Carbon		3.6	2.8	J	mg/L	0.9	2	27-OCT-17
WG2650655-2 LCS								
Dissolved Organic Carbon			103.3		%		80-120	27-OCT-17
WG2650655-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	27-OCT-17
WG2650655-4 MS		**L2011542-3**						
Dissolved Organic Carbon			99.0		%		70-130	27-OCT-17
EC-TITR-TB	**Water**							
Batch R3866051								
WG2647463-11 LCS								
Conductivity (EC)			97.8		%		90-110	24-OCT-17
WG2647463-17 LCS								
Conductivity (EC)			97.5		%		90-110	24-OCT-17
WG2647463-2 LCS								
Conductivity (EC)			96.4		%		90-110	24-OCT-17
WG2647463-8 LCS								
Conductivity (EC)			97.8		%		90-110	24-OCT-17
WG2647463-1 MB								
Conductivity (EC)			<3.0		uS/cm		3	24-OCT-17
WG2647463-10 MB								
Conductivity (EC)			<3.0		uS/cm		3	24-OCT-17
WG2647463-16 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-TITR-TB	**Water**							
Batch R3866051								
WG2647463-16 MB								
Conductivity (EC)			<3.0		uS/cm		3	24-OCT-17
WG2647463-7 MB								
Conductivity (EC)			<3.0		uS/cm		3	24-OCT-17
F-IC-N-TB	**Water**							
Batch R3865645								
WG2647308-2 LCS								
Fluoride (F)			100.9		%		90-110	24-OCT-17
WG2647308-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	24-OCT-17
Batch R3866721								
WG2648536-2 LCS								
Fluoride (F)			100.2		%		90-110	25-OCT-17
WG2648536-6 LCS								
Fluoride (F)			100.4		%		90-110	25-OCT-17
WG2648536-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	25-OCT-17
WG2648536-5 MB								
Fluoride (F)			<0.020		mg/L		0.02	25-OCT-17
HG-D-CVAF-TB	**Water**							
Batch R3866098								
WG2648502-3 DUP		**L2011542-1**						
Mercury (Hg)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	25-OCT-17
WG2648502-2 LCS								
Mercury (Hg)-Dissolved			97.0		%		80-120	25-OCT-17
WG2648502-1 MB								
Mercury (Hg)-Dissolved			<0.000005C		mg/L		0.000005	25-OCT-17
WG2648502-4 MS		**L2011542-2**						
Mercury (Hg)-Dissolved			87.3		%		70-130	25-OCT-17
HG-T-CVAF-TB	**Water**							
Batch R3865937								
WG2648417-3 DUP		**L2011542-1**						
Mercury (Hg)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	25-OCT-17
WG2648417-2 LCS								
Mercury (Hg)-Total			99.5		%		80-120	25-OCT-17
WG2648417-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	25-OCT-17
WG2648417-4 MS		**L2011542-2**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAF-TB	**Water**							
Batch R3865937								
WG2648417-4 MS		**L2011542-2**						
Mercury (Hg)-Total			99.3		%		70-130	25-OCT-17
MET-D-CCMS-TB	**Water**							
Batch R3870917								
WG2652803-18 LCS								
Aluminum (Al)-Dissolved			100.8		%		80-120	31-OCT-17
Antimony (Sb)-Dissolved			100.7		%		80-120	31-OCT-17
Arsenic (As)-Dissolved			97.7		%		80-120	31-OCT-17
Barium (Ba)-Dissolved			101.8		%		80-120	31-OCT-17
Beryllium (Be)-Dissolved			99.6		%		80-120	31-OCT-17
Bismuth (Bi)-Dissolved			96.5		%		80-120	31-OCT-17
Boron (B)-Dissolved			94.9		%		80-120	31-OCT-17
Cadmium (Cd)-Dissolved			96.3		%		80-120	31-OCT-17
Calcium (Ca)-Dissolved			99.3		%		80-120	31-OCT-17
Cesium (Cs)-Dissolved			99.0		%		80-120	31-OCT-17
Chromium (Cr)-Dissolved			97.9		%		80-120	31-OCT-17
Cobalt (Co)-Dissolved			97.8		%		80-120	31-OCT-17
Copper (Cu)-Dissolved			96.4		%		80-120	31-OCT-17
Iron (Fe)-Dissolved			99.0		%		80-120	31-OCT-17
Lead (Pb)-Dissolved			99.3		%		80-120	31-OCT-17
Lithium (Li)-Dissolved			98.6		%		80-120	31-OCT-17
Magnesium (Mg)-Dissolved			107.6		%		80-120	31-OCT-17
Manganese (Mn)-Dissolved			98.9		%		80-120	31-OCT-17
Molybdenum (Mo)-Dissolved			92.6		%		80-120	31-OCT-17
Nickel (Ni)-Dissolved			98.1		%		80-120	31-OCT-17
Phosphorus (P)-Dissolved			98.8		%		70-130	31-OCT-17
Potassium (K)-Dissolved			103.2		%		80-120	31-OCT-17
Rubidium (Rb)-Dissolved			100.4		%		80-120	31-OCT-17
Selenium (Se)-Dissolved			99.98		%		80-120	31-OCT-17
Silicon (Si)-Dissolved			116.3		%		60-140	31-OCT-17
Silver (Ag)-Dissolved			96.9		%		80-120	31-OCT-17
Sodium (Na)-Dissolved			104.4		%		80-120	31-OCT-17
Strontium (Sr)-Dissolved			100.4		%		80-120	31-OCT-17
Sulfur (S)-Dissolved			99.2		%		80-120	31-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R3870917								
WG2652803-18 LCS								
Tellurium (Te)-Dissolved			91.5		%		80-120	31-OCT-17
Thallium (Tl)-Dissolved			99.5		%		80-120	31-OCT-17
Thorium (Th)-Dissolved			96.8		%		80-120	31-OCT-17
Tin (Sn)-Dissolved			94.2		%		80-120	31-OCT-17
Titanium (Ti)-Dissolved			98.1		%		80-120	31-OCT-17
Tungsten (W)-Dissolved			97.6		%		80-120	31-OCT-17
Uranium (U)-Dissolved			101.4		%		80-120	31-OCT-17
Vanadium (V)-Dissolved			100.8		%		80-120	31-OCT-17
Zinc (Zn)-Dissolved			92.0		%		80-120	31-OCT-17
Zirconium (Zr)-Dissolved			91.7		%		80-120	31-OCT-17
WG2652803-17 MB								
Aluminum (Al)-Dissolved			<0.0020		mg/L		0.002	31-OCT-17
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	31-OCT-17
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	31-OCT-17
Boron (B)-Dissolved			<0.010		mg/L		0.01	31-OCT-17
Cadmium (Cd)-Dissolved			<0.000005C		mg/L		0.000005	31-OCT-17
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	31-OCT-17
Cesium (Cs)-Dissolved			<0.000010		mg/L		0.00001	31-OCT-17
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	31-OCT-17
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	31-OCT-17
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	31-OCT-17
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	31-OCT-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	31-OCT-17
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	31-OCT-17
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	31-OCT-17
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	31-OCT-17
Potassium (K)-Dissolved			<0.050		mg/L		0.05	31-OCT-17
Rubidium (Rb)-Dissolved			<0.00020		mg/L		0.0002	31-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R3870917								
WG2652803-17 MB								
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	31-OCT-17
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	31-OCT-17
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	31-OCT-17
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	31-OCT-17
Strontium (Sr)-Dissolved			<0.00020		mg/L		0.0002	31-OCT-17
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	31-OCT-17
Tellurium (Te)-Dissolved			<0.00020		mg/L		0.0002	31-OCT-17
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	31-OCT-17
Thorium (Th)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	31-OCT-17
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	31-OCT-17
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	31-OCT-17
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	31-OCT-17
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	31-OCT-17
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	31-OCT-17
MET-T-CCMS-TB	**Water**							
Batch R3868641								
WG2646775-2 LCS								
Aluminum (Al)-Total			97.6		%		80-120	27-OCT-17
Antimony (Sb)-Total			98.8		%		80-120	27-OCT-17
Arsenic (As)-Total			97.6		%		80-120	27-OCT-17
Barium (Ba)-Total			100.6		%		80-120	27-OCT-17
Beryllium (Be)-Total			95.3		%		80-120	27-OCT-17
Bismuth (Bi)-Total			102.6		%		80-120	27-OCT-17
Boron (B)-Total			85.3		%		80-120	27-OCT-17
Cadmium (Cd)-Total			93.7		%		80-120	27-OCT-17
Calcium (Ca)-Total			97.3		%		80-120	27-OCT-17
Cesium (Cs)-Total			97.6		%		80-120	27-OCT-17
Chromium (Cr)-Total			96.4		%		80-120	27-OCT-17
Cobalt (Co)-Total			96.6		%		80-120	27-OCT-17
Copper (Cu)-Total			97.2		%		80-120	27-OCT-17
Iron (Fe)-Total			98.5		%		80-120	27-OCT-17
Lead (Pb)-Total			102.0		%		80-120	27-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3868641								
WG2646775-2 LCS								
Lithium (Li)-Total			94.4		%		80-120	27-OCT-17
Magnesium (Mg)-Total			101.2		%		80-120	27-OCT-17
Manganese (Mn)-Total			97.8		%		80-120	27-OCT-17
Molybdenum (Mo)-Total			96.0		%		80-120	27-OCT-17
Nickel (Ni)-Total			98.0		%		80-120	27-OCT-17
Phosphorus (P)-Total			101.7		%		70-130	27-OCT-17
Potassium (K)-Total			99.0		%		80-120	27-OCT-17
Rubidium (Rb)-Total			100.7		%		80-120	27-OCT-17
Selenium (Se)-Total			97.1		%		80-120	27-OCT-17
Silicon (Si)-Total			110.9		%		60-140	27-OCT-17
Silver (Ag)-Total			96.8		%		80-120	27-OCT-17
Sodium (Na)-Total			102.3		%		80-120	27-OCT-17
Strontium (Sr)-Total			97.6		%		80-120	27-OCT-17
Sulfur (S)-Total			95.0		%		80-120	27-OCT-17
Tellurium (Te)-Total			94.5		%		80-120	27-OCT-17
Thallium (Tl)-Total			99.6		%		80-120	27-OCT-17
Thorium (Th)-Total			100.2		%		80-120	27-OCT-17
Tin (Sn)-Total			92.8		%		80-120	27-OCT-17
Titanium (Ti)-Total			96.0		%		80-120	27-OCT-17
Tungsten (W)-Total			101.5		%		80-120	27-OCT-17
Uranium (U)-Total			100.7		%		80-120	27-OCT-17
Vanadium (V)-Total			98.8		%		80-120	27-OCT-17
Zinc (Zn)-Total			91.6		%		80-120	27-OCT-17
Zirconium (Zr)-Total			92.8		%		80-120	27-OCT-17
WG2646775-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	27-OCT-17
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Arsenic (As)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Barium (Ba)-Total			<0.000050		mg/L		0.00005	27-OCT-17
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	27-OCT-17
Boron (B)-Total			<0.010		mg/L		0.01	27-OCT-17
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	27-OCT-17
Calcium (Ca)-Total			<0.050		mg/L		0.05	27-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3868641								
WG2646775-1 MB								
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	27-OCT-17
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Copper (Cu)-Total			<0.00050		mg/L		0.0005	27-OCT-17
Iron (Fe)-Total			<0.010		mg/L		0.01	27-OCT-17
Lead (Pb)-Total			<0.000050		mg/L		0.00005	27-OCT-17
Lithium (Li)-Total			<0.0010		mg/L		0.001	27-OCT-17
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	27-OCT-17
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	27-OCT-17
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	27-OCT-17
Phosphorus (P)-Total			<0.050		mg/L		0.05	27-OCT-17
Potassium (K)-Total			<0.050		mg/L		0.05	27-OCT-17
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	27-OCT-17
Selenium (Se)-Total			<0.000050		mg/L		0.00005	27-OCT-17
Silicon (Si)-Total			<0.10		mg/L		0.1	27-OCT-17
Silver (Ag)-Total			<0.000010		mg/L		0.00001	27-OCT-17
Sodium (Na)-Total			<0.050		mg/L		0.05	27-OCT-17
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	27-OCT-17
Sulfur (S)-Total			<0.50		mg/L		0.5	27-OCT-17
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	27-OCT-17
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	27-OCT-17
Thorium (Th)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Tin (Sn)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	27-OCT-17
Tungsten (W)-Total			<0.00010		mg/L		0.0001	27-OCT-17
Uranium (U)-Total			<0.000010		mg/L		0.00001	27-OCT-17
Vanadium (V)-Total			<0.00050		mg/L		0.0005	27-OCT-17
Zinc (Zn)-Total			<0.0030		mg/L		0.003	27-OCT-17
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	27-OCT-17
Batch R3870609								
WG2651424-2 LCS								
Aluminum (Al)-Total			107.5		%		80-120	30-OCT-17
Antimony (Sb)-Total			100.4		%		80-120	30-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3870609								
WG2651424-2 LCS								
Arsenic (As)-Total			104.8		%		80-120	30-OCT-17
Barium (Ba)-Total			105.8		%		80-120	30-OCT-17
Beryllium (Be)-Total			104.4		%		80-120	30-OCT-17
Bismuth (Bi)-Total			101.2		%		80-120	30-OCT-17
Boron (B)-Total			94.6		%		80-120	30-OCT-17
Cadmium (Cd)-Total			104.1		%		80-120	30-OCT-17
Calcium (Ca)-Total			103.7		%		80-120	30-OCT-17
Cesium (Cs)-Total			100.6		%		80-120	30-OCT-17
Chromium (Cr)-Total			106.4		%		80-120	30-OCT-17
Cobalt (Co)-Total			106.0		%		80-120	30-OCT-17
Copper (Cu)-Total			104.5		%		80-120	30-OCT-17
Iron (Fe)-Total			102.3		%		80-120	30-OCT-17
Lead (Pb)-Total			104.5		%		80-120	30-OCT-17
Lithium (Li)-Total			98.0		%		80-120	30-OCT-17
Magnesium (Mg)-Total			114.2		%		80-120	30-OCT-17
Manganese (Mn)-Total			106.5		%		80-120	30-OCT-17
Molybdenum (Mo)-Total			99.8		%		80-120	30-OCT-17
Nickel (Ni)-Total			105.3		%		80-120	30-OCT-17
Phosphorus (P)-Total			109.6		%		70-130	30-OCT-17
Potassium (K)-Total			111.4		%		80-120	30-OCT-17
Rubidium (Rb)-Total			110.5		%		80-120	30-OCT-17
Selenium (Se)-Total			98.7		%		80-120	30-OCT-17
Silicon (Si)-Total			109.2		%		60-140	30-OCT-17
Silver (Ag)-Total			99.6		%		80-120	30-OCT-17
Sodium (Na)-Total			106.7		%		80-120	30-OCT-17
Strontium (Sr)-Total			105.5		%		80-120	30-OCT-17
Sulfur (S)-Total			104.0		%		80-120	30-OCT-17
Tellurium (Te)-Total			91.3		%		80-120	30-OCT-17
Thallium (Tl)-Total			103.0		%		80-120	30-OCT-17
Thorium (Th)-Total			102.2		%		80-120	30-OCT-17
Tin (Sn)-Total			94.8		%		80-120	30-OCT-17
Titanium (Ti)-Total			101.5		%		80-120	30-OCT-17
Tungsten (W)-Total			105.3		%		80-120	30-OCT-17
Uranium (U)-Total			102.8		%		80-120	30-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3870609								
WG2651424-2 LCS								
Vanadium (V)-Total			106.6		%		80-120	30-OCT-17
Zinc (Zn)-Total			100.9		%		80-120	30-OCT-17
Zirconium (Zr)-Total			100.6		%		80-120	30-OCT-17
WG2651424-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	30-OCT-17
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Arsenic (As)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Barium (Ba)-Total			<0.000050		mg/L		0.00005	30-OCT-17
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	30-OCT-17
Boron (B)-Total			<0.010		mg/L		0.01	30-OCT-17
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	30-OCT-17
Calcium (Ca)-Total			<0.050		mg/L		0.05	30-OCT-17
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	30-OCT-17
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Copper (Cu)-Total			<0.00050		mg/L		0.0005	30-OCT-17
Iron (Fe)-Total			<0.010		mg/L		0.01	30-OCT-17
Lead (Pb)-Total			<0.000050		mg/L		0.00005	30-OCT-17
Lithium (Li)-Total			<0.0010		mg/L		0.001	30-OCT-17
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	30-OCT-17
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	30-OCT-17
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	30-OCT-17
Phosphorus (P)-Total			<0.050		mg/L		0.05	30-OCT-17
Potassium (K)-Total			<0.050		mg/L		0.05	30-OCT-17
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	30-OCT-17
Selenium (Se)-Total			<0.000050		mg/L		0.00005	30-OCT-17
Silicon (Si)-Total			<0.10		mg/L		0.1	30-OCT-17
Silver (Ag)-Total			<0.000010		mg/L		0.00001	30-OCT-17
Sodium (Na)-Total			<0.050		mg/L		0.05	30-OCT-17
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	30-OCT-17
Sulfur (S)-Total			<0.50		mg/L		0.5	30-OCT-17
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	30-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3870609								
WG2651424-1 MB								
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	30-OCT-17
Thorium (Th)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Tin (Sn)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	30-OCT-17
Tungsten (W)-Total			<0.00010		mg/L		0.0001	30-OCT-17
Uranium (U)-Total			<0.000010		mg/L		0.00001	30-OCT-17
Vanadium (V)-Total			<0.00050		mg/L		0.0005	30-OCT-17
Zinc (Zn)-Total			<0.0030		mg/L		0.003	30-OCT-17
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	30-OCT-17
NH3-COL-TB	**Water**							
Batch R3868901								
WG2651440-3 DUP		**L2011542-2**						
Ammonia, Total (as N)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	29-OCT-17
WG2651440-2 LCS								
Ammonia, Total (as N)			96.1		%		85-115	29-OCT-17
WG2651440-6 LCS								
Ammonia, Total (as N)			95.2		%		85-115	29-OCT-17
WG2651440-1 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	29-OCT-17
WG2651440-5 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	29-OCT-17
WG2651440-4 MS		**L2011542-2**						
Ammonia, Total (as N)			94.8		%		75-125	29-OCT-17
NO2-IC-N-TB	**Water**							
Batch R3865645								
WG2647308-3 DUP		**L2011542-1**						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	24-OCT-17
WG2647308-2 LCS								
Nitrite (as N)			101.8		%		90-110	24-OCT-17
WG2647308-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	24-OCT-17
WG2647308-4 MS		**L2011542-1**						
Nitrite (as N)			101.8		%		75-125	24-OCT-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-TB	**Water**							
Batch R3866721								
WG2648536-6 LCS								
Nitrite (as N)			106.2		%		90-110	25-OCT-17
WG2648536-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	25-OCT-17
NO3-IC-N-TB	**Water**							
Batch R3865645								
WG2647308-3 DUP		**L2011542-1**						
Nitrate (as N)		0.421	0.417		mg/L	1.1	20	24-OCT-17
WG2647308-2 LCS								
Nitrate (as N)			98.9		%		90-110	24-OCT-17
WG2647308-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	24-OCT-17
WG2647308-4 MS		**L2011542-1**						
Nitrate (as N)			98.8		%		75-125	24-OCT-17
Batch R3866721								
WG2648536-6 LCS								
Nitrate (as N)			98.6		%		90-110	25-OCT-17
WG2648536-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	25-OCT-17
P-T-COL-TB	**Water**							
Batch R3868807								
WG2648037-14 LCS								
Phosphorus (P)-Total			95.2		%		80-120	27-OCT-17
WG2648037-13 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	27-OCT-17
Batch R3869578								
WG2649070-3 DUP		**L2011542-5**						
Phosphorus (P)-Total		0.0079	0.0066		mg/L	18	20	30-OCT-17
WG2649070-2 LCS								
Phosphorus (P)-Total			100.9		%		80-120	30-OCT-17
WG2649070-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	30-OCT-17
WG2649070-4 MS		**L2011542-5**						
Phosphorus (P)-Total			91.3		%		70-130	30-OCT-17
Batch R3871129								
WG2648037-16 DUP		**L2011542-2**						
Phosphorus (P)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	31-OCT-17
WG2651778-2 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-TB	**Water**							
Batch R3871129								
WG2651778-2 LCS								
Phosphorus (P)-Total			99.5		%		80-120	31-OCT-17
WG2651778-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	31-OCT-17
WG2648037-15 MS		**L2011542-2**						
Phosphorus (P)-Total			87.4		%		70-130	31-OCT-17
PH-TITR-TB	**Water**							
Batch R3866051								
WG2647463-11 LCS								
pH			6.01		pH		5.9-6.1	24-OCT-17
WG2647463-17 LCS								
pH			6.01		pH		5.9-6.1	24-OCT-17
WG2647463-2 LCS								
pH			6.01		pH		5.9-6.1	24-OCT-17
WG2647463-8 LCS								
pH			6.01		pH		5.9-6.1	24-OCT-17
PO4-DO-COL-TB	**Water**							
Batch R3865973								
WG2648015-3 DUP		**L2011542-1**						
Orthophosphate-Dissolved (as P)		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	25-OCT-17
WG2648015-10 LCS								
Orthophosphate-Dissolved (as P)			97.4		%		80-120	25-OCT-17
WG2648015-2 LCS								
Orthophosphate-Dissolved (as P)			99.3		%		80-120	25-OCT-17
WG2648015-1 MB								
Orthophosphate-Dissolved (as P)			<0.0030		mg/L		0.003	25-OCT-17
WG2648015-9 MB								
Orthophosphate-Dissolved (as P)			<0.0030		mg/L		0.003	25-OCT-17
WG2648015-4 MS		**L2011542-1**						
Orthophosphate-Dissolved (as P)			95.0		%		70-130	25-OCT-17
Batch R3868845								
WG2650346-2 LCS								
Orthophosphate-Dissolved (as P)			93.9		%		80-120	27-OCT-17
WG2650346-1 MB								
Orthophosphate-Dissolved (as P)			<0.0030		mg/L		0.003	27-OCT-17
SO4-IC-N-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-TB	**Water**							
Batch R3865645								
WG2647308-3 DUP		**L2011542-1**						
Sulfate (SO4)		5.07	4.98		mg/L	1.8	20	24-OCT-17
WG2647308-2 LCS								
Sulfate (SO4)			101.3		%		90-110	24-OCT-17
WG2647308-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	24-OCT-17
WG2647308-4 MS		**L2011542-1**						
Sulfate (SO4)			96.5		%		75-125	24-OCT-17
Batch R3866721								
WG2648536-6 LCS								
Sulfate (SO4)			101.2		%		90-110	25-OCT-17
WG2648536-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	25-OCT-17
TDS-TB	**Water**							
Batch R3865933								
WG2647327-2 LCS								
Total Dissolved Solids			97.7		%		85-115	25-OCT-17
WG2647327-1 MB								
Total Dissolved Solids			<10		mg/L		10	25-OCT-17
Batch R3866078								
WG2647517-2 LCS								
Total Dissolved Solids			98.1		%		85-115	24-OCT-17
WG2647517-1 MB								
Total Dissolved Solids			<10		mg/L		10	24-OCT-17
Batch R3867707								
WG2649340-2 LCS								
Total Dissolved Solids			96.4		%		85-115	26-OCT-17
WG2649340-1 MB								
Total Dissolved Solids			<10		mg/L		10	26-OCT-17
Batch R3868475								
WG2650258-2 LCS								
Total Dissolved Solids			94.4		%		85-115	27-OCT-17
WG2650258-1 MB								
Total Dissolved Solids			<10		mg/L		10	27-OCT-17
TKN-COL-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TKN-COL-TB	**Water**							
Batch R3868784								
WG2649636-10 LCS								
Total Kjeldahl Nitrogen			101.8		%		75-125	28-OCT-17
WG2649636-9 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	28-OCT-17
Batch R3870934								
WG2651559-2 LCS								
Total Kjeldahl Nitrogen			92.3		%		75-125	31-OCT-17
WG2651559-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	31-OCT-17
TOC-TB	**Water**							
Batch R3868525								
WG2650651-3 DUP		**L2011542-2**						
Total Organic Carbon		1.2	1.3		mg/L	8.4	20	27-OCT-17
WG2650651-2 LCS								
Total Organic Carbon			109.4		%		80-120	27-OCT-17
WG2650651-1 MB								
Total Organic Carbon			<1.0		mg/L		1	27-OCT-17
WG2650651-4 MS		**L2011542-2**						
Total Organic Carbon			105.8		%		70-130	27-OCT-17
TSS-L-TB	**Water**							
Batch R3866267								
WG2647528-2 LCS								
Total Suspended Solids			96.3		%		85-115	24-OCT-17
WG2647528-4 LCS								
Total Suspended Solids			93.1		%		85-115	24-OCT-17
WG2647528-1 MB								
Total Suspended Solids			<1.0		mg/L		1	24-OCT-17
WG2647528-3 MB								
Total Suspended Solids			<1.0		mg/L		1	24-OCT-17

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Conductivity							
	1	18-OCT-17 10:00	24-OCT-17 17:12	4	6	days	EHTR
	2	18-OCT-17 14:30	24-OCT-17 17:12	4	6	days	EHTR
	3	19-OCT-17 13:30	24-OCT-17 17:12	4	5	days	EHTR
pH							
	1	18-OCT-17 10:00	24-OCT-17 17:12	4	6	days	EHTR
	2	18-OCT-17 14:30	24-OCT-17 17:12	4	6	days	EHTR
	3	19-OCT-17 13:30	24-OCT-17 17:12	4	5	days	EHTR

Legend & Qualifier Definitions:

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

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2011542 were received on 23-OCT-17 15:35.

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

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

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L2011542-COFC

COC Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Palmer Environmental Consulting Group Inc.
Contact:	Jake McQueen
Phone:	647-795-8153
	Company address below will appear on the final report
Street:	374 Wellington Street West , Suite 3
City/Province:	Toronto, ON
Postal Code:	M5V 1E3
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1: jake@pecg.ca

Email 2: corinne@pegc.ca

Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1: jake@pecg.ca

Email 2:

Project Information

ALS Account # / Quote #: Q62364

Job #: Ambershaw

PO / AFE:

LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#

Major/Minor Code: Routing Code:

Requisitioner:

Location:

ALS Lab Work Order # (lab use only): L2011542

ALS Contact: Sampler:

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

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

PRIORITY (Business Days): 4 day [P4] ☐ 3 day [P3] ☐ 2 day [P2] ☐

EMERGENCY: 1 Business day [E1] ☐ Same Day, Weekend or Statutory holiday [E0] ☐

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

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

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Acidity, Alkalinity, Br, Cl, DOC, Conductivity,	F, Hardness, Dissolved Metals & Mercury,	Total Metals & Mercury, Total Nitrogen,	NH3, No2, NO3, Total Phosphorus, pH,	PO4, SO4, TDS, TOC, Low Level TSS	Number of Containers
	MW4	18-Oct-17	10:00	Surface Water	x	x	x	x	x	9
	MW3d	18-Oct-17	14:30	Surface Water	x	x	x	x	x	9
	MW2	19-Oct-17	13:30	Surface Water	x	x	x	x	x	9
	MW5d	20-Oct-17	13:30	Surface Water	x	x	x	x	x	9
	MW5s	20-Oct-17	14:00	Surface Water	x	x	x	x	x	9
	MW6	21-Oct-17	13:45	Surface Water	x	x	x	x	x	9
	MW7d	21-Oct-17	15:00	Surface Water	x	x	x	x	x	9
	MW7s	22-Oct-17	17:00	Surface Water	x	x	x	x	x	9
	MW7d-DUP	21-Oct-17	15:30	Surface Water	x	x	x	x	x	9
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	

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

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
11.7					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	23-Oct-17			Oct 23/17	3:35			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

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

PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)
ATTN: Jake McQueen
374 Wellington Street West
Suite 3
Toronto ON M5V 1E3

Date Received: 29-MAY-18
Report Date: 05-JUN-18 14:52 (MT)
Version: FINAL

Client Phone: 647-795-8153

Certificate of Analysis

Lab Work Order #: L2101962

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

<Original signed by>

Christine Paradis
Project Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-1 MW4 Sampled By: JM on 25-MAY-18 @ 10:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	72.0		3.0	uS/cm		30-MAY-18	R4062791
Hardness (as CaCO3)	27.8		0.50	mg/L		02-JUN-18	
pH	6.73		0.10	pH		30-MAY-18	R4062791
Total Suspended Solids	<1.0		1.0	mg/L		31-MAY-18	R4063790
Total Dissolved Solids	51		13	mg/L		30-MAY-18	R4063408
Anions and Nutrients							
Acidity (as CaCO3)	5.2		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	29.1		2.0	mg/L		30-MAY-18	R4062791
Ammonia, Total (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		30-MAY-18	R4062864
Chloride (Cl)	0.30		0.10	mg/L		30-MAY-18	R4062864
Fluoride (F)	<0.020		0.020	mg/L		30-MAY-18	R4062864
Nitrate (as N)	0.409		0.020	mg/L		30-MAY-18	R4062864
Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-18	R4062864
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	31-MAY-18	01-JUN-18	R4064020
Total Nitrogen	0.41		0.15	mg/L		01-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062886
Phosphorus (P)-Total	<0.0030		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	5.29		0.30	mg/L		30-MAY-18	R4062864
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	2.8		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	2.5		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0100		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Arsenic (As)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Barium (Ba)-Total	0.0134		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Boron (B)-Total	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cadmium (Cd)-Total	0.0000059		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Calcium (Ca)-Total	9.82		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Chromium (Cr)-Total	0.00020		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cobalt (Co)-Total	0.00013		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Copper (Cu)-Total	0.00215		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Iron (Fe)-Total	0.016		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Lead (Pb)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Lithium (Li)-Total	<0.0010		0.0010	mg/L	30-MAY-18	30-MAY-18	R4063031
Magnesium (Mg)-Total	1.09		0.0050	mg/L	30-MAY-18	30-MAY-18	R4063031
Manganese (Mn)-Total	0.00323		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-1 MW4 Sampled By: JM on 25-MAY-18 @ 10:00 Matrix: Surface Water							
Total Metals							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		30-MAY-18	R4062224
Molybdenum (Mo)-Total	0.000182		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Nickel (Ni)-Total	0.00113		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Phosphorus (P)-Total	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Potassium (K)-Total	2.04		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Rubidium (Rb)-Total	0.00093		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Selenium (Se)-Total	0.000114		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Silicon (Si)-Total	7.01		0.10	mg/L	30-MAY-18	30-MAY-18	R4063031
Silver (Ag)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Sodium (Na)-Total	1.84		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Strontium (Sr)-Total	0.0269		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Sulfur (S)-Total	2.02		0.50	mg/L	30-MAY-18	30-MAY-18	R4063031
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Thorium (Th)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Tin (Sn)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	30-MAY-18	30-MAY-18	R4063031
Tungsten (W)-Total	0.00133		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Uranium (U)-Total	0.000096		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Vanadium (V)-Total	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	30-MAY-18	30-MAY-18	R4063031
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					30-MAY-18	R4062181
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4064751
Aluminum (Al)-Dissolved	0.0046		0.0020	mg/L	30-MAY-18	01-JUN-18	R4065287
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Arsenic (As)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Barium (Ba)-Dissolved	0.0129		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Boron (B)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cadmium (Cd)-Dissolved	0.0000053		0.0000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Calcium (Ca)-Dissolved	9.45		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Chromium (Cr)-Dissolved	0.00033		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cobalt (Co)-Dissolved	0.00012		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Copper (Cu)-Dissolved	0.00142		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-1 MW4 Sampled By: JM on 25-MAY-18 @ 10:00 Matrix: Surface Water							
Dissolved Metals							
Magnesium (Mg)-Dissolved	1.02		0.0050	mg/L	30-MAY-18	01-JUN-18	R4065287
Manganese (Mn)-Dissolved	0.00280		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4062230
Molybdenum (Mo)-Dissolved	0.000186		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Nickel (Ni)-Dissolved	0.00087		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Potassium (K)-Dissolved	2.04		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Rubidium (Rb)-Dissolved	0.00088		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Selenium (Se)-Dissolved	0.000104		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silicon (Si)-Dissolved	6.90		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Sodium (Na)-Dissolved	1.83		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Strontium (Sr)-Dissolved	0.0265		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Sulfur (S)-Dissolved	1.80		0.50	mg/L	30-MAY-18	01-JUN-18	R4065287
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	01-JUN-18	R4065287
Tungsten (W)-Dissolved	0.00121		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Uranium (U)-Dissolved	0.000086		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Zinc (Zn)-Dissolved	0.0055		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	30-MAY-18	01-JUN-18	R4065287
L2101962-2 MW3D Sampled By: JM on 25-MAY-18 @ 11:30 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	268		3.0	uS/cm		30-MAY-18	R4062791
Hardness (as CaCO3)	112		0.50	mg/L		05-JUN-18	
pH	7.85		0.10	pH		30-MAY-18	R4062791
Total Suspended Solids	12.6		1.0	mg/L		31-MAY-18	R4063790
Total Dissolved Solids	163		20	mg/L		30-MAY-18	R4063408
Anions and Nutrients							
Acidity (as CaCO3)	2.3		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	112		2.0	mg/L		30-MAY-18	R4062791
Ammonia, Total (as N)	0.022		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		30-MAY-18	R4062864
Chloride (Cl)	0.22		0.10	mg/L		30-MAY-18	R4062864
Fluoride (F)	0.034		0.020	mg/L		30-MAY-18	R4062864
Nitrate (as N)	0.050		0.020	mg/L		30-MAY-18	R4062864
Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-18	R4062864

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-2 MW3D Sampled By: JM on 25-MAY-18 @ 11:30 Matrix: Surface Water							
Anions and Nutrients							
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	31-MAY-18	01-JUN-18	R4064020
Total Nitrogen	<0.15		0.15	mg/L		01-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062886
Phosphorus (P)-Total	0.0032		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	20.3		0.30	mg/L		30-MAY-18	R4062864
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	3.5	DTC	1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	2.7		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.141		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Antimony (Sb)-Total	0.00018		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Arsenic (As)-Total	0.00017		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Barium (Ba)-Total	0.135		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Boron (B)-Total	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cadmium (Cd)-Total	0.0000275		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Calcium (Ca)-Total	40.4		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Cesium (Cs)-Total	0.000280		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Chromium (Cr)-Total	0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cobalt (Co)-Total	0.00027		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Copper (Cu)-Total	0.00241		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Iron (Fe)-Total	0.130		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Lead (Pb)-Total	0.000119		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Lithium (Li)-Total	0.0034		0.0010	mg/L	30-MAY-18	30-MAY-18	R4063031
Magnesium (Mg)-Total	3.16		0.0050	mg/L	30-MAY-18	30-MAY-18	R4063031
Manganese (Mn)-Total	0.161		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Mercury (Hg)-Total	0.0000052		0.0000050	mg/L		30-MAY-18	R4062224
Molybdenum (Mo)-Total	0.000222		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Nickel (Ni)-Total	0.00084		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Phosphorus (P)-Total	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Potassium (K)-Total	12.6		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Rubidium (Rb)-Total	0.0156		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Selenium (Se)-Total	0.000593		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Silicon (Si)-Total	5.46		0.10	mg/L	30-MAY-18	30-MAY-18	R4063031
Silver (Ag)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Sodium (Na)-Total	1.38		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Strontium (Sr)-Total	0.161		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Sulfur (S)-Total	7.26		0.50	mg/L	30-MAY-18	30-MAY-18	R4063031
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-2 MW3D Sampled By: JM on 25-MAY-18 @ 11:30 Matrix: Surface Water							
Total Metals							
Thallium (Tl)-Total	0.000020		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Thorium (Th)-Total	0.00017		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Tin (Sn)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Titanium (Ti)-Total	0.00266		0.00030	mg/L	30-MAY-18	30-MAY-18	R4063031
Tungsten (W)-Total	0.00079		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Uranium (U)-Total	0.000663		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Vanadium (V)-Total	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Zinc (Zn)-Total	0.0031		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Zirconium (Zr)-Total	0.000163		0.000060	mg/L	30-MAY-18	30-MAY-18	R4063031
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					30-MAY-18	R4062181
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4064751
Aluminum (Al)-Dissolved	0.0035		0.0020	mg/L	30-MAY-18	01-JUN-18	R4065287
Antimony (Sb)-Dissolved	0.00016		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Arsenic (As)-Dissolved	0.00011		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Barium (Ba)-Dissolved	0.132		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Boron (B)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cadmium (Cd)-Dissolved	0.0000243		0.0000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Calcium (Ca)-Dissolved	39.7		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Cesium (Cs)-Dissolved	0.000257		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Chromium (Cr)-Dissolved	0.00182	DTC	0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cobalt (Co)-Dissolved	0.00026		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Copper (Cu)-Dissolved	0.00112		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Iron (Fe)-Dissolved	0.043		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Lithium (Li)-Dissolved	0.0030		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Magnesium (Mg)-Dissolved	3.06		0.0050	mg/L	30-MAY-18	01-JUN-18	R4065287
Manganese (Mn)-Dissolved	0.154		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4062230
Molybdenum (Mo)-Dissolved	0.000583	DTC	0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Nickel (Ni)-Dissolved	0.00064		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Potassium (K)-Dissolved	13.0		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Rubidium (Rb)-Dissolved	0.0147		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Selenium (Se)-Dissolved	0.000452		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silicon (Si)-Dissolved	5.14		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Sodium (Na)-Dissolved	1.24		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Strontium (Sr)-Dissolved	0.157		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-2 MW3D Sampled By: JM on 25-MAY-18 @ 11:30 Matrix: Surface Water							
Dissolved Metals							
Sulfur (S)-Dissolved	6.98		0.50	mg/L	30-MAY-18	01-JUN-18	R4065287
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Thallium (Tl)-Dissolved	0.000018		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	01-JUN-18	R4065287
Tungsten (W)-Dissolved	0.00076		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Uranium (U)-Dissolved	0.000612		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Zinc (Zn)-Dissolved	0.0014		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	30-MAY-18	01-JUN-18	R4065287
L2101962-3 MW2 Sampled By: JM on 26-MAY-18 @ 12:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	153		3.0	uS/cm		30-MAY-18	R4062791
Hardness (as CaCO3)	76.6		0.50	mg/L		02-JUN-18	
pH	7.75		0.10	pH		30-MAY-18	R4062791
Total Suspended Solids	1.4		1.0	mg/L		31-MAY-18	R4063790
Total Dissolved Solids	103		13	mg/L		31-MAY-18	R4064025
Anions and Nutrients							
Acidity (as CaCO3)	<2.0		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	74.0		2.0	mg/L		30-MAY-18	R4062791
Ammonia, Total (as N)	0.023		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		30-MAY-18	R4062864
Chloride (Cl)	<0.10		0.10	mg/L		30-MAY-18	R4062864
Fluoride (F)	0.032		0.020	mg/L		30-MAY-18	R4062864
Nitrate (as N)	0.072		0.020	mg/L		30-MAY-18	R4062864
Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-18	R4062864
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	31-MAY-18	01-JUN-18	R4064020
Total Nitrogen	<0.15		0.15	mg/L		01-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062886
Phosphorus (P)-Total	0.0037		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	7.22		0.30	mg/L		30-MAY-18	R4062864
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	5.0		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	4.2		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0500		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Arsenic (As)-Total	0.00035		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-3 MW2 Sampled By: JM on 26-MAY-18 @ 12:00 Matrix: Surface Water							
Total Metals							
Barium (Ba)-Total	0.0437		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Boron (B)-Total	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cadmium (Cd)-Total	0.0000165		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Calcium (Ca)-Total	26.7		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Chromium (Cr)-Total	0.00056		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cobalt (Co)-Total	0.00045		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Copper (Cu)-Total	0.00272		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Iron (Fe)-Total	0.094		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Lead (Pb)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Lithium (Li)-Total	<0.0010		0.0010	mg/L	30-MAY-18	30-MAY-18	R4063031
Magnesium (Mg)-Total	1.68		0.0050	mg/L	30-MAY-18	30-MAY-18	R4063031
Manganese (Mn)-Total	0.0284		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		30-MAY-18	R4062224
Molybdenum (Mo)-Total	0.000247		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Nickel (Ni)-Total	0.00130		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Phosphorus (P)-Total	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Potassium (K)-Total	2.38		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Rubidium (Rb)-Total	0.00262		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Selenium (Se)-Total	0.000152		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Silicon (Si)-Total	6.60		0.10	mg/L	30-MAY-18	30-MAY-18	R4063031
Silver (Ag)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Sodium (Na)-Total	3.03		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Strontium (Sr)-Total	0.0602		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Sulfur (S)-Total	2.74		0.50	mg/L	30-MAY-18	30-MAY-18	R4063031
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Thorium (Th)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Tin (Sn)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Titanium (Ti)-Total	0.00160		0.00030	mg/L	30-MAY-18	30-MAY-18	R4063031
Tungsten (W)-Total	0.00178		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Uranium (U)-Total	0.000279		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Vanadium (V)-Total	0.00063		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Zinc (Zn)-Total	0.0046		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Zirconium (Zr)-Total	0.000066		0.000060	mg/L	30-MAY-18	30-MAY-18	R4063031
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					30-MAY-18	R4062181
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4064751
Aluminum (Al)-Dissolved	0.0104		0.0020	mg/L	30-MAY-18	01-JUN-18	R4065287

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-3 MW2 Sampled By: JM on 26-MAY-18 @ 12:00 Matrix: Surface Water							
Dissolved Metals							
Antimony (Sb)-Dissolved	0.00012		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Arsenic (As)-Dissolved	0.00033		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Barium (Ba)-Dissolved	0.0463		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Boron (B)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cadmium (Cd)-Dissolved	0.0000178		0.0000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Calcium (Ca)-Dissolved	27.8		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Chromium (Cr)-Dissolved	0.00023		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cobalt (Co)-Dissolved	0.00044		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Copper (Cu)-Dissolved	0.00268		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Magnesium (Mg)-Dissolved	1.72		0.0050	mg/L	30-MAY-18	01-JUN-18	R4065287
Manganese (Mn)-Dissolved	0.0290		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4062230
Molybdenum (Mo)-Dissolved	0.000247		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Nickel (Ni)-Dissolved	0.00099		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Potassium (K)-Dissolved	2.63		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Rubidium (Rb)-Dissolved	0.00269		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Selenium (Se)-Dissolved	0.000167		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silicon (Si)-Dissolved	6.43		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Sodium (Na)-Dissolved	3.25		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Strontium (Sr)-Dissolved	0.0615		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Sulfur (S)-Dissolved	2.43		0.50	mg/L	30-MAY-18	01-JUN-18	R4065287
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Thallium (Tl)-Dissolved	0.000014		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Tin (Sn)-Dissolved	0.00016		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	01-JUN-18	R4065287
Tungsten (W)-Dissolved	0.00155		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Uranium (U)-Dissolved	0.000272		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Zinc (Zn)-Dissolved	0.0042		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Zirconium (Zr)-Dissolved	0.000064		0.000060	mg/L	30-MAY-18	01-JUN-18	R4065287
L2101962-4 MW6 Sampled By: JM on 27-MAY-18 @ 15:45 Matrix: Surface Water							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-4 MW6 Sampled By: JM on 27-MAY-18 @ 15:45 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	321		3.0	uS/cm		30-MAY-18	R4062791
Hardness (as CaCO3)	159		0.50	mg/L		02-JUN-18	
pH	7.72		0.10	pH		30-MAY-18	R4062791
Total Suspended Solids	3.9		1.0	mg/L		31-MAY-18	R4063790
Total Dissolved Solids	214		20	mg/L		31-MAY-18	R4064162
Anions and Nutrients							
Acidity (as CaCO3)	3.5		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	165		2.0	mg/L		30-MAY-18	R4062791
Ammonia, Total (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		30-MAY-18	R4062864
Chloride (Cl)	0.14		0.10	mg/L		30-MAY-18	R4062864
Fluoride (F)	0.023		0.020	mg/L		30-MAY-18	R4062864
Nitrate (as N)	<0.020		0.020	mg/L		30-MAY-18	R4062864
Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-18	R4062864
Total Kjeldahl Nitrogen	0.19		0.15	mg/L	31-MAY-18	01-JUN-18	R4064020
Total Nitrogen	0.19		0.15	mg/L		01-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062886
Phosphorus (P)-Total	0.0063		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	5.53		0.30	mg/L		30-MAY-18	R4062864
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	9.9		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	9.2		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0482		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Antimony (Sb)-Total	0.00011		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Arsenic (As)-Total	0.00017		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Barium (Ba)-Total	0.0136		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Boron (B)-Total	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cadmium (Cd)-Total	0.0000269		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Calcium (Ca)-Total	57.3		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Cesium (Cs)-Total	0.000035		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Chromium (Cr)-Total	0.00042		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cobalt (Co)-Total	0.00049		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Copper (Cu)-Total	0.0166		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Iron (Fe)-Total	0.162		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Lead (Pb)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Lithium (Li)-Total	0.0020		0.0010	mg/L	30-MAY-18	30-MAY-18	R4063031
Magnesium (Mg)-Total	3.84		0.0050	mg/L	30-MAY-18	30-MAY-18	R4063031
Manganese (Mn)-Total	0.284		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-4 MW6 Sampled By: JM on 27-MAY-18 @ 15:45 Matrix: Surface Water							
Total Metals							
Mercury (Hg)-Total	0.0000094		0.0000050	mg/L		30-MAY-18	R4062224
Molybdenum (Mo)-Total	0.000208		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Nickel (Ni)-Total	0.0131		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Phosphorus (P)-Total	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Potassium (K)-Total	1.21		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Rubidium (Rb)-Total	0.00256		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Selenium (Se)-Total	0.000103		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Silicon (Si)-Total	12.2		0.10	mg/L	30-MAY-18	30-MAY-18	R4063031
Silver (Ag)-Total	0.000015		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Sodium (Na)-Total	3.41		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Strontium (Sr)-Total	0.0627		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Sulfur (S)-Total	2.36		0.50	mg/L	30-MAY-18	30-MAY-18	R4063031
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Thorium (Th)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Tin (Sn)-Total	0.00051		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Titanium (Ti)-Total	0.00175		0.00030	mg/L	30-MAY-18	30-MAY-18	R4063031
Tungsten (W)-Total	0.00030		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Uranium (U)-Total	0.000490		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Vanadium (V)-Total	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Zinc (Zn)-Total	0.0159		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Zirconium (Zr)-Total	0.000108		0.000060	mg/L	30-MAY-18	30-MAY-18	R4063031
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					30-MAY-18	R4062181
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4064751
Aluminum (Al)-Dissolved	0.0050		0.0020	mg/L	30-MAY-18	01-JUN-18	R4065287
Antimony (Sb)-Dissolved	0.00012		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Arsenic (As)-Dissolved	0.00013		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Barium (Ba)-Dissolved	0.0129		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Boron (B)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cadmium (Cd)-Dissolved	0.0000123		0.0000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Calcium (Ca)-Dissolved	57.2		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Cesium (Cs)-Dissolved	0.000030		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Chromium (Cr)-Dissolved	0.00026		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Copper (Cu)-Dissolved	0.00995		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Lithium (Li)-Dissolved	0.0018		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-4 MW6 Sampled By: JM on 27-MAY-18 @ 15:45 Matrix: Surface Water							
Dissolved Metals							
Magnesium (Mg)-Dissolved	3.94		0.0050	mg/L	30-MAY-18	01-JUN-18	R4065287
Manganese (Mn)-Dissolved	0.0449		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4062230
Molybdenum (Mo)-Dissolved	0.000209		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Nickel (Ni)-Dissolved	0.00576		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Potassium (K)-Dissolved	1.25		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Rubidium (Rb)-Dissolved	0.00263		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Selenium (Se)-Dissolved	0.000097		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silicon (Si)-Dissolved	11.8		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Sodium (Na)-Dissolved	3.38		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Strontium (Sr)-Dissolved	0.0632		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Sulfur (S)-Dissolved	2.03		0.50	mg/L	30-MAY-18	01-JUN-18	R4065287
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Tin (Sn)-Dissolved	0.00018		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	01-JUN-18	R4065287
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Uranium (U)-Dissolved	0.000453		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Zinc (Zn)-Dissolved	0.0100		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Zirconium (Zr)-Dissolved	0.000081		0.000060	mg/L	30-MAY-18	01-JUN-18	R4065287
L2101962-5 MW7S Sampled By: JM on 27-MAY-18 @ 10:20 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	180		3.0	uS/cm		30-MAY-18	R4062791
Hardness (as CaCO3)	82.2		0.50	mg/L		05-JUN-18	
pH	6.69		0.10	pH		30-MAY-18	R4062791
Total Suspended Solids	2.1		1.0	mg/L		31-MAY-18	R4063790
Total Dissolved Solids	131		13	mg/L		31-MAY-18	R4064162
Anions and Nutrients							
Acidity (as CaCO3)	13.3		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	79.6		2.0	mg/L		30-MAY-18	R4062791
Ammonia, Total (as N)	0.035		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		30-MAY-18	R4062864
Chloride (Cl)	0.27		0.10	mg/L		30-MAY-18	R4062864
Fluoride (F)	0.026		0.020	mg/L		30-MAY-18	R4062864
Nitrate (as N)	0.095		0.020	mg/L		30-MAY-18	R4062864
Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-18	R4062864

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-5 MW7S Sampled By: JM on 27-MAY-18 @ 10:20 Matrix: Surface Water							
Anions and Nutrients							
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	31-MAY-18	01-JUN-18	R4064020
Total Nitrogen	<0.15		0.15	mg/L		01-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062886
Phosphorus (P)-Total	0.0036		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	12.5		0.30	mg/L		30-MAY-18	R4062864
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	2.5		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	2.2		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.101		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Arsenic (As)-Total	0.00014		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Barium (Ba)-Total	0.0483		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Boron (B)-Total	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cadmium (Cd)-Total	0.0000372		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Calcium (Ca)-Total	22.1		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Cesium (Cs)-Total	0.000065		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Chromium (Cr)-Total	0.00038		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cobalt (Co)-Total	0.00763		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Copper (Cu)-Total	0.0254		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Iron (Fe)-Total	0.079		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Lead (Pb)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Lithium (Li)-Total	0.0038		0.0010	mg/L	30-MAY-18	30-MAY-18	R4063031
Magnesium (Mg)-Total	5.71		0.0050	mg/L	30-MAY-18	30-MAY-18	R4063031
Manganese (Mn)-Total	0.139		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		30-MAY-18	R4062224
Molybdenum (Mo)-Total	0.00309		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Nickel (Ni)-Total	0.0389		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Phosphorus (P)-Total	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Potassium (K)-Total	5.03		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Rubidium (Rb)-Total	0.0111		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Selenium (Se)-Total	0.000444		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Silicon (Si)-Total	13.2		0.10	mg/L	30-MAY-18	30-MAY-18	R4063031
Silver (Ag)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Sodium (Na)-Total	4.14		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Strontium (Sr)-Total	0.0858		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Sulfur (S)-Total	4.49		0.50	mg/L	30-MAY-18	30-MAY-18	R4063031
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-5 MW7S Sampled By: JM on 27-MAY-18 @ 10:20 Matrix: Surface Water							
Total Metals							
Thallium (Tl)-Total	0.000043		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Thorium (Th)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Tin (Sn)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Titanium (Ti)-Total	0.00398		0.00030	mg/L	30-MAY-18	30-MAY-18	R4063031
Tungsten (W)-Total	0.0281		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Uranium (U)-Total	0.00183		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Vanadium (V)-Total	<0.00050		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Zinc (Zn)-Total	0.0257		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	30-MAY-18	30-MAY-18	R4063031
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					30-MAY-18	R4062181
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4064751
Aluminum (Al)-Dissolved	0.0134		0.0020	mg/L	30-MAY-18	01-JUN-18	R4065287
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Arsenic (As)-Dissolved	0.00011		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Barium (Ba)-Dissolved	0.0479		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Boron (B)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cadmium (Cd)-Dissolved	0.0000409		0.0000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Calcium (Ca)-Dissolved	22.9		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Cesium (Cs)-Dissolved	0.000054		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Chromium (Cr)-Dissolved	0.00029		0.00010	mg/L	30-MAY-18	04-JUN-18	R4069230
Cobalt (Co)-Dissolved	0.00763		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Copper (Cu)-Dissolved	0.0242		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Iron (Fe)-Dissolved	0.016		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Lithium (Li)-Dissolved	0.0036		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Magnesium (Mg)-Dissolved	6.06		0.0050	mg/L	30-MAY-18	01-JUN-18	R4065287
Manganese (Mn)-Dissolved	0.137		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4062230
Molybdenum (Mo)-Dissolved	0.00322		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Nickel (Ni)-Dissolved	0.0388		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Potassium (K)-Dissolved	5.12		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Rubidium (Rb)-Dissolved	0.0111		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Selenium (Se)-Dissolved	0.000416		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silicon (Si)-Dissolved	12.8		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Sodium (Na)-Dissolved	4.30		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Strontium (Sr)-Dissolved	0.0865		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-5 MW7S Sampled By: JM on 27-MAY-18 @ 10:20 Matrix: Surface Water							
Dissolved Metals							
Sulfur (S)-Dissolved	4.87		0.50	mg/L	30-MAY-18	01-JUN-18	R4065287
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Thallium (Tl)-Dissolved	0.000039		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	01-JUN-18	R4065287
Tungsten (W)-Dissolved	0.0274		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Uranium (U)-Dissolved	0.00174		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Zinc (Zn)-Dissolved	0.0241		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	30-MAY-18	01-JUN-18	R4065287
L2101962-6 MW7D Sampled By: JM on 27-MAY-18 @ 11:35 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	133		3.0	uS/cm		30-MAY-18	R4062791
Hardness (as CaCO3)	59.0		0.50	mg/L		02-JUN-18	
pH	7.10		0.10	pH		30-MAY-18	R4062791
Total Suspended Solids	29.3		1.0	mg/L		31-MAY-18	R4063790
Total Dissolved Solids	92		13	mg/L		31-MAY-18	R4064162
Anions and Nutrients							
Acidity (as CaCO3)	4.4		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	60.6		2.0	mg/L		30-MAY-18	R4062791
Ammonia, Total (as N)	0.091		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		30-MAY-18	R4062864
Chloride (Cl)	0.21		0.10	mg/L		30-MAY-18	R4062864
Fluoride (F)	0.024		0.020	mg/L		30-MAY-18	R4062864
Nitrate (as N)	0.053		0.020	mg/L		30-MAY-18	R4062864
Nitrite (as N)	<0.010		0.010	mg/L		30-MAY-18	R4062864
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	31-MAY-18	01-JUN-18	R4064020
Total Nitrogen	<0.15		0.15	mg/L		01-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		30-MAY-18	R4062886
Phosphorus (P)-Total	0.0098		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	6.87		0.30	mg/L		30-MAY-18	R4062864
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	1.7		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	1.3		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.538		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Arsenic (As)-Total	0.00017		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-6 MW7D Sampled By: JM on 27-MAY-18 @ 11:35 Matrix: Surface Water							
Total Metals							
Barium (Ba)-Total	0.0240		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Boron (B)-Total	<0.010		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cadmium (Cd)-Total	0.0000232		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Calcium (Ca)-Total	17.7		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Cesium (Cs)-Total	0.000093		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Chromium (Cr)-Total	0.00150		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Cobalt (Co)-Total	0.00136		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Copper (Cu)-Total	0.0145		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Iron (Fe)-Total	0.730		0.010	mg/L	30-MAY-18	30-MAY-18	R4063031
Lead (Pb)-Total	0.000254		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Lithium (Li)-Total	0.0028		0.0010	mg/L	30-MAY-18	30-MAY-18	R4063031
Magnesium (Mg)-Total	3.51		0.0050	mg/L	30-MAY-18	30-MAY-18	R4063031
Manganese (Mn)-Total	0.0307		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		30-MAY-18	R4062224
Molybdenum (Mo)-Total	0.00235		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Nickel (Ni)-Total	0.00663		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Phosphorus (P)-Total	<0.050		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Potassium (K)-Total	2.28		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Rubidium (Rb)-Total	0.00495		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Selenium (Se)-Total	0.000764		0.000050	mg/L	30-MAY-18	30-MAY-18	R4063031
Silicon (Si)-Total	9.07		0.10	mg/L	30-MAY-18	30-MAY-18	R4063031
Silver (Ag)-Total	<0.000010		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Sodium (Na)-Total	2.60		0.050	mg/L	30-MAY-18	30-MAY-18	R4063031
Strontium (Sr)-Total	0.0412		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Sulfur (S)-Total	2.42		0.50	mg/L	30-MAY-18	30-MAY-18	R4063031
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	30-MAY-18	30-MAY-18	R4063031
Thallium (Tl)-Total	0.000016		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Thorium (Th)-Total	0.00020		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Tin (Sn)-Total	<0.00010		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Titanium (Ti)-Total	0.0214		0.00030	mg/L	30-MAY-18	30-MAY-18	R4063031
Tungsten (W)-Total	0.00670		0.00010	mg/L	30-MAY-18	30-MAY-18	R4063031
Uranium (U)-Total	0.00198		0.000010	mg/L	30-MAY-18	30-MAY-18	R4063031
Vanadium (V)-Total	0.00144		0.00050	mg/L	30-MAY-18	30-MAY-18	R4063031
Zinc (Zn)-Total	0.0376		0.0030	mg/L	30-MAY-18	30-MAY-18	R4063031
Zirconium (Zr)-Total	0.000124		0.000060	mg/L	30-MAY-18	30-MAY-18	R4063031
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					30-MAY-18	R4062181
Dissolved Metals Filtration Location	FIELD					30-MAY-18	R4064751
Aluminum (Al)-Dissolved	0.0042		0.0020	mg/L	30-MAY-18	01-JUN-18	R4065287

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2101962-6 MW7D Sampled By: JM on 27-MAY-18 @ 11:35 Matrix: Surface Water							
Dissolved Metals							
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Arsenic (As)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Barium (Ba)-Dissolved	0.0217		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Boron (B)-Dissolved	<0.010		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cadmium (Cd)-Dissolved	0.0000125		0.0000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Calcium (Ca)-Dissolved	18.1		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Cesium (Cs)-Dissolved	0.000033		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Chromium (Cr)-Dissolved	0.00018		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Cobalt (Co)-Dissolved	0.00099		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Copper (Cu)-Dissolved	0.00194		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Iron (Fe)-Dissolved	0.194		0.010	mg/L	30-MAY-18	01-JUN-18	R4065287
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Lithium (Li)-Dissolved	0.0019		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Magnesium (Mg)-Dissolved	3.32		0.0050	mg/L	30-MAY-18	01-JUN-18	R4065287
Manganese (Mn)-Dissolved	0.0278		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	30-MAY-18	30-MAY-18	R4062230
Molybdenum (Mo)-Dissolved	0.00234		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Nickel (Ni)-Dissolved	0.00547		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Potassium (K)-Dissolved	2.31		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Rubidium (Rb)-Dissolved	0.00449		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Selenium (Se)-Dissolved	0.000663		0.000050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silicon (Si)-Dissolved	7.91		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Sodium (Na)-Dissolved	2.55		0.050	mg/L	30-MAY-18	01-JUN-18	R4065287
Strontium (Sr)-Dissolved	0.0409		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Sulfur (S)-Dissolved	2.24		0.50	mg/L	30-MAY-18	01-JUN-18	R4065287
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	30-MAY-18	01-JUN-18	R4065287
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	30-MAY-18	01-JUN-18	R4065287
Tungsten (W)-Dissolved	0.00359		0.00010	mg/L	30-MAY-18	01-JUN-18	R4065287
Uranium (U)-Dissolved	0.00178		0.000010	mg/L	30-MAY-18	01-JUN-18	R4065287
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	30-MAY-18	01-JUN-18	R4065287
Zinc (Zn)-Dissolved	0.0118		0.0010	mg/L	30-MAY-18	01-JUN-18	R4065287
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	30-MAY-18	01-JUN-18	R4065287

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Potassium (K)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Rubidium (Rb)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Barium (Ba)-Total	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Calcium (Ca)-Total	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Manganese (Mn)-Total	MS-B	L2101962-1, -2, -3, -4, -5, -6
Matrix Spike	Strontium (Sr)-Total	MS-B	L2101962-1, -2, -3, -4, -5, -6

Sample Parameter Qualifier key listed:

Qualifier	Description
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-TITR-TB	Water	Acidity	APHA 2310 B modified

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-TITR-TB	Water	Alkalinity	APHA 2320B modified

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

BR-IC-N-TB	Water	Bromide in Water by IC	EPA 300.1 (mod)

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

CL-L-IC-N-TB	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

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

DOC-TB	Water	Dissolved Organic Carbon	APHA 5310 B modified

Water samples are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis. Analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

EC-TITR-TB	Water	Conductivity	APHA 2510 B

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

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

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

HARDNESS-CALC-TB	Water	Hardness (as CaCO3)	CALCULATION

HG-D-CVAF-TB	Water	Dissolved Mercury in Water by CVAFS	EPA 1631E (mod)

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

HG-T-CVAF-TB	Water	Total Mercury in Water by CVAFS	EPA 1631E (mod)

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

Reference Information

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

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

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

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

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

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

N-T-CALC-TB	Water	Total Nitrogen (Calculation)	APHA 4500 N-Calculated

Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen +[Nitrate and Nitrite (as N)]

NH3-COL-TB	Water	Ammonia by Discrete Analyzer	APHA 4500-NH3 G. (modified)

Ammonia in aqueous matrices is analyzed using discrete analyzer with colourimetric detection.

NO2-IC-N-TB	Water	Nitrite in Water by IC	EPA 300.1 (mod)

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

NO3-IC-N-TB	Water	Nitrate in Water by IC	EPA 300.1 (mod)

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

P-T-COL-TB	Water	Total Phosphorus by Discrete Analyzer	APHA 4500-P B, F, G (modified)

Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

PH-TITR-TB	Water	pH	APHA 4500-H

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

PO4-DO-COL-TB	Water	Dissolved Orthophosphate	APHA 4500-P B, F, G (modified)

Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

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

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

TDS-TB	Water	Total Dissolved Solids	APHA 2540 C (modified)

Aqueous matrices are analyzed using gravimetry and evaporation

TKN-COL-TB	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg (modified)

Total Kjeldahl Nitrogen in aqueous matrices is analyzed using a discrete analyzer with colourimetric detection.

TOC-TB	Water	Total Organic Carbon (TOC)	APHA 5310 B modified

Water samples are analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

TSS-L-TB	Water	Low Level Total Suspended Solids	APHA 2540 D (modified)

Aqueous matrices are analyzed using gravimetry.

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

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

Laboratory Definition Code	Laboratory Location
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)
374 Wellington Street West Suite 3
Toronto ON M5V 1E3
Contact: Jake McQueen

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ACY-TITR-TB	**Water**							
Batch R4063799								
WG2784972-14 LCS								
Acidity (as CaCO3)			106.2		%		85-115	31-MAY-18
WG2784972-13 MB								
Acidity (as CaCO3)			<2.0		mg/L		2	31-MAY-18
ALK-TITR-TB	**Water**							
Batch R4062791								
WG2784339-3 DUP		**L2101962-3**						
Alkalinity, Total (as CaCO3)		74.0	73.5		mg/L	0.7	20	30-MAY-18
WG2784339-2 LCS								
Alkalinity, Total (as CaCO3)			102.3		%		85-115	30-MAY-18
WG2784339-1 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-MAY-18
BR-IC-N-TB	**Water**							
Batch R4062864								
WG2784073-3 DUP		**L2101962-1**						
Bromide (Br)		<0.10	<0.10	RPD-NA	mg/L	N/A	20	30-MAY-18
WG2784073-2 LCS								
Bromide (Br)			108.8		%		85-115	30-MAY-18
WG2784073-1 MB								
Bromide (Br)			<0.10		mg/L		0.1	30-MAY-18
WG2784073-4 MS		**L2101962-2**						
Bromide (Br)			87.6		%		75-125	30-MAY-18
CL-L-IC-N-TB	**Water**							
Batch R4062864								
WG2784073-3 DUP		**L2101962-1**						
Chloride (Cl)		0.30	0.47	J	mg/L	0.17	0.2	30-MAY-18
WG2784073-2 LCS								
Chloride (Cl)			99.7		%		90-110	30-MAY-18
WG2784073-1 MB								
Chloride (Cl)			<0.10		mg/L		0.1	30-MAY-18
WG2784073-4 MS		**L2101962-2**						
Chloride (Cl)			94.3		%		75-125	30-MAY-18
DOC-TB	**Water**							
Batch R4063771								
WG2785200-3 DUP		**L2101962-4**						
Dissolved Organic Carbon		9.9	9.6		mg/L	3.0	20	31-MAY-18
WG2785200-2 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
DOC-TB	**Water**							
Batch R4063771								
WG2785200-2 LCS								
Dissolved Organic Carbon			113.1		%		80-120	31-MAY-18
WG2785200-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	31-MAY-18
WG2785200-4 MS		**L2101962-5**						
Dissolved Organic Carbon			101.1		%		70-130	31-MAY-18
EC-TITR-TB	**Water**							
Batch R4062791								
WG2784339-3 DUP		**L2101962-3**						
Conductivity (EC)		153	153		uS/cm	0.1	10	30-MAY-18
WG2784339-2 LCS								
Conductivity (EC)			98.9		%		90-110	30-MAY-18
WG2784339-1 MB								
Conductivity (EC)			<3.0		uS/cm		3	30-MAY-18
F-IC-N-TB	**Water**							
Batch R4062864								
WG2784073-3 DUP		**L2101962-1**						
Fluoride (F)		<0.020	0.020	RPD-NA	mg/L	N/A	20	30-MAY-18
WG2784073-2 LCS								
Fluoride (F)			101.2		%		90-110	30-MAY-18
WG2784073-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	30-MAY-18
WG2784073-4 MS		**L2101962-2**						
Fluoride (F)			101.0		%		75-125	30-MAY-18
HG-D-CVAF-TB	**Water**							
Batch R4062230								
WG2784309-3 DUP		**L2101962-1**						
Mercury (Hg)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	30-MAY-18
WG2784309-2 LCS								
Mercury (Hg)-Dissolved			100.7		%		80-120	30-MAY-18
WG2784309-1 MB								
Mercury (Hg)-Dissolved			<0.000005(		mg/L		0.000005	30-MAY-18
WG2784309-4 MS		**L2101962-2**						
Mercury (Hg)-Dissolved			88.5		%		70-130	30-MAY-18
HG-T-CVAF-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAF-TB	**Water**							
Batch R4062224								
WG2784313-3 DUP		**L2101962-1**						
Mercury (Hg)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	30-MAY-18
WG2784313-2 LCS								
Mercury (Hg)-Total			102.6		%		80-120	30-MAY-18
WG2784313-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	30-MAY-18
WG2784313-4 MS		**L2101962-2**						
Mercury (Hg)-Total			87.4		%		70-130	30-MAY-18
MET-D-CCMS-TB	**Water**							
Batch R4065287								
WG2784069-7 DUP		**L2101962-5**						
Aluminum (Al)-Dissolved		0.0134	0.0130		mg/L	2.7	20	01-JUN-18
Antimony (Sb)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-JUN-18
Arsenic (As)-Dissolved		0.00011	0.00012		mg/L	8.4	20	01-JUN-18
Barium (Ba)-Dissolved		0.0479	0.0497		mg/L	3.7	20	01-JUN-18
Beryllium (Be)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-JUN-18
Bismuth (Bi)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	01-JUN-18
Boron (B)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	01-JUN-18
Cadmium (Cd)-Dissolved		0.0000409	0.0000437		mg/L	6.6	20	01-JUN-18
Calcium (Ca)-Dissolved		22.9	22.5		mg/L	2.0	20	01-JUN-18
Cesium (Cs)-Dissolved		0.000054	0.000054		mg/L	0.5	20	01-JUN-18
Cobalt (Co)-Dissolved		0.00763	0.00770		mg/L	0.9	20	01-JUN-18
Copper (Cu)-Dissolved		0.0242	0.0244		mg/L	0.8	20	01-JUN-18
Iron (Fe)-Dissolved		0.016	<0.010	RPD-NA	mg/L	N/A	20	01-JUN-18
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	01-JUN-18
Lithium (Li)-Dissolved		0.0036	0.0037		mg/L	2.9	20	01-JUN-18
Magnesium (Mg)-Dissolved		6.06	6.08		mg/L	0.3	20	01-JUN-18
Manganese (Mn)-Dissolved		0.137	0.138		mg/L	0.7	20	01-JUN-18
Molybdenum (Mo)-Dissolved		0.00322	0.00307		mg/L	4.7	20	01-JUN-18
Nickel (Ni)-Dissolved		0.0388	0.0389		mg/L	0.3	20	01-JUN-18
Phosphorus (P)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	01-JUN-18
Potassium (K)-Dissolved		5.12	5.27		mg/L	2.8	20	01-JUN-18
Rubidium (Rb)-Dissolved		0.0111	0.0114		mg/L	2.6	20	01-JUN-18
Selenium (Se)-Dissolved		0.000416	0.000394		mg/L	5.6	20	01-JUN-18
Silicon (Si)-Dissolved		12.8	13.0		mg/L	0.9	20	01-JUN-18
Silver (Ag)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	01-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4065287								
WG2784069-7 DUP		**L2101962-5**						
Sodium (Na)-Dissolved		4.30	4.34		mg/L	1.0	20	01-JUN-18
Strontium (Sr)-Dissolved		0.0865	0.0875		mg/L	1.1	20	01-JUN-18
Sulfur (S)-Dissolved		4.87	4.78		mg/L	1.9	20	01-JUN-18
Tellurium (Te)-Dissolved		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	01-JUN-18
Thallium (Tl)-Dissolved		0.000039	0.000038		mg/L	2.8	20	01-JUN-18
Thorium (Th)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-JUN-18
Tin (Sn)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	01-JUN-18
Titanium (Ti)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	01-JUN-18
Tungsten (W)-Dissolved		0.0274	0.0278		mg/L	1.3	20	01-JUN-18
Uranium (U)-Dissolved		0.00174	0.00177		mg/L	1.7	20	01-JUN-18
Vanadium (V)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	01-JUN-18
Zinc (Zn)-Dissolved		0.0241	0.0245		mg/L	1.8	20	01-JUN-18
Zirconium (Zr)-Dissolved		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	01-JUN-18
WG2784069-2 LCS								
Aluminum (Al)-Dissolved			101.3		%		80-120	01-JUN-18
Antimony (Sb)-Dissolved			96.9		%		80-120	01-JUN-18
Arsenic (As)-Dissolved			98.7		%		80-120	01-JUN-18
Barium (Ba)-Dissolved			104.2		%		80-120	01-JUN-18
Beryllium (Be)-Dissolved			96.6		%		80-120	01-JUN-18
Bismuth (Bi)-Dissolved			102.6		%		80-120	01-JUN-18
Boron (B)-Dissolved			92.0		%		80-120	01-JUN-18
Cadmium (Cd)-Dissolved			100.3		%		80-120	01-JUN-18
Calcium (Ca)-Dissolved			98.2		%		80-120	01-JUN-18
Cesium (Cs)-Dissolved			100.3		%		80-120	01-JUN-18
Chromium (Cr)-Dissolved			101.7		%		80-120	01-JUN-18
Cobalt (Co)-Dissolved			99.7		%		80-120	01-JUN-18
Copper (Cu)-Dissolved			97.8		%		80-120	01-JUN-18
Iron (Fe)-Dissolved			104.9		%		80-120	01-JUN-18
Lead (Pb)-Dissolved			102.3		%		80-120	01-JUN-18
Lithium (Li)-Dissolved			93.0		%		80-120	01-JUN-18
Magnesium (Mg)-Dissolved			104.9		%		80-120	01-JUN-18
Manganese (Mn)-Dissolved			99.8		%		80-120	01-JUN-18
Molybdenum (Mo)-Dissolved			99.8		%		80-120	01-JUN-18
Nickel (Ni)-Dissolved			97.6		%		80-120	01-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch	**R4065287**							
WG2784069-2	**LCS**							
Phosphorus (P)-Dissolved			102.2		%		80-120	01-JUN-18
Potassium (K)-Dissolved			106.5		%		80-120	01-JUN-18
Rubidium (Rb)-Dissolved			95.9		%		80-120	01-JUN-18
Selenium (Se)-Dissolved			100.1		%		80-120	01-JUN-18
Silicon (Si)-Dissolved			99.9		%		80-120	01-JUN-18
Silver (Ag)-Dissolved			101.6		%		80-120	01-JUN-18
Sodium (Na)-Dissolved			104.4		%		80-120	01-JUN-18
Strontium (Sr)-Dissolved			98.3		%		80-120	01-JUN-18
Sulfur (S)-Dissolved			103.9		%		80-120	01-JUN-18
Tellurium (Te)-Dissolved			95.2		%		80-120	01-JUN-18
Thallium (Tl)-Dissolved			101.8		%		80-120	01-JUN-18
Thorium (Th)-Dissolved			98.9		%		80-120	01-JUN-18
Tin (Sn)-Dissolved			99.96		%		80-120	01-JUN-18
Titanium (Ti)-Dissolved			98.4		%		80-120	01-JUN-18
Tungsten (W)-Dissolved			99.1		%		80-120	01-JUN-18
Uranium (U)-Dissolved			100.4		%		80-120	01-JUN-18
Vanadium (V)-Dissolved			101.0		%		80-120	01-JUN-18
Zinc (Zn)-Dissolved			95.4		%		80-120	01-JUN-18
Zirconium (Zr)-Dissolved			95.9		%		80-120	01-JUN-18
WG2784069-6	**LCS**							
Aluminum (Al)-Dissolved			101.8		%		80-120	01-JUN-18
Antimony (Sb)-Dissolved			98.1		%		80-120	01-JUN-18
Arsenic (As)-Dissolved			99.9		%		80-120	01-JUN-18
Barium (Ba)-Dissolved			101.4		%		80-120	01-JUN-18
Beryllium (Be)-Dissolved			102.8		%		80-120	01-JUN-18
Bismuth (Bi)-Dissolved			104.6		%		80-120	01-JUN-18
Boron (B)-Dissolved			98.9		%		80-120	01-JUN-18
Cadmium (Cd)-Dissolved			100.7		%		80-120	01-JUN-18
Calcium (Ca)-Dissolved			101.3		%		80-120	01-JUN-18
Cesium (Cs)-Dissolved			99.1		%		80-120	01-JUN-18
Chromium (Cr)-Dissolved			100.6		%		80-120	01-JUN-18
Cobalt (Co)-Dissolved			100.1		%		80-120	01-JUN-18
Copper (Cu)-Dissolved			99.5		%		80-120	01-JUN-18
Iron (Fe)-Dissolved			101.6		%		80-120	01-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch	**R4065287**							
WG2784069-6	**LCS**							
Lead (Pb)-Dissolved			103.2		%		80-120	01-JUN-18
Lithium (Li)-Dissolved			102.1		%		80-120	01-JUN-18
Magnesium (Mg)-Dissolved			105.3		%		80-120	01-JUN-18
Manganese (Mn)-Dissolved			99.0		%		80-120	01-JUN-18
Molybdenum (Mo)-Dissolved			103.0		%		80-120	01-JUN-18
Nickel (Ni)-Dissolved			99.0		%		80-120	01-JUN-18
Phosphorus (P)-Dissolved			99.3		%		80-120	01-JUN-18
Potassium (K)-Dissolved			107.4		%		80-120	01-JUN-18
Rubidium (Rb)-Dissolved			104.3		%		80-120	01-JUN-18
Selenium (Se)-Dissolved			98.4		%		80-120	01-JUN-18
Silicon (Si)-Dissolved			100.1		%		80-120	01-JUN-18
Silver (Ag)-Dissolved			102.0		%		80-120	01-JUN-18
Sodium (Na)-Dissolved			102.6		%		80-120	01-JUN-18
Strontium (Sr)-Dissolved			101.3		%		80-120	01-JUN-18
Sulfur (S)-Dissolved			104.8		%		80-120	01-JUN-18
Tellurium (Te)-Dissolved			95.2		%		80-120	01-JUN-18
Thallium (Tl)-Dissolved			102.0		%		80-120	01-JUN-18
Thorium (Th)-Dissolved			101.1		%		80-120	01-JUN-18
Tin (Sn)-Dissolved			100.1		%		80-120	01-JUN-18
Titanium (Ti)-Dissolved			94.7		%		80-120	01-JUN-18
Tungsten (W)-Dissolved			102.1		%		80-120	01-JUN-18
Uranium (U)-Dissolved			104.4		%		80-120	01-JUN-18
Vanadium (V)-Dissolved			102.0		%		80-120	01-JUN-18
Zinc (Zn)-Dissolved			94.0		%		80-120	01-JUN-18
Zirconium (Zr)-Dissolved			99.8		%		80-120	01-JUN-18
WG2784069-1	**MB**							
Aluminum (Al)-Dissolved			<0.0020		mg/L		0.002	01-JUN-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	01-JUN-18
Cadmium (Cd)-Dissolved			<0.000005C		mg/L		0.000005	01-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4065287								
WG2784069-1 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Cesium (Cs)-Dissolved			<0.000010		mg/L		0.00001	01-JUN-18
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	01-JUN-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-18
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	01-JUN-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	01-JUN-18
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	01-JUN-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Rubidium (Rb)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-18
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	01-JUN-18
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Strontium (Sr)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	01-JUN-18
Tellurium (Te)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-18
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	01-JUN-18
Thorium (Th)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	01-JUN-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	01-JUN-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	01-JUN-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	01-JUN-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	01-JUN-18
WG2784069-5 MB								
Aluminum (Al)-Dissolved			<0.0020		mg/L		0.002	01-JUN-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4065287								
WG2784069-5 MB								
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	01-JUN-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	01-JUN-18
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Cesium (Cs)-Dissolved			<0.000010		mg/L		0.00001	01-JUN-18
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	01-JUN-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-18
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	01-JUN-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	01-JUN-18
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	01-JUN-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Rubidium (Rb)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-18
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	01-JUN-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	01-JUN-18
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	01-JUN-18
Strontium (Sr)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	01-JUN-18
Tellurium (Te)-Dissolved			<0.00020		mg/L		0.0002	01-JUN-18
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	01-JUN-18
Thorium (Th)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	01-JUN-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	01-JUN-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	01-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4065287								
WG2784069-5 MB								
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	01-JUN-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	01-JUN-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	01-JUN-18
WG2784069-8 MS		**L2101962-6**						
Aluminum (Al)-Dissolved			101.3		%		70-130	01-JUN-18
Antimony (Sb)-Dissolved			98.3		%		70-130	01-JUN-18
Arsenic (As)-Dissolved			101.1		%		70-130	01-JUN-18
Barium (Ba)-Dissolved			N/A	MS-B	%		-	01-JUN-18
Beryllium (Be)-Dissolved			105.2		%		70-130	01-JUN-18
Bismuth (Bi)-Dissolved			98.3		%		70-130	01-JUN-18
Boron (B)-Dissolved			105.3		%		70-130	01-JUN-18
Cadmium (Cd)-Dissolved			103.0		%		70-130	01-JUN-18
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	01-JUN-18
Cesium (Cs)-Dissolved			99.1		%		70-130	01-JUN-18
Chromium (Cr)-Dissolved			100.7		%		70-130	01-JUN-18
Cobalt (Co)-Dissolved			101.3		%		70-130	01-JUN-18
Copper (Cu)-Dissolved			103.1		%		70-130	01-JUN-18
Iron (Fe)-Dissolved			99.99		%		70-130	01-JUN-18
Lead (Pb)-Dissolved			102.2		%		70-130	01-JUN-18
Lithium (Li)-Dissolved			104.9		%		70-130	01-JUN-18
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	01-JUN-18
Manganese (Mn)-Dissolved			N/A	MS-B	%		-	01-JUN-18
Molybdenum (Mo)-Dissolved			100.3		%		70-130	01-JUN-18
Nickel (Ni)-Dissolved			101.7		%		70-130	01-JUN-18
Phosphorus (P)-Dissolved			99.9		%		70-130	01-JUN-18
Potassium (K)-Dissolved			97.8		%		70-130	01-JUN-18
Rubidium (Rb)-Dissolved			99.2		%		70-130	01-JUN-18
Selenium (Se)-Dissolved			102.0		%		70-130	01-JUN-18
Silicon (Si)-Dissolved			92.5		%		70-130	01-JUN-18
Silver (Ag)-Dissolved			101.8		%		70-130	01-JUN-18
Sodium (Na)-Dissolved			N/A	MS-B	%		-	01-JUN-18
Strontium (Sr)-Dissolved			N/A	MS-B	%		-	01-JUN-18
Sulfur (S)-Dissolved			106.7		%		70-130	01-JUN-18
Tellurium (Te)-Dissolved			101.1		%		70-130	01-JUN-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4065287								
WG2784069-8 MS		**L2101962-6**						
Thallium (Tl)-Dissolved			101.8		%		70-130	01-JUN-18
Thorium (Th)-Dissolved			106.6		%		70-130	01-JUN-18
Tin (Sn)-Dissolved			100.7		%		70-130	01-JUN-18
Titanium (Ti)-Dissolved			101.0		%		70-130	01-JUN-18
Tungsten (W)-Dissolved			100.8		%		70-130	01-JUN-18
Uranium (U)-Dissolved			101.9		%		70-130	01-JUN-18
Vanadium (V)-Dissolved			101.9		%		70-130	01-JUN-18
Zinc (Zn)-Dissolved			96.2		%		70-130	01-JUN-18
Zirconium (Zr)-Dissolved			104.1		%		70-130	01-JUN-18
Batch R4069230								
WG2784069-7 DUP		**L2101962-5**						
Chromium (Cr)-Dissolved		0.00029	0.00017	J	mg/L	0.00011	0.0002	04-JUN-18
MET-T-CCMS-TB	**Water**							
Batch R4063031								
WG2784176-2 LCS								
Aluminum (Al)-Total			93.8		%		80-120	30-MAY-18
Antimony (Sb)-Total			89.9		%		80-120	30-MAY-18
Arsenic (As)-Total			91.1		%		80-120	30-MAY-18
Barium (Ba)-Total			91.2		%		80-120	30-MAY-18
Beryllium (Be)-Total			92.4		%		80-120	30-MAY-18
Bismuth (Bi)-Total			90.9		%		80-120	30-MAY-18
Boron (B)-Total			86.2		%		80-120	30-MAY-18
Cadmium (Cd)-Total			92.1		%		80-120	30-MAY-18
Calcium (Ca)-Total			88.7		%		80-120	30-MAY-18
Cesium (Cs)-Total			90.7		%		80-120	30-MAY-18
Chromium (Cr)-Total			90.8		%		80-120	30-MAY-18
Cobalt (Co)-Total			92.2		%		80-120	30-MAY-18
Copper (Cu)-Total			91.9		%		80-120	30-MAY-18
Iron (Fe)-Total			95.8		%		80-120	30-MAY-18
Lead (Pb)-Total			91.0		%		80-120	30-MAY-18
Lithium (Li)-Total			89.8		%		80-120	30-MAY-18
Magnesium (Mg)-Total			95.7		%		80-120	30-MAY-18
Manganese (Mn)-Total			93.4		%		80-120	30-MAY-18
Molybdenum (Mo)-Total			92.3		%		80-120	30-MAY-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4063031								
WG2784176-2 LCS								
Nickel (Ni)-Total			90.8		%		80-120	30-MAY-18
Phosphorus (P)-Total			99.3		%		80-120	30-MAY-18
Potassium (K)-Total			95.3		%		80-120	30-MAY-18
Rubidium (Rb)-Total			90.4		%		80-120	30-MAY-18
Selenium (Se)-Total			94.8		%		80-120	30-MAY-18
Silicon (Si)-Total			89.1		%		80-120	30-MAY-18
Silver (Ag)-Total			91.1		%		80-120	30-MAY-18
Sodium (Na)-Total			95.7		%		80-120	30-MAY-18
Strontium (Sr)-Total			89.4		%		80-120	30-MAY-18
Sulfur (S)-Total			96.2		%		80-120	30-MAY-18
Tellurium (Te)-Total			87.1		%		80-120	30-MAY-18
Thallium (Tl)-Total			90.5		%		80-120	30-MAY-18
Thorium (Th)-Total			90.3		%		80-120	30-MAY-18
Tin (Sn)-Total			89.5		%		80-120	30-MAY-18
Titanium (Ti)-Total			89.4		%		80-120	30-MAY-18
Tungsten (W)-Total			89.7		%		80-120	30-MAY-18
Uranium (U)-Total			93.5		%		80-120	30-MAY-18
Vanadium (V)-Total			91.5		%		80-120	30-MAY-18
Zinc (Zn)-Total			88.6		%		80-120	30-MAY-18
Zirconium (Zr)-Total			89.5		%		80-120	30-MAY-18
WG2784176-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	30-MAY-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	30-MAY-18
Boron (B)-Total			<0.010		mg/L		0.01	30-MAY-18
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	30-MAY-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	30-MAY-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	30-MAY-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	30-MAY-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4063031								
WG2784176-1 MB								
Iron (Fe)-Total			<0.010		mg/L		0.01	30-MAY-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	30-MAY-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	30-MAY-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	30-MAY-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	30-MAY-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	30-MAY-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	30-MAY-18
Potassium (K)-Total			<0.050		mg/L		0.05	30-MAY-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	30-MAY-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	30-MAY-18
Silicon (Si)-Total			<0.10		mg/L		0.1	30-MAY-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	30-MAY-18
Sodium (Na)-Total			<0.050		mg/L		0.05	30-MAY-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	30-MAY-18
Sulfur (S)-Total			<0.50		mg/L		0.5	30-MAY-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	30-MAY-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	30-MAY-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	30-MAY-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	30-MAY-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	30-MAY-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	30-MAY-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	30-MAY-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	30-MAY-18
NH3-COL-TB	**Water**							
Batch R4063365								
WG2785252-2 LCS								
Ammonia, Total (as N)			100.1		%		85-115	31-MAY-18
WG2785252-1 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	31-MAY-18
NO2-IC-N-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-TB	**Water**							
Batch R4062864								
WG2784073-3 DUP		**L2101962-1**						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	30-MAY-18
WG2784073-2 LCS								
Nitrite (as N)			98.8		%		90-110	30-MAY-18
WG2784073-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	30-MAY-18
WG2784073-4 MS		**L2101962-2**						
Nitrite (as N)			91.2		%		75-125	30-MAY-18
NO3-IC-N-TB	**Water**							
Batch R4062864								
WG2784073-3 DUP		**L2101962-1**						
Nitrate (as N)		0.409	0.409		mg/L	0.0	20	30-MAY-18
WG2784073-2 LCS								
Nitrate (as N)			99.4		%		90-110	30-MAY-18
WG2784073-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	30-MAY-18
WG2784073-4 MS		**L2101962-2**						
Nitrate (as N)			90.6		%		75-125	30-MAY-18
P-T-COL-TB	**Water**							
Batch R4067190								
WG2785347-2 LCS								
Phosphorus (P)-Total			97.0		%		80-120	04-JUN-18
WG2785347-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	04-JUN-18
WG2785347-4 MS		**L2101962-4**						
Phosphorus (P)-Total			95.8		%		70-130	04-JUN-18
PH-TITR-TB	**Water**							
Batch R4062791								
WG2784339-3 DUP		**L2101962-3**						
pH		7.75	7.75	J	pH	0.00	0.2	30-MAY-18
WG2784339-2 LCS								
pH			5.98		pH		5.9-6.1	30-MAY-18
PO4-DO-COL-TB	**Water**							
Batch R4062886								
WG2784233-2 LCS								
Orthophosphate-Dissolved (as P)			103.5		%		80-120	30-MAY-18
WG2784233-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PO4-DO-COL-TB	**Water**							
Batch R4062886								
WG2784233-1 MB								
Orthophosphate-Dissolved (as P)			<0.0030		mg/L		0.003	30-MAY-18
WG2784233-4 MS		**L2101962-4**						
Orthophosphate-Dissolved (as P)			93.8		%		70-130	30-MAY-18
SO4-IC-N-TB	**Water**							
Batch R4062864								
WG2784073-3 DUP		**L2101962-1**						
Sulfate (SO4)		5.29	5.43		mg/L	2.6	20	30-MAY-18
WG2784073-2 LCS								
Sulfate (SO4)			100.5		%		90-110	30-MAY-18
WG2784073-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	30-MAY-18
WG2784073-4 MS		**L2101962-2**						
Sulfate (SO4)			93.5		%		75-125	30-MAY-18
TDS-TB	**Water**							
Batch R4063408								
WG2784696-2 LCS								
Total Dissolved Solids			97.6		%		85-115	30-MAY-18
WG2784696-1 MB								
Total Dissolved Solids			<10		mg/L		10	30-MAY-18
Batch R4064025								
WG2785374-2 LCS								
Total Dissolved Solids			97.4		%		85-115	31-MAY-18
WG2785374-1 MB								
Total Dissolved Solids			<10		mg/L		10	31-MAY-18
Batch R4064162								
WG2785464-2 LCS								
Total Dissolved Solids			99.2		%		85-115	31-MAY-18
WG2785464-1 MB								
Total Dissolved Solids			<10		mg/L		10	31-MAY-18
TKN-COL-TB	**Water**							
Batch R4064020								
WG2784642-2 LCS								
Total Kjeldahl Nitrogen			111.9		%		75-125	01-JUN-18
WG2784642-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	01-JUN-18
TOC-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TOC-TB	**Water**							
Batch R4063755								
WG2785196-3 DUP		**L2101962-1**						
Total Organic Carbon		2.5	1.6	J	mg/L	0.8	2	31-MAY-18
WG2785196-2 LCS								
Total Organic Carbon			111.5		%		80-120	31-MAY-18
WG2785196-1 MB								
Total Organic Carbon			<1.0		mg/L		1	31-MAY-18
WG2785196-4 MS		**L2101962-2**						
Total Organic Carbon			101.4		%		70-130	31-MAY-18
TSS-L-TB	**Water**							
Batch R4063790								
WG2785309-2 LCS								
Total Suspended Solids			97.6		%		85-115	31-MAY-18
WG2785309-1 MB								
Total Suspended Solids			<1.0		mg/L		1	31-MAY-18

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Conductivity							
	1	25-MAY-18 10:00	30-MAY-18 12:02	4	5	days	EHTR
	2	25-MAY-18 11:30	30-MAY-18 12:02	4	5	days	EHTR
pH							
	1	25-MAY-18 10:00	30-MAY-18 12:02	4	5	days	EHTR
	2	25-MAY-18 11:30	30-MAY-18 12:02	4	5	days	EHTR

Legend & Qualifier Definitions:

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

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2101962 were received on 29-MAY-18 12:30.

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

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

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2101962-COFC

COC Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Palmer Environmental Consulting Group Inc.
Contact:	Jake McQueen
Phone:	647-795-8153
	Company address below will appear on the final report
Street:	374 Wellington Street West , Suite 3
City/Province:	Toronto, ON
Postal Code:	M5V 1E3
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1: jake@pecg.ca
Email 2: [redacted] ryan@pecg.ca
Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1: jake@pecg.ca
Email 2:

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

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

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

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	Q62364
Job #:	Ambershaw
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

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

ALS Lab Work Order # (lab use only): L2101962
ALS Contact: Christine A. Sampler: JMQ

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Acidity, Alkalinity, Br, Cl, DOC, Conductivity	F, Hardness, Dissolved Metals & Mercury	Total Metals & Mercury, Total Nitrogen	NH3, No2, NO3, Total Phosphorus, pH	PO4, SO4, TDS, TOC, Low Level TSS	Number of Containers
	MW4	25-MAY-18	10:00	Surface Water	x	x	x	x	x	9
	MW3d	25-May-18	11:30	Surface Water	x	x	x	x	x	"
	MW 2	26-May-18	12:00	Surface Water	x	x	x	x	x	"
	MW6	27-May18	15:45	Surface Water	x	x	x	x	x	"
	MW7s	27-May18	10:20	Surface Water	x	x	x	x	x	"
	MW7d	27-May-18	10:35	Surface Water	x	x	x	x	x	"
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
19.7					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	May 28/2018	9:00AM	LS	05/29/18	12:30			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

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

LS

PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)
ATTN: Jake McQueen
374 Wellington Street West
Suite 3
Toronto ON M5V 1E3

Date Received: 30-MAY-18
Report Date: 11-JUN-18 12:20 (MT)
Version: FINAL

Client Phone: 647-795-8153

Certificate of Analysis

Lab Work Order #: L2103029

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

<Original signed by>

Christine Paradis
Project Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-1 M4 Sampled By: JMC on 27-MAY-18 @ 12:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	46.4		3.0	uS/cm		30-MAY-18	R4062791
Hardness (as CaCO3)	21.3		0.50	mg/L		04-JUN-18	
pH	7.15		0.10	pH		30-MAY-18	R4062791
Total Suspended Solids	2.2		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	53		10	mg/L		31-MAY-18	R4064186
Anions and Nutrients							
Acidity (as CaCO3)	3.3		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	21.6		2.0	mg/L		30-MAY-18	R4062791
Ammonia, Total (as N)	0.021		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	0.12		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805
Total Kjeldahl Nitrogen	0.63		0.15	mg/L	01-JUN-18	05-JUN-18	R4069949
Total Nitrogen	0.63		0.15	mg/L		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	0.0141		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	0.82		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	11.8		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	13.3		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0444		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Arsenic (As)-Total	0.00026		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Barium (Ba)-Total	0.00954		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Boron (B)-Total	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Calcium (Ca)-Total	7.57		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Chromium (Cr)-Total	0.00025		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Copper (Cu)-Total	0.00074		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Iron (Fe)-Total	0.090		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Lead (Pb)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Lithium (Li)-Total	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4064847
Magnesium (Mg)-Total	0.740		0.0050	mg/L	31-MAY-18	02-JUN-18	R4064847
Manganese (Mn)-Total	0.0185		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-1 M4 Sampled By: JMC on 27-MAY-18 @ 12:00 Matrix: Surface Water							
Total Metals							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Phosphorus (P)-Total	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Potassium (K)-Total	1.07		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Rubidium (Rb)-Total	0.00211		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Selenium (Se)-Total	0.000075		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Silicon (Si)-Total	0.47		0.10	mg/L	31-MAY-18	02-JUN-18	R4064847
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Sodium (Na)-Total	0.751		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Strontium (Sr)-Total	0.0135		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Sulfur (S)-Total	0.55		0.50	mg/L	31-MAY-18	02-JUN-18	R4064847
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Tin (Sn)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Titanium (Ti)-Total	0.00038		0.00030	mg/L	31-MAY-18	02-JUN-18	R4064847
Tungsten (W)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Uranium (U)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Vanadium (V)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4064847
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	0.0337		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	0.00020		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.00875		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	7.38		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	0.000011		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	0.00033		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	0.00071		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	0.062		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-1 M4 Sampled By: JMC on 27-MAY-18 @ 12:00 Matrix: Surface Water							
Dissolved Metals							
Magnesium (Mg)-Dissolved	0.705		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	0.00190		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	1.07		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	0.00199		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	0.000068		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	0.388		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	0.694		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	0.0136		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Sulfur (S)-Dissolved	<0.50		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	0.0062		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029
L2103029-2 BEAK-1 Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	29.3		3.0	uS/cm		31-MAY-18	R4063799
Hardness (as CaCO3)	10.8		0.50	mg/L		04-JUN-18	
pH	7.42		0.10	pH		31-MAY-18	R4063799
Total Suspended Solids	<1.0		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	30		10	mg/L		01-JUN-18	R4064880
Anions and Nutrients							
Acidity (as CaCO3)	2.0		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	10.0		2.0	mg/L		01-JUN-18	R4064707
Ammonia, Total (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	1.16		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-2 BEAK-1 Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Anions and Nutrients							
Total Kjeldahl Nitrogen	0.25		0.15	mg/L	01-JUN-18	05-JUN-18	R4069949
Total Nitrogen	0.25		0.15	mg/L		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	0.0100		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	1.23		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	7.0		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	7.9		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0185		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Arsenic (As)-Total	0.00020		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Barium (Ba)-Total	0.00484		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Boron (B)-Total	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cadmium (Cd)-Total	0.0000093		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Calcium (Ca)-Total	3.65		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Cesium (Cs)-Total	0.000012		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Chromium (Cr)-Total	0.00046		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Copper (Cu)-Total	0.00058		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Iron (Fe)-Total	0.082		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Lead (Pb)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Lithium (Li)-Total	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4064847
Magnesium (Mg)-Total	0.605		0.0050	mg/L	31-MAY-18	02-JUN-18	R4064847
Manganese (Mn)-Total	0.0114		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Phosphorus (P)-Total	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Potassium (K)-Total	0.531		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Rubidium (Rb)-Total	0.00202		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Selenium (Se)-Total	0.000098		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Silicon (Si)-Total	1.80		0.10	mg/L	31-MAY-18	02-JUN-18	R4064847
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Sodium (Na)-Total	1.22		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Strontium (Sr)-Total	0.0106		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Sulfur (S)-Total	<0.50		0.50	mg/L	31-MAY-18	02-JUN-18	R4064847
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-2 BEAK-1 Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Total Metals							
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Tin (Sn)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4064847
Tungsten (W)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Uranium (U)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Vanadium (V)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4064847
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	0.0119		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	0.00014		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.00468		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	3.40		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	0.000011		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	0.00047		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	0.038		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Magnesium (Mg)-Dissolved	0.562		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	0.00268		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	0.518		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	0.00180		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	0.000054		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	1.63		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	1.16		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	0.0104		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-2 BEAK-1 Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Dissolved Metals							
Sulfur (S)-Dissolved	<0.50		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	0.0052		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029
L2103029-3 STORM-1 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	74.6		3.0	uS/cm		31-MAY-18	R4063799
Hardness (as CaCO3)	32.9		0.50	mg/L		04-JUN-18	
pH	7.77		0.10	pH		31-MAY-18	R4063799
Total Suspended Solids	<1.0		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	53		13	mg/L		01-JUN-18	R4064880
Anions and Nutrients							
Acidity (as CaCO3)	<2.0		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	33.7		2.0	mg/L		01-JUN-18	R4064707
Ammonia, Total (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	0.47		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805
Total Kjeldahl Nitrogen	0.18		0.15	mg/L	01-JUN-18	05-JUN-18	R4069949
Total Nitrogen	0.18		0.15	mg/L		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	0.0050		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	2.89		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	5.0		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	5.1		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0049		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Arsenic (As)-Total	0.00025		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-3 STORM-1 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Total Metals							
Barium (Ba)-Total	0.00651		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Boron (B)-Total	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Calcium (Ca)-Total	11.8		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Chromium (Cr)-Total	0.00015		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Copper (Cu)-Total	0.00069		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Iron (Fe)-Total	0.013		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Lead (Pb)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Lithium (Li)-Total	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4064847
Magnesium (Mg)-Total	1.03		0.0050	mg/L	31-MAY-18	02-JUN-18	R4064847
Manganese (Mn)-Total	0.00272		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	0.000111		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Phosphorus (P)-Total	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Potassium (K)-Total	0.582		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Rubidium (Rb)-Total	0.00109		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Selenium (Se)-Total	0.000062		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Silicon (Si)-Total	1.43		0.10	mg/L	31-MAY-18	02-JUN-18	R4064847
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Sodium (Na)-Total	1.00		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Strontium (Sr)-Total	0.0256		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Sulfur (S)-Total	0.98		0.50	mg/L	31-MAY-18	02-JUN-18	R4064847
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Tin (Sn)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4064847
Tungsten (W)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Uranium (U)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Vanadium (V)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4064847
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	0.0026		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-3 STORM-1 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Dissolved Metals							
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	0.00020		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.00634		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	11.6		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	0.00058		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	0.017		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Magnesium (Mg)-Dissolved	0.980		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	0.00045		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	0.000104		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	0.591		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	0.00107		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	0.000057		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	1.31		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	0.928		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	0.0261		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Sulfur (S)-Dissolved	0.81		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	0.0036		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029
L2103029-4 SL4 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-4 SL4 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	72.9		3.0	uS/cm		31-MAY-18	R4063799
Hardness (as CaCO3)	32.6		0.50	mg/L		04-JUN-18	
pH	7.81		0.10	pH		31-MAY-18	R4063799
Total Suspended Solids	<1.0		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	50		13	mg/L		01-JUN-18	R4064880
Anions and Nutrients							
Acidity (as CaCO3)	<2.0		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	34.8		2.0	mg/L		01-JUN-18	R4064707
Ammonia, Total (as N)	0.030		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	0.54		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805
Total Kjeldahl Nitrogen	0.20		0.15	mg/L	01-JUN-18	05-JUN-18	R4069949
Total Nitrogen	0.20		0.15	mg/L		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	0.0066		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	2.70		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	4.9		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	5.1		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0059		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Arsenic (As)-Total	0.00024		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Barium (Ba)-Total	0.00650		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Boron (B)-Total	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Calcium (Ca)-Total	11.8		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Chromium (Cr)-Total	0.00018		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Copper (Cu)-Total	0.00062		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Iron (Fe)-Total	0.014		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Lead (Pb)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Lithium (Li)-Total	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4064847
Magnesium (Mg)-Total	1.02		0.0050	mg/L	31-MAY-18	02-JUN-18	R4064847
Manganese (Mn)-Total	0.00326		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-4 SL4 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Total Metals							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	0.000134		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Phosphorus (P)-Total	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Potassium (K)-Total	0.587		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Rubidium (Rb)-Total	0.00107		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Selenium (Se)-Total	0.000057		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Silicon (Si)-Total	1.44		0.10	mg/L	31-MAY-18	02-JUN-18	R4064847
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Sodium (Na)-Total	0.989		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Strontium (Sr)-Total	0.0257		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Sulfur (S)-Total	1.10		0.50	mg/L	31-MAY-18	02-JUN-18	R4064847
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Tin (Sn)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4064847
Tungsten (W)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Uranium (U)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Vanadium (V)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4064847
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	<0.0020		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	0.00021		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.00599		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	11.5		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	0.00053		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-4 SL4 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Dissolved Metals							
Magnesium (Mg)-Dissolved	0.958		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	0.00027		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	0.000103		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	0.582		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	0.00101		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	0.000056		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	1.32		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	0.928		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	0.0246		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Sulfur (S)-Dissolved	0.81		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029
L2103029-5 SL3 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	73.7		3.0	uS/cm		31-MAY-18	R4063799
Hardness (as CaCO3)	32.5		0.50	mg/L		05-JUN-18	
pH	7.72		0.10	pH		31-MAY-18	R4063799
Total Suspended Solids	<1.0		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	52		13	mg/L		01-JUN-18	R4064880
Anions and Nutrients							
Acidity (as CaCO3)	<2.0		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	33.5		2.0	mg/L		01-JUN-18	R4064707
Ammonia, Total (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	0.58		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-5 SL3 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Anions and Nutrients							
Total Kjeldahl Nitrogen	0.25		0.15	mg/L	01-JUN-18	05-JUN-18	R4069949
Total Nitrogen	0.25		0.15	mg/L		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	0.0050		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	2.58		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	5.2		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	5.3		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0065		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Arsenic (As)-Total	0.00026		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Barium (Ba)-Total	0.00683		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Boron (B)-Total	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Calcium (Ca)-Total	12.0		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Chromium (Cr)-Total	0.00015		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Copper (Cu)-Total	0.00065		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Iron (Fe)-Total	0.020		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Lead (Pb)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Lithium (Li)-Total	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4064847
Magnesium (Mg)-Total	1.01		0.0050	mg/L	31-MAY-18	02-JUN-18	R4064847
Manganese (Mn)-Total	0.00366		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	0.000111		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Phosphorus (P)-Total	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Potassium (K)-Total	0.611		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Rubidium (Rb)-Total	0.00113		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Selenium (Se)-Total	0.000081		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Silicon (Si)-Total	1.43		0.10	mg/L	31-MAY-18	02-JUN-18	R4064847
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Sodium (Na)-Total	1.04		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Strontium (Sr)-Total	0.0251		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Sulfur (S)-Total	0.84		0.50	mg/L	31-MAY-18	02-JUN-18	R4064847
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-5 SL3 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Total Metals							
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Tin (Sn)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Titanium (Ti)-Total	0.00033		0.00030	mg/L	31-MAY-18	02-JUN-18	R4064847
Tungsten (W)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Uranium (U)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Vanadium (V)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4064847
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	0.0022		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029
Antimony (Sb)-Dissolved	0.00015		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	0.00020		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.00661		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	11.4		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	0.00070	DTC	0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	0.00058		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	0.017		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Magnesium (Mg)-Dissolved	0.966		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	0.00032		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	0.000237	DTC	0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	0.626		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	0.00110		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	0.000062		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	1.30		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	0.978		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	0.0251		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-5 SL3 Sampled By: JMC on 28-MAY-18 @ 12:00 Matrix: Surface Water							
Dissolved Metals							
Sulfur (S)-Dissolved	0.54		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029
L2103029-6 FB Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	<3.0		3.0	uS/cm		31-MAY-18	R4063799
Hardness (as CaCO3)	<0.50		0.50	mg/L		07-JUN-18	
pH	7.12		0.10	pH		31-MAY-18	R4063799
Total Suspended Solids	<1.0		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	<10		10	mg/L		01-JUN-18	R4064880
Anions and Nutrients							
Acidity (as CaCO3)	<2.0		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		01-JUN-18	R4064707
Ammonia, Total (as N)	0.026		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	01-JUN-18	05-JUN-18	R4069949
Total Nitrogen	<0.15		0.15	mg/L		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	<0.0030		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	<0.30		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	<1.0		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	<1.0		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	<0.0030		0.0030	mg/L	06-JUN-18	06-JUN-18	R4075026
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Arsenic (As)-Total	<0.00010		0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-6 FB Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Total Metals							
Barium (Ba)-Total	<0.00010		0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	06-JUN-18	06-JUN-18	R4075026
Boron (B)-Total	<0.010		0.010	mg/L	06-JUN-18	06-JUN-18	R4075026
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	06-JUN-18	06-JUN-18	R4075026
Calcium (Ca)-Total	<0.050		0.050	mg/L	06-JUN-18	06-JUN-18	R4075026
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	06-JUN-18	06-JUN-18	R4075026
Chromium (Cr)-Total	0.00034	RRV	0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Copper (Cu)-Total	<0.00050		0.00050	mg/L	06-JUN-18	06-JUN-18	R4075026
Iron (Fe)-Total	<0.010		0.010	mg/L	06-JUN-18	06-JUN-18	R4075026
Lead (Pb)-Total	<0.000050		0.000050	mg/L	06-JUN-18	06-JUN-18	R4075026
Lithium (Li)-Total	<0.0010		0.0010	mg/L	06-JUN-18	06-JUN-18	R4075026
Magnesium (Mg)-Total	<0.0050		0.0050	mg/L	06-JUN-18	06-JUN-18	R4075026
Manganese (Mn)-Total	<0.00010		0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Mercury (Hg)-Total	0.0000885		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L	06-JUN-18	06-JUN-18	R4075026
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	06-JUN-18	06-JUN-18	R4075026
Phosphorus (P)-Total	<0.050		0.050	mg/L	06-JUN-18	06-JUN-18	R4075026
Potassium (K)-Total	<0.050		0.050	mg/L	06-JUN-18	06-JUN-18	R4075026
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	06-JUN-18	06-JUN-18	R4075026
Selenium (Se)-Total	<0.000050		0.000050	mg/L	06-JUN-18	06-JUN-18	R4075026
Silicon (Si)-Total	<0.10		0.10	mg/L	06-JUN-18	06-JUN-18	R4075026
Silver (Ag)-Total	<0.000010		0.000010	mg/L	06-JUN-18	06-JUN-18	R4075026
Sodium (Na)-Total	<0.050		0.050	mg/L	06-JUN-18	06-JUN-18	R4075026
Strontium (Sr)-Total	<0.00020		0.00020	mg/L	06-JUN-18	06-JUN-18	R4075026
Sulfur (S)-Total	<0.50		0.50	mg/L	06-JUN-18	06-JUN-18	R4075026
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	06-JUN-18	06-JUN-18	R4075026
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	06-JUN-18	06-JUN-18	R4075026
Thorium (Th)-Total	<0.00010		0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Tin (Sn)-Total	0.00029	RRV	0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	06-JUN-18	06-JUN-18	R4075026
Tungsten (W)-Total	<0.00010		0.00010	mg/L	06-JUN-18	06-JUN-18	R4075026
Uranium (U)-Total	<0.000010		0.000010	mg/L	06-JUN-18	06-JUN-18	R4075026
Vanadium (V)-Total	<0.00050		0.00050	mg/L	06-JUN-18	06-JUN-18	R4075026
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	06-JUN-18	06-JUN-18	R4075026
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	06-JUN-18	06-JUN-18	R4075026
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	<0.0020		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-6 FB Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Dissolved Metals							
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.00016	RRV	0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Magnesium (Mg)-Dissolved	<0.0050		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Sulfur (S)-Dissolved	<0.50		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	0.00027	RRV	0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	0.0030	RRV	0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029
L2103029-7 BL2 Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-7 BL2 Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	29.6		3.0	uS/cm		31-MAY-18	R4063799
Hardness (as CaCO3)	10.5		0.50	mg/L		04-JUN-18	
pH	7.28		0.10	pH		31-MAY-18	R4063799
Total Suspended Solids	1.4		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	34		10	mg/L		01-JUN-18	R4064880
Anions and Nutrients							
Acidity (as CaCO3)	2.5		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	10.4		2.0	mg/L		01-JUN-18	R4064707
Ammonia, Total (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	1.10		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805
Total Kjeldahl Nitrogen	0.27		0.15	mg/L	01-JUN-18	05-JUN-18	R4069949
Total Nitrogen	0.27		0.15	mg/L		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	0.0131		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	1.16		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	7.4		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	7.4		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0267		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Arsenic (As)-Total	0.00020		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Barium (Ba)-Total	0.00487		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Boron (B)-Total	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cadmium (Cd)-Total	0.000813		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Calcium (Ca)-Total	3.65		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Cesium (Cs)-Total	0.000014		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Chromium (Cr)-Total	0.00023		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Copper (Cu)-Total	0.00066		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Iron (Fe)-Total	0.101		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Lead (Pb)-Total	0.000082		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Lithium (Li)-Total	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4064847
Magnesium (Mg)-Total	0.592		0.0050	mg/L	31-MAY-18	02-JUN-18	R4064847
Manganese (Mn)-Total	0.0196		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-7 BL2 Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Total Metals							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Phosphorus (P)-Total	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Potassium (K)-Total	0.528		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Rubidium (Rb)-Total	0.00201		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Selenium (Se)-Total	0.000065		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Silicon (Si)-Total	1.85		0.10	mg/L	31-MAY-18	02-JUN-18	R4064847
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Sodium (Na)-Total	1.24		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Strontium (Sr)-Total	0.0108		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Sulfur (S)-Total	0.97		0.50	mg/L	31-MAY-18	02-JUN-18	R4064847
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Tin (Sn)-Total	0.00021		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Titanium (Ti)-Total	0.00042		0.00030	mg/L	31-MAY-18	02-JUN-18	R4064847
Tungsten (W)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Uranium (U)-Total	0.000012		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Vanadium (V)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Zinc (Zn)-Total	0.0056		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4064847
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	0.0117		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	0.00015		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.00456		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	3.27		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	0.000013		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	0.00016		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	0.00050		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	0.036		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-7 BL2 Sampled By: JMC on 29-MAY-18 @ 12:00 Matrix: Surface Water							
Dissolved Metals							
Magnesium (Mg)-Dissolved	0.564		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	0.00282		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	0.527		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	0.00182		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	1.66		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	1.14		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	0.0102		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Sulfur (S)-Dissolved	<0.50		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	0.0014		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029
L2103029-8 MW5-5 Sampled By: JMC on 28-MAY-18 @ 00:01 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	197		3.0	uS/cm		31-MAY-18	R4063799
Hardness (as CaCO3)	86.5		0.50	mg/L		04-JUN-18	
pH	7.54		0.10	pH		31-MAY-18	R4063799
Total Suspended Solids	8.5		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	115		13	mg/L		01-JUN-18	R4064954
Anions and Nutrients							
Acidity (as CaCO3)	6.6		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	92.5		2.0	mg/L		01-JUN-18	R4064707
Ammonia, Total (as N)	<0.020		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	0.46		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	1.70		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-8 MW5-5 Sampled By: JMC on 28-MAY-18 @ 00:01 Matrix: Surface Water							
Anions and Nutrients							
Total Kjeldahl Nitrogen	0.39		0.15	mg/L	06-JUN-18	07-JUN-18	R4076300
Total Nitrogen	2.08		0.15	mg/L		08-JUN-18	
Orthophosphate-Dissolved (as P)	0.0057		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	<0.0030		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	2.71		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	3.6		1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	1.9		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0558		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Arsenic (As)-Total	0.00011		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Barium (Ba)-Total	0.0233		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Boron (B)-Total	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cadmium (Cd)-Total	0.0000106		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Calcium (Ca)-Total	32.3		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Chromium (Cr)-Total	0.00035		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Copper (Cu)-Total	0.00164		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Iron (Fe)-Total	0.066		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Lead (Pb)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Lithium (Li)-Total	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4064847
Magnesium (Mg)-Total	2.84		0.0050	mg/L	31-MAY-18	02-JUN-18	R4064847
Manganese (Mn)-Total	0.0176		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	0.000226		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Phosphorus (P)-Total	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Potassium (K)-Total	2.57		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Rubidium (Rb)-Total	0.00099		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Selenium (Se)-Total	0.000079		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Silicon (Si)-Total	7.60		0.10	mg/L	31-MAY-18	02-JUN-18	R4064847
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Sodium (Na)-Total	2.76		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Strontium (Sr)-Total	0.0604		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Sulfur (S)-Total	0.96		0.50	mg/L	31-MAY-18	02-JUN-18	R4064847
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-8 MW5-5 Sampled By: JMC on 28-MAY-18 @ 00:01 Matrix: Surface Water							
Total Metals							
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Tin (Sn)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Titanium (Ti)-Total	0.00218		0.00030	mg/L	31-MAY-18	02-JUN-18	R4064847
Tungsten (W)-Total	0.00079		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Uranium (U)-Total	0.000550		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Vanadium (V)-Total	0.00053		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4064847
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	0.0033		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.0219		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	0.0000052		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	30.4		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	0.00018		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	0.00124		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Magnesium (Mg)-Dissolved	2.59		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	0.0163		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	0.000222		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	2.53		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	0.00089		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	0.000059		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	6.68		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	2.53		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	0.0568		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-8 MW5-5 Sampled By: JMC on 28-MAY-18 @ 00:01 Matrix: Surface Water							
Dissolved Metals							
Sulfur (S)-Dissolved	0.58		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	0.00075		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	0.000537		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029
L2103029-9 MW5D Sampled By: JMC on 28-MAY-18 @ 00:01 Matrix: Surface Water							
Physical Tests							
Conductivity (EC)	278		3.0	uS/cm		31-MAY-18	R4063799
Hardness (as CaCO3)	128		0.50	mg/L		04-JUN-18	
pH	8.05		0.10	pH		31-MAY-18	R4063799
Total Suspended Solids	7.8		1.0	mg/L		31-MAY-18	R4063816
Total Dissolved Solids	154		20	mg/L		01-JUN-18	R4064954
Anions and Nutrients							
Acidity (as CaCO3)	2.2		2.0	mg/L		31-MAY-18	R4063799
Alkalinity, Total (as CaCO3)	159		2.0	mg/L		01-JUN-18	R4064707
Ammonia, Total (as N)	0.024		0.020	mg/L		31-MAY-18	R4063365
Bromide (Br)	<0.10		0.10	mg/L		31-MAY-18	R4063805
Chloride (Cl)	0.51		0.10	mg/L		31-MAY-18	R4063805
Fluoride (F)	<0.020		0.020	mg/L		31-MAY-18	R4063805
Nitrate (as N)	0.675		0.020	mg/L		31-MAY-18	R4063805
Nitrite (as N)	<0.010		0.010	mg/L		31-MAY-18	R4063805
Total Kjeldahl Nitrogen	<0.15		0.15	mg/L	01-JUN-18	05-JUN-18	R4069949
Total Nitrogen	0.67		0.15	mg/L		05-JUN-18	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		31-MAY-18	R4063750
Phosphorus (P)-Total	0.0057		0.0030	mg/L	31-MAY-18	04-JUN-18	R4067190
Sulfate (SO4)	3.08		0.30	mg/L		31-MAY-18	R4063805
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					31-MAY-18	R4063084
Dissolved Organic Carbon	4.8	DTC	1.0	mg/L	31-MAY-18	31-MAY-18	R4063771
Total Organic Carbon	1.9		1.0	mg/L		31-MAY-18	R4063755
Total Metals							
Aluminum (Al)-Total	0.0753		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Arsenic (As)-Total	0.00014		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-9 MW5D Sampled By: JMC on 28-MAY-18 @ 00:01 Matrix: Surface Water							
Total Metals							
Barium (Ba)-Total	0.0387		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Boron (B)-Total	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cadmium (Cd)-Total	0.0000130		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Calcium (Ca)-Total	47.4		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Chromium (Cr)-Total	0.00076		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Cobalt (Co)-Total	0.00023		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Copper (Cu)-Total	0.00509		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Iron (Fe)-Total	0.114		0.010	mg/L	31-MAY-18	02-JUN-18	R4064847
Lead (Pb)-Total	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Lithium (Li)-Total	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4064847
Magnesium (Mg)-Total	4.18		0.0050	mg/L	31-MAY-18	02-JUN-18	R4064847
Manganese (Mn)-Total	0.0426		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		31-MAY-18	R4063559
Molybdenum (Mo)-Total	0.000717		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Phosphorus (P)-Total	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Potassium (K)-Total	3.75		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Rubidium (Rb)-Total	0.00210		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Selenium (Se)-Total	0.000186		0.000050	mg/L	31-MAY-18	02-JUN-18	R4064847
Silicon (Si)-Total	6.73		0.10	mg/L	31-MAY-18	02-JUN-18	R4064847
Silver (Ag)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Sodium (Na)-Total	2.48		0.050	mg/L	31-MAY-18	02-JUN-18	R4064847
Strontium (Sr)-Total	0.0971		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Sulfur (S)-Total	1.16		0.50	mg/L	31-MAY-18	02-JUN-18	R4064847
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4064847
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Thorium (Th)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Tin (Sn)-Total	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Titanium (Ti)-Total	0.00379		0.00030	mg/L	31-MAY-18	02-JUN-18	R4064847
Tungsten (W)-Total	0.00112		0.00010	mg/L	31-MAY-18	02-JUN-18	R4064847
Uranium (U)-Total	0.00142		0.000010	mg/L	31-MAY-18	02-JUN-18	R4064847
Vanadium (V)-Total	0.00097		0.00050	mg/L	31-MAY-18	02-JUN-18	R4064847
Zinc (Zn)-Total	0.0172		0.0030	mg/L	31-MAY-18	02-JUN-18	R4064847
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4064847
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					31-MAY-18	R4063147
Dissolved Metals Filtration Location	FIELD					31-MAY-18	R4063265
Aluminum (Al)-Dissolved	0.0051		0.0020	mg/L	31-MAY-18	02-JUN-18	R4067029

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2103029-9 MW5D Sampled By: JMC on 28-MAY-18 @ 00:01 Matrix: Surface Water							
Dissolved Metals							
Antimony (Sb)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Arsenic (As)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Barium (Ba)-Dissolved	0.0372		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Boron (B)-Dissolved	<0.010		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Calcium (Ca)-Dissolved	45.1		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Cesium (Cs)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Chromium (Cr)-Dissolved	0.00077		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Cobalt (Co)-Dissolved	0.00017		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Copper (Cu)-Dissolved	0.00104		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Iron (Fe)-Dissolved	0.013		0.010	mg/L	31-MAY-18	02-JUN-18	R4067029
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Lithium (Li)-Dissolved	<0.0010		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Magnesium (Mg)-Dissolved	3.84		0.0050	mg/L	31-MAY-18	02-JUN-18	R4067029
Manganese (Mn)-Dissolved	0.0397		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Mercury (Hg)-Dissolved	<0.0000050		0.0000050	mg/L	31-MAY-18	31-MAY-18	R4063565
Molybdenum (Mo)-Dissolved	0.000668		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Potassium (K)-Dissolved	3.67		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Rubidium (Rb)-Dissolved	0.00175		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Selenium (Se)-Dissolved	0.000234		0.000050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silicon (Si)-Dissolved	6.08		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Silver (Ag)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Sodium (Na)-Dissolved	2.31		0.050	mg/L	31-MAY-18	02-JUN-18	R4067029
Strontium (Sr)-Dissolved	0.0958		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Sulfur (S)-Dissolved	0.87		0.50	mg/L	31-MAY-18	02-JUN-18	R4067029
Tellurium (Te)-Dissolved	<0.00020		0.00020	mg/L	31-MAY-18	02-JUN-18	R4067029
Thallium (Tl)-Dissolved	<0.000010		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Thorium (Th)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Tin (Sn)-Dissolved	<0.00010		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	31-MAY-18	02-JUN-18	R4067029
Tungsten (W)-Dissolved	0.00126		0.00010	mg/L	31-MAY-18	02-JUN-18	R4067029
Uranium (U)-Dissolved	0.00148		0.000010	mg/L	31-MAY-18	02-JUN-18	R4067029
Vanadium (V)-Dissolved	0.00061		0.00050	mg/L	31-MAY-18	02-JUN-18	R4067029
Zinc (Zn)-Dissolved	0.0097		0.0010	mg/L	31-MAY-18	02-JUN-18	R4067029
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L	31-MAY-18	02-JUN-18	R4067029

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2103029-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2103029-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L2103029-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2103029-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L2103029-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2103029-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2103029-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2103029-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Total	MS-B	L2103029-6
Matrix Spike	Calcium (Ca)-Total	MS-B	L2103029-1, -2, -3, -4, -5, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2103029-1, -2, -3, -4, -5, -7, -8, -9
Matrix Spike	Manganese (Mn)-Total	MS-B	L2103029-6
Matrix Spike	Strontium (Sr)-Total	MS-B	L2103029-1, -2, -3, -4, -5, -7, -8, -9

Sample Parameter Qualifier key listed:

Qualifier	Description
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ACY-TITR-TB	Water	Acidity	APHA 2310 B modified

This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint.

ALK-TITR-TB	Water	Alkalinity	APHA 2320B modified

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

BR-IC-N-TB	Water	Bromide in Water by IC	EPA 300.1 (mod)

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

CL-L-IC-N-TB	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

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

DOC-TB	Water	Dissolved Organic Carbon	APHA 5310 B modified

Water samples are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis. Analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

EC-TITR-TB	Water	Conductivity	APHA 2510 B

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

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

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

HARDNESS-CALC-TB	Water	Hardness (as CaCO3)	CALCULATION

HG-D-CVAF-TB	Water	Dissolved Mercury in Water by CVAFS	EPA 1631E (mod)

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

HG-T-CVAF-TB	Water	Total Mercury in Water by CVAFS	EPA 1631E (mod)

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

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

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

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

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

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

Reference Information

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

N-T-CALC-TB Water Total Nitrogen (Calculation) APHA 4500 N-Calculated
Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen +[Nitrate and Nitrite (as N)]

NH3-COL-TB Water Ammonia by Discrete Analyzer APHA 4500-NH3 G. (modified)
Ammonia in aqueous matrices is analyzed using discrete analyzer with colourimetric detection.

NO2-IC-N-TB Water Nitrite in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-TB Water Nitrate in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-TB Water Total Phosphorus by Discrete APHA 4500-P B, F, G (modified)
Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

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

PO4-DO-COL-TB Water Dissolved Orthophosphate APHA 4500-P B, F, G (modified)
Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

SO4-IC-N-TB Water Sulfate in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-TB Water Total Dissolved Solids APHA 2540 C (modified)
Aqueous matrices are analyzed using gravimetry and evaporation

TKN-COL-TB Water Total Kjeldahl Nitrogen APHA 4500-Norg (modified)
Total Kjeldahl Nitrogen in aqueous matrices is analyzed using a discrete analyzer with colourimetric detection.

TOC-TB Water Total Organic Carbon (TOC) APHA 5310 B modified
Water samples are analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

TSS-L-TB Water Low Level Total Suspended Solids APHA 2540 D (modified)
Aqueous matrices are analyzed using gravimetry.

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

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

Laboratory Definition Code	Laboratory Location
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Workorder: L2103029 Report Date: 11-JUN-18

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)
374 Wellington Street West Suite 3
Toronto ON M5V 1E3
Contact: Jake McQueen

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ACY-TITR-TB	**Water**							
Batch R4063799								
WG2784972-11 LCS								
Acidity (as CaCO3)			101.6		%		85-115	31-MAY-18
WG2784972-17 LCS								
Acidity (as CaCO3)			106.0		%		85-115	31-MAY-18
WG2784972-2 LCS								
Acidity (as CaCO3)			100.0		%		85-115	31-MAY-18
WG2784972-5 LCS								
Acidity (as CaCO3)			100.4		%		85-115	31-MAY-18
WG2784972-1 MB								
Acidity (as CaCO3)			<2.0		mg/L		2	31-MAY-18
WG2784972-10 MB								
Acidity (as CaCO3)			<2.0		mg/L		2	31-MAY-18
WG2784972-16 MB								
Acidity (as CaCO3)			<2.0		mg/L		2	31-MAY-18
WG2784972-4 MB								
Acidity (as CaCO3)			<2.0		mg/L		2	31-MAY-18
ALK-TITR-TB	**Water**							
Batch R4062791								
WG2784339-12 DUP		**L2103029-1**						
Alkalinity, Total (as CaCO3)		21.6	22.8		mg/L	5.4	20	30-MAY-18
WG2784339-11 LCS								
Alkalinity, Total (as CaCO3)			97.5		%		85-115	30-MAY-18
WG2784339-10 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-MAY-18
Batch R4064707								
WG2786301-18 DUP		**L2103029-9**						
Alkalinity, Total (as CaCO3)		159	169		mg/L	6.0	20	01-JUN-18
WG2786301-14 LCS								
Alkalinity, Total (as CaCO3)			98.1		%		85-115	01-JUN-18
WG2786301-17 LCS								
Alkalinity, Total (as CaCO3)			101.2		%		85-115	01-JUN-18
WG2786301-13 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	01-JUN-18
WG2786301-16 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	01-JUN-18
BR-IC-N-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BR-IC-N-TB	**Water**							
Batch R4063805								
WG2785729-6 LCS								
Bromide (Br)			91.6		%		85-115	31-MAY-18
WG2785729-5 MB								
Bromide (Br)			<0.10		mg/L		0.1	31-MAY-18
CL-L-IC-N-TB	**Water**							
Batch R4063805								
WG2785729-6 LCS								
Chloride (Cl)			101.2		%		90-110	31-MAY-18
WG2785729-5 MB								
Chloride (Cl)			<0.10		mg/L		0.1	31-MAY-18
DOC-TB	**Water**							
Batch R4063771								
WG2785200-2 LCS								
Dissolved Organic Carbon			113.1		%		80-120	31-MAY-18
WG2785200-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	31-MAY-18
EC-TITR-TB	**Water**							
Batch R4062791								
WG2784339-12 DUP		**L2103029-1**						
Conductivity (EC)		46.4	46.3		uS/cm	0.2	10	30-MAY-18
WG2784339-11 LCS								
Conductivity (EC)			99.1		%		90-110	30-MAY-18
WG2784339-10 MB								
Conductivity (EC)			<3.0		uS/cm		3	30-MAY-18
Batch R4063799								
WG2784972-11 LCS								
Conductivity (EC)			100.0		%		90-110	31-MAY-18
WG2784972-2 LCS								
Conductivity (EC)			100.2		%		90-110	31-MAY-18
WG2784972-5 LCS								
Conductivity (EC)			100.0		%		90-110	31-MAY-18
WG2784972-1 MB								
Conductivity (EC)			<3.0		uS/cm		3	31-MAY-18
WG2784972-10 MB								
Conductivity (EC)			<3.0		uS/cm		3	31-MAY-18
WG2784972-4 MB								
Conductivity (EC)			<3.0		uS/cm		3	31-MAY-18
F-IC-N-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-TB	**Water**							
Batch R4063805								
WG2785729-6 LCS								
Fluoride (F)			104.7		%		90-110	31-MAY-18
WG2785729-5 MB								
Fluoride (F)			<0.020		mg/L		0.02	31-MAY-18
HG-D-CVAF-TB	**Water**							
Batch R4063565								
WG2785458-2 LCS								
Mercury (Hg)-Dissolved			97.4		%		80-120	31-MAY-18
WG2785458-1 MB								
Mercury (Hg)-Dissolved			<0.000005C		mg/L		0.000005	31-MAY-18
HG-T-CVAF-TB	**Water**							
Batch R4063559								
WG2785466-2 LCS								
Mercury (Hg)-Total			98.5		%		80-120	31-MAY-18
WG2785466-6 LCS								
Mercury (Hg)-Total			97.7		%		80-120	31-MAY-18
WG2785466-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	31-MAY-18
WG2785466-5 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	31-MAY-18
MET-D-CCMS-TB	**Water**							
Batch R4067029								
WG2785333-3 DUP		**L2103029-3**						
Aluminum (Al)-Dissolved		0.0026	<0.0020	RPD-NA	mg/L	N/A	20	02-JUN-18
Antimony (Sb)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-18
Arsenic (As)-Dissolved		0.00020	0.00020		mg/L	0.3	20	02-JUN-18
Barium (Ba)-Dissolved		0.00634	0.00618		mg/L	2.4	20	02-JUN-18
Beryllium (Be)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-18
Bismuth (Bi)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-JUN-18
Boron (B)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	02-JUN-18
Cadmium (Cd)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	02-JUN-18
Calcium (Ca)-Dissolved		11.6	11.7		mg/L	0.9	20	02-JUN-18
Cesium (Cs)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-JUN-18
Chromium (Cr)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-18
Cobalt (Co)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-18
Copper (Cu)-Dissolved		0.00058	0.00054		mg/L	6.4	20	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4067029								
WG2785333-3 DUP		**L2103029-3**						
Iron (Fe)-Dissolved		0.017	0.015		mg/L	16	20	02-JUN-18
Lead (Pb)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-JUN-18
Lithium (Li)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-JUN-18
Magnesium (Mg)-Dissolved		0.980	0.956		mg/L	2.5	20	02-JUN-18
Manganese (Mn)-Dissolved		0.00045	0.00043		mg/L	4.7	20	02-JUN-18
Molybdenum (Mo)-Dissolved		0.000104	0.000148	J	mg/L	0.000044	0.0001	02-JUN-18
Nickel (Ni)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-JUN-18
Phosphorus (P)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	02-JUN-18
Potassium (K)-Dissolved		0.591	0.585		mg/L	1.2	20	02-JUN-18
Rubidium (Rb)-Dissolved		0.00107	0.00104		mg/L	2.6	20	02-JUN-18
Selenium (Se)-Dissolved		0.000057	0.000058		mg/L	1.3	20	02-JUN-18
Silicon (Si)-Dissolved		1.31	1.31		mg/L	0.3	20	02-JUN-18
Silver (Ag)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-JUN-18
Sodium (Na)-Dissolved		0.928	0.913		mg/L	1.7	20	02-JUN-18
Strontium (Sr)-Dissolved		0.0261	0.0252		mg/L	3.6	20	02-JUN-18
Sulfur (S)-Dissolved		0.81	0.80		mg/L	0.2	20	02-JUN-18
Tellurium (Te)-Dissolved		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	02-JUN-18
Thallium (Tl)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-JUN-18
Thorium (Th)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-18
Tin (Sn)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-18
Titanium (Ti)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	02-JUN-18
Tungsten (W)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-JUN-18
Uranium (U)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	02-JUN-18
Vanadium (V)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-JUN-18
Zinc (Zn)-Dissolved		0.0036	0.0032		mg/L	13	20	02-JUN-18
Zirconium (Zr)-Dissolved		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	02-JUN-18
WG2785333-2 LCS								
Aluminum (Al)-Dissolved			111.6		%		80-120	02-JUN-18
Antimony (Sb)-Dissolved			112.6		%		80-120	02-JUN-18
Arsenic (As)-Dissolved			107.0		%		80-120	02-JUN-18
Barium (Ba)-Dissolved			107.8		%		80-120	02-JUN-18
Beryllium (Be)-Dissolved			108.2		%		80-120	02-JUN-18
Bismuth (Bi)-Dissolved			108.8		%		80-120	02-JUN-18
Boron (B)-Dissolved			98.0		%		80-120	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4067029								
WG2785333-2 LCS								
Cadmium (Cd)-Dissolved			108.3		%		80-120	02-JUN-18
Calcium (Ca)-Dissolved			109.9		%		80-120	02-JUN-18
Cesium (Cs)-Dissolved			112.1		%		80-120	02-JUN-18
Chromium (Cr)-Dissolved			109.4		%		80-120	02-JUN-18
Cobalt (Co)-Dissolved			109.0		%		80-120	02-JUN-18
Copper (Cu)-Dissolved			109.1		%		80-120	02-JUN-18
Iron (Fe)-Dissolved			113.8		%		80-120	02-JUN-18
Lead (Pb)-Dissolved			112.5		%		80-120	02-JUN-18
Lithium (Li)-Dissolved			106.2		%		80-120	02-JUN-18
Magnesium (Mg)-Dissolved			114.0		%		80-120	02-JUN-18
Manganese (Mn)-Dissolved			110.3		%		80-120	02-JUN-18
Molybdenum (Mo)-Dissolved			111.4		%		80-120	02-JUN-18
Nickel (Ni)-Dissolved			105.3		%		80-120	02-JUN-18
Phosphorus (P)-Dissolved			110.9		%		80-120	02-JUN-18
Potassium (K)-Dissolved			113.3		%		80-120	02-JUN-18
Rubidium (Rb)-Dissolved			112.4		%		80-120	02-JUN-18
Selenium (Se)-Dissolved			110.9		%		80-120	02-JUN-18
Silicon (Si)-Dissolved			108.1		%		80-120	02-JUN-18
Silver (Ag)-Dissolved			114.8		%		80-120	02-JUN-18
Sodium (Na)-Dissolved			111.3		%		80-120	02-JUN-18
Strontium (Sr)-Dissolved			110.1		%		80-120	02-JUN-18
Sulfur (S)-Dissolved			115.5		%		80-120	02-JUN-18
Tellurium (Te)-Dissolved			109.0		%		80-120	02-JUN-18
Thallium (Tl)-Dissolved			111.8		%		80-120	02-JUN-18
Thorium (Th)-Dissolved			113.2		%		80-120	02-JUN-18
Tin (Sn)-Dissolved			108.8		%		80-120	02-JUN-18
Titanium (Ti)-Dissolved			108.0		%		80-120	02-JUN-18
Tungsten (W)-Dissolved			113.8		%		80-120	02-JUN-18
Uranium (U)-Dissolved			112.0		%		80-120	02-JUN-18
Vanadium (V)-Dissolved			108.6		%		80-120	02-JUN-18
Zinc (Zn)-Dissolved			105.4		%		80-120	02-JUN-18
Zirconium (Zr)-Dissolved			107.5		%		80-120	02-JUN-18
WG2785333-6 LCS								
Aluminum (Al)-Dissolved			95.6		%		80-120	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4067029								
WG2785333-6 LCS								
Antimony (Sb)-Dissolved			96.1		%		80-120	02-JUN-18
Arsenic (As)-Dissolved			94.2		%		80-120	02-JUN-18
Barium (Ba)-Dissolved			97.2		%		80-120	02-JUN-18
Beryllium (Be)-Dissolved			95.2		%		80-120	02-JUN-18
Bismuth (Bi)-Dissolved			98.0		%		80-120	02-JUN-18
Boron (B)-Dissolved			84.8		%		80-120	02-JUN-18
Cadmium (Cd)-Dissolved			97.5		%		80-120	02-JUN-18
Calcium (Ca)-Dissolved			97.6		%		80-120	02-JUN-18
Cesium (Cs)-Dissolved			96.1		%		80-120	02-JUN-18
Chromium (Cr)-Dissolved			96.2		%		80-120	02-JUN-18
Cobalt (Co)-Dissolved			95.3		%		80-120	02-JUN-18
Copper (Cu)-Dissolved			94.1		%		80-120	02-JUN-18
Iron (Fe)-Dissolved			98.1		%		80-120	02-JUN-18
Lead (Pb)-Dissolved			100.2		%		80-120	02-JUN-18
Lithium (Li)-Dissolved			95.2		%		80-120	02-JUN-18
Magnesium (Mg)-Dissolved			95.8		%		80-120	02-JUN-18
Manganese (Mn)-Dissolved			96.6		%		80-120	02-JUN-18
Molybdenum (Mo)-Dissolved			101.4		%		80-120	02-JUN-18
Nickel (Ni)-Dissolved			91.3		%		80-120	02-JUN-18
Phosphorus (P)-Dissolved			101.9		%		80-120	02-JUN-18
Potassium (K)-Dissolved			98.9		%		80-120	02-JUN-18
Rubidium (Rb)-Dissolved			97.1		%		80-120	02-JUN-18
Selenium (Se)-Dissolved			94.7		%		80-120	02-JUN-18
Silicon (Si)-Dissolved			95.2		%		80-120	02-JUN-18
Silver (Ag)-Dissolved			98.0		%		80-120	02-JUN-18
Sodium (Na)-Dissolved			101.6		%		80-120	02-JUN-18
Strontium (Sr)-Dissolved			96.5		%		80-120	02-JUN-18
Sulfur (S)-Dissolved			84.0		%		80-120	02-JUN-18
Tellurium (Te)-Dissolved			102.4		%		80-120	02-JUN-18
Thallium (Tl)-Dissolved			100.3		%		80-120	02-JUN-18
Thorium (Th)-Dissolved			100.8		%		80-120	02-JUN-18
Tin (Sn)-Dissolved			95.9		%		80-120	02-JUN-18
Titanium (Ti)-Dissolved			98.2		%		80-120	02-JUN-18
Tungsten (W)-Dissolved			101.2		%		80-120	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4067029								
WG2785333-6 LCS								
Uranium (U)-Dissolved			99.1		%		80-120	02-JUN-18
Vanadium (V)-Dissolved			95.8		%		80-120	02-JUN-18
Zinc (Zn)-Dissolved			90.3		%		80-120	02-JUN-18
Zirconium (Zr)-Dissolved			95.8		%		80-120	02-JUN-18
WG2785333-1 MB								
Aluminum (Al)-Dissolved			<0.0020		mg/L		0.002	02-JUN-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	02-JUN-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	02-JUN-18
Cadmium (Cd)-Dissolved			<0.000005C		mg/L		0.000005	02-JUN-18
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Cesium (Cs)-Dissolved			<0.000010		mg/L		0.00001	02-JUN-18
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	02-JUN-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	02-JUN-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	02-JUN-18
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	02-JUN-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	02-JUN-18
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	02-JUN-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	02-JUN-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Rubidium (Rb)-Dissolved			<0.00020		mg/L		0.0002	02-JUN-18
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	02-JUN-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	02-JUN-18
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Strontium (Sr)-Dissolved			<0.00020		mg/L		0.0002	02-JUN-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4067029								
WG2785333-1 MB								
Tellurium (Te)-Dissolved			<0.00020		mg/L		0.0002	02-JUN-18
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	02-JUN-18
Thorium (Th)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	02-JUN-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	02-JUN-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	02-JUN-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	02-JUN-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	02-JUN-18
WG2785333-5 MB								
Aluminum (Al)-Dissolved			<0.0020		mg/L		0.002	02-JUN-18
Antimony (Sb)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Arsenic (As)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Barium (Ba)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Beryllium (Be)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Bismuth (Bi)-Dissolved			<0.000050		mg/L		0.00005	02-JUN-18
Boron (B)-Dissolved			<0.010		mg/L		0.01	02-JUN-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	02-JUN-18
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Cesium (Cs)-Dissolved			<0.000010		mg/L		0.00001	02-JUN-18
Chromium (Cr)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Cobalt (Co)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Copper (Cu)-Dissolved			<0.00020		mg/L		0.0002	02-JUN-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	02-JUN-18
Lead (Pb)-Dissolved			<0.000050		mg/L		0.00005	02-JUN-18
Lithium (Li)-Dissolved			<0.0010		mg/L		0.001	02-JUN-18
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	02-JUN-18
Manganese (Mn)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	02-JUN-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	02-JUN-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Potassium (K)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Rubidium (Rb)-Dissolved			<0.00020		mg/L		0.0002	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4067029								
WG2785333-5 MB								
Selenium (Se)-Dissolved			<0.000050		mg/L		0.00005	02-JUN-18
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Silver (Ag)-Dissolved			<0.000010		mg/L		0.00001	02-JUN-18
Sodium (Na)-Dissolved			<0.050		mg/L		0.05	02-JUN-18
Strontium (Sr)-Dissolved			<0.00020		mg/L		0.0002	02-JUN-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	02-JUN-18
Tellurium (Te)-Dissolved			<0.00020		mg/L		0.0002	02-JUN-18
Thallium (Tl)-Dissolved			<0.000010		mg/L		0.00001	02-JUN-18
Thorium (Th)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Tin (Sn)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Titanium (Ti)-Dissolved			<0.00030		mg/L		0.0003	02-JUN-18
Tungsten (W)-Dissolved			<0.00010		mg/L		0.0001	02-JUN-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	02-JUN-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	02-JUN-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	02-JUN-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	02-JUN-18
WG2785333-4 MS		**L2103029-4**						
Aluminum (Al)-Dissolved			98.2		%		70-130	02-JUN-18
Antimony (Sb)-Dissolved			103.6		%		70-130	02-JUN-18
Arsenic (As)-Dissolved			99.2		%		70-130	02-JUN-18
Barium (Ba)-Dissolved			98.3		%		70-130	02-JUN-18
Beryllium (Be)-Dissolved			100.6		%		70-130	02-JUN-18
Bismuth (Bi)-Dissolved			100.7		%		70-130	02-JUN-18
Boron (B)-Dissolved			96.4		%		70-130	02-JUN-18
Cadmium (Cd)-Dissolved			100.5		%		70-130	02-JUN-18
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	02-JUN-18
Cesium (Cs)-Dissolved			103.5		%		70-130	02-JUN-18
Chromium (Cr)-Dissolved			100.2		%		70-130	02-JUN-18
Cobalt (Co)-Dissolved			99.6		%		70-130	02-JUN-18
Copper (Cu)-Dissolved			100.8		%		70-130	02-JUN-18
Iron (Fe)-Dissolved			100.3		%		70-130	02-JUN-18
Lead (Pb)-Dissolved			106.0		%		70-130	02-JUN-18
Lithium (Li)-Dissolved			98.3		%		70-130	02-JUN-18
Magnesium (Mg)-Dissolved			106.4		%		70-130	02-JUN-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R4067029								
WG2785333-4 MS		**L2103029-4**						
Manganese (Mn)-Dissolved			100.4		%		70-130	02-JUN-18
Molybdenum (Mo)-Dissolved			98.0		%		70-130	02-JUN-18
Nickel (Ni)-Dissolved			97.4		%		70-130	02-JUN-18
Phosphorus (P)-Dissolved			101.2		%		70-130	02-JUN-18
Potassium (K)-Dissolved			101.3		%		70-130	02-JUN-18
Rubidium (Rb)-Dissolved			97.7		%		70-130	02-JUN-18
Selenium (Se)-Dissolved			99.7		%		70-130	02-JUN-18
Silicon (Si)-Dissolved			93.2		%		70-130	02-JUN-18
Silver (Ag)-Dissolved			104.4		%		70-130	02-JUN-18
Sodium (Na)-Dissolved			97.0		%		70-130	02-JUN-18
Strontium (Sr)-Dissolved			N/A	MS-B	%		-	02-JUN-18
Sulfur (S)-Dissolved			104.3		%		70-130	02-JUN-18
Tellurium (Te)-Dissolved			104.8		%		70-130	02-JUN-18
Thallium (Tl)-Dissolved			105.0		%		70-130	02-JUN-18
Thorium (Th)-Dissolved			110.0		%		70-130	02-JUN-18
Tin (Sn)-Dissolved			97.4		%		70-130	02-JUN-18
Titanium (Ti)-Dissolved			101.3		%		70-130	02-JUN-18
Tungsten (W)-Dissolved			105.6		%		70-130	02-JUN-18
Uranium (U)-Dissolved			105.6		%		70-130	02-JUN-18
Vanadium (V)-Dissolved			100.5		%		70-130	02-JUN-18
Zinc (Zn)-Dissolved			93.6		%		70-130	02-JUN-18
Zirconium (Zr)-Dissolved			103.3		%		70-130	02-JUN-18
MET-T-CCMS-TB	**Water**							
Batch R4064847								
WG2785100-6 LCS								
Aluminum (Al)-Total			99.4		%		80-120	02-JUN-18
Antimony (Sb)-Total			98.7		%		80-120	02-JUN-18
Arsenic (As)-Total			97.8		%		80-120	02-JUN-18
Barium (Ba)-Total			101.1		%		80-120	02-JUN-18
Beryllium (Be)-Total			98.1		%		80-120	02-JUN-18
Bismuth (Bi)-Total			99.4		%		80-120	02-JUN-18
Boron (B)-Total			90.5		%		80-120	02-JUN-18
Cadmium (Cd)-Total			98.0		%		80-120	02-JUN-18
Calcium (Ca)-Total			98.0		%		80-120	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4064847								
WG2785100-6 LCS								
Cesium (Cs)-Total			97.6		%		80-120	02-JUN-18
Chromium (Cr)-Total			96.4		%		80-120	02-JUN-18
Cobalt (Co)-Total			97.8		%		80-120	02-JUN-18
Copper (Cu)-Total			97.4		%		80-120	02-JUN-18
Iron (Fe)-Total			99.9		%		80-120	02-JUN-18
Lead (Pb)-Total			98.2		%		80-120	02-JUN-18
Lithium (Li)-Total			95.3		%		80-120	02-JUN-18
Magnesium (Mg)-Total			102.6		%		80-120	02-JUN-18
Manganese (Mn)-Total			98.2		%		80-120	02-JUN-18
Molybdenum (Mo)-Total			97.0		%		80-120	02-JUN-18
Nickel (Ni)-Total			95.7		%		80-120	02-JUN-18
Phosphorus (P)-Total			103.2		%		80-120	02-JUN-18
Potassium (K)-Total			99.4		%		80-120	02-JUN-18
Rubidium (Rb)-Total			102.8		%		80-120	02-JUN-18
Selenium (Se)-Total			95.0		%		80-120	02-JUN-18
Silicon (Si)-Total			98.4		%		80-120	02-JUN-18
Silver (Ag)-Total			96.9		%		80-120	02-JUN-18
Sodium (Na)-Total			101.4		%		80-120	02-JUN-18
Strontium (Sr)-Total			94.8		%		80-120	02-JUN-18
Sulfur (S)-Total			95.5		%		80-120	02-JUN-18
Tellurium (Te)-Total			95.6		%		80-120	02-JUN-18
Thallium (Tl)-Total			99.4		%		80-120	02-JUN-18
Thorium (Th)-Total			97.0		%		80-120	02-JUN-18
Tin (Sn)-Total			97.6		%		80-120	02-JUN-18
Titanium (Ti)-Total			93.6		%		80-120	02-JUN-18
Tungsten (W)-Total			98.6		%		80-120	02-JUN-18
Uranium (U)-Total			97.4		%		80-120	02-JUN-18
Vanadium (V)-Total			99.5		%		80-120	02-JUN-18
Zinc (Zn)-Total			88.2		%		80-120	02-JUN-18
Zirconium (Zr)-Total			91.0		%		80-120	02-JUN-18
WG2785406-2 LCS								
Aluminum (Al)-Total			97.6		%		80-120	02-JUN-18
Antimony (Sb)-Total			95.5		%		80-120	02-JUN-18
Arsenic (As)-Total			95.4		%		80-120	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4064847								
WG2785406-2 LCS								
Barium (Ba)-Total			95.4		%		80-120	02-JUN-18
Beryllium (Be)-Total			92.4		%		80-120	02-JUN-18
Bismuth (Bi)-Total			95.1		%		80-120	02-JUN-18
Boron (B)-Total			85.7		%		80-120	02-JUN-18
Cadmium (Cd)-Total			94.1		%		80-120	02-JUN-18
Calcium (Ca)-Total			92.2		%		80-120	02-JUN-18
Cesium (Cs)-Total			93.6		%		80-120	02-JUN-18
Chromium (Cr)-Total			93.0		%		80-120	02-JUN-18
Cobalt (Co)-Total			93.8		%		80-120	02-JUN-18
Copper (Cu)-Total			93.2		%		80-120	02-JUN-18
Iron (Fe)-Total			97.3		%		80-120	02-JUN-18
Lead (Pb)-Total			94.7		%		80-120	02-JUN-18
Lithium (Li)-Total			91.0		%		80-120	02-JUN-18
Magnesium (Mg)-Total			100.2		%		80-120	02-JUN-18
Manganese (Mn)-Total			93.8		%		80-120	02-JUN-18
Molybdenum (Mo)-Total			92.6		%		80-120	02-JUN-18
Nickel (Ni)-Total			93.1		%		80-120	02-JUN-18
Phosphorus (P)-Total			95.0		%		80-120	02-JUN-18
Potassium (K)-Total			95.8		%		80-120	02-JUN-18
Rubidium (Rb)-Total			94.8		%		80-120	02-JUN-18
Selenium (Se)-Total			90.4		%		80-120	02-JUN-18
Silicon (Si)-Total			100.5		%		80-120	02-JUN-18
Silver (Ag)-Total			92.7		%		80-120	02-JUN-18
Sodium (Na)-Total			98.4		%		80-120	02-JUN-18
Strontium (Sr)-Total			89.4		%		80-120	02-JUN-18
Sulfur (S)-Total			99.96		%		80-120	02-JUN-18
Tellurium (Te)-Total			93.6		%		80-120	02-JUN-18
Thallium (Tl)-Total			97.1		%		80-120	02-JUN-18
Thorium (Th)-Total			92.8		%		80-120	02-JUN-18
Tin (Sn)-Total			92.9		%		80-120	02-JUN-18
Titanium (Ti)-Total			93.4		%		80-120	02-JUN-18
Tungsten (W)-Total			94.9		%		80-120	02-JUN-18
Uranium (U)-Total			94.3		%		80-120	02-JUN-18
Vanadium (V)-Total			96.9		%		80-120	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4064847								
WG2785406-2 LCS								
Zinc (Zn)-Total			86.4		%		80-120	02-JUN-18
Zirconium (Zr)-Total			84.7		%		80-120	02-JUN-18
WG2785100-5 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	02-JUN-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	02-JUN-18
Boron (B)-Total			<0.010		mg/L		0.01	02-JUN-18
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	02-JUN-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	02-JUN-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	02-JUN-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	02-JUN-18
Iron (Fe)-Total			<0.010		mg/L		0.01	02-JUN-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	02-JUN-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	02-JUN-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	02-JUN-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	02-JUN-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	02-JUN-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	02-JUN-18
Potassium (K)-Total			<0.050		mg/L		0.05	02-JUN-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	02-JUN-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	02-JUN-18
Silicon (Si)-Total			<0.10		mg/L		0.1	02-JUN-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	02-JUN-18
Sodium (Na)-Total			<0.050		mg/L		0.05	02-JUN-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	02-JUN-18
Sulfur (S)-Total			<0.50		mg/L		0.5	02-JUN-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	02-JUN-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4064847								
WG2785100-5 MB								
Thorium (Th)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	02-JUN-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	02-JUN-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	02-JUN-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	02-JUN-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	02-JUN-18
WG2785406-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	02-JUN-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	02-JUN-18
Boron (B)-Total			<0.010		mg/L		0.01	02-JUN-18
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	02-JUN-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	02-JUN-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	02-JUN-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	02-JUN-18
Iron (Fe)-Total			<0.010		mg/L		0.01	02-JUN-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	02-JUN-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	02-JUN-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	02-JUN-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	02-JUN-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	02-JUN-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	02-JUN-18
Potassium (K)-Total			<0.050		mg/L		0.05	02-JUN-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	02-JUN-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	02-JUN-18
Silicon (Si)-Total			<0.10		mg/L		0.1	02-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4064847								
WG2785406-1 MB								
Silver (Ag)-Total			<0.000010		mg/L		0.00001	02-JUN-18
Sodium (Na)-Total			<0.050		mg/L		0.05	02-JUN-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	02-JUN-18
Sulfur (S)-Total			<0.50		mg/L		0.5	02-JUN-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	02-JUN-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	02-JUN-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	02-JUN-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	02-JUN-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	02-JUN-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	02-JUN-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	02-JUN-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	02-JUN-18
Batch R4075026								
WG2789863-2 LCS								
Aluminum (Al)-Total			102.0		%		80-120	06-JUN-18
Antimony (Sb)-Total			105.2		%		80-120	06-JUN-18
Arsenic (As)-Total			100.2		%		80-120	06-JUN-18
Barium (Ba)-Total			101.8		%		80-120	06-JUN-18
Beryllium (Be)-Total			99.3		%		80-120	06-JUN-18
Bismuth (Bi)-Total			104.8		%		80-120	06-JUN-18
Boron (B)-Total			98.2		%		80-120	06-JUN-18
Cadmium (Cd)-Total			99.3		%		80-120	06-JUN-18
Calcium (Ca)-Total			101.9		%		80-120	06-JUN-18
Cesium (Cs)-Total			101.6		%		80-120	06-JUN-18
Chromium (Cr)-Total			99.6		%		80-120	06-JUN-18
Cobalt (Co)-Total			100.9		%		80-120	06-JUN-18
Copper (Cu)-Total			98.6		%		80-120	06-JUN-18
Iron (Fe)-Total			105.9		%		80-120	06-JUN-18
Lead (Pb)-Total			102.9		%		80-120	06-JUN-18
Lithium (Li)-Total			99.9		%		80-120	06-JUN-18
Magnesium (Mg)-Total			105.7		%		80-120	06-JUN-18
Manganese (Mn)-Total			100.1		%		80-120	06-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4075026								
WG2789863-2 LCS								
Molybdenum (Mo)-Total			101.8		%		80-120	06-JUN-18
Nickel (Ni)-Total			98.7		%		80-120	06-JUN-18
Phosphorus (P)-Total			102.0		%		80-120	06-JUN-18
Potassium (K)-Total			100.3		%		80-120	06-JUN-18
Rubidium (Rb)-Total			103.2		%		80-120	06-JUN-18
Selenium (Se)-Total			101.6		%		80-120	06-JUN-18
Silicon (Si)-Total			102.4		%		80-120	06-JUN-18
Silver (Ag)-Total			102.1		%		80-120	06-JUN-18
Sodium (Na)-Total			99.1		%		80-120	06-JUN-18
Strontium (Sr)-Total			102.1		%		80-120	06-JUN-18
Sulfur (S)-Total			105.4		%		80-120	06-JUN-18
Tellurium (Te)-Total			108.3		%		80-120	06-JUN-18
Thallium (Tl)-Total			105.4		%		80-120	06-JUN-18
Thorium (Th)-Total			102.9		%		80-120	06-JUN-18
Tin (Sn)-Total			99.9		%		80-120	06-JUN-18
Titanium (Ti)-Total			95.4		%		80-120	06-JUN-18
Tungsten (W)-Total			100.2		%		80-120	06-JUN-18
Uranium (U)-Total			103.2		%		80-120	06-JUN-18
Vanadium (V)-Total			100.8		%		80-120	06-JUN-18
Zinc (Zn)-Total			93.4		%		80-120	06-JUN-18
Zirconium (Zr)-Total			100.5		%		80-120	06-JUN-18
WG2789863-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	06-JUN-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	06-JUN-18
Boron (B)-Total			<0.010		mg/L		0.01	06-JUN-18
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	06-JUN-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	06-JUN-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	06-JUN-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	06-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R4075026								
WG2789863-1 MB								
Copper (Cu)-Total			<0.00050		mg/L		0.0005	06-JUN-18
Iron (Fe)-Total			<0.010		mg/L		0.01	06-JUN-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	06-JUN-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	06-JUN-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	06-JUN-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	06-JUN-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	06-JUN-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	06-JUN-18
Potassium (K)-Total			<0.050		mg/L		0.05	06-JUN-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	06-JUN-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	06-JUN-18
Silicon (Si)-Total			<0.10		mg/L		0.1	06-JUN-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	06-JUN-18
Sodium (Na)-Total			<0.050		mg/L		0.05	06-JUN-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	06-JUN-18
Sulfur (S)-Total			<0.50		mg/L		0.5	06-JUN-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	06-JUN-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	06-JUN-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	06-JUN-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	06-JUN-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	06-JUN-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	06-JUN-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	06-JUN-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	06-JUN-18
NH3-COL-TB	**Water**							
Batch R4063365								
WG2785252-10 LCS								
Ammonia, Total (as N)			98.4		%		85-115	31-MAY-18
WG2785252-9 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	31-MAY-18
NO2-IC-N-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-TB	**Water**							
Batch R4063805								
WG2785729-6 LCS								
Nitrite (as N)			98.7		%		90-110	31-MAY-18
WG2785729-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	31-MAY-18
NO3-IC-N-TB	**Water**							
Batch R4063805								
WG2785729-6 LCS								
Nitrate (as N)			99.2		%		90-110	31-MAY-18
WG2785729-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	31-MAY-18
P-T-COL-TB	**Water**							
Batch R4067190								
WG2785347-3 DUP		**L2103029-1**						
Phosphorus (P)-Total		0.0141	0.0148		mg/L	4.9	20	04-JUN-18
WG2785347-2 LCS								
Phosphorus (P)-Total			97.0		%		80-120	04-JUN-18
WG2785347-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	04-JUN-18
PH-TITR-TB	**Water**							
Batch R4062791								
WG2784339-12 DUP		**L2103029-1**						
pH		7.15	7.17	J	pH	0.02	0.2	30-MAY-18
WG2784339-11 LCS								
pH			5.95		pH		5.9-6.1	30-MAY-18
Batch R4063799								
WG2784972-11 LCS								
pH			6.00		pH		5.9-6.1	31-MAY-18
WG2784972-2 LCS								
pH			5.99		pH		5.9-6.1	31-MAY-18
WG2784972-5 LCS								
pH			6.03		pH		5.9-6.1	31-MAY-18
PO4-DO-COL-TB	**Water**							
Batch R4063750								
WG2785613-3 DUP		**L2103029-4**						
Orthophosphate-Dissolved (as P)		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	31-MAY-18
WG2785613-2 LCS								
Orthophosphate-Dissolved (as P)			104.8		%		80-120	31-MAY-18
WG2785613-1								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PO4-DO-COL-TB	**Water**							
Batch R4063750								
WG2785613-1 MB								
Orthophosphate-Dissolved (as P)			<0.0030		mg/L		0.003	31-MAY-18
WG2785613-4 MS		**L2103029-5**						
Orthophosphate-Dissolved (as P)			101.2		%		70-130	31-MAY-18
SO4-IC-N-TB	**Water**							
Batch R4063805								
WG2785729-6 LCS								
Sulfate (SO4)			101.7		%		90-110	31-MAY-18
WG2785729-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	31-MAY-18
TDS-TB	**Water**							
Batch R4064186								
WG2785786-2 LCS								
Total Dissolved Solids			95.9		%		85-115	31-MAY-18
WG2785786-1 MB								
Total Dissolved Solids			<10		mg/L		10	31-MAY-18
Batch R4064880								
WG2786337-2 LCS								
Total Dissolved Solids			96.7		%		85-115	01-JUN-18
WG2786337-1 MB								
Total Dissolved Solids			<10		mg/L		10	01-JUN-18
Batch R4064954								
WG2786541-3 DUP		**L2103029-9**						
Total Dissolved Solids		154	157		mg/L	1.9	20	01-JUN-18
WG2786541-2 LCS								
Total Dissolved Solids			93.7		%		85-115	01-JUN-18
WG2786541-1 MB								
Total Dissolved Solids			<10		mg/L		10	01-JUN-18
TKN-COL-TB	**Water**							
Batch R4069949								
WG2785708-6 LCS								
Total Kjeldahl Nitrogen			103.5		%		75-125	05-JUN-18
WG2785708-5 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	05-JUN-18
Batch R4076300								
WG2789293-2 LCS								
Total Kjeldahl Nitrogen			110.1		%		75-125	07-JUN-18
WG2789293-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TKN-COL-TB	**Water**							
Batch R4076300								
WG2789293-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	07-JUN-18
TOC-TB	**Water**							
Batch R4063755								
WG2785196-2 LCS								
Total Organic Carbon			111.5		%		80-120	31-MAY-18
WG2785196-1 MB								
Total Organic Carbon			<1.0		mg/L		1	31-MAY-18
TSS-L-TB	**Water**							
Batch R4063816								
WG2785360-3 DUP		**L2103029-1**						
Total Suspended Solids		2.2	2.3		mg/L	4.5	20	31-MAY-18
WG2785360-2 LCS								
Total Suspended Solids			97.3		%		85-115	31-MAY-18
WG2785360-1 MB								
Total Suspended Solids			<1.0		mg/L		1	31-MAY-18

Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

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

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

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

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L2103029-COFC

COC Number: 15 -

Page of

Report To	Contact and company name below will appear on the final report
Company:	Palmer Environmental Consulting Group Inc.
Contact:	Jake McQueen
Phone:	647-795-8153
	Company address below will appear on the final report
Street:	374 Wellington Street West , Suite 3
City/Province:	Toronto, ON
Postal Code:	M5V 1E3
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1	jake@pecg.ca
Email 2	[redacted] ryan@pecg.ca
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1	jake@pecg.ca
Email 2	

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

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

PRIORITY (Business Days): 4 day [P4] ☐ | 3 day [P3] ☐ | 2 day [P2] ☐

EMERGENCY: 1 Business day [E1] ☐ | Same Day, Weekend or Statutory holiday [E0] ☐

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

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

Project Information	
ALS Account # / Quote #:	Q62364
Job #:	Ambershaw
PO / AFE:	
LSD:	

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

ALS Lab Work Order # (lab use only): L2103029

ALS Contact: Christine A. Sampler: JMC

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Acidity, Alkalinity, Br, Cl, DOC, Conductivity	F, Hardness, Dissolved Metals & Mercury	Total Metals & Mercury, Total Nitrogen	NH3, No2, NO3, Total Phosphorus, pH	PO4, SO4, TDS, TOC, Low Level TSS	Number of Containers
	MY	27-May-18	12:00	Surface Water	x	x	x	x	x	9
	BEAK-1	29 May 18	12:00	Surface Water	x	x	x	x	x	6
	STORM-1	28 May 18	12:00	Surface Water	x	x	x	x	x	6
	SL4	28 May 18	12:00	Surface Water	x	x	x	x	x	6
	SL3	28 May 18	12:00	Surface Water	x	x	x	x	x	6
	FB	29 May 18	12:00	Surface Water	x	x	x	x	x	6
	BL2	29 May 18	12:00	Surface Water	x	x	x	x	x	6
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	
				Surface Water	x	x	x	x	x	

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

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
19.7					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Jake McQueen	Date: May 30 - 18	Time: 11:30	Received by: LG	Date: 05 JUN 18	Time: 11:06	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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

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

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Appendix J

GROUNDWATER QUALITY – COMPARISON WITH ONTARIO DRINKING WATER STANDARDS (ODWS) (2017; 2018)

Client Sample ID						MW4		MW3D		MW2		MW5D		MW5S		MW6		MW7D		MW7D DUP	MW7S	
Date Sampled						18-Oct-2017	25-May-2018	18-Oct-2017	25-May-2018	19-Oct-2017	26-May-2018	20-Oct-2017	28-May-2018	20-Oct-2017	28-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	22-Oct-2017	27-May-2018
Time Sampled				OWDS		10:00	10:00	14:30	11:30	13:30	12:00	13:30	0:01	14:00	0:01	13:45	15:45	15:00	11:35	15:30	17:00	10:20
ALS Sample ID			AO	OG	MAC	L2011542-1	L2101962-1	L2011542-2	L2101962-2	L2011542-3	L2101962-3	L2011542-4	L2103029-9	L2011542-5	L2103029-8	L2011542-6	L2101962-4	L2011542-7	L2101962-6	L2011542-9	L2011542-8	L2101962-5
Parameter	Lowest Detection Limit	Units	2a	2b	2c	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests (Water)																						
Conductivity (EC)	3.0	uS/cm				72.9	72.0	373	268	250	153	294	278	250	197	422	321	179	133	177	179	180
Hardness (as CaCO3)	0.50	mg/L		80-100		**29.4**	**27.8**	**171**	**112**	**112**	**76.6**	**142**	**128**	**107**	86.5	**210**	**159**	**75.9**	**59**	**76.7**	**68.5**	82.2
pH	0.10	pH		6.5-8.5		7.17	6.73	8.07	7.85	7.48	7.75	7.63	8.05	6.69	7.54	7.05	7.72	6.97	7.10	6.78	6.67	6.69
Total Suspended Solids	1.0	mg/L				<1.0	<1.0	1.3	12.6	31.2	1.4	20.0	7.8	52.4	8.5	23.4	3.9	122	29	26.0	350	2
Total Dissolved Solids	13	mg/L	500			57	51	231	163	154	103	184	154	162	115	243	214	109	92	113	114	131
Anions and Nutrients (Water)																						
Acidity (as CaCO3)	2.0	mg/L				7.3	5.2	5.3	2.3	19.4	<2.0	5.4	2.2	30.4	6.6	45.3	3.5	17.2	4.4	24.3	28.0	13.3
Alkalinity, Total (as CaCO3)	2.0	mg/L		30-500		31.3	**29.1**	242	112	133	74	173	159	121	93	235	165	87.1	60.6	85.3	87.8	79.6
Ammonia, Total (as N)	0.020	mg/L				<0.020	<0.020	<0.020	0.022	0.051	0.023	<0.020	0.024	<0.020	<0.020	<0.020	<0.020	0.027	0.091	0.038	0.027	0.035
Bromide (Br)	0.10	mg/L				<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chloride (Cl)	0.10	mg/L	250			0.20	0.30	0.18	0.22	0.11	<0.10	0.54	0.51	0.81	0.46	0.29	0.14	0.22	0.21	0.22	0.17	0.27
Fluoride (F)	0.020	mg/L				0.023	<0.020	0.069	0.034	0.028	0.032	0.030	<0.020	<0.020	<0.020	<0.020	0.023	0.023	0.024	0.023	0.024	0.026
Nitrate (as N)	0.020	mg/L	10			0.421	0.409	<0.020	0.05	0.130	0.072	0.680	0.675	2.24	1.70	<0.020	<0.020	<0.020	0.053	<0.020	0.077	0.095
Nitrite (as N)	0.010	mg/L	1			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen	0.15	mg/L				<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.75	0.39	0.32	0.19	<0.15	<0.15	<0.15	<0.75	<0.15
Total Nitrogen	0.15	mg/L	10			0.42	0.41	<0.15	<0.15	<0.15	<0.15	0.68	0.67	2.24	2.08	0.32	0.19	<0.15	<0.15	<0.15	<0.75	<0.15
rthophosphate-Dissolved (as F	0.0030	mg/L				<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0057	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Phosphorus (P)-Total	0.0030	mg/L				0.0045	<0.0030	<0.0030	0.0032	0.0115	0.0037	0.0110	0.0057	0.0079	<0.0030	0.0078	0.0063	0.0141	0.0098	0.0050	0.0777	0.0036
Sulfate (SO4)	0.30	mg/L		500		5.07	5.29	28.6	20.3	11.2	7.2	2.88	3.08	6.51	2.71	6.79	5.53	8.50	6.87	7.99	7.53	12.50
ganic / Inorganic Carbon (Water)																						
Dissolved Organic Carbon	1.0	mg/L				1.8	2.8	1.6	3.5	3.6	5.0	1.1	4.8	1.3	3.6	11.1	9.9	2.3	1.7	2.0	2.6	2.5
Total Organic Carbon	1.0	mg/L				1.5	2.5	1.2	2.7	3.2	4.2	1.5	1.9	1.3	1.9	11.3	9.2	1.8	1.3	2.1	4.0	2.2
Total Metals (Water)																						
Aluminum (Al)-Total	0.0030	mg/L		0.1		0.0182	0.0100	0.0224	**0.1410**	**1.56**	0.05	**1.66**	0.08	**0.734**	0.056	**0.325**	0.048	**0.930**	**0.538**	**0.271**	**7.04**	**0.101**
Antimony (Sb)-Total	0.00010	mg/L			0.01	<0.00010	<0.00010	0.00015	0.00018	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00023	0.00011	0.00040	<0.00010	0.00037	<0.00010	<0.00010
Arsenic (As)-Total	0.00010	mg/L			0.03	0.00011	<0.00010	0.00022	0.00017	0.00099	0.00035	0.00030	0.00014	0.00023	0.00011	0.00040	0.00017	0.00034	0.00017	0.00023	0.00099	0.00014
Barium (Ba)-Total	0.000050	mg/L			1	0.0148	0.0134	0.221	0.135	0.0885	0.0437	0.0644	0.0387	0.0475	0.0233	0.0504	0.0136	0.0524	0.0240	0.0462	0.115	0.048
Beryllium (Be)-Total	0.00010	mg/L				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010
Bismuth (Bi)-Total	0.000050	mg/L				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total	0.010	mg/L			5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	0.015	<0.010	0.014	0.011	<0.010
Cadmium (Cd)-Total	0.0000050	mg/L			0.01	<0.0000050	0.0000059	0.0000124	0.0000275	0.000201	0.000017	0.0000345	0.0000130	0.0000336	0.0000106	0.000254	0.000027	0.0000948	0.0000232	0.0000717	0.000116	0.000037
Calcium (Ca)-Total	0.050	mg/L				9.87	9.82	58.8	40.4	39.1	26.7	49.8	47.4	36.5	32.3	75.6	57.3	23.1	17.7	22.3	21.9	22.1
Cesium (Cs)-Total	0.000010	mg/L				0.000012	<0.000010	0.000075	0.000280	0.000059	<0.000010	0.000079	<0.000010	0.000029	<0.000010	0.000061	0.000035	0.000127	0.000093	0.000052	0.000501	0.000065
Chromium (Cr)-Total	0.00010	mg/L			0.05	0.00021	0.00020	0.00016	0.00010	0.00093	0.00056	0.00414	0.00076	0.00127	0.00035	0.00072	0.00042	0.00255	0.00150	0.00072	0.0158	0.0004
Cobalt (Co)-Total	0.00010	mg/L				0.00041	0.00013	0.00134	0.00027	0.00244	0.00045	0.00112	0.00023	0.00065	<0.00010	0.0163	0.0005	0.0128	0.0014	0.0111	0.0163	0.0076
Copper (Cu)-Total	0.00050	mg/L	1			0.00191	0.00215	<0.00050	0.00241	0.00842	0.00272	0.00640	0.00509	0.00208	0.00164	0.0225	0.0166	0.0118	0.0145	0.00645	0.0333	0.0254
Iron (Fe)-Total	0.010	mg/L	0.3			0.032	0.016	**0.456**	0.130	**2.66**	0.09	**1.36**	0.11	**0.598**	0.066	**2.39**	0.16	**5.12**	**0.73**	**3.54**	**5.14**	0.08
Lead (Pb)-Total	0.000050	mg/L				<0.000050	<0.000050	<0.000050	0.000119	0.000435	<0.000050	0.000408	<0.000050	0.000267	<0.000050	0.000212	<0.000050	0.000575	0.000254	0.000298	0.00178	<0.000050
Lithium (Li)-Total	0.0010	mg/L				<0.0010	<0.0010	0.0029	0.0034	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0022	0.0020	0.0044	0.0028	0.0039	0.0034	0.0038
Magnesium (Mg)-Total	0.0050	mg/L				1.09	1.09	5.20	3.16	3.04	1.68	4.95	4.18	3.35	2.84	5.11	3.84	4.73	3.51	4.69	8.10	5.71
Manganese (Mn)-Total	0.00010	mg/L	0.1			0.0131	0.0032	**0.288**	**0.161**	**0.140**	0.028	**0.115**	0.043	**0.0982**	0.0176	**1.62**	**0.28**	**0.696**	0.031	**0.624**	**0.579**	**0.139**
Mercury (Hg)-Total	0.0000050	mg/L				<0.0000050	<0.0000050	<0.0000050	0.0000052	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000100	0.0000094	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	0.000050	mg/L				0.000462	0.000182	0.00114	0.00022	0.000528	0.000247	0.000746	0.000717	0.000767	0.000226	0.000662	0.000208	0.00393	0.00235	0.00370	0.00571	0.00309
Nickel (Ni)-Total	0.00050	mg/L				0.00189	0.00113	0.00085	0.00084	0.00314	0.00130	0.00203	<0.00050	0.00116	<0.00050	0.0407	0.0131	0.00881	0.00663	0.00742	0.0321	0.0389
Phosphorus (P)-Total	0.050	mg/L				<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.105	<0.050
Potassium (K)-Total	0.050	mg/L				2.23	2.04	18.2	12.6	4.27	2.38	4.34	3.75	3.58	2.57	1.60	1.21	4.21	2.28	4.20	6.86	5.03
Rubidium (Rb)-Total	0.00020	mg/L				0.00143	0.00093	0.0214	0.0156	0.00632	0.00262	0.00462	0.00210	0.00301	0.00099	0.00405	0.00256	0.00690	0.00495	0.00645	0.0139	0.0111
Selenium (Se)-Total	0.000050	mg/L			0.01	0.000066	0.000114	<0.000050	0.000593	0.000191	0.000152	0.000294	0.000186	0.000099	0.000079	0.000093	0.000103	0.000635	0.000764	0.000588	0.000325	0.000444
Silicon (Si)-Total	0.10	mg/L				7.33	7.01	6.88	5.46	11.0	6.6	9.98	6.73	10.5	7.6	13.4	12.2	11.5	9.1	10.1	23.5	13.2
Silver (Ag)-Total	0.000010	mg/L				<0.000010	<0.000010	<0.000010	<0.000010	0.000015	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000033	0.000015	0.000019	<0.000010	<0.000010	0.000031	<0.000010
Sodium (Na)-Total	0.050	mg/L	200		20	2.03	1.84	1.91	1.38	5.27	3.03	3.16	2.48	8.67	2.76	5.41	3.41	4.31	2.60	4.21	6.19	4.14
Strontium (Sr)-Total	0.00020	mg/L				0.0274	0.0269	0.299	0.161	0.105	0.060	0.132	0.097	0.0885	0.0604	0.0921	0.0627	0.0814	0.0412	0.0725	0.100	0.086
Sulfur (S)-Total	0.50	mg/L				1.74	2.02	10.8	7.3	3.33	2.74	1.24	1.16	2.27	0.96	2.54	2.36	2.83	2.42	2.45	2.12	4.49
Tellurium (Te)-Total	0.00020	mg/L				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	0.000010	mg/L				<0.000010	<0.000010	0.000019	0.000020	0.000020	<0.000010	0.000016	<0.000010	0.000011	<0.000010	0.000027	<0.000010	0.000024	0.000016	0.000019	0.000069	0.000043
Thorium (Th)-Total	0.00010	mg/L				<0.00010	<0.00010	<0.00010	0.00017	0.00051	<0.00010	0.00076	<0.00010	0.00054	<0.00010	0.00038	<0.00010	0.00040	0.00020	0.00013	0.00197	<0.00010
Tin (Sn)-Total	0.00010	mg/L				<0.00010	<0.00010	<0.00010	<0.00010	0.00017	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.00059	0.00051	0.00035	<0.00010	0.00019	0.00017	<0.00010
Titanium (Ti)-Total	0.00030	mg/L				0.00085	<0.00030	0.00094	0.00266	0.0413	0.0016	0.0599	0.0038	0.0200	0.0022	0.00983	0.00175	0.0422	0.0214	0.0112	0.282	0.004
Tungsten (W)-Total	0.00010	mg/L				0.00338	0.00133	0.0110	0.0008	0.00920	0.00178	0.00588	0.00112	0.00156	0.00079	0.00308	0.00030	0.0210	0.0067	0.0142	0.0534	0.0281
Uranium (U)-Total	0.000010	mg/L			0.02	0.000099	0.000096	0.000844	0.000663	0.000809	0.000279	0.00151	0.00142	0.000649	0.000550	0.000693	0.000490	0.00167	0.00198	0.00177	0.00113	0.00183
Vanadium (V)-Total	0.00050	mg/L				<0.00050	<0.00050	<0.00050	<0.00050	0.00816	0.00063	0.00337	0.00097	0.00127	0.00053	0.00103	<0.00050	0.00245	0.00144	0.00104	0.0119	<0.00050
Zinc (Zn)-Total	0.0030	mg/L	5			<0.0030	<0.0030	0.0412	0.0031	0.0645	0.0046	0.0272	0.0172	0.0108	<0.0030	0.390	0.016	0.246	0.038	0.189	0.0158	0.0257
Zirconium (Zr)-Total	0.000060	mg/L				<0.000060	<0.000060	<0.000060	0.000163	0.000436	0.000066	0.000469	<0.000060	0.000409	<0.000060	0.000225	0.000108	0.000186	0.000124	0.000079	0.000725	<0.000060
Dissolved Metals (Water)																						
Aluminum (Al)-Dissolved	0.0020	mg/L				0.0041	0.0046	0.0038	0.00350	0.0096	0.0104	0.0093	0.0051	0.0070	0.0033	0.0064	0.00500	0.0085	0.0042	0.0043	0.0086	0.0134
Antimony (Sb)-Dissolved	0.00010	mg/L				<0.00010	<0.00010	0.00013	0.00016	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Dissolved	0.00010	mg/L				<0.00010	<0.00010	0.00017	0.000	0.00047	0.0003	0.00012	<0.00010	0.00013	<0.00010	0.00020	0.0001	0.00016	<0.00010	0.00015	0.00020	0.0001
Barium (Ba)-Dissolved	0.000050	mg/L				0.0142	0.0129	0.215	0.132	0.0807	0.0463	0.0501	0.0372	0.0434	0.0219	0.0446	0.0129	0.0432	0.0217	0.0438	0.0713	0.0479
Beryllium (Be)-Dissolved	0.00010	mg/L				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Dissolved	0.000050	mg/L				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved	0.010	mg/L				<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	0.014	0.010	<0.010
Cadmium (Cd)-Dissolved	0.0000050	mg/L				<0.0000050	0.00	0.0000131	0.0	0.000200	0.0	0.0000162	<0.0000050	0.000653	0.0	0.000157	0.0	0.0000573	0.0	0.0000501	0.0000729	0.0
Calcium (Ca)-Dissolved	0.050	mg/L				9.95	9.45	59.3	39.700000	40.4	27.800000	48.9	45.1	37.3	30.4	75.9	57.200000	22.8	18.100000	23.1	18.8	22.900000
Cesium (Cs)-Dissolved	0.000010	mg/L				<0.000010	<0.000010	0.000068	0.00026	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000044	0.00003	0.000020	0.000033	0.000022	0.000020	0.00005
Chromium (Cr)-Dissolved	0.00010	mg/L				0.00014	0.00033	0.00045	0.00182	0.00011	0.00023	0.00050	0.00077	0.00029	0.00018	0.00015	0.0003	<0.00010	0.0002	0.00021	0.00011	0.0003
Cobalt (Co)-Dissolved	0.00010	mg/L				0.00039	0.00012	0.00130	0.00026	0.00129	0.00044	0.00040	0.00017	0.00036	<0.00010	0.0146	<0.00010	0.0106	0.00099	0.0105	0.0108	0.00763
Copper (Cu)-Dissolved	0.00020	mg/L				0.00163	0.00142	0.00032	0.001	0.00339	0.00268	0.00234	0.00104	0.00796	0.00124	0.0223	0.010	0.00266	0.00	0.00237	0.00297	0.0242
Iron (Fe)-Dissolved	0.010	mg/L				<0.010	<0.010	0.225	0.043	<0.010	<0.010	<0.010	0.013	<0.010	<0.010	0.194	2.75	<0.010	2.68	0.194	<0.010	0.016
Lead (Pb)-Dissolved	0.000050	mg/L				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000225	<0.000050	0.000250	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved	0.0010	mg/L				<0.0010	<0.0010	0.0032	0.00	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0024	0.00	0.0045	0.00	0.0048	<0.0010	0.00
Magnesium (Mg)-Dissolved	0.0050	mg/L				1.10	1.0200	5.53	3.060	2.72	1.720	4.87	3.8400	3.48	2.5900	4.99	3.94	4.58	3.320	4.59	5.24	6.060
Manganese (Mn)-Dissolved	0.00010	mg/L				0.0122	0.0028	0.279	0.154	0.100	0.029	0.0903	0.0397	0.0848	0.0163	1.49	0.0449	0.596	0.0278	0.596	0.476	0.137
Mercury (Hg)-Dissolved	0.0000050	mg/L				<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	0.000050	mg/L				0.000405	0.00019	0.00105	0.00058	0.000482	0.00025	0.000710	0.000668	0.000693	0.00022	0.000573	0.0002	0.00362	0.00234	0.00376	0.00467	0.0032
Nickel (Ni)-Dissolved	0.00050	mg/L				0.00174	0.00087	0.00102	0.00064	0.00191	0.00099	<0.00050	<0.00050	0.00070	<0.00050	0.0363	0.00576	0.00661	0.00547	0.00665	0.0183	0.0388
Phosphorus (P)-Dissolved	0.050	mg/L				<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.050	mg/L				2.17	2.04000	18.2	13.0000	4.34	2.63000	4.22	3.67000	3.57	2.53000	1.44	1.25000	4.11	2.31000	4.17	5.29	5.12000
Rubidium (Rb)-Dissolved	0.00020	mg/L				0.00124	0.000880	0.0211	0.0147	0.00598	0.002690	0.00324	0.001750	0.00247	0.000890	0.00332	0.002630	0.00582	0.004490	0.00568	0.00856	0.011100
Selenium (Se)-Dissolved	0.000050	mg/L				0.000138	0.00	<0.000050	0.00	0.000187	0.00	0.000334	0.00	0.000112	0.00	0.000096	0.0	0.000756	0.0	0.000666	0.000317	0.0

Client Sample ID						MW4		MW3D		MW2		MW5D		MW5S		MW6		MW7D		MW7D DUP		MW7S	
Date Sampled						18-Oct-2017	25-May-2018	18-Oct-2017	25-May-2018	19-Oct-2017	26-May-2018	20-Oct-2017	28-May-2018	20-Oct-2017	28-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	22-Oct-2017	27-May-2018	
Time Sampled			OWDS			10:00	10:00	14:30	11:30	13:30	12:00	13:30	0:01	14:00	0:01	13:45	15:45	15:00	11:35	15:30	17:00	10:20	
ALS Sample ID		AO	OG	MAC		L2011542-1	L2101962-1	L2011542-2	L2101962-2	L2011542-3	L2101962-3	L2011542-4	L2103029-9	L2011542-5	L2103029-8	L2011542-6	L2101962-4	L2011542-7	L2101962-6	L2011542-9	L2011542-8	L2101962-5	
Parameter	Lowest Detection Limit	Units	2a	2b	2c	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	
Silicon (Si)-Dissolved	0.050	mg/L				7.40	6.9	6.87	5.14	8.43	6.43	7.31	6.08	9.42	6.68	13.3	11.8	10.1	7.91	9.96	13.8	12.8	
Silver (Ag)-Dissolved	0.000010	mg/L				<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Sodium (Na)-Dissolved	0.050	mg/L				2.01	1.8300	1.84	1.240	5.35	3.250	3.09	2.310	8.78	2.5300	4.92	3.3800	4.10	2.5500	4.16	5.37	4.3000	
Strontium (Sr)-Dissolved	0.00020	mg/L				0.0266	0.03	0.292	0.2	0.100	0.06	0.121	0.10	0.0825	0.06	0.0849	0.06	0.0727	0.04	0.0746	0.0876	0.09	
Sulfur (S)-Dissolved	0.50	mg/L				1.87	1.8	10.3	6.98	3.63	2.43	1.12	0.87	2.13	0.58	2.29	2.03	2.45	2.24	2.62	1.93	4.87	
Tellurium (Te)-Dissolved	0.00020	mg/L				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Thallium (Tl)-Dissolved	0.000010	mg/L				<0.000010	<0.000010	0.000021	0.000018	0.000017	0.000014	0.000011	<0.000010	0.000012	<0.000010	0.000027	<0.000010	0.000021	<0.000010	0.000018	0.000028	0.000039	
Thorium (Th)-Dissolved	0.00010	mg/L				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn)-Dissolved	0.00010	mg/L				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	0.00026	<0.00010	0.00045	0.00018	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti)-Dissolved	0.00030	mg/L				<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	
Tungsten (W)-Dissolved	0.00010	mg/L				0.00298	0.001210	0.0101	0.000760	0.00837	0.001550	0.00512	0.00126	0.00119	0.000750	0.00052	<0.00010	0.0104	0.00359	0.0103	0.0214	0.027400	
Uranium (U)-Dissolved	0.000010	mg/L				0.000084	0.000086	0.000828	0.000612	0.000740	0.000272	0.00138	0.00148	0.000518	0.000537	0.000585	0.000453	0.00172	0.00178	0.00170	0.000501	0.00174	
Vanadium (V)-Dissolved	0.00050	mg/L				<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0006	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Zinc (Zn)-Dissolved	0.0010	mg/L				0.0022	0.0055	0.0242	0.0014	0.0654	0.0042	0.0130	0.0097	0.0112	<0.0010	0.298	0.010000	0.158	0.0118	0.160	0.0056	0.0241	
Zirconium (Zr)-Dissolved	0.000060	mg/L				<0.000060	<0.000060	<0.000060	<0.000060	<0.000060	0.000064	<0.000060	<0.000060	0.000074	<0.000060	0.000077	0.000081	<0.000060	<0.000060	<0.000060	<0.000060	<0.000060	

Qualifier Legend

SAMPLE EXCEEDS ODWS AO

SAMPLE EXCEEDS ODWS OG

SAMPLE EXCEEDS ODWS MAC

Appendix K

GROUNDWATER QUALITY – COMPARISON WITH PROVINCIAL WATER QUALITY OBJECTIVES (PWQO) (2017; 2018)

Client Sample ID				MW4		MW3D		MW2		MW5D		MW5S		MW6		MW7D		MW7D DUP	MW7S	
Date Sampled				18-Oct-2017	25-May-2018	#######	25-May-2018	19-Oct-2017	26-May-2018	20-Oct-2017	28-May-2018	20-Oct-2017	28-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	22-Oct-2017	27-May-2018
Time Sampled			PWQO	10:00	10:00	14:30	11:30	13:30	12:00	13:30	0:01	14:00	0:01	13:45	15:45	15:00	11:35	15:30	17:00	10:20
ALS Sample ID				L2011542-1	L2101962-1	2011542-:	L2101962-2	L2011542-3	L2101962-3	L2011542-4	L2103029-9	L2011542-5	L2103029-8	L2011542-6	L2101962-4	L2011542-7	L2101962-6	L2011542-9	L2011542-8	L2101962-5
Parameter	Lowest Detection Limit	Units	3	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests (Water)																				
Conductivity (EC)	3.0	uS/cm		72.9	72.0	373	268	250	153	294	278	250	197	422	321	179	133	177	179	180
Hardness (as CaCO3)	0.50	mg/L		29.4	27.8	171	112	112	76.6	142	128	107	86.5	210	159	75.9	59	76.7	68.5	82.2
pH	0.10	pH	6.5-8.5	7.17	6.73	8.07	7.85	7.48	7.75	7.63	8.05	6.69	7.54	7.05	7.72	6.97	7.10	6.78	6.67	6.69
Total Suspended Solids	1.0	mg/L		<1.0	<1.0	1.3	12.6	31.2	1.4	20.0	7.8	52.4	8.5	23.4	3.9	122	29	26.0	350	2
Total Dissolved Solids	13	mg/L		57	51	231	163	154	103	184	154	162	115	243	214	109	92	113	114	131
Anions and Nutrients (Water)																				
Acidity (as CaCO3)	2.0	mg/L		7.3	5.2	5.3	2.3	19.4	<2.0	5.4	2.2	30.4	6.6	45.3	3.5	17.2	4.4	24.3	28.0	13.3
Alkalinity, Total (as CaCO3)	2.0	mg/L	s by >25% n	31.3	29.1	242	112	133	74	173	159	121	93	235	165	87.1	60.6	85.3	87.8	79.6
Ammonia, Total (as N)	0.020	mg/L	0.02	<0.020	<0.020	<0.020	**0.022**	**0.051**	**0.023**	<0.020	**0.024**	<0.020	<0.020	<0.020	<0.020	<0.020	**0.027**	**0.091**	**0.038**	**0.027**	**0.035**
Bromide (Br)	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chloride (Cl)	0.10	mg/L		0.20	0.30	0.18	0.22	0.11	<0.10	0.54	0.51	0.81	0.46	0.29	0.14	0.22	0.21	0.22	0.17	0.27
Fluoride (F)	0.020	mg/L		0.023	<0.020	0.069	0.034	0.028	0.032	0.030	<0.020	<0.020	<0.020	<0.020	0.023	0.023	0.024	0.023	0.024	0.026
Nitrate (as N)	0.020	mg/L		0.421	0.409	<0.020	0.05	0.130	0.072	0.680	0.675	2.24	1.70	<0.020	<0.020	<0.020	0.053	<0.020	0.077	0.095
Nitrite (as N)	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen	0.15	mg/L		<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.75	0.39	0.32	0.19	<0.15	<0.15	<0.15	<0.75	<0.15
Total Nitrogen	0.15	mg/L		0.42	0.41	<0.15	<0.15	<0.15	<0.15	0.68	0.67	2.24	2.08	0.32	0.19	<0.15	<0.15	<0.15	<0.75	<0.15
Orthophosphate-Dissolved (as P	0.0030	mg/L		<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0057	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Phosphorus (P)-Total	0.0030	mg/L	ge from 0.01	0.0045	<0.0030	<0.0030	0.0032	**0.0115**	0.0037	**0.0110**	0.0057	0.0079	<0.0030	0.0078	0.0063	**0.0141**	0.0098	0.0050	**0.0777**	0.0036
Sulfate (SO4)	0.30	mg/L		5.07	5.29	28.6	20.3	11.2	7.2	2.88	3.08	6.51	2.71	6.79	5.53	8.50	6.87	7.99	7.53	12.50
ganic / Inorganic Carbon (Water)																				
Dissolved Organic Carbon	1.0	mg/L		1.8	2.8	1.6	3.5	3.6	5.0	1.1	4.8	1.3	3.6	11.1	9.9	2.3	1.7	2.0	2.6	2.5
Total Organic Carbon	1.0	mg/L		1.5	2.5	1.2	2.7	3.2	4.2	1.5	1.9	1.3	1.9	11.3	9.2	1.8	1.3	2.1	4.0	2.2
Total Metals (Water)																				
Aluminum (Al)-Total	0.0030	mg/L	% above nat	0.0182	0.0100	0.0224	**0.1410**	**1.56**	0.05	**1.66**	**0.08**	**0.734**	0.056	**0.325**	0.048	**0.930**	**0.538**	**0.271**	**7.04**	**0.101**
Antimony (Sb)-Total	0.00010	mg/L	0.02	<0.00010	<0.00010	0.00015	0.00018	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00023	0.00011	0.00040	<0.00010	0.00037	<0.00010	<0.00010
Arsenic (As)-Total	0.00010	mg/L	0.005	0.00011	<0.00010	0.00022	0.00017	0.00099	0.00035	0.00030	0.00014	0.00023	0.00011	0.00040	0.00017	0.00034	0.00017	0.00023	0.00099	0.00014
Barium (Ba)-Total	0.000050	mg/L		0.0148	0.0134	0.221	0.135	0.0885	0.0437	0.0644	0.0387	0.0475	0.0233	0.0504	0.0136	0.0524	0.0240	0.0462	0.115	0.048
Beryllium (Be)-Total	0.00010	mg/L	0.011, Hard	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010
Bismuth (Bi)-Total	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total	0.010	mg/L	0.2	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	0.015	<0.010	0.014	0.011	<0.010
Cadmium (Cd)-Total	0.0000050	mg/L	0001, Hard	<0.0000050	0.0000059	#######	0.0000275	0.000201	0.000017	0.0000345	0.0000130	0.0000336	0.0000106	0.000254	0.000027	0.0000948	0.0000232	0.0000717	**0.000116**	0.000037
Calcium (Ca)-Total	0.050	mg/L		9.87	9.82	58.8	40.4	39.1	26.7	49.8	47.4	36.5	32.3	75.6	57.3	23.1	17.7	22.3	21.9	22.1
Cesium (Cs)-Total	0.000010	mg/L		0.000012	<0.000010	0.000075	0.000280	0.000059	<0.000010	0.000079	<0.000010	0.000029	<0.000010	0.000061	0.000035	0.000127	0.000093	0.000052	0.000501	0.000065
Chromium (Cr)-Total	0.00010	mg/L	0.001, CrIII: (	0.00021	0.00020	0.00016	0.00010	0.00093	0.00056	**0.00414**	0.00076	**0.00127**	0.00035	0.00072	0.00042	**0.00255**	**0.00150**	0.00072	**0.0158**	0.0004
Cobalt (Co)-Total	0.00010	mg/L	0.0009	0.00041	0.00013	**0.00134**	0.00027	**0.00244**	0.00045	**0.00112**	0.00023	0.00065	<0.00010	**0.0163**	0.0005	**0.0128**	**0.0014**	**0.0111**	**0.0163**	**0.0076**
Copper (Cu)-Total	0.00050	mg/L	0.001, Hard	0.00191	0.00215	<0.00050	0.00241	**0.00842**	0.00272	**0.00640**	**0.00509**	0.00208	0.00164	**0.0225**	**0.0166**	**0.0118**	**0.0145**	**0.00645**	0.0333	0.0254
Iron (Fe)-Total	0.010	mg/L	0.3	0.032	0.016	**0.456**	0.130	**2.66**	0.09	**1.36**	0.11	**0.598**	0.066	**2.39**	0.16	**5.12**	**0.73**	**3.54**	**5.14**	0.08
Lead (Pb)-Total	0.000050	mg/L	linity 30-80:	<0.000050	<0.000050	<0.000050	0.000119	0.000435	<0.000050	0.000408	<0.000050	0.000267	<0.000050	0.000212	<0.000050	0.000575	0.000254	0.000298	0.00178	<0.000050
Lithium (Li)-Total	0.0010	mg/L		<0.0010	<0.0010	0.0029	0.0034	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0022	0.0020	0.0044	0.0028	0.0039	0.0034	0.0038
Magnesium (Mg)-Total	0.0050	mg/L		1.09	1.09	5.20	3.16	3.04	1.68	4.95	4.18	3.35	2.84	5.11	3.84	4.73	3.51	4.69	8.10	5.71
Manganese (Mn)-Total	0.00010	mg/L		0.0131	0.0032	0.288	0.161	0.140	0.028	0.115	0.043	0.0982	0.0176	1.62	0.28	0.696	0.031	0.624	0.579	0.139
Mercury (Hg)-Total	0.0000050	mg/L	0.0002	<0.0000050	<0.0000050	<0.0000050	0.0000052	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000100	0.0000094	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	0.000050	mg/L	0.04	0.000462	0.000182	0.00114	0.00022	0.000528	0.000247	0.000746	0.000717	0.000767	0.000226	0.000662	0.000208	0.00393	0.00235	0.00370	0.00571	0.00309
Nickel (Ni)-Total	0.00050	mg/L	0.025	0.00189	0.00113	0.00085	0.00084	0.00314	0.00130	0.00203	<0.00050	0.00116	<0.00050	**0.0407**	0.0131	0.00881	0.00663	0.00742	**0.0321**	**0.0389**
Phosphorus (P)-Total	0.050	mg/L	ge from 0.01	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	**0.105**	<0.050
Potassium (K)-Total	0.050	mg/L		2.23	2.04	18.2	12.6	4.27	2.38	4.34	3.75	3.58	2.57	1.60	1.21	4.21	2.28	4.20	6.86	5.03
Rubidium (Rb)-Total	0.00020	mg/L		0.00143	0.00093	0.0214	0.0156	0.00632	0.00262	0.00462	0.00210	0.00301	0.00099	0.00405	0.00256	0.00690	0.00495	0.00645	0.0139	0.0111
Selenium (Se)-Total	0.000050	mg/L	0.1	0.000066	0.000114	<0.000050	0.000593	0.000191	0.000152	0.000294	0.000186	0.000099	0.000079	0.000093	0.000103	0.000635	0.000764	0.000588	0.000325	0.000444
Silicon (Si)-Total	0.10	mg/L		7.33	7.01	6.88	5.46	11.0	6.6	9.98	6.73	10.5	7.6	13.4	12.2	11.5	9.1	10.1	23.5	13.2
Silver (Ag)-Total	0.000010	mg/L	0.0001	<0.000010	<0.000010	<0.000010	<0.000010	0.000015	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000033	0.000015	0.000019	<0.000010	<0.000010	0.000031	<0.000010
Sodium (Na)-Total	0.050	mg/L		2.03	1.84	1.91	1.38	5.27	3.03	3.16	2.48	8.67	2.76	5.41	3.41	4.31	2.60	4.21	6.19	4.14
Strontium (Sr)-Total	0.00020	mg/L		0.0274	0.0269	0.299	0.161	0.105	0.060	0.132	0.097	0.0885	0.0604	0.0921	0.0627	0.0814	0.0412	0.0725	0.100	0.086
Sulfur (S)-Total	0.50	mg/L		1.74	2.02	10.8	7.3	3.33	2.74	1.24	1.16	2.27	0.96	2.54	2.36	2.83	2.42	2.45	2.12	4.49
Tellurium (Te)-Total	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	0.000010	mg/L	0.0003	<0.000010	<0.000010	0.000019	0.000020	0.000020	<0.000010	0.000016	<0.000010	0.000011	<0.000010	0.000027	<0.000010	0.000024	0.000016	0.000019	0.000069	0.000043
Thorium (Th)-Total	0.00010	mg/L		<0.00010	<0.00010	<0.00010	0.00017	0.00051	<0.00010	0.00076	<0.00010	0.00054	<0.00010	0.00038	<0.00010	0.00040	0.00020	0.00013	0.00197	<0.00010
Tin (Sn)-Total	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	0.00017	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.00059	0.00051	0.00035	<0.00010	0.00019	0.00017	<0.00010
Titanium (Ti)-Total	0.00030	mg/L		0.00085	<0.00030	0.00094	0.00266	0.0413	0.0016	0.0599	0.0038	0.0200	0.0022	0.00983	0.00175	0.0422	0.0214	0.0112	0.282	0.004
Tungsten (W)-Total	0.00010	mg/L	0.03	0.00338	0.00133	0.0110	0.0008	0.00920	0.00178	0.00588	0.00112	0.00156	0.00079	0.00308	0.00030	0.0210	0.0067	0.0142	**0.0534**	0.0281
Uranium (U)-Total	0.000010	mg/L	0.005	0.000099	0.000096	0.000844	0.000663	0.000809	0.000279	0.00151	0.00142	0.000649	0.000550	0.000693	0.000490	0.00167	0.00198	0.00177	0.00113	0.00183
Vanadium (V)-Total	0.00050	mg/L	0.006	<0.00050	<0.00050	<0.00050	<0.00050	**0.00816**	0.00063	0.00337	0.00097	0.00127	0.00053	0.00103	<0.00050	0.00245	0.00144	0.00104	0.0119	<0.00050
Zinc (Zn)-Total	0.0030	mg/L	0.02	<0.0030	<0.0030	**0.0412**	0.0031	**0.0645**	0.0046	**0.0272**	0.0172	0.0108	<0.0030	**0.390**	0.016	**0.246**	**0.038**	**0.189**	0.0158	**0.0257**
Zirconium (Zr)-Total	0.000060	mg/L	0.004	<0.000060	<0.000060	<0.000060	0.000163	0.000436	0.000066	0.000469	<0.000060	0.000409	<0.000060	0.000225	0.000108	0.000186	0.000124	0.000079	0.000725	<0.000060
Dissolved Metals (Water)																				
Aluminum (Al)-Dissolved	0.0020	mg/L		0.0041	0.0046	0.0038	0.00350	0.0096	0.0104	0.0093	0.0051	0.0070	0.0033	0.0064	0.00500	0.0085	0.0042	0.0043	0.0086	0.0134
Antimony (Sb)-Dissolved	0.00010	mg/L		<0.00010	<0.00010	0.00013	0.00016	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Dissolved	0.00010	mg/L		<0.00010	<0.00010	0.00017	0.000	0.00047	0.0003	0.00012	<0.00010	0.00013	<0.00010	0.00020	0.0001	0.00016	<0.00010	0.00015	0.00020	0.0001
Barium (Ba)-Dissolved	0.000050	mg/L		0.0142	0.0129	0.215	0.132	0.0807	0.0463	0.0501	0.0372	0.0434	0.0219	0.0446	0.0129	0.0432	0.0217	0.0438	0.0713	0.0479
Beryllium (Be)-Dissolved	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Dissolved	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	0.014	0.010	<0.010
Cadmium (Cd)-Dissolved	0.0000050	mg/L		<0.0000050	0.00	#######	0.0	0.000200	0.0	0.0000162	<0.0000050	0.000653	0.0	0.000157	0.0	0.0000573	0.0	0.0000501	0.0000729	0.0
Calcium (Ca)-Dissolved	0.050	mg/L		9.95	9.45	59.3	39.700000	40.4	27.800000	48.9	45.1	37.3	30.4	75.9	57.200000	22.8	18.100000	23.1	18.8	22.900000
Cesium (Cs)-Dissolved	0.000010	mg/L		<0.000010	<0.000010	0.000068	0.00026	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000044	0.00003	0.000020	0.000033	0.000022	0.000020	0.00005
Chromium (Cr)-Dissolved	0.00010	mg/L		0.00014	0.00033	0.00045	0.00182	0.00011	0.00023	0.00050	0.00077	0.00029	0.00018	0.00015	0.0003	<0.00010	0.0002	0.00021	0.00011	0.0003
Cobalt (Co)-Dissolved	0.00010	mg/L		0.00039	0.00012	0.00130	0.00026	0.00129	0.00044	0.00040	0.00017	0.00036	<0.00010	0.0146	<0.00010	0.0106	0.00099	0.0105	0.0108	0.00763
Copper (Cu)-Dissolved	0.00020	mg/L		0.00163	0.00142	0.00032	0.001	0.00339	0.00268	0.00234	0.00104	0.00796	0.00124	0.0223	0.010	0.00266	0.00	0.00237	0.00297	0.0242
Iron (Fe)-Dissolved	0.010	mg/L		<0.010	<0.010	0.225	0.043	<0.010	<0.010	<0.010	0.013	<0.010	<0.010	0.750	<0.010	2.68	0.194	2.75	<0.010	0.016
Lead (Pb)-Dissolved	0.000050	mg/L		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000225	<0.000050	0.000250	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved	0.0010	mg/L		<0.0010	<0.0010	0.0032	0.00	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0024	0.00	0.0045	0.00	0.0048	<0.0010	0.00
Magnesium (Mg)-Dissolved	0.0050	mg/L		1.10	1.0200	5.53	3.060	2.72	1.720	4.67	3.8400	3.48	2.5900	4.99	3.94	4.58	3.320	4.59	5.24	6.060
Manganese (Mn)-Dissolved	0.00010	mg/L		0.0122	0.0028	0.279	0.154	0.100	0.029	0.0903	0.0397	0.0848	0.0163	1.49	0.0449	0.596	0.0278	0.596	0.476	0.137
Mercury (Hg)-Dissolved	0.0000050	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	0.000050	mg/L		0.000405	0.00019	0.00105	0.00058	0.000482	0.00025	0.000710	0.000668	0.000693	0.00022	0.000573	0.0002	0.00362	0.00234	0.00376	0.00467	0.0032
Nickel (Ni)-Dissolved	0.00050	mg/L		0.00174	0.00087	0.00102	0.00064	0.00191	0.00099	<0.00050	<0.00050	0.00070	<0.00050	0.0363	0.00576	0.00661	0.00547	0.00665	0.0183	0.0388
Phosphorus (P)-Dissolved	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.050	mg/L		2.17	2.04000	18.2	13.0000	4.34	2.63000	4.22	3.67000	3.57	2.53000	1.44	1.25000	4.11	2.31000	4.17	5.29	5.12000
Rubidium (Rb)-Dissolved	0.00020	mg/L		0.00124	0.000880	0.0211	0.0147	0.00598	0.002690	0.00324	0.001750	0.00247	0.000890	0.00332	0.002630	0.00582	0.004490	0.00568	0.00856	0.011100
Selenium (Se)-Dissolved	0.000050	mg/L		0.000138	0.00	<0.000050	0.00	0.000187	0.00	0.000334	0.00	0.000112	0.00	0.000096	0.0	0.000756	0.0	0.000666	0.000317	0.0
Silicon (Si)-Dissolved	0.050	mg/L		7.40	6.9	6.87	5.14	8.43	6.43	7.31	6.08	9.42	6.68	13.3	11.8	10.1	7.91	9.96	13.8	12.8
Silver (Ag)-Dissolved	0.000010	mg/L		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	0.050	mg/L		2.01	1.8300	1.84	1.240	5.35	3.250	3.09	2.310	8.78	2.5300	4.92	3.3800	4.10	2.5500	4.16	5.37	4.3000

Client Sample ID				MW4		MW3D		MW2		MW5D		MW5S		MW6		MW7D		MW7D DUP	MW7S	
Date Sampled				18-Oct-2017	25-May-2018	#######	25-May-2018	19-Oct-2017	26-May-2018	20-Oct-2017	28-May-2018	20-Oct-2017	28-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	22-Oct-2017	27-May-2018
Time Sampled			PWQO	10:00	10:00	14:30	11:30	13:30	12:00	13:30	0:01	14:00	0:01	13:45	15:45	15:00	11:35	15:30	17:00	10:20
ALS Sample ID				L2011542-1	L2101962-1	2011542-:	L2101962-2	L2011542-3	L2101962-3	L2011542-4	L2103029-9	L2011542-5	L2103029-8	L2011542-6	L2101962-4	L2011542-7	L2101962-6	L2011542-9	L2011542-8	L2101962-5
Parameter	Lowest Detection Limit	Units	3	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Strontium (Sr)-Dissolved	0.00020	mg/L		0.0266	0.03	0.292	0.2	0.100	0.06	0.121	0.10	0.0825	0.06	0.0849	0.06	0.0727	0.04	0.0746	0.0876	0.09
Sulfur (S)-Dissolved	0.50	mg/L		1.87	1.8	10.3	6.98	3.63	2.43	1.12	0.87	2.13	0.58	2.29	2.03	2.45	2.24	2.62	1.93	4.87
Tellurium (Te)-Dissolved	0.00020	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Dissolved	0.000010	mg/L		<0.000010	<0.000010	0.000021	0.000018	0.000017	0.000014	0.000011	<0.000010	0.000012	<0.000010	0.000027	<0.000010	0.000021	<0.000010	0.000018	0.000028	0.000039
Thorium (Th)-Dissolved	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)-Dissolved	0.00010	mg/L		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	0.00026	<0.00010	0.00045	0.00018	0.00012	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	0.00030	mg/L		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten (W)-Dissolved	0.00010	mg/L		0.00298	0.001210	0.0101	0.000760	0.00837	0.001550	0.00512	0.00126	0.00119	0.000750	0.00052	<0.00010	0.0104	0.00359	0.0103	0.0214	0.027400
Uranium (U)-Dissolved	0.000010	mg/L		0.000084	0.000086	0.000828	0.000612	0.000740	0.000272	0.00138	0.00148	0.000518	0.000537	0.000585	0.000453	0.00172	0.00178	0.00170	0.000501	0.00174
Vanadium (V)-Dissolved	0.00050	mg/L		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0006	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	0.0010	mg/L		0.0022	0.0055	0.0242	0.0014	0.0654	0.0042	0.0130	0.0097	0.0112	<0.0010	0.298	0.010000	0.158	0.0118	0.160	0.0056	0.0241
Zirconium (Zr)-Dissolved	0.000060	mg/L		<0.000060	<0.000060	<0.000060	<0.000060	<0.000060	0.000064	<0.000060	<0.000060	0.000074	<0.000060	0.000077	0.000081	<0.000060	<0.000060	<0.000060	<0.000060	<0.000060

Qualifier Legend

SAMPLE EXCEEDS PWQO

Appendix L

GROUNDWATER QUALITY – COMPARISON WITH CANADIAN WATER QUALITY GUIDELINES FOR THE PROTECTION OF FRESHWATER AQUATIC LIFE (CWQG-PAL) (2017; 2018)

Client Sample ID					MW4		MW3D		MW2		MW5D		MW5S		MW6		MW7D		MW7D DUP	MW7S	
Date Sampled					18-Oct-2017	25-May-2018	########	25-May-2018	19-Oct-2017	26-May-2018	20-Oct-2017	28-May-2018	20-Oct-2017	28-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	22-Oct-2017	27-May-2018
Time Sampled				CEQG-PAL	10:00	10:00	14:30	11:30	13:30	12:00	13:30	0:01	14:00	0:01	13:45	15:45	15:00	11:35	15:30	17:00	10:20
ALS Sample ID			ST	LT	L2011542-1	L2101962-1	2011542-:	L2101962-2	L2011542-3	L2101962-3	L2011542-4	L2103029-9	L2011542-5	L2103029-8	L2011542-6	L2101962-4	L2011542-7	L2101962-6	L2011542-9	L2011542-8	L2101962-5
Parameter	Lowest Detection Limit	Units	1a	1b	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests (Water)																					
Conductivity (EC)	3.0	µS/cm			72.9	72.0	373	268	250	153	294	278	250	197	422	321	179	133	177	179	180
Hardness (as CaCO3)	0.50	mg/L			29.4	27.8	171	112	112	76.6	142	128	107	86.5	210	159	75.9	59	76.7	68.5	82.2
pH	0.10	pH	6.5-9	6.5-9	7.17	6.73	8.07	7.85	7.48	7.75	7.63	8.05	6.69	7.54	7.05	7.72	6.97	7.10	6.78	6.67	6.69
Total Suspended Solids	1.0	mg/L			<1.0	<1.0	1.3	12.6	31.2	1.4	20.0	7.8	52.4	8.5	23.4	3.9	122	29	26.0	350	2
Total Dissolved Solids	13	mg/L			57	51	231	163	154	103	184	154	162	115	243	214	109	92	113	114	131
Anions and Nutrients (Water)																					
Acidity (as CaCO3)	2.0	mg/L			7.3	5.2	5.3	2.3	19.4	<2.0	5.4	2.2	30.4	6.6	45.3	3.5	17.2	4.4	24.3	28.0	13.3
Alkalinity, Total (as CaCO3)	2.0	mg/L			31.3	29.1	242	112	133	74	173	159	121	93	235	165	87.1	60.6	85.3	87.8	79.6
Ammonia, Total (as N)	0.020	mg/L		*refer to table	<0.020	<0.020	<0.020	0.022	0.051	0.023	<0.020	0.024	<0.020	<0.020	<0.020	<0.020	0.027	0.091	0.038	0.027	0.035
Bromide (Br)	0.10	mg/L			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chloride (Cl)	0.10	mg/L	640	120	0.20	0.30	0.18	0.22	0.11	<0.10	0.54	0.51	0.81	0.46	0.29	0.14	0.22	0.21	0.22	0.17	0.27
Fluoride (F)	0.020	mg/L			0.023	<0.020	0.069	0.034	0.028	0.032	0.030	<0.020	<0.020	<0.020	<0.020	0.023	0.023	0.024	0.023	0.024	0.026
Nitrate (as N)	0.020	mg/L	550	13	0.421	0.409	<0.020	0.05	0.130	0.072	0.680	0.675	2.24	1.70	<0.020	<0.020	<0.020	0.053	<0.020	0.077	0.095
Nitrite (as N)	0.010	mg/L		0.197	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total Kjeldahl Nitrogen	0.15	mg/L			<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.75	0.39	0.32	0.19	<0.15	<0.15	<0.15	<0.75	<0.15
Total Nitrogen	0.15	mg/L			0.42	0.41	<0.15	<0.15	<0.15	<0.15	0.68	0.67	2.24	2.08	0.32	0.19	<0.15	<0.15	<0.15	<0.75	<0.15
Orthophosphate-Dissolved (as P	0.0030	mg/L			<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0057	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Phosphorus (P)-Total	0.0030	mg/L			0.0045	<0.0030	<0.0030	0.0032	0.0115	0.0037	0.0110	0.0057	0.0079	<0.0030	0.0078	0.0063	0.0141	0.0098	0.0050	0.0777	0.0036
Sulfate (SO4)	0.30	mg/L			5.07	5.29	28.6	20.3	11.2	7.2	2.88	3.08	6.51	2.71	6.79	5.53	8.50	6.87	7.99	7.53	12.50
ganic / Inorganic Carbon (Water)																					
Dissolved Organic Carbon	1.0	mg/L			1.8	2.8	1.6	3.5	3.6	5.0	1.1	4.8	1.3	3.6	11.1	9.9	2.3	1.7	2.0	2.6	2.5
Total Organic Carbon	1.0	mg/L			1.5	2.5	1.2	2.7	3.2	4.2	1.5	1.9	1.3	1.9	11.3	9.2	1.8	1.3	2.1	4.0	2.2
Total Metals (Water)																					
Aluminum (Al)-Total	0.0030	mg/L		0.005 to 0.1	0.0182	0.0100	0.0224	**0.1410**	**1.56**	0.05	**1.66**	0.08	**0.734**	0.056	**0.325**	0.048	**0.930**	**0.538**	**0.271**	**7.04**	**0.101**
Antimony (Sb)-Total	0.00010	mg/L			<0.00010	<0.00010	0.00015	0.00018	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00023	0.00011	0.00040	<0.00010	0.00037	<0.00010	<0.00010
Arsenic (As)-Total	0.00010	mg/L		0.005	0.00011	<0.00010	0.00022	0.00017	0.00099	0.00035	0.00030	0.00014	0.00023	0.00011	0.00040	0.00017	0.00034	0.00017	0.00023	0.00099	0.00014
Barium (Ba)-Total	0.000050	mg/L			0.0148	0.0134	0.221	0.135	0.0885	0.0437	0.0644	0.0387	0.0475	0.0233	0.0504	0.0136	0.0524	0.0240	0.0462	0.115	0.048
Beryllium (Be)-Total	0.00010	mg/L			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010
Bismuth (Bi)-Total	0.000050	mg/L			<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total	0.010	mg/L	29	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	0.015	<0.010	0.014	0.011	<0.010
Cadmium (Cd)-Total	0.0000050	mg/L	0.00172	0.000134693	<0.0000050	0.0000059	########	0.0000275	**0.000201**	0.000017	0.0000345	0.000130	0.0000336	0.000106	0.000254	0.000027	0.0000948	0.0000232	0.0000717	**0.000116**	0.000037
Calcium (Ca)-Total	0.050	mg/L			9.87	9.82	58.8	40.4	39.1	26.7	49.8	47.4	36.5	32.3	75.6	57.3	23.1	17.7	22.3	21.9	22.1
Cesium (Cs)-Total	0.000010	mg/L			0.000012	<0.000010	########	0.000280	0.000059	<0.000010	0.000079	<0.000010	0.000029	<0.000010	0.000061	0.000035	0.000127	0.000093	0.000052	0.000501	0.000065
Chromium (Cr)-Total	0.00010	mg/L		0.0089	0.00021	0.00020	0.00016	0.00010	0.00093	0.00056	0.00414	0.00076	0.00127	0.00035	0.00072	0.00042	0.00255	0.00150	0.00072	**0.0158**	0.0004
Cobalt (Co)-Total	0.00010	mg/L			0.00041	0.00013	0.00134	0.00027	0.00244	0.00045	0.00112	0.00023	0.00065	<0.00010	0.0163	0.0005	0.0128	0.0014	0.0111	0.0163	0.0076
Copper (Cu)-Total	0.00050	mg/L		0.000791999	**0.00191**	**0.00215**	<0.00050	0.00241	**0.00842**	**0.00272**	**0.00640**	**0.00509**	0.00208	0.00164	**0.0225**	**0.0166**	**0.0118**	**0.0145**	**0.00645**	**0.0333**	**0.0254**
Iron (Fe)-Total	0.010	mg/L		0.3	0.032	0.016	**0.456**	0.130	**2.66**	0.09	**1.36**	0.11	**0.598**	0.066	**2.39**	0.16	**5.12**	**0.73**	**3.54**	**5.14**	0.08
Lead (Pb)-Total	0.000050	mg/L		0.002478999	<0.000050	<0.000050	<0.000050	0.000119	0.000435	<0.000050	0.000408	<0.000050	0.000267	<0.000050	0.000212	<0.000050	0.000575	0.000254	0.000298	0.00178	<0.000050
Lithium (Li)-Total	0.0010	mg/L			<0.0010	<0.0010	0.0029	0.0034	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0022	0.0020	0.0044	0.0028	0.0039	0.0034	0.0038
Magnesium (Mg)-Total	0.0050	mg/L			1.09	1.09	5.20	3.16	3.04	1.68	4.95	4.18	3.35	2.84	5.11	3.84	4.73	3.51	4.69	8.10	5.71
Manganese (Mn)-Total	0.00010	mg/L			0.0131	0.0032	0.288	0.161	0.140	0.028	0.115	0.043	0.0982	0.0176	1.62	0.28	0.696	0.031	0.624	0.579	0.139
Mercury (Hg)-Total	0.0000050	mg/L		0.000026	<0.0000050	<0.0000050	<0.0000050	0.0000052	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000100	0.0000094	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	0.000050	mg/L		0.073	0.000462	0.000182	0.00114	0.00022	0.000528	0.000247	0.000746	0.000717	0.000767	0.000226	0.000662	0.000208	0.00393	0.00235	0.00370	0.00571	0.00309
Nickel (Ni)-Total	0.00050	mg/L		0.082348318	0.00189	0.00113	0.00085	0.00084	0.00314	0.00130	0.00203	<0.00050	0.00116	<0.00050	0.0407	0.0131	0.00881	0.00663	0.00742	0.0321	0.0389
Phosphorus (P)-Total	0.050	mg/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.105	<0.050
Potassium (K)-Total	0.050	mg/L			2.23	2.04	18.2	12.6	4.27	2.38	4.34	3.75	3.58	2.57	1.60	1.21	4.21	2.28	4.20	6.86	5.03
Rubidium (Rb)-Total	0.00020	mg/L			0.00143	0.00093	0.0214	0.0156	0.00632	0.00262	0.00462	0.00210	0.00301	0.00099	0.00405	0.00256	0.00690	0.00495	0.00645	0.0139	0.0111
Selenium (Se)-Total	0.000050	mg/L		0.001	0.000066	0.000114	<0.000050	0.000593	0.000191	0.000152	0.000294	0.000186	0.000099	0.000079	0.000093	0.000103	0.000635	0.000764	0.000588	0.000325	0.000444
Silicon (Si)-Total	0.10	mg/L			7.33	7.01	6.88	5.46	11.0	6.6	9.98	6.73	10.5	7.6	13.4	12.2	11.5	9.1	10.1	23.5	13.2
Silver (Ag)-Total	0.00010	mg/L		0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00033	0.00015	0.00019	<0.00010	<0.00010	<0.00010	<0.00010
Sodium (Na)-Total	0.050	mg/L			2.03	1.84	1.91	1.38	5.27	3.03	3.16	2.48	8.67	2.76	5.41	3.41	4.31	2.60	4.21	6.19	4.14
Strontium (Sr)-Total	0.00020	mg/L			0.0274	0.0269	0.299	0.161	0.105	0.060	0.132	0.097	0.0885	0.0604	0.0921	0.0627	0.0814	0.0412	0.0725	0.100	0.086
Sulfur (S)-Total	0.50	mg/L			1.74	2.02	10.8	7.3	3.33	2.74	1.24	1.16	2.27	0.96	2.54	2.36	2.83	2.42	2.45	2.12	4.49
Tellurium (Te)-Total	0.00020	mg/L			<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Total	0.000010	mg/L		0.0008	<0.000010	<0.000010	########	0.000020	0.000020	<0.000010	0.000016	<0.000010	0.000011	<0.000010	0.000027	<0.000010	0.000024	0.000016	0.000019	0.000069	0.000043
Thorium (Th)-Total	0.00010	mg/L			<0.00010	<0.00010	<0.00010	0.00017	0.00051	<0.00010	0.00076	<0.00010	0.00054	<0.00010	0.00038	<0.00010	0.00040	0.00020	0.00013	0.00197	<0.00010
Tin (Sn)-Total	0.00010	mg/L			<0.00010	<0.00010	<0.00010	<0.00010	0.00017	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.00059	0.00051	0.00035	<0.00010	0.00019	0.00017	<0.00010
Titanium (Ti)-Total	0.00030	mg/L			0.00085	<0.00030	0.00094	0.00266	0.0413	0.0016	0.0599	0.0038	0.0200	0.0022	0.00983	0.00175	0.0422	0.0214	0.0112	0.282	0.004
Tungsten (W)-Total	0.00010	mg/L			0.00338	0.00133	0.0110	0.0008	0.00920	0.00178	0.00588	0.00112	0.00156	0.00079	0.00308	0.00030	0.0210	0.0067	0.0142	0.0534	0.0281
Uranium (U)-Total	0.000010	mg/L	33	0.015	0.000099	0.000096	######	0.000663	0.000809	0.000279	0.00151	0.00142	0.000649	0.000550	0.000693	0.000490	0.00167	0.00198	0.00177	0.00113	0.00183
Vanadium (V)-Total	0.00050	mg/L		0.03	<0.00050	<0.00050	<0.00050	<0.00050	0.00816	0.00063	0.00337	0.00097	0.00127	0.00053	0.00103	<0.00050	0.00245	0.00144	0.00104	0.0119	<0.00050
Zinc (Zn)-Total	0.0030	mg/L			<0.0030	<0.0030	0.0412	0.0031	0.0645	0.0046	0.0272	0.0172	0.0108	<0.0030	0.390	0.016	0.246	0.038	0.189	0.0158	0.0257
Zirconium (Zr)-Total	0.000060	mg/L			<0.000060	<0.000060	<0.000060	0.000163	0.000436	0.000066	0.000469	<0.000060	0.000409	<0.000060	0.000225	0.000108	0.000186	0.000124	0.000079	0.000725	<0.000060
Dissolved Metals (Water)																					
Aluminum (Al)-Dissolved	0.0020	mg/L			0.0041	0.0046	0.0038	0.00350	0.0096	0.0104	0.0093	0.0051	0.0070	0.0033	0.0064	0.00500	0.0085	0.0042	0.0043	0.0086	0.0134
Antimony (Sb)-Dissolved	0.00010	mg/L			<0.00010	<0.00010	0.00013	0.00016	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Dissolved	0.00010	mg/L			<0.00010	<0.00010	0.00017	0.000	0.00047	0.0003	0.00012	<0.00010	0.00013	<0.00010	0.00020	0.0001	0.00016	<0.00010	0.00015	0.00020	0.0001
Barium (Ba)-Dissolved	0.000050	mg/L			0.0142	0.0129	0.215	0.132	0.0807	0.0463	0.0501	0.0372	0.0434	0.0219	0.0446	0.0129	0.0432	0.0217	0.0438	0.0713	0.0479
Beryllium (Be)-Dissolved	0.00010	mg/L			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Dissolved	0.000050	mg/L			<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved	0.010	mg/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.014	<0.010	0.014	0.010	<0.010
Cadmium (Cd)-Dissolved	0.0000050	mg/L			<0.0000050	0.00	########	0.0	0.000200	0.0	0.0000162	<0.0000050	0.000653	0.0	0.000157	0.0	0.0000573	0.0	0.0000501	0.0000729	0.0
Calcium (Ca)-Dissolved	0.050	mg/L			9.95	9.45	59.3	39.700000	40.4	27.800000	48.9	45.1	37.3	30.4	75.9	57.200000	22.8	18.100000	23.1	18.8	22.900000
Cesium (Cs)-Dissolved	0.000010	mg/L			<0.000010	<0.000010	########	0.00026	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000044	0.00003	0.000020	0.000033	0.000022	0.000020	0.00005
Chromium (Cr)-Dissolved	0.00010	mg/L			0.00014	0.00033	0.00045	0.00182	0.00011	0.00023	0.00050	0.00077	0.00029	0.00018	0.00015	0.0003	<0.00010	0.0002	0.00021	0.00011	0.0003
Cobalt (Co)-Dissolved	0.00010	mg/L			0.00039	0.00012	0.00130	0.00026	0.00129	0.00044	0.00040	0.00017	0.00036	<0.00010	0.0146	<0.00010	0.0106	0.00099	0.0105	0.0108	0.00763
Copper (Cu)-Dissolved	0.00020	mg/L			0.00163	0.00142	0.00032	0.001	0.00339	0.00268	0.00234	0.00104	0.00796	0.00124	0.0223	0.010	0.00266	0.00	0.00237	0.00297	0.0242
Iron (Fe)-Dissolved	0.010	mg/L			<0.010	<0.010	0.225	0.043	<0.010	<0.010	<0.010	0.013	<0.010	<0.010	0.750	<0.010	2.68	0.194	2.75	<0.010	0.016
Lead (Pb)-Dissolved	0.000050	mg/L			<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000225	<0.000050	0.000250	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)-Dissolved	0.0010	mg/L			<0.0010	<0.0010	0.0032	0.00	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0024	0.00	0.0045	0.00	0.0048	<0.0010	0.00
Magnesium (Mg)-Dissolved	0.0050	mg/L			1.10	1.0200	5.53	3.060	2.72	1.720	4.87	3.8400	3.48	2.5900	4.99	3.94	4.58	3.320	4.59	5.24	6.060
Manganese (Mn)-Dissolved	0.00010	mg/L			0.0122	0.0028	0.279	0.154	0.100	0.029	0.0903	0.0397	0.0848	0.0163	1.49	0.0449	0.596	0.0278	0.596	0.476	0.137
Mercury (Hg)-Dissolved	0.0000050	mg/L			<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	0.000050	mg/L			0.000405	0.00019	0.00105	0.00058	0.000482	0.00025	0.000710	0.000668	0.000693	0.00022	0.000573	0.0002	0.00362	0.00234	0.00376	0.00467	0.0032
Nickel (Ni)-Dissolved	0.00050	mg/L			0.00174	0.00087	0.00102	0.00064	0.00191	0.00099	<0.00050	<0.00050	0.00070	<0.00050	0.0363	0.00576	0.00661	0.00547	0.00665	0.0183	0.0388
Phosphorus (P)-Dissolved	0.050	mg/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.050	mg/L			2.17	2.04000	18.2	13.0000	4.34	2.63000	4.22	3.67000	3.57	2.53000	1.44	1.25000	4.11	2.31000	4.17	5.29	5.12000
Rubidium (Rb)-Dissolved	0.00020	mg/L			0.00124	0.000880	0.0211	0.0147	0.00598	0.002690	0.00324	0.001750	0.00247	0.0008890	0.00332	0.002630	0.00582	0.004490	0.00568	0.00856	0.011100
Selenium (Se)-Dissolved	0.000050	mg/L			0.000138	0.00	<0.000050	0.00	0.000187	0.00	0.000334	0.00	0.000112	0.00	0.000096	0.0	0.000756	0.0	0.000666	0.000317	0.0
Silicon (Si)-Dissolved	0.050	mg/L			7.40	6.9	6.87	5.14	8.43	6.43	7.31	6.08	9.42	6.68	13.3	11.8	10.1	7.91	9.96	13.8	12.8
Silver (Ag)-Dissolved	0.000010	mg/L			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	0.050	mg/L			2.01	1.8300	1.84	1.240	5.35	3.250	3.09	2.310	8.78	2.5300	4.92	3.3800	4.10	2.5500	4.16	5.37	4.3000
Strontium (Sr)-Dissolved	0.00020	mg/L			0.0266	0.03	0.292	0.2	0.100	0.06	0.121	0.10	0.0825	0.06	0.0849	0.06	0.0727	0.04	0.0746	0.0876	0.09
Sulfur (S)-Dissolved	0.50	mg/L			1.87	1.8	10.3	6.98	3.63	2.43	1.12	0.87	2.13	0.58	2.29	2.03	2.45	2.24	2.62	1.93	4.87
Tellurium (Te)-Dissolved	0.00020	mg/L			<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium (Tl)-Dissolved	0.000010	mg/L			<0.000010	<0.000010	########	0.000018	0.000017	0.000014	0.000011	<0.000010	0.000012	<0.000010	0.000027	<0.000010	0.000021	<0.000010	0.000018	0.000028	0.000039
Thorium (Th)-Dissolved	0.00010	mg/L			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)-Dissolved	0.00010	mg/L			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	0.00026	<0.00010	0.00045	0.00018	0.00012	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	0.00030	mg/L			<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

Client Sample ID					MW4		MW3D		MW2		MW5D		MW5S		MW6		MW7D		MW7D DUP	MW7S	
Date Sampled					18-Oct-2017	25-May-2018	#######	25-May-2018	19-Oct-2017	26-May-2018	20-Oct-2017	28-May-2018	20-Oct-2017	28-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	27-May-2018	21-Oct-2017	22-Oct-2017	27-May-2018
Time Sampled			CEQG-PAL		10:00	10:00	14:30	11:30	13:30	12:00	13:30	0:01	14:00	0:01	13:45	15:45	15:00	11:35	15:30	17:00	10:20
ALS Sample ID			ST	LT	L2011542-1	L2101962-1	2011542-;	L2101962-2	L2011542-3	L2101962-3	L2011542-4	L2103029-9	L2011542-5	L2103029-8	L2011542-6	L2101962-4	L2011542-7	L2101962-6	L2011542-9	L2011542-8	L2101962-5
Parameter	Lowest Detection Limit	Units	1a	1b	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Tungsten (W)-Dissolved	0.00010	mg/L			0.00298	0.001210	0.0101	0.000760	0.00837	0.001550	0.00512	0.00126	0.00119	0.000750	0.00052	<0.00010	0.0104	0.00359	0.0103	0.0214	0.027400
Uranium (U)-Dissolved	0.000010	mg/L			0.000084	0.000086	#######	0.000612	0.000740	0.000272	0.00138	0.00148	0.000518	0.000537	0.000585	0.000453	0.00172	0.00178	0.00170	0.000501	0.00174
Vanadium (V)-Dissolved	0.00050	mg/L			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0006	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	0.0010	mg/L			0.0022	0.0055	0.0242	0.0014	0.0654	0.0042	0.0130	0.0097	0.0112	<0.0010	0.298	0.010000	0.158	0.0118	0.160	0.0056	0.0241
Zirconium (Zr)-Dissolved	0.000060	mg/L			<0.000060	<0.000060	<0.000060	<0.000060	<0.000060	0.000064	<0.000060	<0.000060	0.000074	<0.000060	0.000077	0.000081	<0.000060	<0.000060	<0.000060	<0.000060	<0.000060

Qualifier Legend

SAMPLE EXCEEDS CEQG-PFAL (SHORT T

SAMPLE EXCEEDS CEQG-PFAL (LONG TE

Appendix M

GROUNDWATER QUALITY – QA/QC EXCEEDANCE SUMMARY

QA/QC Results
Ambershaw Metallics
2017-2018
Palmer Environmental Consulting Group Inc.

	Parameters	Units	MW2				MW3D				MW4			
Collection	Date/QAQC	dd/mm/yy	19-Oct-2017	Dissolved-Total RPD	26-May-2018	Dissolved-Total RPD	18-Oct-2017	Dissolved-Total RPD	25-May-2018	Dissolved-Total RPD	18-Oct-2017	Dissolved-Total RPD	25-May-2018	Dissolved-Total RPD
	Time	hh:mm	13:30		12:40		14:30		11:30		10:00		10:00	
In-Situ	Temp	^{0}C	10.12		20.9		9.72		13.03		7.28		7.9	
	Turbidity	NTU	10		2.6		4.2		6.7		0.5		0.8	
	Conductivity	uS/cm	263		162		382		269		71		75	
	Dissolved Oxygen	%	64		96		16.6		61.2		69.5		79.2	
		mg/L	7.19		8.57		1.89		6.3		8.37		9.37	
	pH	-	6.62		7.65		6.98		7.72		6.25		6.44	
	Oxidation-Reduction Potential	-	183.8		213.8		38.8		229.6		243.3		231.5	
Physical Tests	Conductivity (EC)	uS/cm	250		153		373		268		72.9		72.0	
	Hardness (as CaCO3)	mg/L	112		76.6		171		112		29.4		27.8	
	pH	pH	7.48		7.75		8.07		7.85		7.17		6.73	
	Total Suspended Solids	mg/L	31.2		1.4		1.3		12.6		<1.0		<1.0	
	Total Dissolved Solids	mg/L	154		103		231		163		57		51	
Anions and Nutrients (Water)	Acidity (as CaCO3)	mg/L	19.4		<2.0		5.3		2.3		7.3		5.2	
	Alkalinity, Total (as CaCO3)	mg/L	133		74		242		112		31.3		29.1	
	Ammonia, Total (as N)	mg/L	0.051		0.023		<0.020		0.022		<0.020		<0.020	
	Bromide (Br)	mg/L	<0.10		<0.10		<0.10		<0.10		<0.10		<0.10	
	Chloride (Cl)	mg/L	0.11		<0.10		0.18		0.22		0.20		0.30	
	Fluoride (F)	mg/L	0.028		0.032		0.069		0.034		0.023		<0.020	
	Nitrate (as N)	mg/L	0.130		0.072		<0.020		0.05		0.421		0.409	
	Nitrite (as N)	mg/L	<0.010		<0.010		<0.010		<0.010		<0.010		<0.010	
	Total Kjeldahl Nitrogen	mg/L	<0.15		<0.15		<0.15		<0.15		<0.15		<0.15	
	Total Nitrogen	mg/L	<0.15		<0.15		<0.15		<0.15		0.42		0.41	
	Orthophosphate-Dissolved (as P	mg/L	<0.0030		<0.0030		<0.0030		<0.0030		<0.0030		<0.0030	
	Phosphorus (P)-Total	mg/L	0.0115		0.0037		<0.0030		0.0032		0.0045		<0.0030	
	Sulfate (SO4)	mg/L	11.2		7.2		28.6		20.3		5.07		5.29	
Carbon	Dissolved Organic Carbon	mg/L	3.6		5.0		1.6		3.5		1.8		2.8	
	Total Organic Carbon	mg/L	3.2		4.2		1.2		2.7		1.5		2.5	
Total Metals (Water)	Aluminum (Al)-Total	mg/L	1.56	198%	0.05	131%	0.0224	142%	0.1410	190%	0.0182	126%	0.0100	74%
	Antimony (Sb)-Total	mg/L	<0.00010	#VALUE!	<0.00010	#VALUE!	0.00015	14%	0.00018	12%	<0.00010	#VALUE!	<0.00010	#VALUE!
	Arsenic (As)-Total	mg/L	0.00099	71%	0.00035	6%	0.00022	26%	0.00017	43%	0.00011	#VALUE!	<0.00010	#VALUE!
	Barium (Ba)-Total	mg/L	0.0885	9%	0.0437	-6%	0.221	3%	0.135	2%	0.0148	4%	0.0134	4%
	Beryllium (Be)-Total	mg/L	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!
	Bismuth (Bi)-Total	mg/L	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!
	Boron (B)-Total	mg/L	<0.010	#VALUE!	<0.010	#VALUE!	<0.010	#VALUE!	<0.010	#VALUE!	<0.010	#VALUE!	<0.010	#VALUE!
	Cadmium (Cd)-Total	mg/L	0.000201	0%	0.000017	-8%	0.0000124	-5%	0.0000275	12%	<0.0000050	#VALUE!	0.0000059	11%
	Calcium (Ca)-Total	mg/L	39.1	-3%	26.7	-4%	58.8	-1%	40.4	2%	9.87	-1%	9.82	4%
	Cesium (Cs)-Total	mg/L	0.000059	142%	<0.000010	#VALUE!	0.000075	10%	0.000280	9%	0.000012	#VALUE!	<0.000010	#VALUE!
	Chromium (Cr)-Total	mg/L	0.00093	158%	0.00056	84%	0.00016	-95%	0.00010	-179%	0.00021	40%	0.00020	-49%
	Cobalt (Co)-Total	mg/L	0.00244	62%	0.00045	2%	0.00134	3%	0.00027	4%	0.00041	5%	0.00013	8%
	Copper (Cu)-Total	mg/L	0.00842	85%	0.00272	1%	<0.00050	#VALUE!	0.00241	73%	0.00191	16%	0.00215	41%
	Iron (Fe)-Total	mg/L	2.66	#VALUE!	0.09	#VALUE!	0.456	68%	0.130	101%	0.032	#VALUE!	0.016	#VALUE!
	Lead (Pb)-Total	mg/L	0.000435	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	0.000119	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!
	Lithium (Li)-Total	mg/L	0.0014	#VALUE!	<0.0010	#VALUE!	0.0029	-10%	0.0034	13%	<0.0010	#VALUE!	<0.0010	#VALUE!
	Magnesium (Mg)-Total	mg/L	3.04	11%	1.68	-2%	5.20	-6%	3.16	3%	1.09	-1%	1.09	7%
	Manganese (Mn)-Total	mg/L	0.140	33%	0.028	-2%	0.288	3%	0.161	4%	0.0131	7%	0.0032	14%
	Mercury (Hg)-Total	mg/L	<0.0000050	#VALUE!	<0.0000050	#VALUE!	<0.0000050	#VALUE!	0.0000052	#VALUE!	<0.0000050	#VALUE!	<0.0000050	#VALUE!
	Molybdenum (Mo)-Total	mg/L	0.000528	9%	0.000247	0%	0.00114	8%	0.00022	-90%	0.000462	13%	0.000182	-2%
	Nickel (Ni)-Total	mg/L	0.00314	49%	0.00130	27%	0.00085	-18%	0.00084	27%	0.00189	8%	0.00113	26%
	Phosphorus (P)-Total	mg/L	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!
	Potassium (K)-Total	mg/L	4.27	-2%	2.38	-10%	18.2	0%	12.6	-3%	2.23	3%	2.04	0%
	Rubidium (Rb)-Total	mg/L	0.00632	6%	0.00262	-3%	0.0214	1%	0.0156	6%	0.00143	14%	0.00093	6%
	Selenium (Se)-Total	mg/L	0.000191	2%	0.000152	-9%	<0.000050	#VALUE!	0.000593	27%	0.000066	-71%	0.000114	9%
	Silicon (Si)-Total	mg/L	11.0	26%	6.6	3%	6.88	0%	5.46	6%	7.33	-1%	7.01	2%
	Silver (Ag)-Total	mg/L	0.000015	#VALUE!	<0.000010	#VALUE!	<0.000010	#VALUE!	<0.000010	#VALUE!	<0.000010	#VALUE!	<0.000010	#VALUE!
	Sodium (Na)-Total	mg/L	5.27	-2%	3.03	-7%	1.91	4%	1.38	11%	2.03	1%	1.84	1%
	Strontium (Sr)-Total	mg/L	0.105	5%	0.060	-2%	0.299	2%	0.161	3%	0.0274	3%	0.0269	1%
	Sulfur (S)-Total	mg/L	3.33	-9%	2.74	12%	10.8	5%	7.3	4%	1.74	-7%	2.02	12%
	Tellurium (Te)-Total	mg/L	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!
	Thallium (Tl)-Total	mg/L	0.000020	16%	<0.000010	#VALUE!	0.000019	-10%	0.000020	11%	<0.000010	#VALUE!	<0.000010	#VALUE!
	Thorium (Th)-Total	mg/L	0.00051	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	0.00017	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!
	Tin (Sn)-Total	mg/L	0.00017	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!
	Titanium (Ti)-Total	mg/L	0.0413	#VALUE!	0.0016	#VALUE!	0.00094	#VALUE!	0.00266	#VALUE!	0.00085	#VALUE!	<0.00030	#VALUE!
	Tungsten (W)-Total	mg/L	0.00920	9%	0.00178	14%	0.0110	9%	0.0008	4%	0.00338	13%	0.00133	9%
	Uranium (U)-Total	mg/L	0.000809	9%	0.000279	3%	0.000844	2%	0.000663	8%	0.000099	16%	0.000096	11%
	Vanadium (V)-Total	mg/L	0.00816	#VALUE!	0.00063	#VALUE!	<0.00050	#VALUE!	<0.00050	#VALUE!	<0.00050	#VALUE!	<0.00050	#VALUE!
	Zinc (Zn)-Total	mg/L	0.0645	-1%	0.0046	9%	0.0412	52%	0.0031	76%	<0.0030	#VALUE!	<0.0030	#VALUE!
	Zirconium (Zr)-Total	mg/L	0.000436	#VALUE!	0.000066	3%	<0.000060	#VALUE!	0.000163	#VALUE!	<0.000060	#VALUE!	<0.000060	#VALUE!
Dissolved Metals (Water)	Aluminum (Al)-Dissolved	mg/L	0.0096		0.0104		0.0038		0.00350		0.0041		0.0046	
	Antimony (Sb)-Dissolved	mg/L	<0.00010		0.00012		0.00013		0.00016		<0.00010		<0.00010	
	Arsenic (As)-Dissolved	mg/L	0.00047		0.0003		0.00017		0.000		<0.00010		<0.00010	
	Barium (Ba)-Dissolved	mg/L	0.0807		0.0463		0.215		0.132		0.0142		0.0129	
	Beryllium (Be)-Dissolved	mg/L	<0.00010		<0.00010		<0.00010		<0.00010		<0.00010		<0.00010	
	Bismuth (Bi)-Dissolved	mg/L	<0.000050		<0.000050		<0.000050		<0.000050		<0.000050		<0.000050	
	Boron (B)-Dissolved	mg/L	<0.010		<0.010		<0.010		<0.010		<0.010		<0.010	
	Cadmium (Cd)-Dissolved	mg/L	0.000200		0.0		0.0000131		0.0		<0.0000050		0.00	
	Calcium (Ca)-Dissolved	mg/L	40.4		27.800000		59.3		39.700000		9.95		9.45	
	Cesium (Cs)-Dissolved	mg/L	0.000010		<0.000010		0.000068		0.00026		<0.000010		<0.000010	
	Chromium (Cr)-Dissolved	mg/L	0.00011		0.00023		0.00045		0.00182		0.00014		0.00033	
	Cobalt (Co)-Dissolved	mg/L	0.00129		0.00044		0.00130		0.00026		0.00039		0.00012	
	Copper (Cu)-Dissolved	mg/L	0.00339		0.00268		0.00032		0.001		0.00163		0.00142	
	Iron (Fe)-Dissolved	mg/L	<0.010		<0.010		0.225		0.043		<0.010		<0.010	
	Lead (Pb)-Dissolved	mg/L	<0.000050		<0.000050		<0.000050		<0.000050		<0.000050		<0.000050	
	Lithium (Li)-Dissolved	mg/L	<0.0010		<0.0010		0.0032		0.00		<0.0010		<0.0010	
	Magnesium (Mg)-Dissolved	mg/L	2.72		1.720		5.53		3.060		1.10		1.0200	
	Manganese (Mn)-Dissolved	mg/L	0.100		0.029		0.279		0.154		0.0122		0.0028	
	Mercury (Hg)-Dissolved	mg/L	<0.0000050		<0.0000050		<0.0000050		<0.0000050		<0.0000050		<0.0000050	
	Molybdenum (Mo)-Dissolved	mg/L	0.000482		0.00025		0.00105		0.00058		0.000405		0.00019	
	Nickel (Ni)-Dissolved	mg/L	0.00191		0.00099		0.00102		0.00064		0.00174		0.00087	
	Phosphorus (P)-Dissolved	mg/L	<0.050		<0.050		<0.050		<0.050		<0.050		<0.050	
	Potassium (K)-Dissolved	mg/L	4.34		2.63000		18.2		13.0000		2.17		2.04000	
	Rubidium (Rb)-Dissolved	mg/L	0.00598		0.002690		0.0211		0.0147		0.00124		0.000880	
	Selenium (Se)-Dissolved	mg/L	0.000187		0.00		<0.000050		0.00		0.000138		0.00	
	Silicon (Si)-Dissolved	mg/L	8.43		6.43		6.87		5.14		7.40		6.9	
	Silver (Ag)-Dissolved	mg/L	<0.000010		<0.000010		<0.000010		<0.000010		<0.000010		<0.000010	
	Sodium (Na)-Dissolved	mg/L	5.35		3.250		1.84		1.240		2.01		1.8300	
	Strontium (Sr)-Dissolved	mg/L	0.100		0.06		0.292		0.2		0.0266		0.03	
	Sulfur (S)-Dissolved	mg/L	3.63		2.43		10.3		6.98		1.87		1.8	
	Tellurium (Te)-Dissolved	mg/L	<0.00020		<0.00020		<0.00020		<0.00020		<0.00020		<0.00020	
	Thallium (Tl)-Dissolved	mg/L	0.000017		0.000014		0.000021		0.000018		<0.000010		<0.000010	
	Thorium (Th)-Dissolved	mg/L	<0.00010		<0.00010		<0.00010		<0.00010		<0.00010		<0.00010	
	Tin (Sn)-Dissolved	mg/L	<0.00010		0.00016		<0.00010		<0.00010		<0.00010		<0.00010	
	Titanium (Ti)-Dissolved	mg/L	<0.00030		<0.00030		<0.00030		<0.00030		<0.00030		<0.00030	
	Tungsten (W)-Dissolved	mg/L	0.00837		0.001550		0.0101		0.000760		0.00298		0.001210	
	Uranium (U)-Dissolved	mg/L	0.000740		0.000272		0.000828		0.000612		0.000084		0.000086	
	Vanadium (V)-Dissolved	mg/L	<0.00050		<0.00050		<0.00050		<0.00050		<0.00050		<0.00050	
	Zinc (Zn)-Dissolved	mg/L	0.0654		0.0042		0.0242		0.0014		0.0022		0.0055	
	Zirconium (Zr)-Dissolved	mg/L	<0.000060		0.000064		<0.000060		<0.000060		<0.000060		<0.000060	

Parameters	MW5S				MW5D				MW6			
Date/QAQC	20-Oct-2017	Dissolved-Total RPD	28-May-2018	Dissolved-Total RPD	20-Oct-2017	Dissolved-Total RPD	28-May-2018	Dissolved-Total RPD	21-Oct-2017	Dissolved-Total RPD	27-May-2018	Dissolved-Total RPD
Time	14:00		9:30		13:30		12:15		13:45		15:45	
Temp	13.27		16.2		22.11		19.8		9.81		15	
Turbidity	20.3		5.4		45.4		4.4		14.2		2.4	
Conductivity	257		201		286		287		427		329	
Dissolved Oxygen (%)	70.5		93.4		77.8		91.4		30.4		85.4	
Dissolved Oxygen (mg/L)	7.37		9.14		8.27		8.34		3.4		8.61	
pH	6.4		7.33		7.54		7.86		6.54		7.29	
Oxidation-Reduction Potential	216.5		248.0		144		94.0		40.4		274.1	
Conductivity (EC)	250		197		294		278		422		321	
Hardness (as CaCO3)	107		86.5		142		128		210		159	
pH	6.69		7.54		7.63		8.05		7.05		7.72	
Total Suspended Solids	52.4		8.5		20.0		7.8		23.4		3.9	
Total Dissolved Solids	162		115		184		154		243		214	
Acidity (as CaCO3)	30.4		6.6		5.4		2.2		45.3		3.5	
Alkalinity, Total (as CaCO3)	121		93		173		159		235		165	
Ammonia, Total (as N)	<0.020		<0.020		<0.020		0.024		<0.020		<0.020	
Bromide (Br)	<0.10		<0.10		<0.10		<0.10		<0.10		<0.10	
Chloride (Cl)	0.81		0.46		0.54		0.51		0.29		0.14	
Fluoride (F)	<0.020		<0.020		0.030		<0.020		<0.020		0.023	
Nitrate (as N)	2.24		1.70		0.680		0.675		<0.020		<0.020	
Nitrite (as N)	<0.010		<0.010		<0.010		<0.010		<0.010		<0.010	
Total Kjeldahl Nitrogen	<0.75		0.39		<0.15		<0.15		0.32		0.19	
Total Nitrogen	2.24		2.08		0.68		0.67		0.32		0.19	
Orthophosphate-Dissolved (as P	<0.0030		0.0057		<0.0030		<0.0030		<0.0030		<0.0030	
Phosphorus (P)-Total	0.0079		<0.0030		0.0110		0.0057		0.0078		0.0063	
Sulfate (SO4)	6.51		2.71		2.88		3.08		6.79		5.53	
Dissolved Organic Carbon	1.3		3.6		1.1		4.8		11.1		9.9	
Total Organic Carbon	1.3		1.9		1.5		1.9		11.3		9.2	
Aluminum (Al)-Total	0.734	196%	0.056	178%	1.66	198%	0.08	175%	0.325	192%	0.048	162%
Antimony (Sb)-Total	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	0.00023	79%	0.00011	-9%
Arsenic (As)-Total	0.00023	56%	0.00011	#VALUE!	0.00030	86%	0.00014	#VALUE!	0.00040	67%	0.00017	27%
Barium (Ba)-Total	0.0475	9%	0.0233	6%	0.0644	25%	0.0387	4%	0.0504	12%	0.0136	5%
Beryllium (Be)-Total	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!
Bismuth (Bi)-Total	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!
Boron (B)-Total	<0.010	#VALUE!	<0.010	#VALUE!	<0.010	#VALUE!	<0.010	#VALUE!	0.011	#VALUE!	<0.010	#VALUE!
Cadmium (Cd)-Total	0.0000336	-180%	0.0000106	68%	0.0000345	72%	0.0000130	#VALUE!	0.000254	47%	0.000027	74%
Calcium (Ca)-Total	36.5	-2%	32.3	6%	49.8	2%	47.4	5%	75.6	0%	57.3	0%
Cesium (Cs)-Total	0.000029	#VALUE!	<0.000010	#VALUE!	0.000079	#VALUE!	<0.000010	#VALUE!	0.000061	32%	0.000035	15%
Chromium (Cr)-Total	0.00127	126%	0.00035	64%	0.00414	157%	0.00076	-1%	0.00072	131%	0.00042	47%
Cobalt (Co)-Total	0.00065	57%	<0.00010	#VALUE!	0.00112	95%	0.00023	30%	0.0163	11%	0.0005	#VALUE!
Copper (Cu)-Total	0.00208	-117%	0.00164	28%	0.00640	93%	0.00509	132%	0.0225	1%	0.0166	50%
Iron (Fe)-Total	0.598	#VALUE!	0.066	#VALUE!	1.36	#VALUE!	0.11	159%	2.39	104%	0.16	#VALUE!
Lead (Pb)-Total	0.000267	17%	<0.000050	#VALUE!	0.000408	#VALUE!	<0.000050	#VALUE!	0.000212	-16%	<0.000050	#VALUE!
Lithium (Li)-Total	<0.0010	#VALUE!	<0.0010	#VALUE!	<0.0010	#VALUE!	<0.0010	#VALUE!	0.0022	-9%	0.0020	11%
Magnesium (Mg)-Total	3.35	-4%	2.84	9%	4.95	2%	4.18	8%	5.11	2%	3.84	-3%
Manganese (Mn)-Total	0.0982	15%	0.0176	8%	0.115	24%	0.043	7%	1.62	8%	0.28	145%
Mercury (Hg)-Total	<0.0000050	#VALUE!	<0.0000050	#VALUE!	<0.0000050	#VALUE!	<0.0000050	#VALUE!	0.0000100	#VALUE!	0.0000094	#VALUE!
Molybdenum (Mo)-Total	0.000767	10%	0.000226	2%	0.000746	5%	0.000717	7%	0.000662	14%	0.000208	0%
Nickel (Ni)-Total	0.00116	49%	<0.00050	#VALUE!	0.00203	#VALUE!	<0.00050	#VALUE!	0.0407	11%	0.0131	78%
Phosphorus (P)-Total	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!
Potassium (K)-Total	3.58	0%	2.57	2%	4.34	3%	3.75	2%	1.60	11%	1.21	-3%
Rubidium (Rb)-Total	0.00301	20%	0.00099	11%	0.00462	35%	0.00210	18%	0.00405	20%	0.00256	-3%
Selenium (Se)-Total	0.000099	-12%	0.000079	29%	0.000294	-13%	0.000186	-23%	0.000093	-3%	0.000103	6%
Silicon (Si)-Total	10.5	11%	7.6	13%	9.98	31%	6.73	10%	13.4	1%	12.2	3%
Silver (Ag)-Total	<0.000010	#VALUE!	<0.000010	#VALUE!	<0.000010	#VALUE!	<0.000010	#VALUE!	0.000033	#VALUE!	0.000015	#VALUE!
Sodium (Na)-Total	8.67	-1%	2.76	9%	3.16	2%	2.48	7%	5.41	9%	3.41	1%
Strontium (Sr)-Total	0.0885	7%	0.0604	6%	0.132	9%	0.097	1%	0.0921	8%	0.0627	-1%
Sulfur (S)-Total	2.27	6%	0.96	49%	1.24	10%	1.16	29%	2.54	10%	2.36	15%
Tellurium (Te)-Total	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!
Thallium (Tl)-Total	0.000011	-9%	<0.000010	#VALUE!	0.000016	37%	<0.000010	#VALUE!	0.000027	0%	<0.000010	#VALUE!
Thorium (Th)-Total	0.00054	#VALUE!	<0.00010	#VALUE!	0.00076	#VALUE!	<0.00010	#VALUE!	0.00038	#VALUE!	<0.00010	#VALUE!
Tin (Sn)-Total	<0.00010	#VALUE!	<0.00010	#VALUE!	0.00012	#VALUE!	<0.00010	#VALUE!	0.00059	27%	0.00051	96%
Titanium (Ti)-Total	0.0200	#VALUE!	0.0022	#VALUE!	0.0599	#VALUE!	0.0038	#VALUE!	0.00983	#VALUE!	0.00175	#VALUE!
Tungsten (W)-Total	0.00156	27%	0.00079	5%	0.00588	14%	0.00112	-12%	0.00308	142%	0.00030	#VALUE!
Uranium (U)-Total	0.000649	22%	0.000550	2%	0.00151	9%	0.00142	-4%	0.000693	17%	0.000490	8%
Vanadium (V)-Total	0.00127	#VALUE!	0.00053	#VALUE!	0.00337	#VALUE!	0.00097	46%	0.00103	#VALUE!	<0.00050	#VALUE!
Zinc (Zn)-Total	0.0108	-4%	<0.0030	#VALUE!	0.0272	71%	0.0172	56%	0.390	27%	0.016	46%
Zirconium (Zr)-Total	0.000409	139%	<0.000060	#VALUE!	0.000469	#VALUE!	<0.000060	#VALUE!	0.000225	98%	0.000108	29%
Aluminum (Al)-Dissolved	0.0070		0.0033		0.0093		0.0051		0.0064		0.00500	
Antimony (Sb)-Dissolved	<0.00010		<0.00010		<0.00010		<0.00010		0.00010		0.00012	
Arsenic (As)-Dissolved	0.00013		<0.00010		0.00012		<0.00010		0.00020		0.0001	
Barium (Ba)-Dissolved	0.0434		0.0219		0.0501		0.0372		0.0446		0.0129	
Beryllium (Be)-Dissolved	<0.00010		<0.00010		<0.00010		<0.00010		<0.00010		<0.00010	
Bismuth (Bi)-Dissolved	<0.000050		<0.000050		<0.000050		<0.000050		<0.000050		<0.000050	
Boron (B)-Dissolved	<0.010		<0.010		<0.010		<0.010		<0.010		<0.010	
Cadmium (Cd)-Dissolved	0.000653		0.0		0.0000162		<0.0000050		0.000157		0.0	
Calcium (Ca)-Dissolved	37.3		30.4		48.9		45.1		75.9		57.200000	
Cesium (Cs)-Dissolved	<0.000010		<0.000010		<0.000010		<0.000010		0.000044		0.00003	
Chromium (Cr)-Dissolved	0.00029		0.00018		0.00050		0.00077		0.00015		0.0003	
Cobalt (Co)-Dissolved	0.00036		<0.00010		0.00040		0.00017		0.0146		<0.00010	
Copper (Cu)-Dissolved	0.00796		0.00124		0.00234		0.00104		0.0223		0.010	
Iron (Fe)-Dissolved	<0.010		<0.010		<0.010		0.013		0.750		<0.010	
Lead (Pb)-Dissolved	0.000225		<0.000050		<0.000050		<0.000050		0.000250		<0.000050	
Lithium (Li)-Dissolved	<0.0010		<0.0010		<0.0010		<0.0010		0.0024		0.00	
Magnesium (Mg)-Dissolved	3.48		2.5900		4.87		3.8400		4.99		3.94	
Manganese (Mn)-Dissolved	0.0848		0.0163		0.0903		0.0397		1.49		0.0449	
Mercury (Hg)-Dissolved	<0.0000050		<0.0000050		<0.0000050		<0.0000050		<0.0000050		<0.0000050	
Molybdenum (Mo)-Dissolved	0.000693		0.00022		0.000710		0.000668		0.000573		0.0002	
Nickel (Ni)-Dissolved	0.00070		<0.00050		<0.00050		<0.00050		0.0363		0.00576	
Phosphorus (P)-Dissolved	<0.050		<0.050		<0.050		<0.050		<0.050		<0.050	
Potassium (K)-Dissolved	3.57		2.53000		4.22		3.67000		1.44		1.25000	
Rubidium (Rb)-Dissolved	0.00247		0.000890		0.00324		0.001750		0.00332		0.002630	
Selenium (Se)-Dissolved	0.000112		0.00		0.000334		0.00		0.000096		0.0	
Silicon (Si)-Dissolved	9.42		6.68		7.31		6.08		13.3		11.8	
Silver (Ag)-Dissolved	<0.000010		<0.000010		<0.000010		<0.000010		<0.000010		<0.000010	
Sodium (Na)-Dissolved	8.78		2.5300		3.09		2.310		4.92		3.3800	
Strontium (Sr)-Dissolved	0.0825		0.06		0.121		0.10		0.0849		0.06	
Sulfur (S)-Dissolved	2.13		0.58		1.12		0.87		2.29		2.03	
Tellurium (Te)-Dissolved	<0.00020		<0.00020		<0.00020		<0.00020		<0.00020		<0.00020	
Thallium (Tl)-Dissolved	0.000012		<0.000010		0.000011		<0.000010		0.000027		<0.000010	
Thorium (Th)-Dissolved	<0.00010		<0.00010		<0.00010		<0.00010		<0.00010		<0.00010	
Tin (Sn)-Dissolved	0.00026		<0.00010		<0.00010		<0.00010		0.00045		0.00018	
Titanium (Ti)-Dissolved	<0.00030		<0.00030		<0.00030		<0.00030		<0.00030		<0.00030	
Tungsten (W)-Dissolved	0.00119		0.000750		0.00512		0.00126		0.00052		<0.00010	
Uranium (U)-Dissolved	0.000518		0.000537		0.00138		0.00148		0.000585		0.000453	
Vanadium (V)-Dissolved	<0.00050		<0.00050		<0.00050		0.0006		<0.00050		<0.00050	
Zinc (Zn)-Dissolved	0.0112		<0.0010		0.0130		0.0097		0.298		0.010000	
Zirconium (Zr)-Dissolved	0.000074		<0.000060		<0.000060		<0.000060		0.000077		0.000081	

Parameters	MW7S				MW7D				MW7D DUP		
Date/QAQC	22-Oct-2017	Dissolved-Total RPD	27-May-2018	Dissolved-Total RPD	21-Oct-2017	Dissolved-Total RPD	27-May-2018	Dissolved-Total RPD	21-Oct-2017	Dissolved-Total RPD	DUP RPD
Time	17:00		11:30		15:00		10:30		15:30		
Temp	11.66		13.86		10.4		13.9		10.4		
Turbidity	49.2		16.7		22.9		24.7		22.9		-8%
Conductivity	164		178		195		134		195		37%
Dissolved Oxygen (%)	91.8		79.4		32.4		93		32.4		-97%
Dissolved Oxygen (mg/L)	9.96		8.14		3.61		9.6		3.61		-91%
pH	6.9		6.18		6.51		6.88		6.51		-6%
Oxidation-Reduction Potential	205.8		178		-2.9		150.2		-2.9		-195%
Conductivity (EC)	179		180		179		133		177		28%
Hardness (as CaCO3)	68.5		82.2		75.9		59		76.7		26%
pH	6.67		6.69		6.97		7.10		6.78		-5%
Total Suspended Solids	350		2		122		29		26.0		-12%
Total Dissolved Solids	114		131		109		92		113		20%
Acidity (as CaCO3)	28.0		13.3		17.2		4.4		24.3		139%
Alkalinity, Total (as CaCO3)	87.8		79.6		87.1		60.6		85.3		34%
Ammonia, Total (as N)	0.027		0.035		0.027		0.091		0.038		-82%
Bromide (Br)	<0.10		<0.10		<0.10		<0.10		<0.10		#VALUE!
Chloride (Cl)	0.17		0.27		0.22		0.21		0.22		5%
Fluoride (F)	0.024		0.026		0.023		0.024		0.023		-4%
Nitrate (as N)	0.077		0.095		<0.020		0.053		<0.020		#VALUE!
Nitrite (as N)	<0.010		<0.010		<0.010		<0.010		<0.010		#VALUE!
Total Kjeldahl Nitrogen	<0.75		<0.15		<0.15		<0.15		<0.15		#VALUE!
Total Nitrogen	<0.75		<0.15		<0.15		<0.15		<0.15		#VALUE!
Orthophosphate-Dissolved (as P	<0.0030		<0.0030		<0.0030		<0.0030		<0.0030		#VALUE!
Phosphorus (P)-Total	0.0777		0.0036		0.0141		0.0098		0.0050		-65%
Sulfate (SO4)	7.53		12.50		8.50		6.87		7.99		15%
Dissolved Organic Carbon	2.6		2.5		2.3		1.7		2.0		16%
Total Organic Carbon	4.0		2.2		1.8		1.3		2.1		47%
Aluminum (Al)-Total	7.04	200%	0.101	153%	0.930	196%	0.538	197%	0.271	194%	-66%
Antimony (Sb)-Total	<0.00010	#VALUE!	<0.00010	#VALUE!	0.00040	#VALUE!	<0.00010	#VALUE!	0.00037	#VALUE!	#VALUE!
Arsenic (As)-Total	0.00099	133%	0.00014	24%	0.00034	72%	0.00017	#VALUE!	0.00023	42%	30%
Barium (Ba)-Total	0.115	47%	0.048	1%	0.0524	19%	0.0240	10%	0.0462	5%	63%
Beryllium (Be)-Total	0.00011	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	<0.00010	#VALUE!	#VALUE!
Bismuth (Bi)-Total	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	<0.000050	#VALUE!	#VALUE!
Boron (B)-Total	0.011	10%	<0.010	#VALUE!	0.015	7%	<0.010	#VALUE!	0.014	0%	#VALUE!
Cadmium (Cd)-Total	0.000116	46%	0.000037	-9%	0.0000948	49%	0.0000232	60%	0.0000717	35%	102%
Calcium (Ca)-Total	21.9	15%	22.1	-4%	23.1	1%	17.7	-2%	22.3	-4%	23%
Cesium (Cs)-Total	0.000501	185%	0.000065	18%	0.000127	146%	0.000093	95%	0.000052	81%	-57%
Chromium (Cr)-Total	0.0158	197%	0.0004	27%	0.00255	#VALUE!	0.00150	157%	0.00072	110%	-70%
Cobalt (Co)-Total	0.0163	41%	0.0076	0%	0.0128	19%	0.0014	31%	0.0111	6%	156%
Copper (Cu)-Total	0.0333	167%	0.0254	5%	0.0118	126%	0.0145	153%	0.00645	93%	-77%
Iron (Fe)-Total	5.14	#VALUE!	0.08	133%	5.12	63%	0.73	116%	3.54	25%	132%
Lead (Pb)-Total	0.00178	#VALUE!	<0.000050	#VALUE!	0.000575	#VALUE!	0.000254	#VALUE!	0.000298	#VALUE!	16%
Lithium (Li)-Total	0.0034	#VALUE!	0.0038	5%	0.0044	-2%	0.0028	38%	0.0039	-21%	33%
Magnesium (Mg)-Total	8.10	43%	5.71	-6%	4.73	3%	3.51	6%	4.69	2%	29%
Manganese (Mn)-Total	0.579	20%	0.139	1%	0.696	15%	0.031	10%	0.624	5%	181%
Mercury (Hg)-Total	<0.0000050	#VALUE!	<0.0000050	#VALUE!	<0.0000050	#VALUE!	<0.0000050	#VALUE!	<0.0000050	#VALUE!	#VALUE!
Molybdenum (Mo)-Total	0.00571	20%	0.00309	-4%	0.00393	8%	0.00235	0%	0.00370	-2%	45%
Nickel (Ni)-Total	0.0321	55%	0.0389	0%	0.00881	29%	0.00663	19%	0.00742	11%	11%
Phosphorus (P)-Total	0.105	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	<0.050	#VALUE!	#VALUE!
Potassium (K)-Total	6.86	26%	5.03	-2%	4.21	2%	2.28	-1%	4.20	1%	59%
Rubidium (Rb)-Total	0.0139	48%	0.0111	0%	0.00690	17%	0.00495	10%	0.00645	13%	26%
Selenium (Se)-Total	0.000325	2%	0.000444	7%	0.000635	-17%	0.000764	14%	0.000588	-12%	-26%
Silicon (Si)-Total	23.5	52%	13.2	3%	11.5	13%	9.1	14%	10.1	1%	11%
Silver (Ag)-Total	0.000031	#VALUE!	<0.000010	#VALUE!	0.000019	#VALUE!	<0.000010	#VALUE!	<0.000010	#VALUE!	#VALUE!
Sodium (Na)-Total	6.19	14%	4.14	-4%	4.31	5%	2.60	2%	4.21	1%	47%
Strontium (Sr)-Total	0.100	13%	0.086	-1%	0.0814	11%	0.0412	1%	0.0725	-3%	55%
Sulfur (S)-Total	2.12	9%	4.49	-8%	2.83	14%	2.42	8%	2.45	-7%	1%
Tellurium (Te)-Total	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	<0.00020	#VALUE!	#VALUE!
Thallium (Tl)-Total	0.000069	85%	0.000043	10%	0.000024	13%	0.000016	#VALUE!	0.000019	5%	17%
Thorium (Th)-Total	0.00197	#VALUE!	<0.00010	#VALUE!	0.00040	#VALUE!	0.00020	#VALUE!	0.00013	#VALUE!	-42%
Tin (Sn)-Total	0.00017	#VALUE!	<0.00010	#VALUE!	0.00035	98%	<0.00010	#VALUE!	0.00019	#VALUE!	#VALUE!
Titanium (Ti)-Total	0.282	#VALUE!	0.004	#VALUE!	0.0422	#VALUE!	0.0214	#VALUE!	0.0112	#VALUE!	-63%
Tungsten (W)-Total	0.0534	86%	0.0281	3%	0.0210	68%	0.0067	60%	0.0142	32%	72%
Uranium (U)-Total	0.00113	77%	0.00183	5%	0.00167	-3%	0.00198	11%	0.00177	4%	-11%
Vanadium (V)-Total	0.0119	#VALUE!	<0.00050	#VALUE!	0.00245	#VALUE!	0.00144	#VALUE!	0.00104	#VALUE!	-32%
Zinc (Zn)-Total	0.0158	95%	0.0257	6%	0.246	44%	0.038	104%	0.189	17%	134%
Zirconium (Zr)-Total	0.000725	#VALUE!	<0.000060	#VALUE!	0.000186	#VALUE!	0.000124	#VALUE!	0.000079	#VALUE!	-44%
Aluminum (Al)-Dissolved	0.0086		0.0134		0.0085		0.0042		0.0043		2%
Antimony (Sb)-Dissolved	<0.00010		<0.00010		<0.00010		<0.00010		<0.00010		#VALUE!
Arsenic (As)-Dissolved	0.00020		0.0001		0.00016		<0.00010		0.00015		#VALUE!
Barium (Ba)-Dissolved	0.0713		0.0479		0.0432		0.0217		0.0438		67%
Beryllium (Be)-Dissolved	<0.00010		<0.00010		<0.00010		<0.00010		<0.00010		#VALUE!
Bismuth (Bi)-Dissolved	<0.000050		<0.000050		<0.000050		<0.000050		<0.000050		#VALUE!
Boron (B)-Dissolved	0.010		<0.010		0.014		<0.010		0.014		#VALUE!
Cadmium (Cd)-Dissolved	0.0000729		0.0		0.0000573		0.0		0.0000501		120%
Calcium (Ca)-Dissolved	18.8		22.900000		22.8		18.100000		23.1		24%
Cesium (Cs)-Dissolved	0.000020		0.00005		0.000020		0.000033		0.000022		-40%
Chromium (Cr)-Dissolved	0.00011		0.0003		<0.00010		0.0002		0.00021		15%
Cobalt (Co)-Dissolved	0.0108		0.00763		0.0106		0.00099		0.0105		166%
Copper (Cu)-Dissolved	0.00297		0.0242		0.00266		0.00		0.00237		20%
Iron (Fe)-Dissolved	<0.010		0.016		2.68		0.194		2.75		174%
Lead (Pb)-Dissolved	<0.000050		<0.000050		<0.000050		<0.000050		<0.000050		#VALUE!
Lithium (Li)-Dissolved	<0.0010		0.00		0.0045		0.00		0.0048		87%
Magnesium (Mg)-Dissolved	5.24		6.060		4.58		3.320		4.59		32%
Manganese (Mn)-Dissolved	0.476		0.137		0.596		0.0278		0.596		182%
Mercury (Hg)-Dissolved	<0.0000050		<0.0000050		<0.0000050		<0.0000050		<0.0000050		#VALUE!
Molybdenum (Mo)-Dissolved	0.00467		0.0032		0.00362		0.00234		0.00376		47%
Nickel (Ni)-Dissolved	0.0183		0.0388		0.00661		0.00547		0.00665		19%
Phosphorus (P)-Dissolved	<0.050		<0.050		<0.050		<0.050		<0.050		#VALUE!
Potassium (K)-Dissolved	5.29		5.12000		4.11		2.31000		4.17		57%
Rubidium (Rb)-Dissolved	0.00856		0.011100		0.00582		0.004490		0.00568		23%
Selenium (Se)-Dissolved	0.000317		0.0		0.000756		0.0		0.000666		0%
Silicon (Si)-Dissolved	13.8		12.8		10.1		7.91		9.96		23%
Silver (Ag)-Dissolved	<0.000010		<0.000010		<0.000010		<0.000010		<0.000010		#VALUE!
Sodium (Na)-Dissolved	5.37		4.3000		4.10		2.5500		4.16		48%
Strontium (Sr)-Dissolved	0.0876		0.09		0.0727		0.04		0.0746		58%
Sulfur (S)-Dissolved	1.93		4.87		2.45		2.24		2.62		16%
Tellurium (Te)-Dissolved	<0.00020		<0.00020		<0.00020		<0.00020		<0.00020		#VALUE!
Thallium (Tl)-Dissolved	0.000028		0.000039		0.000021		<0.000010		0.000018		#VALUE!
Thorium (Th)-Dissolved	<0.00010		<0.00010		<0.00010		<0.00010		<0.00010		#VALUE!
Tin (Sn)-Dissolved	<0.00010		<0.00010		0.00012		<0.00010		<0.00010		#VALUE!
Titanium (Ti)-Dissolved	<0.00030		<0.00030		<0.00030		<0.00030		<0.00030		#VALUE!
Tungsten (W)-Dissolved	0.0214		0.027400		0.0104		0.00359		0.0103		97%
Uranium (U)-Dissolved	0.000501		0.00174		0.00172		0.00178		0.00170		-5%
Vanadium (V)-Dissolved	<0.00050		<0.00050		<0.00050		<0.00050		<0.00050		#VALUE!
Zinc (Zn)-Dissolved	0.0056		0.0241		0.158		0.0118		0.160		173%
Zirconium (Zr)-Dissolved	<0.000060		<0.000060		<0.000060		<0.000060		<0.000060		#VALUE!

Legend:
- holding time exceeded
- pH>10 --> sample rejected
- turbidity > 50
- DUP RPD > 20%
- Dissolved-Total Metals RPD > 20%