



February 2018

## MCCARTHY QUARRY

# McCarthy Quarry 2017 Annual Permit To Take Water Compliance Report

**Submitted to:**

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REPORT



**Report Number: 1407634**

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## Table of Contents

**1.0 INTRODUCTION..... 1**

**2.0 BACKGROUND INFORMATION..... 1**

    2.1 Geology ..... 1

    2.2 Hydrogeological Setting ..... 2

    2.3 Quarry Dewatering..... 2

**3.0 MONITORING RESULTS ..... 3**

**4.0 RECOMMENDATIONS..... 6**

**5.0 LIMITATIONS AND USE OF REPORT ..... 6**

**6.0 CLOSURE..... 7**

### FIGURES

- Figure 1 – Location Map
- Figure 2 – Site Location Map
- Figure 3 – Site Section C-C'
- Figure 4 – Site Section D-D'
- Figure 5 – 2017 Weather
- Figure 6 – Overburden Monitoring Wells Groundwater Elevations
- Figure 7 – Verulam Monitoring Wells Groundwater Elevations
- Figure 8 – Bobcaygeon Monitoring Wells Groundwater Elevations
- Figure 9 – Gull River Monitoring Wells Groundwater Elevations
- Figure 10 – Precambrian Bedrock Monitoring Wells Groundwater Elevations

### TABLES

- Table 1 - Groundwater Monitoring Locations (embedded)
- Table 2 - Groundwater Quality Requirements (embedded)
- Table 3 – 2017 Water Levels
- Table 4 – Private Water Supply Water Quality
- Table 5 – Onsite Observation Wells Water Quality
- Table 6 – 2017 Measured Water Volume and Rate of Discharge from Quarry Sump



## MCCARTHY QUARRY 2017 ANNUAL PTTW REPORT

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### **APPENDICES**

#### **APPENDIX A**

PTTW No. 7818-9QJNL4

#### **APPENDIX B**

Hydrographs

#### **APPENDIX C**

Certificates of Analysis



### 1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by QBJR/Coco Aggregates Inc. (Coco) to prepare the annual Permit To Take Water (PTTW) report for the McCarthy Quarry (the Site) located in the Township of Ramara, County of Simcoe (Figure 1). The annual report is a requirement of the PTTW No. 7818-9QJNL4 which expires December 31, 2019 (Appendix A). The PTTW for McCarthy Quarry authorizes pumping of up to 6,544,800 L/day with a maximum taking of 196,500,000 L/year over a maximum of 150 days per year. The disposal of water from the Site is governed by Environmental Compliance Approval (ECA) No. 4731-987KM8 under Section 20.2 of the Environmental Protection Act.

The property is located approximately six kilometres south-east of the Community of Brechin at Lot 1, Concession 1, Township of Ramara former Mara, Simcoe County (Figures 1 and 2). The area around the Site is primarily rural consisting of woodlots, pasture and scattered single-family homes. To the south and east along the Talbot River and Canal Lake are numerous seasonal and year round residences.

PTTW No. 7818-9QJNL4 directs Coco to regularly collect monitoring data of the Site water taking, groundwater levels in the on-Site monitoring wells and off-Site residential wells, groundwater quality in selected on-Site monitoring wells and off-Site residential wells and meteorological data from an on-Site meteorological station (Conditions 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7 and 4.10). Coco is also required to maintain a publically accessible site on the internet containing the required monitoring data and every report that has been required by the PTTW (Condition 4.13). Coco is also required to establish a Public Liaison Committee (PLC) that is to meet once every four months (Condition 4.14).

### 2.0 BACKGROUND INFORMATION

The following provides an overview of the area, including information on the surface water, geological and hydrogeological regime of the Site.

#### 2.1 Geology

The quarry is located on a broad, arching, low relief upland area within a low relief clay and limestone plain typical of the physiography to the east of Lake Simcoe (Chapman & Putman, 1975). The elevation of the land in the area, 255 metres above sea level (masl), places the higher elevations on the property at the shoreline of the glacial Lake Algonquin. The original aggregate operation on this Site extracted gravel deposited on the shoreline of Lake Algonquin. To the south of the Site, the overburden thickens and older silt and clay materials are present over the bedrock. At elevations above 254 masl the land area was in an active erosional environment for approximately 700 years by Lake Algonquin which drained across this area and out the Kirkfield Outlet toward Lake Ontario. In this “washed zone” the surficial geological deposits consist of a patchwork of thin clayey-silt, sandy-silt to silty-sand glacial till, with occasional gravelly beach ridges. Below the level of Lake Algonquin, the pre-existing fine-grained glaciolacustrine and fine-grained till deposits, the land escaped shoreline erosion and in the Talbot River Valley the overburden thickness can reach tens of metres in thickness. On the Site, the overburden thickness ranges from 0.3 m to the north at OW9 to approximately 8 m at OW4 to the south.

Underlying the overburden are Middle Ordovician aged limestone of the Verulam, Bobcaygeon and Gull River Formations, which are part of the Simcoe Group. The Verulam Formation consists of thinly bedded limestone and shale or shaley limestone. The Verulam Formation is relatively thin at the Site (0 to 4 m in thickness).



The underlying Bobcaygeon Formation consists of thin to medium bedded limestones ranging in thickness from approximately 31 m (OW6) to 40 m (OW9) within the area of investigation (Figures 3 and 4). Quarrying at the Site will be primarily in the Bobcaygeon Formation.

The Gull River Formation (approximately 16 m in thickness) will not be quarried at the Site. It consists of fine-grained limestone with minor interbeds of shale or shaley limestone. Beneath the Gull River Formation is the Shadow Lake Formation (estimated to be approximately 7 m thick), which consists of conglomerate sandstone and mudstone, and overlies the Precambrian Bedrock. The Shadow Lake Formation as well as Precambrian Bedrock were encountered at OW8 and OW7.

## 2.2 Hydrogeological Setting

The overburden deposits in the area are thin and generally fine-grained. These deposits host numerous dug or bored wells in the area. Bored wells are often preferred by homeowners because of the fresh water that can be obtained. The wells are often vulnerable to the impact of surface activities and frequently filtration and ultraviolet disinfection is added to domestic water supplies. In the Talbot River Valley there are buried granular deposits that provide sufficient groundwater for domestic use, through both dug and drilled wells.

Wells constructed in the bedrock aquifer most often obtain water supplies from the Gull River Formation. This bedrock, however, is known to contain sulfate minerals and the water often has a sulphurous odour. The deep bedrock wells may also contain salty water where wells intersect a sluggish groundwater flow system. Bedrock wells often produce sufficient water supplies for domestic use; however when wells are drilled deeper than 5 m to 10 m into the bedrock, the well yield is not often improved and the groundwater is prone to containing elevated levels of chloride and sulphur (MOE, 1990).

The Ministry of Environment and Climate Change (MOECC) water well database was reviewed to identify nearby water wells in the vicinity (less than 1,000 m) of the McCarthy Quarry. Nine wells were located within 1,000 m of McCarthy Quarry, seven of which are on Concession Road 1 and two of which are on the Mara-Eldon Boundary Road.

## 2.3 Quarry Dewatering

The handling of water will increase as the quarry area increases and the majority of the water removed from the Site will be precipitation and snow melt. Currently, the water taking on-Site is well below the permitted volume of 6,544,800 L/day at a maximum rate of 76 L/sec. Water is removed from the quarry sump at a rate of 35 L/sec and the water pumping ranges from 0 to 3,024,000 L/day (2,100 L/min) (Table 6).

Groundwater and precipitation entering the quarry is collected in a sump on the quarry floor. The sump is equipped with a 4-inch Grindex pump rated at 35 L/sec and is attached to a 4-inch (101 mm) diameter discharge line. The water is pumped from the quarry floor up the quarry face to a 4-inch (101 mm) diameter discharge pipeline that directs the water to a ditch that runs southward through the McCarthy property to the 14,000 m<sup>3</sup> settling pond. The water in the settling pond is discharged to the roadside ditches along Concession Road 1 with a Hickenbottom control structure. The water in the roadside ditch travels eastward along the north side of Concession Road 1 to a municipal drain and eventually to the Talbot River, which discharges to Lake Simcoe.



### 3.0 MONITORING RESULTS

#### Monitoring Condition 4.1: Water Level Monitoring of Sump

The quarry floor is approximately 15 metres below ground level (mbgl) or 240 masl and is permitted to be extracted to an elevation of 232 masl to an approximate depth of 23 mbgl.

The current quarry footprint is approximately 400 m by 100 m and the future extent of the quarry is shown in Figure 4. The extraction rate is dictated by market demand and the future size of the quarry is difficult to predict. However, the current extraction is approximately 150,000 m<sup>3</sup>/year and at this rate of extraction, the footprint of the quarry would be 18 to 20 ha in ten years if a second lift is not started. If a second lift into the Bobcaygeon Formation is started, then the quarry footprint will be smaller.

#### Monitoring Condition 4.2: Local Climatic Conditions

The on-Site climate conditions are monitored with an RM Young tipping bucket precipitation gauge with a heater that is connected to the Solinst Rainlogger as well as an on-Site Barologger that measures temperature. Precipitation data was not collected from the weather station in 2017 and the 2017 on-Site weather data was supplemented with weather data from the nearby Environment Canada Barrie-Oro weather station. Figure 5 illustrates the precipitation and temperature data collected at the meteorological station for the 2017 monitoring period.

The on-Site meteorological data is used to evaluate fluctuations in the groundwater elevations throughout the monitoring period as well as to estimate how the water pumped from the quarry sump is actually surface water runoff.

#### Monitoring Condition 4.3, 4.4 and 4.5: Groundwater Elevations

Water level monitoring has been ongoing at the McCarthy Quarry since the early stages of quarry development commencing in 2002 and ongoing until 2017. Both on-Site observation wells and off-Site residential wells have been incorporated into the monitoring program in order to meet the requirements of Conditions 4.3, 4.4, 4.5 and 4.6. Pressure transducers are installed in select wells for daily monitoring of the groundwater elevation and monthly monitoring is completed with a manual water level meter. The monitoring wells and residential wells that are monitored are listed in Table 1.

Table 1: Groundwater Monitoring Locations

	Daily Monitoring	Monthly Monitoring
Monitoring Wells	OW4-1, OW4-2, OW5-1, OW6-1, OW6-2, OW9-1, OW9-2, Bored, CKL-1 and CKL-2	AM1b, AMx, TW1-1, OW4-1, OW4-2, OW5-1, OW5-2, OW5-3, OW6-1, OW6-2, OW6-3, OW7-1, OW7-2, OW7-3, OW8-1, OW8-2, OW8-3, OW9-1, OW9-2, Bored, CKL-1 and CKL-2
Residential Wells	DW3	DW3, DW1, DW2, DW4, DW5*, DW6*, DW7* and DW8*

\*Monitored at least once every two months

The water level monitoring data for the 2017 monitoring period is presented in graphic form on Figures 6 to 10 and is listed in Table 2. The ongoing hydrographs can be found in Appendix B. The groundwater monitoring



locations are provided on Figures 1 and 2. With the exception of OW9-1, OW9-2 and OW8-3 (Figures 8 and 9, respectively) no declining trends were observed in the monitoring wells in previous years. These three monitoring wells are in close proximity to the active quarry and it was noted during the PTTW renewal that these monitoring locations are being impacted by the ongoing dewatering activities at the Site. These monitoring locations allow for a zone of influence to be mapped out surrounding the quarry. Additionally, when looking at the historical ranges (Appendix B) the deeper Gull River and Precambrian monitors appear to be changing with time; however, these monitoring wells are much deeper than the quarry excavation and the variation is due to external forces. In 2016, declines were noted at most monitoring wells, notably TW1-1 and OW8-3, and are likely a result of low precipitation throughout 2016. It is noted that water levels started to increase at most locations in December of 2016 until the summer of 2017 when water levels began to decrease, consistent with the anticipated seasonal fluctuations. It is noted that an increasing trend (approximately 6 m) has been observed at OW6-3 since the start of 2015.

Monitoring wells installed in the overburden materials are: Bored, OW5-1, AM1b, and CKL-1. The following private off-Site residential wells are part of the monitoring program: DW1, DW2, DW4, DW5, DW6, DW7 and DW8. The location of these wells is shown in Figure 1. The fluctuations in the groundwater elevations at the overburden observation wells have been minimal since the beginning of the monitoring program in 2006 (Appendix B). During the 2017 monitoring program, the groundwater levels at the on-Site overburden monitoring wells have fluctuated as little as 1.37 m at Bored and as much as 2.42 m at OW5-1. The fluctuations (decreases observed throughout the summer) in 2017 were similar to previous years.

The water levels in the upper bedrock, Verulam Formation, are monitored at wells DW3, OW4-1, OW6-1, OW7-1, OW8-1 and CKL-2 (Figure 7). Changes in the groundwater elevations in the on-Site Verulam Formation ranged from 1.31 m at OW4-1 to 3.12 m at OW8-1. AMx was monitored until April 2015; it was within the quarry extraction area and was removed as the quarry face advanced towards the south. A replacement monitoring well for AMx is planned to be installed along the western property boundary between the quarry face and OW4 in 2018.

Water levels in the Bobcaygeon Formation are monitored at OW4-2, OW5-2, OW5-3, OW6-2, OW7-2, OW8-2, OW9-1, OW9-2, and TW1-1 (Figure 8). Changes in the groundwater elevation in the Bobcaygeon Formation ranged from 0.13 m at OW9-2 to 3.17 m at OW8-2. Water levels at OW9-1 and OW9-2 remained relatively stable in 2017 after large decreases were observed in 2014 and 2015. The water level changes at OW9-1 and OW9-2 appear to be related to quarrying. OW9 is approximately 10 m from the active quarry face now and was originally installed 230 m away from the quarry face. The water levels started to react to gravity drainage when the quarry face was at a distance of approximately 150 m from the well. This is consistent with observations of drawdown at other quarries in this rock type.

Water levels in the Gull River Formation are monitored at OW6-3, OW7-3, and OW8-3 (Figure 9). Changes in the groundwater elevation in the Gull River Formation ranged from 1.01 m at OW7-3 to 3.04 m at OW8-3. The Gull River Formation water levels are reacting to regional groundwater level trends.

The Precambrian bedrock monitoring well is TW1-2. Changes in the groundwater elevation in the Precambrian bedrock monitoring was 1.12 m at TW1-2.



The regional groundwater flow in the Upper Bobcaygeon Formation is generally towards Lake Simcoe in the southwest direction (Figure 2). The regional groundwater flow in the overburden material is most influenced by the topography in the area and the Talbot River and is generally in the south-southeast direction (Figure 1).

### **Impact Assessment**

The impact of development of the McCarthy Quarry as a result of dewatering is minimal. Drawdowns attributable to the quarrying operations have been observed at OW9 and AMx. OW9 was installed after extraction had begun at the quarry; therefore there are no pre-extraction water level data; however water levels were stable until the quarry face was about 150 m from OW9.

OW9 is currently approximately 10 m from the working face of the quarry and the water levels in the upper screen have declined approximately 15 m in response to the lowering of the groundwater table in the quarry footprint (Figure 8). Based on these observations, drawdown occurs in the shallow bedrock when the quarry face is closer than 150 m. The monitoring well AMx also showed signs of impact as the quarry face approached (Figure B-2).

It can be concluded from the water level monitoring that the impact area of quarry dewatering is restricted to less than 150 m from the quarry face. Off-Site impacts are not expected for several years as quarrying will be in the northern part of the Site. At the current extraction rate of approximately 2 ha per year, the quarry will expand to approximately 12 ha over the next five years or 20 ha over the next ten years, unless a deeper lift is developed, then the quarry footprint would be smaller.

The closest neighbour, McIntosh residence, is approximately 280 m from the closest the excavation to their water supply well. It is not expected that this well will be impacted during the life of the current PTTW renewal application. The on-Site observation wells (OW4 and OW6) will serve as sentinel wells for impacts at the McIntosh well.

### **Monitoring Condition 4.6 and 4.7: Groundwater Quality**

Groundwater quality is analyzed on a semi-annual basis at both on-Site monitoring wells and off-Site residential wells. A summary of the parameters and locations are provided in Table 3.

The results from the water quality monitoring program from May 2017 and October 2017 can be found in Appendix C as well as in Tables 4 and 5. The water quality results have been compared to Ontario Drinking Water Standards (ODWS) and any exceedances have been highlighted.

The off-Site private residential wells have been tested since April 2013 and were tested in May and October of 2017 (Table 4). The water quality at DW1, DW2, and DW3 met the ODWS during the 2017 sampling events for the parameters tested with the exception of Total Dissolved Solids (TDS) at DW1 (maximum of 660 mg/L in May 2017) and Hardness ( $\text{CaCO}_3$ ) at DW1, DW2, and DW3 (maximum of 540 mg/L at DW1 in May 2017).

At the on-Site monitoring wells, the water quality continues to represent the pre-quarry conditions (Table 5). Hard water and high TDS are common for this area and are representative of the overburden and bedrock conditions found in the Carden Plain.





Table 2: Groundwater Quality Requirements

	Monitoring Locations	Water Quality Parameters
Monitoring Wells	AM1b, AMx, TW1-1, Bored, OW4-1, OW4-2, OW5-1, OW5-2, OW5-3, OW6-2, OW7-1, OW7-2, OW8-1, OW8-2, OW9-1 and OW9-2	pH, Alkalinity, Bicarbonate, Fluoride, Chloride, Magnesium, Calcium, Sodium, Potassium, Ammonia, Sulphate, Nitrate, Nitrite, Phosphate, Phosphorous, Conductivity, DOC, Colour, TDS, Hardness
Residential Wells	DW3, DW1 and DW2	pH, Alkalinity (CaCO3), Bicarbonate, Conductivity, Fluoride, Chloride, Nitrate, Nitrite, Chromium, Tannins, Sulphate, Magnesium, Calcium, Sodium, Potassium, Ammonia (N), Phosphate, Phosphorous, Anion Sum, Cation Sum, DOC, Colour, Turbidity, Aluminium, Arsenic, Barium, Boron, Cadmium, Ion Ratio, % Difference, Copper, Iron, Lead, Manganese, Selenium, Zinc, Hardness (CaCO3), TDS (iron sum calc.), Langelier Index

Monitoring Conditions 4.10 and 4.12 Water Taking Measurements and Reporting

The rate and volume of discharge from the quarry is measured on-Site by an inline flow meter in the discharge line from the quarry sump. The pump records are provided by McCarthy Quarry staff. The pump records for January 2017 to December 2017 are found in Table 6. The discharge rate between January 2017 and December 2017 was below the permitted rate of 4,545 L/min (76 L/sec).

As previously mentioned the dewatering equipment consists of a Grindex pump with a 4-inch discharge capable of pumping 35 L/sec. Estimating the precipitation proportion of the water taking can be done by assuming the moisture surplus is 500 mm/year and that the capture area for the excavation is 15 ha (the stripped area including the excavation). This volume of water is equal to 75,000,000 L and the total volume removed from January 1 to December 31, 2017 is 144,490,500 L, which results in a proportion of groundwater of 48%. The total volume of water removed was less than the maximum taking of 196,500,000 L/year and the pumping was completed for a total of 114 days in 2017, which was less than the maximum of 150 days per year.

Condition 4.13 Publically-accessible Site

The water quality and quantity monitoring data that is required by the PTTW is available at:

www.cocoaggregates.com

To access the reports for the McCarthy Quarry click "Documents" on the homepage.

4.0 RECOMMENDATIONS

Golder recommends that the groundwater monitoring continue as outlined in the PTTW No. 7818-9QJNL4.

5.0 LIMITATIONS AND USE OF REPORT

The services performed as described in this report were conducted in a manner consistent with the level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.



Any use which a third party makes this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

### **6.0 CLOSURE**

We trust that this report meets your needs at the present time. If you have any questions or require clarification, please do not hesitate to contact the undersigned.



## Report Signature Page

### GOLDER ASSOCIATES LTD.

Jamie Bonany, M.A.Sc.  
Project Scientist

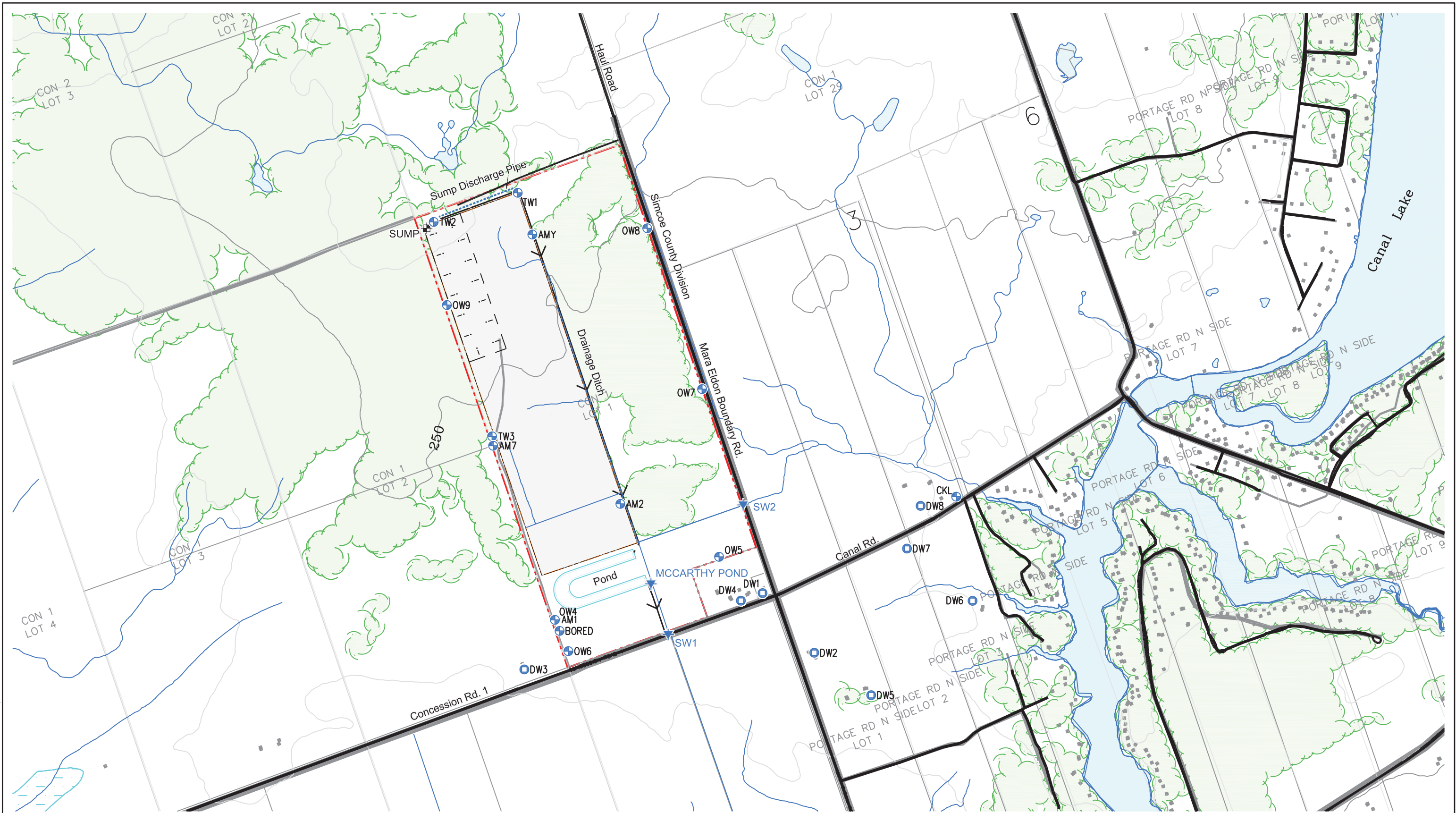
John Easton, M.Sc., P.Geo.  
Associate Senior Hydrogeologist

JEB/JAE/plc

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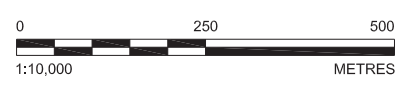
# FIGURES



- LEGEND**
- - - Approximate Property Boundary
  - - - Approximate Licenced Boundary
  - - - Approximate Extent of Quarry
  - Private Well Monitoring Location
  - ⊕ Observation Well Monitoring Location
  - ★ Surface Water Sampling Location

**REFERENCES AND NOTES**

1. Projection UTM NAD83 Zone 17
2. Mapping based on ESRI Geography Network OBM Features and 2012 Road Network
3. All Mapped features are Approximate and Not to Scale



CLIENT  
COCO / QBJR AGGREGATES INC.

PROJECT  
STAN MCCARTHY QUARRY  
2017 ANNUAL MONITORING REPORT

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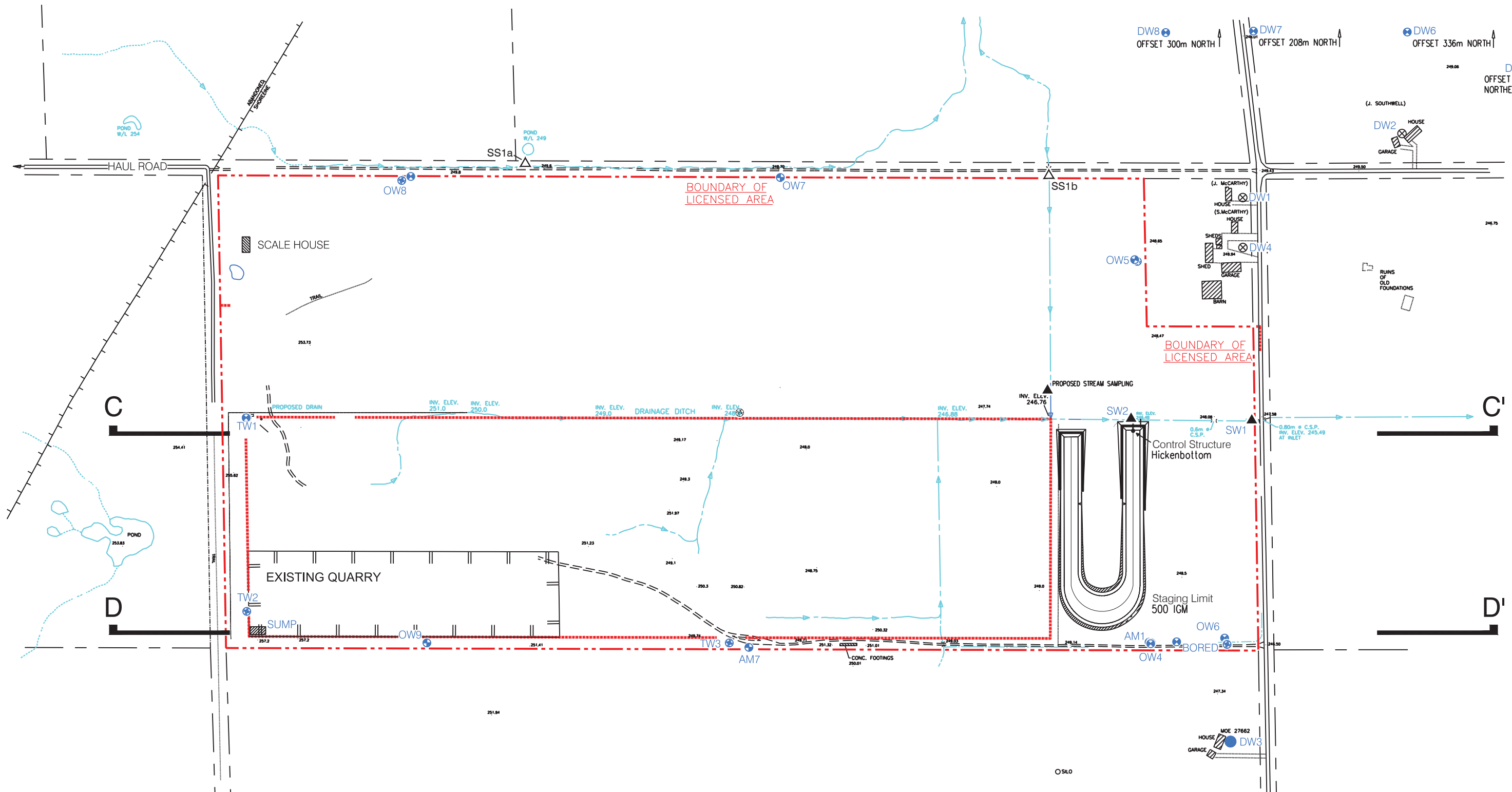
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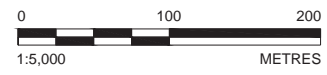




Site Digital Mapping Licenced from KIRBY & ASSOCIATES LTD

LEGEND	
	Quarry Boundary
	Limit of Extraction
	Swales and Drainage Plan
	Surface Water Sampling Location
	Private Dug Well
	Private Drilled Well
	Standpipe
	Observation Well

- NOTES**
1. Test Well AM7 inaccessible
  2. DW1 Formally Degroot
  3. DW2 Formally Southwell
  4. DW3 Formally Lamarre
  5. DW4 Formally McCarthy



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STAN MCCARTHY QUARRY  
2017 ANNUAL MONITORING REPORT

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REVIEW	
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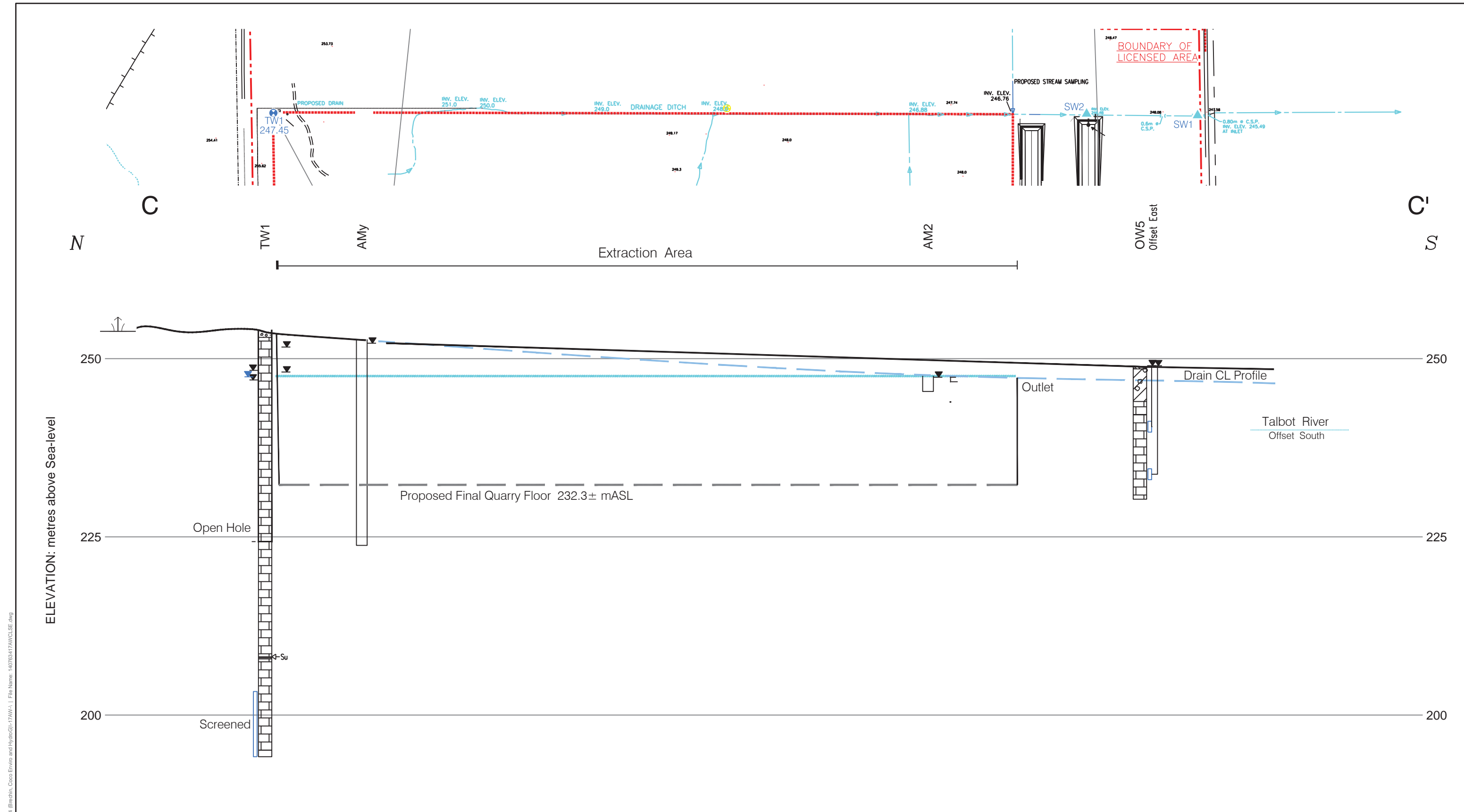


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**SITE LOCATION MAP**

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On all sections, boundaries between soil strata have been determined only at well and test well locations. Between the wells and test wells, boundaries are not proven but are assumed from geological evidence.

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2017 ANNUAL MONITORING REPORT

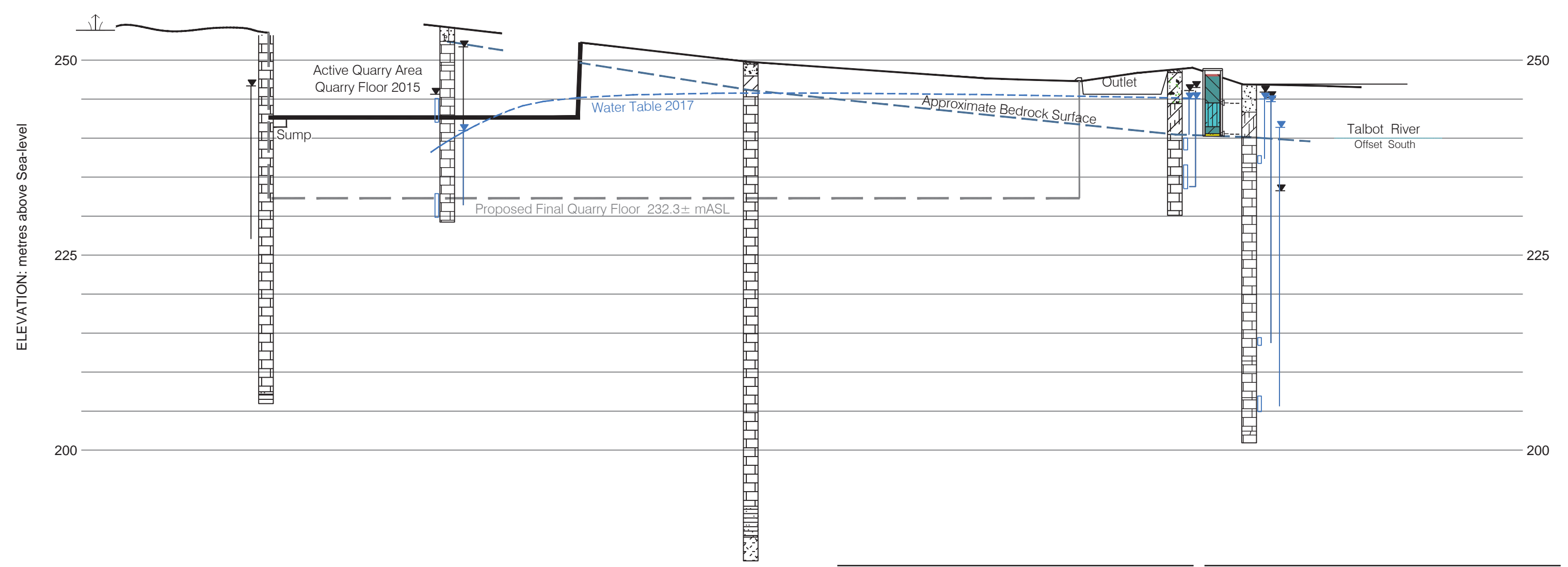
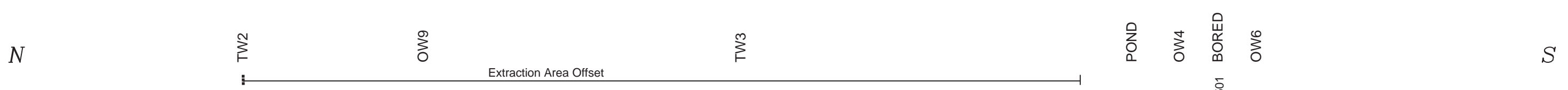
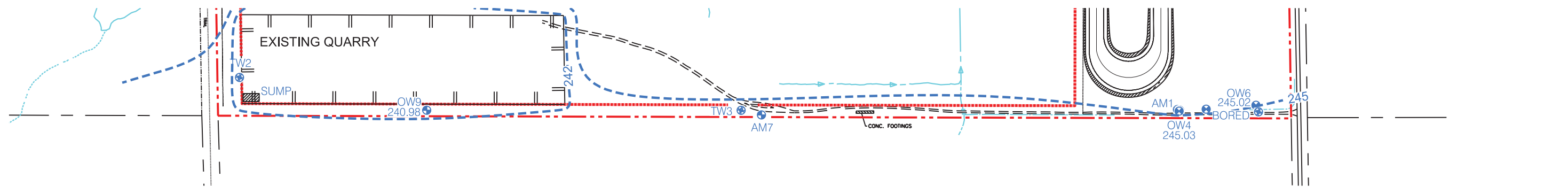
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**SITE SECTION C-C'**

PROJECT No.	Phase	Rev.	Figure
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On all sections, boundaries between soil strata have been determined only at well and test well locations. Between the wells and test wells, boundaries are not proven but are assumed from geological evidence.

Depth of Quarry measured in offset Blast Hole drilling 2014 and reflecting maximum depth

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2017 ANNUAL MONITORING REPORT

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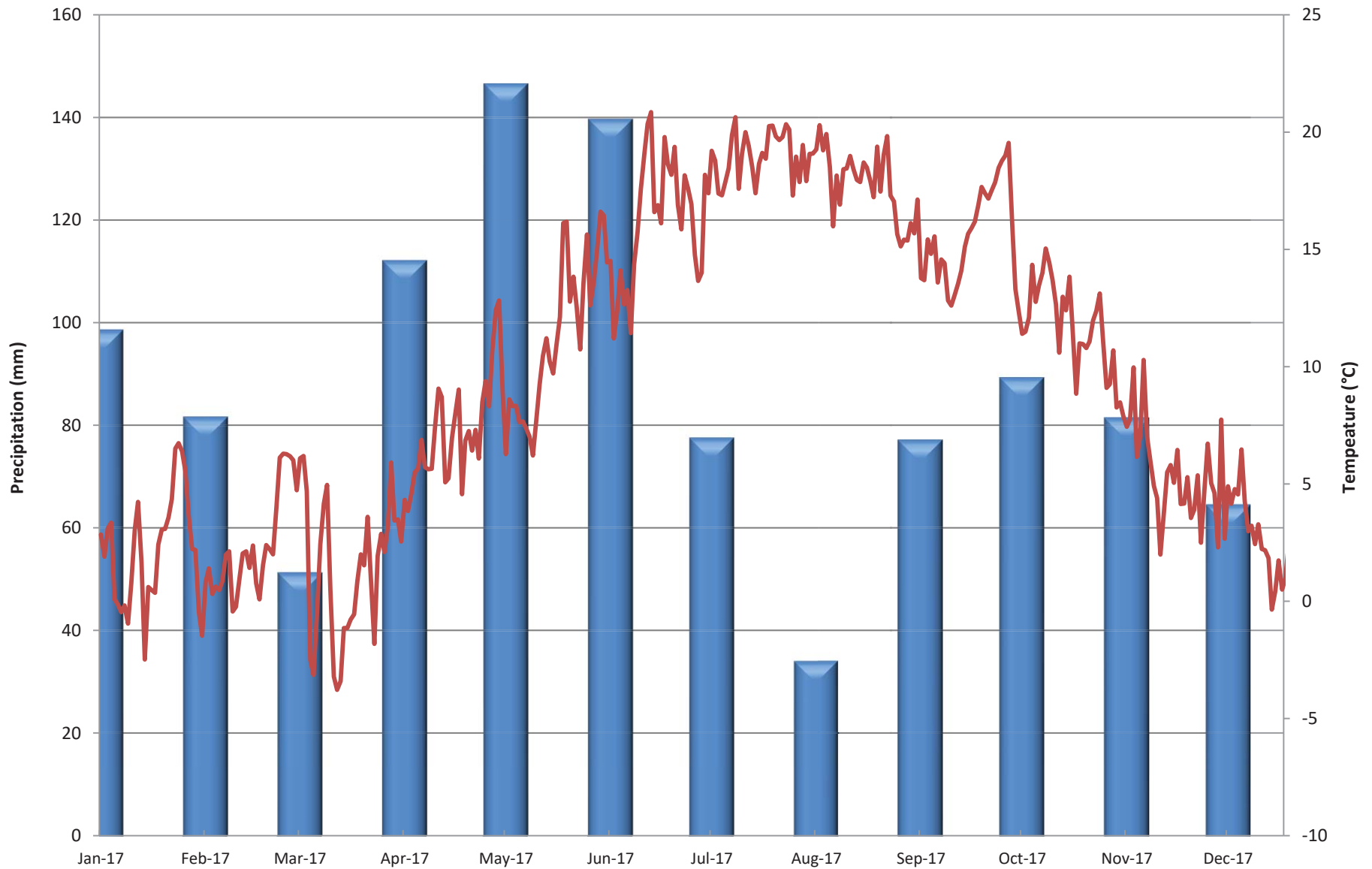
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**SITE SECTION D - D'**

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 Precipitation  
 Temperature



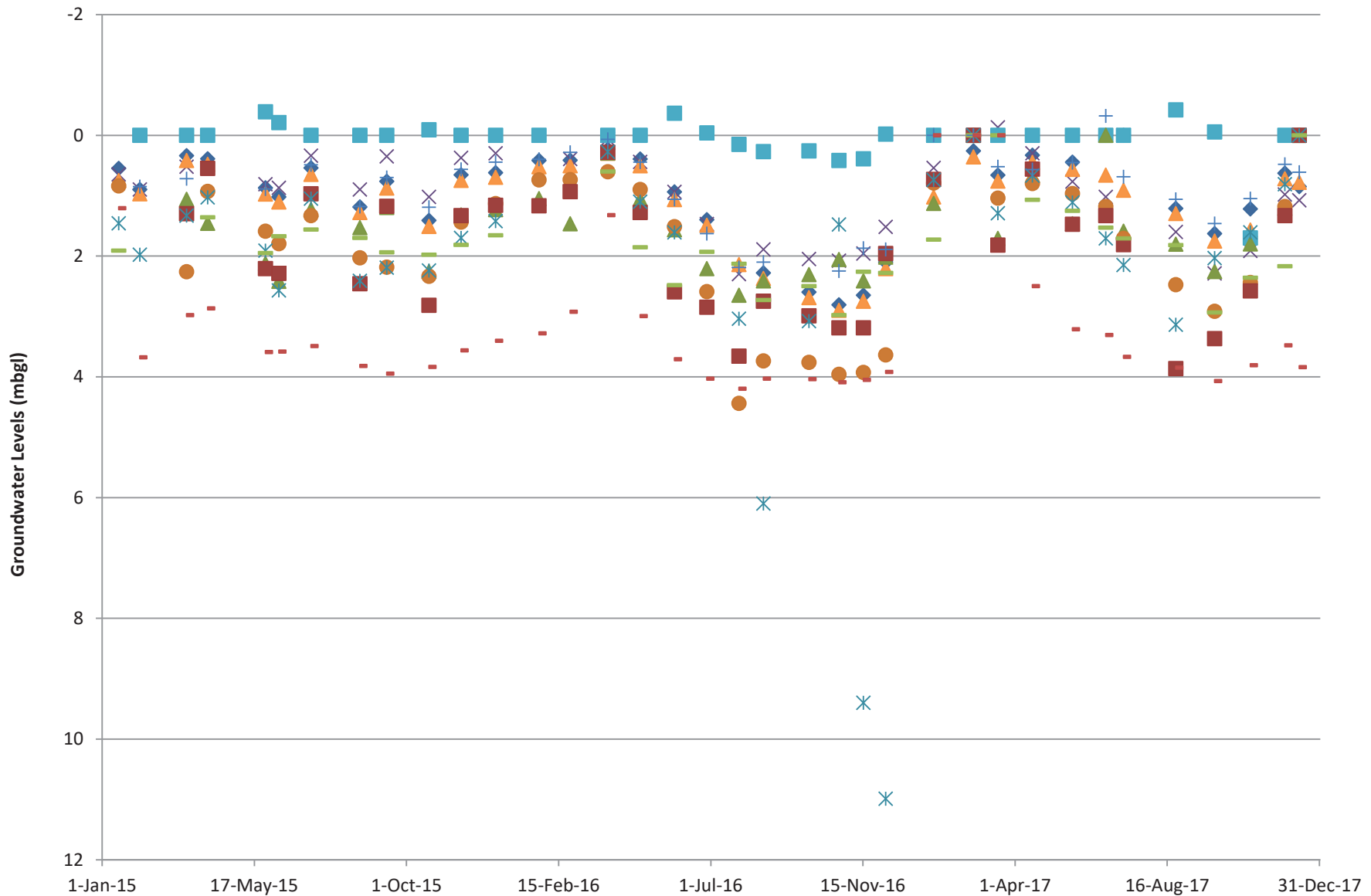
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 TEST:  
 REVIEW: JAE

**McCarthy Quarry  
On Site 2017 Weather**

FILE No.  
 PROJECT No. 1407634

QBJR/Coco Aggregates Inc.  
 PTTW Annual Report

FIGURE No  
**5**



- ◆ Bored
- CKL-1
- DW4
- + DW7
- × OW5-1
- ▲ DW1
- × DW5
- DW8
- ▲ AM1b
- DW2
- DW6



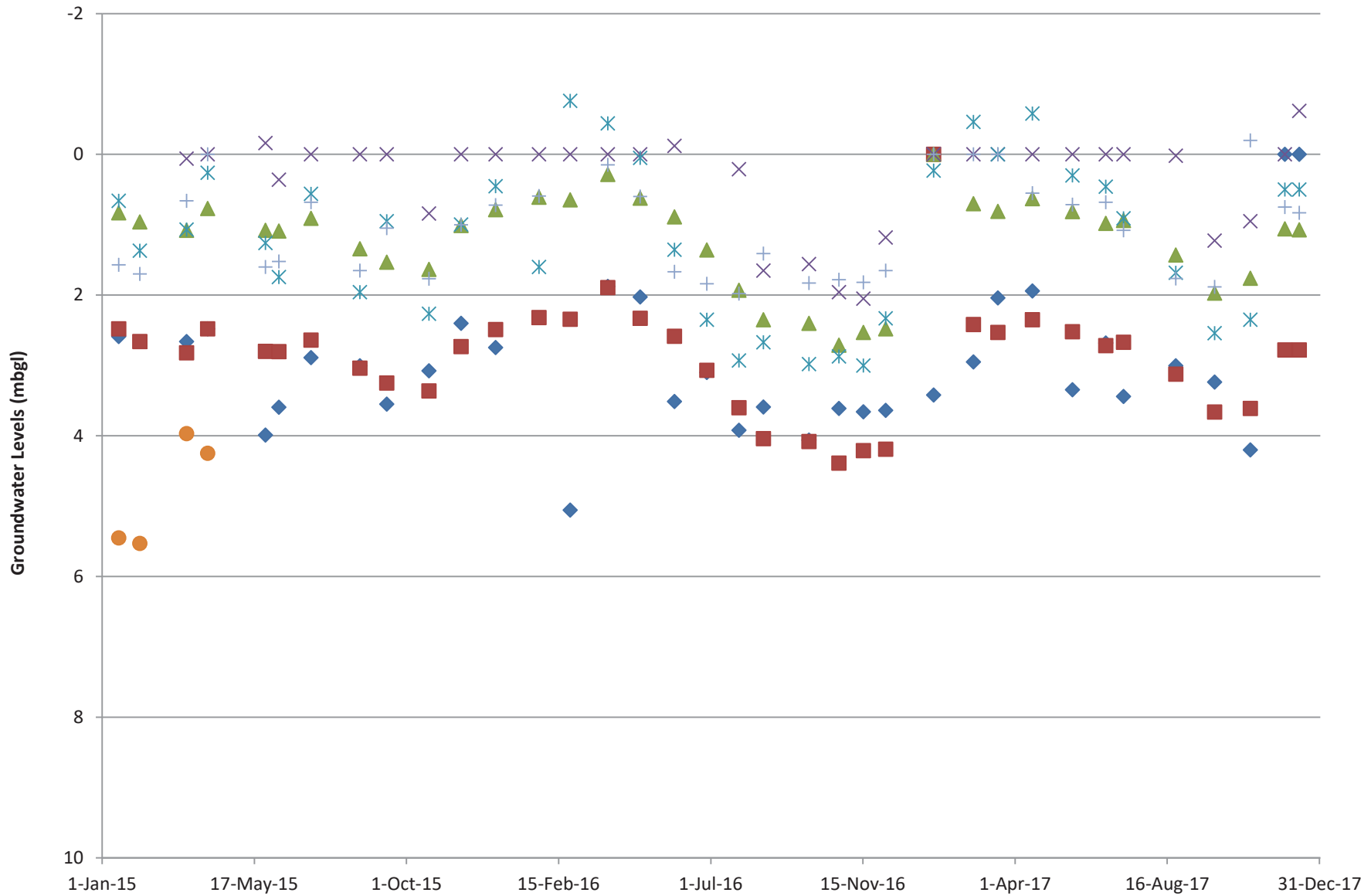
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REVIEW: JAE

**McCarthy Quarry  
Overburden Monitoring Wells  
Groundwater Levels**

QBJR/Coco Aggregates Inc.  
PTTW Annual Report

FIGURE No  
**6**



- ◆ DW3
- OW4-1
- ▲ OW6-1
- × OW7-1
- \* OW8-1
- AMx
- + CKL-2



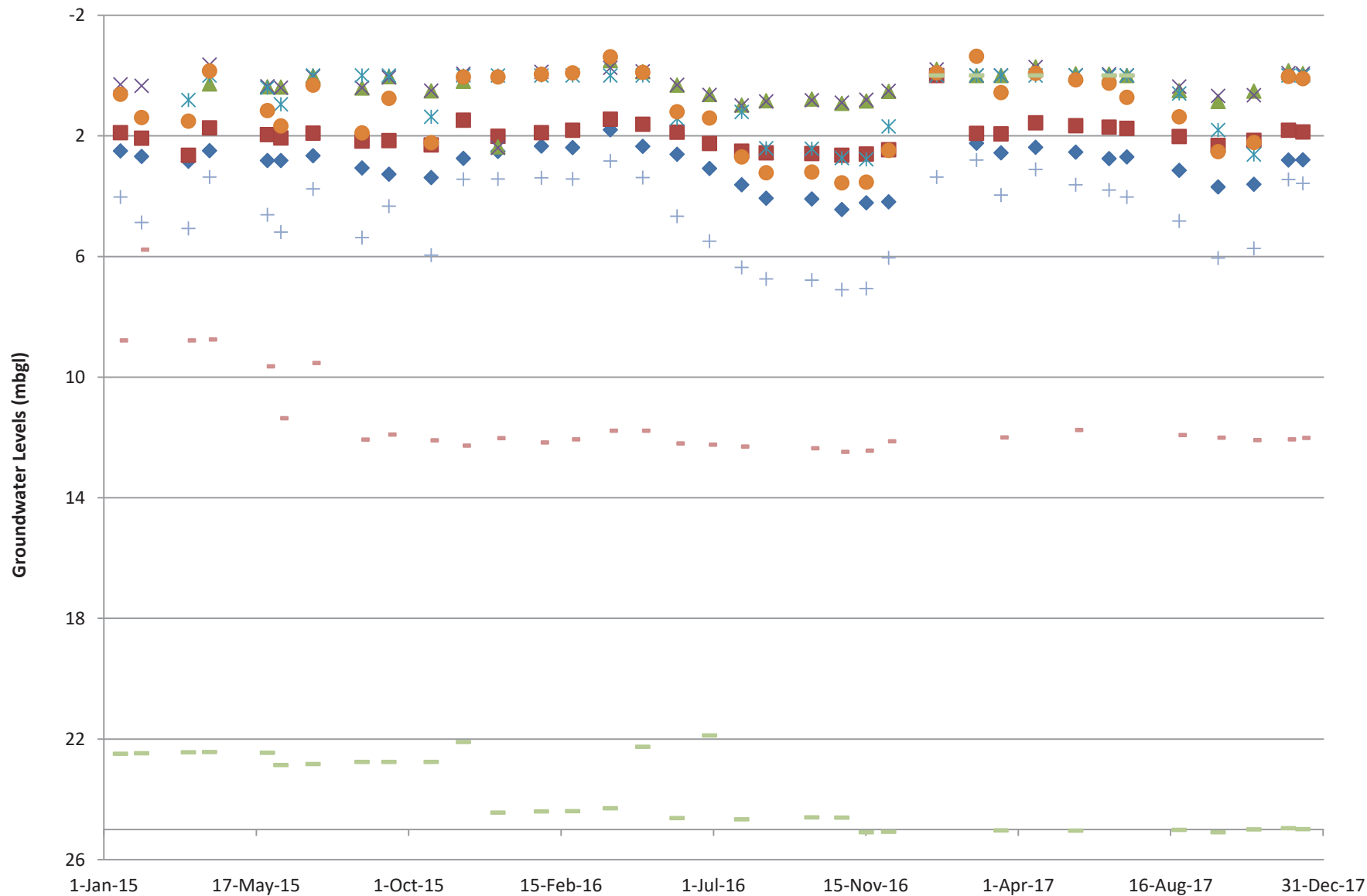
FILE No.  
PROJECT No. 1407634

SCALE: NTS  
DATE: 10-Jan-18  
CAD: JEB  
TEST:  
REVIEW: JAE

**McCarthy Quarry  
Verulam Monitoring Wells  
Groundwater Levels**

QBJR/Coco Aggregates Inc.  
PTTW Annual Report

FIGURE No  
**7**



- ◆ OW4-2    ■ OW6-2    ▲ OW5-2
- × OW5-3    × OW7-2    ● OW8-2
- + TW1-1    - OW9-1    - OW9-2



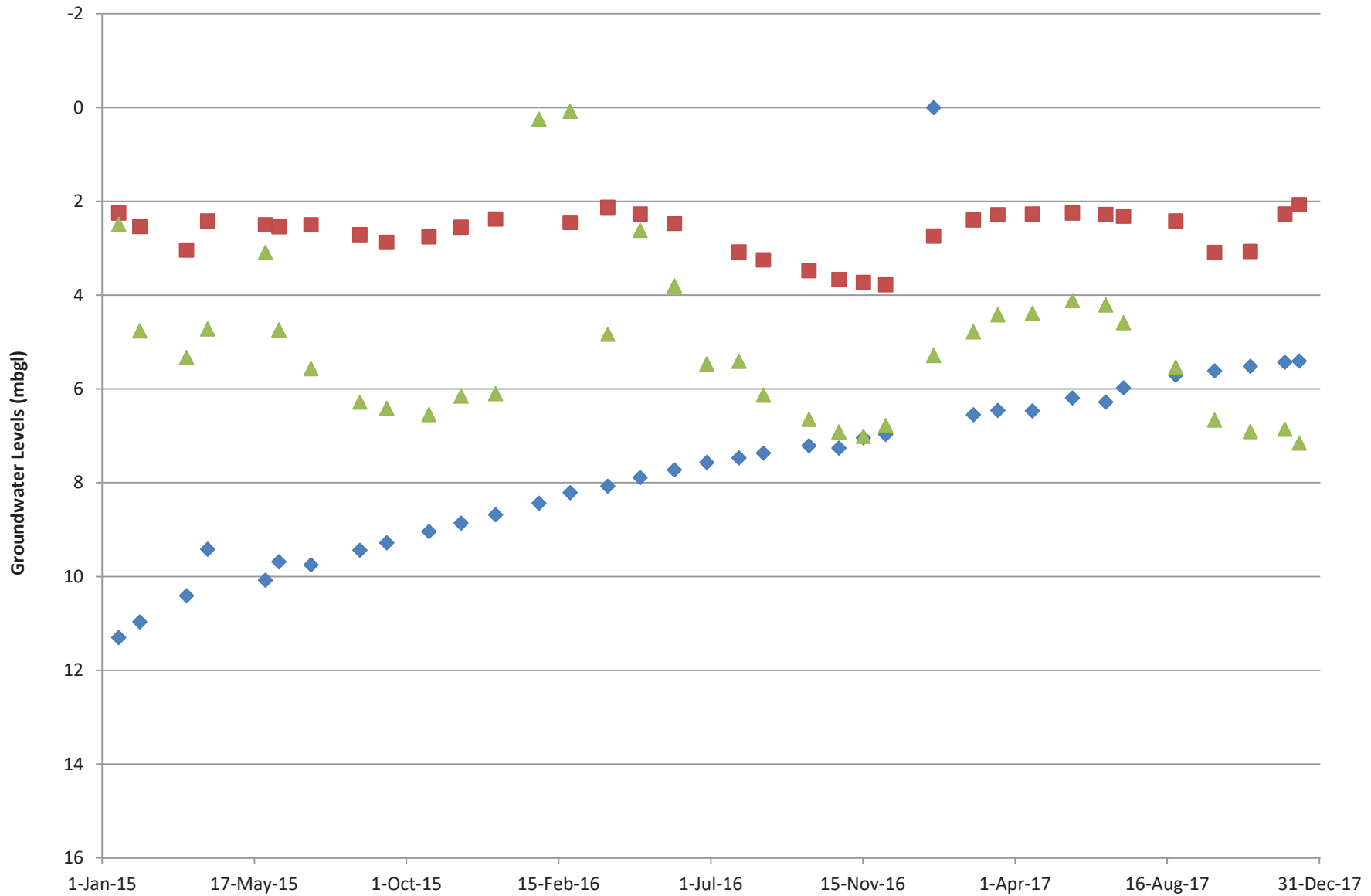
FILE No.  
PROJECT No. 1407634

SCALE: NTS  
DATE: 10-Jan-18  
CAD: JEB  
TEST:  
REVIEW: JAE

**McCarthy Quarry  
Bobcaygeon Monitoring Wells  
Groundwater Level**

QBJR/Coco Aggregates Inc.  
PTTW Annual Report

FIGURE No  
**8**



- ◆ OW6-3
- OW7-3
- ▲ OW8-3



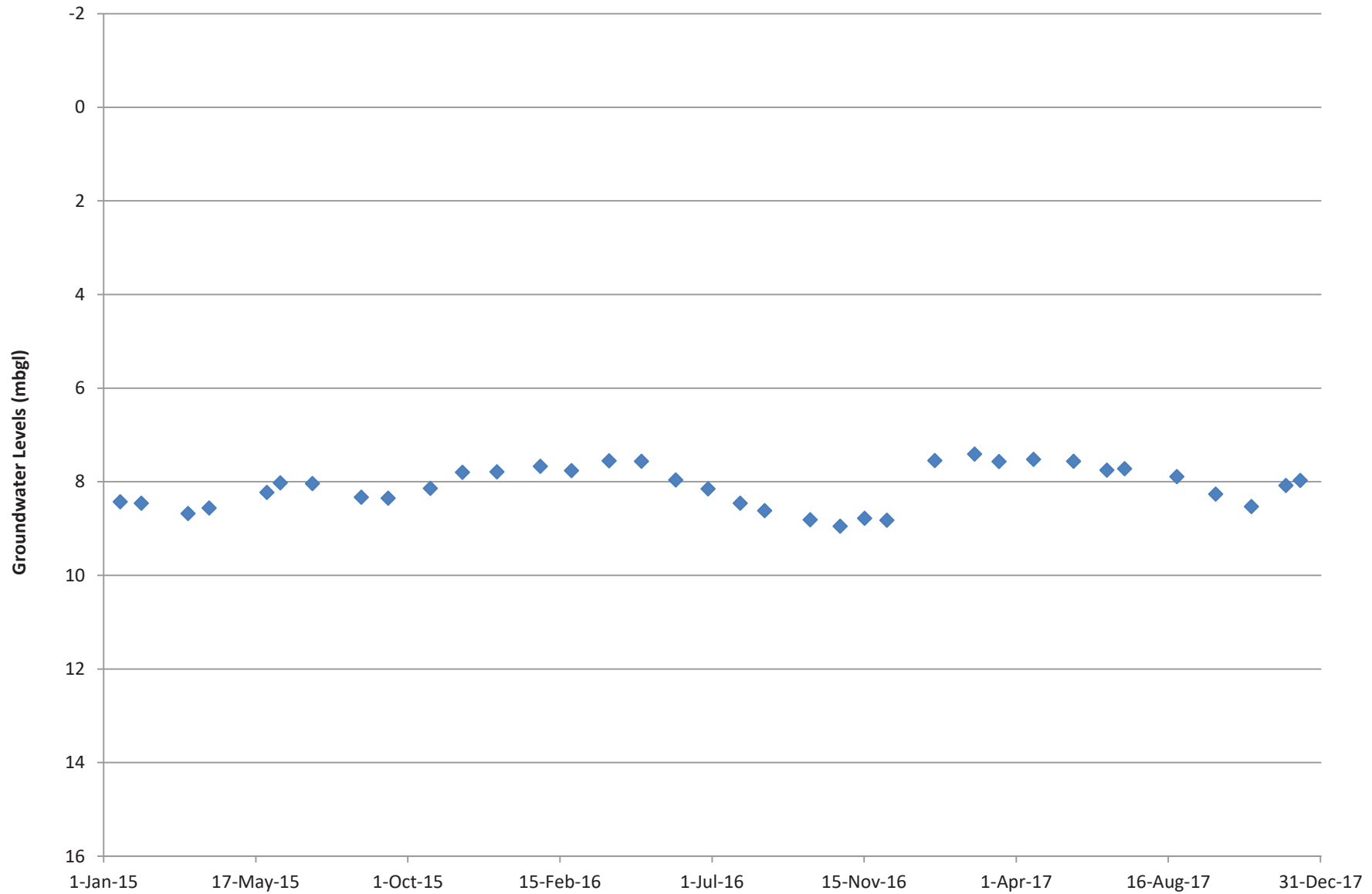
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SCALE: NTS  
DATE: 10-Jan-18  
CAD: JEB  
TEST:  
REVIEW: JAE

**McCarthy Quarry  
Gull River Monitoring Wells  
Groundwater Level**

QBJR/Coco Aggregates Inc.  
PTTW Annual Report

FIGURE No  
**9**



◆ TW1-2



FILE No.  
PROJECT No. 1407634

SCALE: NTS  
DATE: 10-Jan-18  
CAD: JEB  
TEST:  
REVIEW: JAE

**McCarthy Quarry  
Precambrian Monitoring Wells  
Groundwater Level**

QBJR/Coco Aggregates Inc.  
PTTW Annual Report

FIGURE No  
**10**



# TABLES

Well	Unit	Elevation (masl)	Stick up (m)	18-Jan-17	23-Feb-17	17-Mar-17	17-Apr-17	23-May-17	22-Jun-17	08-Jul-17	24-Aug-17	28-Sep-17	30-Oct-17	30-Nov-17	13-Dec-17
				Water Levels (mbgl)											
DW3	Verulam	246.52	0.46	3.42	2.95	2.04	1.94	3.34	2.68	3.44	3.01	3.24	4.20	NA	frozen
OW4-1	Verulam	249.57	0.88	NA	2.42	2.53	2.35	2.52	2.72	2.67	3.13	3.66	3.61	2.78	2.78
OW4-2	Bobcaygeon	249.62	0.86	NA	2.24	2.56	2.38	2.54	2.75	2.70	3.15	3.69	3.61	2.80	2.80
Bored	Overburden	248.86	0.66	NA	0.26	0.66	0.33	0.45	NA	NA	1.21	1.63	1.22	0.63	0.85
OW6-1	Verulam	247.60	0.61	NA	0.70	0.81	0.63	0.81	0.98	0.94	1.43	1.97	1.76	1.06	1.07
OW6-2	Bobcaygeon	247.52	0.53	NA	1.92	1.93	1.57	1.67	1.71	1.75	2.02	2.32	2.15	1.81	1.87
OW6-3	Gull River	247.46	0.47	NA	6.55	6.46	6.47	6.19	6.28	5.98	5.71	5.61	5.52	5.43	5.41
DW4	Overburden	250.19	0.24	0.73	frozen	1.82	0.56	1.48	1.33	1.81	3.87	3.37	2.58	1.33	frozen
DW1	Overburden	249.83	0.3	1.13	frozen	1.71	0.67	1.47	NA	1.59	1.81	2.26	1.80	1.21	frozen
OW5-1	Overburden	249.84	0.8	0.54	frozen	-0.13	0.30	0.77	1.02	NA	1.60	2.29	1.92	0.98	1.08
OW5-2	Bobcaygeon	249.76	1.0	-0.21	frozen	frozen	-0.29	-0.06	-0.05	NA	0.50	0.86	0.51	-0.16	-0.07
OW5-3	Bobcaygeon	249.70	1.0	-0.20	frozen	frozen	-0.28	-0.01	-0.04	NA	0.36	0.68	0.65	-0.08	-0.07
DW5	Overburden		0.3	0.74	frozen	1.29	0.67	1.11	1.71	2.15	3.14	2.04	1.61	0.81	frozen
DW2	Overburden	247.50	0.8	0.79	frozen	1.04	0.80	0.97	1.18	1.71	2.48	2.92	2.44	1.18	frozen
DW7	Overburden		0.32	frozen	frozen	0.52	0.57	0.46	-0.32	0.69	1.06	1.46	1.05	0.48	0.61
DW8	Overburden			frozen	frozen	frozen	2.50	3.22	3.31	3.67	3.85	4.07	3.81	3.48	3.84
DW6	Overburden		0.5	1.73	frozen	frozen	1.07	1.25	1.53	1.71	1.82	2.94	2.36	2.17	frozen
OW7-1	Verulam	249.80	0.62	flowing	flowing	flowing	flowing	flowing	flowing	flowing	0.02	1.23	0.95	flowing	-0.62
OW7-2	Bobcaygeon	249.78		flowing	flowing	flowing	flowing	flowing	flowing	flowing	0.59	1.81	2.62	flowing	flowing
OW7-3	Gull River	249.74	0.61	2.74	2.40	2.29	2.27	2.25	2.28	2.32	2.42	3.09	3.07	2.27	2.07
OW8-1	Verulam	251.47	0.76	0.23	-0.46	frozen	-0.58	0.30	0.46	0.91	1.68	2.54	2.35	0.50	0.50
OW8-2	Bobcaygeon	251.44	0.83	-0.09	-0.64	0.56	-0.07	0.15	0.25	0.72	1.37	2.53	2.22	0.03	0.10
OW8-3	Gull River	251.40	0.8	5.29	4.78	4.42	4.39	4.12	4.21	4.59	5.54	6.66	6.91	6.86	7.16
TW1-1	Bobcaygeon	254.10	0.6	3.37	2.80	3.96	3.11	3.62	3.80	4.03	4.83	6.05	5.73	3.45	3.57
TW1-2	Precambrian	254.10	0.52	7.55	7.41	7.57	7.52	7.56	7.75	7.72	7.89	8.27	8.53	8.08	7.97
OW9-1	Bobcaygeon	253.40	0.41	NA	NA	12.00	NA	11.76	NA	NA	11.92	12.01	12.09	12.06	12.02
OW9-2	Bobcaygeon	253.31	0.35	NA	NA	25.03	NA	25.04	NA	NA	25.02	25.09	25.00	24.96	24.99
CKL-1	Overburden		0.6	frozen	flowing	flowing	flowing	flowing	flowing	flowing	-0.42	-0.05	1.70	flowing	flowing
CKL-2	Verulam		0.6	frozen	frozen	frozen	0.55	0.71	0.68	1.08	1.76	1.88	-0.20	0.75	0.83
AM1b	Overburden	249.45	0.65	1.02	0.36	0.76	0.45	0.57	0.66	0.91	1.30	1.75	1.57	0.72	0.78

## Notes:

1. Highlighted cells represent groundwater measurements in terms of meters above sea level (masl)
2. Not Accessible (NA)



	Sample	DW1								DW2								
		Date	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	30-Oct-17	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	30-Oct-17
		ODWS																
Anion Sum	Sum	4.43	12.80	13	11.9	12.6	12.3	12.3	9.78	5.47	11.80	7.53	7.44	8.62	11.2	7.76	9.18	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	228	340	320	320	330	340	310	350	302	290	310	290	340	330	340	340	
Calculated TDS	mg/L	500 (AO)	<30	680	964	670	700	640	660	530	240	680	430	470	570	400	470	
Cation Sum	Sum	6.67	12.60	13.5	13.3	13.8	11.5	12.4	10.5	9.10	11.60	8.46	8.1	9.22	10.3	7.36	8.51	
Hardness (CaCO3)	mg/L	80-100 (OG)	318	540	590	580	600	500	540	460	426	4	380	350	400	450	340	380
Ion Balance (% Difference)	%	20.18	0.89	2.07	5.68	4.69	3.23	0.37	3.6	24.91	0.80	5.81	4.24	3.37	4.12	2.61	3.8	
Langelier Index (@ 20C)	NA	0	1.110	0.783	0.872	0.917	1.10	0.778	1.08	0.820	-0.796	0.78	0.984	1.01	0.923	0.905	1.04	
Langelier Index (@ 4C)	NA		0.863	0.537	0.625	0.670	0.848	0.531	0.835		-1.040	0.532	0.736	0.757	0.675	0.657	0.792	
Saturation pH (@ 20C)	NA		6.760	6.79	6.75	6.71	6.77	6.8	6.75		8.980	6.88	6.97	6.81	7.01	6.84	6.9	
Saturation pH (@ 4C)	NA		7.010	7.04	7	6.96	7.02	7.05	6.99		9.230	7.13	7.22	7.06	7.26	7.09	7.15	
Total Ammonia-N	mg/L	0.037	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.047	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Colour	TCU	5 (AO)	3.9	<2	<2	<2	<2	<2	4	5.7	<2	<2	<2	<2	<2	<2	<2	
Conductivity	uS/cm	543	1300	1300	1200	1300	1200	1300	910	682	1300	710	730	810	1100	730	840	
Fluoride (F-)	mg/L	1.5	<0.1	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.1	0.150	<0.10	0.11	0.10	0.17	0.11	0.1	
Dissolved Organic Carbon	mg/L	5 (AO)	1.20	1.3	1.1	1.1	1.5	1.4	2.0		1.10	2.9	1.7	3.6	1.9	3.2	2	
Orthophosphate (P)	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	
pH	units	6.5-8.5 (OG)	7.72	7.87	7.57	7.62	7.62	7.86	7.58	7.83	7.69	8.19	7.66	7.96	7.81	7.94	7.75	7.94
Dissolved Sulphate (SO4)	mg/L	500 (AO)	8.1	35.0	36	33	35	32	30	21	10.6	37.0	19	24	32	47	18	29
Tannins & Lignins	mg/L	0.480	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.920	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Turbidity	NTU	5	0.28	<0.2	<0.2	1.8	0.2	1.7	0.2	0.1	0.50	<0.2	<0.2	0.6	<0.1	0.3	0.3	
Alkalinity (Total as CaCO3)	mg/L	30-500 (OG)	229	340	320	320	330	350	310	360	303	300	310	290	340	330	340	340
Dissolved Chloride (Cl)	mg/L	250 (OG)	21	190	210	170	190	170	200	77	14	180	35	41	38	130	22	63
Nitrite (N)	mg/L	1	<0.03	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.03	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Nitrate (N)	mg/L	10	0.11	0.20	0.59	0.35	0.29	0.16	0.13	0.43	0.28	0.85	<0.10	<0.10	<0.10	1.39	<0.10	0.14
Nitrate + Nitrite	mg/L	10	0.200	0.59	0.35	0.29	0.16	0.13	0.43		0.850	<0.10	<0.10	<0.10	1.39	<0.10	0.14	
Dissolved Aluminum (Al)	mg/L	0.1 (OG)	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Dissolved Antimony (Sb)	ug/L	6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Arsenic (As)	ug/L	25	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Dissolved Barium (Ba)	ug/L	1000	60.9	160.0	180	140	170	110	170	90	64.1	2.0	74	76	85	170	51	69
Dissolved Beryllium (Be)	ug/L		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Boron (B)	ug/L	5000	19.7	38.0	21	25	25	30	36	40	129.0	25.0	88	11	30	33	44	17
Dissolved Cadmium (Cd)	ug/L	5	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Calcium (Ca)	mg/L	107.0	160.0	180.0	170.0	190.0	150.0	160.0	150.0	151.0	1.1	120.0	100.0	130.0	89.0	120.0	110.0	
Dissolved Chromium (Cr)	ug/L	50	<1	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	7.9	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Dissolved Cobalt (Co)	ug/L				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50			<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Copper (Cu)	ug/L	1000 (AO)	21.4	26.0	96	1.5	110	1.6	130	<1.0	1.7	24.0	2.7	<1.0	1.3	1.9	1.5	<1.0
Dissolved Iron (Fe)	mg/L	0.3 (AO)	0.040	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.062	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Dissolved Lead (Pb)	ug/L	10			3.5	<0.50	2.5	<0.50	<0.50	<0.50			<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Magnesium (Mg)	mg/L		13.2	33.0	36.0	35.0	30.0	29.0	32.0	21.0	11.9	0.3	17.0	23.0	19.0	55.0	9.8	26.0
Dissolved Manganese (Mn)	ug/L	50 (AO)	1.9	75.0	6.8	44	3.1	34	4.1	32	2.6	<2.0	17	6.5	32	6.6	15	<2.0
Dissolved Molybdenum (Mo)	ug/L		<1	0.5		<0.50	<0.50	<0.50	<0.50	<0.50	4.6	1.2		<0.50	<0.50	1.4	<0.50	<0.50
Dissolved Nickel (Ni)	ug/L		2.8	1.4		<1.0	<1.0	<1.0	<1.0	<1.0	5.5	<1.0		<1.0	1.3	<1.0	<1.0	<1.0
Dissolved Phosphorus (P)	mg/L		0.008	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	0.018	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		0.71	1.90	1.60	2.1	1.6	2.0	1.8	1.6	5.8	0.5	7.0	3.5	8.6	3.3	4.3	3.2
Dissolved Selenium (Se)	ug/L	10	<1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Dissolved Silicon (Si)	mg/L			8.20		8.70	7.2	8.0	7.0	8.4	<0.6	8.2		6.7	5.0	9.1	3.9	7.6
Dissolved Silver (Ag)	ug/L		<0.1	<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
Dissolved Sodium (Na)	mg/L	200 (OG)	10.6	40.0	37.0	41.0	41.0	33.0	38.0	29.0	17.0	270.0	18.0	22.0	22.0	30.0	12.0	21.0
Dissolved Strontium (Sr)	mg/L		0.182	0.550		0.570	0.580	0.520	0.630	0.390	0.264	0.003		0.0003	0.350	0.630	0.280	0.340
Dissolved Thallium (Tl)	mg/L		0.0005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0002	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Dissolved Titanium (Ti)	ug/L		<1	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0	<1	<5.0		<5.0	<5.0	<5.0	<5.0	<5.0
Dissolved Uranium (U)	mg/L	0.02	<0.001	0.002		0.0011	0.0015	0.00088	0.0014	0.00076	<0.001	0.003		0.00052	0.00072	0.0029	0.00031	0.00071
Dissolved Vanadium (V)	ug/L		<1	<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	2.3	<0.50		<0.50	0.77	<0.50	0.56	
Dissolved Zinc (Zn)	ug/L	5000 (AO)	12.8	71.0	41	6.8	36	<5.0	14	<5.0	<1	32.0	5.5	5.4	19	<5.0	5.1	<5.0

Notes:  
 AO: aesthetic objective  
 OG: operational guideline

	Sample	MOE 5727662 (DW3)								
		Date	13-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	30-Oct-17
		ODWS								
Anion Sum	Sum	6.65	8.62	8.57	10.2	8.90	9.10	8.79	8.57	
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	220	230	230	250	240	230	240	230	
Calculated TDS	mg/L	500 (AO)	400	460	464	570	490	490	460	
Cation Sum	Sum	6.81	8.13	9.11	11	9.05	8.86	8.74	8.6	
Hardness (CaCO3)	mg/L	80-100 (OG)	167	180	190	190	200	180	180	
Ion Balance (% Difference)	%	1.19	2.94	3.06	3.82	0.820	1.34	0.29	0.16	
Langelier Index (@ 20C)	NA		0.601	0.471	0.635	0.439	0.548	0.368	0.48	
Langelier Index (@ 4C)	NA		0.353	0.223	0.387	0.191	0.300	0.12	0.232	
Saturation pH (@ 20C)	NA		7.560	7.55	7.55	7.53	7.59	7.57	7.61	
Saturation pH (@ 4C)	NA		7.810	7.8	7.8	7.78	7.83	7.82	7.85	
Total Ammonia-N	mg/L	0.379	0.470	0.42	<0.050	<0.050	0.46	<0.050	0.41	
Colour	TCU	5 (AO)	<2	<2	<2	<2	<2	<2	<2	
Conductivity	uS/cm	393	860	890	1100	900	960	900	860	
Fluoride (F-)	mg/L	1.5	0.560	0.730	0.72	0.8	0.75	0.79	0.77	
Dissolved Organic Carbon	mg/L	5 (AO)	0.97	0.77	0.72	0.78	0.23	1.1	0.38	
Orthophosphate (P)	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
pH	units	6.5-8.5 (OG)	8.05	8.16	8.02	8.19	7.97	8.13	7.94	
Dissolved Sulphate (SO4)	mg/L	500 (AO)	4.1	2.0	5	<10	6.9	1.5	6	
Tannins & Lignins	mg/L		0.210	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Turbidity	NTU	5	0.29	0.20	<0.2	<0.2	0.1	0.3	0.4	
Alkalinity (Total as CaCO3)	mg/L	30-500 (OG)	222	240	230	250	240	230	230	
Dissolved Chloride (Cl)	mg/L	250 (OG)	106	130	130	180	140	160	140	
Nitrite (N)	mg/L	1	<0.03	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Nitrate (N)	mg/L	10	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Nitrate + Nitrite	mg/L	10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Dissolved Aluminum (Al)	mg/L	0.1 (OG)	0.002	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	
Dissolved Antimony (Sb)	ug/L	6				<0.50	<0.50	<0.50	<0.50	
Dissolved Arsenic (As)	ug/L	25	1.600	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Dissolved Barium (Ba)	ug/L	1000	186.0	200.0	190	220	190	210	190	
Dissolved Beryllium (Be)	ug/L					<0.50	<0.50	<0.50	<0.50	
Dissolved Boron (B)	ug/L	5000	696.0	810.0	790	770	730	760	820	
Dissolved Cadmium (Cd)	ug/L	5	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	
Dissolved Calcium (Ca)	mg/L		28.0	34.0	35.0	34.0	36.0	33.0	33.0	
Dissolved Chromium (Cr)	ug/L	50	1.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	
Dissolved Cobalt (Co)	ug/L					<0.50	<0.50	<0.50	<0.50	
Dissolved Copper (Cu)	ug/L	1000 (AO)	6.3	4.9	2.7	97	9.5	<1.0	<1.0	
Dissolved Iron (Fe)	mg/L	0.3 (AO)	0.167	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	
Dissolved Lead (Pb)	ug/L	10			<0.50	<0.50	<0.50	<0.50	<0.50	
Dissolved Magnesium (Mg)	mg/L		23.0	22.0	26.0	26.0	24.0	25.0	25.0	
Dissolved Manganese (Mn)	ug/L	50 (AO)	5.8	4.8	4.6	<2.0	<2.0	4.3	3.9	
Dissolved Molybdenum (Mo)	ug/L		<1	<0.50		0.65	<0.50	<0.50	<0.50	
Dissolved Nickel (Ni)	ug/L		1.6	<1.0		<1.0	<1.0	<1.0	<1.0	
Dissolved Phosphorus (P)	mg/L		<0.001	<0.1		<0.1	<0.1	<0.1	<0.1	
Dissolved Potassium (K)	mg/L		6.4	7.5	7.4	7.20	6.9	7.6	7.1	
Dissolved Selenium (Se)	ug/L	10	1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Dissolved Silicon (Si)	mg/L		3.18	4.60		5.40	5.60	5.00	5.50	
Dissolved Silver (Ag)	ug/L		<0.1	<0.10		0.64	<0.10	<0.10	<0.10	
Dissolved Sodium (Na)	mg/L	200 (OG)	87.4	100.0	120.0	160.0	110.0	120.0	110.0	
Dissolved Strontium (Sr)	mg/L		2.35	2.40		2.50	2.50	2.50	2.20	
Dissolved Thallium (Tl)	mg/L		0.0004	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005	
Dissolved Titanium (Ti)	ug/L		<1	<5.0		<5.0	<5.0	<5.0	<5.0	
Dissolved Uranium (U)	mg/L	0.02	<0.001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	
Dissolved Vanadium (V)	ug/L		<1	<0.50		<0.50	<0.50	<0.50	<0.50	
Dissolved Zinc (Zn)	ug/L	5000 (AO)	13.4	12.0	<5.0	480	210	<5.0	6.9	

Notes:  
 AO: aesthetic objective  
 OG: operational guideline

Parameter	Units	Sample	AM1B								BORED WELL							
		Date	02-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17	02-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	ODWS	382	230	210	200	220	240	210	220	212	200	210	210	230	210	230	220
Total Ammonia-N	mg/L		0.09	0.16	0.075	0.12	0.14	0.11	0.12	0.16	0.02	0.07	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Colour	TCU	<b>5 (AO)</b>	<b>7.4</b>	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Conductivity	uS/cm		488	470	480	470	480	500	470	490	477	480	490	490	490	470	490	490
Total Dissolved Solids	mg/L	<b>500 (AO)</b>	317	244	280	280	290	290	280	270	264	274	290	290	300	280	300	280
Fluoride (F-)	mg/L	<b>1.5</b>	<0.3	0.24	0.23	0.26	0.24	0.23	0.25	0.27	<0.3	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Dissolved Organic Carbon	mg/L	<b>5 (AO)</b>	1.10	0.86	0.7	0.63	0.81	0.61	0.82	0.72	1.40	1.20	0.92	0.88	0.91	1.0	1	1
Hardness	mg/L	<b>80-100 (OG)</b>			240	240	240	240	240	220			180	190	210	190	220	170
Phosphate	mg/L		< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	units	<b>6.5-8.5 (OG)</b>	7.56	7.97	7.92	7.92	7.98	8.03	7.92	7.99	7.57	8.33	8.18	8.2	8.13	8.23	8.17	8.19
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	<b>500 (AO)</b>	31	36	38	41	41	33	41	37	33	36	34	33	34	31	32	30
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	<b>30-500 (OG)</b>	383	230	210	210	220	240	210	220	213	210	210	230	210	230	230	230
Dissolved Chloride (Cl)	mg/L	<b>250 (AO)</b>	5.52	5.00	4	3.9	3.0	3.4	3.2	2.7	4.14	6.00	7	6.1	4.2	4.5	3.5	3.1
Nitrite (N)	mg/L	<b>1</b>	<0.09	<0.010	0.019	<0.010	0.012	<0.010	0.012	<0.010	<0.09	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	<b>10</b>	<0.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.39	0.45	0.29	0.33	0.36	0.44	0.38	0.45
Nitrate + Nitrite	mg/L	<b>10</b>		<0.10	<0.10		<0.10	<0.10	<0.10	<0.10		0.4500	0.29		0.36	0.44	0.38	0.45
Dissolved Calcium (Ca)	mg/L		42	49	46	46	47	48	45	42	29	28	39	40	48	40	48	35
Dissolved Magnesium (Mg)	mg/L		22	29	30	30	31	30	31	29	20	21	21	21	23	21	25	21
Dissolved Phosphorus (P)	mg/L		1.48	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		1.7	2.2	2.3	2.0	2.3	2.3	2.4	2.3	22	24	16	18	13	14	13	13
Dissolved Sodium (Na)	mg/L	<b>200 (AO)</b>	4.6	6.7	6.8	6.9	6.5	6.5	7.6	6.4	26	29	25	26	21	19	19	20

Notes:  
 AO: aesthetic objective  
 OG: operational guideline  
 Exceedances of the OWDS (operational guidelines excluded) are shown in bold.

Parameter	Units	Sample	OW4-I								OW4-II							
		Date	02-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17	02-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	ODWS	222	280	260	270	280	260	260	250	294	280	280	270	280	240	230	230
Total Ammonia-N	mg/L		0.28	0.99	0.72	0.89	0.74	0.84	0.77	1.3	0.59	0.82	0.77	0.81	0.80	1.1	1.1	1.1
Colour	TCU	5 (AO)	6.9	<2	<2	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Conductivity	uS/cm		830	890	760	850	950	910	1200	1600	766	1000	900	1000	1100	1800	1800	1900
Total Dissolved Solids	mg/L	500 (AO)	470	608	430	460	530	490	630	780	436	650	530	550	570	930	910	910
Fluoride (F-)	mg/L	1.5	1.00	1.40	1.5	1.5	1.4	1.4	1.2	0.99	1.30	1.30	1.5	1.4	1.3	0.95	0.95	0.91
Dissolved Organic Carbon	mg/L	5 (AO)	1.60	1.30	1.6	1.3	1.8	3.2	2.2	1.9	1.50	1.30	1.1	1.1	1.2	1.1	1.1	1.1
Hardness	mg/L	80-100 (OG)			72	76	94	82	130	170			120	120	130	250	250	230
Phosphate	mg/L		< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.3	<0.010	<0.010	<0.010	0.014	<0.010	<0.010	<0.010
pH	units	6.5-8.5 (OG)	8.26	8.38	8.33	8.27	8.28	8.45	8.16	8.06	7.75	8.10	8.18	8.13	8.09	8.05	7.94	7.96
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	500 (AO)	22	2	4	6.3	4.1	11	6.7	2.9	1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	30-500 (OG)	226	290	260	280	290	270	260	260	296	280	280	280	280	240	230	240
Dissolved Chloride (Cl)	mg/L	250 (AO)	95.80	120.00	84	95	130	120	210	330	84.8	150	110	140	160	430	400	430
Nitrite (N)	mg/L	1	<0.09	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.09	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	10	0.16	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	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
Dissolved Calcium (Ca)	mg/L		12	18	14	15	18	16	24	32	14	20	22	22	24	45	47	42
Dissolved Magnesium (Mg)	mg/L		6.7	11.0	9	9.3	12	10	17	22	8.2	13.0	15	15	16	32	33	31
Dissolved Phosphorus (P)	mg/L		3.58	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		3.7	5.2	4.9	6.0	6.2	5.2	6.7	7.5	4.72	6.10	6.8	7.0	7.3	9.9	11	9.8
Dissolved Sodium (Na)	mg/L	200 (AO)	127	160	140	150	170	150	190	210	118	170	190	190	180	260	260	250

Notes:  
 AO: aesthetic objective  
 OG: operational guideline  
 Exceedances of the OWDS (operational guidelines excluded) are :

Parameter	Units	Sample	OW5-I								OW5-II							
		Date	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17
		ODWS																
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L		179.0	240.0	220	230	230	240	230	250	82.7	110.0	110	110	110	110	110	110
Total Ammonia-N	mg/L		0.75	0.83	0.84	0.91	0.65	0.78	0.81	0.78	10.20	9.60	9.4	9.9	9.2	9.5	9.4	9.6
Colour	TCU	<b>5 (AO)</b>	<b>38.8</b>	<2	<2	<2	<2	4	<2	<2	<b>25.9</b>	<b>30.0</b>	<b>73</b>	<b>26</b>	<b>51</b>	<b>100</b>	<b>51</b>	<b>9</b>
Conductivity	uS/cm		585	590	610	610	620	620	600	690	25900	28000	28000	26000	29000	27000	28000	28000
Total Dissolved Solids	mg/L	<b>500 (AO)</b>	355	324	330	340	350	340	340	360	<b>18100</b>	<b>16100</b>	<b>17000</b>	<b>16000</b>	<b>16000</b>	<b>16000</b>	<b>16000</b>	<b>16000</b>
Fluoride (F-)	mg/L	<b>1.5</b>	0.60	0.91	0.85	0.90	0.85	0.89	0.82	0.8	<0.5	0.48	0.44	0.46	0.45	0.45	0.44	0.47
Dissolved Organic Carbon	mg/L	<b>5 (AO)</b>	1.90	1.50	1.2	1.1	1.2	1.3	1.4	1.3	<0.4	0.61	0.49	0.34	0.53	0.48	0.7	0.49
Hardness	mg/L	<b>80-100 (OG)</b>			160	160	170	160	170	160			6100	5900	6300	6300	6300	5200
Phosphate	mg/L		< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	units	<b>6.5-8.5 (OG)</b>	7.54	8.20	8.04	8.05	8.02	8.11	8.01	8.02	6.86	7.42	7.23	7.31	7.28	7.34	7.27	7.34
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	<b>500 (AO)</b>	24	28	28	29	32	27	28	31	4	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	<b>30-500 (OG)</b>	180	240	230	230	240	240	230	250	83	110	110	110	110	110	110	110
Dissolved Chloride (Cl)	mg/L	<b>250 (AO)</b>	32.30	34.00	36	37	39	35	37	44	<b>7550</b>	<b>9900</b>	<b>11000</b>	<b>9900</b>	<b>10000</b>	<b>9800</b>	<b>10000</b>	<b>11000</b>
Nitrite (N)	mg/L	<b>1</b>	<0.09	0.03	0.072	0.121	0.107	0.066	0.033	0.055	<0.7	<0.050	<0.010	<0.010	0.013	<0.010	<0.050	<0.010
Nitrate (N)	mg/L	<b>10</b>	0.65	0.59	0.24	0.25	0.41	0.26	<0.10	0.39	1.50	<0.50	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10
Nitrate + Nitrite	mg/L	<b>10</b>		0.6200	0.31		0.52	0.32	<0.10	0.45		<0.50	<0.10		<0.10	<0.10	<0.50	<0.10
Dissolved Calcium (Ca)	mg/L		23	29	28	31	31	29	29	29	1260.00	1200.00	1300	1200	1300	1300	1200	1000
Dissolved Magnesium (Mg)	mg/L		16	20	21	21	22	21	22	22	590.0	740.0	730	710	750	760	780	640
Dissolved Phosphorus (P)	mg/L		0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	<0.01	<1	<1	<1	<1	<0.5	<1
Dissolved Potassium (K)	mg/L		5.5	7.0	6.6	8.0	7.2	7.5	6.9	7.4	76.60	66.00	68	70	69	77	74	62
Dissolved Sodium (Na)	mg/L	<b>200 (AO)</b>	53	66	65	64	63	64	64	64	<b>3200</b>	<b>3600</b>	<b>3700</b>	<b>3700</b>	<b>3800</b>	<b>3900</b>	<b>3900</b>	<b>3300</b>

Notes:  
 AO: aesthetic objective  
 OG: operational guideline  
 Exceedances of the OWDS (operational guidelines excluded) are :

Parameter	Units	Sample	OW5-III							OW6-II								
		Date	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17	02-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	30-Oct-17
		ODWS																
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L		95.1	110	110	100	110	120	110	130	134	170	150	160	160	150	150	
Total Ammonia-N	mg/L		10.30	9.60	9.5	11	8.9	10	9.6	10	0.03	0.83	0.82	1.4	1.0	1.3	0.059	0.96
Colour	TCU	<b>5 (AO)</b>	<b>37.3</b>	<b>6.0</b>	<b>38</b>	<b>18</b>	<b>35</b>	<b>59</b>	2	5	2.8	3.0	<2	2	<2	<2	<2	
Conductivity	uS/cm		26500	22000	29000	37000	27000	32000	29000	33000	2110	4200	5400	6000	6200	6300	6400	6300
Total Dissolved Solids	mg/L	<b>500 (AO)</b>	<b>19600</b>	<b>15500</b>	<b>17000</b>	<b>22000</b>	<b>16000</b>	<b>18000</b>	<b>17000</b>	<b>20000</b>	<b>1260</b>	<b>3270</b>	<b>3100</b>	<b>3800</b>	<b>3800</b>	<b>4000</b>	<b>4000</b>	<b>3700</b>
Fluoride (F-)	mg/L	<b>1.5</b>	<0.5	0.39	0.42	0.44	0.44	0.43	0.44	0.43	<0.3	0.38	0.46	0.49	0.49	0.51	0.51	0.52
Dissolved Organic Carbon	mg/L	<b>5 (AO)</b>	<0.4	0.82	0.97	1.4	1.1	1.3	0.78	1.1	1.30	1.60	1.2	0.86	1.0	0.63	0.77	0.82
Hardness	mg/L	<b>80-100 (OG)</b>			6200	8300	6600	6900	6500	6400			1100	1400	1600	1600	1600	1400
Phosphate	mg/L		< 0.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	units	<b>6.5-8.5 (OG)</b>	6.99	7.50	7.35	7.21	7.28	7.45	7.33	7.36	7.78	7.89	7.82	7.67	7.69	7.77	7.6	7.67
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	<b>500 (AO)</b>	53	27	20	150	33	77	14	83	199	450	570	1000	1000	1100	1100	990
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	<b>30-500 (OG)</b>	95	110	110	100	110	120	110	130	135	170	150	160	160	160	150	150
Dissolved Chloride (Cl)	mg/L	<b>250 (AO)</b>	<b>8060</b>	<b>8000</b>	<b>11000</b>	<b>14000</b>	<b>9900</b>	<b>11000</b>	<b>10000</b>	<b>13000</b>	<b>112.00</b>	<b>1000.00</b>	<b>1400</b>	<b>1400</b>	<b>1400</b>	<b>1500</b>	<b>1500</b>	<b>1400</b>
Nitrite (N)	mg/L	<b>1</b>	<0.7	0.17	<0.010	0.015	0.013	<0.010	<0.050	<0.010	<0.09	0.02	0.256	0.026	0.127	0.020	0.019	0.114
Nitrate (N)	mg/L	<b>10</b>	<0.1	0.12	<0.10	<0.10	<0.10	<0.10	<0.50	<0.10	0.75	0.11	0.66	<0.10	<0.10	<0.10	1.24	0.18
Nitrate + Nitrite	mg/L	<b>10</b>		0.3000	<0.10		0.10	<0.10	<0.50	<0.10		0.1300	0.91		0.21	<0.10	1.26	0.29
Dissolved Calcium (Ca)	mg/L		1250.00	1200.00	1300	1700	1400	1400	1300	1300	110.00	250.00	230	280	330	320	310	280
Dissolved Magnesium (Mg)	mg/L		590.0	710.0	740	960	770	800	790	780	30.5	130.0	120	170	180	190	200	180
Dissolved Phosphorus (P)	mg/L		0.51	<0.01	<1	<1	<1	<1	<0.5	<1	0.03	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5
Dissolved Potassium (K)	mg/L		80.10	65.00	71	79	67	71	76	67	5.38	13.00	13	14	15	16	18	15
Dissolved Sodium (Na)	mg/L	<b>200 (AO)</b>	<b>3200</b>	<b>3600</b>	<b>3800</b>	<b>5200</b>	<b>4200</b>	<b>4300</b>	<b>4200</b>	<b>4200</b>	<b>224.00</b>	<b>580.00</b>	<b>650</b>	<b>790</b>	<b>760</b>	<b>770</b>	<b>790</b>	<b>720</b>

Notes:  
 AO: aesthetic objective  
 OG: operational guideline  
 Exceedances of the OWDS (operational guidelines excluded) are :

Parameter	Units	Sample	OW7-I							OW7-II								
		Date	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	30-Oct-17	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17
		ODWS																
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L		187	220	270	230	270	220	310	230	137	290	270	280	270	290	320	250
Total Ammonia-N	mg/L		0.74	2.00	3.7	3.1	3.0	2.5	2.8	4.7	1.42	2.40	2.3	2.4	2.6	1.6	1.6	3.6
Colour	TCU	5 (AO)	289	16	3	3	76	21	23	90	< 2	3.0000	3	<2	20	<2	3	<2
Conductivity	uS/cm		5070	870	5600	700	5800	690	5300	11000	4570	2100	8000	7300	9800	860	5600	15000
Total Dissolved Solids	mg/L	500 (AO)	2810	496	3200	520	3100	360	2800	5600	2660	2490	4700	3800	5400	470	3000	8300
Fluoride (F-)	mg/L	1.5	3.00	0.49	2.7	0.51	2.7	0.46	2.8	1.2	2.90	0.87	2.4	1.2	2.1	0.49	2.8	1.4
Dissolved Organic Carbon	mg/L	5 (AO)	0.56	2.10	1	1.8	0.92	1.8	0.98	0.92	0.62	2.60	0.86	1.9	2.0	3.2	1	1
Hardness	mg/L	80-100 (OG)			890	450	860	250	710	1900			1500	1500	1800	330	800	3000
Phosphate	mg/L		< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	units	6.5-8.5 (OG)	7.49	7.95	7.76	7.98	7.93	7.90	7.86	7.72	7.54	8.04	7.78	7.83	7.73	8.14	7.87	7.66
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	500 (AO)	30	86	23	49	9.1	49	37	32	34	63	31	55	23	50	24	7
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	30-500 (OG)	188	230	270	230	280	220	310	230	137	290	280	280	270	300	320	250
Dissolved Chloride (Cl)	mg/L	250 (AO)	1300.00	89.00	1700	55	1700	46	1500	3600	1200	440	2700	2200	3200	71	1600	5300
Nitrite (N)	mg/L	1	<0.09	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.09	0.02	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	10	<0.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	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
Dissolved Calcium (Ca)	mg/L		139	65	180	91	170	52	140	390	126	150	320	300	380	66	160	600
Dissolved Magnesium (Mg)	mg/L		62	39	110	54	110	30	86	230	54	89	180	180	210	39	97	360
Dissolved Phosphorus (P)	mg/L		0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.03	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5
Dissolved Potassium (K)	mg/L		9.8	12	15	13	15	12	13	26	9.2	13	20	19	21	13	14	29
Dissolved Sodium (Na)	mg/L	200 (AO)	659	57	910	110	890	28	790	1200	610	370	1300	880	1400	44	850	1900

Notes:  
 AO: aesthetic objective  
 OG: operational guideline  
 Exceedances of the OWDS (operational guidelines excluded) are :

Parameter	Units	Sample	OW8-I								OW8-II							
		Date	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	30-Oct-17	02-May-14	16-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17
		ODWS																
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L		229	300	340	240	330	370	310	300	151	290	300	250	290	340	320	300
Total Ammonia-N	mg/L		0.29	0.84	0.58	2.4	0.72	1.3	0.63	1.4	0.27	0.64	0.93	2.4	1.1	1.7	0.48	1.1
Colour	TCU	<b>5 (AO)</b>	2.2	<2	<2	3	<2	<2	<2	<2	3.3	<2	<2	<b>9</b>	<b>40</b>	<2	<2	<2
Conductivity	uS/cm		1100	1500	1300	7300	2000	3200	980	2400	841	1700	1200	8400	4700	5100	800	3000
Total Dissolved Solids	mg/L	<b>500 (AO)</b>	<b>591</b>	<b>768</b>	<b>680</b>	<b>3900</b>	<b>1100</b>	<b>1700</b>	<b>600</b>	<b>1200</b>	498	<b>982</b>	<b>1000</b>	<b>4500</b>	<b>2500</b>	<b>2700</b>	<b>470</b>	<b>1500</b>
Fluoride (F-)	mg/L	<b>1.5</b>	0.78	0.68	<b>2.4</b>	0.82	<b>2.2</b>	1.3	<b>1.6</b>	0.89	0.36	0.66	0.8	0.71	0.47	1.2	0.71	0.79
Dissolved Organic Carbon	mg/L	<b>5 (AO)</b>	1.60	1.90	1.3	1.1	1.4	1.3	1.5	1.4	2.20	1.80	1.7	1.2	1.7	1.2	1.9	1.4
Hardness	mg/L	<b>80-100 (OG)</b>			250	1500	550	450	240	520			890	1900	1300	780	260	660
Phosphate	mg/L		< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	units	<b>6.5-8.5 (OG)</b>	7.41	7.83	8.02	7.62	7.92	7.85	7.96	7.86	7.29	7.76	7.88	7.62	7.65	7.85	7.73	7.67
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	<b>500 (AO)</b>	48	37	33	19	30	20	53	45	66	39	37	20	54	8.4	52	37
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	<b>30-500 (OG)</b>	230	300	350	240	330	370	310	300	151	290	300	260	290	340	330	300
Dissolved Chloride (Cl)	mg/L	<b>250 (AO)</b>	127.00	<b>260.00</b>	160	<b>2300</b>	<b>420</b>	<b>820</b>	110	<b>540</b>	51.90	<b>340.00</b>	180	<b>2700</b>	<b>1300</b>	<b>1500</b>	36	<b>770</b>
Nitrite (N)	mg/L	<b>1</b>	<0.09	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.09	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	<b>10</b>	<0.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.09	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	<b>10</b>		<0.10	<0.10		<0.10	<0.10	<0.10	<0.10		<0.10	<0.10		<0.10	<0.10	<0.10	<0.10
Dissolved Calcium (Ca)	mg/L		96.90	120.00	66	370	140	110	62	140	131.00	140.00	220	450	340	180	70	170
Dissolved Magnesium (Mg)	mg/L		19.2	40.0	21	150	45	43	22	44	17.6	41.0	85	180	120	79	20	58
Dissolved Phosphorus (P)	mg/L		0.04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.03	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		3.95	6.70	5.4	20	6.9	11	5.5	8.4	3.18	5.90	7.3	20	9.5	14	4.9	9.0
Dissolved Sodium (Na)	mg/L	<b>200 (AO)</b>	91.40	120.00	170	920	<b>270</b>	<b>480</b>	150	<b>250</b>	33.60	140.00	<b>310</b>	<b>1000</b>	<b>430</b>	<b>710</b>	84	<b>300</b>

Notes:  
 AO: aesthetic objective  
 OG: operational guideline  
 Exceedances of the OWDS (operational guidelines excluded) are :



Parameter	Units	Sample	OW9-I							OW9-II						
		Date	02-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17	02-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16
		ODWS														
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L		164	220	220	470	230	150	170	130	238	290	280	260	250	230
Total Ammonia-N	mg/L		2.04	3.70	5.2	2.5	12	18	18	21	1.12	1.90	1.9	2.9	0.23	0.22
Colour	TCU	5 (AO)	26.2	8	7	6	21	87	110	49	2.3	9	7	8	7	4
Conductivity	uS/cm		5880	12000	15000	5200	50000	80000	81000	88000	1290	7200	7000	13000	15000	16000
Total Dissolved Solids	mg/L	500 (AO)	3640	7840	8500	3200	31000	55000	58000	57000	900	4690	4600	7400	8300	9000
Fluoride (F-)	mg/L	1.5	<0.3	0.21	0.18	0.23	<0.10	<0.1	<0.10	<0.10	1.30	0.35	0.36	0.12	0.11	0.11
Dissolved Organic Carbon	mg/L	5 (AO)	3.80	9.10	8.8	11	10	9.1	12	9.1	2.70	9.00	8.8	9.6	8.8	8.7
Hardness	mg/L	80-100 (OG)			2900	1200	16000	26000	27000	25000			1900	2700	3300	3900
Phosphate	mg/L		< 0.3		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010
pH	units	6.5-8.5 (OG)	7.35	7.62	7.6	7.63	7.02	6.90	6.73	6.95	7.84	7.74	7.61	7.4	7.37	7.40
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	500 (AO)	194	200	150	77	150	210	180	160	32	280	270	380	380	320
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	30-500 (OG)	164	220	220	470	230	150	170	130	240	290	290	260	250	240
Dissolved Chloride (Cl)	mg/L	250 (AO)	1420.00	3800.00	5200	1400	19000	35000	37000	39000	180.00	2200.00	2100	4200	4700	5000
Nitrite (N)	mg/L	1	<0.09	0.02	<0.010	<0.010	<0.050	<0.050	<0.10	<0.010	<0.09	<0.050	<0.010	<0.010	0.065	0.026
Nitrate (N)	mg/L	10	0.33	<0.10	<0.10	<0.10	<0.50	<0.50	<1.0	<0.10	0.15	<0.50	<0.10	<0.10	3.38	2.84
Nitrate + Nitrite	mg/L	10		<0.10	<0.10		<0.50	<0.50	<1.0	<0.10		<0.50	<0.10		3.44	2.86
Dissolved Calcium (Ca)	mg/L		289.00	370.00	660	260	3500	5500	5700	5000	23.90	340.00	480	670	800	930
Dissolved Magnesium (Mg)	mg/L		85.0	170.0	300	120	1800	3100	3200	3100	13.3	120.0	180	260	310	370
Dissolved Phosphorus (P)	mg/L		0.97	<0.5	<0.1	<0.1	<1	<1	<2	<1	0.02	<0.5	<0.1	<0.1	<0.5	<0.5
Dissolved Potassium (K)	mg/L		19.60	27.00	40	24	100	150	140	140	8.11	18.00	25	33	34	42
Dissolved Sodium (Na)	mg/L	200 (AO)	888.00	1300.00	2000	1000	6500	11000	11000	10000	196.00	970.00	1300	1700	1900	2200

Notes:  
 AO: aesthetic objective  
 OG: operational guideline  
 Exceedances of the OWDS (operational guidelines excluded) are :

Parameter	Units	Sample	TW1-1							
		Date	02-May-14	15-Oct-14	28-May-15	22-Oct-15	30-May-16	25-Oct-16	23-May-17	26-Oct-17
		ODWS								
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L		145	270	250	270	260	280	290	290
Total Ammonia-N	mg/L		0.68	0.49	0.89	0.93	1.0	1.0	0.47	1.2
Colour	TCU	<b>5 (AO)</b>	< 2	<2	<2	<2	<2	2	<2	<2
Conductivity	uS/cm		548	860	2400	3000	2800	3500	1300	2300
Total Dissolved Solids	mg/L	<b>500 (AO)</b>	394	482	<b>1200</b>	<b>1400</b>	<b>1400</b>	<b>1800</b>	<b>670</b>	<b>1300</b>
Fluoride (F-)	mg/L	<b>1.5</b>	0.30	0.52	0.55	0.51	0.54	0.50	0.5	0.5
Dissolved Organic Carbon	mg/L	<b>5 (AO)</b>	1.10	1.70	1.5	1.5	1.6	1.7	1.8	1.7
Hardness	mg/L	<b>80-100 (OG)</b>			550	640	650	810	410	760
Phosphate	mg/L		< 0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
pH	units	<b>6.5-8.5 (OG)</b>	8.07	8.00	7.82	7.76	7.85	7.84	7.71	7.78
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	<b>500 (AO)</b>	9	23	14	12	17	11	22	20
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	<b>30-500 (OG)</b>	147	270	250	270	260	280	290	290
Dissolved Chloride (Cl)	mg/L	<b>250 (AO)</b>	44.20	100.00	<b>580</b>	<b>770</b>	<b>690</b>	<b>980</b>	<b>220</b>	<b>510</b>
Nitrite (N)	mg/L	<b>1</b>	<0.09	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (N)	mg/L	<b>10</b>	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate + Nitrite	mg/L	<b>10</b>		<0.10	<0.10		<0.10	<0.10	<0.10	<0.10
Dissolved Calcium (Ca)	mg/L		49	79	120	140	140	180	96	160
Dissolved Magnesium (Mg)	mg/L		23	31	61	69	75	89	41	86
Dissolved Phosphorus (P)	mg/L		0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dissolved Potassium (K)	mg/L		5.9	5.3	9.6	10	12	10	6.1	10
Dissolved Sodium (Na)	mg/L	<b>200 (AO)</b>	70	52	<b>230</b>	<b>250</b>	<b>300</b>	<b>320</b>	100	<b>320</b>

Notes:  
 AO: aesthetic objective  
 OG: operational guideline  
 Exceedances of the OWDS (operational guidelines excluded) are :

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
1-Jan-17	NO PUMP		0	0	-	-	-
2-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
3-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
4-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
5-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
6-Jan-17	NO PUMP		0	0	-	-	-
7-Jan-17	NO PUMP		0	0	-	-	-
8-Jan-17	NO PUMP		0	0	-	-	-
9-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
10-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
11-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
12-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
13-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
14-Jan-17	NO PUMP		0	0	-	-	-
15-Jan-17	NO PUMP		0	0	-	-	-
16-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
17-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
18-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
19-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
20-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
21-Jan-17	NO PUMP		0	0	-	-	-
22-Jan-17	NO PUMP		0	0	-	-	-
23-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
24-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
25-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
26-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
27-Jan-17	7AM	5PM	36000	600	1,260,000	35	2,100
28-Jan-17	NO PUMP		0	0	-	-	-
29-Jan-17	NO PUMP		0	0	-	-	-
30-Jan-17	NO PUMP		0	0	-	-	-
31-Jan-17	NO PUMP		0	0	-	-	-
1-Feb-17	NO PUMP		0	0	-	-	-
2-Feb-17	NO PUMP		0	0	-	-	-
3-Feb-17	NO PUMP		0	0	-	-	-
4-Feb-17	NO PUMP		0	0	-	-	-
5-Feb-17	NO PUMP		0	0	-	-	-
6-Feb-17	7AM	5PM	36000	600	1,260,000	35	2,100
7-Feb-17	7AM	5PM	36000	600	1,260,000	35	2,100
8-Feb-17	NO PUMP		0	0	-	-	-
9-Feb-17	7AM	5PM	36000	600	1,260,000	35	2,100

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
10-Feb-17	NO PUMP		0	0	-	-	-
11-Feb-17	NO PUMP		0	0	-	-	-
12-Feb-17	NO PUMP		0	0	-	-	-
13-Feb-17	NO PUMP		0	0	-	-	-
14-Feb-17	NO PUMP		0	0	-	-	-
15-Feb-17	NO PUMP		0	0	-	-	-
16-Feb-17	NO PUMP		0	0	-	-	-
17-Feb-17	NO PUMP		0	0	-	-	-
18-Feb-17	NO PUMP		0	0	-	-	-
19-Feb-17	NO PUMP		0	0	-	-	-
20-Feb-17	NO PUMP		0	0	-	-	-
21-Feb-17	NO PUMP		0	0	-	-	-
22-Feb-17	NO PUMP		0	0	-	-	-
23-Feb-17	NO PUMP		0	0	-	-	-
24-Feb-17	NO PUMP		0	0	-	-	-
25-Feb-17	NO PUMP		0	0	-	-	-
26-Feb-17	NO PUMP		0	0	-	-	-
27-Feb-17	NO PUMP		0	0	-	-	-
28-Feb-17	NO PUMP		0	0	-	-	-
1-Mar-17	NO PUMP		0	0	-	-	-
2-Mar-17	NO PUMP		0	0	-	-	-
3-Mar-17	NO PUMP		0	0	-	-	-
4-Mar-17	NO PUMP		0	0	-	-	-
5-Mar-17	NO PUMP		0	0	-	-	-
6-Mar-17	NO PUMP		0	0	-	-	-
7-Mar-17	NO PUMP		0	0	-	-	-
8-Mar-17	NO PUMP		0	0	-	-	-
9-Mar-17	NO PUMP		0	0	-	-	-
10-Mar-17	NO PUMP		0	0	-	-	-
11-Mar-17	NO PUMP		0	0	-	-	-
12-Mar-17	NO PUMP		0	0	-	-	-
13-Mar-17	NO PUMP		0	0	-	-	-
14-Mar-17	NO PUMP		0	0	-	-	-
15-Mar-17	NO PUMP		0	0	-	-	-
16-Mar-17	NO PUMP		0	0	-	-	-
17-Mar-17	NO PUMP		0	0	-	-	-
18-Mar-17	NO PUMP		0	0	-	-	-
19-Mar-17	NO PUMP		0	0	-	-	-
20-Mar-17	NO PUMP		0	0	-	-	-
21-Mar-17	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
22-Mar-17	NO PUMP		0	0	-	-	-
23-Mar-17	NO PUMP		0	0	-	-	-
24-Mar-17	NO PUMP		0	0	-	-	-
25-Mar-17	NO PUMP		0	0	-	-	-
26-Mar-17	NO PUMP		0	0	-	-	-
27-Mar-17	7AM	5PM	36000	600	1,260,000	35	2,100
28-Mar-17	NO PUMP		0	0	-	-	-
29-Mar-17	NO PUMP		0	0	-	-	-
30-Mar-17	7AM	5PM	36000	600	1,260,000	35	2,100
31-Mar-17	7AM	5PM	36000	600	1,260,000	35	2,100
1-Apr-17	NO PUMP		0	0	-	-	-
2-Apr-17	NO PUMP		0	0	-	-	-
3-Apr-17	7AM	6PM	39600	660	1,386,000	35	2,100
4-Apr-17	7AM	5PM	36000	600	1,260,000	35	2,100
5-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
6-Apr-17	7AM	6PM	39600	660	1,386,000	35	2,100
7-Apr-17	7AM	6PM	39600	660	1,386,000	35	2,100
8-Apr-17	NO PUMP		0	0	-	-	-
9-Apr-17	NO PUMP		0	0	-	-	-
10-Apr-17	6AM	5PM	39600	660	1,386,000	35	2,100
11-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
12-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
13-Apr-17	6AM	5PM	39600	660	1,386,000	35	2,100
14-Apr-17	NO PUMP		0	0	-	-	-
15-Apr-17	NO PUMP		0	0	-	-	-
16-Apr-17	NO PUMP		0	0	-	-	-
17-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
18-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
19-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
20-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
21-Apr-17	6AM	5PM	39600	660	1,386,000	35	2,100
22-Apr-17	NO PUMP		0	0	-	-	-
23-Apr-17	NO PUMP		0	0	-	-	-
24-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
25-Apr-17	NO PUMP		0	0	-	-	-
26-Apr-17	NO PUMP		0	0	-	-	-
27-Apr-17	6AM	6PM	43200	720	1,512,000	35	2,100
28-Apr-17	6AM	4PM	36000	600	1,260,000	35	2,100
29-Apr-17	NO PUMP		0	0	-	-	-
30-Apr-17	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
1-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
2-May-17	6AM	7PM	46800	780	1,638,000	35	2,100
3-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
4-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
5-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
6-May-17	NO PUMP		0	0	-	-	-
7-May-17	NO PUMP		0	0	-	-	-
8-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
9-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
10-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
11-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
12-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
13-May-17	NO PUMP		0	0	-	-	-
14-May-17	NO PUMP		0	0	-	-	-
15-May-17	NO PUMP		0	0	-	-	-
16-May-17	12PM	7PM	25200	420	882,000	35	2,100
17-May-17	NO PUMP		0	0	-	-	-
18-May-17	9AM	6PM	32400	540	1,134,000	35	2,100
19-May-17	NO PUMP		0	0	-	-	-
20-May-17	NO PUMP		0	0	-	-	-
21-May-17	NO PUMP		0	0	-	-	-
22-May-17	NO PUMP		0	0	-	-	-
23-May-17	6AM	7PM	46800	780	1,638,000	35	2,100
24-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
25-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
26-May-17	6AM	4PM	36000	600	1,260,000	35	2,100
27-May-17	NO PUMP		0	0	-	-	-
28-May-17	NO PUMP		0	0	-	-	-
29-May-17	NO PUMP		0	0	-	-	-
30-May-17	NO PUMP		0	0	-	-	-
31-May-17	NO PUMP		0	0	-	-	-
1-Jun-17	NO PUMP		0	0	-	-	-
2-Jun-17	7AM	5PM	36000	600	1,260,000	35	2,100
3-Jun-17	NO PUMP		0	0	-	-	-
4-Jun-17	NO PUMP		0	0	-	-	-
5-Jun-17	7AM	6PM	39600	660	1,386,000	35	2,100
6-Jun-17	7AM	6PM	39600	660	1,386,000	35	2,100
7-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
8-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
9-Jun-17	6AM	4PM	36000	600	1,260,000	35	2,100

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
10-Jun-17	NO PUMP		0	0	-	-	-
11-Jun-17	NO PUMP		0	0	-	-	-
12-Jun-17	NO PUMP		0	0	-	-	-
13-Jun-17	NO PUMP		0	0	-	-	-
14-Jun-17	NO PUMP		0	0	-	-	-
15-Jun-17	NO PUMP		0	0	-	-	-
16-Jun-17	NO PUMP		0	0	-	-	-
17-Jun-17	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
18-Jun-17	NO PUMP		0	0	-	-	-
19-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
20-Jun-17	7AM	5PM	39600	660	1,386,000	35	2,100
21-Jun-17	6AM	9AM	10800	180	378,000	35	2,100
22-Jun-17	6AM	7PM	46800	780	1,638,000	35	2,100
23-Jun-17	6AM	5PM	39600	660	1,386,000	35	2,100
24-Jun-17	NO PUMP		0	0	-	-	-
25-Jun-17	NO PUMP		0	0	-	-	-
26-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
27-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
28-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
29-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
30-Jun-17	6AM	4PM	36000	600	1,260,000	35	2,100
1-Jul-17	NO PUMP		0	0	-	-	-
2-Jul-17	NO PUMP		0	0	-	-	-
3-Jul-17	NO PUMP		0	0	-	-	-
4-Jul-17	7AM	5PM	36000	600	1,260,000	35	2,100
5-Jul-17	NO PUMP		0	0	-	-	-
6-Jul-17	NO PUMP		0	0	-	-	-
7-Jul-17	NO PUMP		0	0	-	-	-
8-Jul-17	NO PUMP		0	0	-	-	-
9-Jul-17	NO PUMP		0	0	-	-	-
10-Jul-17	7AM	5PM	36000	600	1,260,000	35	2,100
11-Jul-17	7AM	5PM	36000	600	1,260,000	35	2,100
12-Jul-17	NO PUMP		0	0	-	-	-
13-Jul-17	6AM	7PM	46800	780	1,638,000	35	2,100
14-Jul-17	6AM	7PM	46800	780	1,638,000	35	2,100
15-Jul-17	NO PUMP		0	0	-	-	-
16-Jul-17	NO PUMP		0	0	-	-	-
17-Jul-17	NO PUMP		0	0	-	-	-
18-Jul-17	NO PUMP		0	0	-	-	-
19-Jul-17	NO PUMP		0	0	-	-	-
20-Jul-17	NO PUMP		0	0	-	-	-
21-Jul-17	NO PUMP		0	0	-	-	-
22-Jul-17	NO PUMP		0	0	-	-	-
23-Jul-17	NO PUMP		0	0	-	-	-
24-Jul-17	NO PUMP		0	0	-	-	-
25-Jul-17	6AM	6PM	43200	720	1,512,000	35	2,100



Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
26-Jul-17	NO PUMP		0	0	-	-	-
27-Jul-17	7AM	5PM	36000	600	1,260,000	35	2,100
28-Jul-17	NO PUMP		0	0	-	-	-
29-Jul-17	NO PUMP		0	0	-	-	-
30-Jul-17	NO PUMP		0	0	-	-	-
31-Jul-17	NO PUMP		0	0	-	-	-
1-Aug-17	NO PUMP		0	0	-	-	-
2-Aug-17	NO PUMP		0	0	-	-	-
3-Aug-17	NO PUMP		0	0	-	-	-
4-Aug-17	NO PUMP		0	0	-	-	-
5-Aug-17	NO PUMP		0	0	-	-	-
6-Aug-17	NO PUMP		0	0	-	-	-
7-Aug-17	NO PUMP		0	0	-	-	-
8-Aug-17	6AM	5PM	39600	660	1,386,000	35	2,100
9-Aug-17	NO PUMP		0	0	-	-	-
10-Aug-17	NO PUMP		0	0	-	-	-
11-Aug-17	NO PUMP		0	0	-	-	-
12-Aug-17	6AM	7PM	46800	780	1,638,000	35	2,100
13-Aug-17	6AM	4PM	36000	600	-	-	-
14-Aug-17	NO PUMP		0	0	-	-	-
15-Aug-17	NO PUMP		0	0	-	-	-
16-Aug-17	7AM	5PM	36000	600	1,260,000	35	2,100
17-Aug-17	6AM	4PM	36000	600	1,260,000	35	2,100
18-Aug-17	NO PUMP		0	0	-	-	-
19-Aug-17	NO PUMP		0	0	-	-	-
20-Aug-17	NO PUMP		0	0	-	-	-
21-Aug-17	NO PUMP		0	0	-	-	-
22-Aug-17	NO PUMP		0	0	-	-	-
23-Aug-17	NO PUMP		0	0	-	-	-
24-Aug-17	NO PUMP		0	0	-	-	-
25-Aug-17	NO PUMP		0	0	-	-	-
26-Aug-17	NO PUMP		0	0	-	-	-
27-Aug-17	NO PUMP		0	0	-	-	-
28-Aug-17	NO PUMP		0	0	-	-	-
29-Aug-17	NO PUMP		0	0	-	-	-
30-Aug-17	7AM	5:30PM	37800	630	1,323,000	35	2,100
31-Aug-17	NO PUMP		0	0	-	-	-
1-Sep-17	NO PUMP		0	0	-	-	-
2-Sep-17	NO PUMP		0	0	-	-	-
3-Sep-17	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
4-Sep-17	NO PUMP		0	0	-	-	-
5-Sep-17	NO PUMP		0	0	-	-	-
6-Sep-17	NO PUMP		0	0	-	-	-
7-Sep-17	NO PUMP		0	0	-	-	-
8-Sep-17	NO PUMP		0	0	-	-	-
9-Sep-17	NO PUMP		0	0	-	-	-
10-Sep-17	NO PUMP		0	0	-	-	-
11-Sep-17	NO PUMP		0	0	-	-	-
12-Sep-17	NO PUMP		0	0	-	-	-
13-Sep-17	NO PUMP		0	0	-	-	-
14-Sep-17	7AM	4PM	32400	540	1,134,000	35	2,100
15-Sep-17	NO PUMP		0	0	-	-	-
16-Sep-17	NO PUMP		0	0	-	-	-
17-Sep-17	NO PUMP		0	0	-	-	-
18-Sep-17	NO PUMP		0	0	-	-	-
19-Sep-17	NO PUMP		0	0	-	-	-
20-Sep-17	NO PUMP		0	0	-	-	-
21-Sep-17	NO PUMP		0	0	-	-	-
22-Sep-17	NO PUMP		0	0	-	-	-
23-Sep-17	NO PUMP		0	0	-	-	-
24-Sep-17	NO PUMP		0	0	-	-	-
25-Sep-17	NO PUMP		0	0	-	-	-
26-Sep-17	7:30AM	5:30PM	36000	600	1,260,000	35	2,100
27-Sep-17	NO PUMP		0	0	-	-	-
28-Sep-17	NO PUMP		0	0	-	-	-
29-Sep-17	NO PUMP		0	0	-	-	-
30-Sep-17	NO PUMP		0	0	-	-	-
1-Oct-17	NO PUMP		0	0	-	-	-
2-Oct-17	NO PUMP		0	0	-	-	-
3-Oct-17	NO PUMP		0	0	-	-	-
4-Oct-17	NO PUMP		0	0	-	-	-
5-Oct-17	NO PUMP		0	0	-	-	-
6-Oct-17	NO PUMP		0	0	-	-	-
7-Oct-17	NO PUMP		0	0	-	-	-
8-Oct-17	NO PUMP		0	0	-	-	-
9-Oct-17	NO PUMP		0	0	-	-	-
10-Oct-17	NO PUMP		0	0	-	-	-
11-Oct-17	NO PUMP		0	0	-	-	-
12-Oct-17	NO PUMP		0	0	-	-	-
13-Oct-17	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
14-Oct-17	NO PUMP		0	0	-	-	-
15-Oct-17	NO PUMP		0	0	-	-	-
16-Oct-17	6AM	6PM	43200	720	1,512,000	35	2,100
17-Oct-17	6AM	6PM	43200	720	1,512,000	35	2,100
18-Oct-17	7AM	5PM	36000	600	1,260,000	35	2,100
19-Oct-17	7AM	5PM	36000	600	1,260,000	35	2,100
20-Oct-17	6AM	4PM	36000	600	1,260,000	35	2,100
21-Oct-17	NO PUMP		0	0	-	-	-
22-Oct-17	NO PUMP		0	0	-	-	-
23-Oct-17	7AM	5PM	36000	600	1,260,000	35	2,100
24-Oct-17	NO PUMP		0	0	-	-	-
25-Oct-17	7AM	5PM	36000	600	1,260,000	35	2,100
26-Oct-17	7AM	5PM	36000	600	1,260,000	35	2,100
27-Oct-17	7AM	5PM	36000	600	1,260,000	35	2,100
28-Oct-17	NO PUMP		0	0	-	-	-
29-Oct-17	NO PUMP		0	0	-	-	-
30-Oct-17	7AM	5PM	36000	600	1,260,000	35	2,100
31-Oct-17	NO PUMP		0	0	-	-	-
1-Nov-17	10AM	12PM	7200	120	252,000	35	2,100
2-Nov-17	6:30AM	11AM	16200	270	567,000	35	2,100
3-Nov-17	8:15AM	10AM	6300	105	220,500	35	2,100
4-Nov-17	NO PUMP		0	0	-	-	-
5-Nov-17	NO PUMP		0	0	-	-	-
6-Nov-17	NO PUMP		0	0	-	-	-
7-Nov-17	NO PUMP		0	0	-	-	-
8-Nov-17	NO PUMP		0	0	-	-	-
9-Nov-17	6:30AM	12PM	19800	330	693,000	35	2,100
10-Nov-17	7:30AM	12PM	16200	270	567,000	35	2,100
11-Nov-17	6:30AM	12:30PM	21600	360	756,000	35	2,100
12-Nov-17	NO PUMP		0	0	-	-	-
13-Nov-17	NO PUMP		0	0	-	-	-
14-Nov-17	6:30AM	12PM	19800	330	693,000	35	2,100
15-Nov-17	6:30AM	12PM	19800	330	693,000	35	2,100
16-Nov-17	NO PUMP		0	0	-	-	-
17-Nov-17	6:30AM	12PM	19800	330	693,000	35	2,100
18-Nov-17	NO PUMP		0	0	-	-	-
19-Nov-17	NO PUMP		0	0	-	-	-
20-Nov-17	NO PUMP		0	0	-	-	-
21-Nov-17	NO PUMP		0	0	-	-	-
22-Nov-17	NO PUMP		0	0	-	-	-

Table 6: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
<b>ECA Permitted Rate</b>					<b>6,550,000</b>	<b>76</b>	<b>4,545</b>
23-Nov-17	NO PUMP		0	0	-	-	-
24-Nov-17	NO PUMP		0	0	-	-	-
25-Nov-17	6:30AM	1:30PM	25200	420	882,000	35	2,100
26-Nov-17	NO PUMP		0	0	-	-	-
27-Nov-17	NO PUMP		0	0	-	-	-
28-Nov-17	10AM	6PM	28800	480	1,008,000	35	2,100
29-Nov-17	6:30AM	12:30PM	21600	360	756,000	35	2,100
30-Nov-17	6:30AM	4PM	34200	570	1,197,000	35	2,100
1-Dec-17	NO PUMP		0	0	-	-	-
2-Dec-17	NO PUMP		0	0	-	-	-
3-Dec-17	NO PUMP		0	0	-	-	-
4-Dec-17	7AM	4PM	32400	540	1,134,000	35	2,100
5-Dec-17	7AM	4PM	32400	540	1,134,000	35	2,100
6-Dec-17	NO PUMP		0	0	-	-	-
7-Dec-17	NO PUMP		0	0	-	-	-
8-Dec-17	NO PUMP		0	0	-	-	-
9-Dec-17	NO PUMP		0	0	-	-	-
10-Dec-17	NO PUMP		0	0	-	-	-
11-Dec-17	NO PUMP		0	0	-	-	-
12-Dec-17	NO PUMP		0	0	-	-	-
13-Dec-17	NO PUMP		0	0	-	-	-
14-Dec-17	NO PUMP		0	0	-	-	-
15-Dec-17	NO PUMP		0	0	-	-	-
16-Dec-17	NO PUMP		0	0	-	-	-
17-Dec-17	NO PUMP		0	0	-	-	-
18-Dec-17	NO PUMP		0	0	-	-	-
19-Dec-17	NO PUMP		0	0	-	-	-
20-Dec-17	NO PUMP		0	0	-	-	-
21-Dec-17	NO PUMP		0	0	-	-	-
22-Dec-17	NO PUMP		0	0	-	-	-
23-Dec-17	NO PUMP		0	0	-	-	-
24-Dec-17	NO PUMP		0	0	-	-	-
25-Dec-17	NO PUMP		0	0	-	-	-
26-Dec-17	NO PUMP		0	0	-	-	-
27-Dec-17	NO PUMP		0	0	-	-	-
28-Dec-17	NO PUMP		0	0	-	-	-
29-Dec-17	NO PUMP		0	0	-	-	-
30-Dec-17	NO PUMP		0	0	-	-	-
31-Dec-17	NO PUMP		0	0	-	-	-



# APPENDIX A

## PTTW No. 7818-9QJNL4



**PERMIT TO TAKE WATER**  
Ground Water  
NUMBER 7818-9QJNL4

*Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:*

QBJR Aggregates Inc.  
949 Wilson Ave  
Toronto, Ontario, M3K 1G2  
Canada

*For the water taking from:* Quarry Sump, McCarthy Quarry

*Located at:* Lot 1, Concession 1, Geographic Township of Mara  
Ramara, County of Simcoe

*For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:*

**DEFINITIONS**

- (a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.
- (b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.
- (c) "Ministry" means Ontario Ministry of the Environment and Climate Change.
- (d) "District Office" means the Barrie District Office.
- (e) "Permit" means this Permit to Take Water No. 7818-9QJNL4 including its Schedules, if any, issued in accordance with Section 34 of the OWRA.
- (f) "Permit Holder" means QBJR Aggregates Inc..
- (g) "OWRA " means the *Ontario Water Resources Act*, R.S.O. 1990, c. O. 40, as amended.

*You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:*

## **TERMS AND CONDITIONS**

### **1. Compliance with Permit**

- 1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated October 7, 2014 and signed by Jenny Coco, and all Schedules included in this Permit.
- 1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.
- 1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.
- 1.4 This Permit is not transferable to another person.
- 1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.
- 1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.
- 1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

### **2. General Conditions and Interpretation**

#### **2.1 Inspections**

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

#### **2.2 Other Approvals**

The issuance of, and compliance with this Permit, does not:

- (a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and the *Environmental Protection Act*, and any regulations made thereunder; or



(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

### 2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

### 2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

### 2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

### 2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

## 3. **Water Takings Authorized by This Permit**

### 3.1 Expiry

This Permit expires on **December 31, 2019**. No water shall be taken under authority of this Permit after the expiry date.

### 3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

**Table A**

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Quarry Sump	Pond Connected	Pits and Quarries	Dewatering	4,545	24	6,544,800	150	17 650950 4933500
							<b>Total Taking:</b>	6,544,800	

3.3 There is an additional water taking limitation per year for Source 1 described as Quarry Sump within Table A. The maximum taking per year from the Quarry Sump is 196,500,000 litres.

**4. Monitoring**

4.1 The Permit Holder shall not lower the water in the quarry below an elevation of 232.0 metres above sea level.

4.2 The Permit Holder shall establish and maintain a weather station within 1 km of the McCarthy Quarry property that collects and records, at a minimum, the following climatic data on a daily basis:

- a) Precipitation (rain and/or snow); and
- b) Temperature (maximum and minimum).

4.3 The Permit Holder shall conduct daily water level monitoring with the use of pressure transducers and data loggers at:

- a) The residential well known by the MOE Water Well Record Number 5727662 and identified as well DW3 on Figure 2 in Item 2 of Schedule A of this Permit, if granted permission by the property owner.
- b) The monitoring wells named OW4-1, OW4-2, OW5-1, OW6-1, OW6-2, OW9-1, OW9-2, and Bored Well (shown on Figure 2, in Item 2 of Schedule A of this Permit).
- c) The City of Kwartha Lakes monitoring well CKL-1, if granted permission by the property owner .

These pressure transducers and data loggers shall be inspected and downloaded at least every 6 months.

4.4 The Permit Holder shall conduct monthly water level monitoring with the use of a manual water level meter at:

- a) The residential well known by the MOE Water Well Record Number 5727662 and identified as well DW3 on Figure 2 in Item 2 of Schedule A of this Permit, if granted permission by the property owner.
- b) The residential wells named DW1, DW2, and DW4, if granted permission by the property owner (shown on Figure 2, in Item 2 of Schedule A of this Permit).

- c) The monitoring wells named AM1b, AMx, TW1-1, OW4-1, OW4-2, OW5-1, OW5-2, OW5-3, OW6-1, OW6-2, OW6-3, OW7-1, OW7-2, OW7-3, OW8-1, OW8-2, OW8-3, OW9-1, OW9-2, and Bored Well (shown on Figure 2 in Item 2 of Schedule A of this Permit).
- d) The City of Kwartha Lakes monitoring wells CKL-1 and CKL-2, if granted permission by the property owner .

The Permit Holder may suspend monthly water level monitoring under Condition 4.4 for the months of January and/or February if no water is taken from the quarry on those months.

4.5 The Permit Holder shall, if granted permission by the property owner, measure and record static water levels in the residential wells named DW5, DW6, DW7, and DW8, as shown on Figure 2 in Item 2 of Schedule A of this Permit, at least once in every two (2) month period during which water is taken from the quarry. The Permit Holder may suspend monthly water level monitoring under Condition 4.5 for the months of January and/or February if no water is taken from the quarry on those months.

4.6 The Permit Holder shall, if granted permission by the property owner, on a semi-annual basis collect raw water samples from the residential wells named DW1, DW2, and the well identified in condition 4.3(a). Each sample shall be tested, at a minimum, for the parameters listed in Table 1 below:

Table 1: Water Quality Parameters for Residential Wells

pH	Sulphate	DOC	Copper
Alkalinity (CaCO3)	Magnesium	Colour	Iron
Bicarbonate	Calcium	Turbidity	Lead
Conductivity	Sodium	Aluminium	Manganese
Fluoride	Potassium	Arsenic	Selenium
Chloride	Ammonia (N)	Barium	Zinc
Nitrate	Phosphate	Boron	Hardness (CaCO3)
Nitrite	Phosphorus	Cadmium	TDS (iron sum calc.)
Chromium	Anion Sum	Ion Ratio	Langelier Index
Tannins	Cation Sum	% Difference	

The Permit Holder shall immediately report to the respective well owner, the Director, and District Office any sampling result that exceeds the Ontario Drinking Water Quality Standards as prescribed by O.Reg. 169/03, as amended.

- 4.7 The Permit Holder shall on a semi-annual basis conduct the groundwater quality monitoring from the on-site groundwater monitors listed in Table 2. Each sample shall be tested, at a minimum, for the parameters listed in Table 3.

Table 2: On-Site Groundwater Monitors for Water Quality Sampling

AM1b	OW4-I	OW5-III	OW8-I
AMx	OW4-II	OW6-II	OW8-II
TW1-1	OW5-I	OW7-I	OW9-I
Bored Well	OW5-II	OW7-II	OW9-II

Table 3: Water Quality Parameters for On-Site Groundwater Monitors

pH	Magnesium	Sulphate	Conductivity
Alkalinity	Calcium	Nitrate	DOC
Bicarbonate	Sodium	Nitrite	Colour
Fluoride	Potassium	Phosphate	TDS
Chloride	Ammonia	Phosphorus	Hardness

- 4.8 Monitoring well AMx is within the quarry extraction area and will be mined out as the quarry face advances to the south. The Permit Holder shall continue to monitor AMx as listed in Conditions 4.4 and 4.7 until such monitoring is either deemed unsafe or the monitoring is not possible due to damage to AMx. Once monitoring of AMx is not possible under Conditions 4.4 and/or 4.7, then a replacement monitoring well must be established along the western property boundary between the quarry face and OW4. This replacement well shall be monitored as per Conditions 4.4 and 4.7 instead of AMx.
- 4.9 The Permit Holder shall notify the Director, in writing, within 30 days if the groundwater level or groundwater quality monitoring of any well listed under conditions 4.3, 4.4, 4.5, 4.6, and 4.7 is not possible, including being denied access to a private well. In the event of damage or loss of any monitoring well, monitoring devices or related equipment, the Permit Holder shall be allowed 30 calendar days from the date of discovery of the occurrence to repair or replace equipment. If a well is too damaged to be repaired or monitored, or if the well is deemed unsafe to be monitored, then the Director will decide if a replacement well is required and will modify the appropriate monitoring conditions in a written letter to the Permit Holder.
- 4.10 The Permit Holder shall maintain a record of all water takings. This record shall include the dates and times of water takings, and the total measured or calculated amounts for water pumped per day for each day that water is taken under the authorization of this Permit.
- 4.11 The Permit Holder shall keep all required records up to date and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.
- 4.12 The Permit Holder shall provide to the Director an annual monitoring report no

later than March 1 each year during the life of this Permit. The annual monitoring report shall be prepared by an individual with P.Geo. or equivalent qualifications and shall include, at a minimum:

- a) The review and assessment of all monitoring data required by this Permit.
- b) An up-date of the quarry operations and predicted quarrying and dewatering for the next twelve (12) months.
- c) An assessment of the groundwater trends using the on-site on off-site monitoring data. This analysis should state the actual impact area of quarry dewatering and determine the potential for off-site impacts. If any impacts are predicted then a detailed mitigation plan shall be included within this report.
- d) Analysis that includes amount of water pumped, precipitation data, and an estimate of how much groundwater was pumped versus surface water.
- e) Figures that include site maps with current quarry depths, groundwater contour maps, impact area of quarry dewatering, groundwater elevation graphs, and geological cross-sections.
- f) Any groundwater interference complaints.
- g) Description of all communication with the public.
- h) Conclusions and recommendations, if any, to improve the monitoring and reporting at the site.

An electronic copy of the data collected must also accompany the report.

- 4.13 The Permit Holder shall make available on a publicly-accessible site on the internet the water quality and quantity data that it is required to monitor and record under this Permit and O.Reg. 387/04, as amended, and a copy of every report that is required to be prepared under this Permit. For greater clarity, the Permit Holder shall not publish any personal information as defined by the *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. F.31, as amended.
- 4.14 The Permit Holder shall maintain a Public Liaison Committee ("PLC") comprised of not more than seven (7) members that will meet at least once every four (4) months, unless the majority of the PLC decide that more or less frequent meetings are required. The PLC shall be comprised of: two (2) members appointed by the Permit Holder - one of whom shall act as Chairperson; one (1) member from each of the Township and the County, if they wish to have representatives; and three (3) members appointed by the public, if they wish to have representatives, who must be permanent residents within a 3 kilometre radius of the quarry property. The PLC shall serve in an advisory / community liaison role and shall have no powers to direct the Permit Holder or the Ministry.
- 4.15 Any request for an amendment or renewal of this Permit must be accompanied by a report prepared by an individual with P.Geo. or equivalent qualifications and shall include, at a minimum:
  - a) The review and assessment of all monitoring data required by this Permit.
  - b) An up-date of the quarry operations and predicted quarrying and dewatering for the duration of the requested permit.
  - c) An assessment of the groundwater trends using the on-site on off-site monitoring

data. This analysis should state the actual impact area of quarry dewatering and determine the potential for off-site impacts. If any impacts are predicted then a detailed mitigation plan shall be included within this report.

- d) Analysis that includes amount of water pumped, precipitation data, and an estimate of how much groundwater was pumped versus surface water.
- e) Figures that include site maps with current quarry depths, groundwater contour maps, impact area of quarry dewatering, groundwater elevation graphs, and geological cross-sections.
- f) Any groundwater interference complaints.
- g) Description of all communication with the public.
- h) Conclusions and recommendations, if any, to improve the monitoring and reporting at the site.

An electronic copy of the data collected must also accompany the report. Any application for renewal of this Permit must be submitted to the Ministry at least ninety (90) days prior to the expiry of this Permit.

- 4.16 The Permit Holder shall, as directed by the Ministry, participate in a cumulative impact assessment for the Carden Plain Area with other quarry operators who have been issued a permit to take water in this area.

## **5. Impacts of the Water Taking**

### **5.1 Notification**

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

### **5.2 For Groundwater Takings**

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

- 5.2.1 Where the water supply provided by the well known by MOE Water Well Record Number 5727662 is restored in accordance with Condition 5.2, the Permit Holder shall

restore the supply in a manner satisfactory to the Director, taking into account the residential needs, requirements and preferences of the persons serviced by the well.

- 5.3 Upon the receipt of a groundwater interference complaint, the Permit Holder shall:
- a) Implement the McCarthy Quarry Complaint Resolution Process as described in Item 3 of Schedule A of this Permit.
  - b) In addition, appropriate notification and actions must be taken as described in conditions 5.1 and 5.2 of this Permit. The provisions of conditions 5.1 and 5.2 shall take precedence over the provisions of condition 5.3(a) if there is a conflict.

**6. Director May Amend Permit**

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (4).

*The reasons for the imposition of these terms and conditions are as follows:*

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.
2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.
3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

*In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a hearing shall state:*

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

*In addition to these legal requirements, the Notice should also include:*

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

*This notice must be served upon:*

*The Secretary  
Environmental Review Tribunal  
655 Bay Street, 15th Floor  
Toronto ON  
M5G 1E5  
Fax: (416) 314-4506  
Email:  
ERTTribunalsecretary@ontario.ca*

*AND*

*The Environmental Commissioner  
1075 Bay Street  
6th Floor, Suite 605  
Toronto, Ontario M5S 2W5*

*AND*

*The Director, Section 34,  
Ministry of the Environment and  
Climate Change  
8th Floor  
5775 Yonge St  
Toronto ON M2M 4J1  
Fax: (416) 325-6347*

**Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:**

**by telephone at (416) 314-4600**

**by fax at (416) 314-4506**

**by e-mail at [www.ert.gov.on.ca](http://www.ert.gov.on.ca)**

*This instrument is subject to Section 38 of the **Environmental Bill of Rights** that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

This Permit cancels and replaces Permit Number 8271-8VQJGU, issued on 2012/07/11.

Dated at Toronto this 30th day of December, 2014.



Helen Zhang, P.Eng.

Director, Section 34

*Ontario Water Resources Act*, R.S.O. 1990



### **Schedule A**

This Schedule "A" forms part of Permit To Take Water 7818-9QJNL4, dated December 30, 2014.

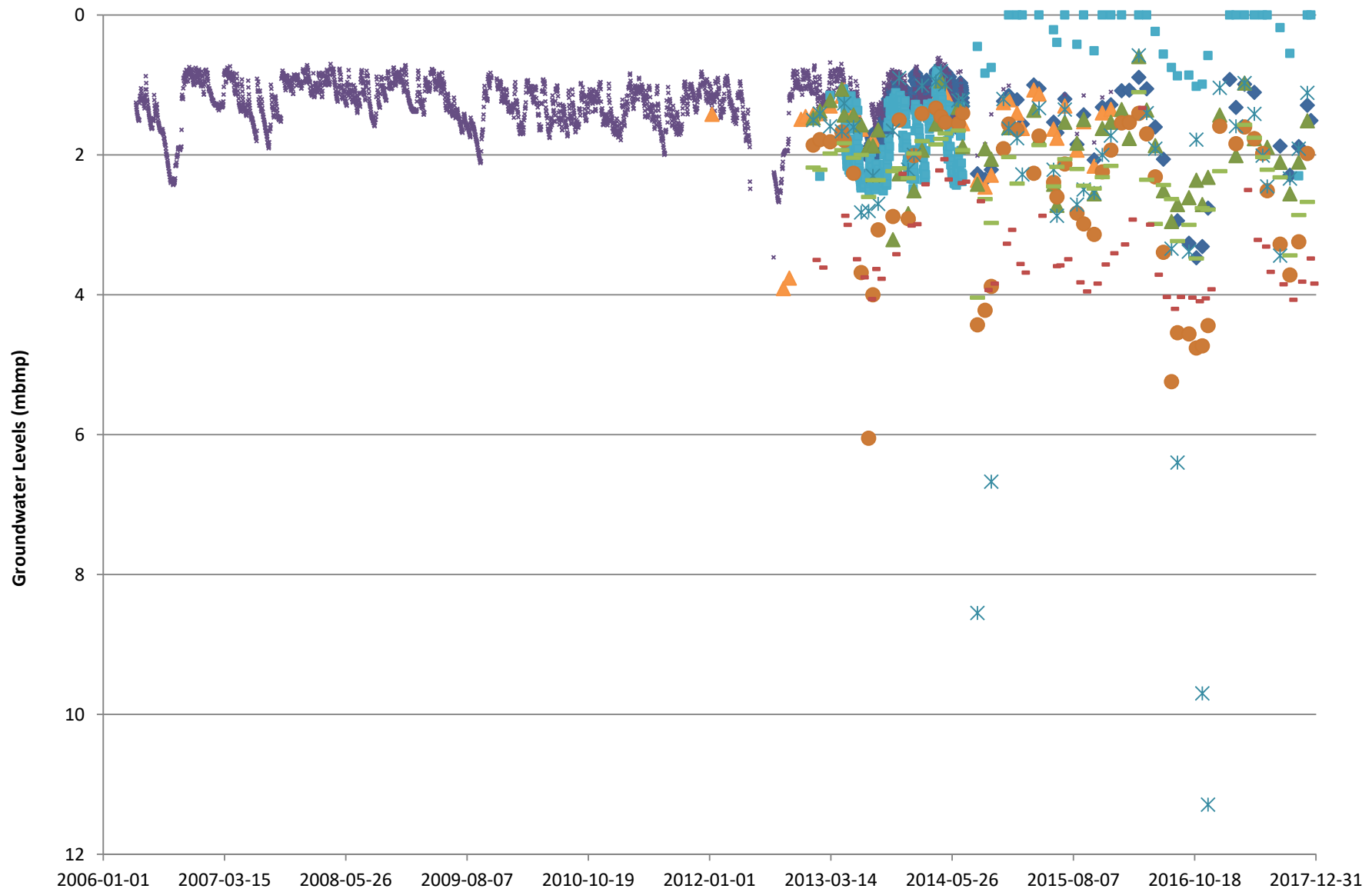
1. Permit To Take Water Application, signed by Jenny Coco, October 7, 2014.
2. Permit To Take Water Application - Renewal Application for McCarthy Quarry, Township of Ramara. Golder Associates Ltd. October 2014.
3. McCarthy Quarry Complaint Resolution Process, Golder Associates Ltd. November 2014.
4. Further Changes to PTTW No. 8271-8VQJGU. Golder Associates Ltd. November 11, 2014.




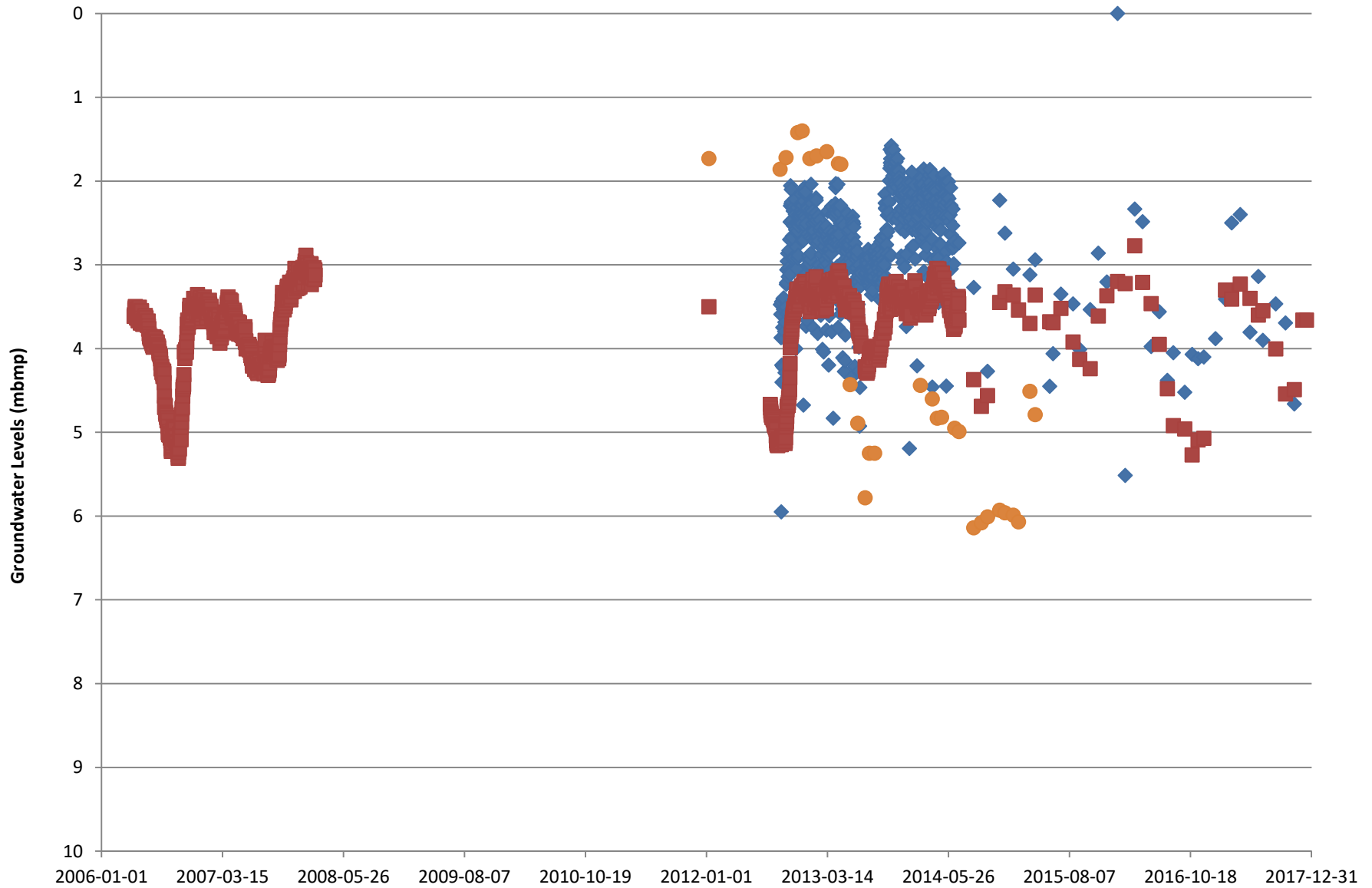
# APPENDIX B

## Hydrographs





◆ Bored ■ CKL-1 ✖ DW5	✖ OW5-1 ▲ DW1 — DW6	▲ AM1b ● DW2 - DW8			SCALE: NTS	<b>McCarthy Quarry Overburden Monitoring Wells Groundwater Level</b>
					DATE: 11-Jan-18	
FILE No.			TEST:	QBJR/Coco Aggregates Inc. PTTW Annual Report	FIGURE No <b>B-1</b>	
PROJECT No. 1407634			REVIEW: JAE			



◆ DW3    ■ OW4-1    ● AMx



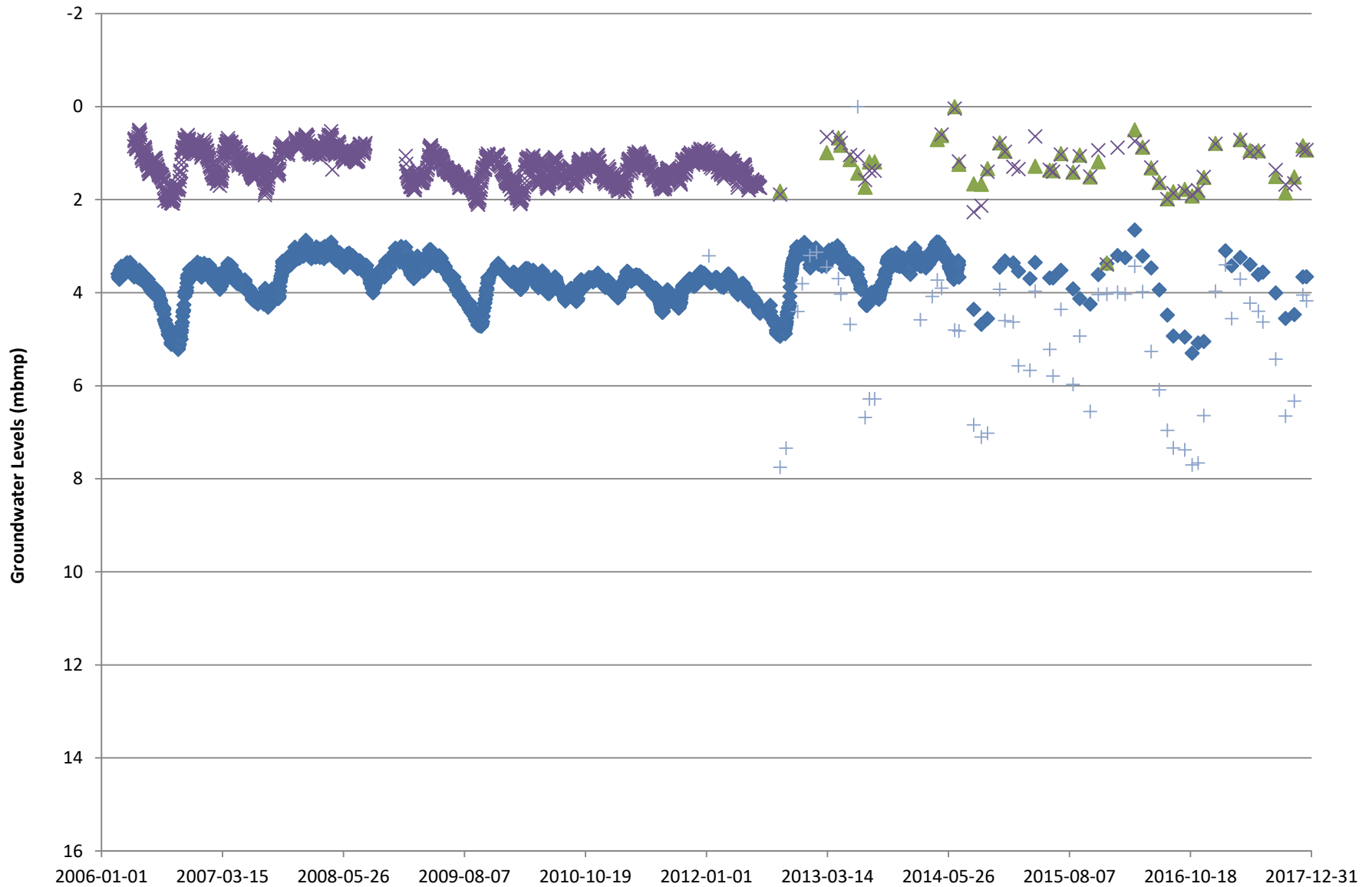
FILE No.  
PROJECT No. 1407634

SCALE: NTS  
DATE: 11-Jan-18  
CAD: JEB  
TEST:  
REVIEW: JAE

**McCarthy Quarry  
Verulam Monitoring Wells  
Groundwater Level**

QBJR/Coco Aggregates Inc.  
PTTW Annual Report

FIGURE No  
**B-2**



◆ OW4-2 ▲ OW5-2 ✕ OW5-3 + TW1-1



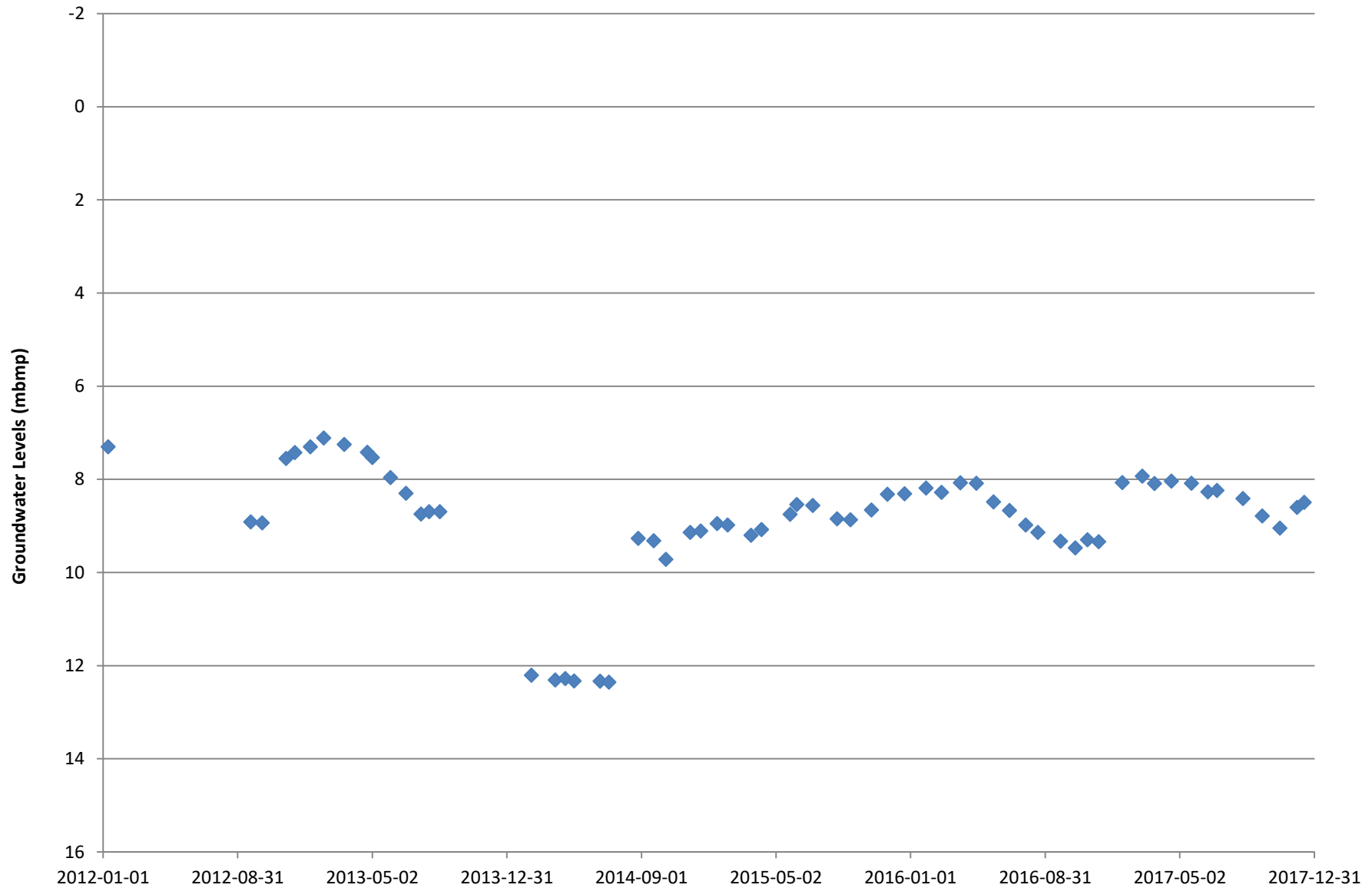
FILE No.  
PROJECT No. 1407634

SCALE: NTS  
DATE: 11-Jan-18  
CAD: JEB  
TEST:  
REVIEW: JAE

**McCarthy Quarry  
Bobcaygeon Monitoring Wells  
Groundwater Level**

QBJR/Coco Aggregates Inc.  
PTTW Annual Report

FIGURE No  
**B-3**



◆ TW1-2



FILE No.  
PROJECT No. 1407634

SCALE: NTS  
DATE: 11-Jan-18  
CAD: JEB  
TEST:  
REVIEW: JAE

**McCarthy Quarry  
Precambrian Monitoring Wells  
Groundwater Level**

QBJR/Coco Aggregates Inc.  
PTTW Annual Report

FIGURE No  
**B-4**



# APPENDIX C

## Certificates of Analysis



Your Project #: 1407634  
 Site Location: MCCARTHY- COCO  
 Your C.O.C. #: 611503-01-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2017/05/30**  
 Report #: R4492508  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7A5736**

**Received: 2017/05/24, 10:15**

Sample Matrix: Water  
 # Samples Received: 3

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Alkalinity	2	N/A	2017/05/27	CAM SOP-00448	SM 22 2320 B m
Alkalinity	1	N/A	2017/05/29	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	3	N/A	2017/05/29	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	3	N/A	2017/05/26	CAM SOP-00463	EPA 325.2 m
Colour	3	N/A	2017/05/25	CAM SOP-00412	SM 22 2120C m
Conductivity	2	N/A	2017/05/27	CAM SOP-00414	SM 22 2510 m
Conductivity	1	N/A	2017/05/29	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2017/05/25	CAM SOP-00446	SM 22 5310 B m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2017/05/26	CAM SOP-00446	SM 22 5310 B m
Fluoride	2	2017/05/26	2017/05/27	CAM SOP-00449	SM 22 4500-F C m
Fluoride	1	2017/05/26	2017/05/29	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2017/05/30	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	3	N/A	2017/05/29	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	3	N/A	2017/05/30		
Anion and Cation Sum	3	N/A	2017/05/30		
Total Ammonia-N	3	N/A	2017/05/30	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2017/05/26	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	2	N/A	2017/05/27	CAM SOP-00413	SM 4500H+ B m
pH	1	N/A	2017/05/29	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	3	N/A	2017/05/26	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	3	N/A	2017/05/30		
Sat. pH and Langelier Index (@ 4C)	3	N/A	2017/05/30		
Sulphate by Automated Colourimetry	3	N/A	2017/05/26	CAM SOP-00464	EPA 375.4 m
Tannins & Lignins	3	N/A	2017/05/25	CAM SOP-00410	SM 22 5550 B m
Total Dissolved Solids (TDS calc)	3	N/A	2017/05/30		
Turbidity	3	N/A	2017/05/25	CAM SOP-00417	SM 22 2130 B m

**Remarks:**

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted,

Your Project #: 1407634  
Site Location: MCCARTHY- COCO  
Your C.O.C. #: 611503-01-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2017/05/30**  
Report #: R4492508  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7A5736**

**Received: 2017/05/24, 10:15**

procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: EGitej@maxxam.ca

Phone# (905)817-5829

=====  
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**RCAP - COMPREHENSIVE (WATER)**

<b>Maxxam ID</b>					EKW642			EKW643	EKW643		
<b>Sampling Date</b>					2017/05/23 11:15			2017/05/23 10:30	2017/05/23 10:30		
<b>COC Number</b>					611503-01-01			611503-01-01	611503-01-01		
	<b>UNITS</b>	<b>Criteria</b>	<b>M/I</b>	<b>A/O</b>	<b>DW1</b>	<b>RDL</b>	<b>QC Batch</b>	<b>DW2</b>	<b>DW2 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>											
Anion Sum	me/L	-	-	-	12.3	N/A	4997030	7.76		N/A	4997030
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	-	310	1.0	4996485	340		1.0	4996485
Calculated TDS	mg/L	-	-	500	<b>660</b>	1.0	4996098	400		1.0	4996098
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	-	1.1	1.0	4996485	1.8		1.0	4996485
Cation Sum	me/L	-	-	-	12.4	N/A	4997030	7.36		N/A	4997030
Hardness (CaCO3)	mg/L	-	-	80:100	<b>540</b>	1.0	4996097	<b>340</b>		1.0	4996097
Ion Balance (% Difference)	%	-	-	-	0.370	N/A	4997029	2.61		N/A	4997029
Langelier Index (@ 20C)	N/A	-	-	-	0.778		4997031	0.905			4997031
Langelier Index (@ 4C)	N/A	-	-	-	0.531		4997032	0.657			4997032
Saturation pH (@ 20C)	N/A	-	-	-	6.80		4997031	6.84			4997031
Saturation pH (@ 4C)	N/A	-	-	-	7.05		4997032	7.09			4997032

<b>Inorganics</b>											
Total Ammonia-N	mg/L	-	-	-	<0.050	0.050	5002130	<0.050		0.050	5002130
Conductivity	umho/cm	-	-	-	1300	1.0	5001162	730	730	1.0	5001453
Dissolved Organic Carbon	mg/L	-	-	5	1.4	0.20	4999157	3.2	3.2	0.20	4999164
Orthophosphate (P)	mg/L	-	-	-	<0.010	0.010	4999453	<0.010		0.010	4999453
pH	pH	6.5:8.5	-	6.5:8.5	7.58		5001196	7.75	7.75		5001468
Dissolved Sulphate (SO4)	mg/L	-	-	500	30	1.0	4999434	18		1.0	4999434
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	310	1.0	5001152	340	340	1.0	5001446
Dissolved Chloride (Cl)	mg/L	-	-	250	200	2.0	4999428	22		1.0	4999428
Nitrite (N)	mg/L	-	1	-	<0.010	0.010	4999386	<0.010		0.010	4999386
Nitrate (N)	mg/L	-	10	-	0.13	0.10	4999386	<0.10		0.10	4999386
Nitrate + Nitrite (N)	mg/L	-	10	-	0.13	0.10	4999386	<0.10		0.10	4999386

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels
<p>RDL = Reportable Detection Limit          QC Batch = Quality Control Batch          Lab-Dup = Laboratory Initiated Duplicate          Criteria: Ontario Provincial Water Quality Objectives          Ref. to MOEE Water Management document dated Feb.1999          M/I,A/O: Ontario Drinking Water Standards (SDWA 2002)          M/I: Table 1 Microbiological Standards, Table 2 Chemical Standards, &amp; Table 3 Radionuclide Standards (Maximum Acceptable Concentrations &amp; Interim Maximum Acceptable Concentrations)          A/O: Table 4 Aesthetic Objectives &amp; Operational Guidelines          N/A = Not Applicable</p>	

**RCAP - COMPREHENSIVE (WATER)**

<b>Maxxam ID</b>					EKW642			EKW643	EKW643		
<b>Sampling Date</b>					2017/05/23 11:15			2017/05/23 10:30	2017/05/23 10:30		
<b>COC Number</b>					611503-01-01			611503-01-01	611503-01-01		
	<b>UNITS</b>	<b>Criteria</b>	<b>M/I</b>	<b>A/O</b>	<b>DW1</b>	<b>RDL</b>	<b>QC Batch</b>	<b>DW2</b>	<b>DW2 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Metals</b>											
Dissolved Aluminum (Al)	ug/L	-	-	100	<5.0	5.0	5000874	<5.0		5.0	5000770
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	5000874	<0.50		0.50	5000770
Dissolved Arsenic (As)	ug/L	100	25	-	<1.0	1.0	5000874	<1.0		1.0	5000770
Dissolved Barium (Ba)	ug/L	-	1000	-	170	2.0	5000874	51		2.0	5000770
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	5000874	<0.50		0.50	5000770
Dissolved Boron (B)	ug/L	200	5000	-	36	10	5000874	44		10	5000770
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	5000874	<0.10		0.10	5000770
Dissolved Calcium (Ca)	ug/L	-	-	-	160000	200	5000874	120000		200	5000770
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	5000874	<5.0		5.0	5000770
Dissolved Cobalt (Co)	ug/L	0.9	-	-	<0.50	0.50	5000874	<0.50		0.50	5000770
Dissolved Copper (Cu)	ug/L	5	-	1000	<b>130</b>	1.0	5000874	1.5		1.0	5000770
Dissolved Iron (Fe)	ug/L	300	-	300	<100	100	5000874	<100		100	5000770
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	0.50	5000874	<0.50		0.50	5000770
Dissolved Magnesium (Mg)	ug/L	-	-	-	32000	50	5000874	9800		50	5000770
Dissolved Manganese (Mn)	ug/L	-	-	50	4.1	2.0	5000874	15		2.0	5000770
Dissolved Molybdenum (Mo)	ug/L	40	-	-	<0.50	0.50	5000874	<0.50		0.50	5000770
Dissolved Nickel (Ni)	ug/L	25	-	-	<1.0	1.0	5000874	<1.0		1.0	5000770
Dissolved Phosphorus (P)	ug/L	-	-	-	<100	100	5000874	<100		100	5000770
Dissolved Potassium (K)	ug/L	-	-	-	1800	200	5000874	4300		200	5000770
Dissolved Selenium (Se)	ug/L	100	10	-	<2.0	2.0	5000874	<2.0		2.0	5000770
Dissolved Silicon (Si)	ug/L	-	-	-	7000	50	5000874	3900		50	5000770
Dissolved Silver (Ag)	ug/L	0.1	-	-	<0.10	0.10	5003914	<0.10		0.10	5000770
Dissolved Sodium (Na)	ug/L	-	20000	200000	<b>38000</b>	100	5000874	12000		100	5000770
Dissolved Strontium (Sr)	ug/L	-	-	-	630	1.0	5000874	280		1.0	5000770

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 Criteria: Ontario Provincial Water Quality Objectives  
 Ref. to MOEE Water Management document dated Feb.1999  
 M/I,A/O: Ontario Drinking Water Standards (SDWA 2002)  
 M/I: Table 1 Microbiological Standards, Table 2 Chemical Standards, & Table 3 Radionuclide Standards (Maximum Acceptable Concentrations & Interim Maximum Acceptable Concentrations)  
 A/O: Table 4 Aesthetic Objectives & Operational Guidelines

**RCAP - COMPREHENSIVE (WATER)**

Maxxam ID					EKW642			EKW643	EKW643		
Sampling Date					2017/05/23 11:15			2017/05/23 10:30	2017/05/23 10:30		
COC Number					611503-01-01			611503-01-01	611503-01-01		
	UNITS	Criteria	M/I	A/O	DW1	RDL	QC Batch	DW2	DW2 Lab-Dup	RDL	QC Batch
Dissolved Thallium (Tl)	ug/L	0.3	-	-	<0.050	0.050	5000874	<0.050		0.050	5000770
Dissolved Titanium (Ti)	ug/L	-	-	-	<5.0	5.0	5000874	<5.0		5.0	5000770
Dissolved Uranium (U)	ug/L	5	20	-	1.4	0.10	5000874	0.31		0.10	5000770
Dissolved Vanadium (V)	ug/L	6	-	-	<0.50	0.50	5000874	<0.50		0.50	5000770
Dissolved Zinc (Zn)	ug/L	30	-	5000	14	5.0	5000874	5.1		5.0	5000770

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 Criteria: Ontario Provincial Water Quality Objectives  
 Ref. to MOEE Water Management document dated Feb.1999  
 M/I,A/O: Ontario Drinking Water Standards (SDWA 2002)  
 M/I: Table 1 Microbiological Standards, Table 2 Chemical Standards, & Table 3 Radionuclide Standards (Maximum Acceptable Concentrations & Interim Maximum Acceptable Concentrations)  
 A/O: Table 4 Aesthetic Objectives & Operational Guidelines

**RCAP - COMPREHENSIVE (WATER)**

Maxxam ID					EKW644		
Sampling Date					2017/05/23 14:00		
COC Number					611503-01-01		
	UNITS	Criteria	M/I	A/O	DW3	RDL	QC Batch
<b>Calculated Parameters</b>							
Anion Sum	me/L	-	-	-	8.79	N/A	4997030
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	-	240	1.0	4996485
Calculated TDS	mg/L	-	-	500	480	1.0	4996098
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	-	1.9	1.0	4996485
Cation Sum	me/L	-	-	-	8.74	N/A	4997030
Hardness (CaCO3)	mg/L	-	-	80:100	<b>180</b>	1.0	4996097
Ion Balance (% Difference)	%	-	-	-	0.290	N/A	4997029
Langelier Index (@ 20C)	N/A	-	-	-	0.368		4997031
Langelier Index (@ 4C)	N/A	-	-	-	0.120		4997032
Saturation pH (@ 20C)	N/A	-	-	-	7.57		4997031
Saturation pH (@ 4C)	N/A	-	-	-	7.82		4997032
<b>Inorganics</b>							
Total Ammonia-N	mg/L	-	-	-	<0.050	0.050	5002130
Conductivity	umho/cm	-	-	-	900	1.0	5001162
Dissolved Organic Carbon	mg/L	-	-	5	0.38	0.20	4999157
Orthophosphate (P)	mg/L	-	-	-	<0.010	0.010	4999453
pH	pH	6.5:8.5	-	6.5:8.5	7.94		5001196
Dissolved Sulphate (SO4)	mg/L	-	-	500	6.0	1.0	4999434
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	240	1.0	5001152
Dissolved Chloride (Cl)	mg/L	-	-	250	140	2.0	4999428
Nitrite (N)	mg/L	-	1	-	<0.010	0.010	4999386
Nitrate (N)	mg/L	-	10	-	<0.10	0.10	4999386
Nitrate + Nitrite (N)	mg/L	-	10	-	<0.10	0.10	4999386
No Fill	No Exceedance						
Grey	Exceeds 1 criteria policy/level						
Black	Exceeds both criteria/levels						
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Criteria: Ontario Provincial Water Quality Objectives							
Ref. to MOEE Water Management document dated Feb.1999							
M/I,A/O: Ontario Drinking Water Standards (SDWA 2002)							
M/I: Table 1 Microbiological Standards, Table 2 Chemical Standards, & Table 3 Radionuclide Standards (Maximum Acceptable Concentrations & Interim Maximum Acceptable Concentrations)							
A/O: Table 4 Aesthetic Objectives & Operational Guidelines							
N/A = Not Applicable							

**RCAP - COMPREHENSIVE (WATER)**

Maxxam ID					EKW644		
Sampling Date					2017/05/23 14:00		
COC Number					611503-01-01		
	UNITS	Criteria	M/I	A/O	DW3	RDL	QC Batch
<b>Metals</b>							
Dissolved Aluminum (Al)	ug/L	-	-	100	6.0	5.0	5000770
Dissolved Antimony (Sb)	ug/L	20	6	-	<0.50	0.50	5000770
Dissolved Arsenic (As)	ug/L	100	25	-	<1.0	1.0	5000770
Dissolved Barium (Ba)	ug/L	-	1000	-	190	2.0	5000770
Dissolved Beryllium (Be)	ug/L	11	-	-	<0.50	0.50	5000770
Dissolved Boron (B)	ug/L	200	5000	-	<b>820</b>	10	5000770
Dissolved Cadmium (Cd)	ug/L	0.2	5	-	<0.10	0.10	5000770
Dissolved Calcium (Ca)	ug/L	-	-	-	33000	200	5000770
Dissolved Chromium (Cr)	ug/L	-	50	-	<5.0	5.0	5000770
Dissolved Cobalt (Co)	ug/L	0.9	-	-	<0.50	0.50	5000770
Dissolved Copper (Cu)	ug/L	5	-	1000	<1.0	1.0	5000770
Dissolved Iron (Fe)	ug/L	300	-	300	<100	100	5000770
Dissolved Lead (Pb)	ug/L	5	10	-	<0.50	0.50	5000770
Dissolved Magnesium (Mg)	ug/L	-	-	-	25000	50	5000770
Dissolved Manganese (Mn)	ug/L	-	-	50	3.9	2.0	5000770
Dissolved Molybdenum (Mo)	ug/L	40	-	-	<0.50	0.50	5000770
Dissolved Nickel (Ni)	ug/L	25	-	-	<1.0	1.0	5000770
Dissolved Phosphorus (P)	ug/L	-	-	-	<100	100	5000770
Dissolved Potassium (K)	ug/L	-	-	-	7100	200	5000770
Dissolved Selenium (Se)	ug/L	100	10	-	<2.0	2.0	5000770
Dissolved Silicon (Si)	ug/L	-	-	-	5500	50	5000770
Dissolved Silver (Ag)	ug/L	0.1	-	-	<0.10	0.10	5000770
Dissolved Sodium (Na)	ug/L	-	20000	200000	<b>110000</b>	100	5000770
Dissolved Strontium (Sr)	ug/L	-	-	-	2200	1.0	5000770
No Fill	No Exceedance						
Grey	Exceeds 1 criteria policy/level						
Black	Exceeds both criteria/levels						
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Criteria: Ontario Provincial Water Quality Objectives							
Ref. to MOEE Water Management document dated Feb.1999							
M/I,A/O: Ontario Drinking Water Standards (SDWA 2002)							
M/I: Table 1 Microbiological Standards, Table 2 Chemical Standards, & Table 3 Radionuclide Standards (Maximum Acceptable Concentrations & Interim Maximum Acceptable Concentrations)							
A/O: Table 4 Aesthetic Objectives & Operational Guidelines							

**RCAP - COMPREHENSIVE (WATER)**

<b>Maxxam ID</b>					EKW644		
<b>Sampling Date</b>					2017/05/23 14:00		
<b>COC Number</b>					611503-01-01		
	<b>UNITS</b>	<b>Criteria</b>	<b>M/I</b>	<b>A/O</b>	<b>DW3</b>	<b>RDL</b>	<b>QC Batch</b>
Dissolved Thallium (TI)	ug/L	0.3	-	-	<0.050	0.050	5000770
Dissolved Titanium (Ti)	ug/L	-	-	-	<5.0	5.0	5000770
Dissolved Uranium (U)	ug/L	5	20	-	<0.10	0.10	5000770
Dissolved Vanadium (V)	ug/L	6	-	-	<0.50	0.50	5000770
Dissolved Zinc (Zn)	ug/L	30	-	5000	6.9	5.0	5000770
No Fill	No Exceedance						
Grey	Exceeds 1 criteria policy/level						
Black	Exceeds both criteria/levels						
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
Criteria: Ontario Provincial Water Quality Objectives							
Ref. to MOEE Water Management document dated Feb.1999							
M/I,A/O: Ontario Drinking Water Standards (SDWA 2002)							
M/I: Table 1 Microbiological Standards, Table 2 Chemical Standards, & Table 3 Radionuclide Standards (Maximum Acceptable Concentrations & Interim Maximum Acceptable Concentrations)							
A/O: Table 4 Aesthetic Objectives & Operational Guidelines							



**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW642	EKW642		EKW643	EKW643		
Sampling Date				2017/05/23 11:15	2017/05/23 11:15		2017/05/23 10:30	2017/05/23 10:30		
COC Number				611503-01-01	611503-01-01		611503-01-01	611503-01-01		
	UNITS	M/I	A/O	DW1	DW1 Lab-Dup	QC Batch	DW2	DW2 Lab-Dup	RDL	QC Batch
<b>Inorganics</b>										
Colour	TCU	-	5	<2		4996587	<2		2	4996587
Fluoride (F-)	mg/L	1.5	-	<0.10		5001195	0.11	<0.10	0.10	5001457
Tannins & Lignins	mg/L	-	-	<0.2	<0.2	4997871	<0.2		0.2	4997871
Turbidity	NTU	-	5	0.2		4998392	0.3	0.3	0.1	4998392
No Fill	No Exceedance									
Grey	Exceeds 1 criteria policy/level									
Black	Exceeds both criteria/levels									
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Lab-Dup = Laboratory Initiated Duplicate										
M/I,A/O: Ontario Drinking Water Standards (SDWA 2002)										
M/I: Table 1 Microbiological Standards, Table 2 Chemical Standards, & Table 3 Radionuclide Standards (Maximum Acceptable Concentrations & Interim Maximum Acceptable Concentrations)										
A/O: Table 4 Aesthetic Objectives & Operational Guidelines										

Maxxam ID				EKW644		
Sampling Date				2017/05/23 14:00		
COC Number				611503-01-01		
	UNITS	M/I	A/O	DW3	RDL	QC Batch
<b>Inorganics</b>						
Colour	TCU	-	5	<2	2	4996587
Fluoride (F-)	mg/L	1.5	-	0.75	0.10	5001195
Tannins & Lignins	mg/L	-	-	<0.2	0.2	4997871
Turbidity	NTU	-	5	0.4	0.1	4998392
No Fill	No Exceedance					
Grey	Exceeds 1 criteria policy/level					
Black	Exceeds both criteria/levels					
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
M/I,A/O: Ontario Drinking Water Standards (SDWA 2002)						
M/I: Table 1 Microbiological Standards, Table 2 Chemical Standards, & Table 3 Radionuclide Standards (Maximum Acceptable Concentrations & Interim Maximum Acceptable Concentrations)						
A/O: Table 4 Aesthetic Objectives & Operational Guidelines						

### TEST SUMMARY

**Maxxam ID:** EKW642  
**Sample ID:** DW1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4996485	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	4999428	N/A	2017/05/26	Alina Dobreanu
Colour	SPEC	4996587	N/A	2017/05/25	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4999157	N/A	2017/05/25	Anastasia Hamanov
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4996097	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Ion Balance (% Difference)	CALC	4997029	N/A	2017/05/30	Automated Statchk
Anion and Cation Sum	CALC	4997030	N/A	2017/05/30	Automated Statchk
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4999386	N/A	2017/05/26	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	4999453	N/A	2017/05/26	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4997031	N/A	2017/05/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4997032	N/A	2017/05/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4999434	N/A	2017/05/26	Deonarine Ramnarine
Tannins & Lignins	SPEC	4997871	N/A	2017/05/25	Viorica Rotaru
Total Dissolved Solids (TDS calc)	CALC	4996098	N/A	2017/05/30	Automated Statchk
Turbidity	AT	4998392	N/A	2017/05/25	Tahir Anwar

**Maxxam ID:** EKW642 Dup  
**Sample ID:** DW1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Tannins & Lignins	SPEC	4997871	N/A	2017/05/25	Viorica Rotaru

**Maxxam ID:** EKW643  
**Sample ID:** DW2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001446	N/A	2017/05/29	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4996485	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	4999428	N/A	2017/05/26	Alina Dobreanu
Colour	SPEC	4996587	N/A	2017/05/25	Viorica Rotaru
Conductivity	AT	5001453	N/A	2017/05/29	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4999164	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001457	2017/05/26	2017/05/29	Surinder Rai
Hardness (calculated as CaCO3)		4996097	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000770	N/A	2017/05/29	Thao Nguyen
Ion Balance (% Difference)	CALC	4997029	N/A	2017/05/30	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** EKW643  
**Sample ID:** DW2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Anion and Cation Sum	CALC	4997030	N/A	2017/05/30	Automated Statchk
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4999386	N/A	2017/05/26	Chandra Nandlal
pH	AT	5001468	N/A	2017/05/29	Surinder Rai
Orthophosphate	KONE	4999453	N/A	2017/05/26	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	4997031	N/A	2017/05/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4997032	N/A	2017/05/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4999434	N/A	2017/05/26	Deonarine Ramnarine
Tannins & Lignins	SPEC	4997871	N/A	2017/05/25	Viorica Rotaru
Total Dissolved Solids (TDS calc)	CALC	4996098	N/A	2017/05/30	Automated Statchk
Turbidity	AT	4998392	N/A	2017/05/25	Tahir Anwar

**Maxxam ID:** EKW643 Dup  
**Sample ID:** DW2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001446	N/A	2017/05/29	Surinder Rai
Conductivity	AT	5001453	N/A	2017/05/29	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4999164	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001457	2017/05/26	2017/05/29	Surinder Rai
pH	AT	5001468	N/A	2017/05/29	Surinder Rai
Turbidity	AT	4998392	N/A	2017/05/25	Tahir Anwar

**Maxxam ID:** EKW644  
**Sample ID:** DW3  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4996485	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	4999428	N/A	2017/05/26	Alina Dobreanu
Colour	SPEC	4996587	N/A	2017/05/25	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4999157	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4996097	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000770	N/A	2017/05/29	Thao Nguyen
Ion Balance (% Difference)	CALC	4997029	N/A	2017/05/30	Automated Statchk
Anion and Cation Sum	CALC	4997030	N/A	2017/05/30	Automated Statchk
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	4999386	N/A	2017/05/26	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	4999453	N/A	2017/05/26	Alina Dobreanu

Maxxam Job #: B7A5736  
Report Date: 2017/05/30

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY- COCO  
Sampler Initials: DEH

### TEST SUMMARY

**Maxxam ID:** EKW644  
**Sample ID:** DW3  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Sat. pH and Langelier Index (@ 20C)	CALC	4997031	N/A	2017/05/30	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	4997032	N/A	2017/05/30	Automated Statchk
Sulphate by Automated Colourimetry	KONE	4999434	N/A	2017/05/26	Deonarine Ramnarine
Tannins & Lignins	SPEC	4997871	N/A	2017/05/25	Viorica Rotaru
Total Dissolved Solids (TDS calc)	CALC	4996098	N/A	2017/05/30	Automated Statchk
Turbidity	AT	4998392	N/A	2017/05/25	Tahir Anwar

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.3°C
Package 2	3.3°C
Package 3	3.3°C

Sample EKW642, Dissolved Metals by ICPMS: Test repeated.

**Results relate only to the items tested.**

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4996587	VRO	Spiked Blank	Colour	2017/05/25		97	%	80 - 120
4996587	VRO	Method Blank	Colour	2017/05/25	<2		TCU	
4996587	VRO	RPD	Colour	2017/05/25	15		%	25
4997871	VRO	Matrix Spike [EKW642-02]	Tannins & Lignins	2017/05/25		89	%	80 - 120
4997871	VRO	Spiked Blank	Tannins & Lignins	2017/05/25		92	%	80 - 120
4997871	VRO	Method Blank	Tannins & Lignins	2017/05/25	<0.2		mg/L	
4997871	VRO	RPD [EKW642-02]	Tannins & Lignins	2017/05/25	NC		%	25
4998392	TA1	Spiked Blank	Turbidity	2017/05/25		99	%	85 - 115
4998392	TA1	Method Blank	Turbidity	2017/05/25	<0.1		NTU	
4998392	TA1	RPD [EKW643-01]	Turbidity	2017/05/25	4.0		%	20
4999157	AHA	Matrix Spike	Dissolved Organic Carbon	2017/05/25		95	%	80 - 120
4999157	AHA	Spiked Blank	Dissolved Organic Carbon	2017/05/25		96	%	80 - 120
4999157	AHA	Method Blank	Dissolved Organic Carbon	2017/05/25	<0.20		mg/L	
4999157	AHA	RPD	Dissolved Organic Carbon	2017/05/25	1.3		%	20
4999164	AHA	Matrix Spike [EKW643-04]	Dissolved Organic Carbon	2017/05/26		95	%	80 - 120
4999164	AHA	Spiked Blank	Dissolved Organic Carbon	2017/05/26		96	%	80 - 120
4999164	AHA	Method Blank	Dissolved Organic Carbon	2017/05/26	<0.20		mg/L	
4999164	AHA	RPD [EKW643-04]	Dissolved Organic Carbon	2017/05/26	0.51		%	20
4999386	C_N	Matrix Spike	Nitrite (N)	2017/05/26		90	%	80 - 120
			Nitrate (N)	2017/05/26		98	%	80 - 120
4999386	C_N	Spiked Blank	Nitrite (N)	2017/05/26		95	%	80 - 120
			Nitrate (N)	2017/05/26		101	%	80 - 120
4999386	C_N	Method Blank	Nitrite (N)	2017/05/26	<0.010		mg/L	
			Nitrate (N)	2017/05/26	<0.10		mg/L	
4999386	C_N	RPD	Nitrite (N)	2017/05/26	0.56		%	20
			Nitrate (N)	2017/05/26	0.086		%	20
4999428	ADB	Matrix Spike	Dissolved Chloride (Cl)	2017/05/26		102	%	80 - 120
4999428	ADB	Spiked Blank	Dissolved Chloride (Cl)	2017/05/26		104	%	80 - 120
4999428	ADB	Method Blank	Dissolved Chloride (Cl)	2017/05/26	<1.0		mg/L	
4999428	ADB	RPD	Dissolved Chloride (Cl)	2017/05/26	0.80		%	20
4999434	DRM	Matrix Spike	Dissolved Sulphate (SO4)	2017/05/26		109	%	75 - 125
4999434	DRM	Spiked Blank	Dissolved Sulphate (SO4)	2017/05/26		101	%	80 - 120
4999434	DRM	Method Blank	Dissolved Sulphate (SO4)	2017/05/26	<1.0		mg/L	
4999434	DRM	RPD	Dissolved Sulphate (SO4)	2017/05/26	11		%	20
4999453	ADB	Matrix Spike	Orthophosphate (P)	2017/05/26		110	%	75 - 125
4999453	ADB	Spiked Blank	Orthophosphate (P)	2017/05/26		100	%	80 - 120
4999453	ADB	Method Blank	Orthophosphate (P)	2017/05/26	<0.010		mg/L	
4999453	ADB	RPD	Orthophosphate (P)	2017/05/26	23		%	25
5000770	TNG	Matrix Spike	Dissolved Aluminum (Al)	2017/05/29		101	%	80 - 120
			Dissolved Antimony (Sb)	2017/05/29		105	%	80 - 120
			Dissolved Arsenic (As)	2017/05/29		99	%	80 - 120
			Dissolved Barium (Ba)	2017/05/29		100	%	80 - 120
			Dissolved Beryllium (Be)	2017/05/29		97	%	80 - 120
			Dissolved Boron (B)	2017/05/29		98	%	80 - 120
			Dissolved Cadmium (Cd)	2017/05/29		103	%	80 - 120
			Dissolved Calcium (Ca)	2017/05/29		NC	%	80 - 120
			Dissolved Chromium (Cr)	2017/05/29		97	%	80 - 120
			Dissolved Cobalt (Co)	2017/05/29		95	%	80 - 120
			Dissolved Copper (Cu)	2017/05/29		100	%	80 - 120
			Dissolved Iron (Fe)	2017/05/29		97	%	80 - 120

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Lead (Pb)	2017/05/29		96	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/29		96	%	80 - 120
			Dissolved Manganese (Mn)	2017/05/29		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/05/29		102	%	80 - 120
			Dissolved Nickel (Ni)	2017/05/29		95	%	80 - 120
			Dissolved Phosphorus (P)	2017/05/29		100	%	80 - 120
			Dissolved Potassium (K)	2017/05/29		99	%	80 - 120
			Dissolved Selenium (Se)	2017/05/29		100	%	80 - 120
			Dissolved Silicon (Si)	2017/05/29		99	%	80 - 120
			Dissolved Silver (Ag)	2017/05/29		99	%	80 - 120
			Dissolved Sodium (Na)	2017/05/29		95	%	80 - 120
			Dissolved Strontium (Sr)	2017/05/29		96	%	80 - 120
			Dissolved Thallium (Tl)	2017/05/29		95	%	80 - 120
			Dissolved Titanium (Ti)	2017/05/29		102	%	80 - 120
			Dissolved Uranium (U)	2017/05/29		101	%	80 - 120
			Dissolved Vanadium (V)	2017/05/29		97	%	80 - 120
			Dissolved Zinc (Zn)	2017/05/29		96	%	80 - 120
5000770	TNG	Spiked Blank	Dissolved Aluminum (Al)	2017/05/29		103	%	80 - 120
			Dissolved Antimony (Sb)	2017/05/29		107	%	80 - 120
			Dissolved Arsenic (As)	2017/05/29		101	%	80 - 120
			Dissolved Barium (Ba)	2017/05/29		102	%	80 - 120
			Dissolved Beryllium (Be)	2017/05/29		97	%	80 - 120
			Dissolved Boron (B)	2017/05/29		98	%	80 - 120
			Dissolved Cadmium (Cd)	2017/05/29		104	%	80 - 120
			Dissolved Calcium (Ca)	2017/05/29		99	%	80 - 120
			Dissolved Chromium (Cr)	2017/05/29		100	%	80 - 120
			Dissolved Cobalt (Co)	2017/05/29		99	%	80 - 120
			Dissolved Copper (Cu)	2017/05/29		103	%	80 - 120
			Dissolved Iron (Fe)	2017/05/29		101	%	80 - 120
			Dissolved Lead (Pb)	2017/05/29		100	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/29		101	%	80 - 120
			Dissolved Manganese (Mn)	2017/05/29		101	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/05/29		104	%	80 - 120
			Dissolved Nickel (Ni)	2017/05/29		99	%	80 - 120
			Dissolved Phosphorus (P)	2017/05/29		111	%	80 - 120
			Dissolved Potassium (K)	2017/05/29		102	%	80 - 120
			Dissolved Selenium (Se)	2017/05/29		101	%	80 - 120
			Dissolved Silicon (Si)	2017/05/29		100	%	80 - 120
			Dissolved Silver (Ag)	2017/05/29		101	%	80 - 120
			Dissolved Sodium (Na)	2017/05/29		100	%	80 - 120
			Dissolved Strontium (Sr)	2017/05/29		101	%	80 - 120
			Dissolved Thallium (Tl)	2017/05/29		98	%	80 - 120
			Dissolved Titanium (Ti)	2017/05/29		103	%	80 - 120
			Dissolved Uranium (U)	2017/05/29		104	%	80 - 120
			Dissolved Vanadium (V)	2017/05/29		99	%	80 - 120
			Dissolved Zinc (Zn)	2017/05/29		100	%	80 - 120
5000770	TNG	Method Blank	Dissolved Aluminum (Al)	2017/05/29	<5.0		ug/L	
			Dissolved Antimony (Sb)	2017/05/29	<0.50		ug/L	
			Dissolved Arsenic (As)	2017/05/29	<1.0		ug/L	
			Dissolved Barium (Ba)	2017/05/29	<2.0		ug/L	
			Dissolved Beryllium (Be)	2017/05/29	<0.50		ug/L	
			Dissolved Boron (B)	2017/05/29	<1.0		ug/L	

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Cadmium (Cd)	2017/05/29	<0.10		ug/L	
			Dissolved Calcium (Ca)	2017/05/29	<200		ug/L	
			Dissolved Chromium (Cr)	2017/05/29	<5.0		ug/L	
			Dissolved Cobalt (Co)	2017/05/29	<0.50		ug/L	
			Dissolved Copper (Cu)	2017/05/29	<1.0		ug/L	
			Dissolved Iron (Fe)	2017/05/29	<100		ug/L	
			Dissolved Lead (Pb)	2017/05/29	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2017/05/29	<5.0		ug/L	
			Dissolved Manganese (Mn)	2017/05/29	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2017/05/29	<0.50		ug/L	
			Dissolved Nickel (Ni)	2017/05/29	<1.0		ug/L	
			Dissolved Phosphorus (P)	2017/05/29	<100		ug/L	
			Dissolved Potassium (K)	2017/05/29	<200		ug/L	
			Dissolved Selenium (Se)	2017/05/29	<2.0		ug/L	
			Dissolved Silicon (Si)	2017/05/29	<50		ug/L	
			Dissolved Silver (Ag)	2017/05/29	<0.10		ug/L	
			Dissolved Sodium (Na)	2017/05/29	<100		ug/L	
			Dissolved Strontium (Sr)	2017/05/29	<1.0		ug/L	
			Dissolved Thallium (Tl)	2017/05/29	<0.050		ug/L	
			Dissolved Titanium (Ti)	2017/05/29	<5.0		ug/L	
			Dissolved Uranium (U)	2017/05/29	<0.10		ug/L	
			Dissolved Vanadium (V)	2017/05/29	<0.50		ug/L	
			Dissolved Zinc (Zn)	2017/05/29	<5.0		ug/L	
5000770	TNG	RPD	Dissolved Calcium (Ca)	2017/05/29	2.5		%	20
			Dissolved Chromium (Cr)	2017/05/29	NC		%	20
			Dissolved Magnesium (Mg)	2017/05/29	2.9		%	20
5000874	KCO	Matrix Spike	Dissolved Aluminum (Al)	2017/05/29		113	%	80 - 120
			Dissolved Antimony (Sb)	2017/05/29		112	%	80 - 120
			Dissolved Arsenic (As)	2017/05/29		104	%	80 - 120
			Dissolved Barium (Ba)	2017/05/29		107	%	80 - 120
			Dissolved Beryllium (Be)	2017/05/29		113	%	80 - 120
			Dissolved Boron (B)	2017/05/29		NC	%	80 - 120
			Dissolved Cadmium (Cd)	2017/05/29		105	%	80 - 120
			Dissolved Calcium (Ca)	2017/05/29		NC	%	80 - 120
			Dissolved Chromium (Cr)	2017/05/29		105	%	80 - 120
			Dissolved Cobalt (Co)	2017/05/29		99	%	80 - 120
			Dissolved Copper (Cu)	2017/05/29		104	%	80 - 120
			Dissolved Iron (Fe)	2017/05/29		101	%	80 - 120
			Dissolved Lead (Pb)	2017/05/29		96	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/29		NC	%	80 - 120
			Dissolved Manganese (Mn)	2017/05/29		103	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/05/29		116	%	80 - 120
			Dissolved Nickel (Ni)	2017/05/29		94	%	80 - 120
			Dissolved Phosphorus (P)	2017/05/29		117	%	80 - 120
			Dissolved Potassium (K)	2017/05/29		110	%	80 - 120
			Dissolved Selenium (Se)	2017/05/29		83	%	80 - 120
			Dissolved Silicon (Si)	2017/05/29		120	%	80 - 120
			Dissolved Sodium (Na)	2017/05/29		NC	%	80 - 120
			Dissolved Strontium (Sr)	2017/05/29		NC	%	80 - 120
			Dissolved Thallium (Tl)	2017/05/29		98	%	80 - 120
			Dissolved Titanium (Ti)	2017/05/29		112	%	80 - 120
			Dissolved Uranium (U)	2017/05/29		99	%	80 - 120



**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5000874	KCO	Spiked Blank	Dissolved Vanadium (V)	2017/05/29		103	%	80 - 120
			Dissolved Zinc (Zn)	2017/05/29		96	%	80 - 120
			Dissolved Aluminum (Al)	2017/05/29		96	%	80 - 120
			Dissolved Antimony (Sb)	2017/05/29		103	%	80 - 120
			Dissolved Arsenic (As)	2017/05/29		97	%	80 - 120
			Dissolved Barium (Ba)	2017/05/29		102	%	80 - 120
			Dissolved Beryllium (Be)	2017/05/29		100	%	80 - 120
			Dissolved Boron (B)	2017/05/29		99	%	80 - 120
			Dissolved Cadmium (Cd)	2017/05/29		99	%	80 - 120
			Dissolved Calcium (Ca)	2017/05/29		97	%	80 - 120
			Dissolved Chromium (Cr)	2017/05/29		99	%	80 - 120
			Dissolved Cobalt (Co)	2017/05/29		98	%	80 - 120
			Dissolved Copper (Cu)	2017/05/29		103	%	80 - 120
			Dissolved Iron (Fe)	2017/05/29		99	%	80 - 120
			Dissolved Lead (Pb)	2017/05/29		100	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/29		100	%	80 - 120
			Dissolved Manganese (Mn)	2017/05/29		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/05/29		103	%	80 - 120
			Dissolved Nickel (Ni)	2017/05/29		94	%	80 - 120
			Dissolved Phosphorus (P)	2017/05/29		105	%	80 - 120
Dissolved Potassium (K)	2017/05/29		105	%	80 - 120			
Dissolved Selenium (Se)	2017/05/29		94	%	80 - 120			
Dissolved Silicon (Si)	2017/05/29		98	%	80 - 120			
Dissolved Sodium (Na)	2017/05/29		101	%	80 - 120			
Dissolved Strontium (Sr)	2017/05/29		98	%	80 - 120			
Dissolved Thallium (Tl)	2017/05/29		101	%	80 - 120			
Dissolved Titanium (Ti)	2017/05/29		95	%	80 - 120			
Dissolved Uranium (U)	2017/05/29		96	%	80 - 120			
Dissolved Vanadium (V)	2017/05/29		95	%	80 - 120			
Dissolved Zinc (Zn)	2017/05/29		96	%	80 - 120			
5000874	KCO	Method Blank	Dissolved Aluminum (Al)	2017/05/29	<5.0		ug/L	
			Dissolved Antimony (Sb)	2017/05/29	<0.50		ug/L	
			Dissolved Arsenic (As)	2017/05/29	<1.0		ug/L	
			Dissolved Barium (Ba)	2017/05/29	<2.0		ug/L	
			Dissolved Beryllium (Be)	2017/05/29	<0.50		ug/L	
			Dissolved Boron (B)	2017/05/29	<10		ug/L	
			Dissolved Cadmium (Cd)	2017/05/29	<0.10		ug/L	
			Dissolved Calcium (Ca)	2017/05/29	<200		ug/L	
			Dissolved Chromium (Cr)	2017/05/29	<5.0		ug/L	
			Dissolved Cobalt (Co)	2017/05/29	<0.50		ug/L	
			Dissolved Copper (Cu)	2017/05/29	<1.0		ug/L	
			Dissolved Iron (Fe)	2017/05/29	<100		ug/L	
			Dissolved Lead (Pb)	2017/05/29	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2017/05/29	<50		ug/L	
			Dissolved Manganese (Mn)	2017/05/29	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2017/05/29	<0.50		ug/L	
			Dissolved Nickel (Ni)	2017/05/29	<1.0		ug/L	
			Dissolved Phosphorus (P)	2017/05/29	<100		ug/L	
			Dissolved Potassium (K)	2017/05/29	<200		ug/L	
			Dissolved Selenium (Se)	2017/05/29	<2.0		ug/L	
Dissolved Silicon (Si)	2017/05/29	<50		ug/L				

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2017/05/29	160, RDL=100		ug/L	
			Dissolved Strontium (Sr)	2017/05/29	<1.0		ug/L	
			Dissolved Thallium (Tl)	2017/05/29	<0.050		ug/L	
			Dissolved Titanium (Ti)	2017/05/29	<5.0		ug/L	
			Dissolved Uranium (U)	2017/05/29	<0.10		ug/L	
			Dissolved Vanadium (V)	2017/05/29	<0.50		ug/L	
			Dissolved Zinc (Zn)	2017/05/29	<5.0		ug/L	
5000874	KCO	RPD	Dissolved Calcium (Ca)	2017/05/29	1.2		%	20
			Dissolved Magnesium (Mg)	2017/05/29	1.7		%	20
			Dissolved Phosphorus (P)	2017/05/29	NC		%	20
			Dissolved Potassium (K)	2017/05/29	0.65		%	20
			Dissolved Sodium (Na)	2017/05/29	1.3		%	20
5001152	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2017/05/27		95	%	85 - 115
5001152	YPA	Method Blank	Alkalinity (Total as CaCO3)	2017/05/27	<1.0		mg/L	
5001152	YPA	RPD	Alkalinity (Total as CaCO3)	2017/05/27	1.2		%	20
5001162	YPA	Spiked Blank	Conductivity	2017/05/27		100	%	85 - 115
5001162	YPA	Method Blank	Conductivity	2017/05/27	<1.0		umho/cm	
5001162	YPA	RPD	Conductivity	2017/05/27	0.20		%	25
5001195	YPA	Matrix Spike	Fluoride (F-)	2017/05/27		98	%	80 - 120
5001195	YPA	Spiked Blank	Fluoride (F-)	2017/05/27		105	%	80 - 120
5001195	YPA	Method Blank	Fluoride (F-)	2017/05/27	<0.10		mg/L	
5001195	YPA	RPD	Fluoride (F-)	2017/05/27	7.1		%	20
5001196	YPA	Spiked Blank	pH	2017/05/27		102	%	98 - 103
5001196	YPA	RPD	pH	2017/05/27	0.39		%	N/A
5001446	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2017/05/29		94	%	85 - 115
5001446	SAU	Method Blank	Alkalinity (Total as CaCO3)	2017/05/29	<1.0		mg/L	
5001446	SAU	RPD [EKW643-01]	Alkalinity (Total as CaCO3)	2017/05/29	1.3		%	20
5001453	SAU	Spiked Blank	Conductivity	2017/05/29		101	%	85 - 115
5001453	SAU	Method Blank	Conductivity	2017/05/29	<1.0		umho/cm	
5001453	SAU	RPD [EKW643-01]	Conductivity	2017/05/29	0.14		%	25
5001457	SAU	Matrix Spike [EKW643-01]	Fluoride (F-)	2017/05/29		100	%	80 - 120
5001457	SAU	Spiked Blank	Fluoride (F-)	2017/05/29		105	%	80 - 120
5001457	SAU	Method Blank	Fluoride (F-)	2017/05/29	<0.10		mg/L	
5001457	SAU	RPD [EKW643-01]	Fluoride (F-)	2017/05/29	9.3		%	20
5001468	SAU	Spiked Blank	pH	2017/05/29		102	%	98 - 103
5001468	SAU	RPD [EKW643-01]	pH	2017/05/29	0.027		%	N/A
5002130	COP	Matrix Spike	Total Ammonia-N	2017/05/30		92	%	80 - 120
5002130	COP	Spiked Blank	Total Ammonia-N	2017/05/30		98	%	85 - 115
5002130	COP	Method Blank	Total Ammonia-N	2017/05/30	<0.050		mg/L	
5002130	COP	RPD	Total Ammonia-N	2017/05/30	0.25		%	20
5003914	TNG	Matrix Spike	Dissolved Silver (Ag)	2017/05/30		95	%	80 - 120
5003914	TNG	Spiked Blank	Dissolved Silver (Ag)	2017/05/30		97	%	80 - 120
5003914	TNG	Method Blank	Dissolved Silver (Ag)	2017/05/30	<0.10		ug/L	

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	5003914	TNG	RPD	Dissolved Silver (Ag)	2017/05/30	NC		%	20
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference &lt;= 2x RDL).</p>									

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).


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Ewa Pranjić, M.Sc., C.Chem, Scientific Specialist

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**Exceedence Summary Table – Prov. Water Quality Obj.**

**Result Exceedences**

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
DW1	EKW642-05	Dissolved Copper (Cu)	5	130	1.0	ug/L
DW3	EKW644-05	Dissolved Boron (B)	200	820	10	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

**Exceedence Summary Table – ODWS (MAC/IMAC & AO/OG)**

**Result Exceedences**

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
DW1	EKW642-05	Dissolved Sodium (Na)	20000	38000	100	ug/L
DW3	EKW644-05	Dissolved Sodium (Na)	20000	110000	100	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

Your Project #: 1407634  
 Site Location: MCCARTHY COCO  
 Your C.O.C. #: 611505-01-01, 611505-02-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2017/05/31**  
 Report #: R4494338  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7A5766**  
**Received: 2017/05/24, 10:15**

Sample Matrix: Water  
 # Samples Received: 16

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Alkalinity	15	N/A	2017/05/27	CAM SOP-00448	SM 22 2320 B m
Alkalinity	1	N/A	2017/05/31	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	16	N/A	2017/05/29	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	15	N/A	2017/05/29	CAM SOP-00463	EPA 325.2 m
Chloride by Automated Colourimetry	1	N/A	2017/05/31	CAM SOP-00463	EPA 325.2 m
Colour	16	N/A	2017/05/29	CAM SOP-00412	SM 22 2120C m
Conductivity	16	N/A	2017/05/27	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	7	N/A	2017/05/26	CAM SOP-00446	SM 22 5310 B m
Dissolved Organic Carbon (DOC) (1)	9	N/A	2017/05/27	CAM SOP-00446	SM 22 5310 B m
Fluoride	16	2017/05/26	2017/05/27	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	16	N/A	2017/05/30	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	15	N/A	2017/05/29	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2017/05/31	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	16	N/A	2017/05/30	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	16	N/A	2017/05/29	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	16	N/A	2017/05/27	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	16	N/A	2017/05/29	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	15	N/A	2017/05/29	CAM SOP-00464	EPA 375.4 m
Sulphate by Automated Colourimetry	1	N/A	2017/05/31	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	16	N/A	2017/05/30		

**Remarks:**

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Your Project #: 1407634  
Site Location: MCCARTHY COCO  
Your C.O.C. #: 611505-01-01, 611505-02-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2017/05/31**  
Report #: R4494338  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7A5766**

**Received: 2017/05/24, 10:15**

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: EGitej@maxxam.ca

Phone# (905)817-5829

=====  
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW747			EKW748		EKW749		
Sampling Date				2017/05/23 12:45			2017/05/23 09:30		2017/05/23 12:30		
COC Number				611505-01-01			611505-01-01		611505-01-01		
	UNITS	MAC	A/O	AM 1B	RDL	QC Batch	TW1-1	RDL	BORED	RDL	QC Batch

Calculated Parameters											
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	210	1.0	4998026	290	1.0	230	1.0	4998026
Calculated TDS	mg/L	-	500	280	1.0	4998033	<b>670</b>	1.0	300	1.0	4998033
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	1.7	1.0	4998026	1.4	1.0	3.1	1.0	4998026
Hardness (CaCO3)	mg/L	-	80:100	<b>240</b>	1.0	4999003	<b>410</b>	1.0	<b>220</b>	1.0	4999003

Inorganics											
Total Ammonia-N	mg/L	-	-	0.12	0.050	5002130	0.47	0.050	<0.050	0.050	5002130
Colour	TCU	-	5	<2	2	5001472	<2	2	<2	2	5001472
Conductivity	umho/cm	-	-	470	1.0	5001162	1300	1.0	490	1.0	5001162
Fluoride (F-)	mg/L	1.5	-	0.25	0.10	5001195	0.50	0.10	0.15	0.10	5001195
Dissolved Organic Carbon	mg/L	-	5	0.82	0.20	5001274	1.8	0.20	1.0	0.20	5000873
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	5001297	<0.010	0.010	<0.010	0.010	5001297
pH	pH	-	6.5:8.5	7.92		5001196	7.71		8.17		5001196
Dissolved Sulphate (SO4)	mg/L	-	500	41	1.0	5001303	22	1.0	32	1.0	5001303
Alkalinity (Total as CaCO3)	mg/L	-	30:500	210	1.0	5001152	290	1.0	230	1.0	5001152
Dissolved Chloride (Cl)	mg/L	-	250	3.2	1.0	5001291	220	3.0	3.5	1.0	5001291
Nitrite (N)	mg/L	1	-	0.012	0.010	5001217	<0.010	0.010	<0.010	0.010	5001217
Nitrate (N)	mg/L	10	-	<0.10	0.10	5001217	<0.10	0.10	0.38	0.10	5001217
Nitrate + Nitrite (N)	mg/L	10	-	<0.10	0.10	5001217	<0.10	0.10	0.38	0.10	5001217

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively  
(Made under the Ontario Safe Drinking Water Act, 2002)



**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW749		EKW750			EKW751		
Sampling Date				2017/05/23 12:30		2017/05/23 12:45			2017/05/23 13:00		
COC Number				611505-01-01		611505-01-01			611505-01-01		
	UNITS	MAC	A/O	BORED Lab-Dup	RDL	OW4-1	RDL	QC Batch	OW4-2	RDL	QC Batch

Calculated Parameters											
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-		1.0	260	1.0	4998026	230	1.0	4998026
Calculated TDS	mg/L	-	500		1.0	<b>630</b>	1.0	4998033	<b>910</b>	1.0	4998033
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-		1.0	3.5	1.0	4998026	1.9	1.0	4998026
Hardness (CaCO3)	mg/L	-	80:100		1.0	<b>130</b>	1.0	4999003	<b>250</b>	1.0	4999003

Inorganics											
Total Ammonia-N	mg/L	-	-		0.050	0.77	0.050	5002130	1.1	0.050	5002130
Colour	TCU	-	5		2	<2	2	5001472	<2	2	5001472
Conductivity	umho/cm	-	-	490	1.0	1200	1.0	5001162	1800	1.0	5001162
Fluoride (F-)	mg/L	1.5	-	0.14	0.10	1.2	0.10	5001195	0.95	0.10	5001195
Dissolved Organic Carbon	mg/L	-	5		0.20	2.2	0.20	5000873	1.1	0.20	5001274
Orthophosphate (P)	mg/L	-	-		0.010	<0.010	0.010	5001297	<0.010	0.010	5001297
pH	pH	-	6.5:8.5	8.14		8.16		5001196	7.94		5001196
Dissolved Sulphate (SO4)	mg/L	-	500		1.0	6.7	1.0	5001303	<1.0	1.0	5001303
Alkalinity (Total as CaCO3)	mg/L	-	30:500	230	1.0	260	1.0	5001152	230	1.0	5001152
Dissolved Chloride (Cl)	mg/L	-	250		1.0	210	3.0	5001291	<b>400</b>	5.0	5001291
Nitrite (N)	mg/L	1	-		0.010	<0.010	0.010	5001217	<0.010	0.010	5001217
Nitrate (N)	mg/L	10	-		0.10	<0.10	0.10	5001217	<0.10	0.10	5001217
Nitrate + Nitrite (N)	mg/L	10	-		0.10	<0.10	0.10	5001217	<0.10	0.10	5001217

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively  
(Made under the Ontario Safe Drinking Water Act, 2002)

**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW751			EKW752	EKW752		
Sampling Date				2017/05/23 13:00			2017/05/23 11:30	2017/05/23 11:30		
COC Number				611505-01-01			611505-01-01	611505-01-01		
	UNITS	MAC	A/O	OW4-2 Lab-Dup	RDL	QC Batch	OW5-1	OW5-1 Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>										
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-		1.0	4998026	230		1.0	4998026
Calculated TDS	mg/L	-	500		1.0	4998033	340		1.0	4998033
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-		1.0	4998026	2.2		1.0	4998026
Hardness (CaCO3)	mg/L	-	80:100		1.0	4999003	<b>170</b>		1.0	4999003
<b>Inorganics</b>										
Total Ammonia-N	mg/L	-	-		0.050	5002130	0.81		0.050	5002130
Colour	TCU	-	5		2	5001472	<2	<2	2	5001472
Conductivity	umho/cm	-	-		1.0	5001162	600		1.0	5001162
Fluoride (F-)	mg/L	1.5	-		0.10	5001195	0.82		0.10	5001195
Dissolved Organic Carbon	mg/L	-	5	1.1	0.20	5001274	1.4		0.20	5000779
Orthophosphate (P)	mg/L	-	-		0.010	5001297	<0.010		0.010	5001297
pH	pH	-	6.5:8.5			5001196	8.01			5001196
Dissolved Sulphate (SO4)	mg/L	-	500		1.0	5001303	28		1.0	5001303
Alkalinity (Total as CaCO3)	mg/L	-	30:500		1.0	5001152	230		1.0	5001152
Dissolved Chloride (Cl)	mg/L	-	250		5.0	5001291	37		1.0	5001291
Nitrite (N)	mg/L	1	-		0.010	5001217	0.033		0.010	5001217
Nitrate (N)	mg/L	10	-		0.10	5001217	<0.10		0.10	5001217
Nitrate + Nitrite (N)	mg/L	10	-		0.10	5001217	<0.10		0.10	5001217
No Fill	No Exceedance									
Grey	Exceeds 1 criteria policy/level									
Black	Exceeds both criteria/levels									
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Lab-Dup = Laboratory Initiated Duplicate										
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)										

**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW753		EKW754	EKW754		
Sampling Date				2017/05/23 11:45		2017/05/23 11:45	2017/05/23 11:45		
COC Number				611505-01-01		611505-01-01	611505-01-01		
	UNITS	MAC	A/O	OW5-2	QC Batch	OW5-3	OW5-3 Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>									
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	110	4998026	110		1.0	4998026
Calculated TDS	mg/L	-	500	<b>16000</b>	4998033	<b>17000</b>		1.0	4998033
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	<1.0	4998026	<1.0		1.0	4998026
Hardness (CaCO3)	mg/L	-	80:100	<b>6300</b>	4999003	<b>6500</b>		1.0	4999003
<b>Inorganics</b>									
Total Ammonia-N	mg/L	-	-	9.4	5002130	9.6		0.25	5002130
Colour	TCU	-	5	<b>51</b>	5001472	2		2	5001472
Conductivity	umho/cm	-	-	28000	5001162	29000		1.0	5001162
Fluoride (F-)	mg/L	1.5	-	0.44	5001195	0.44		0.10	5001195
Dissolved Organic Carbon	mg/L	-	5	0.70	5000873	0.78		0.20	5001274
Orthophosphate (P)	mg/L	-	-	<0.010	5001297	<0.010	<0.010	0.010	5001297
pH	pH	-	6.5:8.5	7.27	5001196	7.33			5001196
Dissolved Sulphate (SO4)	mg/L	-	500	<1.0	5001303	14	14	1.0	5001303
Alkalinity (Total as CaCO3)	mg/L	-	30:500	110	5001152	110		1.0	5001152
Dissolved Chloride (Cl)	mg/L	-	250	<b>10000</b>	5001291	<b>10000</b>	<b>10000</b>	120	5001291
Nitrite (N)	mg/L	1	-	<0.050	5001217	<0.050		0.050	5001217
Nitrate (N)	mg/L	10	-	<0.50	5001217	<0.50		0.50	5001217
Nitrate + Nitrite (N)	mg/L	10	-	<0.50	5001217	<0.50		0.50	5001217
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively									
(Made under the Ontario Safe Drinking Water Act, 2002)									

**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW755			EKW756		
Sampling Date				2017/05/23 12:30			2017/05/23 10:00		
COC Number				611505-01-01			611505-01-01		
	UNITS	MAC	A/O	OW6-2	RDL	QC Batch	OW7-1	RDL	QC Batch
<b>Calculated Parameters</b>									
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	150	1.0	4998026	310	1.0	4998026
Calculated TDS	mg/L	-	500	<b>4000</b>	1.0	4998033	<b>2800</b>	1.0	4998033
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	<1.0	1.0	4998026	2.1	1.0	4998026
Hardness (CaCO3)	mg/L	-	80:100	<b>1600</b>	1.0	4999003	<b>710</b>	1.0	4999003
<b>Inorganics</b>									
Total Ammonia-N	mg/L	-	-	0.059	0.050	5002130	2.8	0.50	5002130
Colour	TCU	-	5	<2	2	5001472	<b>23</b>	2	5001472
Conductivity	umho/cm	-	-	6400	1.0	5001162	5300	1.0	5001162
Fluoride (F-)	mg/L	1.5	-	0.51	0.10	5001195	<b>2.8</b>	0.10	5001195
Dissolved Organic Carbon	mg/L	-	5	0.77	0.20	5000873	0.98	0.20	5001274
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	5001297	<0.010	0.010	5001297
pH	pH	-	6.5:8.5	7.60		5001196	7.86		5001196
Dissolved Sulphate (SO4)	mg/L	-	500	<b>1100</b>	5.0	5001303	37	1.0	5001303
Alkalinity (Total as CaCO3)	mg/L	-	30:500	150	1.0	5001152	310	1.0	5001152
Dissolved Chloride (Cl)	mg/L	-	250	<b>1500</b>	20	5001291	<b>1500</b>	20	5001291
Nitrite (N)	mg/L	1	-	0.019	0.010	5001217	<0.010	0.010	5001217
Nitrate (N)	mg/L	10	-	1.24	0.10	5001217	<0.10	0.10	5001217
Nitrate + Nitrite (N)	mg/L	10	-	1.26	0.10	5001217	<0.10	0.10	5001217
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)									

**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW757	EKW757			EKW758		
Sampling Date				2017/05/23 10:15	2017/05/23 10:15			2017/05/23 09:45		
COC Number				611505-02-01	611505-02-01			611505-02-01		
	UNITS	MAC	A/O	OW7-2	OW7-2 Lab-Dup	RDL	QC Batch	OW8-1	RDL	QC Batch
<b>Calculated Parameters</b>										
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	320		1.0	4998026	310	1.0	4998026
Calculated TDS	mg/L	-	500	<b>3000</b>		1.0	4998033	<b>600</b>	1.0	4998033
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	2.2		1.0	4998026	2.6	1.0	4998026
Hardness (CaCO3)	mg/L	-	80:100	<b>800</b>		1.0	4999003	<b>240</b>	1.0	4999003
<b>Inorganics</b>										
Total Ammonia-N	mg/L	-	-	1.6	1.6	0.050	5002130	0.63	0.050	5002130
Colour	TCU	-	5	3		2	5001472	<2	2	5001472
Conductivity	umho/cm	-	-	5600		1.0	5001162	980	1.0	5001162
Fluoride (F-)	mg/L	1.5	-	<b>2.8</b>		0.10	5001195	<b>1.6</b>	0.10	5001195
Dissolved Organic Carbon	mg/L	-	5	1.0		0.20	5000873	1.5	0.20	5001274
Orthophosphate (P)	mg/L	-	-	<0.010		0.010	5001297	<0.010	0.010	5001297
pH	pH	-	6.5:8.5	7.87			5001196	7.96		5001196
Dissolved Sulphate (SO4)	mg/L	-	500	24		1.0	5001303	53	1.0	5005957
Alkalinity (Total as CaCO3)	mg/L	-	30:500	320		1.0	5001152	310	1.0	5006475
Dissolved Chloride (Cl)	mg/L	-	250	<b>1600</b>		20	5001291	110	1.0	5005956
Nitrite (N)	mg/L	1	-	<0.010	<0.010	0.010	5001217	<0.010	0.010	5001217
Nitrate (N)	mg/L	10	-	<0.10	<0.10	0.10	5001217	<0.10	0.10	5001217
Nitrate + Nitrite (N)	mg/L	10	-	<0.10	<0.10	0.10	5001217	<0.10	0.10	5001217
No Fill	No Exceedance									
Grey	Exceeds 1 criteria policy/level									
Black	Exceeds both criteria/levels									
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Lab-Dup = Laboratory Initiated Duplicate										
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)										

**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW759			EKW760		
Sampling Date				2017/05/23 09:45			2017/05/23 14:45		
COC Number				611505-02-01			611505-02-01		
	UNITS	MAC	A/O	OW8-2	RDL	QC Batch	OW9-1	RDL	QC Batch
<b>Calculated Parameters</b>									
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	320	1.0	4998026	170	1.0	4998026
Calculated TDS	mg/L	-	500	470	1.0	4998033	<b>58000</b>	1.0	4998033
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	1.7	1.0	4998026	<1.0	1.0	4998026
Hardness (CaCO3)	mg/L	-	80:100	<b>260</b>	1.0	4999003	<b>27000</b>	1.0	4999003
<b>Inorganics</b>									
Total Ammonia-N	mg/L	-	-	0.48	0.050	5002130	18	0.25	5002130
Colour	TCU	-	5	<2	2	5001472	<b>110</b>	4	5001472
Conductivity	umho/cm	-	-	800	1.0	5001162	81000	1.0	5001162
Fluoride (F-)	mg/L	1.5	-	0.71	0.10	5001195	<0.10	0.10	5001195
Dissolved Organic Carbon	mg/L	-	5	1.9	0.20	5000873	<b>12</b>	0.20	5001274
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	5001297	<0.010	0.010	5001297
pH	pH	-	6.5:8.5	7.73		5001196	6.73		5001196
Dissolved Sulphate (SO4)	mg/L	-	500	52	1.0	5001303	180	1.0	5001303
Alkalinity (Total as CaCO3)	mg/L	-	30:500	330	1.0	5001152	170	1.0	5001152
Dissolved Chloride (Cl)	mg/L	-	250	36	1.0	5001291	<b>37000</b>	400	5001291
Nitrite (N)	mg/L	1	-	<0.010	0.010	5001217	<0.10	0.10	5001217
Nitrate (N)	mg/L	10	-	<0.10	0.10	5001217	<1.0	1.0	5001217
Nitrate + Nitrite (N)	mg/L	10	-	<0.10	0.10	5001217	<1.0	1.0	5001217
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)									

**RESULTS OF ANALYSES OF WATER**

Maxxam ID				EKW761		EKW762		
Sampling Date				2017/05/23 12:45		2017/05/23 11:45		
COC Number				611505-02-01		611505-02-01		
	UNITS	MAC	A/O	AM1B-D	RDL	OW5#2-D	RDL	QC Batch
<b>Calculated Parameters</b>								
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	210	1.0	110	1.0	4998026
Calculated TDS	mg/L	-	500	280	1.0	<b>16000</b>	1.0	4998033
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	1.8	1.0	<1.0	1.0	4998026
Hardness (CaCO3)	mg/L	-	80:100	<b>240</b>	1.0	<b>6500</b>	1.0	4999003
<b>Inorganics</b>								
Total Ammonia-N	mg/L	-	-	0.11	0.050	9.4	0.25	5002130
Colour	TCU	-	5	<2	2	<b>51</b>	2	5001472
Conductivity	umho/cm	-	-	480	1.0	28000	1.0	5001162
Fluoride (F-)	mg/L	1.5	-	0.25	0.10	0.43	0.10	5001195
Dissolved Organic Carbon	mg/L	-	5	0.89	0.20	0.58	0.20	5000873
Orthophosphate (P)	mg/L	-	-	<0.010	0.010	<0.010	0.010	5001297
pH	pH	-	6.5:8.5	7.96		7.28		5001196
Dissolved Sulphate (SO4)	mg/L	-	500	42	1.0	<1.0	1.0	5001303
Alkalinity (Total as CaCO3)	mg/L	-	30:500	210	1.0	110	1.0	5001152
Dissolved Chloride (Cl)	mg/L	-	250	3.1	1.0	<b>10000</b>	120	5001291
Nitrite (N)	mg/L	1	-	<0.010	0.010	<0.010	0.010	5001217
Nitrate (N)	mg/L	10	-	<0.10	0.10	<0.10	0.10	5001217
Nitrate + Nitrite (N)	mg/L	10	-	<0.10	0.10	<0.10	0.10	5001217
No Fill	No Exceedance							
Grey	Exceeds 1 criteria policy/level							
Black	Exceeds both criteria/levels							
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)								

**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Maxxam ID				EKW747	EKW748	EKW749	EKW750	EKW751		
Sampling Date				2017/05/23 12:45	2017/05/23 09:30	2017/05/23 12:30	2017/05/23 12:45	2017/05/23 13:00		
COC Number				611505-01-01	611505-01-01	611505-01-01	611505-01-01	611505-01-01		
	UNITS	MAC	A/O	AM 1B	TW1-1	BORED	OW4-1	OW4-2	RDL	QC Batch

Metals										
Dissolved Calcium (Ca)	ug/L	-	-	45000	96000	48000	24000	47000	200	5000874
Dissolved Magnesium (Mg)	ug/L	-	-	31000	41000	25000	17000	33000	50	5000874
Dissolved Phosphorus (P)	ug/L	-	-	<100	<100	<100	<100	<100	100	5000874
Dissolved Potassium (K)	ug/L	-	-	2400	6100	13000	6700	11000	200	5000874
Dissolved Sodium (Na)	ug/L	20000	200000	7600	<b>100000</b>	19000	<b>190000</b>	<b>260000</b>	100	5000874

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively

(Made under the Ontario Safe Drinking Water Act, 2002)

Maxxam ID				EKW752		EKW753	EKW754		EKW755		
Sampling Date				2017/05/23 11:30		2017/05/23 11:45	2017/05/23 11:45		2017/05/23 12:30		
COC Number				611505-01-01		611505-01-01	611505-01-01		611505-01-01		
	UNITS	MAC	A/O	OW5-1	RDL	OW5-2	OW5-3	RDL	OW6-2	RDL	QC Batch

Metals											
Dissolved Calcium (Ca)	ug/L	-	-	29000	200	1200000	1300000	4000	310000	1000	5000874
Dissolved Magnesium (Mg)	ug/L	-	-	22000	50	780000	790000	250	200000	50	5000874
Dissolved Phosphorus (P)	ug/L	-	-	<100	100	<500	<500	500	<100	100	5000874
Dissolved Potassium (K)	ug/L	-	-	6900	200	74000	76000	1000	18000	200	5000874
Dissolved Sodium (Na)	ug/L	20000	200000	<b>64000</b>	100	<b>3900000</b>	<b>4200000</b>	2000	<b>790000</b>	500	5000874

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively

(Made under the Ontario Safe Drinking Water Act, 2002)



**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Maxxam ID				EKW756	EKW756		EKW757			EKW758		
Sampling Date				2017/05/23 10:00	2017/05/23 10:00		2017/05/23 10:15			2017/05/23 09:45		
COC Number				611505-01-01	611505-01-01		611505-02-01			611505-02-01		
	UNITS	MAC	A/O	OW7-1	OW7-1 Lab-Dup	RDL	OW7-2	RDL	QC Batch	OW8-1	RDL	QC Batch
<b>Metals</b>												
Dissolved Calcium (Ca)	ug/L	-	-	140000	140000	400	160000	1000	5000874	62000	200	5006510
Dissolved Magnesium (Mg)	ug/L	-	-	86000	87000	50	97000	50	5000874	22000	50	5006510
Dissolved Phosphorus (P)	ug/L	-	-	<100	<100	100	<100	100	5000874	<100	100	5006510
Dissolved Potassium (K)	ug/L	-	-	13000	13000	200	14000	200	5000874	5500	200	5006510
Dissolved Sodium (Na)	ug/L	20000	200000	<b>790000</b>	<b>800000</b>	500	<b>850000</b>	500	5000874	<b>150000</b>	100	5006510
No Fill	No Exceedance											
Grey	Exceeds 1 criteria policy/level											
Black	Exceeds both criteria/levels											
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)												

Maxxam ID				EKW758		EKW759		EKW760		
Sampling Date				2017/05/23 09:45		2017/05/23 09:45		2017/05/23 14:45		
COC Number				611505-02-01		611505-02-01		611505-02-01		
	UNITS	MAC	A/O	OW8-1 Lab-Dup	QC Batch	OW8-2	RDL	OW9-1	RDL	QC Batch
<b>Metals</b>										
Dissolved Calcium (Ca)	ug/L	-	-	62000	5006510	70000	200	5700000	20000	5000874
Dissolved Magnesium (Mg)	ug/L	-	-	22000	5006510	20000	50	3200000	1000	5000874
Dissolved Phosphorus (P)	ug/L	-	-	<100	5006510	<100	100	<2000	2000	5000874
Dissolved Potassium (K)	ug/L	-	-	5600	5006510	4900	200	140000	4000	5000874
Dissolved Sodium (Na)	ug/L	20000	200000	<b>150000</b>	5006510	<b>84000</b>	100	<b>11000000</b>	2000	5000874
No Fill	No Exceedance									
Grey	Exceeds 1 criteria policy/level									
Black	Exceeds both criteria/levels									
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)										

**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Maxxam ID				EKW761		EKW762		
Sampling Date				2017/05/23 12:45		2017/05/23 11:45		
COC Number				611505-02-01		611505-02-01		
	UNITS	MAC	A/O	AM1B-D	RDL	OW5#2-D	RDL	QC Batch
<b>Metals</b>								
Dissolved Calcium (Ca)	ug/L	-	-	45000	200	1300000	4000	5000874
Dissolved Magnesium (Mg)	ug/L	-	-	31000	50	800000	250	5000874
Dissolved Phosphorus (P)	ug/L	-	-	<100	100	<500	500	5000874
Dissolved Potassium (K)	ug/L	-	-	2300	200	78000	1000	5000874
Dissolved Sodium (Na)	ug/L	20000	200000	7200	100	<b>4000000</b>	2000	5000874
No Fill	No Exceedance							
Grey	Exceeds 1 criteria policy/level							
Black	Exceeds both criteria/levels							
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively								
(Made under the Ontario Safe Drinking Water Act, 2002)								

### TEST SUMMARY

**Maxxam ID:** EKW747  
**Sample ID:** AM 1B  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5001274	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW748  
**Sample ID:** TW1-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW749  
**Sample ID:** BORED  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk

**TEST SUMMARY**

**Maxxam ID:** EKW749  
**Sample ID:** BORED  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW749 Dup  
**Sample ID:** BORED  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel

**Maxxam ID:** EKW750  
**Sample ID:** OW4-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** EKW751  
**Sample ID:** OW4-2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5001274	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO <sub>3</sub> )		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH <sub>4</sub>	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO <sub>3</sub> ) and Nitrite (NO <sub>2</sub> ) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW751 Dup  
**Sample ID:** OW4-2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5001274	N/A	2017/05/26	Anastasia Hamanov

**Maxxam ID:** EKW752  
**Sample ID:** OW5-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000779	N/A	2017/05/26	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO <sub>3</sub> )		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH <sub>4</sub>	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO <sub>3</sub> ) and Nitrite (NO <sub>2</sub> ) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** EKW752 Dup  
**Sample ID:** OW5-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru

**Maxxam ID:** EKW753  
**Sample ID:** OW5-2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW754  
**Sample ID:** OW5-3  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5001274	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** EKW754 Dup  
**Sample ID:** OW5-3  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine

**Maxxam ID:** EKW755  
**Sample ID:** OW6-2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW756  
**Sample ID:** OW7-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5001274	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine



### TEST SUMMARY

**Maxxam ID:** EKW756  
**Sample ID:** OW7-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW756 Dup  
**Sample ID:** OW7-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford

**Maxxam ID:** EKW757  
**Sample ID:** OW7-2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW757 Dup  
**Sample ID:** OW7-2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal

**Maxxam ID:** EKW758  
**Sample ID:** OW8-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5006475	N/A	2017/05/31	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk



### TEST SUMMARY

**Maxxam ID:** EKW758  
**Sample ID:** OW8-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5005956	N/A	2017/05/31	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5001274	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5006510	N/A	2017/05/31	Thao Nguyen
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5005957	N/A	2017/05/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW758 Dup  
**Sample ID:** OW8-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5006510	N/A	2017/05/31	Thao Nguyen

**Maxxam ID:** EKW759  
**Sample ID:** OW8-2  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** EKW760  
**Sample ID:** OW9-1  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5001274	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW761  
**Sample ID:** AM1B-D  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO3)		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH4	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

**Maxxam ID:** EKW762  
**Sample ID:** OW5#2-D  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5001152	N/A	2017/05/27	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	4998026	N/A	2017/05/29	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** EKW762  
**Sample ID:** OW5#2-D  
**Matrix:** Water

**Collected:** 2017/05/23  
**Shipped:**  
**Received:** 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Colour	SPEC	5001472	N/A	2017/05/29	Viorica Rotaru
Conductivity	AT	5001162	N/A	2017/05/27	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5000873	N/A	2017/05/27	Azadeh Shahbazi
Fluoride	ISE	5001195	2017/05/26	2017/05/27	Yogesh Patel
Hardness (calculated as CaCO <sub>3</sub> )		4999003	N/A	2017/05/30	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5000874	N/A	2017/05/29	Kevin Comerford
Total Ammonia-N	LACH/NH <sub>4</sub>	5002130	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO <sub>3</sub> ) and Nitrite (NO <sub>2</sub> ) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
pH	AT	5001196	N/A	2017/05/27	Yogesh Patel
Orthophosphate	KONE	5001297	N/A	2017/05/29	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids (TDS calc)	CALC	4998033	N/A	2017/05/30	Automated Statchk

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.3°C
Package 2	3.3°C
Package 3	3.3°C

Sample EKW753 [OW5-2] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Nitrite+Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample EKW754 [OW5-3] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Nitrite+Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample EKW760 [OW9-1] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Nitrite+Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample EKW762 [OW5#2-D] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

**Results relate only to the items tested.**

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5000779	ASZ	Matrix Spike	Dissolved Organic Carbon	2017/05/26		98	%	80 - 120
5000779	ASZ	Spiked Blank	Dissolved Organic Carbon	2017/05/26		100	%	80 - 120
5000779	ASZ	Method Blank	Dissolved Organic Carbon	2017/05/26	0.22, RDL=0.20		mg/L	
5000779	ASZ	RPD	Dissolved Organic Carbon	2017/05/26	1.1		%	20
5000873	ASZ	Matrix Spike	Dissolved Organic Carbon	2017/05/27		98	%	80 - 120
5000873	ASZ	Spiked Blank	Dissolved Organic Carbon	2017/05/27		100	%	80 - 120
5000873	ASZ	Method Blank	Dissolved Organic Carbon	2017/05/27	0.24, RDL=0.20		mg/L	
5000873	ASZ	RPD	Dissolved Organic Carbon	2017/05/27	0.27		%	20
5000874	KCO	Matrix Spike [EKW756-04]	Dissolved Calcium (Ca)	2017/05/29		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/29		NC	%	80 - 120
			Dissolved Phosphorus (P)	2017/05/29		117	%	80 - 120
			Dissolved Potassium (K)	2017/05/29		110	%	80 - 120
			Dissolved Sodium (Na)	2017/05/29		NC	%	80 - 120
5000874	KCO	Spiked Blank	Dissolved Calcium (Ca)	2017/05/29		97	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/29		100	%	80 - 120
			Dissolved Phosphorus (P)	2017/05/29		105	%	80 - 120
			Dissolved Potassium (K)	2017/05/29		105	%	80 - 120
			Dissolved Sodium (Na)	2017/05/29		101	%	80 - 120
5000874	KCO	Method Blank	Dissolved Calcium (Ca)	2017/05/29	<200		ug/L	
			Dissolved Magnesium (Mg)	2017/05/29	<50		ug/L	
			Dissolved Phosphorus (P)	2017/05/29	<100		ug/L	
			Dissolved Potassium (K)	2017/05/29	<200		ug/L	
			Dissolved Sodium (Na)	2017/05/29	160, RDL=100		ug/L	
5000874	KCO	RPD [EKW756-04]	Dissolved Calcium (Ca)	2017/05/29	1.2		%	20
			Dissolved Magnesium (Mg)	2017/05/29	1.7		%	20
			Dissolved Phosphorus (P)	2017/05/29	NC		%	20
			Dissolved Potassium (K)	2017/05/29	0.65		%	20
			Dissolved Sodium (Na)	2017/05/29	1.3		%	20
5001152	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2017/05/27		95	%	85 - 115
5001152	YPA	Method Blank	Alkalinity (Total as CaCO3)	2017/05/27	<1.0		mg/L	
5001152	YPA	RPD [EKW749-01]	Alkalinity (Total as CaCO3)	2017/05/27	1.2		%	20
5001162	YPA	Spiked Blank	Conductivity	2017/05/27		100	%	85 - 115
5001162	YPA	Method Blank	Conductivity	2017/05/27	<1.0		umho/cm	
5001162	YPA	RPD [EKW749-01]	Conductivity	2017/05/27	0.20		%	25
5001195	YPA	Matrix Spike [EKW749-01]	Fluoride (F-)	2017/05/27		98	%	80 - 120
5001195	YPA	Spiked Blank	Fluoride (F-)	2017/05/27		105	%	80 - 120
5001195	YPA	Method Blank	Fluoride (F-)	2017/05/27	<0.10		mg/L	
5001195	YPA	RPD [EKW749-01]	Fluoride (F-)	2017/05/27	7.1		%	20
5001196	YPA	Spiked Blank	pH	2017/05/27		102	%	98 - 103
5001196	YPA	RPD [EKW749-01]	pH	2017/05/27	0.39		%	N/A
5001217	C_N	Matrix Spike [EKW757-01]	Nitrite (N)	2017/05/29		100	%	80 - 120
			Nitrate (N)	2017/05/29		109	%	80 - 120
5001217	C_N	Spiked Blank	Nitrite (N)	2017/05/29		97	%	80 - 120
			Nitrate (N)	2017/05/29		103	%	80 - 120
5001217	C_N	Method Blank	Nitrite (N)	2017/05/29	<0.010		mg/L	
			Nitrate (N)	2017/05/29	<0.10		mg/L	

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5001217	C_N	RPD [EKW757-01]	Nitrite (N)	2017/05/29	NC		%	20
			Nitrate (N)	2017/05/29	NC		%	20
5001274	AHA	Matrix Spike [EKW751-03]	Dissolved Organic Carbon	2017/05/26		96	%	80 - 120
5001274	AHA	Spiked Blank	Dissolved Organic Carbon	2017/05/26		97	%	80 - 120
5001274	AHA	Method Blank	Dissolved Organic Carbon	2017/05/26	<0.20		mg/L	
5001274	AHA	RPD [EKW751-03]	Dissolved Organic Carbon	2017/05/26	0.36		%	20
5001291	DRM	Matrix Spike [EKW754-01]	Dissolved Chloride (Cl)	2017/05/29		NC	%	80 - 120
5001291	DRM	Spiked Blank	Dissolved Chloride (Cl)	2017/05/29		105	%	80 - 120
5001291	DRM	Method Blank	Dissolved Chloride (Cl)	2017/05/29	<1.0		mg/L	
5001291	DRM	RPD [EKW754-01]	Dissolved Chloride (Cl)	2017/05/29	2.3		%	20
5001297	ADB	Matrix Spike [EKW754-01]	Orthophosphate (P)	2017/05/29		113	%	75 - 125
5001297	ADB	Spiked Blank	Orthophosphate (P)	2017/05/29		100	%	80 - 120
5001297	ADB	Method Blank	Orthophosphate (P)	2017/05/29	<0.010		mg/L	
5001297	ADB	RPD [EKW754-01]	Orthophosphate (P)	2017/05/29	NC		%	25
5001303	DRM	Matrix Spike [EKW754-01]	Dissolved Sulphate (SO4)	2017/05/29		110	%	75 - 125
5001303	DRM	Spiked Blank	Dissolved Sulphate (SO4)	2017/05/29		103	%	80 - 120
5001303	DRM	Method Blank	Dissolved Sulphate (SO4)	2017/05/29	<1.0		mg/L	
5001303	DRM	RPD [EKW754-01]	Dissolved Sulphate (SO4)	2017/05/29	1.4		%	20
5001472	VRO	Spiked Blank	Colour	2017/05/29		102	%	80 - 120
5001472	VRO	Method Blank	Colour	2017/05/29	<2		TCU	
5001472	VRO	RPD [EKW752-01]	Colour	2017/05/29	NC		%	25
5002130	COP	Matrix Spike [EKW757-02]	Total Ammonia-N	2017/05/30		92	%	80 - 120
5002130	COP	Spiked Blank	Total Ammonia-N	2017/05/30		98	%	85 - 115
5002130	COP	Method Blank	Total Ammonia-N	2017/05/30	<0.050		mg/L	
5002130	COP	RPD [EKW757-02]	Total Ammonia-N	2017/05/30	0.25		%	20
5005956	DRM	Matrix Spike	Dissolved Chloride (Cl)	2017/05/31		121 (1)	%	80 - 120
5005956	DRM	Spiked Blank	Dissolved Chloride (Cl)	2017/05/31		104	%	80 - 120
5005956	DRM	Method Blank	Dissolved Chloride (Cl)	2017/05/31	<1.0		mg/L	
5005956	DRM	RPD	Dissolved Chloride (Cl)	2017/05/31	1.5		%	20
5005957	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2017/05/31		NC	%	75 - 125
5005957	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2017/05/31		103	%	80 - 120
5005957	ADB	Method Blank	Dissolved Sulphate (SO4)	2017/05/31	<1.0		mg/L	
5005957	ADB	RPD	Dissolved Sulphate (SO4)	2017/05/31	0.55		%	20
5006475	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2017/05/31		95	%	85 - 115
5006475	SAU	Method Blank	Alkalinity (Total as CaCO3)	2017/05/31	<1.0		mg/L	
5006475	SAU	RPD	Alkalinity (Total as CaCO3)	2017/05/31	4.4		%	20
5006510	TNG	Matrix Spike [EKW758-04]	Dissolved Calcium (Ca)	2017/05/31		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/31		94	%	80 - 120
			Dissolved Phosphorus (P)	2017/05/31		101	%	80 - 120
			Dissolved Potassium (K)	2017/05/31		96	%	80 - 120
			Dissolved Sodium (Na)	2017/05/31		NC	%	80 - 120
5006510	TNG	Spiked Blank	Dissolved Calcium (Ca)	2017/05/31		91	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/31		92	%	80 - 120
			Dissolved Phosphorus (P)	2017/05/31		97	%	80 - 120
			Dissolved Potassium (K)	2017/05/31		92	%	80 - 120
			Dissolved Sodium (Na)	2017/05/31		91	%	80 - 120

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5006510	TNG	Method Blank	Dissolved Calcium (Ca)	2017/05/31	<200		ug/L	
			Dissolved Magnesium (Mg)	2017/05/31	<50		ug/L	
			Dissolved Phosphorus (P)	2017/05/31	<100		ug/L	
			Dissolved Potassium (K)	2017/05/31	<200		ug/L	
			Dissolved Sodium (Na)	2017/05/31	<100		ug/L	
5006510	TNG	RPD [EKW758-04]	Dissolved Calcium (Ca)	2017/05/31	0.66		%	20
			Dissolved Magnesium (Mg)	2017/05/31	2.2		%	20
			Dissolved Phosphorus (P)	2017/05/31	NC		%	20
			Dissolved Potassium (K)	2017/05/31	2.1		%	20
			Dissolved Sodium (Na)	2017/05/31	2.2		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

*Cristina Carriere*

\_\_\_\_\_  
Cristina Carriere, Scientific Services

*Eva Pranjic*



\_\_\_\_\_  
Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



**Exceedence Summary Table – ODWS (2002)**  
**Result Exceedences**

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
TW1-1	EKW748-04	Dissolved Sodium (Na)	20000	100000	100	ug/L
OW4-1	EKW750-04	Dissolved Sodium (Na)	20000	190000	100	ug/L
OW4-2	EKW751-04	Dissolved Sodium (Na)	20000	260000	100	ug/L
OW5-1	EKW752-04	Dissolved Sodium (Na)	20000	64000	100	ug/L
OW5-2	EKW753-04	Dissolved Sodium (Na)	20000	3900000	2000	ug/L
OW5-3	EKW754-04	Dissolved Sodium (Na)	20000	4200000	2000	ug/L
OW6-2	EKW755-04	Dissolved Sodium (Na)	20000	790000	500	ug/L
OW7-1	EKW756-01	Fluoride (F-)	1.5	2.8	0.10	mg/L
OW7-1	EKW756-04	Dissolved Sodium (Na)	20000	790000	500	ug/L
OW7-1	EKW756-04-Lab Dup	Dissolved Sodium (Na)	20000	800000	500	ug/L
OW7-2	EKW757-01	Fluoride (F-)	1.5	2.8	0.10	mg/L
OW7-2	EKW757-04	Dissolved Sodium (Na)	20000	850000	500	ug/L
OW8-1	EKW758-01	Fluoride (F-)	1.5	1.6	0.10	mg/L
OW8-1	EKW758-04	Dissolved Sodium (Na)	20000	150000	100	ug/L
OW8-1	EKW758-04-Lab Dup	Dissolved Sodium (Na)	20000	150000	100	ug/L
OW8-2	EKW759-04	Dissolved Sodium (Na)	20000	84000	100	ug/L
OW9-1	EKW760-04	Dissolved Sodium (Na)	20000	11000000	2000	ug/L
OW5#2-D	EKW762-04	Dissolved Sodium (Na)	20000	4000000	2000	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

Your Project #: 1407634  
 Site Location: MCCARTHY  
 Your C.O.C. #: 634302-01-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2017/11/03**  
 Report #: R4822023  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B701188**  
**Received: 2017/10/28, 10:08**

Sample Matrix: Water  
 # Samples Received: 13

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Alkalinity	13	N/A	2017/11/01	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	13	N/A	2017/11/02	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	13	N/A	2017/11/01	CAM SOP-00463	EPA 325.2 m
Colour	13	N/A	2017/11/02	CAM SOP-00412	SM 22 2120C m
Conductivity	13	N/A	2017/11/01	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	13	N/A	2017/10/30	CAM SOP-00446	SM 22 5310 B m
Fluoride	13	2017/11/01	2017/11/01	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	13	N/A	2017/11/03	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	13	N/A	2017/11/03	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	13	N/A	2017/11/02	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	13	N/A	2017/10/31	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	13	N/A	2017/11/01	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	13	N/A	2017/10/31	CAM SOP-00461	EPA 365.1 m
Sulphate by Automated Colourimetry	13	N/A	2017/10/31	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	13	N/A	2017/11/03		

**Remarks:**

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope

Your Project #: 1407634  
Site Location: MCCARTHY  
Your C.O.C. #: 634302-01-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2017/11/03**  
Report #: R4822023  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7O1188**

**Received: 2017/10/28, 10:08**

dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: EGitej@maxxam.ca

Phone# (905)817-5829

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

### RESULTS OF ANALYSES OF WATER

Maxxam ID		FKZ874		FKZ875	FKZ875		FKZ876		
Sampling Date		2017/10/26 02:30		2017/10/26 11:00	2017/10/26 11:00		2017/10/26 04:00		
COC Number		634302-01-01		634302-01-01	634302-01-01		634302-01-01		
	UNITS	AM1B	RDL	TW1-1	TW1-1 Lab-Dup	RDL	BORED	RDL	QC Batch
<b>Calculated Parameters</b>									
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	220	1.0	290		1.0	220	1.0	5237975
Calculated TDS	mg/L	270	1.0	1300		1.0	280	1.0	5237979
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	2.0	1.0	1.6		1.0	3.3	1.0	5237975
Hardness (CaCO <sub>3</sub> )	mg/L	220	1.0	760		1.0	170	1.0	5237978
<b>Inorganics</b>									
Total Ammonia-N	mg/L	0.16	0.050	1.2		0.050	<0.050	0.050	5241589
Colour	TCU	<2	2	<2	<2	2	<2	2	5242753
Conductivity	umho/cm	490	1.0	2300		1.0	490	1.0	5242230
Fluoride (F <sup>-</sup> )	mg/L	0.27	0.10	0.50		0.10	0.15	0.10	5242233
Dissolved Organic Carbon	mg/L	0.72	0.20	1.7		0.20	1.0	0.20	5238737
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010		0.010	<0.010	0.010	5238958
pH	pH	7.99		7.78			8.19		5242243
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	37	1.0	20		1.0	30	1.0	5238962
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	220	1.0	290		1.0	230	1.0	5242222
Dissolved Chloride (Cl)	mg/L	2.7	1.0	510		5.0	3.1	1.0	5238285
Nitrite (N)	mg/L	<0.010	0.010	<0.010		0.010	<0.010	0.010	5238883
Nitrate (N)	mg/L	<0.10	0.10	<0.10		0.10	0.45	0.10	5238883
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	<0.10		0.10	0.45	0.10	5238883
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate									

### RESULTS OF ANALYSES OF WATER

Maxxam ID		FKZ876		FKZ877		FKZ878	FKZ878		
Sampling Date		2017/10/26 04:00		2017/10/26 03:00		2017/10/26 03:15	2017/10/26 03:15		
COC Number		634302-01-01		634302-01-01		634302-01-01	634302-01-01		
	UNITS	BORED Lab-Dup	RDL	OW4-1	RDL	OW4-2	OW4-2 Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>									
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L		1.0	250	1.0	230		1.0	5237975
Calculated TDS	mg/L		1.0	780	1.0	910		1.0	5237979
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L		1.0	2.8	1.0	2.0		1.0	5237975
Hardness (CaCO <sub>3</sub> )	mg/L		1.0	170	1.0	230		1.0	5237978
<b>Inorganics</b>									
Total Ammonia-N	mg/L		0.050	1.3	0.050	1.1		0.050	5241589
Colour	TCU		2	<2	2	<2		2	5242753
Conductivity	umho/cm		1.0	1600	1.0	1900		1.0	5242230
Fluoride (F <sup>-</sup> )	mg/L		0.10	0.99	0.10	0.91		0.10	5242233
Dissolved Organic Carbon	mg/L		0.20	1.9	0.20	1.1		0.20	5238737
Orthophosphate (P)	mg/L		0.010	<0.010	0.010	<0.010	<0.010	0.010	5238958
pH	pH			8.06		7.96			5242243
Dissolved Sulphate (SO <sub>4</sub> )	mg/L		1.0	2.9	1.0	<1.0	<1.0	1.0	5238962
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L		1.0	260	1.0	240		1.0	5242222
Dissolved Chloride (Cl)	mg/L		1.0	330	4.0	430	430	5.0	5238285
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	<0.010		0.010	5238883
Nitrate (N)	mg/L	0.45	0.10	<0.10	0.10	<0.10		0.10	5238883
Nitrate + Nitrite (N)	mg/L	0.45	0.10	<0.10	0.10	<0.10		0.10	5238883
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate									

### RESULTS OF ANALYSES OF WATER

Maxxam ID		FKZ879		FKZ880	FKZ881		FKZ882		
Sampling Date		2017/10/26 01:15		2017/10/26 01:45	2017/10/26 01:30		2017/10/26 12:30		
COC Number		634302-01-01		634302-01-01	634302-01-01		634302-01-01		
	UNITS	OW5-1	RDL	OW5-2	OW5-3	RDL	OW7-2	RDL	QC Batch
<b>Calculated Parameters</b>									
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	250	1.0	110	130	1.0	250	1.0	5237975
Calculated TDS	mg/L	360	1.0	16000	20000	1.0	8300	1.0	5237979
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	2.4	1.0	<1.0	<1.0	1.0	1.1	1.0	5237975
Hardness (CaCO <sub>3</sub> )	mg/L	160	1.0	5200	6400	1.0	3000	1.0	5237978
<b>Inorganics</b>									
Total Ammonia-N	mg/L	0.78	0.050	9.6	10	0.25	3.6	0.050	5241589
Colour	TCU	<2	2	9	5	2	<2	2	5242753
Conductivity	umho/cm	690	1.0	28000	33000	1.0	15000	1.0	5242230
Fluoride (F <sup>-</sup> )	mg/L	0.80	0.10	0.47	0.43	0.10	1.4	0.10	5242233
Dissolved Organic Carbon	mg/L	1.3	0.20	0.49	1.1	0.20	1.0	0.20	5238737
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	<0.010	0.010	<0.010	0.010	5238958
pH	pH	8.02		7.34	7.36		7.66		5242243
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	31	1.0	<1.0	83	1.0	7.0	1.0	5238962
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	250	1.0	110	130	1.0	250	1.0	5242222
Dissolved Chloride (Cl)	mg/L	44	1.0	11000	13000	120	5300	70	5238285
Nitrite (N)	mg/L	0.055	0.010	<0.010	<0.010	0.010	<0.010	0.010	5238883
Nitrate (N)	mg/L	0.39	0.10	<0.10	<0.10	0.10	<0.10	0.10	5238883
Nitrate + Nitrite (N)	mg/L	0.45	0.10	<0.10	<0.10	0.10	<0.10	0.10	5238883
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		FKZ883		FKZ884			FKZ885		
Sampling Date		2017/10/26 12:00		2017/10/26 09:00			2017/10/26 02:30		
COC Number		634302-01-01		634302-01-01			634302-01-01		
	UNITS	OW8-2	RDL	OW9-1	RDL	QC Batch	AM1B-D	RDL	QC Batch
<b>Calculated Parameters</b>									
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	300	1.0	130	1.0	5237975	220	1.0	5237975
Calculated TDS	mg/L	1500	1.0	57000	1.0	5237979	280	1.0	5237979
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1.3	1.0	<1.0	1.0	5237975	1.9	1.0	5237975
Hardness (CaCO <sub>3</sub> )	mg/L	660	1.0	25000	1.0	5237978	220	1.0	5237978
<b>Inorganics</b>									
Total Ammonia-N	mg/L	1.1	0.050	21	0.50	5241589	0.094	0.050	5241589
Colour	TCU	<2	2	49	2	5242753	<2	2	5242753
Conductivity	umho/cm	3000	1.0	88000	1.0	5242230	500	1.0	5242230
Fluoride (F <sup>-</sup> )	mg/L	0.79	0.10	<0.10	0.10	5242233	0.25	0.10	5242233
Dissolved Organic Carbon	mg/L	1.4	0.20	9.1	0.20	5238737	0.71	0.20	5238737
Orthophosphate (P)	mg/L	<0.010	0.010	<0.010	0.010	5238958	<0.010	0.010	5238958
pH	pH	7.67		6.95		5242243	7.96		5242243
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	37	1.0	160	1.0	5238962	38	1.0	5238962
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	300	1.0	130	1.0	5242222	220	1.0	5242222
Dissolved Chloride (Cl)	mg/L	770	10	39000	400	5238285	2.7	1.0	5238285
Nitrite (N)	mg/L	<0.010	0.010	<0.010	0.010	5238883	<0.010	0.010	5239468
Nitrate (N)	mg/L	<0.10	0.10	<0.10	0.10	5238883	<0.10	0.10	5239468
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	<0.10	0.10	5238883	<0.10	0.10	5239468
RDL = Reportable Detection Limit QC Batch = Quality Control Batch									

### RESULTS OF ANALYSES OF WATER

Maxxam ID		FKZ886		
Sampling Date		2017/10/26 01:45		
COC Number		634302-01-01		
	UNITS	OW5-2-D	RDL	QC Batch
<b>Calculated Parameters</b>				
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	110	1.0	5237975
Calculated TDS	mg/L	15000	1.0	5237979
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	<1.0	1.0	5237975
Hardness (CaCO <sub>3</sub> )	mg/L	5100	1.0	5237978
<b>Inorganics</b>				
Total Ammonia-N	mg/L	9.7	0.25	5241589
Colour	TCU	8	2	5242753
Conductivity	umho/cm	28000	1.0	5242230
Fluoride (F <sup>-</sup> )	mg/L	0.46	0.10	5242233
Dissolved Organic Carbon	mg/L	0.47	0.20	5238737
Orthophosphate (P)	mg/L	<0.010	0.010	5238958
pH	pH	7.37		5242243
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	<1.0	1.0	5238962
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	120	1.0	5242222
Dissolved Chloride (Cl)	mg/L	9900	120	5238285
Nitrite (N)	mg/L	<0.010	0.010	5239468
Nitrate (N)	mg/L	<0.10	0.10	5239468
Nitrate + Nitrite (N)	mg/L	<0.10	0.10	5239468
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

<b>Maxxam ID</b>		FKZ874			FKZ875	FKZ875			FKZ876		
<b>Sampling Date</b>		2017/10/26 02:30			2017/10/26 11:00	2017/10/26 11:00			2017/10/26 04:00		
<b>COC Number</b>		634302-01-01			634302-01-01	634302-01-01			634302-01-01		
	<b>UNITS</b>	<b>AM1B</b>	<b>RDL</b>	<b>QC Batch</b>	<b>TW1-1</b>	<b>TW1-1 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>	<b>BORED</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Metals</b>											
Dissolved Calcium (Ca)	ug/L	42000	200	5238859	160000	160000	400	5246829	35000	200	5238859
Dissolved Magnesium (Mg)	ug/L	29000	50	5238859	86000	84000	50	5246829	21000	50	5238859
Dissolved Phosphorus (P)	ug/L	<100	100	5238859	<100	<100	100	5246829	<100	100	5238859
Dissolved Potassium (K)	ug/L	2300	200	5238859	10000	10000	200	5246829	13000	200	5238859
Dissolved Sodium (Na)	ug/L	6400	100	5238859	320000	320000	100	5246829	20000	100	5238859
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate											

<b>Maxxam ID</b>		FKZ877			FKZ878	FKZ879		FKZ880	FKZ881		
<b>Sampling Date</b>		2017/10/26 03:00			2017/10/26 03:15	2017/10/26 01:15		2017/10/26 01:45	2017/10/26 01:30		
<b>COC Number</b>		634302-01-01			634302-01-01	634302-01-01		634302-01-01	634302-01-01		
	<b>UNITS</b>	<b>OW4-1</b>	<b>QC Batch</b>	<b>OW4-2</b>	<b>OW5-1</b>	<b>RDL</b>	<b>OW5-2</b>	<b>OW5-3</b>	<b>RDL</b>	<b>QC Batch</b>	

<b>Metals</b>											
Dissolved Calcium (Ca)	ug/L	32000	5246829	42000	29000	200	1000000	1300000	4000	5238859	
Dissolved Magnesium (Mg)	ug/L	22000	5246829	31000	22000	50	640000	780000	500	5238859	
Dissolved Phosphorus (P)	ug/L	<100	5246829	<100	<100	100	<1000	<1000	1000	5238859	
Dissolved Potassium (K)	ug/L	7500	5246829	9800	7400	200	62000	67000	2000	5238859	
Dissolved Sodium (Na)	ug/L	210000	5246829	250000	64000	100	3300000	4200000	1000	5238859	
RDL = Reportable Detection Limit QC Batch = Quality Control Batch											

<b>Maxxam ID</b>		FKZ882			FKZ883		FKZ884		FKZ885		
<b>Sampling Date</b>		2017/10/26 12:30			2017/10/26 12:00		2017/10/26 09:00		2017/10/26 02:30		
<b>COC Number</b>		634302-01-01			634302-01-01		634302-01-01		634302-01-01		
	<b>UNITS</b>	<b>OW7-2</b>	<b>RDL</b>	<b>QC Batch</b>	<b>OW8-2</b>	<b>RDL</b>	<b>OW9-1</b>	<b>RDL</b>	<b>AM1B-D</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Metals</b>											
Dissolved Calcium (Ca)	ug/L	600000	2000	5246829	170000	400	5000000	20000	42000	200	5238859
Dissolved Magnesium (Mg)	ug/L	360000	250	5246829	58000	50	3100000	500	29000	50	5238859
Dissolved Phosphorus (P)	ug/L	<500	500	5246829	<100	100	<1000	1000	<100	100	5238859
Dissolved Potassium (K)	ug/L	29000	1000	5246829	9000	200	140000	2000	2300	200	5238859
Dissolved Sodium (Na)	ug/L	1900000	500	5246829	300000	100	10000000	5000	6700	100	5238859
RDL = Reportable Detection Limit QC Batch = Quality Control Batch											

**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

<b>Maxxam ID</b>		FKZ886		
<b>Sampling Date</b>		2017/10/26 01:45		
<b>COC Number</b>		634302-01-01		
	<b>UNITS</b>	<b>OW5-2-D</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Metals</b>				
Dissolved Calcium (Ca)	ug/L	1000000	4000	5238859
Dissolved Magnesium (Mg)	ug/L	640000	500	5238859
Dissolved Phosphorus (P)	ug/L	<1000	1000	5238859
Dissolved Potassium (K)	ug/L	63000	2000	5238859
Dissolved Sodium (Na)	ug/L	3300000	1000	5238859
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

### TEST SUMMARY

**Maxxam ID:** FKZ874  
**Sample ID:** AM1B  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ875  
**Sample ID:** TW1-1  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5246829	N/A	2017/11/03	Prempal Bhatti
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ875 Dup  
**Sample ID:** TW1-1  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Dissolved Metals by ICPMS	ICP/MS	5246829	N/A	2017/11/03	Prempal Bhatti

### TEST SUMMARY

**Maxxam ID:** FKZ876  
**Sample ID:** BORED  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ876 Dup  
**Sample ID:** BORED  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal

**Maxxam ID:** FKZ877  
**Sample ID:** OW4-1  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5246829	N/A	2017/11/03	Prempal Bhatti
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** FKZ878  
**Sample ID:** OW4-2  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ878 Dup  
**Sample ID:** OW4-2  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu

**Maxxam ID:** FKZ879  
**Sample ID:** OW5-1  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu

### TEST SUMMARY

**Maxxam ID:** FKZ879  
**Sample ID:** OW5-1  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ880  
**Sample ID:** OW5-2  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ881  
**Sample ID:** OW5-3  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** FKZ882  
**Sample ID:** OW7-2  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5246829	N/A	2017/11/03	Prempal Bhatti
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ883  
**Sample ID:** OW8-2  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ884  
**Sample ID:** OW9-1  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** FKZ884  
**Sample ID:** OW9-1  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5238883	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ885  
**Sample ID:** AM1B-D  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5239468	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

**Maxxam ID:** FKZ886  
**Sample ID:** OW5-2-D  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5242222	N/A	2017/11/01	Surinder Rai
Carbonate, Bicarbonate and Hydroxide	CALC	5237975	N/A	2017/11/02	Automated Statchk
Chloride by Automated Colourimetry	KONE	5238285	N/A	2017/11/01	Deonarine Ramnarine
Colour	SPEC	5242753	N/A	2017/11/02	Viorica Rotaru



**TEST SUMMARY**

**Maxxam ID:** FKZ886  
**Sample ID:** OW5-2-D  
**Matrix:** Water

**Collected:** 2017/10/26  
**Shipped:**  
**Received:** 2017/10/28

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	5242230	N/A	2017/11/01	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5238737	N/A	2017/10/30	Anastasia Hamanov
Fluoride	ISE	5242233	2017/11/01	2017/11/01	Surinder Rai
Hardness (calculated as CaCO3)		5237978	N/A	2017/11/03	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5238859	N/A	2017/11/03	Thao Nguyen
Total Ammonia-N	LACH/NH4	5241589	N/A	2017/11/02	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5239468	N/A	2017/10/31	Chandra Nandlal
pH	AT	5242243	N/A	2017/11/01	Surinder Rai
Orthophosphate	KONE	5238958	N/A	2017/10/31	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	5238962	N/A	2017/10/31	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5237979	N/A	2017/11/03	Automated Statchk

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.3°C
Package 2	4.0°C

Sample FKZ880 [OW5-2] : Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Sample FKZ881 [OW5-3] : Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Sample FKZ882 [OW7-2] : Metal Analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Sample FKZ884 [OW9-1] : Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Sample FKZ886 [OW5-2-D] : Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

**Results relate only to the items tested.**

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5238285	DRM	Matrix Spike [FKZ878-01]	Dissolved Chloride (Cl)	2017/11/01		NC	%	80 - 120
5238285	DRM	Spiked Blank	Dissolved Chloride (Cl)	2017/11/01		102	%	80 - 120
5238285	DRM	Method Blank	Dissolved Chloride (Cl)	2017/11/01	<1.0		mg/L	
5238285	DRM	RPD [FKZ878-01]	Dissolved Chloride (Cl)	2017/11/01	0.83		%	20
5238737	AHA	Matrix Spike	Dissolved Organic Carbon	2017/10/30		94	%	80 - 120
5238737	AHA	Spiked Blank	Dissolved Organic Carbon	2017/10/30		95	%	80 - 120
5238737	AHA	Method Blank	Dissolved Organic Carbon	2017/10/30	<0.20		mg/L	
5238737	AHA	RPD	Dissolved Organic Carbon	2017/10/30	1.8		%	20
5238859	TNG	Matrix Spike [FKZ877-04]	Dissolved Calcium (Ca)	2017/11/03		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/03		92	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/03		99	%	80 - 120
			Dissolved Potassium (K)	2017/11/03		94	%	80 - 120
			Dissolved Sodium (Na)	2017/11/03		NC	%	80 - 120
5238859	TNG	Spiked Blank	Dissolved Calcium (Ca)	2017/11/03		90	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/03		97	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/03		111	%	80 - 120
			Dissolved Potassium (K)	2017/11/03		96	%	80 - 120
			Dissolved Sodium (Na)	2017/11/03		96	%	80 - 120
5238859	TNG	Method Blank	Dissolved Calcium (Ca)	2017/11/03	<200		ug/L	
			Dissolved Magnesium (Mg)	2017/11/03	<50		ug/L	
			Dissolved Phosphorus (P)	2017/11/03	<100		ug/L	
			Dissolved Potassium (K)	2017/11/03	<200		ug/L	
			Dissolved Sodium (Na)	2017/11/03	<100		ug/L	
5238883	C_N	Matrix Spike [FKZ876-01]	Nitrite (N)	2017/10/31		102	%	80 - 120
			Nitrate (N)	2017/10/31		95	%	80 - 120
5238883	C_N	Spiked Blank	Nitrite (N)	2017/10/31		103	%	80 - 120
			Nitrate (N)	2017/10/31		96	%	80 - 120
5238883	C_N	Method Blank	Nitrite (N)	2017/10/31	<0.010		mg/L	
			Nitrate (N)	2017/10/31	<0.10		mg/L	
5238883	C_N	RPD [FKZ876-01]	Nitrite (N)	2017/10/31	NC		%	20
			Nitrate (N)	2017/10/31	0.40		%	20
5238958	ADB	Matrix Spike [FKZ878-01]	Orthophosphate (P)	2017/10/31		104	%	75 - 125
5238958	ADB	Spiked Blank	Orthophosphate (P)	2017/10/31		100	%	80 - 120
5238958	ADB	Method Blank	Orthophosphate (P)	2017/10/31	<0.010		mg/L	
5238958	ADB	RPD [FKZ878-01]	Orthophosphate (P)	2017/10/31	NC		%	25
5238962	ADB	Matrix Spike [FKZ878-01]	Dissolved Sulphate (SO4)	2017/10/31		98	%	75 - 125
5238962	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2017/10/31		102	%	80 - 120
5238962	ADB	Method Blank	Dissolved Sulphate (SO4)	2017/10/31	<1.0		mg/L	
5238962	ADB	RPD [FKZ878-01]	Dissolved Sulphate (SO4)	2017/10/31	NC		%	20
5239468	C_N	Matrix Spike	Nitrite (N)	2017/10/31		103	%	80 - 120
			Nitrate (N)	2017/10/31		95	%	80 - 120
5239468	C_N	Spiked Blank	Nitrite (N)	2017/10/31		103	%	80 - 120
			Nitrate (N)	2017/10/31		95	%	80 - 120
5239468	C_N	Method Blank	Nitrite (N)	2017/10/31	<0.010		mg/L	
			Nitrate (N)	2017/10/31	<0.10		mg/L	
5239468	C_N	RPD	Nitrite (N)	2017/10/31	NC		%	20
			Nitrate (N)	2017/10/31	NC		%	20
5241589	COP	Matrix Spike	Total Ammonia-N	2017/11/02		99	%	80 - 120
5241589	COP	Spiked Blank	Total Ammonia-N	2017/11/02		101	%	85 - 115
5241589	COP	Method Blank	Total Ammonia-N	2017/11/02	<0.050		mg/L	
5241589	COP	RPD	Total Ammonia-N	2017/11/02	1.0		%	20
5242222	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2017/11/01		96	%	85 - 115

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5242222	SAU	Method Blank	Alkalinity (Total as CaCO3)	2017/11/01	<1.0		mg/L	
5242222	SAU	RPD	Alkalinity (Total as CaCO3)	2017/11/01	0.057		%	20
5242230	SAU	Spiked Blank	Conductivity	2017/11/01		99	%	85 - 115
5242230	SAU	Method Blank	Conductivity	2017/11/01	<1.0		umho/cm	
5242230	SAU	RPD	Conductivity	2017/11/01	0.098		%	25
5242233	SAU	Matrix Spike	Fluoride (F-)	2017/11/01		101	%	80 - 120
5242233	SAU	Spiked Blank	Fluoride (F-)	2017/11/01		97	%	80 - 120
5242233	SAU	Method Blank	Fluoride (F-)	2017/11/01	<0.10		mg/L	
5242233	SAU	RPD	Fluoride (F-)	2017/11/01	0.93		%	20
5242243	SAU	Spiked Blank	pH	2017/11/01		101	%	98 - 103
5242243	SAU	RPD	pH	2017/11/01	2.0		%	N/A
5242753	VRO	Spiked Blank	Colour	2017/11/02		103	%	80 - 120
5242753	VRO	Method Blank	Colour	2017/11/02	<2		TCU	
5242753	VRO	RPD [FKZ875-01]	Colour	2017/11/02	NC		%	25
5246829	PBA	Matrix Spike [FKZ875-04]	Dissolved Calcium (Ca)	2017/11/03		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/03		NC	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/03		103	%	80 - 120
			Dissolved Potassium (K)	2017/11/03		104	%	80 - 120
			Dissolved Sodium (Na)	2017/11/03		NC	%	80 - 120
5246829	PBA	Spiked Blank	Dissolved Calcium (Ca)	2017/11/03		97	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/03		103	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/03		108	%	80 - 120
			Dissolved Potassium (K)	2017/11/03		102	%	80 - 120
			Dissolved Sodium (Na)	2017/11/03		97	%	80 - 120
5246829	PBA	Method Blank	Dissolved Calcium (Ca)	2017/11/03	<200		ug/L	
			Dissolved Magnesium (Mg)	2017/11/03	<50		ug/L	
			Dissolved Phosphorus (P)	2017/11/03	<100		ug/L	
			Dissolved Potassium (K)	2017/11/03	<200		ug/L	
			Dissolved Sodium (Na)	2017/11/03	110, RDL=100		ug/L	
5246829	PBA	RPD [FKZ875-04]	Dissolved Calcium (Ca)	2017/11/03	0.099		%	20
			Dissolved Magnesium (Mg)	2017/11/03	2.0		%	20
			Dissolved Phosphorus (P)	2017/11/03	NC		%	20
			Dissolved Potassium (K)	2017/11/03	1.2		%	20
			Dissolved Sodium (Na)	2017/11/03	0.55		%	20

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

**VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



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Brad Newman, Scientific Service Specialist

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your Project #: 1407634  
 Site Location: MCCARTHY  
 Your C.O.C. #: 634304-01-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2017/11/08**  
 Report #: R4836277  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7O3950**  
**Received: 2017/11/01, 08:58**

Sample Matrix: Water  
 # Samples Received: 3

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Reference</b>
Alkalinity	3	N/A	2017/11/05	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	3	N/A	2017/11/06	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	3	N/A	2017/11/03	CAM SOP-00463	EPA 325.2 m
Colour	3	N/A	2017/11/03	CAM SOP-00412	SM 22 2120C m
Conductivity	3	N/A	2017/11/05	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2017/11/03	CAM SOP-00446	SM 22 5310 B m
Fluoride	3	2017/11/04	2017/11/05	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2017/11/06	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	3	2017/11/04	2017/11/06	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	3	N/A	2017/11/06		
Anion and Cation Sum	3	N/A	2017/11/06		
Total Ammonia-N	3	N/A	2017/11/06	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2017/11/04	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	3	N/A	2017/11/05	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	3	N/A	2017/11/03	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	3	N/A	2017/11/06		
Sat. pH and Langelier Index (@ 4C)	3	N/A	2017/11/06		
Sulphate by Automated Colourimetry	3	N/A	2017/11/03	CAM SOP-00464	EPA 375.4 m
Tannins & Lignins	3	N/A	2017/11/02	CAM SOP-00410	SM 22 5550 B m
Total Dissolved Solids (TDS calc)	3	N/A	2017/11/06		
Turbidity	3	N/A	2017/11/02	CAM SOP-00417	SM 22 2130 B m

**Remarks:**

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.



Your Project #: 1407634  
Site Location: MCCARTHY  
Your C.O.C. #: 634304-01-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2017/11/08**  
Report #: R4836277  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7O3950**  
**Received: 2017/11/01, 08:58**

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

- (1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
- (2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.  
Ema Gitej, Senior Project Manager  
Email: EGitej@maxxam.ca  
Phone# (905)817-5829

=====  
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**RCAP - COMPREHENSIVE (WATER)**

<b>Maxxam ID</b>				FLN885		FLN886		FLN887		
<b>Sampling Date</b>				2017/10/30 11:30		2017/10/30 12:00		2017/10/30 10:45		
<b>COC Number</b>				634304-01-01		634304-01-01		634304-01-01		
	<b>UNITS</b>	<b>MAC</b>	<b>A/O</b>	<b>DW1</b>	<b>QC Batch</b>	<b>DW2</b>	<b>QC Batch</b>	<b>DW3</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>										
Anion Sum	me/L	-	-	9.78	5243114	9.18	5243114	8.57	N/A	5243114
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	350	5242468	340	5242468	230	1.0	5242468
Calculated TDS	mg/L	-	500	<b>530</b>	5243118	470	5243118	460	1.0	5243118
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	2.2	5242468	2.8	5242468	2.6	1.0	5242468
Cation Sum	me/L	-	-	10.5	5243114	8.51	5243114	8.60	N/A	5243114
Hardness (CaCO3)	mg/L	-	80:100	<b>460</b>	5242540	<b>380</b>	5242540	<b>180</b>	1.0	5242540
Ion Balance (% Difference)	%	-	-	3.60	5243113	3.80	5243113	0.160	N/A	5243113
Langelier Index (@ 20C)	N/A	-	-	1.08	5243116	1.04	5243116	0.480		5243116
Langelier Index (@ 4C)	N/A	-	-	0.835	5243117	0.792	5243117	0.232		5243117
Saturation pH (@ 20C)	N/A	-	-	6.75	5243116	6.90	5243116	7.61		5243116
Saturation pH (@ 4C)	N/A	-	-	6.99	5243117	7.15	5243117	7.85		5243117

<b>Inorganics</b>										
Total Ammonia-N	mg/L	-	-	<0.050	5245916	<0.050	5245916	0.41	0.050	5245916
Conductivity	umho/cm	-	-	910	5249304	840	5249304	860	1.0	5249304
Dissolved Organic Carbon	mg/L	-	5	2.0	5247105	2.0	5247417	<0.50	0.50	5247156
Orthophosphate (P)	mg/L	-	-	<0.010	5246073	<0.010	5246073	<0.010	0.010	5246073
pH	pH	-	6.5:8.5	7.83	5249305	7.94	5249305	8.08		5249305
Dissolved Sulphate (SO4)	mg/L	-	500	21	5246072	29	5246072	2.4	1.0	5246072
Alkalinity (Total as CaCO3)	mg/L	-	30:500	360	5249303	340	5249303	230	1.0	5249303
Dissolved Chloride (Cl)	mg/L	-	250	77	5246053	63	5246053	140	1.0	5246053
Nitrite (N)	mg/L	1	-	<0.010	5246111	<0.010	5246111	<0.010	0.010	5246111
Nitrate (N)	mg/L	10	-	0.43	5246111	0.14	5246111	<0.10	0.10	5246111
Nitrate + Nitrite (N)	mg/L	10	-	0.43	5246111	0.14	5246111	<0.10	0.10	5246111

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch  
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively  
(Made under the Ontario Safe Drinking Water Act, 2002)  
N/A = Not Applicable



**RESULTS OF ANALYSES OF WATER**

Maxxam ID				FLN885	FLN885	FLN886	FLN887		
Sampling Date				2017/10/30 11:30	2017/10/30 11:30	2017/10/30 12:00	2017/10/30 10:45		
COC Number				634304-01-01	634304-01-01	634304-01-01	634304-01-01		
	UNITS	MAC	A/O	DW1	DW1 Lab-Dup	DW2	DW3	RDL	QC Batch
<b>Inorganics</b>									
Colour	TCU	-	5	4		<2	<2	2	5244917
Fluoride (F-)	mg/L	1.5	-	<0.10		0.10	0.77	0.10	5249307
Tannins & Lignins	mg/L	-	-	<0.2	<0.2	<0.2	<0.2	0.2	5244078
Turbidity	NTU	-	5	0.1		0.3	2.4	0.1	5243832
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Lab-Dup = Laboratory Initiated Duplicate									
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)									

**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Maxxam ID					FLN885	FLN886	FLN887		
Sampling Date					2017/10/30 11:30	2017/10/30 12:00	2017/10/30 10:45		
COC Number					634304-01-01	634304-01-01	634304-01-01		
	UNITS	MAC	IMC	A/O	DW1	DW2	DW3	RDL	QC Batch
<b>Metals</b>									
Dissolved Aluminum (Al)	ug/L	-	-	100	<5.0	<5.0	<5.0	5.0	5249336
Dissolved Antimony (Sb)	ug/L	-	6	-	<0.50	<0.50	<0.50	0.50	5249336
Dissolved Arsenic (As)	ug/L	-	25	-	<1.0	<1.0	<1.0	1.0	5249336
Dissolved Barium (Ba)	ug/L	1000	-	-	90	69	190	2.0	5249336
Dissolved Beryllium (Be)	ug/L	-	-	-	<0.50	<0.50	<0.50	0.50	5249336
Dissolved Bismuth (Bi)	ug/L	-	-	-	<1.0	<1.0	<1.0	1.0	5249336
Dissolved Boron (B)	ug/L	-	5000	-	40	17	790	10	5249336
Dissolved Cadmium (Cd)	ug/L	5	-	-	<0.10	<0.10	<0.10	0.10	5249336
Dissolved Calcium (Ca)	ug/L	-	-	-	150000	110000	31000	200	5249336
Dissolved Chromium (Cr)	ug/L	50	-	-	<5.0	<5.0	<5.0	5.0	5249336
Dissolved Cobalt (Co)	ug/L	-	-	-	<0.50	<0.50	<0.50	0.50	5249336
Dissolved Copper (Cu)	ug/L	-	-	1000	<1.0	<1.0	<1.0	1.0	5249336
Dissolved Iron (Fe)	ug/L	-	-	300	<100	<100	<100	100	5249336
Dissolved Lead (Pb)	ug/L	10	-	-	<0.50	<0.50	<0.50	0.50	5249336
Dissolved Lithium (Li)	ug/L	-	-	-	<5.0	<5.0	79	5.0	5249336
Dissolved Magnesium (Mg)	ug/L	-	-	-	21000	26000	25000	50	5249336
Dissolved Manganese (Mn)	ug/L	-	-	50	32	<2.0	4.9	2.0	5249336
Dissolved Molybdenum (Mo)	ug/L	-	-	-	<0.50	<0.50	<0.50	0.50	5249336
Dissolved Nickel (Ni)	ug/L	-	-	-	<1.0	<1.0	<1.0	1.0	5249336
Dissolved Phosphorus (P)	ug/L	-	-	-	<100	<100	<100	100	5249336
Dissolved Potassium (K)	ug/L	-	-	-	1600	3200	7200	200	5249336
Dissolved Selenium (Se)	ug/L	50	-	-	<2.0	<2.0	<2.0	2.0	5249336
Dissolved Silicon (Si)	ug/L	-	-	-	8400	7600	5300	50	5249336
Dissolved Silver (Ag)	ug/L	-	-	-	<0.10	<0.10	<0.10	0.10	5249336
Dissolved Sodium (Na)	ug/L	20000	-	200000	<b>29000</b>	<b>21000</b>	<b>110000</b>	100	5249336
Dissolved Strontium (Sr)	ug/L	-	-	-	390	340	2300	1.0	5249336
Dissolved Tellurium (Te)	ug/L	-	-	-	<1.0	<1.0	<1.0	1.0	5249336
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
MAC,IMC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)									

**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Maxxam ID					FLN885	FLN886	FLN887		
Sampling Date					2017/10/30 11:30	2017/10/30 12:00	2017/10/30 10:45		
COC Number					634304-01-01	634304-01-01	634304-01-01		
	UNITS	MAC	IMC	A/O	DW1	DW2	DW3	RDL	QC Batch
Dissolved Thallium (Tl)	ug/L	-	-	-	<0.050	<0.050	<0.050	0.050	5249336
Dissolved Tin (Sn)	ug/L	-	-	-	1.0	<1.0	<1.0	1.0	5249336
Dissolved Titanium (Ti)	ug/L	-	-	-	<5.0	<5.0	<5.0	5.0	5249336
Dissolved Tungsten (W)	ug/L	-	-	-	<1.0	<1.0	<1.0	1.0	5249336
Dissolved Uranium (U)	ug/L	20	-	-	0.76	0.71	<0.10	0.10	5249336
Dissolved Vanadium (V)	ug/L	-	-	-	<0.50	0.56	<0.50	0.50	5249336
Dissolved Zinc (Zn)	ug/L	-	-	5000	<5.0	<5.0	180	5.0	5249336
Dissolved Zirconium (Zr)	ug/L	-	-	-	<1.0	<1.0	<1.0	1.0	5249336
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
MAC,IMC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)									

### TEST SUMMARY

**Maxxam ID:** FLN885  
**Sample ID:** DW1  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5249303	N/A	2017/11/05	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	5242468	N/A	2017/11/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	5246053	N/A	2017/11/03	Alina Dobreanu
Colour	SPEC	5244917	N/A	2017/11/03	Viorica Rotaru
Conductivity	AT	5249304	N/A	2017/11/05	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5247105	N/A	2017/11/03	Anastasia Hamanov
Fluoride	ISE	5249307	2017/11/04	2017/11/05	Yogesh Patel
Hardness (calculated as CaCO3)		5242540	N/A	2017/11/06	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	5249336	2017/11/04	2017/11/06	Arefa Dabhad
Ion Balance (% Difference)	CALC	5243113	N/A	2017/11/06	Automated Statchk
Anion and Cation Sum	CALC	5243114	N/A	2017/11/06	Automated Statchk
Total Ammonia-N	LACH/NH4	5245916	N/A	2017/11/06	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5246111	N/A	2017/11/04	Anastasia Hamanov
pH	AT	5249305	N/A	2017/11/05	Yogesh Patel
Orthophosphate	KONE	5246073	N/A	2017/11/03	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	5243116	N/A	2017/11/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5243117	N/A	2017/11/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	5246072	N/A	2017/11/03	Alina Dobreanu
Tannins & Lignins	SPEC	5244078	N/A	2017/11/02	Viorica Rotaru
Total Dissolved Solids (TDS calc)	CALC	5243118	N/A	2017/11/06	Automated Statchk
Turbidity	AT	5243832	N/A	2017/11/02	Neil Dassanayake

**Maxxam ID:** FLN885 Dup  
**Sample ID:** DW1  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Tannins & Lignins	SPEC	5244078	N/A	2017/11/02	Viorica Rotaru

**Maxxam ID:** FLN886  
**Sample ID:** DW2  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5249303	N/A	2017/11/05	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	5242468	N/A	2017/11/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	5246053	N/A	2017/11/03	Alina Dobreanu
Colour	SPEC	5244917	N/A	2017/11/03	Viorica Rotaru
Conductivity	AT	5249304	N/A	2017/11/05	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5247417	N/A	2017/11/03	Anastasia Hamanov
Fluoride	ISE	5249307	2017/11/04	2017/11/05	Yogesh Patel
Hardness (calculated as CaCO3)		5242540	N/A	2017/11/06	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	5249336	2017/11/04	2017/11/06	Arefa Dabhad
Ion Balance (% Difference)	CALC	5243113	N/A	2017/11/06	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** FLN886  
**Sample ID:** DW2  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Anion and Cation Sum	CALC	5243114	N/A	2017/11/06	Automated Statchk
Total Ammonia-N	LACH/NH4	5245916	N/A	2017/11/06	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5246111	N/A	2017/11/04	Anastasia Hamanov
pH	AT	5249305	N/A	2017/11/05	Yogesh Patel
Orthophosphate	KONE	5246073	N/A	2017/11/03	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	5243116	N/A	2017/11/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5243117	N/A	2017/11/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	5246072	N/A	2017/11/03	Alina Dobreanu
Tannins & Lignins	SPEC	5244078	N/A	2017/11/02	Viorica Rotaru
Total Dissolved Solids (TDS calc)	CALC	5243118	N/A	2017/11/06	Automated Statchk
Turbidity	AT	5243832	N/A	2017/11/02	Neil Dassanayake

**Maxxam ID:** FLN887  
**Sample ID:** DW3  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5249303	N/A	2017/11/05	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	5242468	N/A	2017/11/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	5246053	N/A	2017/11/03	Alina Dobreanu
Colour	SPEC	5244917	N/A	2017/11/03	Viorica Rotaru
Conductivity	AT	5249304	N/A	2017/11/05	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5247156	N/A	2017/11/03	Anastasia Hamanov
Fluoride	ISE	5249307	2017/11/04	2017/11/05	Yogesh Patel
Hardness (calculated as CaCO3)		5242540	N/A	2017/11/06	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	5249336	2017/11/04	2017/11/06	Arefa Dabhad
Ion Balance (% Difference)	CALC	5243113	N/A	2017/11/06	Automated Statchk
Anion and Cation Sum	CALC	5243114	N/A	2017/11/06	Automated Statchk
Total Ammonia-N	LACH/NH4	5245916	N/A	2017/11/06	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5246111	N/A	2017/11/04	Anastasia Hamanov
pH	AT	5249305	N/A	2017/11/05	Yogesh Patel
Orthophosphate	KONE	5246073	N/A	2017/11/03	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	5243116	N/A	2017/11/06	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5243117	N/A	2017/11/06	Automated Statchk
Sulphate by Automated Colourimetry	KONE	5246072	N/A	2017/11/03	Alina Dobreanu
Tannins & Lignins	SPEC	5244078	N/A	2017/11/02	Viorica Rotaru
Total Dissolved Solids (TDS calc)	CALC	5243118	N/A	2017/11/06	Automated Statchk
Turbidity	AT	5243832	N/A	2017/11/02	Neil Dassanayake

**GENERAL COMMENTS**

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.3°C
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**Results relate only to the items tested.**

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5243832	NYS	Spiked Blank	Turbidity	2017/11/02		101	%	85 - 115
5243832	NYS	Method Blank	Turbidity	2017/11/02	<0.1		NTU	
5243832	NYS	RPD	Turbidity	2017/11/02	2.1		%	20
5244078	VRO	Matrix Spike [FLN885-01]	Tannins & Lignins	2017/11/02		98	%	80 - 120
5244078	VRO	Spiked Blank	Tannins & Lignins	2017/11/02		102	%	80 - 120
5244078	VRO	Method Blank	Tannins & Lignins	2017/11/02	<0.2		mg/L	
5244078	VRO	RPD [FLN885-01]	Tannins & Lignins	2017/11/02	NC		%	20
5244917	VRO	Spiked Blank	Colour	2017/11/03		101	%	80 - 120
5244917	VRO	Method Blank	Colour	2017/11/03	<2		TCU	
5244917	VRO	RPD	Colour	2017/11/03	0.19		%	25
5245916	COP	Matrix Spike	Total Ammonia-N	2017/11/06		98	%	80 - 120
5245916	COP	Spiked Blank	Total Ammonia-N	2017/11/06		102	%	85 - 115
5245916	COP	Method Blank	Total Ammonia-N	2017/11/06	<0.050		mg/L	
5245916	COP	RPD	Total Ammonia-N	2017/11/06	9.2		%	20
5246053	ADB	Matrix Spike	Dissolved Chloride (Cl)	2017/11/03		NC	%	80 - 120
5246053	ADB	Spiked Blank	Dissolved Chloride (Cl)	2017/11/03		104	%	80 - 120
5246053	ADB	Method Blank	Dissolved Chloride (Cl)	2017/11/03	<1.0		mg/L	
5246053	ADB	RPD	Dissolved Chloride (Cl)	2017/11/03	1.2		%	20
5246072	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2017/11/03		NC	%	75 - 125
5246072	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2017/11/03		101	%	80 - 120
5246072	ADB	Method Blank	Dissolved Sulphate (SO4)	2017/11/03	<1.0		mg/L	
5246072	ADB	RPD	Dissolved Sulphate (SO4)	2017/11/03	0.19		%	20
5246073	ADB	Matrix Spike	Orthophosphate (P)	2017/11/03		103	%	75 - 125
5246073	ADB	Spiked Blank	Orthophosphate (P)	2017/11/03		101	%	80 - 120
5246073	ADB	Method Blank	Orthophosphate (P)	2017/11/03	<0.010		mg/L	
5246073	ADB	RPD	Orthophosphate (P)	2017/11/03	NC		%	25
5246111	AHA	Matrix Spike	Nitrite (N)	2017/11/04		98	%	80 - 120
			Nitrate (N)	2017/11/04		90	%	80 - 120
5246111	AHA	Spiked Blank	Nitrite (N)	2017/11/04		100	%	80 - 120
			Nitrate (N)	2017/11/04		98	%	80 - 120
5246111	AHA	Method Blank	Nitrite (N)	2017/11/04	<0.010		mg/L	
			Nitrate (N)	2017/11/04	<0.10		mg/L	
5246111	AHA	RPD	Nitrite (N)	2017/11/04	NC		%	20
			Nitrate (N)	2017/11/04	1.0		%	20
5247105	AHA	Matrix Spike	Dissolved Organic Carbon	2017/11/03		93	%	80 - 120
5247105	AHA	Spiked Blank	Dissolved Organic Carbon	2017/11/03		100	%	80 - 120
5247105	AHA	Method Blank	Dissolved Organic Carbon	2017/11/03	<0.50		mg/L	
5247105	AHA	RPD	Dissolved Organic Carbon	2017/11/03	1.3		%	20
5247156	AHA	Matrix Spike	Dissolved Organic Carbon	2017/11/03		96	%	80 - 120
5247156	AHA	Spiked Blank	Dissolved Organic Carbon	2017/11/03		97	%	80 - 120
5247156	AHA	Method Blank	Dissolved Organic Carbon	2017/11/03	<0.50		mg/L	
5247156	AHA	RPD	Dissolved Organic Carbon	2017/11/03	1.2		%	20
5247417	AHA	Matrix Spike	Dissolved Organic Carbon	2017/11/03		91	%	80 - 120
5247417	AHA	Spiked Blank	Dissolved Organic Carbon	2017/11/03		99	%	80 - 120
5247417	AHA	Method Blank	Dissolved Organic Carbon	2017/11/03	<0.50		mg/L	
5247417	AHA	RPD	Dissolved Organic Carbon	2017/11/03	2.3		%	20
5249303	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2017/11/05		96	%	85 - 115
5249303	YPA	Method Blank	Alkalinity (Total as CaCO3)	2017/11/05	<1.0		mg/L	
5249303	YPA	RPD	Alkalinity (Total as CaCO3)	2017/11/05	0.18		%	20
5249304	YPA	Spiked Blank	Conductivity	2017/11/05		101	%	85 - 115
5249304	YPA	Method Blank	Conductivity	2017/11/05	<1.0		umho/cm	
5249304	YPA	RPD	Conductivity	2017/11/05	0.26		%	25

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5249305	YPA	Spiked Blank	pH	2017/11/05		102	%	98 - 103
5249305	YPA	RPD	pH	2017/11/05	0.15		%	N/A
5249307	YPA	Matrix Spike	Fluoride (F-)	2017/11/05		109	%	80 - 120
5249307	YPA	Spiked Blank	Fluoride (F-)	2017/11/05		102	%	80 - 120
5249307	YPA	Method Blank	Fluoride (F-)	2017/11/05	<0.10		mg/L	
5249307	YPA	RPD	Fluoride (F-)	2017/11/05	0		%	20
5249336	ADA	Matrix Spike	Dissolved Aluminum (Al)	2017/11/06		105	%	80 - 120
			Dissolved Antimony (Sb)	2017/11/06		107	%	80 - 120
			Dissolved Arsenic (As)	2017/11/06		105	%	80 - 120
			Dissolved Barium (Ba)	2017/11/06		100	%	80 - 120
			Dissolved Beryllium (Be)	2017/11/06		108	%	80 - 120
			Dissolved Bismuth (Bi)	2017/11/06		99	%	80 - 120
			Dissolved Boron (B)	2017/11/06		109	%	80 - 120
			Dissolved Cadmium (Cd)	2017/11/06		104	%	80 - 120
			Dissolved Calcium (Ca)	2017/11/06		NC	%	80 - 120
			Dissolved Chromium (Cr)	2017/11/06		105	%	80 - 120
			Dissolved Cobalt (Co)	2017/11/06		103	%	80 - 120
			Dissolved Copper (Cu)	2017/11/06		108	%	80 - 120
			Dissolved Iron (Fe)	2017/11/06		104	%	80 - 120
			Dissolved Lead (Pb)	2017/11/06		101	%	80 - 120
			Dissolved Lithium (Li)	2017/11/06		105	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/06		104	%	80 - 120
			Dissolved Manganese (Mn)	2017/11/06		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/11/06		110	%	80 - 120
			Dissolved Nickel (Ni)	2017/11/06		101	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/06		113	%	80 - 120
			Dissolved Potassium (K)	2017/11/06		102	%	80 - 120
			Dissolved Selenium (Se)	2017/11/06		103	%	80 - 120
			Dissolved Silicon (Si)	2017/11/06		105	%	80 - 120
			Dissolved Silver (Ag)	2017/11/06		102	%	80 - 120
			Dissolved Sodium (Na)	2017/11/06		NC	%	80 - 120
			Dissolved Strontium (Sr)	2017/11/06		108	%	80 - 120
			Dissolved Tellurium (Te)	2017/11/06		103	%	80 - 120
			Dissolved Thallium (Tl)	2017/11/06		100	%	80 - 120
			Dissolved Tin (Sn)	2017/11/06		105	%	80 - 120
			Dissolved Titanium (Ti)	2017/11/06		102	%	80 - 120
			Dissolved Tungsten (W)	2017/11/06		104	%	80 - 120
			Dissolved Uranium (U)	2017/11/06		101	%	80 - 120
			Dissolved Vanadium (V)	2017/11/06		101	%	80 - 120
			Dissolved Zinc (Zn)	2017/11/06		103	%	80 - 120
			Dissolved Zirconium (Zr)	2017/11/06		103	%	80 - 120
5249336	ADA	Spiked Blank	Dissolved Aluminum (Al)	2017/11/06		103	%	80 - 120
			Dissolved Antimony (Sb)	2017/11/06		102	%	80 - 120
			Dissolved Arsenic (As)	2017/11/06		101	%	80 - 120
			Dissolved Barium (Ba)	2017/11/06		102	%	80 - 120
			Dissolved Beryllium (Be)	2017/11/06		103	%	80 - 120
			Dissolved Bismuth (Bi)	2017/11/06		100	%	80 - 120
			Dissolved Boron (B)	2017/11/06		104	%	80 - 120
			Dissolved Cadmium (Cd)	2017/11/06		101	%	80 - 120
			Dissolved Calcium (Ca)	2017/11/06		97	%	80 - 120
			Dissolved Chromium (Cr)	2017/11/06		100	%	80 - 120
			Dissolved Cobalt (Co)	2017/11/06		101	%	80 - 120



**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Copper (Cu)	2017/11/06		103	%	80 - 120
			Dissolved Iron (Fe)	2017/11/06		101	%	80 - 120
			Dissolved Lead (Pb)	2017/11/06		101	%	80 - 120
			Dissolved Lithium (Li)	2017/11/06		100	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/06		102	%	80 - 120
			Dissolved Manganese (Mn)	2017/11/06		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/11/06		100	%	80 - 120
			Dissolved Nickel (Ni)	2017/11/06		100	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/06		113	%	80 - 120
			Dissolved Potassium (K)	2017/11/06		101	%	80 - 120
			Dissolved Selenium (Se)	2017/11/06		100	%	80 - 120
			Dissolved Silicon (Si)	2017/11/06		100	%	80 - 120
			Dissolved Silver (Ag)	2017/11/06		100	%	80 - 120
			Dissolved Sodium (Na)	2017/11/06		100	%	80 - 120
			Dissolved Strontium (Sr)	2017/11/06		95	%	80 - 120
			Dissolved Tellurium (Te)	2017/11/06		97	%	80 - 120
			Dissolved Thallium (Tl)	2017/11/06		101	%	80 - 120
			Dissolved Tin (Sn)	2017/11/06		100	%	80 - 120
			Dissolved Titanium (Ti)	2017/11/06		97	%	80 - 120
			Dissolved Tungsten (W)	2017/11/06		105	%	80 - 120
			Dissolved Uranium (U)	2017/11/06		100	%	80 - 120
			Dissolved Vanadium (V)	2017/11/06		98	%	80 - 120
			Dissolved Zinc (Zn)	2017/11/06		100	%	80 - 120
			Dissolved Zirconium (Zr)	2017/11/06		98	%	80 - 120
5249336	ADA	Method Blank	Dissolved Aluminum (Al)	2017/11/06	<5.0		ug/L	
			Dissolved Antimony (Sb)	2017/11/06	<0.50		ug/L	
			Dissolved Arsenic (As)	2017/11/06	<1.0		ug/L	
			Dissolved Barium (Ba)	2017/11/06	<2.0		ug/L	
			Dissolved Beryllium (Be)	2017/11/06	<0.50		ug/L	
			Dissolved Bismuth (Bi)	2017/11/06	<1.0		ug/L	
			Dissolved Boron (B)	2017/11/06	<10		ug/L	
			Dissolved Cadmium (Cd)	2017/11/06	<0.10		ug/L	
			Dissolved Calcium (Ca)	2017/11/06	<200		ug/L	
			Dissolved Chromium (Cr)	2017/11/06	<5.0		ug/L	
			Dissolved Cobalt (Co)	2017/11/06	<0.50		ug/L	
			Dissolved Copper (Cu)	2017/11/06	<1.0		ug/L	
			Dissolved Iron (Fe)	2017/11/06	<100		ug/L	
			Dissolved Lead (Pb)	2017/11/06	<0.50		ug/L	
			Dissolved Lithium (Li)	2017/11/06	<5.0		ug/L	
			Dissolved Magnesium (Mg)	2017/11/06	<50		ug/L	
			Dissolved Manganese (Mn)	2017/11/06	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2017/11/06	<0.50		ug/L	
			Dissolved Nickel (Ni)	2017/11/06	<1.0		ug/L	
			Dissolved Phosphorus (P)	2017/11/06	<100		ug/L	
			Dissolved Potassium (K)	2017/11/06	<200		ug/L	
			Dissolved Selenium (Se)	2017/11/06	<2.0		ug/L	
			Dissolved Silicon (Si)	2017/11/06	<50		ug/L	
			Dissolved Silver (Ag)	2017/11/06	<0.10		ug/L	
			Dissolved Sodium (Na)	2017/11/06	<100		ug/L	
			Dissolved Strontium (Sr)	2017/11/06	<1.0		ug/L	
			Dissolved Tellurium (Te)	2017/11/06	<1.0		ug/L	
			Dissolved Thallium (Tl)	2017/11/06	<0.050		ug/L	

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Tin (Sn)	2017/11/06	<1.0		ug/L	
			Dissolved Titanium (Ti)	2017/11/06	<5.0		ug/L	
			Dissolved Tungsten (W)	2017/11/06	<1.0		ug/L	
			Dissolved Uranium (U)	2017/11/06	<0.10		ug/L	
			Dissolved Vanadium (V)	2017/11/06	<0.50		ug/L	
			Dissolved Zinc (Zn)	2017/11/06	<5.0		ug/L	
			Dissolved Zirconium (Zr)	2017/11/06	<1.0		ug/L	
5249336	ADA	RPD	Dissolved Lead (Pb)	2017/11/06	NC		%	20
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference &lt;= 2x RDL).</p>								

**VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



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Brad Newman, Scientific Service Specialist

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**Exceedence Summary Table – ODWS (2002)**  
**Result Exceedences**

<b>Sample ID</b>	<b>Maxxam ID</b>	<b>Parameter</b>	<b>Criteria</b>	<b>Result</b>	<b>DL</b>	<b>Units</b>
DW1	FLN885-02	Dissolved Sodium (Na)	20000	29000	100	ug/L
DW2	FLN886-02	Dissolved Sodium (Na)	20000	21000	100	ug/L
DW3	FLN887-02	Dissolved Sodium (Na)	20000	110000	100	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

Your Project #: 1407634  
 Site Location: MCCARTHY  
 Your C.O.C. #: 634304-02-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2017/11/08**  
 Report #: R4837671  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7O3958**  
**Received: 2017/11/01, 08:58**

Sample Matrix: Water  
 # Samples Received: 3

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Reference</b>
Alkalinity	3	N/A	2017/11/04	CAM SOP-00448	SM 22 2320 B m
Carbonate, Bicarbonate and Hydroxide	3	N/A	2017/11/06	CAM SOP-00102	APHA 4500-CO2 D
Chloride by Automated Colourimetry	3	N/A	2017/11/06	CAM SOP-00463	EPA 325.2 m
Colour	3	N/A	2017/11/03	CAM SOP-00412	SM 22 2120C m
Conductivity	3	N/A	2017/11/04	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2017/11/03	CAM SOP-00446	SM 22 5310 B m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2017/11/04	CAM SOP-00446	SM 22 5310 B m
Fluoride	3	2017/11/04	2017/11/04	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2017/11/07	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	2	N/A	2017/11/07	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2017/11/08	CAM SOP-00447	EPA 6020B m
Ion Balance (% Difference)	3	N/A	2017/11/07		
Anion and Cation Sum	3	N/A	2017/11/07		
Total Ammonia-N	3	N/A	2017/11/06	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2017/11/04	CAM SOP-00440	SM 22 4500-NO3I/NO2B
pH	3	N/A	2017/11/04	CAM SOP-00413	SM 4500H+ B m
Orthophosphate	3	N/A	2017/11/06	CAM SOP-00461	EPA 365.1 m
Sat. pH and Langelier Index (@ 20C)	3	N/A	2017/11/07		
Sat. pH and Langelier Index (@ 4C)	3	N/A	2017/11/07		
Sulphate by Automated Colourimetry	3	N/A	2017/11/06	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids (TDS calc)	3	N/A	2017/11/07		

**Remarks:**

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Your Project #: 1407634  
Site Location: MCCARTHY  
Your C.O.C. #: 634304-02-01

**Attention: Jamie Bonany**

Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2017/11/08**  
Report #: R4837671  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B7O3958**

**Received: 2017/11/01, 08:58**

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: EGitej@maxxam.ca

Phone# (905)817-5829

=====  
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**RCAP - COMPREHENSIVE (WATER)**

Maxxam ID					FLN910	FLN910			FLN911		
Sampling Date					2017/10/30 14:15	2017/10/30 14:15			2017/10/30 13:30		
COC Number					634304-02-01	634304-02-01			634304-02-01		
	UNITS	MAC	IMC	A/O	OW6-2	OW6-2 Lab-Dup	RDL	QC Batch	OW7-1	RDL	QC Batch

Calculated Parameters											
Anion Sum	me/L	-	-	-	64.0		N/A	5243114	107	N/A	5243114
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	-	150		1.0	5242468	230	1.0	5242468
Calculated TDS	mg/L	-	-	500	<b>3700</b>		1.0	5243118	<b>5600</b>	1.0	5243118
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	-	<1.0		1.0	5242468	1.1	1.0	5242468
Cation Sum	me/L	-	-	-	60.7		N/A	5243114	89.8	N/A	5243114
Hardness (CaCO3)	mg/L	-	-	80:100	<b>1400</b>		1.0	5242540	<b>1900</b>	1.0	5242540
Ion Balance (% Difference)	%	-	-	-	2.65		N/A	5243113	8.82	N/A	5243113
Langelier Index (@ 20C)	N/A	-	-	-	0.563			5243116	0.869		5243116
Langelier Index (@ 4C)	N/A	-	-	-	0.322			5243117	0.629		5243117
Saturation pH (@ 20C)	N/A	-	-	-	7.11			5243116	6.85		5243116
Saturation pH (@ 4C)	N/A	-	-	-	7.35			5243117	7.09		5243117

Inorganics											
Total Ammonia-N	mg/L	-	-	-	0.96		0.050	5245935	4.7	0.50	5245916
Conductivity	umho/cm	-	-	-	6300		1.0	5248778	11000	1.0	5248778
Dissolved Organic Carbon	mg/L	-	-	5	0.82		0.50	5247156	0.92	0.50	5247586
Orthophosphate (P)	mg/L	-	-	-	<0.010		0.010	5249289	<0.010	0.010	5249289
pH	pH	-	-	6.5:8.5	7.67			5248781	7.72		5248781
Dissolved Sulphate (SO4)	mg/L	-	-	500	<b>990</b>		5.0	5249288	32	1.0	5249288
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	150		1.0	5248776	230	1.0	5248776
Dissolved Chloride (Cl)	mg/L	-	-	250	<b>1400</b>		15	5249283	<b>3600</b>	40	5249283
Nitrite (N)	mg/L	1	-	-	0.114	0.113	0.010	5245337	<0.010	0.010	5245337
Nitrate (N)	mg/L	10	-	-	0.18	0.17	0.10	5245337	<0.10	0.10	5245337
Nitrate + Nitrite (N)	mg/L	10	-	-	0.29	0.28	0.10	5245337	<0.10	0.10	5245337

Metals											
Dissolved Aluminum (Al)	ug/L	-	-	100	<25	<25	25	5245539	<5.0	5.0	5253914
Dissolved Antimony (Sb)	ug/L	-	6	-	<2.5	<2.5	2.5	5245539	<0.50	0.50	5253914

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 MAC,IMC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively  
 (Made under the Ontario Safe Drinking Water Act, 2002)  
 N/A = Not Applicable

**RCAP - COMPREHENSIVE (WATER)**

Maxxam ID					FLN910	FLN910			FLN911		
Sampling Date					2017/10/30 14:15	2017/10/30 14:15			2017/10/30 13:30		
COC Number					634304-02-01	634304-02-01			634304-02-01		
	UNITS	MAC	IMC	A/O	OW6-2	OW6-2 Lab-Dup	RDL	QC Batch	OW7-1	RDL	QC Batch
Dissolved Arsenic (As)	ug/L	-	25	-	<5.0	<5.0	5.0	5245539	<1.0	1.0	5253914
Dissolved Barium (Ba)	ug/L	1000	-	-	81	82	10	5245539	190	2.0	5253914
Dissolved Beryllium (Be)	ug/L	-	-	-	<2.5	<2.5	2.5	5245539	<0.50	0.50	5253914
Dissolved Boron (B)	ug/L	-	5000	-	3300	3300	50	5245539	1700	10	5253914
Dissolved Cadmium (Cd)	ug/L	5	-	-	<0.50	<0.50	0.50	5245539	<0.10	0.10	5253914
Dissolved Calcium (Ca)	ug/L	-	-	-	280000	270000	1000	5245539	390000	1000	5253914
Dissolved Chromium (Cr)	ug/L	50	-	-	<25	<25	25	5245539	<5.0	5.0	5253914
Dissolved Cobalt (Co)	ug/L	-	-	-	<2.5	<2.5	2.5	5245539	<0.50	0.50	5253914
Dissolved Copper (Cu)	ug/L	-	-	1000	<5.0	<5.0	5.0	5245539	<1.0	1.0	5253914
Dissolved Iron (Fe)	ug/L	-	-	300	<500 (1)	<500 (1)	500	5245539	1700	100	5253914
Dissolved Lead (Pb)	ug/L	10	-	-	<2.5	<2.5	2.5	5245539	<0.50	0.50	5253914
Dissolved Magnesium (Mg)	ug/L	-	-	-	180000	180000	250	5245539	230000	50	5253914
Dissolved Manganese (Mn)	ug/L	-	-	50	2400	2400	10	5245539	84	2.0	5253914
Dissolved Molybdenum (Mo)	ug/L	-	-	-	2.7	<2.5	2.5	5245539	3.6	0.50	5253914
Dissolved Nickel (Ni)	ug/L	-	-	-	<5.0	<5.0	5.0	5245539	1.6	1.0	5253914
Dissolved Phosphorus (P)	ug/L	-	-	-	<500	<500	500	5245539	<100	100	5253914
Dissolved Potassium (K)	ug/L	-	-	-	15000	15000	1000	5245539	26000	200	5253914
Dissolved Selenium (Se)	ug/L	50	-	-	<10	<10	10	5245539	<2.0	2.0	5253914
Dissolved Silicon (Si)	ug/L	-	-	-	3500	3500	250	5245539	2800	50	5253914
Dissolved Silver (Ag)	ug/L	-	-	-	<0.50	<0.50	0.50	5245539	<0.10	0.10	5253914
Dissolved Sodium (Na)	ug/L	20000	-	200000	720000	720000	500	5245539	1200000	500	5253914
Dissolved Strontium (Sr)	ug/L	-	-	-	14000	13000	5.0	5245539	26000	1.0	5253914
Dissolved Thallium (Tl)	ug/L	-	-	-	<0.25	<0.25	0.25	5245539	<0.050	0.050	5253914
Dissolved Titanium (Ti)	ug/L	-	-	-	<25	<25	25	5245539	<5.0	5.0	5253914
Dissolved Uranium (U)	ug/L	20	-	-	1.1	1.1	0.50	5245539	<0.10	0.10	5253914
Dissolved Vanadium (V)	ug/L	-	-	-	<2.5	<2.5	2.5	5245539	<0.50	0.50	5253914
Dissolved Zinc (Zn)	ug/L	-	-	5000	<25	<25	25	5245539	<5.0	5.0	5253914

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 MAC,IMC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively  
 (Made under the Ontario Safe Drinking Water Act, 2002)  
 (1) RDL exceeds criteria



**RCAP - COMPREHENSIVE (WATER)**

Maxxam ID					FLN912		
Sampling Date					2017/10/30 15:15		
COC Number					634304-02-01		
	UNITS	MAC	IMC	A/O	OW8-1	RDL	QC Batch
<b>Calculated Parameters</b>							
Anion Sum	me/L	-	-	-	22.2	N/A	5243114
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	-	-	-	300	1.0	5242468
Calculated TDS	mg/L	-	-	500	<b>1200</b>	1.0	5243118
Carb. Alkalinity (calc. as CaCO3)	mg/L	-	-	-	2.0	1.0	5242468
Cation Sum	me/L	-	-	-	21.6	N/A	5243114
Hardness (CaCO3)	mg/L	-	-	80:100	<b>520</b>	1.0	5242540
Ion Balance (% Difference)	%	-	-	-	1.46	N/A	5243113
Langelier Index (@ 20C)	N/A	-	-	-	0.901		5243116
Langelier Index (@ 4C)	N/A	-	-	-	0.656		5243117
Saturation pH (@ 20C)	N/A	-	-	-	6.96		5243116
Saturation pH (@ 4C)	N/A	-	-	-	7.20		5243117
<b>Inorganics</b>							
Total Ammonia-N	mg/L	-	-	-	1.4	0.050	5245916
Conductivity	umho/cm	-	-	-	2400	1.0	5248778
Dissolved Organic Carbon	mg/L	-	-	5	1.4	0.50	5247105
Orthophosphate (P)	mg/L	-	-	-	<0.010	0.010	5249289
pH	pH	-	-	6.5:8.5	7.86		5248781
Dissolved Sulphate (SO4)	mg/L	-	-	500	45	1.0	5249288
Alkalinity (Total as CaCO3)	mg/L	-	-	30:500	300	1.0	5248776
Dissolved Chloride (Cl)	mg/L	-	-	250	<b>540</b>	5.0	5249283
Nitrite (N)	mg/L	1	-	-	<0.010	0.010	5245337
Nitrate (N)	mg/L	10	-	-	<0.10	0.10	5245337
Nitrate + Nitrite (N)	mg/L	10	-	-	<0.10	0.10	5245337
<b>Metals</b>							
Dissolved Aluminum (Al)	ug/L	-	-	100	<5.0	5.0	5245539
Dissolved Antimony (Sb)	ug/L	-	6	-	<0.50	0.50	5245539
No Fill	No Exceedance						
Grey	Exceeds 1 criteria policy/level						
Black	Exceeds both criteria/levels						
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
MAC,IMC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively							
(Made under the Ontario Safe Drinking Water Act, 2002)							
N/A = Not Applicable							

**RCAP - COMPREHENSIVE (WATER)**

Maxxam ID					FLN912		
Sampling Date					2017/10/30 15:15		
COC Number					634304-02-01		
	UNITS	MAC	IMC	A/O	OW8-1	RDL	QC Batch
Dissolved Arsenic (As)	ug/L	-	25	-	<1.0	1.0	5245539
Dissolved Barium (Ba)	ug/L	1000	-	-	240	2.0	5245539
Dissolved Beryllium (Be)	ug/L	-	-	-	<0.50	0.50	5245539
Dissolved Boron (B)	ug/L	-	5000	-	850	10	5245539
Dissolved Cadmium (Cd)	ug/L	5	-	-	<0.10	0.10	5245539
Dissolved Calcium (Ca)	ug/L	-	-	-	140000	200	5245539
Dissolved Chromium (Cr)	ug/L	50	-	-	<5.0	5.0	5245539
Dissolved Cobalt (Co)	ug/L	-	-	-	<0.50	0.50	5245539
Dissolved Copper (Cu)	ug/L	-	-	1000	<1.0	1.0	5245539
Dissolved Iron (Fe)	ug/L	-	-	300	<b>1600</b>	100	5245539
Dissolved Lead (Pb)	ug/L	10	-	-	<0.50	0.50	5245539
Dissolved Magnesium (Mg)	ug/L	-	-	-	44000	50	5245539
Dissolved Manganese (Mn)	ug/L	-	-	50	<b>100</b>	2.0	5245539
Dissolved Molybdenum (Mo)	ug/L	-	-	-	<0.50	0.50	5245539
Dissolved Nickel (Ni)	ug/L	-	-	-	1.3	1.0	5245539
Dissolved Phosphorus (P)	ug/L	-	-	-	<100	100	5245539
Dissolved Potassium (K)	ug/L	-	-	-	8400	200	5245539
Dissolved Selenium (Se)	ug/L	50	-	-	<2.0	2.0	5245539
Dissolved Silicon (Si)	ug/L	-	-	-	3300	50	5245539
Dissolved Silver (Ag)	ug/L	-	-	-	<0.10	0.10	5245539
Dissolved Sodium (Na)	ug/L	20000	-	200000	<b>250000</b>	100	5245539
Dissolved Strontium (Sr)	ug/L	-	-	-	4300	1.0	5245539
Dissolved Thallium (Tl)	ug/L	-	-	-	<0.050	0.050	5245539
Dissolved Titanium (Ti)	ug/L	-	-	-	<5.0	5.0	5245539
Dissolved Uranium (U)	ug/L	20	-	-	<0.10	0.10	5245539
Dissolved Vanadium (V)	ug/L	-	-	-	<0.50	0.50	5245539
Dissolved Zinc (Zn)	ug/L	-	-	5000	<5.0	5.0	5245539
No Fill	No Exceedance						
Grey	Exceeds 1 criteria policy/level						
Black	Exceeds both criteria/levels						
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							
MAC,IMC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively							
(Made under the Ontario Safe Drinking Water Act, 2002)							

**RESULTS OF ANALYSES OF WATER**

Maxxam ID				FLN910	FLN911	FLN912		
Sampling Date				2017/10/30 14:15	2017/10/30 13:30	2017/10/30 15:15		
COC Number				634304-02-01	634304-02-01	634304-02-01		
	<b>UNITS</b>	<b>MAC</b>	<b>A/O</b>	<b>OW6-2</b>	<b>OW7-1</b>	<b>OW8-1</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Inorganics</b>								
Colour	TCU	-	5	<2	<b>90</b>	<2	2	5244917
Fluoride (F-)	mg/L	1.5	-	0.52	1.2	0.89	0.10	5248780
No Fill	No Exceedance							
Grey	Exceeds 1 criteria policy/level							
Black	Exceeds both criteria/levels							
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC], Interim Maximum Acceptable Concentration [IMC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)								

### TEST SUMMARY

**Maxxam ID:** FLN910  
**Sample ID:** OW6-2  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5248776	N/A	2017/11/04	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	5242468	N/A	2017/11/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	5249283	N/A	2017/11/06	Deonarine Ramnarine
Colour	SPEC	5244917	N/A	2017/11/03	Viorica Rotaru
Conductivity	AT	5248778	N/A	2017/11/04	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5247156	N/A	2017/11/03	Anastasia Hamanov
Fluoride	ISE	5248780	2017/11/04	2017/11/04	Yogesh Patel
Hardness (calculated as CaCO3)		5242540	N/A	2017/11/07	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5245539	N/A	2017/11/07	Thao Nguyen
Ion Balance (% Difference)	CALC	5243113	N/A	2017/11/07	Automated Statchk
Anion and Cation Sum	CALC	5243114	N/A	2017/11/07	Automated Statchk
Total Ammonia-N	LACH/NH4	5245935	N/A	2017/11/06	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5245337	N/A	2017/11/04	Anastasia Hamanov
pH	AT	5248781	N/A	2017/11/04	Yogesh Patel
Orthophosphate	KONE	5249289	N/A	2017/11/06	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	5243116	N/A	2017/11/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5243117	N/A	2017/11/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	5249288	N/A	2017/11/06	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5243118	N/A	2017/11/07	Automated Statchk

**Maxxam ID:** FLN910 Dup  
**Sample ID:** OW6-2  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	5245539	N/A	2017/11/07	Thao Nguyen
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5245337	N/A	2017/11/04	Anastasia Hamanov

**Maxxam ID:** FLN911  
**Sample ID:** OW7-1  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5248776	N/A	2017/11/04	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	5242468	N/A	2017/11/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	5249283	N/A	2017/11/06	Deonarine Ramnarine
Colour	SPEC	5244917	N/A	2017/11/03	Viorica Rotaru
Conductivity	AT	5248778	N/A	2017/11/04	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5247586	N/A	2017/11/04	Anastasia Hamanov
Fluoride	ISE	5248780	2017/11/04	2017/11/04	Yogesh Patel
Hardness (calculated as CaCO3)		5242540	N/A	2017/11/07	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5253914	N/A	2017/11/08	Prempal Bhatti
Ion Balance (% Difference)	CALC	5243113	N/A	2017/11/07	Automated Statchk
Anion and Cation Sum	CALC	5243114	N/A	2017/11/07	Automated Statchk

### TEST SUMMARY

**Maxxam ID:** FLN911  
**Sample ID:** OW7-1  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	5245916	N/A	2017/11/06	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5245337	N/A	2017/11/04	Anastasia Hamanov
pH	AT	5248781	N/A	2017/11/04	Yogesh Patel
Orthophosphate	KONE	5249289	N/A	2017/11/06	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	5243116	N/A	2017/11/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5243117	N/A	2017/11/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	5249288	N/A	2017/11/06	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5243118	N/A	2017/11/07	Automated Statchk

**Maxxam ID:** FLN912  
**Sample ID:** OW8-1  
**Matrix:** Water

**Collected:** 2017/10/30  
**Shipped:**  
**Received:** 2017/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5248776	N/A	2017/11/04	Yogesh Patel
Carbonate, Bicarbonate and Hydroxide	CALC	5242468	N/A	2017/11/06	Automated Statchk
Chloride by Automated Colourimetry	KONE	5249283	N/A	2017/11/06	Deonarine Ramnarine
Colour	SPEC	5244917	N/A	2017/11/03	Viorica Rotaru
Conductivity	AT	5248778	N/A	2017/11/04	Yogesh Patel
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5247105	N/A	2017/11/03	Anastasia Hamanov
Fluoride	ISE	5248780	2017/11/04	2017/11/04	Yogesh Patel
Hardness (calculated as CaCO3)		5242540	N/A	2017/11/07	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	5245539	N/A	2017/11/07	Thao Nguyen
Ion Balance (% Difference)	CALC	5243113	N/A	2017/11/07	Automated Statchk
Anion and Cation Sum	CALC	5243114	N/A	2017/11/07	Automated Statchk
Total Ammonia-N	LACH/NH4	5245916	N/A	2017/11/06	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5245337	N/A	2017/11/04	Anastasia Hamanov
pH	AT	5248781	N/A	2017/11/04	Yogesh Patel
Orthophosphate	KONE	5249289	N/A	2017/11/06	Alina Dobreanu
Sat. pH and Langelier Index (@ 20C)	CALC	5243116	N/A	2017/11/07	Automated Statchk
Sat. pH and Langelier Index (@ 4C)	CALC	5243117	N/A	2017/11/07	Automated Statchk
Sulphate by Automated Colourimetry	KONE	5249288	N/A	2017/11/06	Alina Dobreanu
Total Dissolved Solids (TDS calc)	CALC	5243118	N/A	2017/11/07	Automated Statchk

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	1.3°C
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Sample FLN910 [OW6-2] : Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

Sample FLN911 [OW7-1] : Metal Analysis:Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

**Results relate only to the items tested.**

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5244917	VRO	Spiked Blank	Colour	2017/11/03		101	%	80 - 120
5244917	VRO	Method Blank	Colour	2017/11/03	<2		TCU	
5244917	VRO	RPD	Colour	2017/11/03	0.19		%	25
5245337	AHA	Matrix Spike [FLN910-01]	Nitrite (N)	2017/11/04		99	%	80 - 120
			Nitrate (N)	2017/11/04		95	%	80 - 120
5245337	AHA	Spiked Blank	Nitrite (N)	2017/11/04		100	%	80 - 120
			Nitrate (N)	2017/11/04		98	%	80 - 120
5245337	AHA	Method Blank	Nitrite (N)	2017/11/04	<0.010		mg/L	
			Nitrate (N)	2017/11/04	<0.10		mg/L	
5245337	AHA	RPD [FLN910-01]	Nitrite (N)	2017/11/04	1.2		%	20
			Nitrate (N)	2017/11/04	4.5		%	20
5245539	TNG	Matrix Spike [FLN910-03]	Dissolved Aluminum (Al)	2017/11/07		99	%	80 - 120
			Dissolved Antimony (Sb)	2017/11/07		104	%	80 - 120
			Dissolved Arsenic (As)	2017/11/07		97	%	80 - 120
			Dissolved Barium (Ba)	2017/11/07		97	%	80 - 120
			Dissolved Beryllium (Be)	2017/11/07		104	%	80 - 120
			Dissolved Boron (B)	2017/11/07		NC	%	80 - 120
			Dissolved Cadmium (Cd)	2017/11/07		101	%	80 - 120
			Dissolved Calcium (Ca)	2017/11/07		NC	%	80 - 120
			Dissolved Chromium (Cr)	2017/11/07		97	%	80 - 120
			Dissolved Cobalt (Co)	2017/11/07		95	%	80 - 120
			Dissolved Copper (Cu)	2017/11/07		98	%	80 - 120
			Dissolved Iron (Fe)	2017/11/07		97	%	80 - 120
			Dissolved Lead (Pb)	2017/11/07		96	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/07		NC	%	80 - 120
			Dissolved Manganese (Mn)	2017/11/07		NC	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/11/07		103	%	80 - 120
			Dissolved Nickel (Ni)	2017/11/07		95	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/07		100	%	80 - 120
			Dissolved Potassium (K)	2017/11/07		96	%	80 - 120
			Dissolved Selenium (Se)	2017/11/07		98	%	80 - 120
			Dissolved Silicon (Si)	2017/11/07		97	%	80 - 120
			Dissolved Silver (Ag)	2017/11/07		85 (1)	%	80 - 120
			Dissolved Sodium (Na)	2017/11/07		NC	%	80 - 120
			Dissolved Strontium (Sr)	2017/11/07		NC	%	80 - 120
			Dissolved Thallium (Tl)	2017/11/07		95	%	80 - 120
			Dissolved Titanium (Ti)	2017/11/07		98	%	80 - 120
			Dissolved Uranium (U)	2017/11/07		97	%	80 - 120
			Dissolved Vanadium (V)	2017/11/07		97	%	80 - 120
			Dissolved Zinc (Zn)	2017/11/07		96	%	80 - 120
5245539	TNG	Spiked Blank	Dissolved Aluminum (Al)	2017/11/07		97	%	80 - 120
			Dissolved Antimony (Sb)	2017/11/07		104	%	80 - 120
			Dissolved Arsenic (As)	2017/11/07		98	%	80 - 120
			Dissolved Barium (Ba)	2017/11/07		99	%	80 - 120
			Dissolved Beryllium (Be)	2017/11/07		103	%	80 - 120
			Dissolved Boron (B)	2017/11/07		101	%	80 - 120
			Dissolved Cadmium (Cd)	2017/11/07		102	%	80 - 120
			Dissolved Calcium (Ca)	2017/11/07		93	%	80 - 120
			Dissolved Chromium (Cr)	2017/11/07		99	%	80 - 120
			Dissolved Cobalt (Co)	2017/11/07		98	%	80 - 120
			Dissolved Copper (Cu)	2017/11/07		100	%	80 - 120
			Dissolved Iron (Fe)	2017/11/07		100	%	80 - 120

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Lead (Pb)	2017/11/07		99	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/07		99	%	80 - 120
			Dissolved Manganese (Mn)	2017/11/07		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/11/07		102	%	80 - 120
			Dissolved Nickel (Ni)	2017/11/07		99	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/07		116	%	80 - 120
			Dissolved Potassium (K)	2017/11/07		99	%	80 - 120
			Dissolved Selenium (Se)	2017/11/07		98	%	80 - 120
			Dissolved Silicon (Si)	2017/11/07		94	%	80 - 120
			Dissolved Silver (Ag)	2017/11/07		101	%	80 - 120
			Dissolved Sodium (Na)	2017/11/07		98	%	80 - 120
			Dissolved Strontium (Sr)	2017/11/07		98	%	80 - 120
			Dissolved Thallium (Tl)	2017/11/07		98	%	80 - 120
			Dissolved Titanium (Ti)	2017/11/07		97	%	80 - 120
			Dissolved Uranium (U)	2017/11/07		99	%	80 - 120
			Dissolved Vanadium (V)	2017/11/07		98	%	80 - 120
			Dissolved Zinc (Zn)	2017/11/07		99	%	80 - 120
5245539	TNG	Method Blank	Dissolved Aluminum (Al)	2017/11/07	<5.0		ug/L	
			Dissolved Antimony (Sb)	2017/11/07	<0.50		ug/L	
			Dissolved Arsenic (As)	2017/11/07	<1.0		ug/L	
			Dissolved Barium (Ba)	2017/11/07	<2.0		ug/L	
			Dissolved Beryllium (Be)	2017/11/07	<0.50		ug/L	
			Dissolved Boron (B)	2017/11/07	<10		ug/L	
			Dissolved Cadmium (Cd)	2017/11/07	<0.10		ug/L	
			Dissolved Calcium (Ca)	2017/11/07	<200		ug/L	
			Dissolved Chromium (Cr)	2017/11/07	<5.0		ug/L	
			Dissolved Cobalt (Co)	2017/11/07	<0.50		ug/L	
			Dissolved Copper (Cu)	2017/11/07	<1.0		ug/L	
			Dissolved Iron (Fe)	2017/11/07	<100		ug/L	
			Dissolved Lead (Pb)	2017/11/07	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2017/11/07	<50		ug/L	
			Dissolved Manganese (Mn)	2017/11/07	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2017/11/07	<0.50		ug/L	
			Dissolved Nickel (Ni)	2017/11/07	<1.0		ug/L	
			Dissolved Phosphorus (P)	2017/11/07	<100		ug/L	
			Dissolved Potassium (K)	2017/11/07	<200		ug/L	
			Dissolved Selenium (Se)	2017/11/07	<2.0		ug/L	
			Dissolved Silicon (Si)	2017/11/07	<50		ug/L	
			Dissolved Silver (Ag)	2017/11/07	<0.10		ug/L	
			Dissolved Sodium (Na)	2017/11/07	<100		ug/L	
			Dissolved Strontium (Sr)	2017/11/07	<1.0		ug/L	
			Dissolved Thallium (Tl)	2017/11/07	<0.050		ug/L	
			Dissolved Titanium (Ti)	2017/11/07	<5.0		ug/L	
			Dissolved Uranium (U)	2017/11/07	<0.10		ug/L	
			Dissolved Vanadium (V)	2017/11/07	<0.50		ug/L	
			Dissolved Zinc (Zn)	2017/11/07	<5.0		ug/L	
5245539	TNG	RPD [FLN910-03]	Dissolved Aluminum (Al)	2017/11/07	NC		%	20
			Dissolved Antimony (Sb)	2017/11/07	NC		%	20
			Dissolved Arsenic (As)	2017/11/07	NC		%	20
			Dissolved Barium (Ba)	2017/11/07	0.29		%	20
			Dissolved Beryllium (Be)	2017/11/07	NC		%	20
			Dissolved Boron (B)	2017/11/07	0.94		%	20



### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Cadmium (Cd)	2017/11/07	NC		%	20
			Dissolved Calcium (Ca)	2017/11/07	2.8		%	20
			Dissolved Chromium (Cr)	2017/11/07	NC		%	20
			Dissolved Cobalt (Co)	2017/11/07	NC		%	20
			Dissolved Copper (Cu)	2017/11/07	NC		%	20
			Dissolved Iron (Fe)	2017/11/07	NC		%	20
			Dissolved Lead (Pb)	2017/11/07	NC		%	20
			Dissolved Magnesium (Mg)	2017/11/07	0.035		%	20
			Dissolved Manganese (Mn)	2017/11/07	0.90		%	20
			Dissolved Molybdenum (Mo)	2017/11/07	8.2		%	20
			Dissolved Nickel (Ni)	2017/11/07	NC		%	20
			Dissolved Phosphorus (P)	2017/11/07	NC		%	20
			Dissolved Potassium (K)	2017/11/07	1.9		%	20
			Dissolved Selenium (Se)	2017/11/07	NC		%	20
			Dissolved Silicon (Si)	2017/11/07	1.0		%	20
			Dissolved Silver (Ag)	2017/11/07	NC		%	20
			Dissolved Sodium (Na)	2017/11/07	0.32		%	20
			Dissolved Strontium (Sr)	2017/11/07	1.1		%	20
			Dissolved Thallium (Tl)	2017/11/07	NC		%	20
			Dissolved Titanium (Ti)	2017/11/07	NC		%	20
			Dissolved Uranium (U)	2017/11/07	4.7		%	20
			Dissolved Vanadium (V)	2017/11/07	NC		%	20
			Dissolved Zinc (Zn)	2017/11/07	NC		%	20
5245916	COP	Matrix Spike	Total Ammonia-N	2017/11/06		98	%	80 - 120
5245916	COP	Spiked Blank	Total Ammonia-N	2017/11/06		102	%	85 - 115
5245916	COP	Method Blank	Total Ammonia-N	2017/11/06	<0.050		mg/L	
5245916	COP	RPD	Total Ammonia-N	2017/11/06	9.2		%	20
5245935	COP	Matrix Spike	Total Ammonia-N	2017/11/06		98	%	80 - 120
5245935	COP	Spiked Blank	Total Ammonia-N	2017/11/06		101	%	85 - 115
5245935	COP	Method Blank	Total Ammonia-N	2017/11/06	<0.050		mg/L	
5245935	COP	RPD	Total Ammonia-N	2017/11/06	NC		%	20
5247105	AHA	Matrix Spike	Dissolved Organic Carbon	2017/11/03		93	%	80 - 120
5247105	AHA	Spiked Blank	Dissolved Organic Carbon	2017/11/03		100	%	80 - 120
5247105	AHA	Method Blank	Dissolved Organic Carbon	2017/11/03	<0.50		mg/L	
5247105	AHA	RPD	Dissolved Organic Carbon	2017/11/03	1.3		%	20
5247156	AHA	Matrix Spike	Dissolved Organic Carbon	2017/11/03		96	%	80 - 120
5247156	AHA	Spiked Blank	Dissolved Organic Carbon	2017/11/03		97	%	80 - 120
5247156	AHA	Method Blank	Dissolved Organic Carbon	2017/11/03	<0.50		mg/L	
5247156	AHA	RPD	Dissolved Organic Carbon	2017/11/03	1.2		%	20
5247586	AHA	Matrix Spike	Dissolved Organic Carbon	2017/11/04		91	%	80 - 120
5247586	AHA	Spiked Blank	Dissolved Organic Carbon	2017/11/04		98	%	80 - 120
5247586	AHA	Method Blank	Dissolved Organic Carbon	2017/11/04	<0.50		mg/L	
5247586	AHA	RPD	Dissolved Organic Carbon	2017/11/04	1.4		%	20
5248776	YPA	Spiked Blank	Alkalinity (Total as CaCO3)	2017/11/04		97	%	85 - 115
5248776	YPA	Method Blank	Alkalinity (Total as CaCO3)	2017/11/04	<1.0		mg/L	
5248776	YPA	RPD	Alkalinity (Total as CaCO3)	2017/11/04	0.18		%	20
5248778	YPA	Spiked Blank	Conductivity	2017/11/04		102	%	85 - 115
5248778	YPA	Method Blank	Conductivity	2017/11/04	<1.0		umho/cm	
5248778	YPA	RPD	Conductivity	2017/11/04	0.18		%	25
5248780	YPA	Matrix Spike	Fluoride (F-)	2017/11/04		104	%	80 - 120
5248780	YPA	Spiked Blank	Fluoride (F-)	2017/11/04		103	%	80 - 120
5248780	YPA	Method Blank	Fluoride (F-)	2017/11/04	<0.10		mg/L	

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5248780	YPA	RPD	Fluoride (F-)	2017/11/04	NC		%	20
5248781	YPA	Spiked Blank	pH	2017/11/04		102	%	98 - 103
5248781	YPA	RPD	pH	2017/11/04	0.26		%	N/A
5249283	DRM	Matrix Spike	Dissolved Chloride (Cl)	2017/11/06		NC	%	80 - 120
5249283	DRM	Spiked Blank	Dissolved Chloride (Cl)	2017/11/06		99	%	80 - 120
5249283	DRM	Method Blank	Dissolved Chloride (Cl)	2017/11/06	<1.0		mg/L	
5249283	DRM	RPD	Dissolved Chloride (Cl)	2017/11/06	0.68		%	20
5249288	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2017/11/06		NC	%	75 - 125
5249288	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2017/11/06		98	%	80 - 120
5249288	ADB	Method Blank	Dissolved Sulphate (SO4)	2017/11/06	<1.0		mg/L	
5249288	ADB	RPD	Dissolved Sulphate (SO4)	2017/11/06	0.12		%	20
5249289	ADB	Matrix Spike	Orthophosphate (P)	2017/11/06		95	%	75 - 125
5249289	ADB	Spiked Blank	Orthophosphate (P)	2017/11/06		100	%	80 - 120
5249289	ADB	Method Blank	Orthophosphate (P)	2017/11/06	<0.010		mg/L	
5249289	ADB	RPD	Orthophosphate (P)	2017/11/06	8.4		%	25
5253914	PBA	Matrix Spike	Dissolved Aluminum (Al)	2017/11/08		118	%	80 - 120
			Dissolved Antimony (Sb)	2017/11/08		110	%	80 - 120
			Dissolved Arsenic (As)	2017/11/08		103	%	80 - 120
			Dissolved Barium (Ba)	2017/11/08		106	%	80 - 120
			Dissolved Beryllium (Be)	2017/11/08		113	%	80 - 120
			Dissolved Boron (B)	2017/11/08		NC	%	80 - 120
			Dissolved Cadmium (Cd)	2017/11/08		100	%	80 - 120
			Dissolved Calcium (Ca)	2017/11/08		NC	%	80 - 120
			Dissolved Chromium (Cr)	2017/11/08		103	%	80 - 120
			Dissolved Cobalt (Co)	2017/11/08		102	%	80 - 120
			Dissolved Copper (Cu)	2017/11/08		104	%	80 - 120
			Dissolved Iron (Fe)	2017/11/08		104	%	80 - 120
			Dissolved Lead (Pb)	2017/11/08		91	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/08		NC	%	80 - 120
			Dissolved Manganese (Mn)	2017/11/08		NC	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/11/08		108	%	80 - 120
			Dissolved Nickel (Ni)	2017/11/08		95	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/08		119	%	80 - 120
			Dissolved Potassium (K)	2017/11/08		NC	%	80 - 120
			Dissolved Selenium (Se)	2017/11/08		99	%	80 - 120
			Dissolved Silicon (Si)	2017/11/08		123 (1)	%	80 - 120
			Dissolved Silver (Ag)	2017/11/08		92	%	80 - 120
			Dissolved Strontium (Sr)	2017/11/08		NC	%	80 - 120
			Dissolved Thallium (Tl)	2017/11/08		93	%	80 - 120
			Dissolved Titanium (Ti)	2017/11/08		115	%	80 - 120
			Dissolved Uranium (U)	2017/11/08		101	%	80 - 120
			Dissolved Vanadium (V)	2017/11/08		108	%	80 - 120
			Dissolved Zinc (Zn)	2017/11/08		89	%	80 - 120
5253914	PBA	Spiked Blank	Dissolved Aluminum (Al)	2017/11/08		104	%	80 - 120
			Dissolved Antimony (Sb)	2017/11/08		105	%	80 - 120
			Dissolved Arsenic (As)	2017/11/08		100	%	80 - 120
			Dissolved Barium (Ba)	2017/11/08		99	%	80 - 120
			Dissolved Beryllium (Be)	2017/11/08		102	%	80 - 120
			Dissolved Boron (B)	2017/11/08		97	%	80 - 120
			Dissolved Cadmium (Cd)	2017/11/08		101	%	80 - 120
			Dissolved Calcium (Ca)	2017/11/08		98	%	80 - 120
			Dissolved Chromium (Cr)	2017/11/08		97	%	80 - 120

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Cobalt (Co)	2017/11/08		100	%	80 - 120
			Dissolved Copper (Cu)	2017/11/08		98	%	80 - 120
			Dissolved Iron (Fe)	2017/11/08		101	%	80 - 120
			Dissolved Lead (Pb)	2017/11/08		95	%	80 - 120
			Dissolved Magnesium (Mg)	2017/11/08		102	%	80 - 120
			Dissolved Manganese (Mn)	2017/11/08		100	%	80 - 120
			Dissolved Molybdenum (Mo)	2017/11/08		97	%	80 - 120
			Dissolved Nickel (Ni)	2017/11/08		98	%	80 - 120
			Dissolved Phosphorus (P)	2017/11/08		113	%	80 - 120
			Dissolved Potassium (K)	2017/11/08		104	%	80 - 120
			Dissolved Selenium (Se)	2017/11/08		98	%	80 - 120
			Dissolved Silicon (Si)	2017/11/08		105	%	80 - 120
			Dissolved Silver (Ag)	2017/11/08		97	%	80 - 120
			Dissolved Sodium (Na)	2017/11/08		100	%	80 - 120
			Dissolved Strontium (Sr)	2017/11/08		100	%	80 - 120
			Dissolved Thallium (Tl)	2017/11/08		99	%	80 - 120
			Dissolved Titanium (Ti)	2017/11/08		102	%	80 - 120
			Dissolved Uranium (U)	2017/11/08		99	%	80 - 120
			Dissolved Vanadium (V)	2017/11/08		98	%	80 - 120
			Dissolved Zinc (Zn)	2017/11/08		98	%	80 - 120
5253914	PBA	Method Blank	Dissolved Aluminum (Al)	2017/11/08	<5.0		ug/L	
			Dissolved Antimony (Sb)	2017/11/08	<0.50		ug/L	
			Dissolved Arsenic (As)	2017/11/08	<1.0		ug/L	
			Dissolved Barium (Ba)	2017/11/08	<2.0		ug/L	
			Dissolved Beryllium (Be)	2017/11/08	<0.50		ug/L	
			Dissolved Boron (B)	2017/11/08	<10		ug/L	
			Dissolved Cadmium (Cd)	2017/11/08	<0.10		ug/L	
			Dissolved Calcium (Ca)	2017/11/08	<200		ug/L	
			Dissolved Chromium (Cr)	2017/11/08	<5.0		ug/L	
			Dissolved Cobalt (Co)	2017/11/08	<0.50		ug/L	
			Dissolved Copper (Cu)	2017/11/08	<1.0		ug/L	
			Dissolved Iron (Fe)	2017/11/08	<100		ug/L	
			Dissolved Lead (Pb)	2017/11/08	<0.50		ug/L	
			Dissolved Magnesium (Mg)	2017/11/08	<50		ug/L	
			Dissolved Manganese (Mn)	2017/11/08	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2017/11/08	<0.50		ug/L	
			Dissolved Nickel (Ni)	2017/11/08	<1.0		ug/L	
			Dissolved Phosphorus (P)	2017/11/08	<100		ug/L	
			Dissolved Potassium (K)	2017/11/08	<200		ug/L	
			Dissolved Selenium (Se)	2017/11/08	<2.0		ug/L	
			Dissolved Silicon (Si)	2017/11/08	<50		ug/L	
			Dissolved Silver (Ag)	2017/11/08	<0.10		ug/L	
			Dissolved Sodium (Na)	2017/11/08	<100		ug/L	
			Dissolved Strontium (Sr)	2017/11/08	<1.0		ug/L	
			Dissolved Thallium (Tl)	2017/11/08	<0.050		ug/L	
			Dissolved Titanium (Ti)	2017/11/08	<5.0		ug/L	
			Dissolved Uranium (U)	2017/11/08	<0.10		ug/L	
			Dissolved Vanadium (V)	2017/11/08	<0.50		ug/L	
			Dissolved Zinc (Zn)	2017/11/08	<5.0		ug/L	

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	5253914	PBA	RPD	Dissolved Lead (Pb)	2017/11/08	NC		%	20
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)</p> <p>NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference &lt;= 2x RDL).</p> <p>(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.</p>									

**VALIDATION SIGNATURE PAGE**

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



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Brad Newman, Scientific Service Specialist

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Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**Exceedence Summary Table – ODWS (2002)**  
**Result Exceedences**

<b>Sample ID</b>	<b>Maxxam ID</b>	<b>Parameter</b>	<b>Criteria</b>	<b>Result</b>	<b>DL</b>	<b>Units</b>
OW6-2	FLN910-03	Dissolved Sodium (Na)	20000	720000	500	ug/L
OW6-2	FLN910-03-Lab Dup	Dissolved Sodium (Na)	20000	720000	500	ug/L
OW7-1	FLN911-03	Dissolved Sodium (Na)	20000	1200000	500	ug/L
OW8-1	FLN912-03	Dissolved Sodium (Na)	20000	250000	100	ug/L

The exceedence summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.

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