



**2023 ANNUAL MONITORING REPORT  
SOUTH BAPTISTE WASTE DISPOSAL SITE  
ENVIRONMENTAL COMPLIANCE APPROVAL  
NO. A361602**

Prepared for:

**The Corporation of the Municipality of Hastings Highlands**

P.O. Box 130

33011 Highway No. 62

Maynooth, ON K0L 2S0

Prepared by:

**BluMetric Environmental Inc.**

4 Cataraqui Street

The Woolen Mill, The Tower

Kingston, ON K7K 1Z7

Project Number: 230225-09

25 March 2024

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# 1 Introduction

This report provides a summary and analysis of environmental monitoring activities at the South Baptiste Disposal Site (WDS), in Maynooth, Ontario. The WDS, as shown in Figure 01 is herein after referred to as “the Site”. BluMetric Environmental Inc. (BluMetric®) was retained by the Municipality to conduct the 2023 environmental monitoring and sampling program and prepare the 2023 Annual Report.

This report is being prepared for the Corporation of the Municipality of Hastings Highlands (the Municipality). The South Baptiste WDS is owned and operated by the Municipality and is operated under Environmental Compliance Approval (ECA) No. A361602, a copy of which is included in **Appendix A (A1)**. The amended ECA is dated October 24, 2019, and was updated to include a revised sampling program and trigger mechanisms. This report covers all work and activities carried out for the period from January 1 to December 31, 2023.

The intent of this report is to be consistent with the general requirements of the Ontario Ministry of Environment, Conservation and Parks (MECP) document titled; *Monitoring and Reporting for Waste Disposal Sites (WDS), Groundwater and Surface Water: Technical Guidance Document (MOE November 2010)*, referred to as the “WDS Technical Guidance”. The Monitoring and Screening Checklist from the WDS Technical Guidance has been completed and is included as **Appendix B** of this report. The screening checklist was completed with the Operational Status set as “open” as the Site operated throughout 2023.

## 1.1 Location

The South Baptiste WDS is located at 2539 South Baptiste Road, Maynooth, Ontario. The South Baptiste WDS is located on part of Lot 28, Concession 4, which is designated as Crown Land, in the former Herschel Township, now part of the Municipality of Hastings Highlands. Figure 01 depicts the Site location. The facility layout, road network, and site features are shown on Figure 02.



In accordance with the Site ECA, the Site is approved for the use of a 2.02-hectare (ha) waste disposal/transfer site within a total site area of 4.46 ha.

## 1.2 Ownership and Key Personnel

The facility is operated by the MHHs, with the Municipal office location in Maynooth, Ontario. As mentioned, the Crown owns the lands of, and surrounding, the WDS. A new Land Use Permit (LUP) for the Site was provided by the MNRF in 2017 and a copy is provided in **Appendix A (A2)**.

The facility’s operational representative is responsible for all activities on-site. The Competent Environmental Practitioner (CEP) for both groundwater and surface water is S’rana Scholes, P.Eng., of BluMetric. Ms. Scholes is a Professional Engineer as designated by Professional Engineers Ontario (PEO).

**Table 1: Contact Information**

	Name	Address	Phone Number	Email
<b>Site Owner / Contact</b>	The Corporation of the Municipality of Hastings Highlands CAO – David Stewart	P.O. Box 130 33011 Highway No. 62 Maynooth, ON K0L 2S0	(613) 338-2811 ext.289	dstewart@hastingshighlands.ca
<b>CEP</b>	Senior Environmental Engineer, BluMetric – S’rana Scholes, P.Eng.	209 Frederick Street, Kitchener, ON N2H 2M7	(877) 487-8436 ext. 218	sscholes@blumetric.ca

## 1.3 Description and Development of the WDS

The Site has a total area of approximately 4.46 ha with a 2.02 ha approved landfilling area. It is believed that waste disposal has been occurring at the Site since 1971 and the Site has been operating as a municipal landfill since the late 1980s. Figure 02 illustrates the general site layout and the 4.46 ha property boundary.

In addition to domestic waste, the WDS operates a waste transfer station (WTS) which includes recycling bins for metal, plastic, paper/cardboard products, as well as segregated areas for scrap metal, tires, and brush. The Ontario Electronic Stewardship (OES) has approved the WDS for the collection of Waste Electrical and Electronic Equipment (WEEE) wastes. Regulations came into effect in 2020 with respect to this material, now referred to as Electrical and Electronic Equipment (EEE). The new regulation with respect to EEE falls under the Resource Recovery and Circular Economy Act, 2016, and the regulation was filed on September 21, 2020. Historically, domestic wastes were disposed of in trenches; however, the Site is currently using an area fill method of operation.

## 2 Physical Setting

### 2.1 Geology and Hydrogeology

#### 2.1.1 Surficial Geology

The surficial geology of the area consists of glacial spillway deposits, and the immediate area of the Site is characterized by sand and gravel overburden in the upland area and fine or silty sands in the valley bottom areas (MNDM, 1991). The Site has a steep topography and the thickness of the overburden ranges from 0 to 5 m below ground surface (mbgs). Bedrock outcrops are evident around the Site and overburden has been encountered at depths greater than 6 m. The South Baptiste WDS is located within the Grenville geological province, on Precambrian bedrock. Figure 03 shows the topography and site design based on the 2017 topographic survey.

There are currently 10 monitoring wells on and near the WDS. The overburden on the Site generally ranged from 2.4 m (MW7) to over 6.7 m (MW10) in thickness and consists of primarily sand. Overburden thickness was further confirmed at the two bedrock monitoring wells MW7 and MW11 and were 2.4 m and 4.5 m, respectively. The monitoring well logs are provided in **Appendix C**.

### **2.1.2 Bedrock Geology**

Bedrock in the area is classified as early felsic plutonic results (granodiorite; tonalite; monzogranite; syenogranite; derived gneisses and migmatites) according to MNDM, 1991. Bedrock outcrops are visible in the vicinity of the Site.

According to the Groundwater Information Network, potential groundwater users within 1.5 km of the Site include:

- three private bedrock wells north of the WDS,
- three private bedrock wells northeast of the WDS,
- two private bedrock wells west of the WDS, and
- two private bedrock wells southwest of the WDS.

### **2.1.3 Overburden Hydrogeology**

In January 2019, slug-bail testing was carried out on three monitoring wells (SB-MW4, SB-MW7, and SB-MW10). The results of the field testing were analyzed using the Hvorslev analyses for the overburden sand unit at SB-MW4 and SB-MW10, and the bedrock unit at SB-MW7.

The hydraulic conductivity result of these analyses for the sand unit was  $10^{-7}$  m/s at SB-MW4 and  $10^{-4}$  m/s at SB-MW10. The analysis result for the bedrock was  $10^{-4}$  m/s at SB-MW7.

## **2.2 Surface Water Features**

Surface water features in the area surrounding the Site are shown on Figure 01 and include:

- Baptiste Lake, 900 m northeast of the Site,
- Diamond Lake, 1.2 km southwest of the Site, and
- A tributary stream to Baptiste Lake, 70 m north of the Site.

### 3 Monitoring Program

The surface water and groundwater monitoring requirements for the South Baptiste WDS are defined in Schedule B of the ECA (**Appendix A, A1**). The monitoring events for the South Baptiste WDS were conducted on May 4, August 9 (surface water monitoring only), and October 19, 2023.

#### 3.1 Site Inspections and Operations Monitoring

Site inspections were completed on May 4, August 9, and October 19, 2023. The detailed site inspection checklists are provided in **Appendix D (D1)**. Generally, the Site was observed to be in good condition, although the following concerns were noted:

- Windblown waste was observed due to a large area of uncovered waste;
- The segregated waste piles were observed to be over capacity;
- Segregated waste pile signage was observed to be knocked over during the spring site visit.

Select photographs taken during the site visits are provided at the end of the text following the tables and figures.

#### 3.2 Monitoring Locations, Frequency and Monitoring Parameters

##### 3.2.1 Groundwater Monitoring

There are currently ten groundwater monitoring wells located at the Site. The groundwater samples were collected and analyzed to characterize groundwater quality. The monitoring requirements for the South Baptiste WDS are defined in Schedule B of the Site ECA with modifications to the program recommended and/or approved by the MECP from time to time. The locations and descriptions of the groundwater monitoring wells are provided in Table 2. Sampling events occurred on May 4, 2023, and October 19, 2023.

**Table 2: Groundwater Monitor Locations**

Monitor Name	Northing	Easting	Relative Location
SB-MW2	4,996,511	734,458	Up-gradient (background location) west of design footprint.
SB-MW3	4,996,547	734,474	Western corner or design footprint boundary.
SB-MW4	4,996,612	734,527	20 m north of design footprint boundary.
SB-MW5	4,996,562	734,501	5 m south of design footprint northern boundary.
SB-MW6R	4,996,583	734,540	5 m south of design footprint northern boundary.
SB-MW7	4,996,602	734,534	15 m north of design footprint boundary.
SB-MW8	4,996,601	734,430	75 m northwest of design footprint along the north side of South Baptiste Lake Road.
SB-MW9	4,996,605	734,434	75 m northwest of design footprint along the north side of South Baptiste Lake Road.
SB-MW10	4,996,612	734,580	15 m northeast of design footprint along valley to creek.
SB-MW11	4,996,684	734,601	85 m northeast of design footprint along south side of South Baptiste Lake Road.

Note: UTM Zone 17, NAD 83 coordinates – Based on BluMetric geodetic survey (January 9, 2019).

Groundwater samples were collected from all monitoring wells in the spring. Groundwater samples were collected from all monitoring wells in the fall except for SB-MW2, SB-MW3, and SB-MW11, which had insufficient water for sampling. The groundwater monitor locations are shown on Figure 02, Figure 03, Figure 04, and Figure 05. A sample was collected from monitoring well SB-MW11 during the spring sampling event for the first time since the time of drilling (September 2020). SB-MW11 is not listed within the ECA, however, was installed following an MECP recommendation to install additional monitoring wells along South Baptiste Road in order to delineate off-site groundwater impacts in the overburden and bedrock.

The full laboratory analytical reports are provided in **Appendix D (D2)**. Field measurements of groundwater pH, temperature, and conductivity were collected at the time of sampling and are discussed in Section 4.1.

**Table 3: South Baptiste Groundwater Monitoring Suite**

Category	Parameters
Volatile Organics*	1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethylene, 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Acetone, Benzene, Bromodichloromethane, Bromoform, Bromomethane, Carbon Tetrachloride, Chlorobenzene, Chloroform, Dibromochloromethane, Dichlorodifluoromethane, Ethylbenzene, Ethylene Dibromide, Methyl Ethyl Ketone, Methyl Isobutyl Ketone, Methylene Chloride, Methyl tertiary-butyl ether (MTBE), Styrene, Tetrachloroethylene, Toluene, Trichloroethylene, Trichlorofluoromethane, Vinyl Chloride, Xylene Mixture, cis-1,2-Dichloroethylene, cis-1,3-Dichloropropene, m & p-Xylene, n-Hexane, o-Xylene, trans-1,2-Dichloroethylene, trans-1,3-Dichloropropene
Organic	Dissolved Organic Carbon (DOC), Phenols, Total Phosphorus, Total Kjeldahl Nitrogen (TKN)
Inorganic	Alkalinity, Chloride, Nitrite, Nitrate, Sulphate, Ammonia (N)-Total Aluminum, Arsenic, Barium, Beryllium, Boron, Calcium, Cadmium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Silicon, Silver, Strontium, Thallium, Titanium, Vanadium, Sodium, Zinc, Lead
Physical/Chemical	Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS)

Notes:

Groundwater monitoring suite in accordance with Schedule B, Table B1 of the Site ECA.

\*VOC parameters are to be sampled every five years at SB-MW6R. The next scheduled VOC sample collection and analysis is scheduled for the 2024 sampling season.

TSS was inadvertently omitted from the groundwater quality monitoring parameter suite from 2013 to 2022. TSS was analyzed at all groundwater monitoring locations in 2023 as required by the ECA.

During the 2023 spring and fall monitoring events, the conditions of the groundwater monitoring wells were inspected. Watertight casings and seals are in place at six wells (SB-MW6R, SB-MW7, SB-MW8, SB-MW9, SB-MW10, and SB-MW11) to ensure that surface water or foreign materials cannot enter groundwater monitoring wells. These groundwater monitoring wells are fitted with a vermin-proof cap to meet the requirements of Ontario Regulation 903, are locked to provide protection against

vandalism, and are in line with industry best practices. Monitoring well locations SB-MW5 and SB-MW6R have been equipped with steel protective casings; other historic monitoring wells have not been upgraded with protective casings.

### 3.2.1.1 Groundwater Elevations

During each monitoring event, groundwater elevations were collected from the monitoring wells. Groundwater level measurements were collected using a Solinst electronic water level meter prior to purging/sampling activity. Groundwater elevation data are summarized in Table 4. The groundwater elevation data and groundwater contours are illustrated on Figures 04 and 05. The elevations collected at SB-MW7 and SB-MW11 are identified on the figures but are not used for the interpretation of the groundwater elevation contours as they are bedrock wells, while the other wells are screened in the overburden.

**Table 4: Groundwater Elevation Data**

Groundwater Monitor	Bottom Depth (mbTPVC)	Elevation of TPVC <sup>1</sup> (masl)	Water Level 04-May-23 (mbTPVC)	Water Level 19-Oct-23 (mbTPVC)	GW Elevation 04-May-23 (masl)	GW Elevation 19-Oct-23 (masl)
<b>Overburden Wells</b>						
SB-MW2	3.02	388.95	1.05	3.01	387.90	385.94
SB-MW3	3.86	382.54	0.83	3.40	381.71	379.14
SB-MW4	4.51	379.31	1.74	2.21	377.57	377.10
SB-MW5	3.23	380.50	1.20	2.08	379.30	378.42
SB-MW6R	4.87	382.87	2.51	3.92	380.36	378.95
SB-MW8	4.57	380.34	1.03	2.57	379.31	377.77
SB-MW9	6.10	380.49	1.87	2.76	378.62	377.73
SB-MW10	6.71	386.39	5.53	6.64	380.86	379.75
<b>Bedrock Well</b>						
SB-MW7	10.92	380.80	3.23	3.83	377.57	376.97
SB-MW11	19.42	377.92	17.78	18.46	360.14	359.46

Notes:

mbTPVC - meters below top of PVC stick-up

masl - metres above sea level

1 - Elevation data is based on 2019 GPS survey data for all wells except SB-MW11 which was drilled and surveyed in the fall of 2020.

### 3.2.1.2 Groundwater Gradients and Flow Direction

Using the calculated groundwater elevation data, the groundwater flow direction for the west side of the Site (SB-MW2, SB-MW3) was determined to be to the north-northeast (for both monitoring events). The gradient towards the north-northeast is estimated to be approximately 0.16 m/m, similar to previous years. From the east area of the Site around SB-MW4 and SB-MW6R, the groundwater flow direction appears to be flowing northwest at a slightly shallower gradient than in the northeast direction. The groundwater flow direction beyond the property boundary is not confirmed but is assumed to be north to northeast towards Baptiste Lake.

### 3.2.2 Surface Water Monitoring

Three surface water sampling events were conducted in 2023. Samples were collected on May 4, August 9, and October 19, 2023. The four surface water sampling stations are shown on Figure 02 and are described in Table 5.

**Table 5: Surface Water Monitor Locations**

Monitor Name	Northing	Easting	Description
BAP-A	4,996,664	734,575	Watercourse flowing directly from the WDS property, flowing north.
BAP-B	4,996,677	734,565	Downstream from BAP-D.
BAP-C	4,996,695	734,583	Farthest downstream – after confluence of flow from BAP-A and BAP-B.
BAP-D	4,996,585	734,324	Upstream from the WDS – approximately 80 m to the northwest of the property boundary.

Note:

Northings and Eastings are based on January 2019 survey data, NAD83 Datum, UTM zone 17.

Surface water samples were analyzed for the parameters listed in Table 6. Like groundwater, the laboratory analytical results and chain of custody forms for surface water results are also included in **Appendix D (D3)**.



**Table 6: South Baptiste Surface Water Monitoring Suite**

Category	Parameters
Biological Parameters	Biological Oxygen Demand (BOD <sub>5</sub> )
Organic Parameters	Phenols, Phosphorus (total), Total Kjeldahl Nitrogen (TKN)
Inorganic Parameters	Alkalinity, Chloride, Nitrite, Nitrate, Sulphate, Ammonia (N)-Total, Hardness, Calcium, Aluminum (dissolved & total), Arsenic, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Magnesium, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Zinc, Lead
Physical/Chemical Parameters	pH, Conductivity, TDS, Total Suspended Solids (TSS), Colour, Turbidity

Note:

Surface water monitoring suite in accordance with Schedule B, Table B2 of the Site ECA.

Field temperature, pH, conductivity, and dissolved oxygen measurements were recorded at the time of sampling. Surface flow measurements were collected using a Global Flow Probe for open channel flow. The flow velocity in meters per second (m/s) was recorded along with the width and depth of the channel. Table 7 summarizes the calculated flow measurements and water clarity observations for each location. Photographs for each sampling event are provided following the tables and figures at the end of the report.

**Table 7: 2023 Surface Water Sampling Observations**

Location	Discharge (m <sup>3</sup> /s) <sup>1</sup>	Description
<b>May 04, 2023</b>		
BAP-A	0.0132	Water was clear.
BAP-B	0.1292	Water was clear with a very light brown tinge.
BAP-C	0.0954	Water was clear with a very light brown tinge.
BAP-D	0.042	Water was clear with a very light brown tinge.
<b>August 09, 2023</b>		
BAP-A	N/A	Water was clear.
BAP-B	0.015	Water was clear.
BAP-C	0.015	Water was clear.
BAP-D	0.015	Water was clear.
<b>October 19, 2023</b>		
BAP-A	N/A	Water was clear with a very light black tinge.
BAP-B	N/A	Water was clear with a light brown tinge.

Location	Discharge (m <sup>3</sup> /s) <sup>1</sup>	Description
<b>October 19, 2023</b>		
BAP-C	N/A	Water was clear with a light brown tinge.
BAP-D	N/A	Water was clear with a light brown tinge.

Notes:

N/A - Velocity too low to measure (<0.10 m/s); flow not calculated.

1 - Calculated assuming a simple channel with a rectangular cross section.

### 3.2.3 Landfill Gas Monitoring

The primary gas present at landfill sites is methane. Methane cannot cause an explosion unless it accumulates to a concentration above its lower explosive limit (LEL) in an enclosed area. The LEL for methane is 5% in air. Regulation 232/98 methane concentration limits are:

- Less than 2.5% methane gas (25,000 ppm, LEL=50%) in the subsurface at the property;
- Less than 1.0% methane gas (10,000 ppm, LEL=20%) in an on-site building, or its foundation; and,
- Less than 0.05 % methane gas (500 ppm, LEL=1%) in a building, or its foundation, which is located off-site.

Routine landfill gas monitoring within any buildings or structures is required at the Site.

## 3.3 Monitoring Procedures and Methods

### 3.3.1 Groundwater Monitoring Methodology

Groundwater monitors were purged a minimum of three borehole volumes or until the monitor purged dry. In the case where a monitor was purged dry, samples were collected after sufficient water had returned for sampling purposes. Field temperature, pH, and conductivity measurements were recorded at the time of sampling using a YSI Professional Series Multi-Parameter system. The instrument was calibrated and/or checked for pH and conductivity. Samples were field filtered for DOC and metals analyses. Samples were collected in laboratory prepared and supplied bottles and

submitted to AGAT Laboratories during the spring sampling event and to Bureau Veritas (BV) Laboratories during the fall sampling event. Additional confirmatory phenols samples were submitted to BV and Caduceon Environmental Laboratory during the spring sampling event for each of the groundwater monitoring locations. AGAT, BV, and Caduceon are accredited members of the Canadian Association of Laboratory Accreditation (CALA). Groundwater samples were stored at approximately 4° Celsius during shipment to AGAT for chemical analyses.

Holding times for samples conformed to Canadian Council of Ministers of the Environment (CCME) Standards where applicable (CCME, 1993). Chain of custody forms accompanied the samples from submittal to the laboratory until the chemical results were provided to BluMetric. Laboratory reports and chain of custody forms are compiled in **Appendix D (D2)**.

### **3.3.2 Surface Water Monitoring Methodology**

Field temperature, pH, conductivity, and dissolved oxygen measurements are recorded at the time of sampling. During sampling events the field parameters were measured using a YSI Professional Series Multi-Parameter system calibrated as per the manufacturer's instructions. Surface water samples were filtered by the laboratory for the dissolved aluminum and mercury analyses.

Surface water samples were collected in laboratory-prepared and supplied bottles and submitted to AGAT Laboratories during the spring sampling event and to BV Laboratories during the summer and fall sampling events. Additional confirmatory phenols samples were submitted to BV and Caduceon Environmental Laboratory during the spring sampling event for each of the surface water monitoring locations. Surface water samples were stored at approximately 4° Celsius during shipment to the laboratories for chemical analyses. Chain of custody forms accompanied the samples from submittal to the laboratory until the chemical results were provided to BluMetric. Laboratory reports and chain of custody forms are compiled in **Appendix D (D3)**.

Attempts were made to sample after rain events. However, the timing of the summer and fall surface water sampling in 2023 did not coincide within 24 hours of a 10 mm precipitation event. The spring sampling event on May 4 was preceded by 11.2 mm on May 3. The summer sampling event occurred on August 9 and 7.7 mm of rain fell in the two days prior to the Site visit. The fall sampling event occurred on October 19 and 0.2 mm of rain fell on the day of the site visit. Recorded precipitation and temperature values at Environment Canada's Bancroft, Ontario Weather Station for the rain events are presented in **Appendix E**.

Supplemental monitoring of surface water for toxicity at BAP-A is required in accordance with Schedule B of the ECA. Toxicity samples were collected from BAP-A during each of the three sampling events in 2023. The surface water toxicity samples were submitted to Nautilus Environmental for single-concentration acute lethality testing of *Daphnia magna* (48 hour) and rainbow trout (96 hour). Toxicity laboratory reports are compiled in **Appendix D (D4)**.

### **3.3.3 Landfill Gas Monitoring Methodology**

There are no sampling valves, ports, or vapour monitors on-site. Gas monitoring using a calibrated RKI Eagle gas monitor was collected from the on-site attendant's building and groundwater monitoring wells during the spring and fall 2023 sampling events. Gas monitoring measurements were taken from the building by inserting the intake of the gas monitoring equipment through a small hole or gap within the structure while the structure remained closed. Gas monitoring measurements from the groundwater monitoring wells were collected, prior to collecting groundwater levels or samples, by inserting the intake of the gas monitoring equipment under the cap of the monitoring well prior to removal of the cap and by keeping the best seal possible around the cap and gas equipment intake.

### 3.3.4 Field QA/QC Program Methodology

The Quality Assurance/Quality Control (QA/QC) program for the Site included the collection of field duplicate samples to demonstrate that field sampling techniques utilized by BluMetric personnel can yield reproducible results. Field duplicates were collected concurrently with the original sample. One field duplicate per sample matrix was collected during each sampling event at the WDS.

Precision is a measure of the reproducibility of analytical results and can be expressed quantitatively by the relative percent difference (RPD) between the original sample(s) and their corresponding field blind duplicate sample(s). The RPD is defined by the following equation:

$$RPD = 2 \times \frac{|(S - D)|}{(S + D)} \times 100$$

Where: S = concentration in the original sample  
D = Concentration in the duplicate

An RPD is calculated where the average of the measured parameter concentrations of the original (S) and duplicate (D) samples are greater than 5X the laboratory reporting detection limits (RDL), which represents the RPD qualification criteria. A lower level of precision is expected where the above criteria are not met. A high level of reproducibility with respect to sample results collected at the Site is indicated by an RPD value below 10% for electrical conductivity, 20% for metals and inorganics, and 30% for BTEX and PHC. These criteria are used as a general guideline and correspond to those recommended within the O. Reg. 153/04 Analytical Protocol (MOE, 2011) and by the Ontario QA/QC Interpretation Guide – Environmental Services (Maxxam, 2015). An RPD below the recommended criteria is considered acceptable, indicating that the sampling methodology can produce repeatable results.

All equipment for field parameter testing and gas monitoring are calibrated in the field during each sampling event, or by the supplier.

One blind field duplicate per media was sampled and submitted for analyses during each of the 2023 sampling events. The field duplicate bottles are filled simultaneously to the sample location selected for duplication. The laboratory-prepared bottles (identified and duplicate) for each group of chemical parameters (e.g., metals, nutrients etc.) is first filled for the identified location and then the duplicate for that same group of chemical parameters is immediately filled. This continues until the two sample bottles for each group of parameters are filled.

## 4 Monitoring Results

### 4.1 Groundwater Quality

Field measurements were recorded at the time of sampling. The pH values ranged from 5.77 at SB-MW8 to 7.21 at SB-MW11 in the spring and from 6.22 at SB-MW4 to 6.68 at SB-MW8 in the fall. Conductivity values ranged from 52  $\mu\text{S}/\text{cm}$  at SB-MW2 to 1885  $\mu\text{S}/\text{cm}$  at SB-MW6 in the spring and from 68  $\mu\text{S}/\text{cm}$  at SB-MW9 to 1710  $\mu\text{S}/\text{cm}$  at SB-MW6R in the fall.

Groundwater monitor SB-MW2 is located up-gradient of the waste mound and represents background groundwater quality for the Site. All other overburden groundwater monitors are located downgradient of the waste mound. Groundwater monitor SB-MW2 could not be sampled in the fall of 2023 due to insufficient water.

Groundwater quality results for each sampling event were compared to the Ontario Drinking Water Standards Objectives and Guidelines (ODWSOG), the calculated Reasonable Use Values (RUVs), and the Provincial Water Quality Objectives (PWQO). The 2023 groundwater chemistry results for the South Baptiste WDS are summarized in Table 15 (end of text).

**Ontario Drinking Water Standard and Operational Guidelines (ODWSOG)**

The summary of the 2023 groundwater parameters with results that fall below or are exceeding the ODWSOG criteria are summarized in Table 8 below. The full laboratory results are presented in Table 15 at the end of the text. The laboratory reports and chain of custody records are included in **Appendix D (D-2)**.

**Table 8: Groundwater Chemistry Parameters Exceeding ODWSOG**

Monitoring Location	Parameter	2023 Sampling Event(s)
SB-MW2 (Background)	Alkalinity (below criteria)	May
SB-MW3	None	None
SB-MW4	DOC Manganese Nitrite	October October October
SB-MW5	DOC Iron Manganese	May, October May, October May, October
SB-MW6 (Leachate Well)	Alkalinity (above criteria) DOC TDS Iron Manganese	May, October May, October May, October May, October May, October
SB-MW7	Alkalinity (above criteria) DOC Manganese TDS	May, October May, October May, October May, October
SB-MW8	None	None
SB-MW9	Alkalinity (below criteria)	October
SB-MW10	Alkalinity (above criteria) DOC Manganese TDS	May May, October May, October May
SB-MW11	Sulphate TDS	May May

Note: Background alkalinity is typically below criteria.

**Reasonable Use Values (RUVs)**

The water quality results from 2006 to 2023 for background well SB-MW2 were used to calculate RUVs as per the guidance offered by MECP Procedures B-7 and B-7-1 using the following equation.

$$C_m = C_b + x(C_r - C_b)$$

$C_m$  – maximum allowable concentration in groundwater beneath adjacent property (Reasonable Use Values)

$C_b$  – median background concentration before any effects from human activity

$C_r$  – maximum concentration that should be present based on use (ODWSOG)

$x$  – constant that reduces the contamination to a level considered by the MOECC to have only a negligible effect on the use of the water (0.25 for a health-related parameter and 0.5 for an aesthetic or physical parameter)

Table 9 summarizes the values that have been used to arrive at  $C_m$  values (RUVs) for the landfill leachate indicator parameters.

**Table 9: Summary of Parameters Used in RUV Calculations**

Parameter	$C_b$ (mg/L)	$C_r$ (mg/L)	Constant $x$	$C_m$ (Reasonable Use Value – RUV) mg/L
Alkalinity (upper limit)	21.0	500	0.5	<b>260.5</b>
Aluminum	0.005	0.1	0.5	<b>0.053</b>
Boron	0.005	5	0.25	<b>1.25</b>
Chloride	0.56	250	0.5	<b>125.3</b>
Copper	0.0015	1	0.5	<b>0.501</b>
Dissolved Organic Carbon (DOC)	1.4	5	0.5	<b>3.2</b>
Iron	0.015	0.3	0.5	<b>0.1575</b>
Manganese	0.005	0.05	0.5	<b>0.0275</b>
Nitrate	0.025	10	0.25	<b>2.52</b>
Sodium	1.2	200	0.5	<b>100.6</b>
Total Dissolved Solids (TDS)	38.0	500	0.5	<b>269.0</b>
Zinc	0.005	5	0.5	<b>2.503</b>

Notes:

The lower limit for alkalinity was not used as it is naturally below the lower limit for water in the region.



Table 10 summarizes the parameters that exceeded RUVs in 2023. It is noted that the RUVs are used to assess compliance at the property boundary but have been used as an assessment tool at all monitoring wells.

**Table 10: Groundwater Reasonable Use Parameter Exceedances**

Monitoring Location	Parameter	2023 Sampling Event(s)
SB-MW2 (Background)	None	None
SB-MW3	None	None
SB-MW4	DOC Manganese	May, October October
SB-MW5	DOC Iron Manganese	May, October May, October May, October
SB-MW6R (Leachate Well)	Aluminum Alkalinity Boron DOC Iron Manganese TDS	October May, October May, October May, October May, October May, October May, October
SB-MW7	Alkalinity DOC Manganese TDS	May, October May, October May, October May, October
SB-MW8	Chloride TDS	May May
SB-MW9	None	None
SB-MW10	Alkalinity DOC Manganese TDS	May, October May, October May, October May, October
SB-MW11	Sodium TDS Boron Manganese	May May May May

**Provincial Water Quality Objectives (PWQO)**

Groundwater chemistry results for each sampling event were also compared to the Provincial Water Quality Objectives (PWQO) because of the potential for groundwater to discharge to surface water at the South Baptiste WDS. Table 11 summarizes the parameters that exceeded PWQO in 2023.

**Table 11: Groundwater PWQO Parameter Exceedances**

<b>Groundwater Monitoring Location</b>	<b>Parameter</b>	<b>2023 Sampling Event(s)</b>
SB-MW2 (Background)	Total Phosphorus Copper	May May
SB-MW3	Total Phosphorus Copper	May May
SB-MW4	Total Phosphorus Boron Cobalt Copper	May, October May, October October October
SB-MW5	Boron Total Phosphorus Iron	October May, October May, October
SB-MW6R (Leachate Well)	Boron Cobalt Copper Total Phosphorus Iron Phenols	May, October May, October May, October May, October May, October May, October
SB-MW7	Boron Cobalt Copper Nickel Total Phosphorus Zinc	May, October May, October May, October May, October May May, October
SB-MW8	Total Phosphorus Copper	May, October October
SB-MW9	Copper Total Phosphorus	October May, October

Groundwater Monitoring Location	Parameter	2023 Sampling Event(s)
SB-MW10	Boron	May, October
	Cobalt	May, October
	Copper	May, October
	Nickel	May
	Total Phosphorus	May, October
SB-MW11	Boron	May
	Total Phosphorus	May

Groundwater alkalinity concentrations at the Site are naturally low. The background well (SB-MW2) mean concentration (2006-2022 data) is 21.0 mg/L. PWQO criteria states that alkalinity cannot be decrease by more than 25%. Impacts from the WDS are observed to increase the alkalinity at the Site, therefore, the downgradient wells do not exceed the PWQO for this parameter.

Historic groundwater data up to and including 2023 is provided in **Appendix F (F-1)**.

## 4.2 Surface Water Quality

Three surface water sampling events were conducted in 2023. Samples were collected on May 4, August 9, and October 19, 2023. The 2023 surface water chemistry results for the South Baptiste WDS are summarized in Table 16 (end of text). The four surface water sampling locations are shown on Figure 02.

Surface water quality results were compared to PWQO, and Table A and Table B criteria of the WDS Technical Guidance (MOE, 2010). Table 12 summarizes the parameters that exceeded criteria.

**Table 12: Surface Water Chemistry Parameters Exceeding Criteria**

Monitoring Location	Parameter	Criteria Exceeded	2023 Sampling Event(s)
BAP-A	Boron	PWQO	May, August, October
	Iron	PWQO, Table A	August
	Cobalt	PWQO	August
	Total Phosphorus	PWQO	August
BAP-B	Iron	PWQO, Table A (October)	August, October

Monitoring Location	Parameter	Criteria Exceeded	2023 Sampling Event(s)
BAP-C	Iron	PWQO	May, August
BAP-D (Background)	Iron	PWQO, Table A (August)	May, August, October

The average background (BAP-D) surface water concentration for alkalinity in 2023 was 51.7 mg/L. PWQO criteria states that alkalinity cannot be decreased by more than 25%, which in this case would be 38.75 mg/L. Alkalinity concentration at BAP-A, BAP-B, and BAP-C had alkalinity concentrations above 38.75 mg/L during each sampling event in 2023.

The detection limit for cadmium was above the Table B criteria for all surface water samples collected in 2023. Cadmium has only been above the detection limit on two occasions since monitoring began in 2006.

All toxicity samples collected in 2023 passed for single concentration acute lethality testing of *Daphnia magna* (48 hour) and rainbow trout (96 hour).

Historic surface water data up to and including 2023 is provided in **Appendix F (F-2)**.

### 4.3 Landfill Gas Monitoring

Landfill gas readings collected during the 2023 spring and fall samplings events are presented in Table 13 below.

**Table 13: 2023 Landfill Gas Field Data**

Location	Description of Location	May 4, 2023 (ppm)	October 19, 2023 (ppm)
Attendant's Building	RKI probe inserted through main door	0	25
SB-MW2	Well head	0	0
SB-MW3	Well head	0	0
SB-MW4	Well head	0	20
SB-MW5	Well head	10	10
SB-MW6R	Well head	0	15

Location	Description of Location	May 4, 2023 (ppm)	October 19, 2023 (ppm)
SB-MW7	Well head	0	10
SB-MW8	Well head	0	15
SB-MW9	Well head	0	5
SB-MW10	Well head	0	0
SB-MW11	Well head	0	0

#### 4.4 QA/QC Results

One duplicate sample per sample matrix was collected during each sampling event in 2023, totalling two groundwater duplicates and three surface water duplicates. The consistency of the results was evaluated based on the RPD of each field duplicate pair, as discussed in Section 3.3.4. The QA/QC results are presented in **Appendix D (D5)**.

Exceedances of the RPD guidance criteria are as follows:

- Groundwater: TSS (RPD of 68%) and dissolved calcium (RPD of 20%) in the spring.
- Surface water: Turbidity (RPD of 22%) in the spring and TDS (RPD of 40%) and total iron (RPD of 159%) in the fall.

The five RPD values in exceedance of the guideline criterion represent less than 1% of all analyzed parameters during the 2023 monitoring period. Therefore, the results of the 2023 QA/QC program are considered acceptable with a high degree of reproducibility.

## 5 Assessment, Interpretation, and Discussion

### 5.1 Groundwater Assessment

Groundwater at the Site was primarily assessed using select parameters (for example, alkalinity, chloride, DOC, aluminum, iron, manganese, TDS) which have been found to have elevated concentrations in monitors that are considered impacted by leachate.

In general, all downgradient monitoring wells are elevated relative to concentrations of landfill leachate parameters in the background monitor (SB-MW2).

The groundwater chemistry results from the two monitoring events in 2023 are summarized in Table 15 (end of text). Parameters that were outside the RUVs, ODWSOG, and/or PWQO criteria are flagged. **Appendix F-1** presents the historical groundwater quality results from the South Baptiste WDS. Chemistry trend graphs for select parameters are provided following the tables, figures, and photographs at the end of this report.

Monitoring well SB-MW2 is located to the west of the design footprint and is the upgradient background monitoring location. The alkalinity concentrations at SB-MW2 are typically below the ODWSOG (lower limit) and are representative of background conditions. Iron and manganese are sporadically detected above ODWSOG and RUV criteria, however, there were no exceedances during the spring 2023 sampling event. Concentrations at SB-MW2 have generally remained consistent since monitoring began in 2006 with the exception of chloride and sodium which have generally shown a slight decreasing trend since 2011.

Leachate impacts are apparent at downgradient monitoring wells SB-MW3, SB-MW4, SB-MW5, SB-MW6R, SB-MW10, and bedrock monitoring well SB-MW7. Parameters in exceedance of applicable criteria (RUV, ODWSOG) generally consist of alkalinity, DOC, TDS, aluminum, iron, and manganese. The highest concentrations of leachate indicator parameters are generally observed at SB-MW4, SB-MW6R, SB-MW7, and SB-MW10.

The trend graphs show that concentrations at SB-MW3 have generally remained within the historical range of results. In addition, chloride and sodium have shown a slight increasing trend since monitoring began in 2006. Concentrations at SB-MW4 have shown a slight increasing trend of alkalinity, boron, and TDS as well as decreasing trends of aluminum and DOC. Concentrations at SB-MW5 have shown a slight increasing trend in chloride, manganese, and sodium while a slight decreasing trend is apparent for iron and DOC. Several trends are apparent at SB-MW6R including increasing trends of alkalinity, boron, and iron. In addition, several decreasing trends are also apparent including TDS, chloride, manganese, aluminum, DOC, and sodium following increasing

trends between approximately 2006 and 2014. Several trends are apparent at SB-MW10, including a slight increasing trend for concentrations of boron, iron, and manganese. In addition, several decreasing trends are apparent since around the spring 2021 sampling event including alkalinity, DOC, chloride, sodium, and TDS.

Concentrations at bedrock monitoring well SB-MW7 have shown slight decreasing trends of chloride, DOC, and sodium while remaining parameters generally remain within the historical range of results. A second bedrock monitoring well, SB-MW11, was installed in 2019, and was sampled for the first time since it was installed during the spring sampling event. Several parameters were recorded at the highest concentrations on site at SB-MW11, including sulphate, sodium, and TDS. Further monitoring is required to establish potential trends at this location.

Off-site monitoring wells SB-MW8 and SB-MW9 were installed in 2018 on the north side of South Baptiste Lake Road. RUV exceedances were limited to chloride and TDS in the spring at SB-MW8. Alkalinity was recorded below the ODWSOG during the fall sampling event at SB-MW9, however, was comparable to the alkalinity at background location SB-MW2. Several parameter concentrations are slightly elevated at SB-MW8 and SB-MW9 compared to the background location including alkalinity, boron, TDS, chloride, aluminum, and sodium. The elevated chloride and sodium concentrations may be attributed to road salting activities. Due to the limited RUV and ODWSOG exceedances recorded at SB-MW8 and SB-MW9 since the monitoring wells were installed in 2018 and 2019, the wells are not believed to be impacted by landfill activities, however, further monitoring is required to confirm whether leachate impacts are present.

A comparison of the groundwater results at SB-MW4, SB-MW5, SB-MW6, SW-MW7, and SW-MW10 with surface water results at location BAP-A, indicates that leachate-impacted groundwater discharge is adversely affecting surface water downgradient at the Site. Concentrations of surface water indicator parameters, such as alkalinity, boron, chloride, sodium, and sulphate, were elevated in both the groundwater and the surface water. A review of the groundwater trend graphs indicate that the concentrations of alkalinity and boron are generally continuing to be on an upward trend, similar to the trends observed at surface water location BAP-A.

A comparison of groundwater quality results to PWQO has been requested by the MECP because of the potential for groundwater to discharge to surface. This comparison is provided in Table 15 (end of text). Total phosphorus exceeded PWQO in all groundwater samples collected in 2023 (except for SB-MW7 during the fall sampling event), including background monitoring well SB-MW2. Concentrations of total phosphorus in overburden monitoring wells ranged from 0.45 mg/L at SB-MW10 to 75 mg/L at SB-MW4. Other parameters which exceed PWQO include phenols (at SB-MW6R), boron, cobalt, copper, iron, nickel, and zinc. A summary of all PWQO exceedances at the groundwater monitoring wells is provided in Table 11. Groundwater that discharges to surface has the potential to adversely impact surface water in the vicinity of the WDS. A review of the surface water data is presented in Section 5.2.

Based on the results of the 2023 monitoring and review of historic results, it is apparent that the WDS is impacting the nearby groundwater quality with elevated parameters and RUV/ODWSOG criteria exceedances at most downgradient monitoring wells.

Groundwater at the Site is expected to discharge to surface at or before the property line and therefore it is expected that groundwater downgradient from the WDS property boundary is not being impacted by leachate and is compliant with Guideline B-7. This is also evident by the results at SB-MW8 and SB-MW9, which are located north of the property boundary and have only had sporadic RUV exceedances since they were installed in 2019.

## 5.2 Surface Water Assessment

The surface water chemistry results from the monitoring events in 2023 are summarized in Table 16 (end of text). Parameters that were outside the PWQO, MECP Table A and/or Table B criteria are flagged. **Appendix F (F-2)** presents the historical surface water quality results from the South Baptiste WDS. Chemistry trend graphs for select parameters are provided following the tables, figures, and photographs at the end of this report.



Surface water monitoring location BAP-D represents background surface water conditions for the South Baptiste WDS. Monitoring location BAP-D is collected approximately 80 m to the northwest of the WDS in the creek located along the north side of South Baptiste Lake Road. This creek flows from the west through a series of beaver dams and continues west to east along the north side of South Baptiste Lake Road. Surface water monitoring location BAP-B is also located in this creek, north of the WDS but prior to the confluence with flow from BAP-A. BAP-C is located downgradient of the confluence with BAP-A. However, it is in the same creek downstream from BAP-D and BAP-B.

Surface water monitoring location BAP-A represents surface water that drains directly from the South Baptiste WDS property. Monitoring location BAP-A is on a small creek located on the south side of South Baptiste Lake Road. It flows northward off the WDS property, runs east along the south side of the road, and then drains to the north through a culvert under the road. It then merges with a creek running along the north side of South Baptiste Lake Road. It enters that creek and continues in a northeast direction towards BAP-C.

Background surface water monitoring location BAP-D had PWQO exceedances for iron during each of the monitoring events in 2023. In addition, Table A iron criteria was exceeded during the summer sampling event. The attached trend graphs show generally stable parameter concentrations for all parameters.

BAP-B has followed very similar trends as the background location BAP-D, located approximately 250 m upstream. PWQO exceedances at BAP-B were limited to iron. In addition, Table A criteria for iron was exceeded during the fall sampling event. Parameters concentrations were generally comparable to BAP-D.

Surface water monitoring location BAP-A, located closest to the WDS, exceeds PWQO criteria for total phosphorus, boron, cobalt, and iron. In addition, Table A criteria was exceeded for iron during the summer sampling event. Generally, nearly all parameter concentrations are highest at BAP-A. Concentrations of parameters at BAP-A have generally remained within the historical range of results, with the exception of boron which has shown a steady increasing trend since monitoring began in 2008 and chloride

which has been on an increasing trend since 2010, however, has been on a decline since 2019. The 2023 analytical results indicate that leachate from the landfill is having an impact on surface water quality in the immediate vicinity of the WDS.

The furthest downstream monitoring location is BAP-C which is located downstream from the confluence of the stream where BAP-B and BAP-D are located and the stream flowing off site where BAP-A is located. PWQO exceedances at BAP-C were limited to iron during the spring and summer monitoring events. Parameter concentrations at BAP-C tend to be the second highest among all surface water monitoring locations, behind BAP-A. Parameter concentrations have generally remained within the historical range of results with the exception of boron which has shown a slight increasing trend and chloride which has shown an increasing trend up until 2019, where it has since started to show a decreasing trend. These trends are similarly observed at BAP-A. In addition, a slight decreasing trend in sulphate is also apparent at BAP-C.

Based on the results from the 2023 monitoring events and review of historic results, it is apparent that leachate from the South Baptiste WDS is having an impact on surface water quality in the creek to the north of the Site, along the north side of South Baptiste Lake Road.

### 5.3 Landfill Gas Assessment

The RKI Eagle gas monitoring results for 2023 ranged from 0 to 10 ppm in the spring and from 0 to 25 ppm in the fall. These results indicate that methane gas concentrations are well below the concentration of concern, which is 10,000 ppm for the subsurface, buildings and structures on-site.

### 5.4 Trigger Mechanisms and Contingency Plans

The Site Trigger Mechanisms and Contingency Plan for surface water was approved by MECP in the fall of 2019. A copy of the approved surface water Trigger Mechanisms and Contingency Plan is appended to this report as **Appendix G**. In accordance with the approved surface water Trigger Mechanisms and Contingency Plan, toxicity sampling was collected three times in 2023 at BAP-A, in conjunction with the surface water

sampling events on May 4, August 9, and October 19, 2023. Toxicity testing includes a 48-hour *Daphnia magna* single concentration test and a 96-hour Rainbow Trout single concentration test with 50% mortality being the passing limit. The surface water toxicity results in 2023 did not trigger the Contingency response sampling.

In addition to the toxicity sampling at BAP-A, additional assessment points include SB-MW4 and SB-MW7. Groundwater samples are collected on a semi-annual basis with assessment criteria for alkalinity, boron, chloride, cobalt, iron, TDS, and un-ionized ammonia. The Contingency Plan is triggered if three or more of the trigger parameters exceed their trigger limit, which vary between the PWQO, CCME Canadian Water Quality Guidelines (CWQG), or the 75<sup>th</sup> percentile of the historical data between May 2006 and May 2017 at BAP-D.

The Contingency Plan was triggered at SB-MW4 during the fall sampling event with trigger parameter exceedances of alkalinity, TDS, boron, and cobalt. The contingency plan was also triggered at SB-MW7 during the spring and fall 2023 sampling events with trigger parameter exceedances of alkalinity, TDS, boron, and cobalt. The Tier 1 response of the Contingency Plan includes the tri-annual toxicity sampling at BAP-A. Based on the toxicity results at BAP-A, escalation to Tier 2 sampling was not required. It is recommended that the Trigger Plan be updated to only trigger the Contingency Plan following an exceedance of a new trigger parameter or when an emerging increasing trend is present.

## 6 On-Site Operations

### 6.1 Annual Recyclables and Waste Summary

The Municipality implemented a clear bag policy in October 2014 to facilitate increased waste diversion to extend the operational life of the municipal landfill sites. The clear bag policy applies to both recyclable and household waste, with non-compliant bags to be refused unless residents remove recyclables from the bag (Municipality of Hastings Highlands, 2015). An updated clear bag policy was put in place in 2018.

Although access to the landfill site is controlled via a locked steel security gate, residents may deposit garbage at the disposal site outside of the landfill’s normal operating hours. This contribution is collected by site personnel, recorded, and included in the total waste volumes identified for the Site. Estimated volumes of waste received at the Site in 2023 are provided in Table 14 and are based on a combination of contractors’ tonnages and estimations based on the number of bags deposited at the Site. The tonnages below include recyclables (R) and waste (W) from residences and some commercial establishments within the municipality.

**Table 14: Annual Recycling and Waste Tonnages**

Q1		Q2		Q3		Q4		Year end	
2022									
R	W	R	W	R	W	R	W	R	W
9.99	73.86	13.32	86.81	21.15	129.50	12.02	86.54	56.47	376.70
2023									
R	W	R	W	R	W	R	W	R	W
14.86	75.68	19.35	111.32	26.02	178.01	14.48	127.59	74.71	492.59

Based on the estimated numbers, 13% of the total waste tonnage disposed at the Site was separated for recycling in 2023, consistent with the 2022 operating year. Recycling quantities have increased by approximately 32% in 2023 compared to 2022 while the waste quantity at the South Baptiste WDS in 2023 was approximately 31% higher than the 2022 quantity.

It should be noted that these numbers are based on estimates. The 2023 and 2022 residential waste calculations are based on bag counts at the WDS. There were 25,907 bags of residential waste and 6,932 bags of industrial, commercial, and institutional waste deposited at the South Baptiste WDS in 2023. An assumed 15 kg/bag (based on experience of the MHHs Operations Manager at similar waste sites) was used in the tonnage calculations.

**6.1.1 Waste Rejection Summary**

No waste was rejected from the South Baptiste WDS in 2023.

### 6.1.2 Annual Segregated Materials Removed Summary

In addition, there were segregated materials collected at the nine waste disposal sites in the MHHs. The breakdown of these wastes in 2023 at the South Baptiste WDS are presented below.

- Scrap metal – 27.4 tonnes;
- Electronic waste – 7.88 tonnes;
- Leaf and yard waste – 874 truck or trailer loads; and,
- 4 tires.

### 6.2 Emergency Situations and Complaints Summary

There were no emergency situations or complaints in 2023.

### 6.3 Site Capacity

The South Baptiste WDS has a total area of 4.46 hectares (ha), of which 2.02 ha is designated as approved landfilling area. The final volumetric capacity of the Site, excluding final cover, is 82,785 m<sup>3</sup>. Figure 6 provides Phase 1 of the cell development from 396 to 398 masl at the WDS and Figure 07 provides the remaining capacity of the WDS based on the June 29, 2023, Site survey.

The last ten annual monitoring reports for the Site have recorded annual waste generation rates of 357 (2014), 453 (2015), 568.2 (2016), 398.5 (2017), 380.4 (2018), 342.5 (2019), 381.7 (2020), 359.3 (2021), 376.7 (2022), and 492.6 (2023) tonnes; resulting in an average waste generation rate of 411 tonnes per year. The 411 tonnes are estimated to equate to 822 m<sup>3</sup> of compacted waste per year (no soil cover), assuming a compaction density of 500 kg/m<sup>3</sup>. Clean fill which is to be applied as daily cover between waste layers is estimated at 25% of the waste volume. Therefore, the total average annual fill rate is expected to be approximately 1,096 m<sup>3</sup> per year.

In 2023, it is estimated that 492.6 tonnes, or 985.2 m<sup>3</sup> by volume, of waste (residential and commercial) were deposited at the Site. Taking soil cover into consideration, this volume is estimated at 1313.6 m<sup>3</sup>.

An area of fill beyond approved limits (FBAL) was excavated between September 19 and September 21, 2023. The FBAL was located along the southeast waste site boundary and can be seen in Figure 07. Based on the topographic data from the Site survey completed on June 29, 2023, the volume of waste within the FBAL that was relocated within the waste site footprint was calculated to be approximately 1,349 m<sup>3</sup>. This volume was considered within the remaining volumetric capacity and life expectancy calculations provided below. The Site will be resurveyed in 2024 to provide updated volumes reflective to the FBAL excavation.

The remaining volumetric capacity and life expectancy for the South Baptiste WDS is calculated as follows:

Net fill available (2023 Site survey):	15,363 m <sup>3</sup>
FBAL volume excavated into WDS:	1,349 m <sup>3</sup>
<u>Estimated fill rate for 2023 (July to December):</u>	<u>611 m<sup>3</sup></u>
Remaining Capacity (2023)	13,403 m <sup>3</sup>
Average annual fill rate	1,096 m <sup>3</sup>
Life Expectancy:	12 years

Based on the remaining volumetric capacity at the Site, the life expectancy is 12 years. The remaining capacity (13,403 m<sup>3</sup>) and estimated life expectancy are slight overestimates as the amount of intermediate cover has not been considered. The life expectancy can vary due to limited environmental attenuation as well as changes in fill rates such as floods, fires or other natural disasters.

The recently amended ECA for the Site identifies in Section 9 (1) that at least two years prior to the anticipated date of closure of this Site, the Owner shall submit a Closure Plan for approval.

Operational stakes should be placed to ensure that the waste site continues to operate in accordance with the Development and Operations Plan and at the underside of final cover elevations and design slopes. Annual operational survey stakes should include the waste footprint, side slopes, and the active cell boundaries and elevations for the given year. This work has yet to be completed. The Site should continue to be operated in accordance with the 2018 Development and Operations Plan.

## **7 Summary Statements, Conclusions, and Recommendations**

The following statements, conclusions, and recommendations are based on the observations and results of the 2023 monitoring program.

### **7.1 Site Operations**

- Berms were initiated in 2016 to direct the public to new waste cell locations to contain waste. This practice was continued in 2023. General maintenance and operations should include maintaining a limited amount of exposed and active landfilling area and installing barriers along the tipping face. Wind-blown litter should be cleaned up on a regular basis.
- Measures should be taken to ensure all stockpiles for off-site transport are well segregated (e.g., metal, tires, and bulky items).
- It is recommended that waste transferred to the Site continue to be accounted for and documented by tracking the number of truck and/or vehicle loads or bags of waste deposited at the Site. Detailed descriptions and quantities of rejected waste should continue to be documented for the South Baptiste Lake WDS.
- Grading of the north side of the Site should be completed in order to cut down the slope to keep within the design elevations defined within the Development and Operations Plan. The cut slope should then be covered by a low permeability compacted cover and seeded to reduce infiltration. BluMetric will provide onsite supervision for this work. Following the completion of the

grading and compaction of the cover, a UAV survey should be carried out to determine the remaining capacity of the WDS.

- It is recommended that operational stakes be placed to ensure that the waste site continues to operate in accordance with the Development and Operations Plan and that the Site development remains within the design elevations to reduce the amount of re-grading required during Site closure activities. Annual operational survey stakes should include the waste footprint, side slopes, and the active cell boundaries and elevations for the given year. Figure 06 shows the cell development for the Site.
- It is recommended that a Site capacity survey be completed a minimum of once every three to five years until the Site life expectancy is at 10 years. The frequency of the capacity surveys should be increased based on the average annual waste generation trends at that time.

## 7.2 Groundwater Monitoring

- Based on the groundwater elevation data collected during the 2023 monitoring events, the groundwater flow direction is assumed to be north to northeast towards Baptiste Lake.
- Leachate impacts are apparent at downgradient monitoring wells SB-MW3, SB-MW4, SB-MW5, SB-MW6R, SB-MW10, and bedrock monitoring well SB-MW7. Parameters in exceedance of applicable criteria (RUV, ODWSOG) generally consist of alkalinity, DOC, TDS, aluminum, iron, and manganese. The highest concentrations of leachate indicator parameters are generally observed at SB-MW4, SB-MW6R, SB-MW7, and SB-MW10.
- VOC sampling should remain as part of the groundwater monitoring program for SB-MW6R at the South Baptiste WDS. VOC samples should be analyzed every five years. Should impacts be observed, samples should be analyzed semi-annually until they are not detected. The next VOC sampling is to occur in the fall of 2024.



- Groundwater at the Site is expected to discharge to surface at or before the property line and therefore it is expected that groundwater downgradient from the WDS property boundary is not being impacted by leachate and is compliant with Guideline B-7. This is also evident by the results at SB-MW8 and SB-MW9, which are located north of the property boundary which have only had sporadic RUV exceedances since they were installed in 2019.

### **7.3 Surface Water Monitoring**

- Based on the results from the 2023 monitoring events and review of historic results, it is apparent that leachate from the South Baptiste WDS is having an impact on surface water quality in the creek to the north of the Site, along the north side of South Baptiste Lake Road.
- The highest concentrations of nearly all parameters are observed at BAP-A, located in the creek flowing directly from the WDS towards the north. Criteria exceedances at BAP-A generally include total phosphorus, boron, and iron. Parameter concentrations are generally stable with the exception of boron which has shown a steady increasing trend and chloride which after showing an increasing trend between 2010 and 2019, has begun to show a decreasing trend.
- The boron and other elevated parameters at BAP-C indicate that the landfill is having an impact on the creek on the north side of South Baptiste Lake Road.
- Like previous years, 2023 iron concentrations in surface water upstream of the WDS are elevated. These chemistry results indicate that the WDS is not likely causing the PWQO exceedances for iron in surface water downstream of the Site.
- In 2019, the MHHs installed the perimeter ditch around the south and west sides of the Site to direct groundwater away from (around) the waste mound. This was carried out to limit infiltration of surface water through the waste (BluMetric, 2020).
- Based on the groundwater flow directions, the creek north of South Baptiste Lake Road and Baptiste Lake are potential surface water receptors. Diamond Lake southwest of the Site is not considered to be a potential receptor.

## 7.4 Trigger Mechanisms and Contingency Plan

- The Trigger Mechanisms and Contingency Plan for surface water and groundwater was approved by MECP in the fall of 2019.
- The Contingency Plan was triggered at SB-MW4 during the fall sampling event with trigger parameter exceedances of alkalinity, TDS, boron, and cobalt. The contingency plan was also triggered at SB-MW7 during the spring and fall 2022 sampling events with trigger parameter exceedances of alkalinity, TDS, boron, and cobalt. The Tier 1 response of the Contingency Plan includes the tri-annual toxicity sampling at BAP-A. Based on the toxicity results at BAP-A, escalation to Tier 2 sampling was not required.
- It is recommended that the Trigger Plan be updated to only trigger the Contingency Plan following an exceedance of a new trigger parameter or when an emerging increasing trend is present.

## 7.5 Landfill Gas

- Gas readings collected in 2023 during the semi-annual sampling events ranged between 0 and 25 ppm, well below concentrations of concern.
- Gas readings should continue to be sampled at all structures on site during the spring and fall sampling events.

## 7.6 Landfill Capacity

- The remaining volumetric capacity for waste, daily cover, and intermediate cover based on the June 29, 2023, Site survey was calculated to be 15,363 m<sup>3</sup>.
- Excavation of the FBAL was completed in September 2023. A total of approximately 1,349 m<sup>3</sup> of waste was relocated within the approved landfill footprint.
- The estimated remaining volumetric life expectancy of the South Baptiste WDS is approximately 12 years.

- Waste fill rates can be highly variable. It is recommended that site surveys be completed on a regular basis (every 3 to 5 years) to estimate the annual fill rate and life expectancy more accurately.
- The recently amended ECA for the Site identifies in Section 9 (1) that at least two years prior to the anticipated date of closure of this Site, the Owner shall submit a Closure Plan for approval.

## **8 Limiting Conditions**

The conclusions presented in this report represent our professional opinion and are based upon the work described in this report and any limiting conditions in the terms of reference, scope of work, or conditions noted herein.

The findings presented in this report are based on conditions observed at the specified dates and locations, the analysis of samples for the specified parameters, and information obtained for this project. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, locations that were not investigated directly, or types of analysis not performed.

BluMetric Environmental Inc. makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information.

This report has been prepared for The Corporation of the Municipality of Hastings Highlands. Any use a third party makes of this report, any reliance on the report, or decisions based upon the report, are the responsibility of those third parties unless authorization is received from BluMetric Environmental Inc. in writing. BluMetric Environmental Inc. accepts no responsibility for any loss or damages suffered by any unauthorized third party as a result of decisions made or actions taken based on this report.

Respectfully submitted,  
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## 9 References

BluMetric Environmental Inc. 2018. Development and Operations Plan South Baptiste WDS – 2018, February 2018.

BluMetric Environmental Inc. 2022. South Baptiste WDS - 2021 Annual Report. Submitted to The Corporation of the Municipality of Hastings Highlands, March 2022.

Canadian Council of Ministers of the Environment (CCME). 2011. Protocols Manual For Water Quality Sampling in Canada.

Ministry of Northern Development and Mines (MNDM), Map 2544, 1991.

Ministry of Northern Development and Mines (MNDM), Map 2556, 1991.

Ministry of the Environment (MOE). 1999. Provincial Water Quality Objectives.

Ministry of the Environment (MOE). 2003. Ontario Drinking Water Standards, Objectives and Guidelines, Government of Ontario. Last Revised July 2017.

Groundwater Information Network, <http://gw-info.net>

Ministry of the Environment (MOE). 2012. Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New and Expanding Landfill Sites. Last revised January 2012.

Ministry of the Environment (MOE). 2010. Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water-Technical Guidance Document, November 2010.

## Tables

Table 15- 2023 Groundwater Chemistry Results																										
Parameter	Units	RUV-SB	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Location	SB-MW2	SB-MW3	SB-MW4	SB-MW4	SB-MW5	SB-MW5	SB-MW6R	SB-MW6R	SB-MW7	SB-MW7	SB-MW7	SB-MW8	SB-MW8	SB-MW9	SB-MW9	SB-MW10	SB-MW10	SB-MW11		
						Sample ID	SB MW2	SB MW3	SB MW4	SB-MW4	SB MW5	SB-MW5	SB MW6R	SB-MW6R	SB MW7	SB-MW7	AQC-GW1 (SB-N)	SB MW8	SB-MW8	SB MW9	AQC-GW1 (SB-N)	SB-MW9	SB MW10	SB-MW10	SB MW10	SB-MW10
Detection Limit						2023-May-04	2023-May-04	2023-May-04	2023-Oct-19	2023-May-04	2023-Oct-19	2023-May-04	2023-Oct-19	2023-May-04	2023-Oct-19	2023-Oct-19	2023-Oct-19	2023-May-04	2023-Oct-19	2023-May-04	2023-May-04	2023-Oct-19	2023-May-04	2023-Oct-19		
<b>Anions</b>																										
Chloride	mg/L	125.28	250	-	-	0.1	0.45	16.4	1.41	3.9	50.2	39	47.7	11	90.9	97	90	138	5.4	48.7	48.7	<1	65.1	33	18.2	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	2.64	-	<0.1	-	0.12	-	0.28	0.28	-	0.18	-	-	0.13	-	0.45	-	
Nitrate as N	mg/L	2.51875	10	-	-	0.05	<0.05	0.55	3.16	1.58	0.11	<0.1	0.34	<0.1	0.32	0.28	0.28	<0.05	0.18	0.16	0.13	<0.05	0.45	0.42		
Nitrite as N	mg/L	-	1	-	-	0.01	<0.05	<0.05	0.32	1.07	<0.05	0.016	<0.05	0.029	<0.05	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05		
Sulphate	mg/L	-	500	-	-	0.1	3.54	13	15.9	54	11.2	3.7	92.1	16	67.5	72	66	3.65	4.2	3.21	3.57	3.7	39.7	27	652	
<b>Cations</b>																										
Calcium (diss)	mg/L	-	-	-	-	0.05	5.54	16.9	13.4	54	34.8	42	159	180	142	170	170	53.5	3	23.8	19.5	4.1	121	86	173	
Magnesium (diss)	mg/L	-	-	-	-	0.05	0.79	2.22	1.82	4.8	6.83	7.7	30.7	29	24.5	29	28	5.89	0.3	2.75	2.49	0.49	23.6	16	21.1	
Potassium (diss)	mg/L	-	-	-	-	0.2	0.54	2.46	6.03	13	17.6	23	74.2	84	33.9	29	28	2.34	0.77	1.6	1.45	0.73	47.7	32	2.49	
Sodium (diss)	mg/L	100.6	200	-	-	0.05	1.28	9.46	3.58	20	28.1	31	81.6	69	87.2	91	89	28	16	17.5	15	7.5	63.7	41	155	
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	260.5	30 - 500	See Factsheet	-	1	23	39	45	150	128	180	907	830	623	620	620	34	31	35	37	24	565	310	177	
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	4.02	4.4	0.54	1	45.5	50	10.2	19	19	<0.02	<0.05	<0.02	<0.02	<0.05	15.5	6.1	<0.02	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	<5	8	47	59	29	20	80	290	51	75	76	<5	12	<5	<5	6.9	59	20	<5	
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4	1.9	1.4	4.9	7.8	5.3	5.2	44.9	48	22.1	23	23	1.4	3.2	1	0.8	1.3	20.8	11	2.7	
Electrical Conductivity	uS/cm	-	-	-	-	1	44	160	158	450	428	490	1870	1800	1470	1500	1500	537	91	232	237	59	1240	770	1520	
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-	-	6.99	6.83	7.03	7.4	7.28	7.55	7.37	7.53	7.29	7.64	7.74	6.61	7.33	6.82	6.85	7.26	7.42	7.55	7.87	
Phenols	mg/L	-	-	0.001	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	
Total Dissolved Solids	mg/L	269	500	-	-	10	38	94	116	265	232	250	982	770	808	940	930	336	130	152	136	15	724	420	1080	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.15	0.31	4.23	5.7	1.26	1.4	58.5	48	10.7	18	19	0.19	0.12	<0.1	<0.1	<0.1	15.5	6.2	0.16	
Total Phosphorus	mg/L	-	-	0.03	-	0.02	0.54	7.4	48.8	75	5.92	8.6	3.4	52	0.09	<0.02	0.029	27.9	36	3.72	3.84	3.8	0.45	0.36	0.4	
Total Suspended Solids	mg/L	-	-	-	-	10	196	5740	41400	67000	2590	2500	54300	120000	28	13	15	8830	28000	3690	1820	1000	164	980	409	
<b>Metals</b>																										
Aluminum (diss)	mg/L	0.0525	0.1	-	Calculated	0.004	0.007	0.011	0.052	0.033	0.011	0.0089	0.044	0.056	<0.004	<0.0049	<0.0049	0.019	0.021	0.007	0.007	<0.0049	0.022	0.0059	<0.004	
Arsenic (diss)	mg/L	-	0.01	-	0.005	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium (diss)	mg/L	-	1	-	-	0.002	0.004	0.014	0.096	0.49	0.04	0.06	0.18	0.27	0.153	0.18	0.18	0.031	0.0029	0.014	0.012	0.0029	0.089	0.08	0.058	
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0005	<0.0005	<0.0005	<0.0004	<0.0005	<0.0004	<0.0005	<0.0004	<0.0005	<0.0004	<0.0004	<0.0005	<0.0004	<0.0005	<0.0005	<0.0004	<0.0005	<0.0004	<0.0005	
Boron (diss)	mg/L	1.25375	5	-	0.2	0.01	<0.01	0.021	0.244	0.57	0.159	0.25	2.08	2.5	0.885	0.94	0.94	<0.01	0.013	<0.01	<0.01	<0.01	0.879	0.61	1.36	
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.00009	<0.0001	<0.0001	<0.0001	<0.00009	<0.0001	<0.00009	<0.0001	<0.00009	<0.0001	0.0004	0.00033	0.00038	<0.0001	<0.00009	<0.0001	<0.0001	<0.00009	0.0002	0.0002	<0.0001
Chromium (diss)	mg/L	-	0.05	-	-	0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.005	<0.002	<0.005	<0.002	<0.005	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002	
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	<0.0005	<0.0005	0.0005	0.0013	<0.0005	<0.0005	0.0369	0.045	0.0177	0.015	0.014	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.045	0.015	<0.0005	
Copper (diss)	mg/L	0.50075	1	-	Calculated	0.0009	0.005	0.006	0.004	0.01	<0.001	<0.0009	0.01	0.0089	0.039	0.037	0.037	0.001	0.0047	<0.001	<0.001	0.0025	0.047	0.029	<0.001	
Iron (diss)	mg/L	0.1575	0.3	0.3	-	0.01	0.019	0.017	0.028	<0.1	3.12	1.5	37.7	63	0.024	<0.1	<0.1	0.116	<0.1	<0.1	<0.1	<0.1	0.019	<0.1	<0.01	
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Manganese (diss)	mg/L	0.0275	0.05	-	-	0.002	<0.002	0.003	0.023	0.1	1.52	1.7	4.3	4.3	10.9	8.7	8.5	0.007	<0.002	<0.002	<0.002	<0.002	16.5	9	0.035	
Mercury (diss)	mg/L	-	0.001	0.0002	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.002	<0.002	<0.002	0.00052	<0.002	0.001	0.003	0.0061	0.008	0.006	0.0062	<0.002	0.00081	<0.002	<0.002	<0.0005	0.01	0.0072	0.036	
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.001	0.002	<0.001	0.0011	<0.001	<0.001	0.008	0.0084	0.035	0.028	0.028	0.003	<0.001	0.001	<0.001	<0.001	0.034	0.015	0.002	
Silicon (diss)	mg/L	-	-	-	-	0.05	5.56	6.07	2.93	3.5	6.63	7.5	3.55	3.9	7.81	8.1	7.9	5.66	4.2	6.52	6.61	5.7	7.51	6.5	4.9	
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.0001	<0.0001	<0.0001	<0.00009	<0.0001	<0.00009	<0.0001	<0.00009	<0.0001	<0.00009	<0.00009	<0.0001	<0.00009	<0.0001	<0.0001	<0.00009	<0.0001	<0.00009	<0.0001	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.052	0.128	0.102	0.28	0.282	0.36	0.56	0.61	1.19	1.5	1.5	0.592	0.035	0.221	0.198	0.039	0.744	0.6	8.21	
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.0003	<0.0003	<0.0003	0.000081	<0.0003	<0.00005	<0.0003	0.0003	<0.0003	0.00014	0.00014	<0.0003	<0.00005	<0.0003	<0.0003	<0.00005	<0.0003	0.00013	<0.0003	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	0.004	<0.005	<0.002	<0.005	0.01	<0.005	<0.002	<0.005	<0.005	<0.002	<0.005	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.002	<0.002	<0.002	<0.0005	<0.002	0.0012	0.002	0.0028	<0.002	<0.0005	<0.0005	<0.002	<0.0005	<0.002	<0.002	<0.0005	<0.002	<0.0005	<0.002	
Zinc (diss)	mg/L	2.5025	5	-	0.02	0.005	0.011	0.012	<0.005	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	0.06	0.062	0.061	0.006	<0.005	0.006					

Table 16: 2023 Surface Water Chemistry Results																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-A	BAP-A	BAP-A	BAP-A	BAP-B	BAP-B	BAP-B	BAP-B	BAP-C	BAP-C	BAP-C	BAP-C	BAP-D	BAP-D	BAP-D					
						Sample ID	BAP-A	QAQC-SW1 (BA	BAP-A	BAP-A	BAP-B	BAP-B	BAP-B	BAP-B	QAQC-SW1 (BA	BAP-C	BAP-C	QAQC SW1 (BA	BAP-C	BAP-D	BAP-D	BAP-D				
						Sample Date	2023-May-04	2023-May-04	2023-Aug-09	2023-Oct-19	2023-May-04	2023-Aug-09	2023-Oct-19	2023-Oct-19	2023-May-04	2023-Aug-09	2023-Aug-09	2023-Aug-09	2023-Oct-19	2023-May-04	2023-Aug-09	2023-Oct-19				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	40.2	39.6	36	40	4.83	3.6	6.7	6.9	7.33	6.9	6.9	12	5.67	1.9	5.1					
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	1.33	1.62	-	<0.1	<0.1	<0.1	-	0.14	0.14	0.22	-	<0.1	<0.1					
Nitrate as N	mg/L	-	-	-	-	0.05	1.88	1.92	1.31	1.62	<0.05	<0.1	<0.1	<0.1	0.12	0.14	0.14	0.22	<0.05	<0.1	<0.1					
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	0.023	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01					
Sulphate	mg/L	-	-	100	-	0.1	43.1	43.3	13	16	3.79	4.1	5.9	6.1	6.38	5.2	5.2	7.6	3.14	4.1	4.6					
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.2	55	52.1	48	53	22.9	29	28	29	25.1	30	29	32	15.2	23	23					
Magnesium (tot)	mg/L	-	-	-	-	0.05	10.1	9.74	7.4	8.9	1.11	1.3	1.3	1.3	1.73	1.8	1.7	2.3	0.86	1.2	1.3					
Potassium (tot)	mg/L	-	-	-	-	0.2	21.9	21.5	17	20	0.51	0.64	0.84	0.85	1.87	2.1	2	3.3	<0.5	0.74	1					
Sodium (tot)	mg/L	-	-	-	-	0.1	37.4	37.4	30	35	4.31	4.9	5.7	5.7	6.64	7.3	7.2	10	4.5	4.9	5.6					
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	147	151	170	170	54	77	71	71	60	86	85	87	39	61	55					
Ammonia as N	mg/L	-	-	-	-	0.02	0.14	0.15	0.071	<0.05	0.02	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	0.05	<0.05	<0.05					
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	5	<2	<2	<2	<2	<2	<2	12	<2	<2	<2	<2	<2					
Colour	TCU	-	-	-	-	2	17.6	17.5	18	14	32.9	25	15	13	31.1	23	23	13	43.3	40	21					
Electrical Conductivity	uS/cm	-	-	-	-	1	535	535	480	520	129	170	170	180	156	200	200	230	103	140	150					
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.76	7.87	7.84	8.06	7.57	7.81	8.05	7.95	7.6	7.81	7.79	8.01	7.4	7.67	7.83					
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001					
Total Dissolved Solids	mg/L	-	-	-	-	10	302	298	265	290	72	95	60	90	82	115	120	95	62	85	85					
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	179	170	150	160	61.8	81	74	75	69.8	89	84	88	41.5	66	61					
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.49	0.54	0.27	0.24	0.19	0.16	0.18	<0.1	0.22	0.16	0.17	0.22	0.19	0.2	0.2					
Total Phosphorus	mg/L	0.03	-	-	-	0.02	<0.02	<0.02	0.041	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.02					
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	34	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	11					
Turbidity	NTU	-	-	-	-	0.1	2	1.6	1.3	0.5	1.4	3.6	1.2	1.2	1.2	3	3	0.9	2.4	6.6	1.9					
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.000308	0.00033	<0.00061	<0.00061	0.000028	<0.00061	<0.00061	<0.00061	<0.000002	<0.00061	<0.00061	<0.00061	0.000109	<0.00061	<0.00061					
<b>Metals</b>																										
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	0.018	0.018	<0.005	<0.005	0.026	0.01	0.006	0.006	0.022	0.009	0.01	0.005	0.043	0.014	0.008					
Aluminum (tot)	mg/L	-	-	-	-	0.0049	-	-	0.28	0.01	-	0.024	0.2	0.021	-	0.025	0.021	0.015	-	0.028	0.029					
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001	<0.003	<0.001	<0.001					
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.374	0.364	0.24	0.24	<0.01	<0.01	<0.01	<0.01	0.034	0.029	0.029	0.039	<0.01	<0.01	<0.01					
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.00009	<0.00009	<0.00009	<0.0001	<0.00009	<0.00009	<0.00009	<0.0001	<0.00009	<0.00009					
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.005	<0.005	<0.003	<0.005	<0.005	<0.005	<0.003	<0.005	<0.005	<0.005	<0.003	<0.005	<0.005					
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	0.0012	<0.0005	<0.0005	<0.0005	0.00075	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005					
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.003	0.001	0.0013	<0.0009	<0.001	<0.0009	0.001	<0.0009	<0.001	<0.0009	<0.0009	<0.0009	0.001	<0.0009	<0.0009					
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.046	0.05	1.2	<0.1	0.282	0.75	2.2	0.25	0.311	0.66	0.63	0.23	0.513	1.2	0.4					
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005					
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001					
Nickel (tot)	mg/L	0.025	-	-	-	0.001	0.012	<0.003	0.0027	0.0018	<0.003	<0.001	<0.001	<0.001	<0.003	<0.001	<0.001	<0.001	<0.003	<0.001	<0.001					
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002					
Silicon (tot)	mg/L	-	-	-	-	0.18	3.77	3.84	-	-	3.02	-	-	-	3.04	-	-	-	3.1	-	-					
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.00009	<0.00009	<0.00009	<0.0001	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.00009					
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.02	<0.02	0.011	<0.005	<0.02	<0.005	<0.005	<0.005	<0.02	<0.005	<0.005	<0.005	<0.02	<0.005	<0.005					

-LEGEND-

Detection Limit DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General

Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim

Concentration exceeds MECP-GD-TA MECP Guidance Document Table A

Concentration exceeds MECP-GD-TB MECP Guidance Document Table B



## Figures



**LEGEND**

Property Boundary (PA Miller, 2018)

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

**REFERENCES**  
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1:50,000

**CLIENT**  
 Municipality of Hastings Highlands

**PROJECT**  
 South Baptiste Waste Disposal Site

**TITLE**  
 Site Location Map

The Tower - The Woolen Mill,  
 4 Cataraqui St.,  
 Kingston, Ontario K7K 1Z7  
 TEL: (613) 531-2725  
 FAX: (613) 531-1852  
 Email: info@blumetric.ca  
 Web: http://www.blumetric.ca

<b>PROJECT #</b> 230225-09		<b>DATE</b> February 26, 2024	
<b>DRAWN</b> ZS	<b>CHECKED</b> CM	<b>FIG NO.</b> 01	<b>REV</b> 0



**LEGEND**

- Groundwater Monitoring Location
- Decommissioned Monitoring Well
- Staff Gauge
- Surface Water Sampling Location
- Benchmark
- Property Boundary (PA Miller, 2018)
- Road

**Note:** Orthographic imagery collected by BluMetric RPA survey, June 2023

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

**REFERENCES**  
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

1:1,500

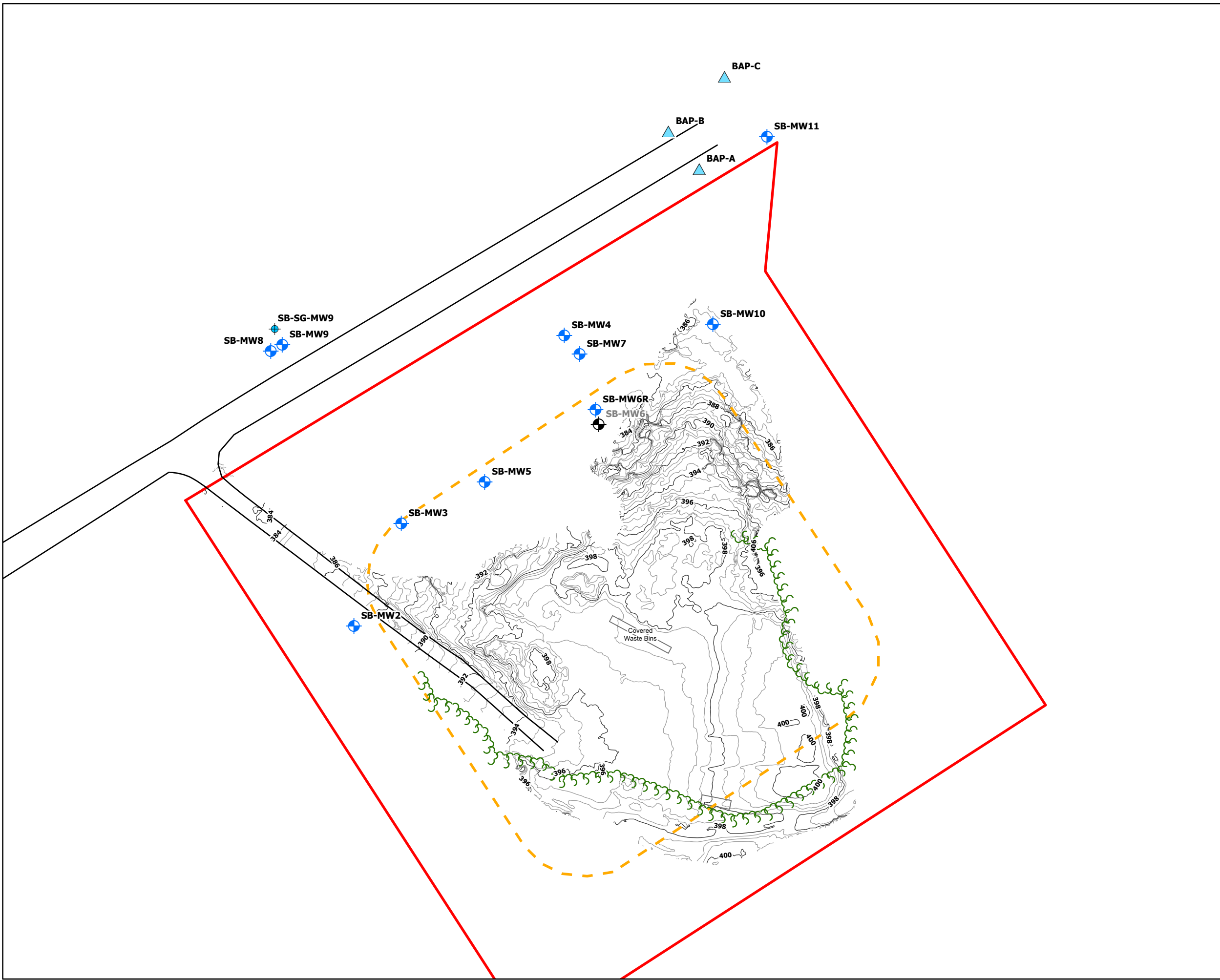
**CLIENT**  
 Municipality of Hastings Highlands

**PROJECT**  
 South Baptiste Waste Disposal Site

**TITLE**  
 Site Plan and Monitoring Locations

The Tower - The Woolen Mill,  
 4 Cataraqui St.,  
 Kingston, Ontario K7K 1Z7  
 TEL: (613) 531-2725  
 FAX: (613) 531-1852  
 Email: info@blumetric.ca  
 Web: http://www.blumetric.ca

<b>PROJECT #</b> 230225-09		<b>DATE</b> February 26, 2024	
<b>DRAWN</b> ZS	<b>CHECKED</b> CM	<b>FIG NO.</b> 02	<b>REV</b> 0



**LEGEND**

- Groundwater Monitoring Location
- Decommissioned Monitoring Well
- Staff Gauge
- Surface Water Sampling Location
- Road
- Treeline
- Property Boundary (PA Miller, 2018)
- Approved Buffer Design (1996)
- 2023 Topographic Contours (0.5 masl)
- 2023 Topographic Contours (2 masl)

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

**REFERENCES**  
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

1:1,250

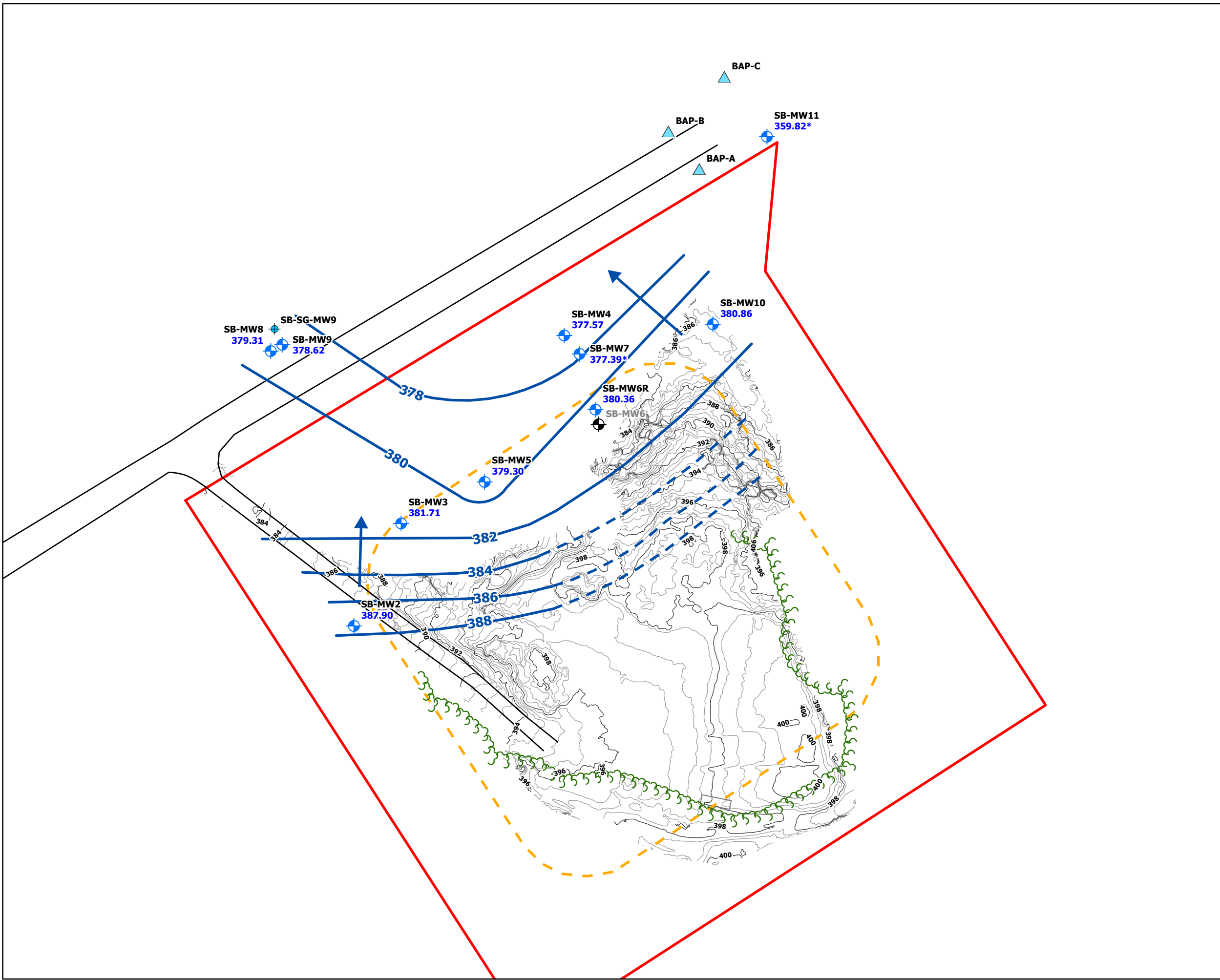
**CLIENT**  
 Municipality of Hastings Highlands

**PROJECT**  
 South Baptiste Waste Disposal Site

**TITLE**  
 Topography (2023) and Site Design

The Tower - The Woolen Mill,  
 4 Cataraqui St.,  
 Kingston, Ontario K7K 1Z7  
 TEL: (613) 531-2725  
 FAX: (613) 531-1852  
 Email: info@blumetric.ca  
 Web: http://www.blumetric.ca

<b>PROJECT #</b> 230225-09		<b>DATE</b> February 26, 2024	
<b>DRAWN</b> ZS	<b>CHECKED</b> CM	<b>FIG NO.</b> 03	<b>REV</b> 0



**LEGEND**

- Groundwater Monitoring Location
- Decommissioned Monitoring Well
- Staff Gauge
- Surface Water Sampling Location
- 380.64** Groundwater Elevation (Spring, 2023)
- Inferred Direction of Groundwater Flow
- Groundwater Elevation Contour (m asl)
- Estimated Groundwater Elevation Contour (m asl)
- Road
- Treeline
- Property Boundary (PA Miller, 2018)
- Approved Buffer Design (1996)
- 2023 Topographic Contours (0.5 masl)
- 2023 Topographic Contours (2 masl)

\* Bedrock well not used to develop groundwater contours

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

**REFERENCES**  
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

1:1,250

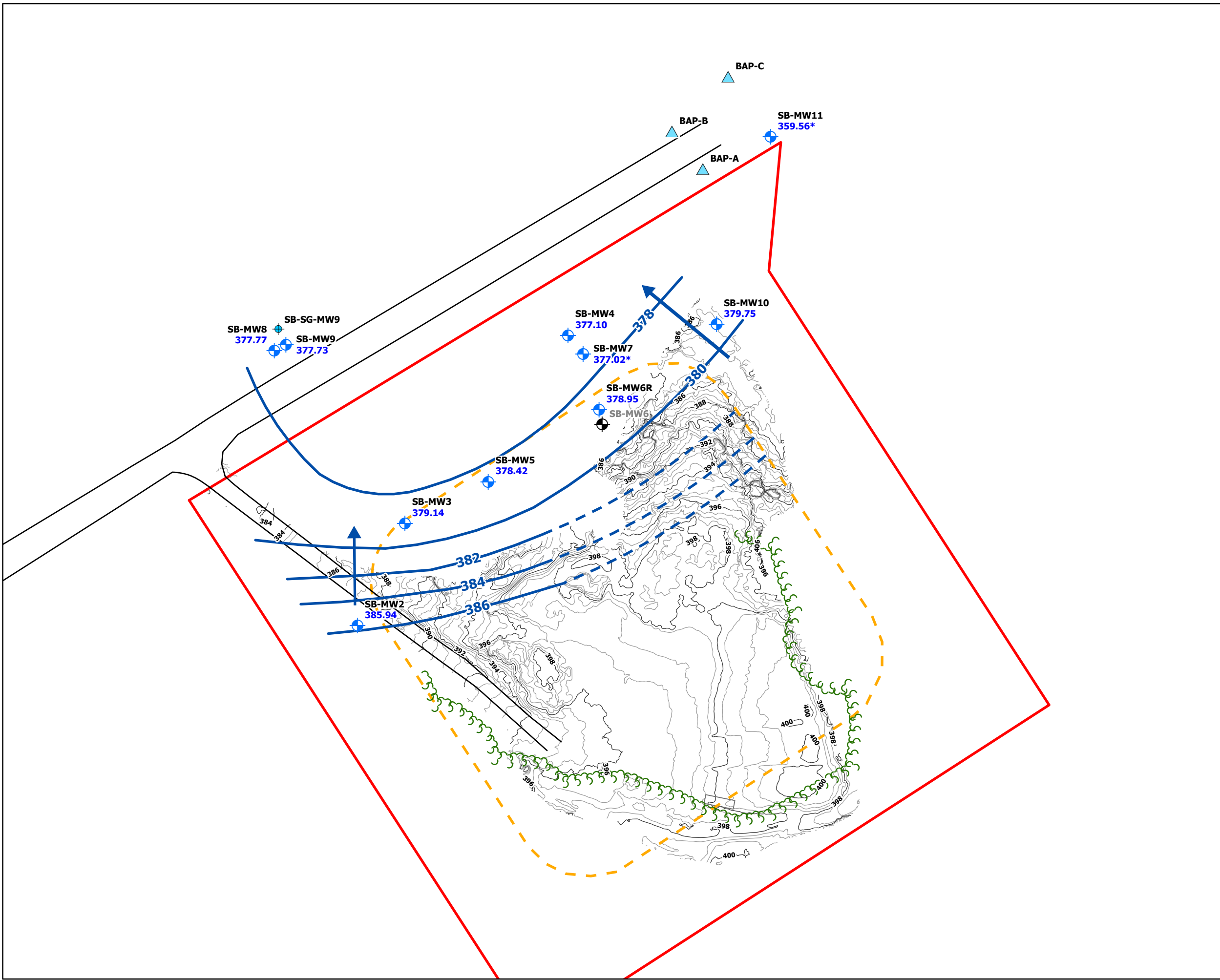
**CLIENT**  
 Municipality of Hastings Highlands

**PROJECT**  
 South Baptiste Waste Disposal Site

**TITLE**  
 Groundwater Flow Direction - Spring 2023

The Tower - The Woolen Mill,  
 4 Cataraqui St.,  
 Kingston, Ontario K7K 1Z7  
 TEL: (613) 531-2725  
 FAX: (613) 531-1852  
 Email: info@blumetric.ca  
 Web: http://www.blumetric.ca

<b>PROJECT #</b> 230225-09		<b>DATE</b> February 28, 2024	
<b>DRAWN</b> ZS	<b>CHECKED</b> CM	<b>FIG NO.</b> 04	<b>REV</b> 0



**LEGEND**

- Groundwater Monitoring Location
- Decommissioned Monitoring Well
- Staff Gauge
- Surface Water Sampling Location
- 380.64** Groundwater Elevation (Fall, 2023)
- Inferred Direction of Groundwater Flow
- Groundwater Elevation Contour (m asl)
- Estimated Groundwater Elevation Contour (m asl)
- Road
- Treeline
- Property Boundary (PA Miller, 2018)
- Approved Buffer Design (1996)
- 2023 Topographic Contours (0.5 masl)
- 2023 Topographic Contours (2 masl)

\* Bedrock well not used to develop groundwater contours

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

**REFERENCES**  
 PROPRIETARY INFORMATION MAY NOT BE REPRODUCED OR DIVULGED WITHOUT PRIOR WRITTEN CONSENT OF BLUMETRIC ENVIRONMENTAL INC. DO NOT SCALE DRAWING. THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

1:1,250

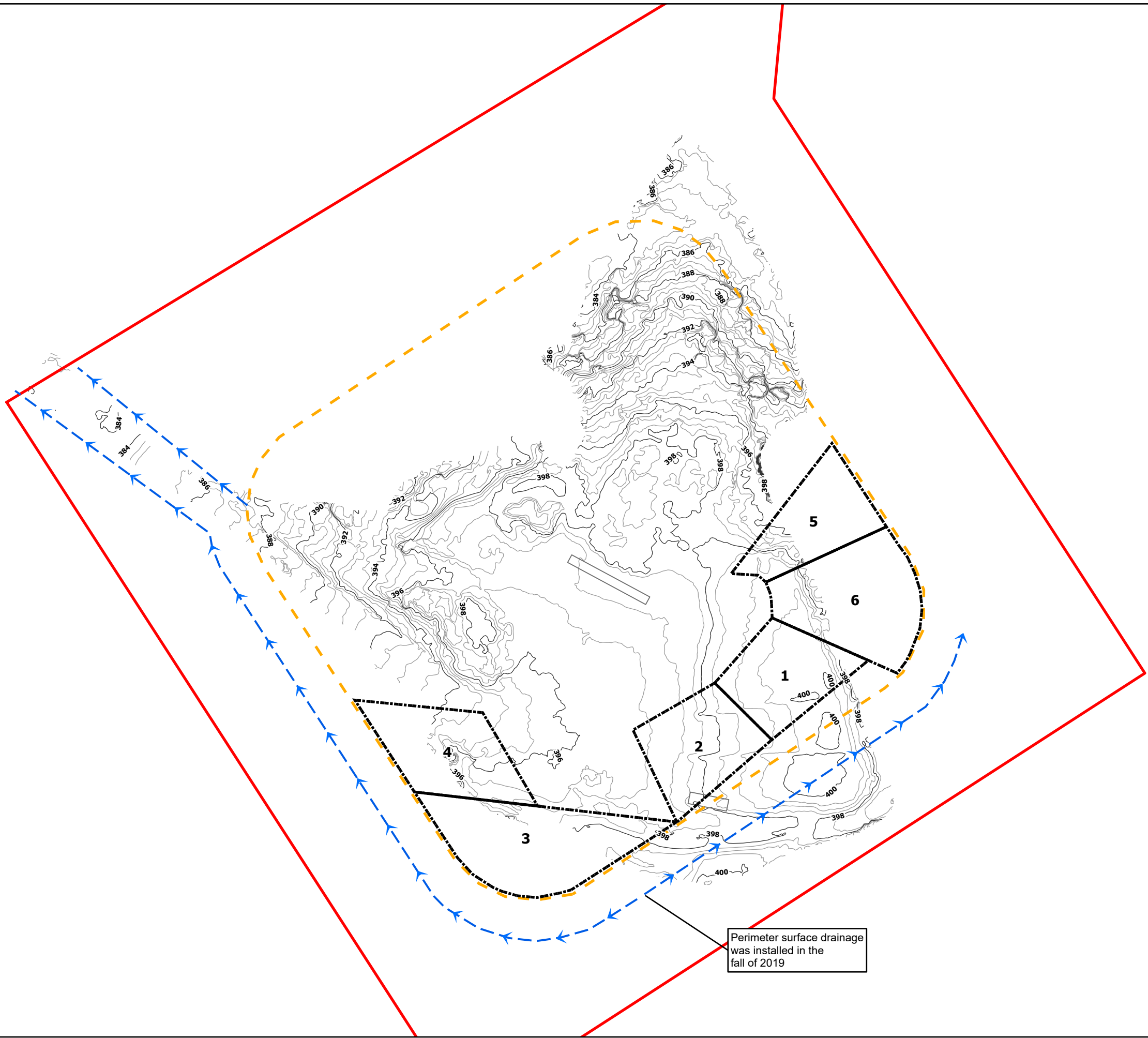
**CLIENT**  
 Municipality of Hastings Highlands

**PROJECT**  
 South Baptiste Waste Disposal Site

**TITLE**  
 Groundwater Flow Direction - Fall 2023

The Tower - The Woolen Mill,  
 4 Cataraqui St.,  
 Kingston, Ontario K7K 1Z7  
 TEL: (613) 531-2725  
 FAX: (613) 531-1852  
 Email: info@blumetric.ca  
 Web: http://www.blumetric.ca

<b>PROJECT #</b> 230225-09		<b>DATE</b> February 28, 2024	
<b>DRAWN</b> ZS	<b>CHECKED</b> CM	<b>FIG NO.</b> 05	<b>REV</b> 0



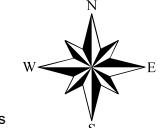
**LEGEND**


- Property Boundary (PA Miller, 2018)
- Approved Buffer Design (1996)
- Cell Boundaries
- 2023 Topographic Contours (0.5 masl)
- 2023 Topographic Contours (2 masl)
- Drainage Swale

**Notes:**  
 The final design contours were georeferenced and raised 283.048 m in elevation based on a 2017 geodetic survey of MW-6 noted on the original design.

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

**REFERENCES**  
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1:1,000

**CLIENT**  
 Municipality of Hastings Highlands

**PROJECT**  
 South Baptist Waste Disposal Site

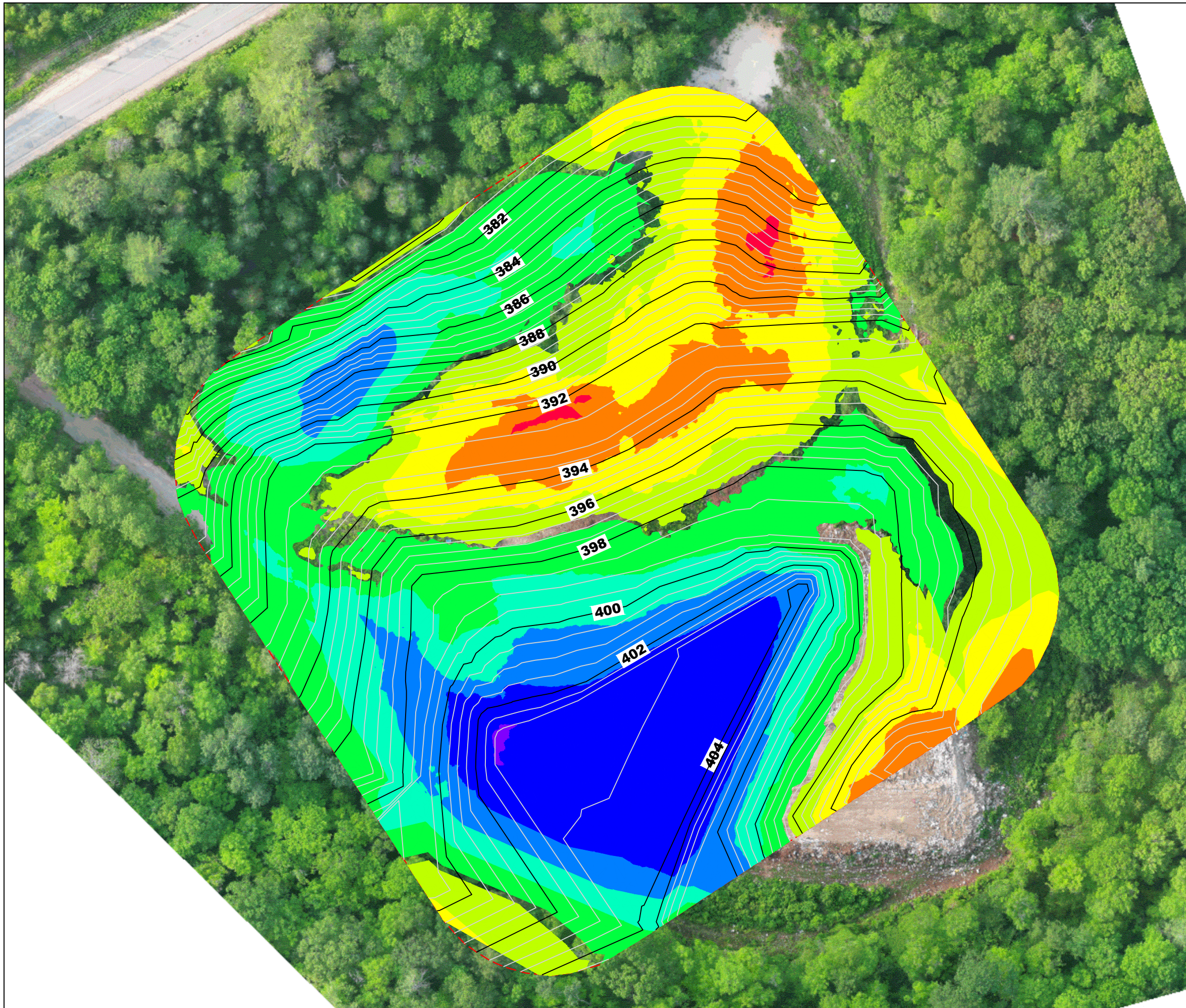
**TITLE**  
 Cell Development - Phase 1  
 396 - 398 m asl



The Tower - The Woolen Mill,  
 4 Cataraqui St.,  
 Kingston, Ontario K7K 1Z7  
 TEL: (613) 531-2725  
 FAX: (613) 531-1852  
 Email: info@blumetric.ca  
 Web: http://www.blumetric.ca

<b>PROJECT #</b> 230225-09		<b>DATE</b> February 26, 2024	
<b>DRAWN</b> ZS	<b>CHECKED</b> CM	<b>FIG NO.</b> 06	<b>REV</b> 0

Perimeter surface drainage was installed in the fall of 2019



LEGEND

- 382 - Final Design Contours (0.5m)

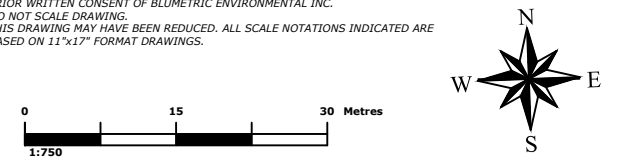
Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Volume	Color
1	-7.69	-6.00	22	Red
2	-6.00	-4.00	1222	Orange
3	-4.00	-2.00	5799	Yellow
4	-2.00	-0.25	9908	Light Green
5	0.25	2.00	14360	Green
6	2.00	4.00	9598	Cyan
7	4.00	6.00	5391	Blue
8	6.00	8.00	2146	Dark Blue
9	8.00	8.20	1	Purple

Volumes Table - 2023 to Final Design Contours	
Cut	18,834 Cu. M.
Fill	34,197 Cu. M.
Net Fill	15,363 Cu. M.

REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES

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CLIENT

**Municipality of Hastings Highlands**

PROJECT

**South Baptiste Waste Disposal Site**

TITLE

**Remaining Fill Capacity  
June 29, 2023**



4 Cataraqi Street, The Tower - The Woolen Mill  
Kingston, Ontario, K7K 1Z7  
TEL: (613) 531-2725  
FAX: (613) 531-1852  
Email: info@blumetric.ca  
Web: http://www.blumetric.ca

PROJECT #	DATE		
<b>230225-09</b>	<b>February 26, 2024</b>		
DRAWN	CHECKED	DWG NO.	REV
<b>ZS</b>	<b>CM</b>	<b>07</b>	<b>0</b>



# Site Photographs



Photo 1: Site entrance – May 4, 2023



Photo 2: Covered waste bins – May 4, 2023



Photo 3: Active landfill cell – May 4, 2023



Photo 4: Landfilling site, facing northwest – May 4, 2023



Photo 5: Bulky waste and tire pile – May 4, 2023



Photo 6: Downed signage – May 4, 2023



Photo 7: Scrap metal pile – May 4, 2023



Photo 8: Brush and yard waste pile – May 4, 2023



Photo 9: BAP-A – May 4, 2023



Photo 10: BAP-B – May 4, 2023



Photo 11: BAP-C – May 4, 2023



Photo 12: BAP-D – May 4, 2023



Photo 13: Bulky waste and tire pile – August 9, 2023



Photo 14: Bulky waste pile– August 9, 2023



Photo 15: Scrap metal pile – August 9, 2023



Photo 16: Brush and yard waste pile – August 9, 2023



Photo 17: BAP-A – August 9, 2023



Photo 18: BAP-B – August 9, 2023



Photo 19: BAP-C – August 9, 2023



Photo 20: BAP-D – August 9, 2023



Photo 21: FBAL excavation – September 21, 2023



Photo 22: FBAL excavation – September 21, 2023



Photo 23: FBAL excavation – September 21, 2023



Photo 24: FBAL excavation – September 21, 2023



Photo 25: Site entrance gate – October 19, 2023



Photo 26: Site entrance gate – October 19, 2023



Photo 27: Attendant's hut – October 19, 2023



Photo 28: Covered waste bins – October 19, 2023





Photo 29: Active landfill cell – October 19, 2023



Photo 30: Active landfill cell – October 19, 2023



Photo 31: Uncovered waste from FBAL excavation – October 19, 2023



Photo 32: Landfilling site, facing southwest – October 19, 2023



Photo 33: Tire pile – October 19, 2023



Photo 34: Bulky waste pile – October 19, 2023



Photo 35: Scrap metal pile – October 19, 2023



Photo 36: Brush and yard waste pile – October 19, 2023



Photo 37: BAP-A – October 19, 2023



Photo 38: BAP-B – October 19, 2023

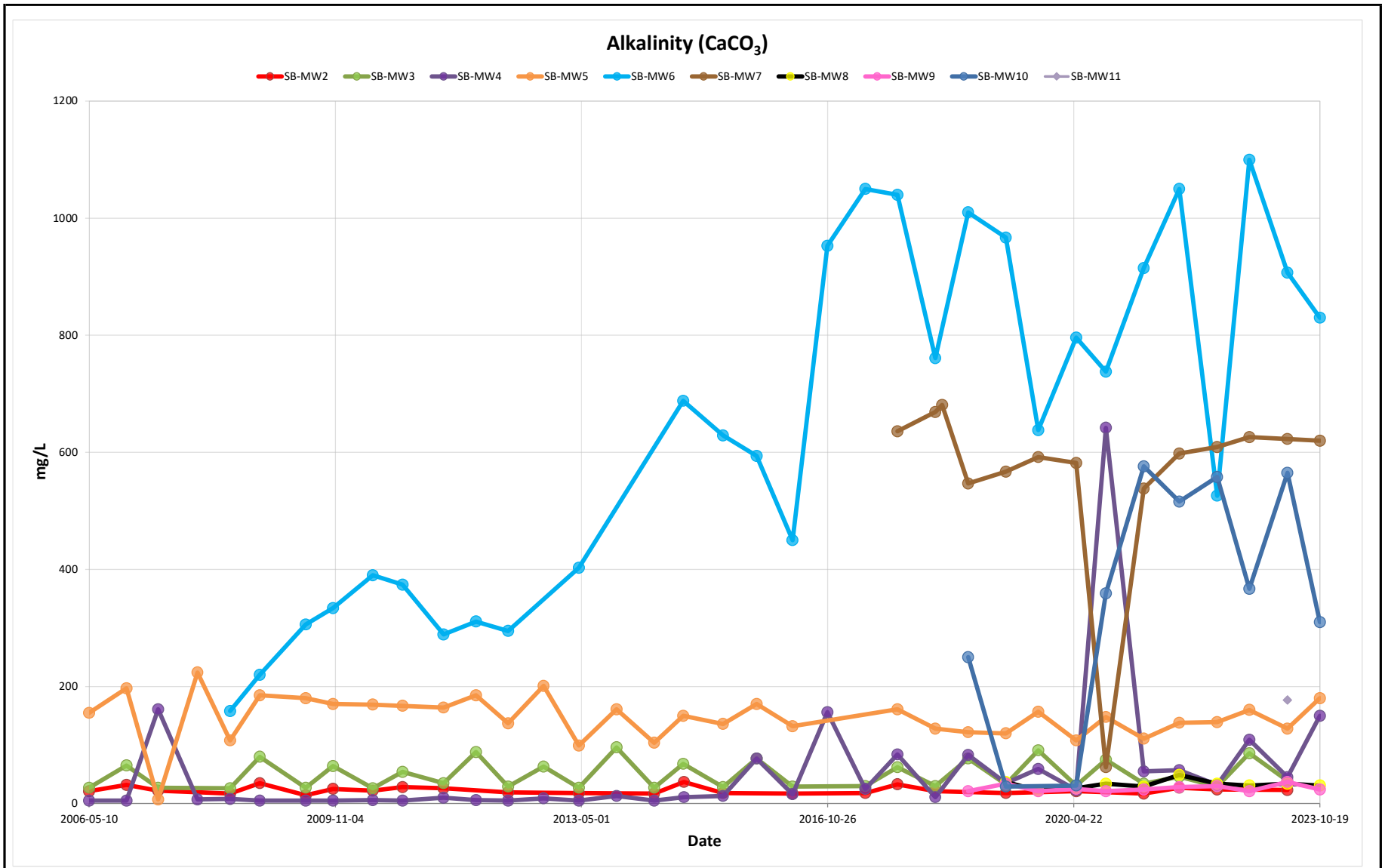


Photo 39: BAP-C – October 19, 2023



Photo 40: BAP-D – October 19, 2023

## Chemistry Trend Graphs



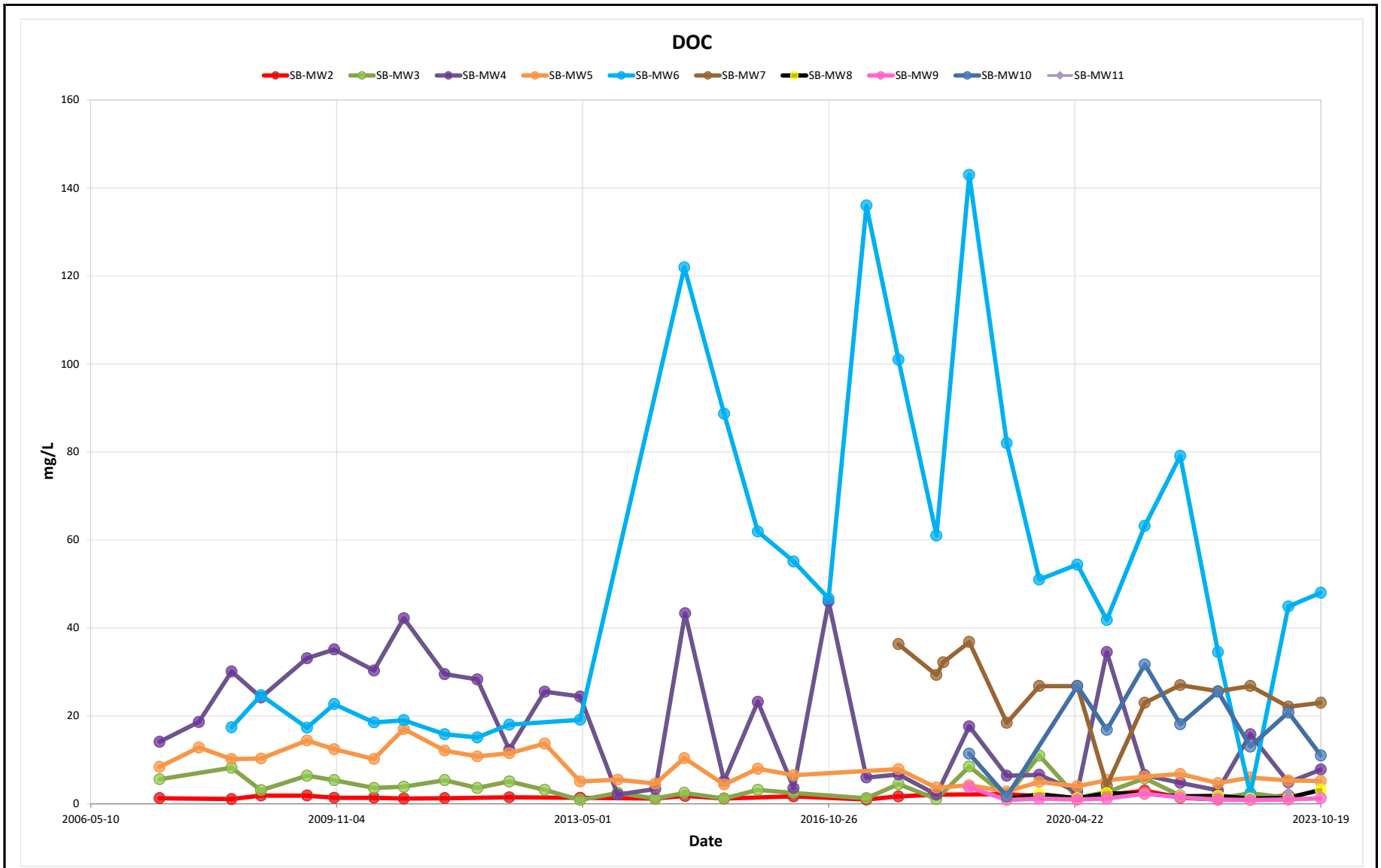
South Baptiste WDS  
Municipality of Hasting's Highlands

BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 1  
Alkalinity in Groundwater

Created by: LH  
Checked by: CM





South Baptiste WDS  
Municipality of Hasting's Highlands

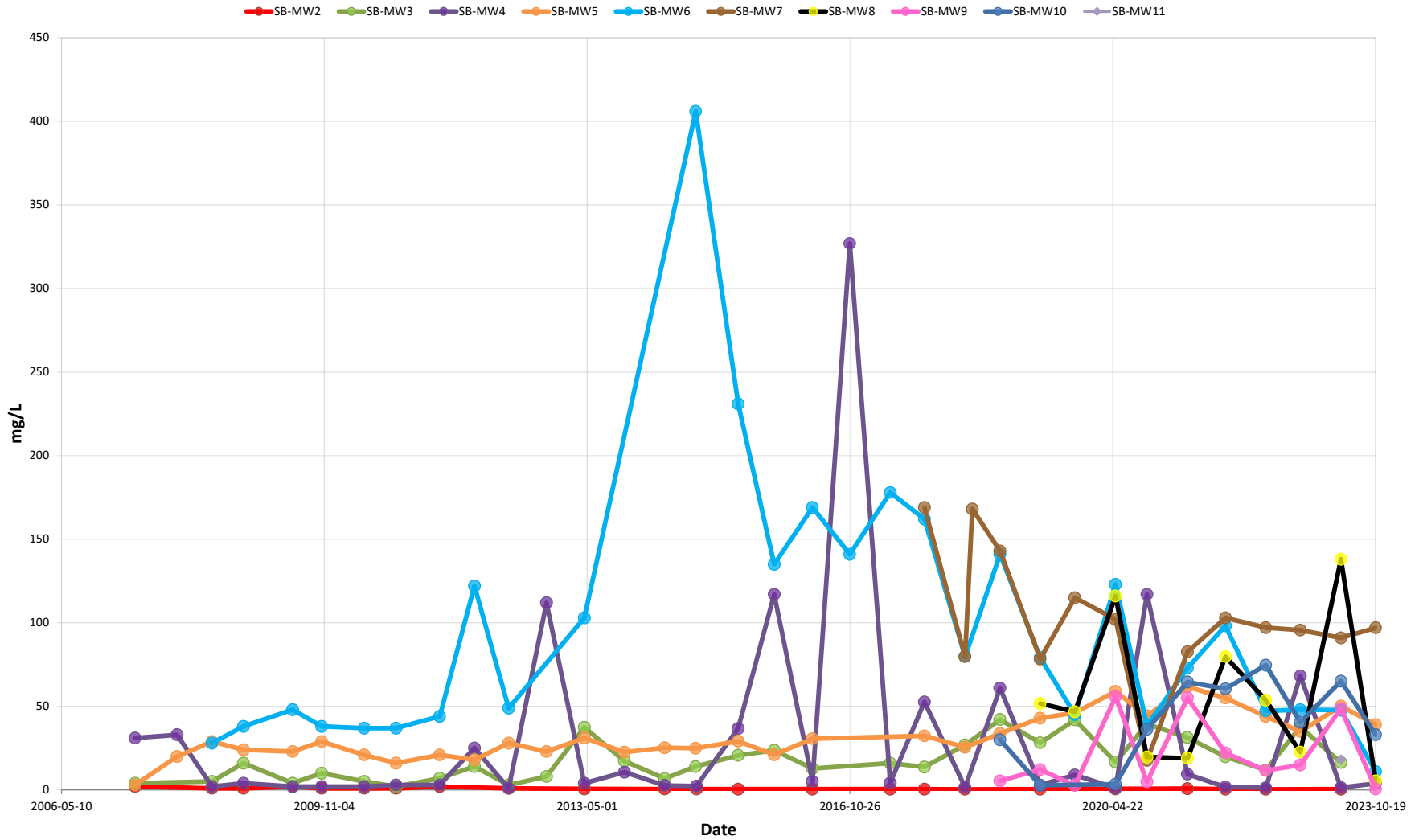
BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 2  
Dissolved Organic Carbon in Groundwater

Created by: LH  
Checked by: CM



### Chloride



South Baptiste WDS  
Municipality of Hasting's Highlands

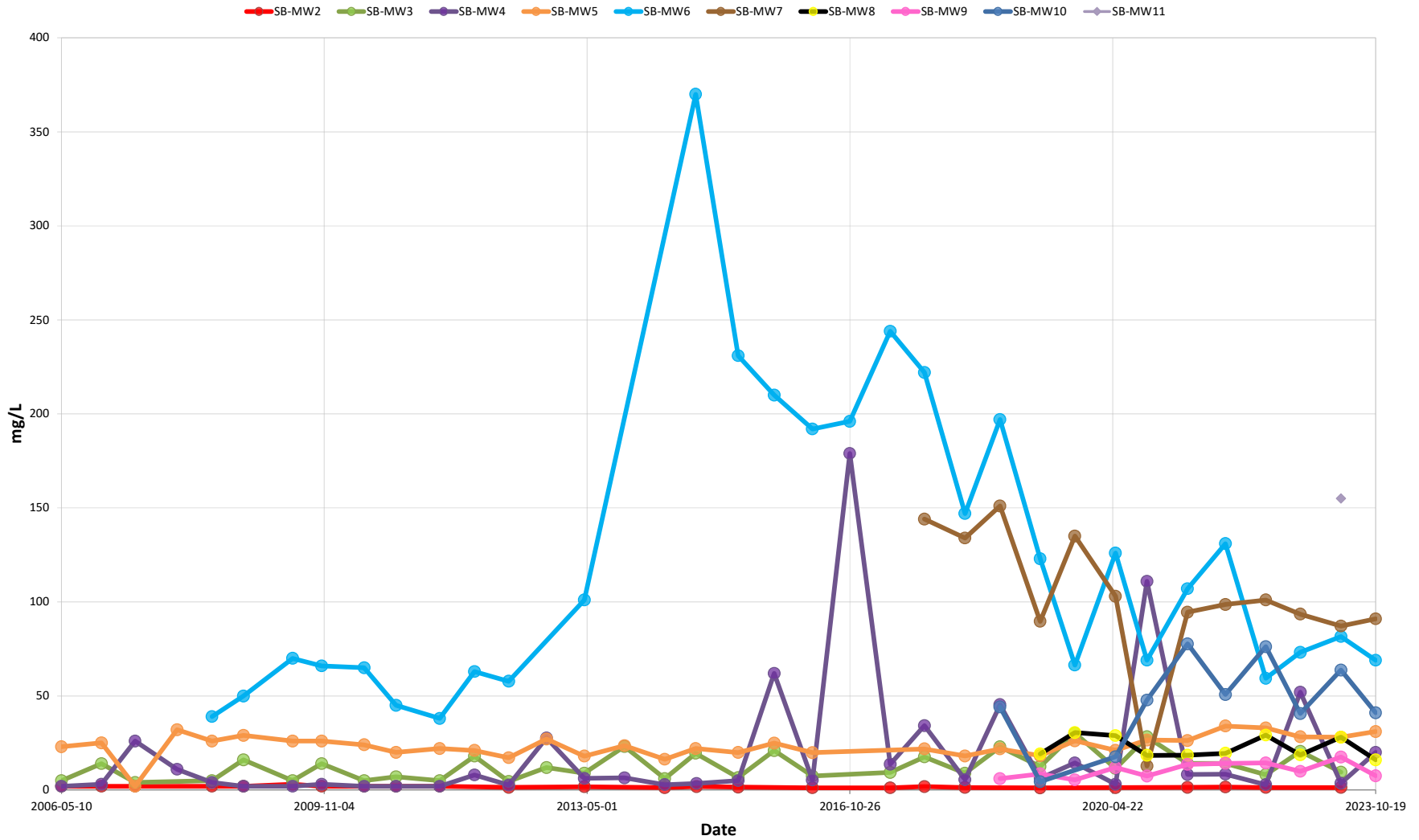
BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 3  
Chloride in Groundwater

Created by: LH  
Checked by: CM



### Sodium (Dissolved)



South Baptiste WDS  
Municipality of Hasting's Highlands

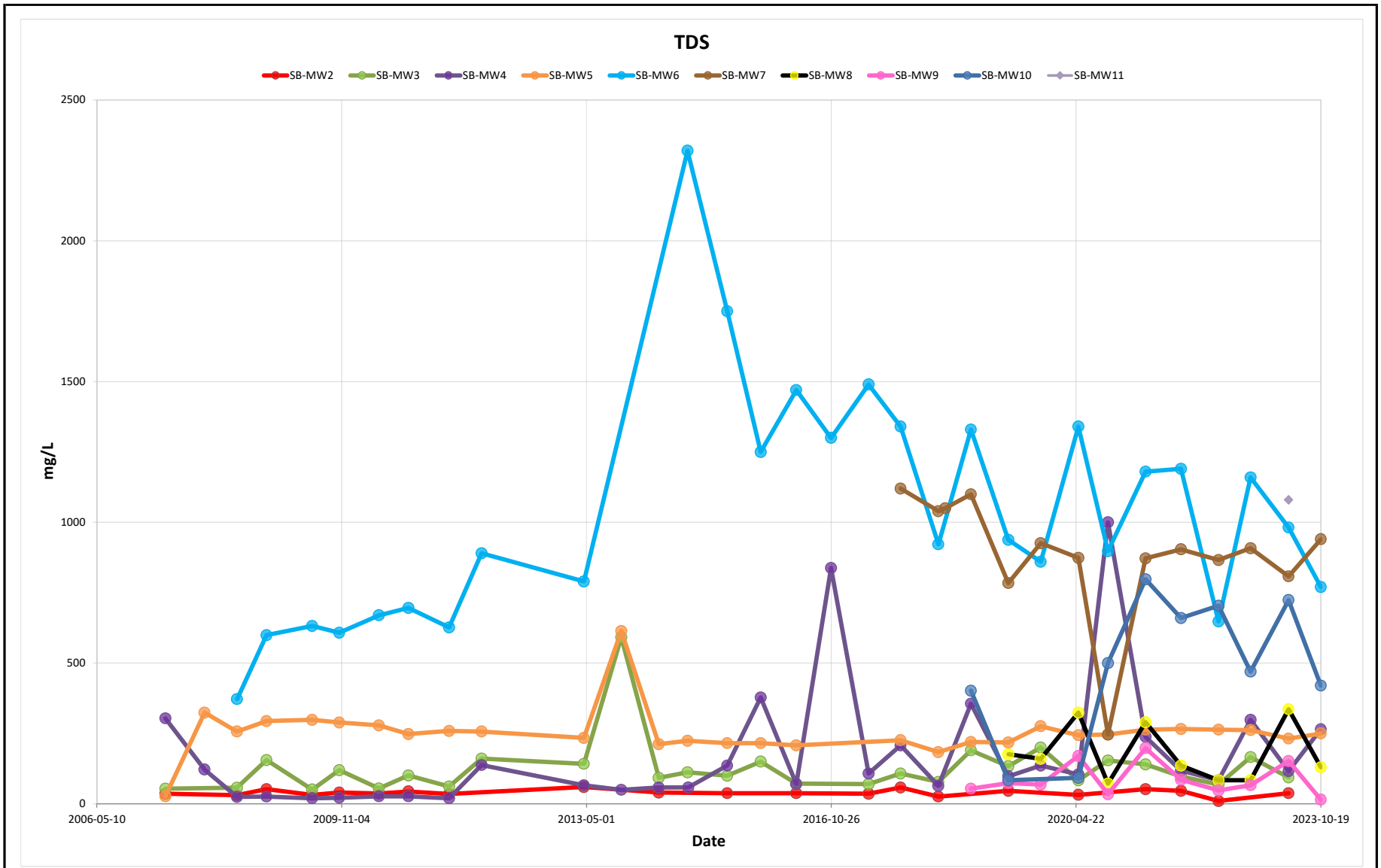
BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 4  
Dissolved Sodium in Groundwater

Created by: LH  
Checked by: CM







South Baptiste WDS  
Municipality of Hasting's Highlands

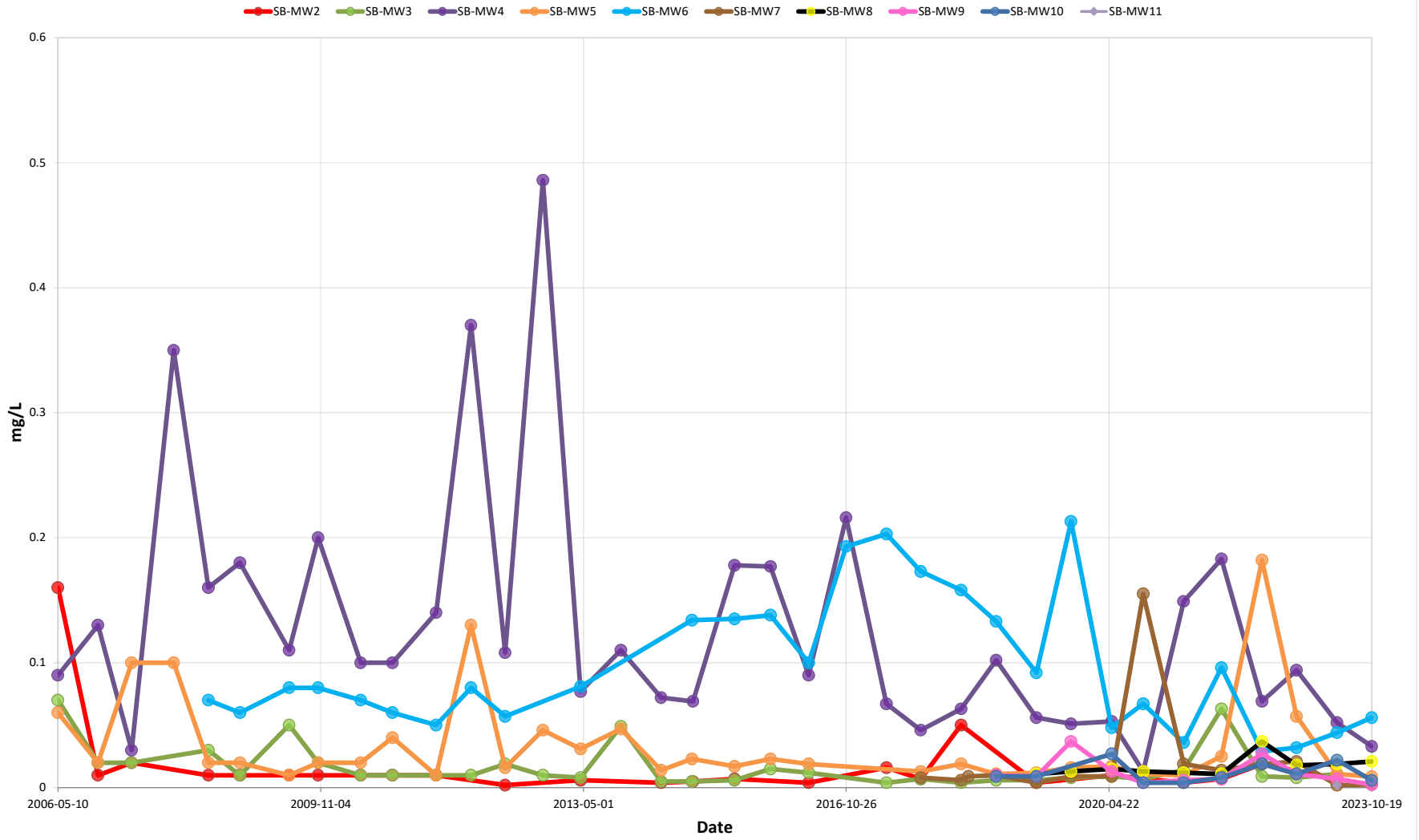
BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 5  
Total Dissolved Solids in Groundwater

Created by: LH  
Checked by: CM



### Aluminum (Dissolved)



South Baptiste WDS  
Municipality of Hasting's Highlands

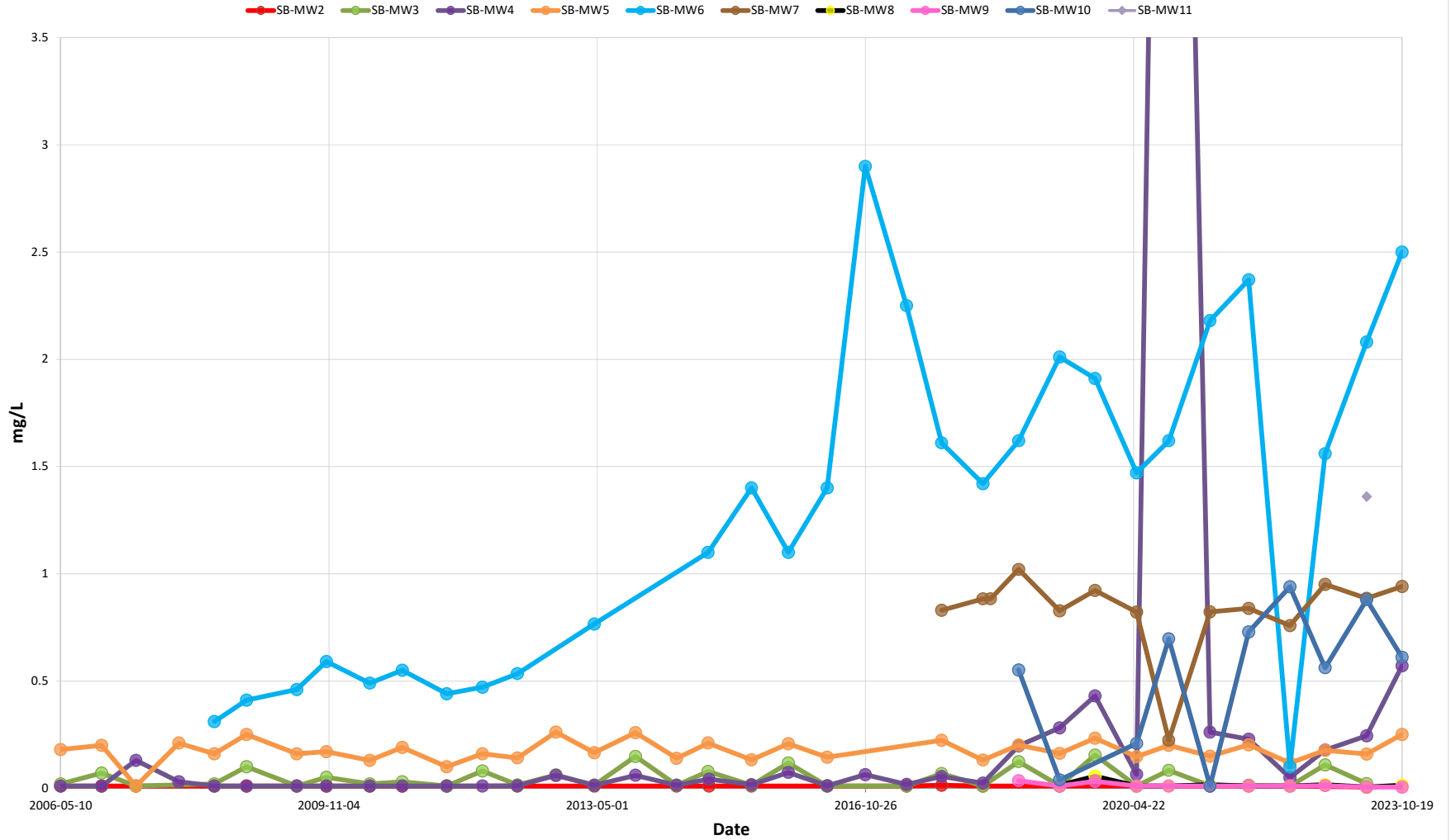
BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 6  
Dissolved Aluminum in Groundwater

Created by: LH  
Checked by: CM



### Boron (Dissolved)



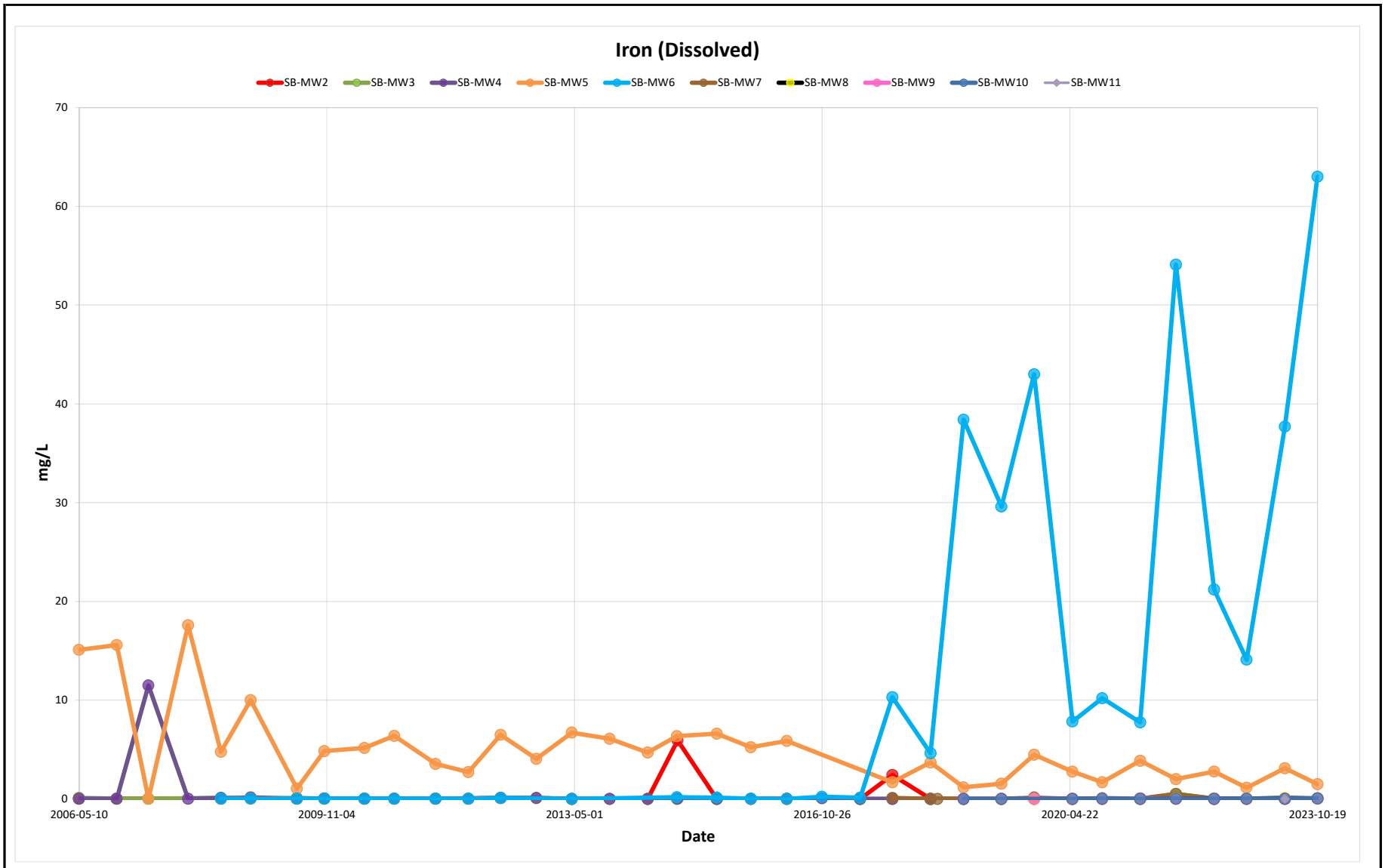
South Baptiste WDS  
Municipality of Hasting's Highlands

BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 7  
Dissolved Boron in Groundwater

Created by: LH  
Checked by: CM





South Baptiste WDS  
Municipality of Hasting's Highlands

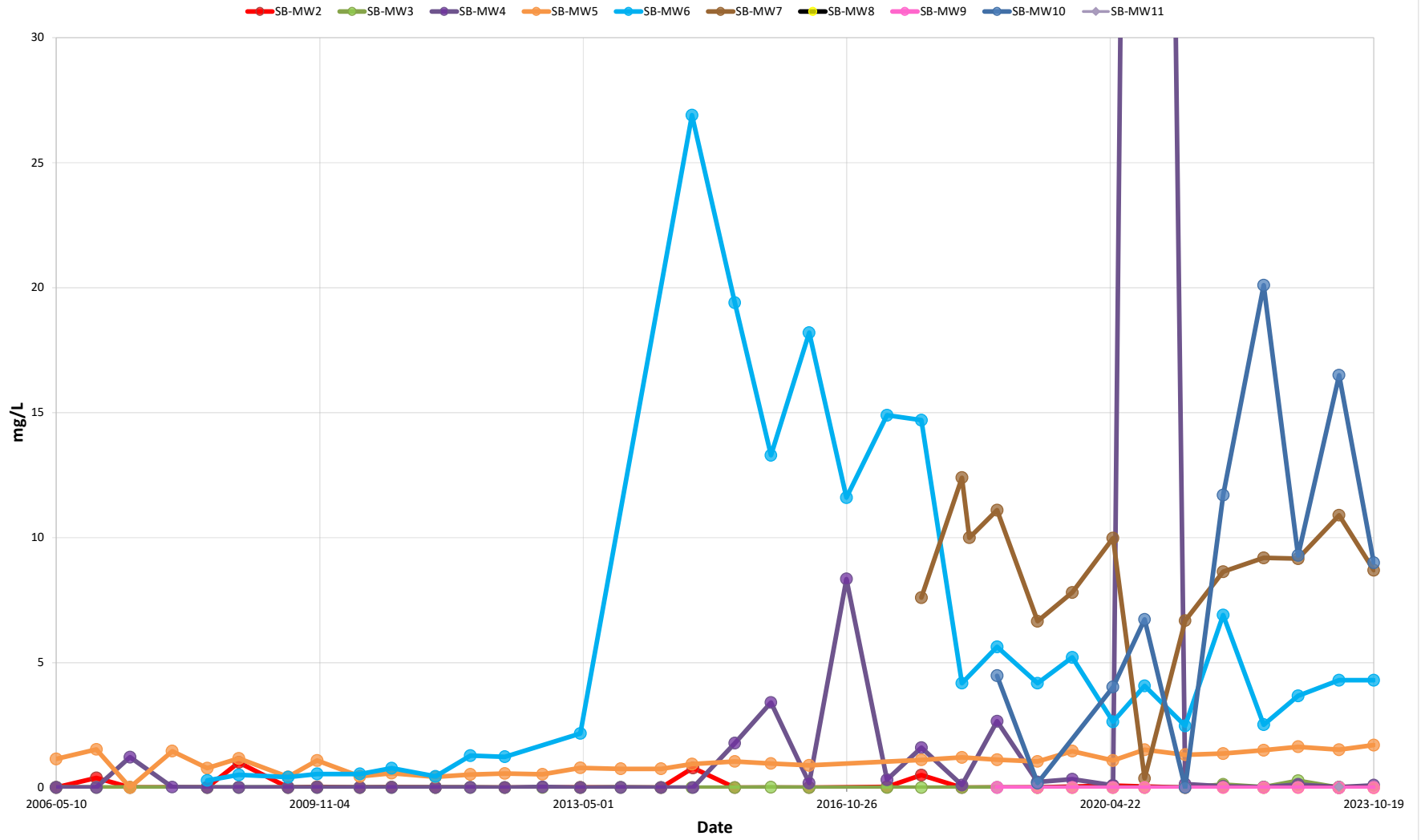
BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 8  
Dissolved Iron in Groundwater

Created by: LH  
Checked by: CM



### Manganese (Dissolved)



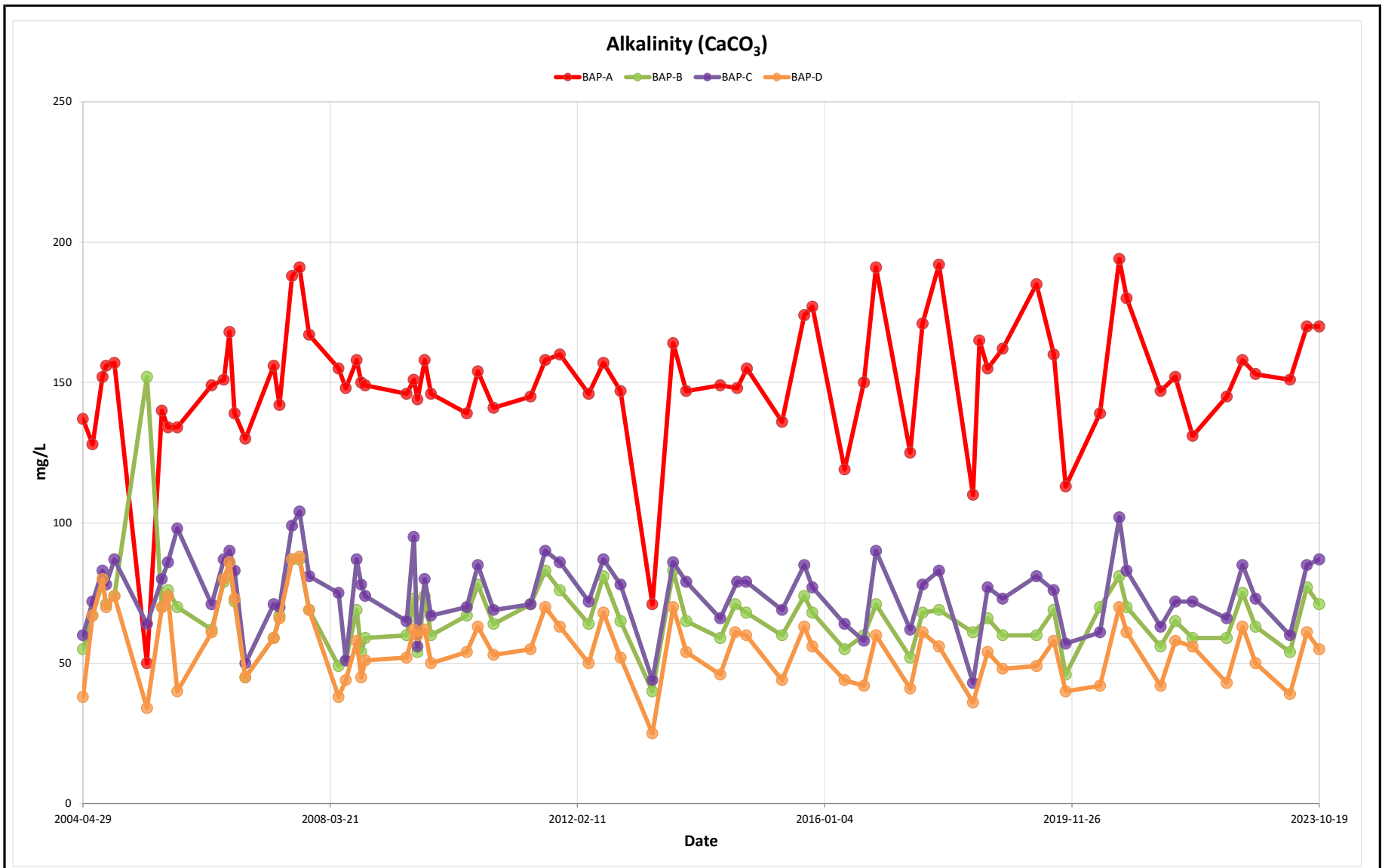
South Baptiste WDS  
Municipality of Hasting's Highlands

BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 9  
Dissolved Manganese in Groundwater

Created by: LH  
Checked by: CM





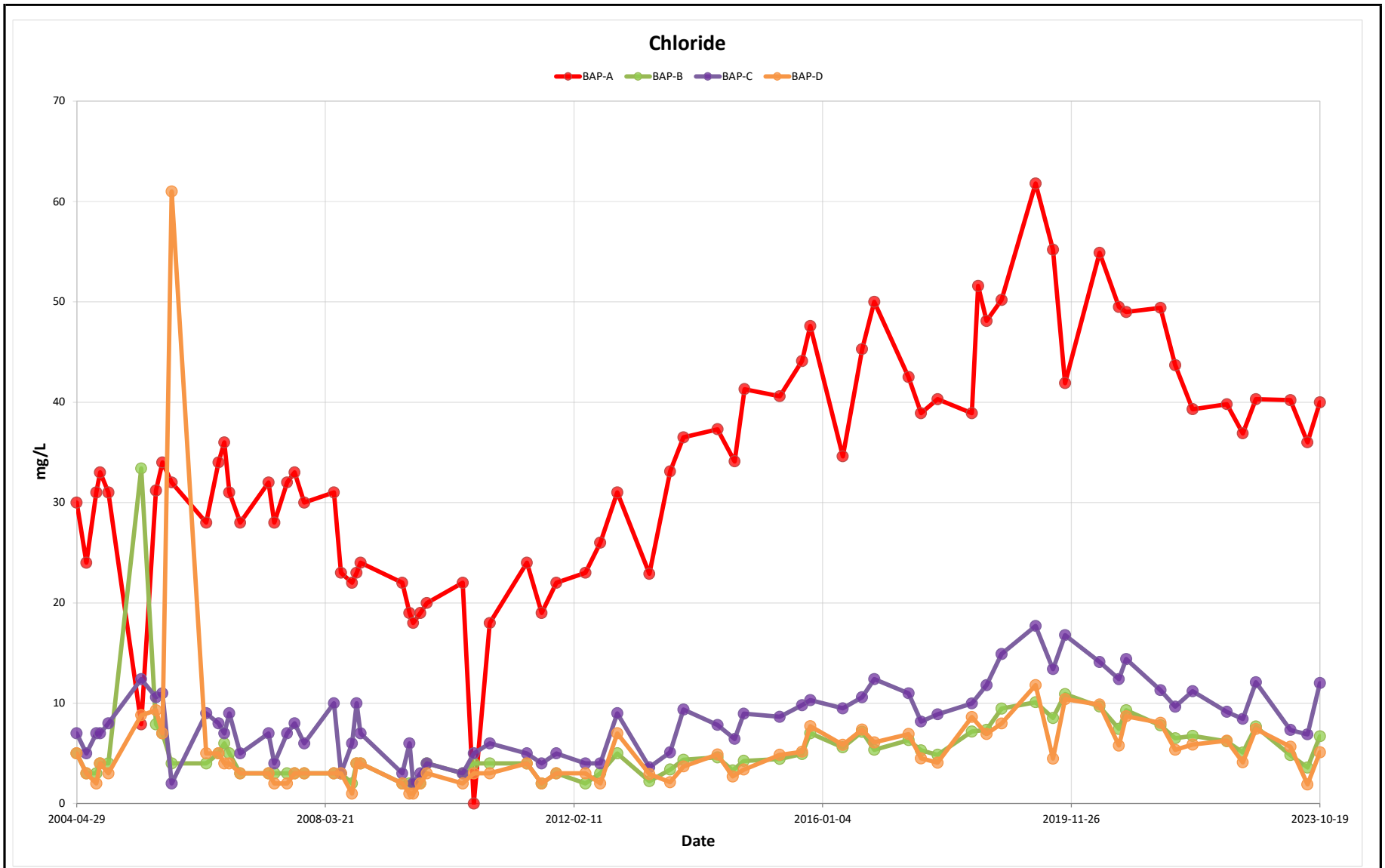
South Baptiste WDS  
Municipality of Hasting's Highlands

BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 10  
Alkalinity in Surface Water

Created by: LH  
Checked by: CM





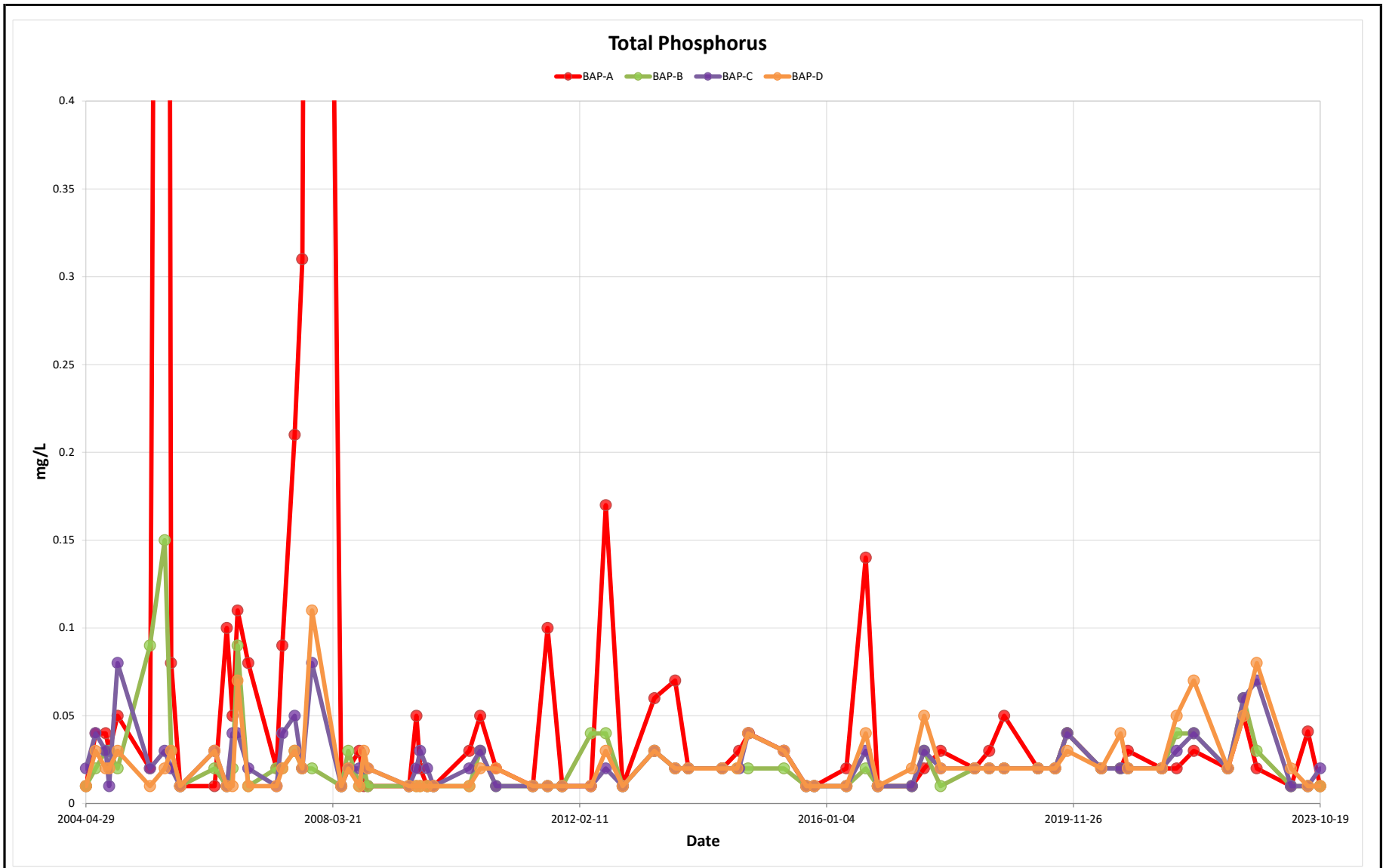
South Baptiste WDS  
Municipality of Hasting's Highlands

Graph 11  
Chloride in Surface Water

BluMetric Proj No: 230225  
Date: February 22, 2024

Created by: LH  
Checked by: CM





South Baptiste WDS  
Municipality of Hasting's Highlands

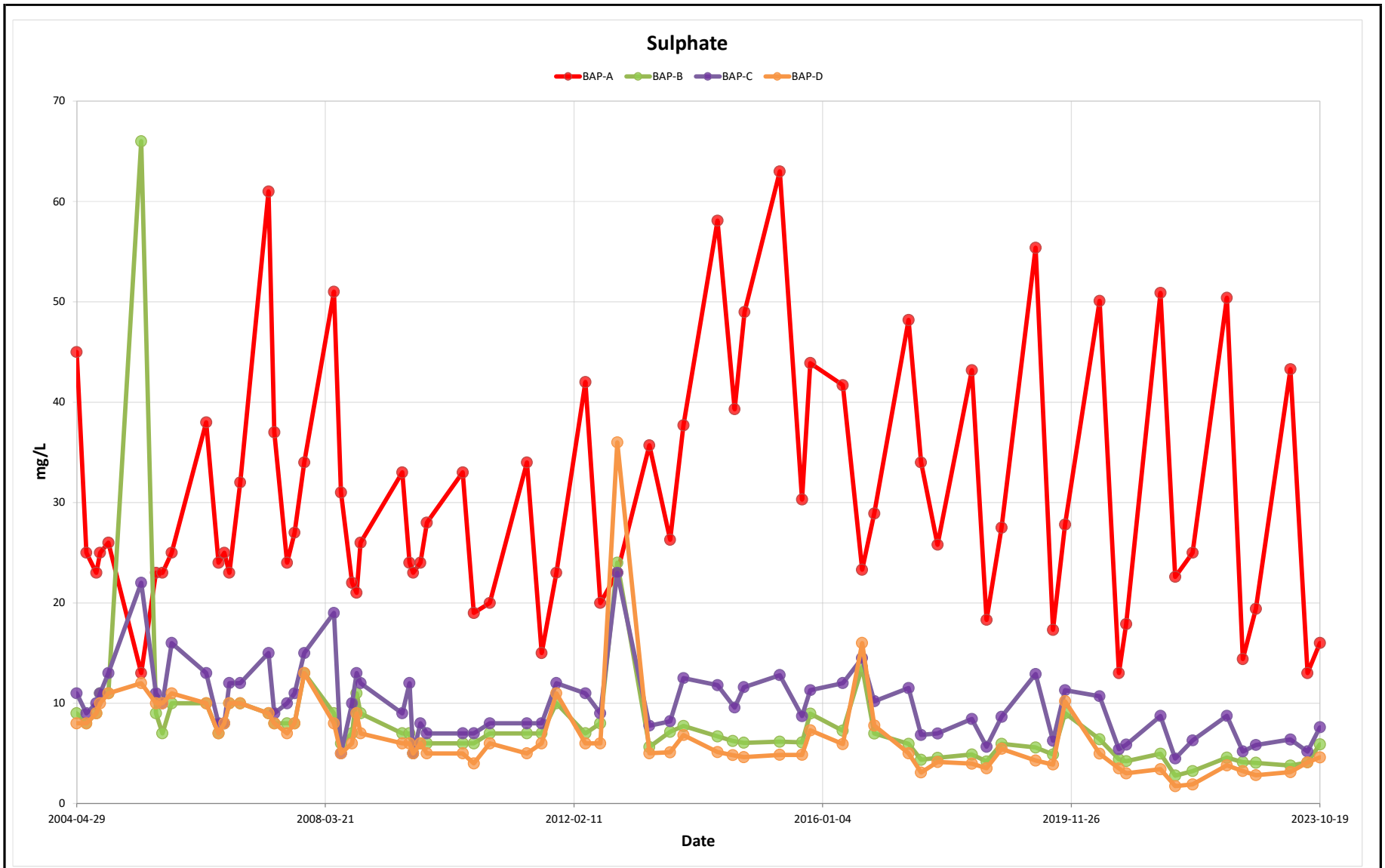
BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 12  
Total Phosphorus in Surface Water

Created by: LH  
Checked by: CM







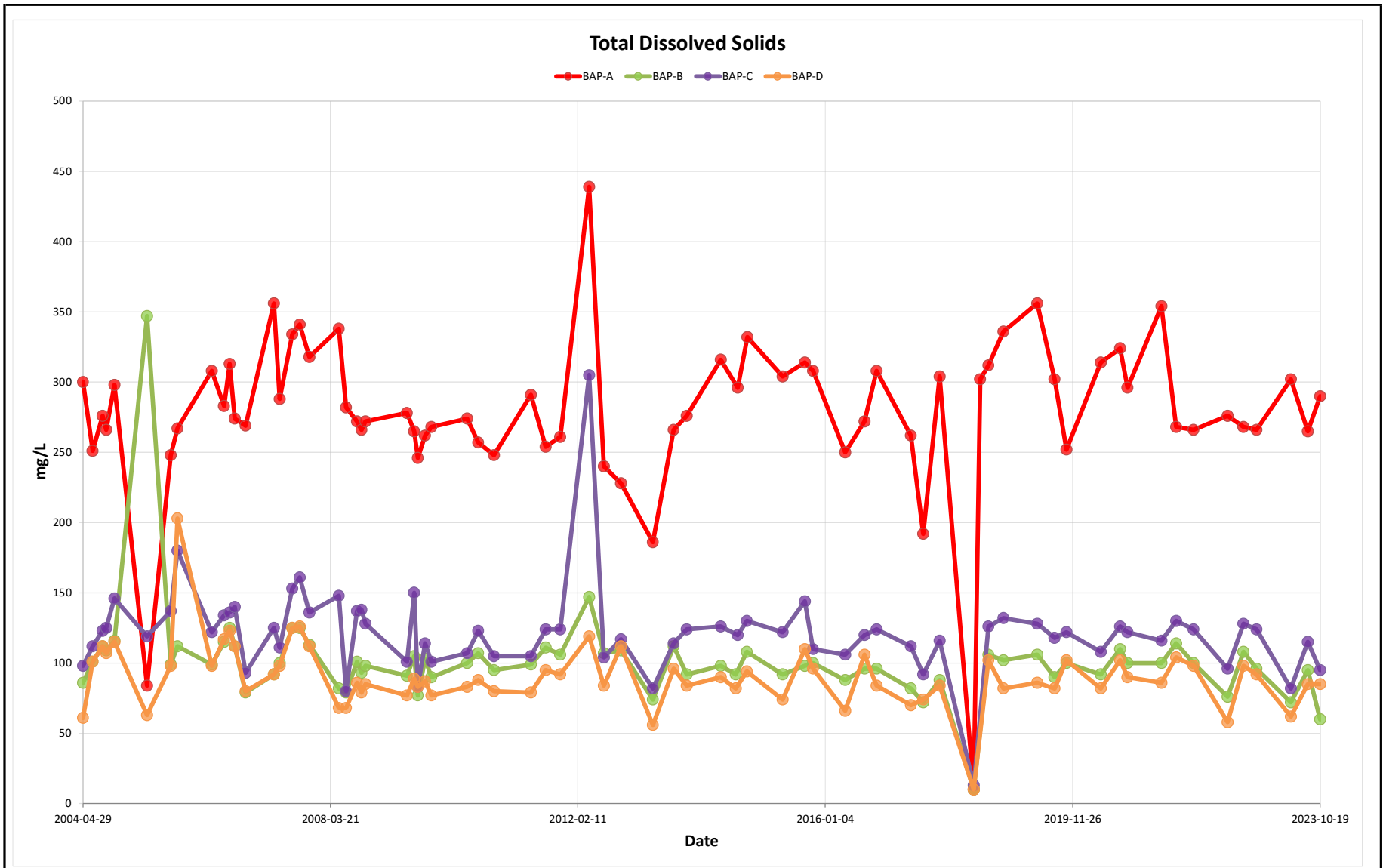
South Baptiste WDS  
Municipality of Hasting's Highlands

Graph 13  
Sulphate in Surface Water

BluMetric Proj No: 230225  
Date: February 22, 2024

Created by: LH  
Checked by: CM





South Baptiste WDS  
Municipality of Hasting's Highlands

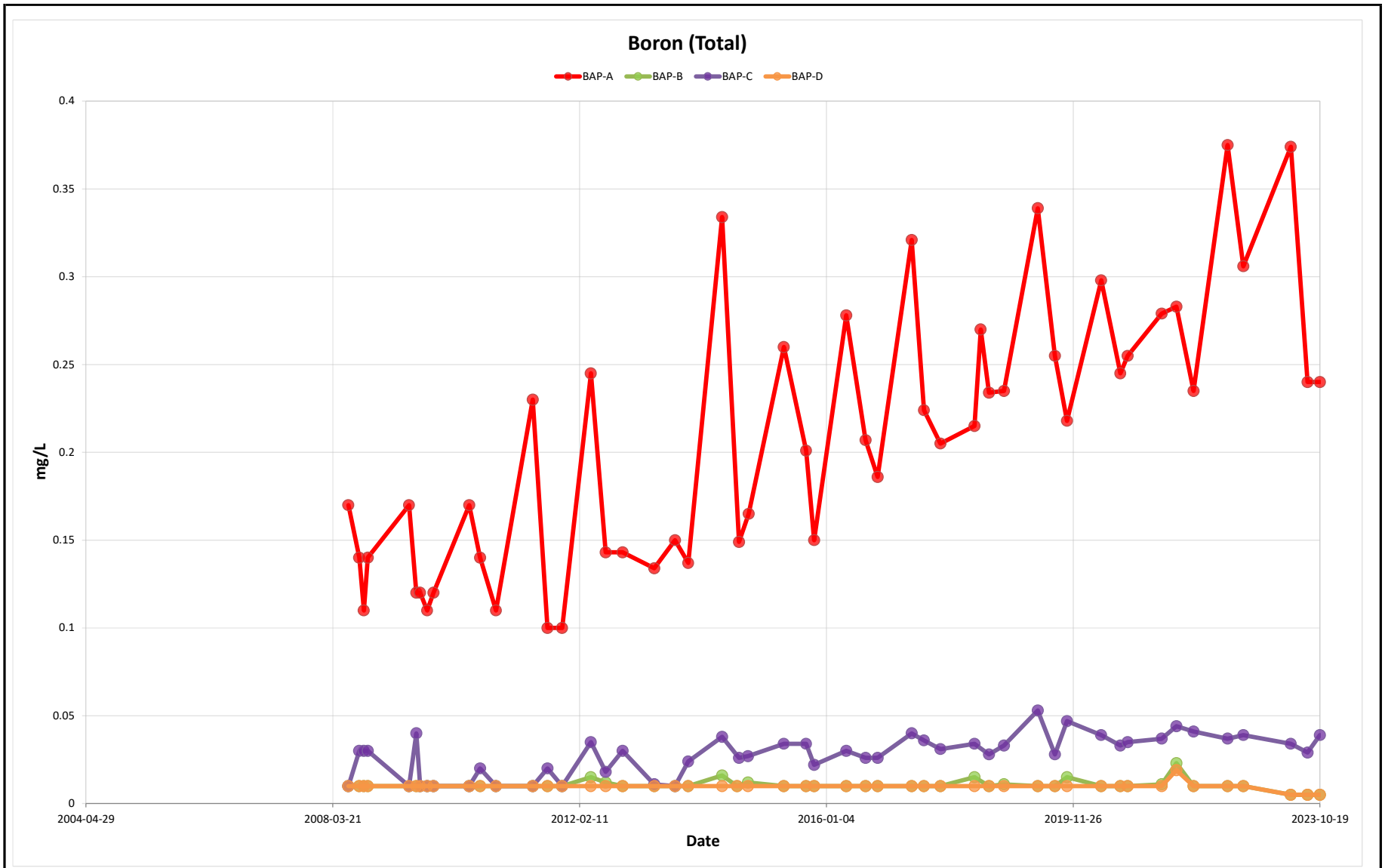
BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 14  
Total Dissolved Solids in Surface Water

Created by: LH  
Checked by: CM







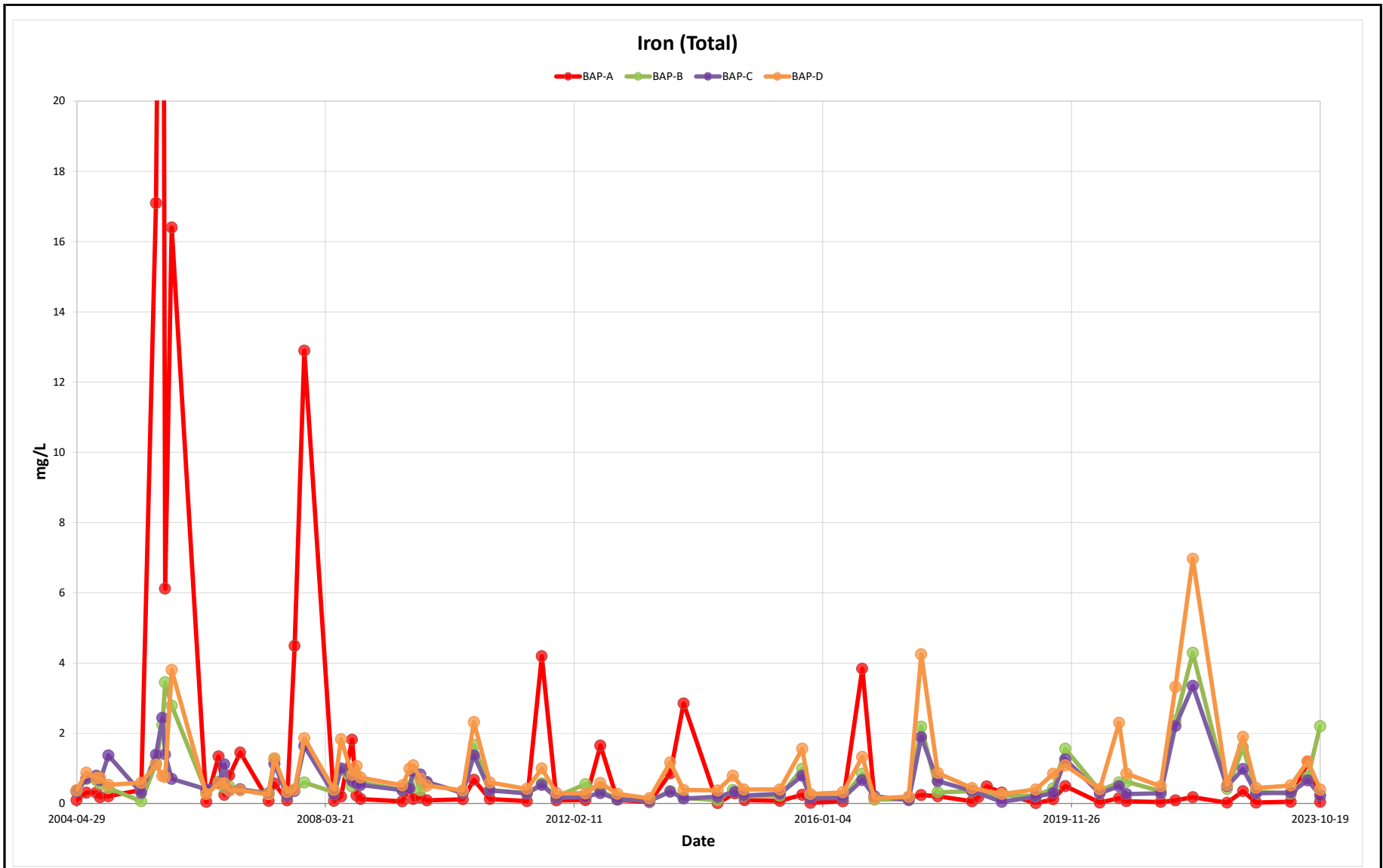
South Baptiste WDS  
Municipality of Hasting's Highlands

Graph 16  
Total Boron in Surface Water

BluMetric Proj No: 230225  
Date: February 22, 2024

Created by: LH  
Checked by: CM





South Baptiste WDS  
Municipality of Hasting's Highlands

BluMetric Proj No: 230225  
Date: February 22, 2024

Graph 17  
Total Iron in Surface Water

Created by: LH  
Checked by: CM



## **Appendix A**

A-1 Environmental Compliance Approval

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A361602

Issue Date: October 24, 2019

The Corporation of the Municipality of Hastings Highlands  
33011 Highway 62 N  
Post Office Box, No. 130  
Maynooth, Ontario  
K0L 2S0

Site Location: South Baptiste Waste Disposal Site  
2539 South Baptiste Lake Road, Maynooth  
Lot 28, Concession 4  
Hastings Highlands Municipality, County of Hastings

*You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:*

the use and operation of 2.02 hectare waste disposal/transfer site within a total site area of 4.46 hectares.

*For the purpose of this environmental compliance approval, the following definitions apply:*

- "Approval" means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";
- "Contaminating Life Span" means contaminating life span as defined in *Regulation 232* ;
- "Director" means any *Ministry* employee appointed in writing by the Minister pursuant to section 5 of the EPA as a Director for the purposes of Part II.1 of the *EPA*;
- "District Manager" means the District Manager of the local district office of the *Ministry* in which the *Site* is geographically located;
- "EPA" means *Environmental Protection Act* , R.S.O. 1990, c. E. 19, as amended;
- "Ministry" means the Ontario Ministry of the Environment, Conservation and Parks;
- "NMA" means *Nutrient Management Act* , 2002, S.O. 2002, c. 4, as amended;
- "Ontario Drinking Water Quality Standards" means Ontario Regulation 169/03 (Ontario Drinking

Water Quality Standards) as amended;

- “*Operator*” means any person, other than the *Owner's* employees, authorized by the *Owner* as having the charge, management or control of any aspect of the *Site* and includes its successors or assigns;
- “*Owner*” means any person that is responsible for the establishment or operation of the *Site* being approved by this *Approval*, and includes the Corporation of the County of the Municipality of Hastings Highlands and its successors and assigns;
- “*OWRA*” means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;
- “*PA*” means the *Pesticides Act*, R.S.O. 1990, c. P-11, as amended;
- “*Provincial Officer*” means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the *OWRA*, Section 5 of the *EPA*, Section 17 of the *PA*, Section 4 of the *NMA*, or Section 8 of the *SDWA*;
- “*Refrigerant Appliances*” means household appliances which use, or may use refrigerants, and which include, but is not restricted to, refrigerators, freezers and air-conditioning systems;
- “*Regional Director*” means the Regional Director of the local Regional Office of the *Ministry* in which the *Site* is located;
- “*Regulation 232*” means Ontario Regulation 232/98 (New Landfill Standards) made under the *EPA*, as amended from time to time;
- “*Regulation 347*” means Regulation 347, R.R.O. 1990, made under the *EPA*, as amended;
- “*Regulation 903*” means Regulation 903, R.R.O. 1990, made under the *OWRA*, as amended;
- “*SDWA*” means *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, as amended;
- “*Site*” means the entire waste disposal site, including the buffer lands, and contaminant attenuation zone at South Baptiste Waste Disposal Site, 2539 South Baptiste Lake Road, Maynooth, Lot 28, Concession 4 Hastings Highlands Municipality, County of Hastings; and
- “*Trained Personnel*” means personnel knowledgeable in the following through instruction and/or practice:
  - o relevant waste management legislation, regulations and guidelines;
  - o major environmental concerns pertaining to the waste to be handled;
  - o occupational health and safety concerns pertaining to the processes and wastes to be handled;
  - o management procedures including the use and operation of equipment for the processes and wastes to be handled;
  - o emergency response procedures;
  - o specific written procedures for the control of nuisance conditions;
  - o specific written procedures for refusal of unacceptable waste loads; and
  - o the requirements of this *Approval*.



*You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:*

## **TERMS AND CONDITIONS**

### **1. GENERAL**

#### **Compliance**

- (1) The *Owner* and *Operator* shall ensure compliance with all the conditions of this *Approval* and shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of this *Approval* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
- (2) Any person authorized to carry out work on or operate any aspect of the *Site* shall comply with the conditions of this *Approval*.

#### **In Accordance**

- (3) Except as otherwise provided by this *Approval*, the *Site* shall be designed, developed, built, operated and maintained in accordance with the documentation listed in the attached Schedule "A".

#### **Interpretation**

- (4) Where there is a conflict between a provision of any document listed in Schedule "A" in this *Approval*, and the conditions of this *Approval*, the conditions in this *Approval* shall take precedence.
- (5) Where there is a conflict between the application and a provision in any document listed in Schedule "A", the application shall take precedence, unless it is clear that the purpose of the document was to amend the application and that the *Ministry* approved the amendment.
- (6) Where there is a conflict between any two documents listed in Schedule "A", the document bearing the most recent date shall take precedence.
- (7) The conditions of this *Approval* are severable. If any condition of this *Approval*, or the application of any condition of this *Approval* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Approval* shall not be affected thereby.

### **Other Legal Obligations**

- (8) The issuance of, and compliance with, this *Approval* does not:
- a. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
  - b. limit in any way the authority of the *Ministry* to require certain steps be taken or to require the *Owner* and *Operator* to furnish any further information related to compliance with this *Approval*.

### **Adverse Effect**

- (9) The *Owner* and *Operator* shall take steps to minimize and ameliorate any adverse effect on the natural environment or impairment of water quality resulting from the *Site*, including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.
- (10) Despite an *Owner*, *Operator* or any other person fulfilling any obligations imposed by this *Approval* the person remains responsible for any contravention of any other condition of this *Approval* or any applicable statute, regulation, or other legal requirement resulting from any act or omission that caused the adverse effect to the natural environment or impairment of water quality.

### **Change of Ownership**

- (11) The *Owner* shall notify the *Director*, in writing, and forward a copy of the notification to the *District Manager*, within 30 days of the occurrence of any changes in the following information:
- a. the ownership of the *Site*;
  - b. the *Operator* of the *Site*;
  - c. the address of the *Owner or Operator*; and
  - d. the partners, where the *Owner or Operator* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act*, R. S. O. 1990, c. B.17, shall be included in the notification.
- (12) No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and sufficient financial assurance is deposited with the *Ministry* to ensure that these conditions will be carried out.
- (13) In the event of any change in ownership of the *Site*, other than change to a successor municipality, the *Owner* shall notify the successor of and provide the successor with a copy of this *Approval*, and the *Owner* shall provide a copy of the notification to the *District Manager* and the *Director*.

### Registration on Title Requirement

- (14) Prior to dealing with the property in any way, the *Owner* shall provide a copy of this *Approval* and any amendments, to any person who will acquire an interest in the property as a result of the dealing.
- (15) a. If the *Site* is not patented, the *Owner* shall, within three (3) years of receiving the patent for the land occupying the waste disposal site, submit to the *Director* a completed Certificate of Requirement which shall include:
- (i) a plan of survey prepared, signed and sealed by an Ontario Land Surveyor, which shows the area of the *Site* where waste has been or is to be deposited at the *Site*;
  - (ii) proof of ownership of the *Site*;
  - (iii) a letter signed by a member of the Law Society of Upper Canada or other qualified legal practitioner acceptable to the *Director*, verifying the legal description provided in the Certificate of Requirement;
  - (iv) the legal abstract of the property; and
  - (v) any supporting documents including a registerable description of the *Site*.
- b. Within thirty (30) calendar days of receiving a Certificate of Requirement authorized by the *Director*, the *Owner* shall:
- (i) register the Certificate of Requirement in the appropriate Land Registry Office on the title to the property; and
  - (ii) submit to the *Director* and the District Manager, written verification that the Certificate of Requirement has been registered on title.

### Inspections by the Ministry

- (16) No person shall hinder or obstruct a *Provincial Officer* from carrying out any and all inspections authorized by the *OWRA*, the *EPA*, the *PA*, the *SDWA* or the *NMA*, of any place to which this *Approval* relates, and without limiting the foregoing:
- a. to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this *Approval* are kept;
  - b. to have access to, inspect, and copy any records required to be kept by the conditions of this *Approval*;
  - c. to inspect the *Site*, related equipment and appurtenances;
  - d. to inspect the practices, procedures, or operations required by the conditions of this *Approval*; and
  - e. to sample and monitor for the purposes of assessing compliance with the terms and conditions of this *Approval* or the *EPA*, the *OWRA*, the *PA*, the *SDWA* or the *NMA*.

### Information and Record Retention

- (17) a. Except as authorized in writing by the *Director*, all records required by this

*Approval* shall be retained at the *Site* for a minimum of two (2) years from their date of creation.

- b. The *Owner* shall retain all documentation listed in Schedule "A" for as long as this *Approval* is valid.
  - c. All monthly summary reports of waste records collected are to be kept at the *Site* until they are included in the Annual Report.
  - d. The *Owner* shall retain employee training records as long as the employee is working at the *Site*.
  - e. The *Owner* shall make all of the above documents available for inspection upon request of *Ministry* staff.
- (18) The receipt of any information by the *Ministry* or the failure of the *Ministry* to prosecute any person or to require any person to take any action under this *Approval* or under any statute, regulation or other legal requirement, 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 any term or condition of this *Approval* or any statute, regulation or other legal requirement; or
  - b. acceptance by the *Ministry* of the information's completeness or accuracy.
19. The *Owner* shall ensure that a copy of this *Approval*, in its entirety and including all its Notices of Amendment, and documentation listed in Schedule "A", are retained at the *Site* at all times.
20. Any information related to this *Approval* and contained in *Ministry* files may be made available to the public in accordance with the provisions of the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31.

## 2. SITE OPERATION

### Operation

- (1) The *Site* shall be operated and maintained at all times including management and disposal of all waste, in accordance with the *EPA, Regulation 347*, and the conditions of this *Approval*. At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

### Signs

- (2) A sign shall be installed and maintained at the main entrance/exit to the *Site* which

legibly display the following information:

- a. the name of the *Site* and *Owner*;
  - b. the number of the *Approval*;
  - c. the name of the *Operator*;
  - d. the normal hours of operation;
  - e. the allowable and prohibited waste types;
  - f. the telephone number to which complaints may be directed;
  - g. a warning against unauthorized access;
  - h. a twenty-four (24) hour emergency telephone number (if different from above);  
and
  - i. a warning against dumping outside the *Site*.
- (3) The *Owner* shall install and maintain signs to direct vehicles to working face and recycling areas.
- (4) The *Owner* shall provide signs at recycling depot informing users what materials are acceptable and directing users to appropriate storage areas.

#### **Vermin, Vectors, Dust, Litter, Odour, Noise and Traffic**

- (5) The *Site* shall be operated and maintained such that the vermin, vectors, dust, litter, odour, noise and traffic do not create a nuisance.

#### **Burning Waste Prohibited**

- (6) a. Burning of waste at the *Site* is prohibited.
- b. Notwithstanding Condition 2. (6) (a) above, burning of segregated, clean wood and brush at the landfill may be carried out in strict compliance with the *Ministry* document titled "Guideline C-7, Burning at Landfill Sites" dated April 1994.

#### **Site Access**

- (7) Waste shall only be accepted during the following time periods:

##### **Summer (Victoria Day to Thanksgiving Day)**

Wednesday	:12:00 p.m. - 5:00 p.m.
Saturday	:07:00 a.m. - 12:00 p.m.
Sunday	:12:00 p.m. - 7:00 p.m.
Statutory Holiday Monday	:12:00 p.m. - 7:00 p.m.

##### **Winter (Thanksgiving Day to Victoria Day)**

Wednesday	:12:00 p.m. - 5:00 p.m.
Saturday and Sunday	:12:00 p.m. - 5:00 p.m.

- (8) On-site equipment used for daily site preparation and closing activities may be operated

one (1) hour before and one (1) hour after the hours of operation approved by this *Approval*.

- (9) With the prior written approval from the *District Manager*, the time periods may be extended to accommodate seasonal or unusual quantities of waste.

### **Site Security**

- (10) (a) No waste shall be received, landfilled or removed from the *Site* unless a site supervisor or an attendant is present and supervises the operations during operating hours. The *Site* shall be closed when a site attendant is not present to supervise landfilling operations.
- (b) Waste/recyclables may be removed from the *Site* or brought into the *Site* by a registered/licensed waste hauler who are *Trained Personnel* during the hours of 7 a.m. to 5 p.m. Monday to Friday.
- (11) The *Site* shall be operated and maintained in a safe and secure manner. During non-operating hours, the *Site* entrance and exit gates shall be locked and the *Site* shall be secured against access by unauthorized persons.

### **3. EMPLOYEE TRAINING**

- (1) A training plan for all employees that operate any aspect of the *Site* shall be developed and implemented by the *Owner* or the *Operator*. Only *Trained Personnel* shall operate any aspect of the *Site* or carry out any activity required under this *Approval*.

### **4. COMPLAINTS RESPONSE PROCEDURE**

- (1) If at any time the *Owner* receives complaints regarding the operation of the *Site*, the *Owner* shall respond to these complaints according to the following procedure:
- a. The *Owner* shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;
- b. The *Owner*, upon notification of the complaint, shall initiate appropriate steps to determine possible causes of the complaint, proceed to take the necessary actions to eliminate the cause of the complaint and forward a formal reply to the complainant; and
- c. The *Owner* shall complete and retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes

to reasonably avoid the recurrence of similar incidents.

## 5. EMERGENCY RESPONSE

- (1) All Spills as defined in the *EPA* shall be immediately reported to the *Ministry's Spills Action Centre at 1-800-268-6060* and shall be recorded in the log book as to the nature of the emergency situation, and the action taken for clean-up, correction and prevention of future occurrences.
- (2) In addition, the *Owner* shall submit, to the *District Manager* a written report within three (3) business days of the emergency situation, outlining the nature of the incident, remedial measures taken, handling of waste generated as a result of the emergency situation and the measures taken to prevent future occurrences at the *Site*.
- (3) All wastes resulting from an emergency situation shall be managed and disposed of in accordance with *Regulation 347*.
- (4) All equipment and materials required to handle the emergency situations shall be:
  - a. kept on hand at all times that waste landfilling and/or handling is undertaken at the *Site*; and
  - b. adequately maintained and kept in good repair.
- (5) The *Owner* shall ensure that the emergency response personnel are familiar with the use of such equipment and its location(s).

## 6. INSPECTIONS, RECORD KEEPING AND REPORTING

### Daily Log Book

- (1) A daily log shall be maintained in written or electronic format and shall include the following information:
  - a. the type, date and time of arrival, hauler, and quantity (tonnes) of all waste and cover material received at the *Site*;
  - b. the area of the *Site* in which waste disposal operations are taking place;
  - c. a record of litter collection activities and the application of any dust suppressants;
  - d. a record of the daily inspections; and
  - e. a description of any out-of-service period of any control, treatment, disposal or monitoring facilities, the reasons for the loss of service, and action taken to restore and maintain service.
- (2) Any information requested, by the *Director* or a *Provincial Officer*, concerning the *Site* and its operation under this *Approval*, including but not limited to any records required to be kept by this *Approval* shall be provided to the *Ministry*, upon request.

### **Daily Inspections and Log Book**

- (3) An inspection of the entire *Site* and all equipment on the *Site* shall be conducted each day the *Site* is in operation to ensure that: the *Site* is secure; that the operation of the *Site* is not causing any nuisances; that the operation of the *Site* is not causing any adverse effects on the environment and that the *Site* is being operated in compliance with this *Approval*. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Site* if needed.
- (4) A record of the inspections shall be kept in a daily log book that includes:
  - a. the name and signature of person that conducted the inspection;
  - b. the date and time of the inspection;
  - c. the list of any deficiencies discovered;
  - d. the recommendations for remedial action; and
  - e. the date, time and description of actions taken.
- (5) A record shall be kept in the daily log book of all refusals of waste shipments, the reason(s) for refusal, and the origin of the waste, if known.

### **Annual Report**

- (6) A written report on the development, operation and monitoring of the *Site*, shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *District Manager*, by March 31st of the year following the period being reported upon.
- (7) The Annual Report shall include but not be limited to the following information:
  - a. the results and an interpretive analysis of the results of all leachate, groundwater surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;
  - b. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site*, and the adequacy of and need to implement the contingency plans;
  - c. site plans showing the existing contours of the *Site*; areas of landfilling operation during the reporting period; areas of intended operation during the next reporting period; areas of excavation during the reporting period; the progress of final cover, vegetative cover, and any intermediate cover application; facilities existing, added or removed during the reporting period; and site preparations and facilities planned for installation during the next reporting period;
  - d. calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of *Site* capacity used during the reporting period;
  - e. calculation of the remaining capacity of the *Site* and an estimate of the remaining *Site* life;



- f. a summary of the weekly, maximum daily and total annual quantity (tonnes) of waste received at the *Site*;
- g. a summary of any complaints received and the responses made;
- h. a discussion of any operational problems encountered at the *Site* and corrective action taken;
- i. any changes to the Design and Operations Report and the Closure Plan that have been approved by the *Director* since the last *Annual Report*;
- j. a report on the status of all monitoring wells and a statement as to compliance with *Regulation 903*; and
- k. any other information with respect to the *Site* which the *District Manager* may require from time to time.

## 7. LANDFILL DESIGN AND DEVELOPMENT

### Approved Waste Types

- (1) Only municipal waste as defined under *Regulation 347* being solid non-hazardous shall be accepted at the *Site* for landfilling.
- (2) The *Owner* shall develop and implement a program to inspect waste to ensure that the waste received at the *Site* is of a type approved for acceptance under this *Approval*.
- (3) The *Owner* shall ensure that all loads of waste are properly inspected by *Trained personnel* prior to acceptance at the *Site* and that the waste vehicles are directed to the appropriate areas for disposal or transfer of the waste. The *Owner* shall notify the *District Manager*, in writing, of load rejections at the *Site* within one (1) business day from their occurrence.

### Capacity

- (4) Approved maximum volumetric capacity of the *Site*, consisting of the waste, daily cover and intermediate cover, but excluding the final cover is 82,785 cubic metres.

### Service Area

- (5) Only waste that is generated within the boundaries of the Municipality of Hastings Highlands may be accepted at the *Site*.

### Cover

- (6) Alternative materials to soil may be used as weekly and interim cover material, based on an application with supporting information and applicable fee for a trial use or permanent use, submitted by the *Owner* to the *Director*, copied to the *District Manager* and as approved by the *Director* via an amendment to this *Approval*. The alternative material

shall be non-hazardous according to *Regulation 347* and will be expected to perform at least as well as soil in relation to the following functions:

- a. Control of blowing litter, odours, dust, landfill gas, gulls, vectors, vermin and fires;
- b. Provision for an aesthetic condition of the landfill during the active life of the *Site*;
- c. Provision for vehicle access to the active tipping face; and
- d. Compatibility with the design of the *Site* for groundwater protection, leachate management and landfill gas management.

(7) Cover material shall be applied as follows:

- a. **Weekly Cover** - Weather permitting, deposited waste shall be covered **weekly** in a manner acceptable to the *District Manager* so that no waste is exposed to the atmosphere;
- b. **Intermediate Cover** - In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 millimetre of soil cover or an approved thickness of alternative cover material shall be placed; and
- c. **Final Cover** - In areas where landfilling has been completed to final contours, a minimum 600 millimetre thick layer of soil of medium permeability and 150 millimetres of top soil (vegetative cover) shall be placed. Fill areas shall be progressively completed and rehabilitated as landfill development reaches final contours.

## 8. LANDFILL MONITORING

### Landfill Gas

- (1) The *Owner* shall ensure that any buildings or structures at the *Site* contain adequate ventilation systems to relieve any possible landfill gas accumulation to prevent methane concentration reaching the levels within its explosive range. Routine monitoring for explosive methane gas levels shall be conducted in all buildings or structures at the *Site*, especially enclosed structures which at times are occupied by people.

### Compliance

- (2) The *Site* shall be operated in such a way as to ensure compliance with the following:
  - a. Reasonable Use Guideline B-7 for the protection of the groundwater at the *Site*; and
  - b. Provincial Water Quality Objectives included in the July 1994 publication entitled *Water Management Policies, Guidelines, Provincial Water Quality Objectives*, as amended from time to time or limits set by the *Regional Director*, for the protection of the surface water at and off the *Site*.

### **Surface Water and Groundwater**

- (3) The *Owner* shall monitor surface water and ground water in accordance with the monitoring programs outlined in Schedule "B".
- (4) A certified Professional Geoscientist or Professional Engineer possessing appropriate hydrogeologic training and experience shall execute or directly supervise the execution of the groundwater monitoring and reporting program.

### **Groundwater Wells and Monitors**

- (5) The *Owner* shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.
- (6) Where landfilling is to proceed around monitoring wells, suitable extensions shall be added to the wells and the wells shall be properly re-secured.
- (7) Any groundwater monitoring well included in the on-going monitoring program that is damaged shall be assessed, repaired, replaced or decommissioned by the *Owner*, as required.
  - a. The *Owner* shall repair or replace any monitoring well which is destroyed or in any way made to be inoperable for sampling such that no more than one regular sampling event is missed.
  - b. All monitoring wells which are no longer required as part of the groundwater monitoring program, and have been approved by the *Director* for abandonment, shall be decommissioned by the *Owner*, as required, in accordance with *O.Reg. 903*, to prevent contamination through the abandoned well. A report on the decommissioning of the well shall be included in the Annual Report for the period during which the well was decommissioned.

### **Trigger Mechanisms and Contingency Plans**

- (8)
  - a. Trigger mechanisms shall be in accordance with documents in Schedule "A".
  - b. Contingency plan in the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate shall be in accordance with the documents in Schedule "A".
- (9) In the event of a confirmed exceedance of a site-specific trigger level relating to leachate mounding or groundwater or surface water impacts due to leachate, the *Owner* shall immediately notify the *District Manager*, and an investigation into the cause and the need for implementation of remedial or contingency actions shall be carried out by the *Owner* in accordance with the approved trigger mechanisms and associated contingency

plans.

- (10) If monitoring results, investigative activities and/or trigger mechanisms indicate the need to implement contingency measures, the *Owner* shall ensure that the following steps are taken:
  - a. The *Owner* shall notify the *District Manager*, in writing of the need to implement contingency measures, no later than 30 days after confirmation of the exceedances;
  - b. Detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures shall be prepared and submitted by the *Owner* to the *Director* for approval; and
  - c. The contingency measures shall be implemented by the *Owner* upon approval by the *Director*.
- (11) The *Owner* shall ensure that any proposed changes to the site-specific trigger levels for leachate impacts to the surface water or groundwater, are approved in advance by the *Director* via an amendment to this *Approval*.

#### **Changes to the Monitoring Programs, Trigger Mechanisms and Contingency Plans**

- (12) The *Owner* may request to make changes to the monitoring program(s), trigger mechanisms and/or contingency plan to the *District Manager* in accordance with the recommendations of the annual report. The *Owner* shall make clear reference to the proposed changes in a separate letter that shall accompany the annual report.
- (13) Within fourteen (14) days of receiving the written correspondence from the *District Manager* confirming that the *District Manager* is in agreement with the proposed changes to the environmental monitoring program, trigger mechanisms and/or contingency plans, the *Owner* shall forward a letter identifying the proposed changes and a copy of the correspondences from the *District Manager* and all other correspondences and responses related to the changes, to the *Director* requesting the *Approval* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

### **9. CLOSURE PLAN**

- (1) At least two (2) years prior to the anticipated date of closure of this *Site*, the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager*, a detailed *Site* closure plan pertaining to the termination of landfilling operations at this *Site*, post-closure inspection, maintenance and monitoring, and end use. The plan shall include but not be limited to the following information:
  - a. a plan showing *Site* appearance after closure;
  - b. a description of the proposed end use of the *Site*;
  - c. a description of the procedures for closure of the *Site*, including:

- (i) advance notification of the public of the landfill closure;
  - (ii) posting of a sign at the *Site* entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
  - (iii) completion, inspection and maintenance of the final cover and landscaping;
  - (iv) *Site* security;
  - (v) removal of unnecessary landfill-related structures, buildings and facilities;
  - (vi) final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas; and
  - (vii) a schedule indicating the time-period for implementing sub-conditions (i) to (vi) above;
- d. descriptions of the procedures for post-closure care of the *Site*, including:
- (i) operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
  - (ii) record keeping and reporting; and
  - (iii) complaint contact and response procedures;
- e. an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and
- f. an updated estimate of the *contaminating life span* of the *Site*, based on the results of the monitoring programs to date.

- (2) The *Site* shall be closed in accordance with the closure plan as approved by the *Director*.

## 10. WASTE DIVERSION

- (1) The *Owner* shall ensure that:
- a. all bins and waste storage areas are clearly labelled;
  - b. all lids or doors on bins shall be kept closed during non-operating hours and during high wind events; and
  - c. if necessary to prevent litter, waste storage areas shall be covered during high winds events.
- (2) The *Owner* shall provide a segregated area for the storage of *Refrigerant Appliances* so that the following are ensured:
- a. all *Refrigerant Appliances* have been tagged to indicate that the refrigerant has been removed by a licensed technician. The tag number shall be recorded in the log book and shall remain affixed to the appliance until transferred from the *Site*;
  - or**
  - b. all *Refrigerant Appliances* accepted at the *Site*, which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored segregated, in a clearly marked area, in an upright position and in a manner which allows for the safe handling and transfer from the *Site* for removal

- of refrigerants as required by Ontario Regulation 189/94 (O. Reg. 189/94); and
- c. all *Refrigerant Appliances* received on-site shall either have the refrigerant removed prior to being transferred from the *Site* or shall be shipped off-site only to facilities where the refrigerants can be removed by a licensed technician in accordance with O. Reg. 189/94.
- (3) The *Owner* shall transfer waste and recyclable materials from the *Site* as follows:
    - a. recyclable materials shall be transferred off-site once their storage bins are full;
    - b. scrap metal shall be transferred off-site at least twice a year;
    - c. tires shall be transferred off-site as soon as a load for the contractor hired by the *Owner* has accumulated or as soon as the accumulated volume exceeds the storage capacity of its bunker; and
    - d. immediately, in the event that waste is creating an odour or vector problem.
  - (4) The *Owner* shall notify the appropriate contractors that waste and recyclable wastes that are to be transferred off-site are ready for removal. Appropriate notice time, as determined by the contract shall be accommodated in the notification procedure.
  - (5) Collection, storage and transfer of Waste Electrical and Electronic Equipment shall be in accordance with the documents in the Schedule "A". If there is any discrepancy between the guideline titled "Collection Site Organizing & Operating Waste Electrical and Electronic Equipment (WEEE) Guidebook" dated November 2012 as amended prepared by Ontario Electronic Stewardship and the documents in Schedule "A", the guideline shall take precedence.

## SCHEDULE "A"

1. Application and supporting information for Approval of a Waste Disposal Site to amend a Certificate of Approval for a Waste Disposal Site, dated October 27, 1996 and signed by Mrs. E. Dafoe, Clerk-Treasurer, the Corporation of the Township of Herschel.
2. Letter from Mrs. Erma Dafoe, Clerk-Treasurer, Municipality of Herschel to MOE, dated October 27, 1996, Re: Township of Herschel, Baptiste Lake South Road Waste Disposal Site, Provisional Certificate of Approval No. A361602.
3. Document entitled "The Corporation of the Township of Herschel, Baptiste Lake South Road Waste Disposal Site, Provisional Certificate of Approval No. A361602, Site Development Plan and Operations Report", dated September 1996 and prepared by the Greer Galloway Group Inc., Engineers and Planners.
4. Memo from Myron Zurawsky MOE to Jim Mulder, MOE, dated January 28, 1997, Re: Baptiste Lake South Road Waste Disposal Site, Amendment to Provisional C/A #A361602, Herschel Twp., Lot 28, Concession 4.
5. Memo from Ross Cholmondeley, MOE to Jim Mulder, MOE, January 17, 1997, Re: Baptiste Lake South Road Waste Disposal Site, Site Development Plan, Capacity and Operations Report, Provisional Certificate of Approval No. A361602.
6. Fax Cover Sheet and its attachment from Jim Mulder, MOE to J. S. Rybak, the Greer Galloway Group Inc., dated September 18, 1997, Client/Matter: Twp. Of Herschel, Baptiste and McGarry Landfill Site application.
7. Facsimile and its attachment from Mohsen Keyvani, MOE to Steve Clark, Greer Galloway Group Inc., dated February 7, 2000.
8. Facsimile and its attachment from Mohsen Keyvani, MOE to Erma Dafoe, Clerk-Treasurer, Municipality of Herschel, dated March 16, 2000.
9. Letter from Erma Dafoe, Clerk-Treasurer, Municipality of Herschel to Mohsen Keyvani, MOE, dated April 5, 2000, Re: Baptiste and McGarry Waste Disposal Site, Township of Herschel.
10. Letter from Steve Clark; Greer Galloway Group Inc. to Mohsen Keyvani, MOE, dated April 12, 2000, Re: Baptiste and McGarry Waste Disposal Sites, GGG Project No. 00-1-5313.
11. Letter from Mohsen Keyvani, MOE to Erma Dafoe, Clerk-Treasurer, Municipality of Herschel, dated May 3, 2000, Re: Amendment to Provisional Certificate of Approval, No.A361602, Baptiste Lake South Road Landfill Site, Located at Lot 28, Concession 4, and No. A361603, McGarry Landfill Site, Located at Part of Lot 3, Concession 10, Township of Herschel, County of Hastings.

12. Letter and its attachment from Steve Clarke, Greer Galloway Group Inc. to Mohsen Keyvani, MOE, dated May 31, 2000, Re: Amendment to the Provisional Certificate of Approvals: No. A361602, Baptiste Lake South Road Landfill Site, Located at Lot 28, Concession 4, and No. A361603, McGarry Landfill Site, Located at Part of Lot 3, Concession 10; Township of Herschel, County of Hastings.
13. Memo from Dana Cruikshank, MOE to Mohsen Keyvani, MOE, dated July 26 , 2000, Re: Baptiste Lake South Rd. Waste Disposal Sites , Interim Review Surface Water Sampling, Provisional Certificate of Approval No. A361602.
14. Letter from Steve Clark, the Greer Galloway Group Inc. to Mohsen Keyvani, MOE, dated October 17, 2000, Re: Response to Draft Certificate of Approvals: No . A361602, Baptiste Lake South Road Landfill Site; No. A361603, McGarry Landfill Site; GG Project 00-1-5313.
15. Letter from Steve Clark, Greer Galloway Group Inc. to Mohsen Keyvani, MOE, dated December 21, 2000, Re: No. 361602, Baptiste Lake South Road Landfill site; No. A361603, McGarry Landfill Site; GGG Project No. 00-1-5313.
16. Facsimile copy of letter from Mrs. Erma Dafoe, Deputy Clerk-Treasurer for Hastings Highlands to Mohsen Keyvani, MOE, dated January 8, 2001, re: amalgamation of the Towns hip of Herschel.
17. Environmental Compliance Approval Application dated February 2, 2018 and signed Pat Pilgrim, CAO/Clerk, Municipality of Hastings Highlands, including the attached supporting documentation.
18. Report titled "Development and Operations Plan, South Baptiste Waste Disposal Site, Environmental Compliance Approval No. A361602" dated January 2018 prepared by BluMetric Environmental Inc.
19. Surface Water Trigger Mechanism and Contingency Plan for South Baptiste Lake Waste Disposal Site revised and accepted June 25, 2018 prepare by BluMetric Environmental Inc.
20. Letter dated September 11, 2019 from Iris O'connor, P.Eng., BluMetric Environmental Inc. to Ranjani Munasinghe, P.Eng., Ministry of the Environment, Conservation and Park regarding additional site characterization, monitoring, trigger mechanisms and contingency plans.



**Schedule "B"**  
**Surface Water and Groundwater Monitoring Plan**

**Table B1: Annual (Spring & Fall) Groundwater Analysis**

Monitoring Locations	Category	Parameters
MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10	Organic Parameters	Dissolved Organic Carbon (DOC), Phenols, Total Phosphorus, Total Kjeldahl Nitrogen (TKN), Volatile Organic Compounds ((full suite of VOCs at MW-6 only)
	Inorganic Parameters	Ammonia, Chloride, Nitrate, Nitrite, Major Ions (Sodium, Potassium, Calcium, Magnesium, Sulphate, Alkalinity)
	Metals	Aluminum, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Silicon, Silver, Strontium, Thallium, Titanium, Vanadium, Zinc, Mercury
	Physical/Chemical Parameters	Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS)

Note: Full VOCs scan, to be sampled every five years in the fall at MW-6 if results are found to be non-detectable. Should impacts be detected then the VOCs scan shall be conducted for the following fall sampling event.

Schedule "B" continued...

**Table B2: Annual (Spring, Summer & Fall) Surface Water Analysis**

Monitoring Locations	Category	Parameters
BAP-A, BAP-B, BAP-C, BAP-D	Organic Parameters	Biological Oxygen Demand (BOD <sub>5</sub> ), Phenols, Total Phosphorus, Total Kjeldahl Nitrogen (TKN), Turbidity, Hardness
BAP-A, BAP-B, BAP-C, BAP-D	Inorganic Parameters	Ammonia, Chloride, Nitrate, Nitrite, Major Ions (Sodium, Potassium, Calcium, Magnesium, Sulphate, Alkalinity)
BAP-A, BAP-B, BAP-C, BAP-D	Metals	Total Aluminum (clay free), Arsenic, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Nickel, Selenium, Silver, Zinc, Dissolved Mercury
BAP-A, BAP-B, BAP-C, BAP-D	Physical/Chemical Parameters	Conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Colour
BAP-A	Toxicity	Toxicity test (Single Concentration – Acute Lethality)

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

**GENERAL**

- The reason for Conditions 1(1), (2), (4), (5), (6), (7), (8), (9), (10), (17), (18) and (19) is to clarify the legal rights and responsibilities of the *Owner* and *Operator* under this *Approval*.
- The reasons for Condition 1(3) are to ensure that the *Site* is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the *Owner*, and not in a manner which the *Director* has not been asked to consider.
- The reasons for Condition 1(11) are to ensure that the *Site* is operated under the corporate name which appears on the application form submitted for this *approval* and to ensure that the *Director* is informed of any changes.
- The reasons for Condition 1(12) are to restrict potential transfer or encumbrance of the *Site* without the approval of the *Director* and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this *Approval*.
- The reason for Condition 1(13) is to ensure that the successor is aware of its legal responsibilities.

- The reasons for Conditions 1(14) and (15) are that the Part II.1 *Director* is an individual with authority pursuant to Section 197 of the Environmental Protection Act to require registration on title and provide any person with an interest in property before dealing with the property in any way to give a copy of the *Approval* to any person who will acquire an interest in the property as a result of the dealing.
- The reason for Condition 1(16) is to ensure that appropriate Ministry staff has ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this *Approval*. This Condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *Act*, the *OWRA*, the *PA*, the *NMA* and the *SDWA*.
- Condition 1 (20) has been included in order to clarify what information may be subject to the Freedom of Information and Protection of Privacy Act, RSO 1990, CF-31.

### **SITE OPERATION**

- The reasons for Conditions 2(1), 2(5) and 6(3) are to ensure that the *Site* is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.
- The reason for Conditions 2 (2), 2(3) and 2(4) is to ensure that users of the *Site* are fully aware of important information and restrictions related to *Site* operations and access under this *Approval*.
- The reasons for Condition 2(6) are open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance effects, and the potential fire hazard and to make sure burning of brush and wood are carried out in accordance with Ministry guidelines.
- The reasons for Condition 2(7), 2(8) and 2(9) are to specify the hours of operation for the landfill site and a mechanism for amendment of the hours of operation, as required.
- The reasons for Condition 2(10) and 2(11) are to ensure that the *Site* is supervised by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person and to ensure the controlled access and integrity of the *Site* by preventing unauthorized access when the Site is closed and no site attendant is on duty.

### **EMPLOYEE TRAINING**

- The reason for Condition 3(1) is to ensure that the *Site* is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.

### **COMPLAINTS RESPONSE PROCEDURE**

- The reason for Condition 4(1) is to ensure that any complaints regarding landfill operations at this

*Site* are responded to in a timely and efficient manner.

### **EMERGENCY RESPONSE**

- Conditions 5(1) and 5(2) are included to ensure that emergency situations are reported to the Ministry to ensure public health and safety and environmental protection.
- Conditions 5(3), 5(4) and 5(5) are included to ensure that emergency situations are handled in a manner to minimize the likelihood of an adverse effect and to ensure public health and safety and environmental protection.

### **RECORD KEEPING AND REPORTING**

- The reason for Conditions 6(1) and 6(2) is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this *Approval* (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the *EPA* and its regulations.
- The reason for Conditions 6(4) and 6(5) is to ensure that detailed records of *Site* inspections are recorded and maintained for inspection and information purposes.
- The reasons for Conditions 6(6) and 6(7) are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.

### **LANDFILL DESIGN AND DEVELOPMENT**

- The reason for Conditions 7(1) to 7(5) inclusive is to specify the approved areas from which waste may be accepted at the *Site* and the types and amounts of waste that may be accepted for disposal at the *Site*, based on the *Owner*'s application and supporting documentation.
- Condition 7(6) is to provide the *Owner* the process for getting the approval for alternative daily and intermediate cover material.
- The reasons for Condition 7(7) are to ensure that daily/weekly and intermediate cover are used to control potential nuisance effects, to facilitate vehicle access on the *Site*, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the *Site*.

### **LANDFILL MONITORING**

- Reasons for Condition 8(1) are to ensure that off-site migration of landfill gas is monitored and all buildings at the *Site* are free of any landfill gas accumulation, which due to a methane gas component

may be explosive and thus create a danger to any persons at the *Site*.

- Condition 8(2) is included to provide the groundwater and surface water limits to prevent water pollution at the *Site*.
- Conditions 8(3) and 8(4) are included to require the Owner to demonstrate that the *Site* is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.
- Conditions 8(5), 8(6) and 8(7) are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved and the natural environment is protected.
- Conditions 8(8) to 8(11) inclusive are added to ensure the *Owner* has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination at the *Site's* compliance point.
- Conditions 8(12), 8(13) and 8(14) are included to streamline the approval of the changes to the monitoring plan.

#### **CLOSURE PLAN**

- The reasons for Condition 9 are to ensure that final closure of the *Site* is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

#### **WASTE DIVERSION**

- Condition 10 is included to ensure that the recyclable materials are stored in their temporary storage location and transferred off-site in a manner as to minimize a likelihood of an adverse effect or a hazard to the natural environment or any person.

**Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A361602 issued on September 20, 2018**

*In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:*

- a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
- b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

*Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect*

to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary\*  
 Environmental Review Tribunal  
 655 Bay Street, Suite 1500  
 Toronto, Ontario  
 M5G 1E5

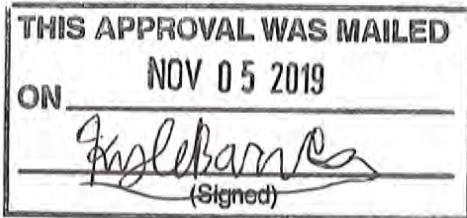
AND

The Director appointed for the purposes of Part II.1 of  
 the Environmental Protection Act  
 Ministry of the Environment, Conservation and Parks  
 135 St. Clair Avenue West, 1st Floor  
 Toronto, Ontario  
 M4V 1P5

\* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or [www.ert.gov.on.ca](http://www.ert.gov.on.ca)

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 24th day of October, 2019



\_\_\_\_\_  
 Mohsen Keyvani, P.Eng.  
 Director  
 appointed for the purposes of Part II.1 of the  
*Environmental Protection Act*

RM/  
 c: Area Manager, MECP Belleville  
 c: District Manager, MECP Kingston - District  
 Iris O'Connor P. Eng., BluMetric Environmental

## **Appendix A**

A-2 Land Use Permit

Ministry of Natural  
Resources and Forestry  
Bancroft District  
PO Box 500  
106 Monck Street  
Bancroft, ON K0L 1C0

Ministère des Richesses  
naturelles et des Forêts  
Telephone: (613) 332-3940  
Facsimile: (613) 332-0608



June 15, 2017

Municipality of Hastings Highlands  
33011 Hwy. 62  
P.O. Box 130  
Maynooth, ON K0L 2S0

(FEB)

Dear Sir/Madam:

**SUBJECT: Waste Disposal Site at Pt. Lot 28, Con. 4, HERSCHEL Township  
and New Land Use Permit #1634-1001004201**

Enclosed please find two copies of your new Land Use Permit, as the existing permit expired on February 28, 2017.

In order to ensure that rental rates charged for Crown land are based on current market values, rental rate reviews are carried out periodically, depending on the terms and conditions of the Land Use Permit which, in this case, allow for a review of the annual rate (currently \$235.00) in 2016. In keeping with this schedule, we have carried out a review of the rent for this site prior to its renewal.

After you have reviewed the application to make sure all information is correct, please sign and date the two copies. In addition to the signed and dated LUPs, please **remit a payment of \$810.49** (administrative fee plus 13% HST included). Refer to the "Summary of Fees" on the second page, for a breakdown of the fees. Your cheque or money order is to be made **payable to the Minister of Finance** and should be sent in, along with both copies of your signed Land Use Permit, to the following address:

Ministry of Natural Resources and Forestry  
Lands Business Unit, Program Services Section  
300 Water Street, 5<sup>th</sup> Floor South  
Peterborough, Ontario K9J 3C7  
Attn: Financial Administrative Clerk

If you wish to pay by Visa or Master Card, please fill out the attached credit card payment form and submit with your signed and dated LUP copies. Credit card payments cannot be processed over the phone for the first payment of a new LUP.

Once the Peterborough office has processed your payment, they will forward the two copies of your signed Land Use Permit #1634-1004201 to our office for approval. A copy of the approved permit will then be sent to you for your files.

... /2



**Summary of Fees:**

New Annual Rent was derived as follows:

Waste Disposal Site – Sand Bay	=	11.02 acres	
		x \$ 3,549.25 (LBU value per acre)	
Market Value	=	\$39,100.00 (rounded)	
		x 4% (LUP rate of return)	
New Annual Rent	=	<b>\$ 1,564.00 + Administrative Fee + HST</b>	

As the increase in rent is more than four times the current rent, we will phase in the increase over a four-year period as per the following schedule:

<u>Year</u>	<u>Old Rent + Increase</u>
2017	\$235.00 + \$332.25 = \$567.25 (plus \$150.00 Admin. Fee and HST)
2018	\$567.25 + \$332.25 = \$899.50 (plus HST)
2019	\$899.50 + \$332.25 = \$1,231.75 (plus HST)
2020	\$1,231.75 + \$332.25 = \$1,564.00 (plus HST)

This Land Use Permit has been issued for a 10-year term, with a termination date of February 28, 2027. Your fees for the first year include administration fees of \$150.00 (plus HST), which will be removed in subsequent years. After the final phased-in increase is applied in 2020, your annual fees due will then be \$1,767.32 (HST included). All future invoices will be administered by Ontario Shared Services and invoices will be generated annually, approximately six weeks prior to the anniversary date until the permit termination date. Statements reflecting the status of your account will be generated monthly if unpaid. Overdue accounts will be charged interest at a prescribed rate set by the Ministry of Finance.

If you have any questions regarding the payment of your LUP, please contact the Lands Business Unit at 705-755-1453 during regular business hours.

Any changes to the LUP during the term (e.g. address, client name, etc.) or changes to the improvements on the land must still be directed to the Bancroft office of the Ministry of Natural Resources and Forestry. This office is responsible for the administering of, and compliance with, the conditions of your Land Use Permit.

If you have any questions regarding your Land Use Permit, please call Christine Apostolov at 613-332-3940, extension 203.

Yours truly,



Jesse Van Allen  
Resources Operations Supervisor

/et

Enclosures – Permit (2 copies), CC Payment Form, Return Envelope



Use shaded areas for corrections.

Name of Applicant/Permittee (insert Corporate Name if Applicant is "Limited" or "Incorporated") The Corporation of the Municipality of Hastings Highlands		Area Code 613	Telephone No. 338-2811
As Trustee for			
Postal Address of Applicant/Permittee 33011 Hwy. 62 PO Box 130			
City, Town or Village Maynooth	Prov/State ON	Country Canada	Postal Code K0L 2S0

Location of Land

Lot 28	Concession/Block No. 4	Geographic Township HERSCHEL	Municipality HASTINGS HIGHLANDS M
U.T.M. Grid Zone 18 E 262356 N 4996632		Geographic Location	Area in ha. 4.46

As per sketch and description which is attached to the original permit for this site and forms part of this permit. A copy of this sketch and description is on file at the District Office and available for inspection by the applicant at any time during normal business hours.

Improvement Type WASTE DISPOSAL, GARBAGE	Sales Tax I.D. Number R124668666
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Fee(s) and Period of Land Use

Amount Due \$810.49	Annual Fee (subject to adjustment) \$567.25 + \$73.74 (HST)	Permit Effective Date Mar 1, 2017	Permit Termination Date Feb 28, 2027
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\*Note: Terms and Conditions applicable to all Land Use Permits are on the reverse side of this form.\*

Terms and Conditions applicable to this permit

	Purpose Waste Disposal Site
	Sub-Purpose Other

Applicant's certification

I certify that the information given herein is true and complete, and that I have read, fully understand, and agree to comply with all of the terms and conditions set out in this permit and that I am of the age of majority.

I agree that this is the complete agreement between the parties hereto.

Signature of Applicant (Incl. Corporation Official) <i>[Signature]</i>	Date Signed June 20/17
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Corporation Use Only

I have authority to bind the herein-named Corporation

Initials and Surname of Corporation Official (Please Print) E. P. KARVINEN	Signature of Corporation Official <i>[Signature]</i>	Position Chairman	Date Signed June 20/17
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Ministry Approval

Under authority of the Regulations under the Public Lands Act, this Land Use Permit is hereby issued to the above applicant, subject to all terms and conditions contained herein and no other, and these shall be the exclusive terms and conditions applicable to the use of this land.

Signature of MNRF Official	Date Signed	Cash Register Validation or Receipt No.	Amount Paid
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Personal information on this form is collected under authority of the Public Lands Act and will be used for the administration of that Act. Questions about this information should be directed to the local MNRF Office, whose address and telephone number appear in the Ontario Government Telephone Directory.

## **Appendix B**

### Monitoring and Screening Checklist (MECP/MO)

## Appendix D-Monitoring and Screening Checklist General Information and Instructions

**General Information: The checklist is to be completed, and submitted with the Monitoring Report.**

**Instructions:** A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

**Definition of Groundwater CEP:**

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

**Definition of Surface water CEP:**

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

<b>Monitoring Report and Site Information</b>	
<b>Waste Disposal Site Name</b>	South Baptiste Waste Disposal Site
<b>Location (e.g. street address, lot, concession)</b>	2539 South Baptiste Lake Road
<b>GPS Location (taken within the property boundary at front gate/ front entry)</b>	734410 m E, 4996556 m N
<b>Municipality</b>	Municipality of Hasting Highlands (formerly Twp. of Herschel)
<b>Client and/or Site Owner</b>	The Corporation of Hasting Highlands
<b>Monitoring Period (Year)</b>	2023
This Monitoring Report is being submitted under the following:	
<b>Environmental Compliance Approval Number:</b>	A 361602
<b>Director's Order No.:</b>	
<b>Provincial Officer's Order No.:</b>	
<b>Other:</b>	

<b>Report Submission Frequency</b>	<input checked="" type="radio"/> <b>Annual</b> <input type="radio"/> <b>Other</b>	March 31st of the following reporting period	
<b>The site is: (Operation Status)</b>	<input checked="" type="radio"/> <b>Open</b> <input type="radio"/> <b>Inactive</b> <input type="radio"/> <b>Closed</b>		
<b>Does your Site have a Total Approved Capacity?</b>	<input checked="" type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b>		
<b>If yes, please specify Total Approved Capacity</b>	82,785	Units	Cubic Metres
<b>Does your Site have a Maximum Approved Fill Rate?</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>		
<b>If yes, please specify Maximum Approved Fill Rate</b>		Units	
<b>Total Waste Received within Monitoring Period (Year)</b>	493	Units	Tonnes
<b>Total Waste Received within Monitoring Period (Year)</b> <i>Methodology</i>	Estimation		
<b>Estimated Remaining Capacity</b>	13,403	Units	Cubic Metres
<b>Estimated Remaining Capacity</b> <i>Methodology</i>	Aerial Photogrammetry		
<b>Estimated Remaining Capacity</b> <i>Date Last Determined</i>	31-Dec-2023		
<b>Non-Hazardous Approved Waste Types</b>	<input checked="" type="checkbox"/> Domestic <input checked="" type="checkbox"/> Industrial, Commercial & Institutional (IC&I) <input type="checkbox"/> Source Separated Organics (Green Bin) <input checked="" type="checkbox"/> Tires	<input checked="" type="checkbox"/> Contaminated Soil <input checked="" type="checkbox"/> Wood Waste <input checked="" type="checkbox"/> Blue Box Material <input type="checkbox"/> Processed Organics <input checked="" type="checkbox"/> Leaf and Yard Waste	<input type="checkbox"/> Food Processing/Preparation Operations Waste <input type="checkbox"/> Hauled Sewage Other: <input type="text"/>
<b>Subject Waste Approved Waste Classes: Hazardous &amp; Liquid Industrial</b> <i>(separate waste classes by comma)</i>			
<b>Year Site Opened</b> <i>(enter the Calendar Year only)</i>	1980	<b>Current ECA Issue Date</b>	24-Oct-2019
<b>Is your Site required to submit Financial Assurance?</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>		
<b>Describe how your Landfill is designed.</b>	<input checked="" type="radio"/> Natural Attenuation only <input type="radio"/> Fully engineered Facility <input type="radio"/> Partially engineered Facility		
<b>Does your Site have an approved Contaminant Attenuation Zone?</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>		

**If closed, specify C of A, control or authorizing document closure date:**

Select Date

**Has the nature of the operations at the site changed during this monitoring period?**

Yes

No

**If yes, provide details:**

**Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)**

Yes

No

# Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

## Sampling and Monitoring Program Status:

<p>1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>Currently, the Site is believed to be in compliance along the north and east sides of the Site, however, future monitoring will determine if additional wells are required.</p>
<p>2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document (s):</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach information.</p>

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
SB-MW2	Dry	19-Oct-2023
SB-MW3	Dry	19-Oct-2023
SB-MW11	Dry	19-Oct-2023

3) a) Is landfill gas being monitored or controlled at the site?	<input checked="" type="radio"/> Yes <input type="radio"/> No
--	--

If yes to 3(a), please answer the next two questions below.

b) Have any measurements been taken since the last reporting period that indicate landfill gas is present in the subsurface at levels exceeding criteria established for the site?	<input type="radio"/> Yes <input checked="" type="radio"/> No
--	--

c) Has the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable	If no, list exceptions below or attach additional information.
--	--	--

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):	<input checked="" type="radio"/> Yes <input type="radio"/> No	
--	--	--



## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>	<p>Groundwater discharges to surface water on the north side of the Site. There is a SW trigger mechanism in place that includes groundwater monitors as triggers. There is no specific GW trigger mechanism approved as of yet.</p>	
<p>6) The site meets compliance and assessment criteria.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>Well nest SB-MW8 and SB-MW9 are located downgradient and off-site to the north of South Baptiste Lake Road. In 2023, RUV exceedances were limited to chloride and TDS. RUV exceedances at MW8 and MW9 have been sporadic since they were installed</p>	
<p>7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>		
<p>1) Is one or more of the following risk reduction practices in place at the site:                  (a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or                  (b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or                  (c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation):   <i>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and  <i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a) <input type="checkbox"/> (b) <input type="checkbox"/> (c)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable</p>	<p>Triggers have been exceeded, perimeter ditching has been put in place, and toxicity sampling is collected on a regular basis.</p>	

## Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

16-Mar-2023

## Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

<p><input type="radio"/> No changes to the monitoring program are recommended</p> <p><input checked="" type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	<p>It is recommended that the Trigger Plan be updated to only trigger the Contingency Plan following an exceedance of a new trigger parameter or when an emerging increasing trend is present.</p>
<p><input type="radio"/> No Changes to site design and operation are recommended</p> <p><input checked="" type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	<p>Ensure operations and waste placement adhere to new D&amp;O Plan (December 2017). The perimeter surface water diversion ditch put in place during the late fall of 2019 should be kept clear and flow maintained around the waste mound in 2024.</p>

<b>Name:</b>	S'rana Scholes, P.Eng.		
<b>Seal:</b>			
<b>Signature:</b>		<b>Date:</b>	25-Mar-2024
<b>CEP Contact Information:</b>			
<b>Company:</b>	BluMetric Environmental Inc.		
<b>Address:</b>	209 Frederick street, Kitchener, ON, N2H 2M7		
<b>Telephone No.:</b>	(877) 487-8436 ext. 218	<b>Fax No. :</b>	
<b>E-mail Address:</b>	sscholes@blumetric.ca		
<b>Co-signers for additional expertise provided:</b>			
<b>Signature:</b>		<b>Date:</b>	Select Date
<b>Signature:</b>		<b>Date:</b>	Select Date

## Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

<b>Name (s)</b>	South Baptiste Lake and the un-named creek (tributary to South Baptiste Lake)
<b>Distance(s)</b>	1.0 km (east), 1.2 km (west), 20 m (north)

Based on all available information and site knowledge, it is my opinion that:

### Sampling and Monitoring Program Status:

<p>1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>Field observations to identify potential impacts to background water sample should be made.</p>
<p>2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p> <p><b>Not applicable (No C of A, authorizing / control document applies)</b></p>	<p>If no, specify below or provide details in an attachment.</p>

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
All	Total aluminum was not analyzed during the spring 2023 sampling event	4-May-2023

<p>3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.</p>	<p><input type="radio"/> Yes  <input checked="" type="radio"/> No  <input type="radio"/> Not Applicable</p>
---	---

<p>b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:</p>	<p><input type="radio"/> Yes  <input type="radio"/> No  <input checked="" type="radio"/> Not Applicable</p>	<p>If no, specify below or provide details in an attachment.</p>
--	---	--

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

<p>4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input checked="" type="radio"/> Yes  <input type="radio"/> No</p>
--	---

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<b>5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No
--	--

**If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:**

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
See attached document		
<b>6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No	Boron exceedances are attributed to WDS activities, all other exceedances may be related to de-icing salt, other activities, or natural conditions.

<p>7) <b>All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.</b></p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p>	<p>BAP-A and BAP-C are showing an increasing trend in boron.</p>
<p>8) <b>For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g. , PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):</b></p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Known</p> <p><input type="radio"/> Not Applicable</p>	<p>PWQO exceedances of phenols, total phosphorus, aluminum, boron, cadmium, cobalt, copper, iron, nickel, and zinc were recorded in the groundwater monitoring wells adjacent to the WDS mound. Trigger Mechanisms and a Contingency Plan for surface water has been developed.</p>
<p>9) <b>Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</b></p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>The Contingency Plan was triggered at SB-MW4 during the fall sampling event with trigger parameter exceedances of alkalinity, TDS, boron, and cobalt. The contingency plan was also triggered at SB-MW7 during the spring and fall 2023 sampling events with trigger parameter exceedances of alkalinity, TDS, boron, and cobalt. The Tier 1 response of the Contingency Plan includes the tri-annual toxicity sampling at BAP-A. Based on the toxicity results at BAP-A, escalation to Tier 2 sampling was not required.</p>

## Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

16-Mar-2023

## Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

<p><input checked="" type="radio"/> <b>No Changes to the monitoring program are recommended</b></p> <p><input type="radio"/> <b>The following change(s) to the monitoring program is/are recommended:</b></p>	
<p><input type="radio"/> <b>No changes to the site design and operation are recommended</b></p> <p><input checked="" type="radio"/> <b>The following change(s) to the site design and operation is/are recommended:</b></p>	<p>Perimeter drainage diversion to be maintained.</p>



<b>CEP Signature</b>	<i>Sirana Scholes</i>	
<b>Relevant Discipline</b>	Senior Environmental P.Eng. with 19 years experience assessing landfill SW at landfills. Hydrology a	
<b>Date:</b>	25-Mar-2024	
<b>CEP Contact Information:</b>		
<b>Company:</b>	BluMetric Environmental Inc.	
<b>Address:</b>	Unit 3B, 209 Frederick Street, Kitchener, ON, N2H 2M7	
<b>Telephone No.:</b>	877-487-8436 x218	
<b>Fax No. :</b>		
<b>E-mail Address:</b>	sscholes@blumetric.ca	
<b>Save As</b>		<b>Print Form</b>

**Appendix B-2 South Baptiste Surface Water Exceedances 2023**

Surface Water Monitoring Location	Parameter	Compliance Criteria	Percentage above/below criteria
BAP-A	Iron (1.2 mg/L)	PWQO - 0.30 mg/L	300% above criteria
		Table A - 1.00 mg/L	20% above criteria
	Boron (0.374 mg/L, 0.24, 0.24 mg/L)	PWQO - 0.20 mg/L	up to 87% above criteria
	Total phosphorus (0.041 mg/L)	PWQO - 0.03 mg/L	37% above criteria
	Cobalt (0.0012 mg/L)	PWQO - 0.0009 mg/L	33% above criteria
BAP-B	Iron (0.75 mg/L, 2.2 mg/L)	PWQO - 0.30 mg/L	Up to 633% above criteria
		Table A - 1.00 mg/L	60% above criteria
BAP-C	Iron (0.311 mg/L, 0.66 mg/L)	PWQO - 0.30 mg/L	Up to 120% above criteria
BAP-D	Iron (0.513 mg/L, 1.2 mg/L, 0.4 mg/L)	PWQO - 0.30 mg/L	Up to 300% above criteria
		Table A - 1.00 mg/L	20% above criteria

## **Appendix C**

### Monitoring Well Logs

## Well Log: Lithology & Construction

Well Ident **SB**  
**MW-1**

Name

Drill. Method

auger

Drill. Dates

February 8, 1996

X

1011

Y

876

Z

112.00

Meas. Pt. Elev.

112.00

All measurements are in meters. Hole and casing diameters in inches.

Scales (1: xxx)

Water Level (m AMSL)

Vertical

50.0

Horizontal

Depth [m]	Hole	Annulus	Casing	Screen	Lithology	Elev. [m]
0.5						111.5
1						111
1.5						110.5
2	4	Native drill cuttings			Br m-c sa, tr si, su gravel cobbles, dry, loose sample 3.8-4.0m	110
2.5						109.5
3						109
3.5						108.5
4	4.27	4.27				108
4.5						107.5
5					Refusal on presumed bedrock	107
5.5				5.27		106.5
6						106
6.5						105.5
7						105
7.5						104.5
8						104
8.5						103.5

## Well Log: Lithology & Construction

Well Ident **SB**  
**MW-2**

Name

Drill. Method **auger**

Drill. Dates **February 8, 1996**

X **1014**

Y **925**

Z **104.40**

Meas. Pt. Elev. **105.41**

All measurements are in meters. Hole and casing diameters in inches.

Scales (1: xxx)

Water Level (m AMSL)  
**103.93**

Vertical  
**40.0**

Horizontal

Depth [m]	Hole	Annulus	Casing	Screen	Lithology	Elev. [m]
0.2		Bentonite seal	0.3		Bk. topsoil	104
0.5				0.56		103.5
1	4	Sand	2		Red-br, f-m sa, tr-sm si rare (angular) pebbles, oxidized wet @ 0.45m sample 1.4-1.6m	103
1.5						102.5
2			2.06	2.06		102
2.13		Native drill cuttings			Red-br, m-f sa, <tr si rare pebbles, hard sample 2.2-2.4m	101.5
2.5	2.74		2.74			101
2.74						100.5
3					Refusal on presumed bedrock	100
3.5						99.5
4						99
4.5						98.5
5						98
5.5						97.5
6						97
						96.5
						96
						95.5
						95
						94.5
						94
						93.5
						93
						92.5
						92
						91.5
						91
						90.5
						90
						89.5
						89
						88.5
						88

## Well Log: Lithology & Construction

Well Ident **SB**  
**MW-3**

Name

Drill. Method **auger**

Drill. Dates **February 8, 1996**

X **1047**

Y **945**

Z **97.90**

Meas. Pt. Elev. **98.90**

All measurements are in meters. Hole and casing diameters in inches.

Scales (1:xxx)

Water Level (m AMSL)  
**97.30**

Vertical **40.0**

Horizontal

Depth [m]	Hole	Annulus	Casing	Screen	Lithology	Elev. [m]
0.3		Bentonite seal			Blk topsoil & peat	97.5
0.5		Native drill cuttings				97
1.0		Bentonite seal			Yel-br, vf sa, sm sl, soft wet @ 0.6m sample 1.2-1.5m	96.5
1.5	4		2	1.41		96
2.0		Sand				95.5
2.5					Br f sa, tr sl, tr gvl decrease w depth sample 2.1-2.4m	95
3.0	3.02		2.91	2.91		94.5
3.5						94
4.0					Refusal on presumed bedrock	93.5
4.5						93
5.0						92.5
5.5						92
6.0						91.5

## Well Log: Lithology & Construction

Well Ident <b>SB</b> MW-4	Name
------------------------------	------

Drill. Method <b>auger</b>	Drill. Dates <b>February 8, 1996</b>
----------------------------	--------------------------------------

X <b>1129</b>	Y <b>967</b>	Z <b>94.93</b>	Meas. Pt. Elev. <b>96.36</b>
---------------	--------------	----------------	------------------------------

All measurements are in meters. Hole and casing diameters in inches.

Scales (1: xxx)

Water Level (m AMSL) <b>93.54</b>	Vertical <b>50.0</b>	Horizontal
--------------------------------------	-------------------------	------------

Depth [m]	Hole	Annulus	Casing	Screen	Lithology	Elev. [m]
0.5		Bentonite seal <u>0.3</u>				94.5
1		Native drill cuttings			Drill pad fill, mix of peat and local sand	94
1.5					1.5	93.5
2		Bentonite seal <u>1.9</u> <u>2.3</u>	2			93
2.5						92.5
3				<u>2.68</u>		92
3.5	4	Sand			Grey f sa (quicksand), tr of soil, wet at 1.85m sample 2.4-2.9m sample 4.5-4.8	91.5
4			<u>4.18</u>	<u>4.185</u>		91
4.5						90.5
5						90
5.5		Native drill cuttings				89.5
6					5.79	89
6.5					Br f sa and boulders auger broke, end of hole	88.5
6.7	<u>6.7</u>	<u>6.7</u>			6.7	88.5
7						88
7.5						87.5
						87

# Well Log: Lithology & Construction

Well Ident **SBMW5**

**T-4**

Name

Drill. Method

backhoe test pit

Drill. Dates

November 22, 1995

X

1078

Y

941

Z

96.05

Meas. Pt. Elev.

96.93

All measurements are in meters. Hole and casing diameters in inches.

Scales (1:xxx)

Water Level (m AMSL)

95.50

Vertical

40.0

Horizontal

Depth [m]	Hole	Annulus	Casing	Screen	Lithology	Elev. [m]
0.5					Blk organic topsoil/muck	95.5
1	2		2	0.99		95
1.5						94.5
2					Grey-br f-m sa, tr si saturated below 1m, sloughing @ 1.37m sample 1.5-1.75m sample 2.3-2.6m	94
2.5	2.492		2.492	2.49		93.5
3						93
3.5						92.5
4						92
4.5						91.5
5						91
5.5						90.5
6						90
6.5						89.5



# Well Log: Lithology & Construction

**Well Ident** SB MW6  
T-3

Name

Drill. Method **backhoe test pit**

Drill. Dates **November 22, 1995**

X **1121**

Y **935**

Z **97.96**

Meas. Pt. Elev. **99.23**

All measurements are in meters. Hole and casing diameters in inches.

Scales (1: xxx)

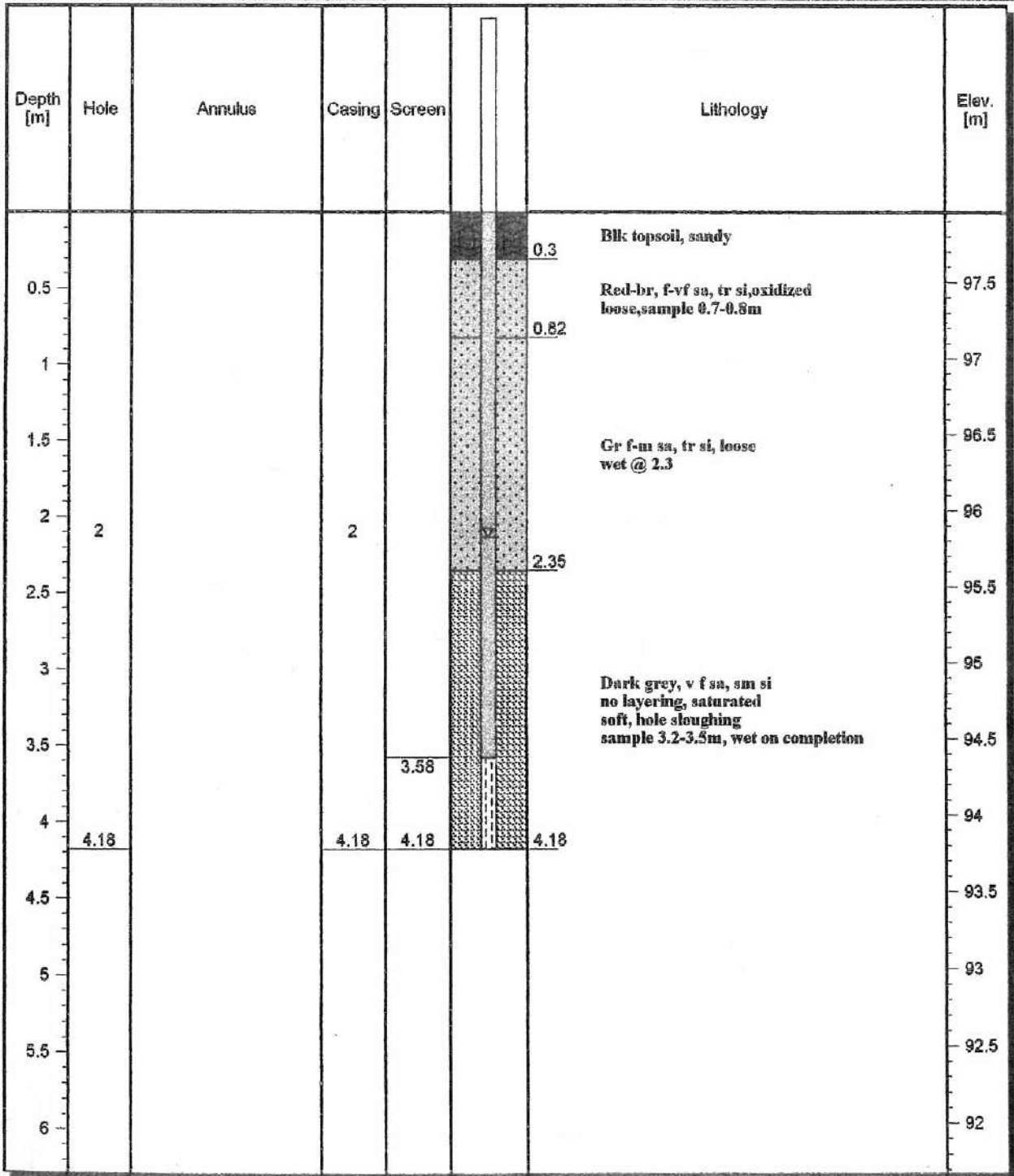
Water Level (m AMSL)

**95.83**

Vertical

**40.0**

Horizontal





# BOREHOLE ID: SB-MW6R

**Project No.:** 170543  
**Client:** Municipality of Hastings Highlands  
**Report:** 2017 New Wells  
**Site Address:** 2539 South Baptiste Lake Road

**Elevation** Ground: 382.16 m  
 TOP: 382.99 m  
**UTM (Zone 18N):** 4996583.1 N  
 734540.2 E

SUBSURFACE PROFILE				SAMPLE					WELL COMPLETION				
Depth (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)			Construction	Notes
									10	100	1000		
-1													0.825m PVC Stick-Up 4" Square Protector, Locked
0		Ground Surface	0.00 382.16										
0.825		<b>OVERBURDEN</b> Fine SAND, Brown, Dry											3/8" Bentonite Holeplug
1.52			1.52 380.64										2" Solid PVC
2.96		<b>OVERBURDEN</b> Fine Silty SAND, Grey/Brown, Moist											#3 Silica Sand
3.05			3.05 379.11										
4.57		<b>OVERBURDEN</b> Fine Silty SAND, Brown/Grey, Wet											
4.57			4.57 377.59										2" Slot 10 PVC
6.00		<b>OVERBURDEN</b> Fine Silty SAND, Brown/Grey, Wet to Saturated											
6.00			6.00 376.16										
6.00		End of borehole at 6.00 m											
7.00		Well Completion Details: Screened interval from 2.96 m to 6.00 m below surface Elevation at top of pipe (TOP) = 382.99 m											
8.00													
9.00													
10.00													
11.00													

BH MW OB LOG V1.0 170543 - SOUTH BAPTISTE.GPJ VL TEMPLATE.GDT 18-1-5

**Drill Date:** 2017 September 13  
**Drilled By:** Lantech Drilling Services  
**Drilling Method:** Hollow Stem Auger  
**Hole Diameter:** 0.20 m (OD)

**Logged By:** KS  
**Checked By:** BM

**Notes:**



# BOREHOLE ID: SB-MW7

**Project No.:** 170543  
**Client:** Municipality of Hastings Highlands  
**Report:** 2017 New Wells  
**Site Address:** 2539 South Baptiste Lake Road

**Elevation Ground:** 379.90 m  
**TOP:** 380.79 m  
**MOECC Well Tag:** A235170  
**UTM (Zone 18N):** 4996602.1 N  
 734534.8 E

SUBSURFACE PROFILE				SAMPLE					WELL COMPLETION				
Depth (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)			Construction	Notes
									10	100	1000		
-1													0.89m PVC Stick-Up
0		Ground Surface	0.00 / 379.90										5.5" Round Steel Casing, Locked
0 to 2.41		<b>OVERBURDEN</b> Fine Silty SAND, Brown/Grey											
2.41 to 2.41			2.41 / 377.49										3/8" Bentonite Holeplug
2.41 to 3.32		<b>Granite BEDROCK</b> Broken, Fractured											
3.32 to 3.32			3.32 / 376.58										2" Solid PVC
3.32 to 4.57		3.99m Possible Fracture											
4.57 to 4.57		4.39m Possible Fracture											
4.57 to 5.12		5.12m Possible Fracture											
5.12 to 5.49		5.49m Possible Fracture											
5.49 to 6.37		6.37m Possible Fracture											
6.37 to 7.89													
7.89 to 7.89		<b>Granite BEDROCK</b> Possible Sediment Seams and Red Staining											
7.89 to 8.50													
8.50 to 8.50		<b>Granite BEDROCK</b>											
8.50 to 9.27		9.27m Large Fracture with Sediment and Red Staining											
9.27 to 10.03													
10.03 to 10.03		End of borehole at 10.03 m	10.03 / 369.87										
10.03 to 11.0		Well Completion Details: Screened interval from 4.57 m to 10.03 m below surface Elevation at top of pipe (TOP) = 380.79 m											

BH MW OB LOG V1.0 170543 - SOUTH BAPTISTE.GPJ VL TEMPLATE.GDT 18-1-5

**Drill Date:** 2017 September 13  
**Drilled By:** Lantech Drilling Services  
**Drilling Method:** Hollow Stem Auger/HQ Diamond Coring  
**Hole Diameter:** 0.20/0.10 m (OD)

**Logged By:** KS  
**Checked By:** BM

Notes:



# BOREHOLE ID: SB-MW-8

**Project No.:** 180580-2  
**Client:** South Baptiste Township  
**Report:** South Baptiste Well Install 2018  
**Site Address:** 2539, SOUTH BAPTISTE LAKE RD  
 HASTINGS HIGHLANDS, ONTARIO

**Elevation** Ground: *Not Surveyed*  
 TOP: 380.10 m

SUBSURFACE PROFILE				SAMPLE							WELL COMPLETION				
Depth (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)				Construction	Notes	
									10	100	1000	10000			
0		Ground Surface	0.00												
0 - 2.10		<b>Sand</b> Silty Fine Sand, Soft, Grey-Brown, moist													50 mm solid PVC pipe
2.10 - 2.74		<b>Sand</b> Silty Fine Sand, Soft, Moist, Grey-Brown, Water encountered at 2.10, saturated	2.10												50 mm solid PVC pipe
2.74 - 4.57		<b>Sand</b> Silty Fine Sand, Soft, Moist, Grey, saturated	2.74												50 mm 010 slot PVC pipe
4.57		End of borehole at 4.57 m	4.57												
5															
6															
7															

BH MW OB LOG V1.0 SOUTH BAPTISTE\_2018.GPJ VL TEMPLATE.GDT 19-2-14

**Drill Date:** 2018 October 23  
**Drilled By:** Dedicated Environmental Drilling  
**Drilling Method:** Hollow Stem Auger  
**Hole Diameter:** m (OD)

**Logged By:** AB  
**Checked By:** AB

Notes:



# BOREHOLE ID: SB-MW-9

**Project No.:** 180580-2  
**Client:** South Baptiste Township  
**Report:** South Baptiste Well Install 2018  
**Site Address:** 2539, SOUTH BAPTISTE LAKE RD  
 HASTINGS HIGHLANDS, ONTARIO

**Elevation** Ground: *Not Surveyed*  
 TOP: 380.10 m

SUBSURFACE PROFILE				SAMPLE						WELL COMPLETION					
Depth (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)				Construction	Notes	
									10	100	1000	10000			
0		Ground Surface	0.00												
0 to 3.66		<b>Sand</b> Silty Fine Sand, Soft, dry													50 mm solid PVC pipe
3.66 to 4.00		<b>Sand</b> Silty Fine Sand, Soft, Wet, wet	3.66												50 mm solid PVC pipe
4.00 to 6.10		<b>Sand</b> Silty Fine Sand, Soft, wet	4.00												50 mm 010 slot PVC pipe
6.10		End of borehole at 6.10 m	6.10												
7															

BH MW 0B LOG V1.0 SOUTH BAPTISTE\_2018.GPJ VL TEMPLATE.GDT 19-2-14

**Drill Date:** 2018 October 23  
**Drilled By:** Dedicated Environmental Drilling  
**Drilling Method:** Hollow Stem Auger  
**Hole Diameter:** m (OD)

**Logged By:** AB  
**Checked By:** AB

Notes:



# BOREHOLE ID: SB-MW-10

**Project No.:** 180580-2  
**Client:** South Baptiste Township  
**Report:** South Baptiste Well Install 2018  
**Site Address:** 2539, SOUTH BAPTISTE LAKE RD  
 HASTINGS HIGHLANDS, ONTARIO

**Elevation** Ground: *Not Surveyed*  
 TOP: 383.10 m

SUBSURFACE PROFILE				SAMPLE							WELL COMPLETION				
Depth (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)				Construction	Notes	
									10	100	1000	10000			
0		Ground Surface	0.00												
0 - 3.57		<b>Sand</b> Silty Fine Sand, Soft, dry													50 mm solid PVC pipe
3.57 - 4.00		<b>Boulder</b> Boulders and Cobbles, Sand mix, dry	3.57												50 mm solid PVC pipe
4.00 - 6.71		<b>Cobbles</b> Sand and gravel mix., moist	4.00												silica sand
6.71 - 7.00		End of borehole at 6.71 m	6.71												GW = 376.36 m 50 mm 010 slot PVC pipe
7.00															

BH MW OB LOG V1.0 SOUTH BAPTISTE\_2018.GPJ VL TEMPLATE.GDT 19-2-14

**Drill Date:** 2018 October 23  
**Drilled By:** Dedicated Environmental Drilling  
**Drilling Method:** Hollow Stem Auger  
**Hole Diameter:** m (OD)

**Logged By:** AB  
**Checked By:** AB

Notes:



# BOREHOLE ID: SB-MW11

**Project No.:** 200461  
**Client:** Municipality of Hastings Highlands  
**Report:** 2020 Additional Engineering Services  
**Site Address:** 2539 South Baptiste Lake Road  
 Highland Grove, ON

**Elevation Ground:** 377.12 m  
**TOP:** 377.92 m  
**MOECC Well Tag:** A292955  
**UTM (Zone 17):** 4996676 N  
 734598 E

SUBSURFACE PROFILE				SAMPLE						WELL COMPLETION		
Depth (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)	Construction	Notes	
									10 100			
-1												
0		Ground Surface	0.00 / 377.12								jplug Stickup is 0.80m	
0		<b>SAND and GRAVEL</b> Fill used to create drill rig access									Cement	
1		<b>SAND</b> Trace gravel	0.91 / 376.21									
2												
3		Moist to wet below 3.05m										
3.35			3.35 / 373.77									
4		<b>SAND and GRAVEL</b> With cobbles; wet to saturated										
4.57			4.57 / 372.55									
5		<b>BEDROCK</b> Granite bedrock, dark grey to black										
6												
7											3/8" Bentonite seal	
8												
9												
9.1		Light grey below 9.1m										
<b>Drill Date:</b> 2020 September 9 <b>Drilled By:</b> Canadian Environmental Drilling <b>Drilling Method:</b> Hollow Stem Auger, Air Hammer <b>Hole Diameter:</b> 0.20 m (OD)				<b>Logged By:</b> BM <b>Checked By:</b> DK						<b>Notes:</b>		<b>Sheet</b> 1 of 2

BH MW OB LOG V1.0 200461 MW11 DK GPJ WESA TEMPLATE V1.2.GDT 21-1-21



# BOREHOLE ID: SB-MW11

**Project No.:** 200461  
**Client:** Municipality of Hastings Highlands  
**Report:** 2020 Additional Engineering Services  
**Site Address:** 2539 South Baptiste Lake Road  
 Highland Grove, ON

**Elevation Ground:** 377.12 m  
**TOP:** 377.92 m  
**MOECC Well Tag:** A292955  
**UTM (Zone 17):** 4996676 N  
 734598 E

SUBSURFACE PROFILE			SAMPLE							WELL COMPLETION		
Depth (m)	Symbol	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)	Construction	Notes	
									10 100			
10												
11												
12												
13												
14		Grey to black below 13.7m										
15												
16												
17		Potentially water-bearing 16.7m and below										
18												
18.49		End of borehole at 18.49 m	18.49 358.63								end cap	
19		Well Completion Details: Screened interval from 13.92 m to 18.49 m below surface Elevation at top of pipe (TOP) = 377.92 m									#3 Silica sand 38 mm 010 slot PVC pipe	
20												
<b>Drill Date:</b> 2020 September 9 <b>Drilled By:</b> Canadian Environmental Drilling <b>Drilling Method:</b> Hollow Stem Auger, Air Hammer <b>Hole Diameter:</b> 0.20 m (OD)				<b>Notes:</b>							<b>Sheet</b> 2 of 2	

BH MW OB LOG V1.0 200461 MW11 DK GPJ WESA TEMPLATE V1.2.GDT 21-1-21



## **Appendix D**

Inspection Forms, Laboratory Reports and Chain of Custody Records

# Appendix D

D-1 Operation and Inspection Forms

**SMALL LANDFILL  
OPERATION AND INSPECTION FORM**



<b>Site Name:</b> South Baptiste WDS, MHHs	<b>Date:</b> May 4, 2023	<b>Weather Conditions:</b>
<b>Project #:</b> 230225-09	<b>BluMetric Staff:</b> BM/MD	Overcast 5° Occasional Mist Rain

Photographs of each item below should be collected during site visits.

**OVERALL INSPECTION AND OPERATION REVIEW**

- Signage in good condition Yes  No
- ECA and emergency numbers on signage Yes  No
- Hour of operation observed Yes  No
- Site open under normal operating hours Yes  No  *Closed today*
- Perimeter fencing and gate in good condition Yes  No
- Gate locked if closed Yes  No

**DESIGNATED WASTE AREA**

- Working active/trench area (moderate size, daily cover, compacted) Yes  No
- Designated waste areas are properly signed and easily accessed by public Yes  No

**RECYCLING OPERATION (if applicable)**

- Proper signage and bins present Yes  No
- Clearly signed Yes  No
- Overall neat in appearance Yes  No

*"Spring cleanup" has not happened at this site*

**SEGREGATED SCRAP PILES (metal, tires, brush, etc.)**

- Metals neat and appropriate size Yes  No
- Tires neat and appropriate size Yes  No
- Bulky items neat and appropriate size Yes  No
- Brush pile neat and appropriate size Yes  No
- Construction Debris neat and appropriate size Yes  No

*Segregation piles need work  
Signage has fallen down  
Bulk and tires need separation  
~NA Metals and brush need separation*

**MONITORING WELL CONDITION**

- Casing conditions (frost heave, lock, cap) Yes  No
- Monitor condition (capped, vented) Yes  No
- Wells clearly labeled (re-label as required) Yes  No
- Well clearly visible (clear brush if necessary) Yes  No

**LANDFILL GAS MONITORING**

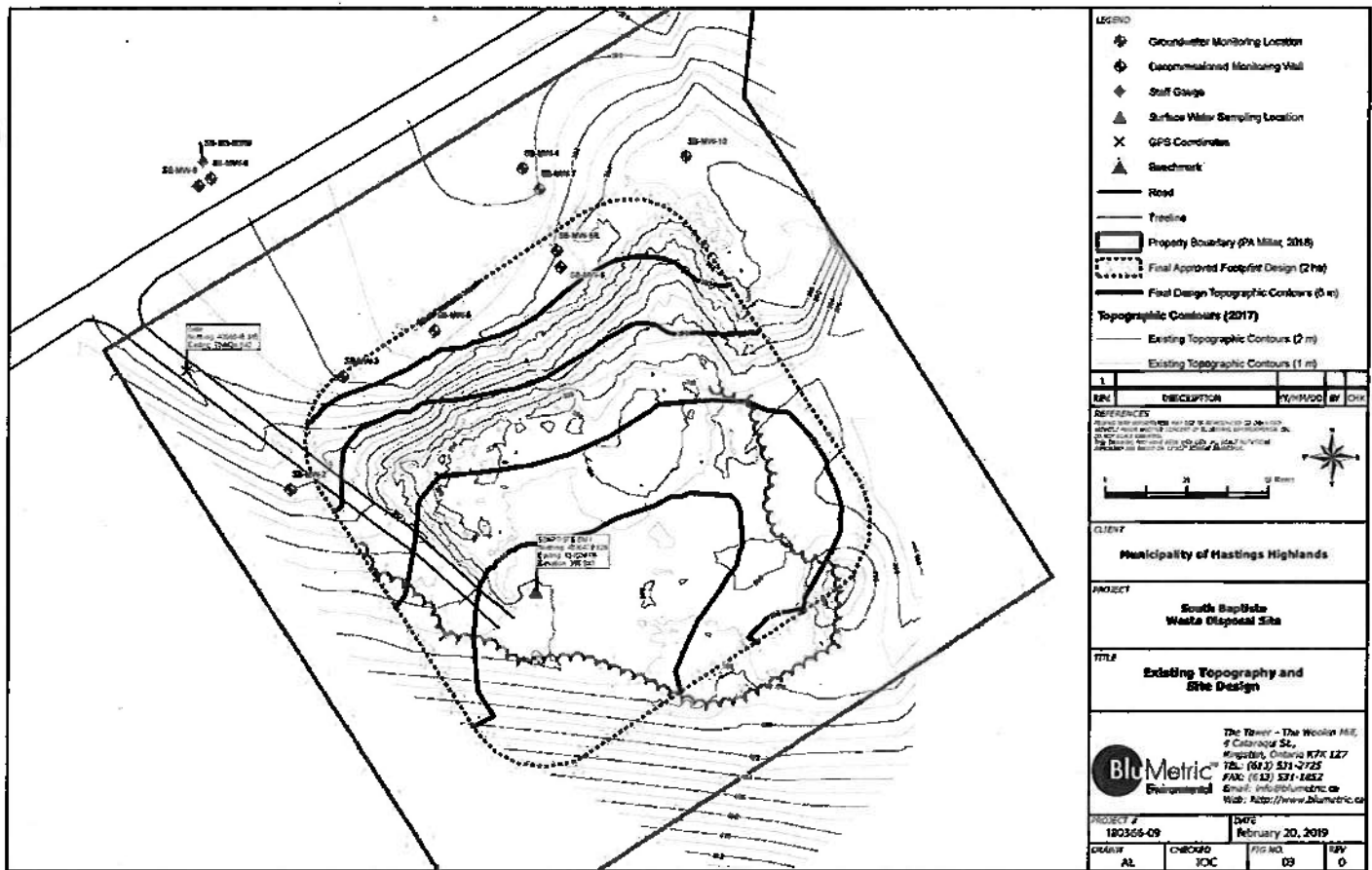
- Conducted at structures Yes  No
- Conducted at monitoring wells Yes  No

*Attendant Buildings open*

**REPAIRS:** Provide details of repairs made or materials required for repairs upon next site visit:

**OBSERVATIONS OF PHYSICAL ENVIRONMENT:** Please comment on any changes to the local environment (e.g. settling or slumping of waste/cover, new or altered drainage, presence of seeps, changes in vegetation cover, etc.)

This form is intended as a general reminder of information that should be recorded during monitoring activities. The above information is a minimum guide. Any information deemed important should be recorded in the field notes for each site.



Identify any changes to site layout on drawing and/or comment:

\*\*\*Confirm and take pictures of perimeter drainage ditch to the south and east.\*\*\*

Drainage ditch ok. Excessive blown plastic in ditch and surrounding forest area

This form is intended as a general reminder of information that should be recorded during monitoring activities. The above information is a minimum guide. Any information deemed important should be recorded in the field notes for each site.

**SMALL LANDFILL  
OPERATION AND INSPECTION FORM**



Site Name: South Baptiste WDS, MHHs	Date: 09/08/23	Weather Conditions: Sunny
Project #: 230 225	BluMetric Staff: MD AM	

Photographs of each item below should be collected during site visits.

**OVERALL INSPECTION AND OPERATION REVIEW**

- Signage in good condition Yes  No
- ECA and emergency numbers on signage Yes  No
- Hour of operation observed Yes  No
- Site open under normal operating hours Yes  No
- Perimeter fencing and gate in good condition Yes  No
- Gate locked if closed Yes  No  N/A

**DESIGNATED WASTE AREA**

- Working active/trench area (moderate size, daily cover, compacted) Yes  No
- Designated waste areas are properly signed and easily accessed by public Yes  No

**RECYCLING OPERATION (if applicable)**

- Proper signage and bins present Yes  No
- Clearly signed Yes  No
- Overall neat in appearance Yes  No

**SEGREGATED SCRAP PILES (metal, tires, brush, etc.)**

- Metals neat and appropriate size Yes  No
- Tires neat and appropriate size Yes  No
- Bulky Items neat and appropriate size Yes  No
- Brush pile neat and appropriate size Yes  No
- Construction Debris neat and appropriate size Yes  No  N/A

**MONITORING WELL CONDITION**

- Casing conditions (frost heave, lock, cap) Yes  No
- Monitor condition (capped, vented) Yes  No
- Wells clearly labeled (re-label as required) Yes  No
- Well clearly visible (clear brush if necessary) Yes  No  N/A

**LANDFILL GAS MONITORING**

- Conducted at structures Yes  No
- Conducted at monitoring wells Yes  No

REPAIRS: Provide details of repairs made or materials required for repairs upon next site visit:

OBSERVATIONS OF PHYSICAL ENVIRONMENT: Please comment on any changes to the local environment (e.g. settling or slumping of waste/cover, new or altered drainage, presence of seeps, changes in vegetation cover, etc.)

This form is intended as a general reminder of information that should be recorded during monitoring activities. The above information is a minimum guide. Any information deemed important should be recorded in the field notes for each site.



Identify any changes to site layout on drawing and/or comment:

**\*\*\*Confirm and take pictures of perimeter drainage ditch to the south and east.\*\*\***

This form is intended as a general reminder of information that should guide. Any information deemed important

**SMALL LANDFILL  
OPERATION AND INSPECTION FORM**



Site Name: South Baptiste WDS, MHHs	Date: Oct 19 2023	Weather Conditions:
Project #: 230225-09	BluMetric Staff: BM MD	cloudy 12°C

Photographs of each item below should be collected during site visits.

**OVERALL INSPECTION AND OPERATION REVIEW**

- Signage in good condition Yes  No
- ECA and emergency numbers on signage Yes  No
- Hour of operation observed Yes  No
- Site open under normal operating hours Yes  No
- Perimeter fencing and gate in good condition Yes  No
- Gate locked if closed Yes  No

**DESIGNATED WASTE AREA**

- Working active/trench area (moderate size, daily cover, compacted) Yes  No  not covered
- Designated waste areas are properly signed and easily accessed by public Yes  No

**RECYCLING OPERATION (if applicable)**

- Proper signage and bins present Yes  No
- Clearly signed Yes  No
- Overall neat in appearance Yes  No

**SEGREGATED SCRAP PILES (metal, tires, brush, etc.)**

- Metals neat and appropriate size Yes  No
- Tires neat and appropriate size Yes  No  overflowing
- Bulky Items neat and appropriate size Yes  No  overflowing
- Brush pile neat and appropriate size Yes  No  large
- Construction Debris neat and appropriate size Yes  No  NA

**MONITORING WELL CONDITION**

- Casing conditions (frost heave, lock, cap) Yes  No
- Monitor condition (capped, vented) Yes  No
- Wells clearly labeled (re-label as required) Yes  No
- Well clearly visible (clear brush if necessary) Yes  No

**LANDFILL GAS MONITORING**

- Conducted at structures Yes  No  25 ppm
- Conducted at monitoring wells Yes  No

REPAIRS: Provide details of repairs made or materials required for repairs upon next site visit:

OBSERVATIONS OF PHYSICAL ENVIRONMENT: Please comment on any changes to the local environment (e.g. settling or slumping of waste/cover, new or altered drainage, presence of seeps, changes in vegetation cover, etc.)

This form is intended as a general reminder of information that should be recorded during monitoring activities. The above information is a minimum guide. Any information deemed important should be recorded in the field notes for each site.

## **Appendix D**

### D-2 2022 Groundwater Analytical Results



**CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.**

**4 Cataraqui Street  
Kingston, ON K7K1Z7  
(613) 531-2725**

**ATTENTION TO: Carolyn Miller**

**PROJECT: 230225-09**

**AGAT WORK ORDER: 23P021640**

**WATER ANALYSIS REVIEWED BY: Chuandi Zhang, Lab Team Lead**

**DATE REPORTED: May 26, 2023**

**PAGES (INCLUDING COVER): 12**

**VERSION\*: 2**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

**\*Notes**

VERSION 2:V2 issued 2023-05-26. Total Phenols data removed by client request. Supersedes previous version. (LB)

**Disclaimer:**

- *All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.*
- *All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.*
- *AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.*
- *This Certificate shall not be reproduced except in full, without the written approval of the laboratory.*
- *The test results reported herewith relate only to the samples as received by the laboratory.*
- *Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.*
- *All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.*
- *For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.*



## Certificate of Analysis

AGAT WORK ORDER: 23P021640

PROJECT: 230225-09

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

ATTENTION TO: Carolyn Miller

SAMPLING SITE: SOUTH BAPTISTE

SAMPLED BY:

### Groundwater Parameters

DATE RECEIVED: 2023-05-05

DATE REPORTED: 2023-05-26

Parameter	Unit	SAMPLE DESCRIPTION:		SB MW2		SB MW3		SB MW4		SB MW5	
		G / S	RDL	Water	4968683	Water	4968686	Water	4968687	Water	4968688
				2023-05-04 10:52		2023-05-04 11:38		2023-05-04 11:10		2023-05-04 11:33	
pH	pH Units		NA	6.99	NA	6.83	NA	7.03	NA	7.28	
Alkalinity (as CaCO3)	mg/L	5	23	5	39	5	45	5	128		
Electrical Conductivity	µS/cm	2	44	2	160	2	158	2	428		
Total Dissolved Solids	mg/L	10	38	10	94	10	116	10	232		
Total Suspended Solids	mg/L	10	196	10	5740	10	41400	10	2590		
Chloride	mg/L	0.10	0.45	0.10	16.4	0.10	1.41	0.10	50.2		
Nitrate as N	mg/L	0.05	<0.05	0.05	0.55	0.05	3.16	0.05	0.11		
Nitrite as N	mg/L	0.05	<0.05	0.05	<0.05	0.05	0.32	0.05	<0.05		
Sulphate	mg/L	0.10	3.54	0.10	13.0	0.10	15.9	0.10	11.2		
Ammonia as N	mg/L	0.02	<0.02	0.02	<0.02	0.03	4.02	0.02	0.54		
Total Kjeldahl Nitrogen	mg/L	0.10	0.15	0.10	0.31	0.10	4.23	0.10	1.26		
Total Phosphorus	mg/L	0.02	0.54	0.03	7.40	0.06	48.8	0.03	5.92		
Chemical Oxygen Demand	mg/L	5	<5	5	8	5	47	5	29		
Dissolved Organic Carbon	mg/L	0.5	1.9	0.5	1.4	0.5	4.9	0.5	5.3		
Dissolved Calcium	mg/L	0.05	5.54	0.05	16.9	0.05	13.4	0.05	34.8		
Dissolved Magnesium	mg/L	0.05	0.79	0.05	2.22	0.05	1.82	0.05	6.83		
Dissolved Potassium	mg/L	0.50	0.54	0.50	2.46	0.50	6.03	0.50	17.6		
Dissolved Sodium	mg/L	0.05	1.28	0.05	9.46	0.05	3.58	0.05	28.1		
Dissolved Aluminum	mg/L	0.004	0.007	0.004	0.011	0.004	0.052	0.004	0.011		
Dissolved Arsenic	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001		
Dissolved Barium	mg/L	0.002	0.004	0.002	0.014	0.002	0.096	0.002	0.040		
Dissolved Beryllium	mg/L	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005		
Dissolved Boron	mg/L	0.010	<0.010	0.010	0.021	0.010	0.244	0.010	0.159		
Dissolved Cadmium	mg/L	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001		
Dissolved Chromium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002		
Dissolved Cobalt	mg/L	0.0005	<0.0005	0.0005	<0.0005	0.0005	0.0005	0.0005	<0.0005		
Dissolved Copper	mg/L	0.001	0.005	0.001	0.006	0.001	0.004	0.001	<0.001		
Dissolved Lead	mg/L	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005		
Dissolved Iron	mg/L	0.010	0.019	0.010	0.017	0.010	0.028	0.010	3.12		

Certified By:



## Certificate of Analysis

AGAT WORK ORDER: 23P021640

PROJECT: 230225-09

5835 COOPERS AVENUE  
 MISSISSAUGA, ONTARIO  
 CANADA L4Z 1Y2  
 TEL (905)712-5100  
 FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.  
 SAMPLING SITE: SOUTH BAPTISTE

ATTENTION TO: Carolyn Miller  
 SAMPLED BY:

### Groundwater Parameters

DATE RECEIVED: 2023-05-05

DATE REPORTED: 2023-05-26

Parameter	Unit	SAMPLE DESCRIPTION:		SB MW2		SB MW3		SB MW4		SB MW5	
		G / S	RDL	Water	Water	Water	Water	Water	Water		
DATE SAMPLED:		2023-05-04		2023-05-04		2023-05-04		2023-05-04		2023-05-04	
		10:52		11:38		11:10		11:33		4968688	
		4968683		4968686		4968687		4968687		4968688	
Dissolved Manganese	mg/L		0.002	<0.002	0.002	0.003	0.002	0.023	0.002	1.52	
Dissolved Mercury	mg/L		0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	
Dissolved Molybdenum	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	
Dissolved Nickel	mg/L		0.001	<0.001	0.001	0.002	0.001	<0.001	0.001	<0.001	
Dissolved Silicon	mg/L		0.05	5.56	0.05	6.07	0.05	2.93	0.05	6.63	
Dissolved Silver	mg/L		0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	
Dissolved Strontium	mg/L		0.005	0.052	0.005	0.128	0.005	0.102	0.005	0.282	
Dissolved Thallium	mg/L		0.0003	<0.0003	0.0003	<0.0003	0.0003	<0.0003	0.0003	<0.0003	
Dissolved Titanium	mg/L		0.002	<0.002	0.002	<0.002	0.002	0.004	0.002	<0.002	
Dissolved Vanadium	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	
Dissolved Zinc	mg/L		0.005	0.011	0.005	0.012	0.005	<0.005	0.005	<0.005	

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ATTENTION TO: Carolyn Miller

SAMPLING SITE: SOUTH BAPTISTE

SAMPLED BY:

### Groundwater Parameters

DATE RECEIVED: 2023-05-05

DATE REPORTED: 2023-05-26

Parameter	Unit	SAMPLE DESCRIPTION: SB MW6R		SB MW7		SB MW8		SB MW9		
		G / S	RDL	RDL	RDL	RDL	RDL	RDL	RDL	
pH	pH Units		NA	7.37	NA	7.29	NA	6.61	NA	6.82
Alkalinity (as CaCO3)	mg/L	5	907	5	623	5	34	5	35	
Electrical Conductivity	µS/cm	2	1870	2	1470	2	537	2	232	
Total Dissolved Solids	mg/L	10	982	10	808	10	336	10	152	
Total Suspended Solids	mg/L	10	54300	10	28	10	8830	10	3690	
Chloride	mg/L	0.24	47.7	0.12	90.9	0.12	138	0.10	48.7	
Nitrate as N	mg/L	0.07	0.34	0.05	0.32	0.05	<0.05	0.05	0.16	
Nitrite as N	mg/L	0.05	<0.05	0.05	<0.05	0.05	<0.05	0.05	<0.05	
Sulphate	mg/L	0.19	92.1	0.10	67.5	0.10	3.65	0.10	3.21	
Ammonia as N	mg/L	0.3	45.5	0.03	10.2	0.02	<0.02	0.02	<0.02	
Total Kjeldahl Nitrogen	mg/L	0.10	58.5	0.10	10.7	0.10	0.19	0.10	<0.10	
Total Phosphorus	mg/L	0.03	3.40	0.02	0.09	0.06	27.9	0.02	3.72	
Chemical Oxygen Demand	mg/L	5	80	5	51	5	<5	5	<5	
Dissolved Organic Carbon	mg/L	0.5	44.9	0.5	22.1	0.5	1.4	0.5	1.0	
Dissolved Calcium	mg/L	0.05	159	0.05	142	0.05	53.5	0.05	23.8	
Dissolved Magnesium	mg/L	0.05	30.7	0.05	24.5	0.05	5.89	0.05	2.75	
Dissolved Potassium	mg/L	0.50	74.2	0.50	33.9	0.50	2.34	0.50	1.60	
Dissolved Sodium	mg/L	0.05	81.6	0.05	87.2	0.05	28.0	0.05	17.5	
Dissolved Aluminum	mg/L	0.004	0.044	0.004	<0.004	0.004	0.019	0.004	0.007	
Dissolved Arsenic	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	0.001	<0.001	
Dissolved Barium	mg/L	0.002	0.180	0.002	0.153	0.002	0.031	0.002	0.014	
Dissolved Beryllium	mg/L	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005	
Dissolved Boron	mg/L	0.010	2.08	0.010	0.885	0.010	<0.010	0.010	<0.010	
Dissolved Cadmium	mg/L	0.0001	<0.0001	0.0001	0.0004	0.0001	<0.0001	0.0001	<0.0001	
Dissolved Chromium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	
Dissolved Cobalt	mg/L	0.0005	0.0369	0.0005	0.0177	0.0005	<0.0005	0.0005	<0.0005	
Dissolved Copper	mg/L	0.001	0.010	0.001	0.039	0.001	0.001	0.001	<0.001	
Dissolved Lead	mg/L	0.0005	<0.0005	0.0005	<0.0005	0.0005	0.0008	0.0005	<0.0005	
Dissolved Iron	mg/L	0.010	37.7	0.010	0.024	0.010	0.116	0.010	<0.010	

Certified By:



## Certificate of Analysis

AGAT WORK ORDER: 23P021640

PROJECT: 230225-09

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CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

ATTENTION TO: Carolyn Miller

SAMPLING SITE: SOUTH BAPTISTE

SAMPLED BY:

### Groundwater Parameters

DATE RECEIVED: 2023-05-05

DATE REPORTED: 2023-05-26

Parameter	Unit	SAMPLE DESCRIPTION: SB MW6R		SB MW7		SB MW8		SB MW9		
		G / S	RDL	RDL	RDL	RDL	RDL	RDL		
Dissolved Manganese	mg/L		0.002	4.30	0.004	10.9	0.002	0.007	0.002	<0.002
Dissolved Mercury	mg/L		0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001
Dissolved Molybdenum	mg/L		0.002	0.003	0.002	0.008	0.002	<0.002	0.002	<0.002
Dissolved Nickel	mg/L		0.001	0.008	0.001	0.035	0.001	0.003	0.001	0.001
Dissolved Silicon	mg/L		0.25	3.55	0.25	7.81	0.05	5.66	0.05	6.52
Dissolved Silver	mg/L		0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001
Dissolved Strontium	mg/L		0.005	0.560	0.005	1.19	0.005	0.592	0.005	0.221
Dissolved Thallium	mg/L		0.0003	<0.0003	0.0003	<0.0003	0.0003	<0.0003	0.0003	<0.0003
Dissolved Titanium	mg/L		0.002	0.010	0.002	<0.002	0.002	<0.002	0.002	<0.002
Dissolved Vanadium	mg/L		0.002	0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002
Dissolved Zinc	mg/L		0.005	<0.005	0.005	0.060	0.005	0.006	0.005	0.006

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SAMPLING SITE: SOUTH BAPTISTE

SAMPLED BY:

## Groundwater Parameters

DATE RECEIVED: 2023-05-05

DATE REPORTED: 2023-05-26

Parameter	Unit	SAMPLE DESCRIPTION: SB MW10		SB MW11		SB QAQC-GW1		
		G / S	RDL	RDL	RDL	RDL	RDL	
pH	pH Units		NA	7.42	NA	7.87	NA	6.85
Alkalinity (as CaCO <sub>3</sub> )	mg/L		5	565	5	177	5	37
Electrical Conductivity	µS/cm		2	1240	2	1520	2	237
Total Dissolved Solids	mg/L		10	724	10	1080	10	136
Total Suspended Solids	mg/L		10	164	10	409	10	1820
Chloride	mg/L		0.12	65.1	0.12	18.2	0.10	48.7
Nitrate as N	mg/L		0.05	<0.05	0.05	0.42	0.05	0.18
Nitrite as N	mg/L		0.05	<0.05	0.05	<0.05	0.05	<0.05
Sulphate	mg/L		0.10	39.7	0.19	652	0.10	3.57
Ammonia as N	mg/L		0.03	15.5	0.02	<0.02	0.02	<0.02
Total Kjeldahl Nitrogen	mg/L		0.10	15.5	0.10	0.16	0.10	<0.10
Total Phosphorus	mg/L		0.02	0.45	0.02	0.40	0.02	3.84
Chemical Oxygen Demand	mg/L		5	59	5	<5	5	<5
Dissolved Organic Carbon	mg/L		0.5	20.8	0.5	2.7	0.5	0.8
Dissolved Calcium	mg/L		0.05	121	0.05	173	0.05	19.5
Dissolved Magnesium	mg/L		0.05	23.6	0.05	21.1	0.05	2.49
Dissolved Potassium	mg/L		0.50	47.7	0.50	2.49	0.50	1.45
Dissolved Sodium	mg/L		0.05	63.7	0.05	155	0.05	15.0
Dissolved Aluminum	mg/L		0.004	0.022	0.004	<0.004	0.004	0.007
Dissolved Arsenic	mg/L		0.001	<0.001	0.001	<0.001	0.001	<0.001
Dissolved Barium	mg/L		0.002	0.089	0.002	0.058	0.002	0.012
Dissolved Beryllium	mg/L		0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005
Dissolved Boron	mg/L		0.010	0.879	0.010	1.36	0.010	<0.010
Dissolved Cadmium	mg/L		0.0001	0.0002	0.0001	<0.0001	0.0001	<0.0001
Dissolved Chromium	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002
Dissolved Cobalt	mg/L		0.0005	0.0450	0.0005	<0.0005	0.0005	<0.0005
Dissolved Copper	mg/L		0.001	0.047	0.001	<0.001	0.001	<0.001
Dissolved Lead	mg/L		0.0005	<0.0005	0.0005	<0.0005	0.0005	<0.0005
Dissolved Iron	mg/L		0.010	0.019	0.010	<0.010	0.010	<0.010

Certified By:





## Certificate of Analysis

AGAT WORK ORDER: 23P021640

PROJECT: 230225-09

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CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

SAMPLING SITE: SOUTH BAPTISTE

ATTENTION TO: Carolyn Miller

SAMPLED BY:

### Groundwater Parameters

DATE RECEIVED: 2023-05-05

DATE REPORTED: 2023-05-26

Parameter	Unit	SAMPLE DESCRIPTION: SB MW10		SB MW11		SB QAQC-GW1		
		G / S	RDL	G / S	RDL	G / S	RDL	
Dissolved Manganese	mg/L		0.004	16.5	0.002	0.035	0.002	<0.002
Dissolved Mercury	mg/L		0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001
Dissolved Molybdenum	mg/L		0.002	0.010	0.002	0.036	0.002	<0.002
Dissolved Nickel	mg/L		0.001	0.034	0.001	0.002	0.001	<0.001
Dissolved Silicon	mg/L		0.25	7.51	0.25	4.90	0.05	6.61
Dissolved Silver	mg/L		0.0001	<0.0001	0.0001	<0.0001	0.0001	<0.0001
Dissolved Strontium	mg/L		0.005	0.744	0.005	8.21	0.005	0.198
Dissolved Thallium	mg/L		0.0003	<0.0003	0.0003	<0.0003	0.0003	<0.0003
Dissolved Titanium	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002
Dissolved Vanadium	mg/L		0.002	<0.002	0.002	<0.002	0.002	<0.002
Dissolved Zinc	mg/L		0.005	0.017	0.005	<0.005	0.005	<0.005

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

4968683-4968695 Dilution required, RDL has been increased accordingly.

Analysis performed at AGAT Toronto (unless marked by \*)

Certified By:

## Quality Assurance

**CLIENT NAME:** BLUMETRIC ENVIRONMENTAL INC.  
**PROJECT:** 230225-09  
**SAMPLING SITE:** SOUTH BAPTISTE

**AGAT WORK ORDER:** 23P021640  
**ATTENTION TO:** Carolyn Miller  
**SAMPLED BY:**

Water Analysis															
RPT Date: May 26, 2023			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE		MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

<b>Groundwater Parameters</b>															
pH	4968447		7.78	7.78	0.0%	NA	102%	90%	110%						
Alkalinity (as CaCO3)	4968447		327	327	0.0%	< 5	110%	80%	120%						
Electrical Conductivity	4968447		686	688	0.3%	< 2	102%	90%	110%						
Total Dissolved Solids	4968484		12	14	NA	< 10	100%	80%	120%						
Total Suspended Solids	4968693	4968693	164	180	9.3%	< 10	98%	80%	120%						
Chloride	4968690	4968690	90.9	92.2	1.4%	< 0.10	94%	70%	130%	100%	80%	120%	101%	70%	130%
Nitrate as N	4968690	4968690	0.32	0.30	6.5%	< 0.05	98%	70%	130%	102%	80%	120%	99%	70%	130%
Nitrite as N	4968690	4968690	<0.05	<0.05	NA	< 0.05	101%	70%	130%	104%	80%	120%	112%	70%	130%
Sulphate	4968690	4968690	67.5	67.5	0.0%	< 0.10	101%	70%	130%	101%	80%	120%	95%	70%	130%
Ammonia as N	4961342		0.19	0.19	0.0%	< 0.02	108%	70%	130%	101%	80%	120%	87%	70%	130%
Total Kjeldahl Nitrogen	4968686	4968686	0.31	0.32	NA	< 0.10	102%	70%	130%	100%	80%	120%	95%	70%	130%
Total Phosphorus	4967316		<0.02	<0.02	NA	< 0.02	101%	70%	130%	100%	80%	120%	91%	70%	130%
Chemical Oxygen Demand	4968694	4968694	<5	<5	NA	< 5	112%	80%	120%	104%	90%	110%	116%	70%	130%
Dissolved Organic Carbon	4968683	4968683	1.9	2.0	NA	< 0.5	93%	90%	110%	101%	90%	110%	95%	80%	120%
Dissolved Calcium	4968686	4968686	16.9	17.2	1.8%	< 0.05	113%	70%	130%	105%	80%	120%	85%	70%	130%
Dissolved Magnesium	4968686	4968686	2.22	2.15	3.2%	< 0.05	114%	70%	130%	106%	80%	120%	95%	70%	130%
Dissolved Potassium	4968686	4968686	2.46	2.34	NA	< 0.50	115%	70%	130%	100%	80%	120%	92%	70%	130%
Dissolved Sodium	4968686	4968686	9.46	9.31	1.6%	< 0.05	115%	70%	130%	107%	80%	120%	90%	70%	130%
Dissolved Aluminum	4968686	4968686	0.011	0.011	NA	< 0.004	100%	70%	130%	104%	80%	120%	91%	70%	130%
Dissolved Arsenic	4968686	4968686	<0.001	<0.001	NA	< 0.001	99%	70%	130%	103%	80%	120%	95%	70%	130%
Dissolved Barium	4968686	4968686	0.014	0.014	0.0%	< 0.002	94%	70%	130%	94%	80%	120%	84%	70%	130%
Dissolved Beryllium	4968686	4968686	<0.0005	<0.0005	NA	< 0.0005	105%	70%	130%	103%	80%	120%	96%	70%	130%
Dissolved Boron	4968686	4968686	0.021	0.018	NA	< 0.010	106%	70%	130%	104%	80%	120%	95%	70%	130%
Dissolved Cadmium	4968686	4968686	<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	101%	80%	120%	95%	70%	130%
Dissolved Chromium	4968686	4968686	<0.002	<0.002	NA	< 0.002	98%	70%	130%	100%	80%	120%	92%	70%	130%
Dissolved Cobalt	4968686	4968686	<0.0005	<0.0005	NA	< 0.0005	102%	70%	130%	100%	80%	120%	93%	70%	130%
Dissolved Copper	4968686	4968686	0.006	0.006	0.0%	< 0.001	99%	70%	130%	100%	80%	120%	92%	70%	130%
Dissolved Lead	4968686	4968686	<0.0005	<0.0005	NA	< 0.0005	103%	70%	130%	95%	80%	120%	86%	70%	130%
Dissolved Iron	4968686	4968686	0.017	0.011	NA	< 0.010	98%	70%	130%	102%	80%	120%	93%	70%	130%
Dissolved Manganese	4968686	4968686	0.003	0.002	NA	< 0.002	103%	70%	130%	102%	80%	120%	93%	70%	130%
Dissolved Mercury	4968683	4968683	<0.0001	<0.0001	NA	< 0.0001	102%	70%	130%	98%	80%	120%	100%	70%	130%
Dissolved Molybdenum	4968686	4968686	<0.002	<0.002	NA	< 0.002	103%	70%	130%	104%	80%	120%	99%	70%	130%
Dissolved Nickel	4968686	4968686	0.002	<0.001	NA	< 0.001	99%	70%	130%	103%	80%	120%	94%	70%	130%
Dissolved Silicon	4968683	4968683	5.56	5.69	2.3%	< 0.05	104%	70%	130%	103%	80%	120%	112%	70%	130%
Dissolved Silver	4968686	4968686	<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	98%	80%	120%	91%	70%	130%
Dissolved Strontium	4968686	4968686	0.128	0.125	2.4%	< 0.005	102%	70%	130%	104%	80%	120%	88%	70%	130%
Dissolved Thallium	4968686	4968686	<0.0003	<0.0003	NA	< 0.0003	104%	70%	130%	101%	80%	120%	89%	70%	130%
Dissolved Titanium	4968686	4968686	<0.002	<0.002	NA	< 0.002	104%	70%	130%	109%	80%	120%	98%	70%	130%
Dissolved Vanadium	4968686	4968686	<0.002	<0.002	NA	< 0.002	103%	70%	130%	102%	80%	120%	99%	70%	130%



## Quality Assurance

**CLIENT NAME:** BLUMETRIC ENVIRONMENTAL INC.  
**PROJECT:** 230225-09  
**SAMPLING SITE:** SOUTH BAPTISTE

**AGAT WORK ORDER:** 23P021640  
**ATTENTION TO:** Carolyn Miller  
**SAMPLED BY:**

### Water Analysis (Continued)

RPT Date: May 26, 2023			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits			Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper	Lower		Upper	Lower		Upper	
Dissolved Zinc	4968686	4968686	0.012	0.010	NA	< 0.005	99%	70%	130%	101%	80%	120%	91%	70%	130%	

Certified By: \_\_\_\_\_



## Method Summary

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

AGAT WORK ORDER: 23P021640

PROJECT: 230225-09

ATTENTION TO: Carolyn Miller

SAMPLING SITE: SOUTH BAPTISTE

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
<b>Water Analysis</b>			
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Alkalinity (as CaCO <sub>3</sub> )	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Electrical Conductivity	INOR-93-6000	modified from SM 2510 B	PC TITRATE
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Total Suspended Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH <sub>3</sub> H	LACHAT FIA
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Total Phosphorus	INOR-93-6057	modified from LACHAT 10-115-01-3A	LACHAT FIA
Chemical Oxygen Demand	INOR-93-6042	modified from SM 5220 A and SM 5220 D	SPECTROPHOTOMETER
Dissolved Organic Carbon	INOR-93-6049	modified from SM 5310 B	SHIMADZU CARBON ANALYZER
Dissolved Calcium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP/MS
Dissolved Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Dissolved Potassium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP/MS
Dissolved Sodium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP/MS
Dissolved Aluminum	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Arsenic	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Barium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Beryllium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Boron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cadmium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Chromium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Cobalt	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Copper	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Lead	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Iron	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Manganese	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Dissolved Molybdenum	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS

## Method Summary

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

AGAT WORK ORDER: 23P021640

PROJECT: 230225-09

ATTENTION TO: Carolyn Miller

SAMPLING SITE: SOUTH BAPTISTE

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dissolved Nickel	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Silicon	MET-93-6105	modified from EPA 6010D	ICP/OES
Dissolved Silver	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Strontium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Thallium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Titanium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Vanadium	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Dissolved Zinc	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS



# AGAT Laboratories

5835 Coopers Avenue  
Mississauga, Ontario L4Z 1Y2  
Ph: 905.712.5100 Fax: 905.712.5122  
web@earth.agatlabs.com

### Laboratory Use Only

Work Order #: 23PO21640  
Cooler Quantity: 2  
Arrival Temperatures: 5.4 | 6.2 | 6.1  
4.6 | 4.9 | 5.3  
Custody Seal Intact:  Yes  No  N/A  
Notes: ice 2.5 2.8 2.9

## Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

### Report Information:

Company: BluMetric  
Contact: Carolyn Miller  
Address: 4 Catarqui St  
Kingston, ON, K7K1Z7  
Phone: 613-328-0243 Fax: \_\_\_\_\_  
Reports to be sent to: cmiller@blumetric.ca  
1. Email: \_\_\_\_\_  
2. Email: cbandler@blumetric.ca

### Regulatory Requirements:

(Please check all applicable boxes)

- Regulation 153/04  Excess Soils R406  Sewer Use  
 Sanitary  Storm  
Table \_\_\_\_\_ Indicate One  
 Ind/Com  
 Res/Park  
 Agriculture  
 Regulation 558  Prov. Water Quality Objectives (PWQO)  
 Other  
OWDS  
Soil Texture (Check One)  CCME  
 Coarse  
 Fine  
Region \_\_\_\_\_

### Project Information:

Project: 230225-09  
Site Location: South Baptiste  
Sampled By: \_\_\_\_\_  
AGAT Quota #: 740807 PO: 230225-09

### Is this submission for a Record of Site Condition?

Yes  No

### Report Guideline on Certificate of Analysis

Yes  No

### Invoice Information:

Bill To Same: Yes  No

Company: \_\_\_\_\_  
Contact: \_\_\_\_\_  
Address: \_\_\_\_\_  
Email: ap@blumetric.ca

### Sample Matrix Legend

- B Biota  
GW Ground Water  
O Oil  
P Paint  
S Soil  
SD Sediment  
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	O. Reg 153		O. Reg 558		O. Reg 406		93-262 Groundwater	TSS	Potentially Hazardous or High Concentration (Y/N)
							Metals & Inorganics	Metals - CrVI, Hg, HWWSB	Landfill Disposal Characterization TOCP	Excess Soils S/PLP Reinwater Leach	Excess Soils Characterization Package	pH, IC/PMs Metals, BTEX, FL-F4			
SB MW2	May 4/23	10:52 AM	9	GW		Y									
SB MW3	May 4/23	11:38 AM	9	GW	Field Filter: Metals, DOC, Hg	Y									
SB MW4	May 4/23	11:10 AM	9	GW		Y									
SB MW5	May 4/23	11:33 AM	9	GW		Y									
SB-MW6R	May 4/23	11:25 AM	9	GW		Y									
SB-MW7	May 4/23	11:15 AM	9	GW		Y									
SB-MW8	May 4/23	9:54 AM	9	GW		Y									
SB-MW9	May 4/23	10:02 AM	9	GW		Y									
SB-MW10	May 4/23	11:02 AM	9	GW		Y									
SB-MW11	May 4/23	12:10 AM	9	GW		Y									
SB-QAQC-GW1	May 4/23	10:02 AM	9	GW		Y									

Samples Relinquished By (Print Name and Sign): <u>Brad McCallum / Bred M Callum</u>	Date: <u>May 5, 2023</u>	Time: <u>9:30 am</u>	Samples Received By (Print Name and Sign): <u>Kary Jones</u>	Date: <u>May 5/23</u>	Time: <u>9:30</u>
Samples Relinquished By (Print Name and Sign): <u>[Signature]</u>	Date: <u>May 5/23</u>	Time: <u>10:00</u>	Samples Received By (Print Name and Sign): <u>Anusha</u>	Date: <u>06/05</u>	Time: <u>10:33</u>
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:



Your P.O. #: 230301-00  
 Site#: 200  
 Your C.O.C. #: n/a

**Attention: Cecilia Bandler**

BluMetric Environmental Inc  
 The Tower - The Woolen Mill  
 4 Catarauqui St  
 Kingston, ON  
 CANADA K7K 1Z7

**Report Date: 2023/05/16**  
 Report #: R7630630  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3D0982**

**Received: 2023/05/09, 09:08**

Sample Matrix: Water  
 # Samples Received: 11

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Analytical Method</b>
Phenols (4AAP)	11	N/A	2023/05/12	CAM SOP-00444	OMOE E3179 m

**Remarks:**  
 Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas 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. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas 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 Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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. When sampling is not conducted by Bureau Veritas, results relate to the supplied 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.



Your P.O. #: 230301-00  
Site#: 200  
Your C.O.C. #: n/a

**Attention: Cecilia Bandler**

BluMetric Environmental Inc  
The Tower - The Woolen Mill  
4 Cataraqui St  
Kingston, ON  
CANADA K7K 1Z7

**Report Date: 2023/05/16**  
Report #: R7630630  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3D0982**  
**Received: 2023/05/09, 09:08**

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:  
Christine Gripton, Senior Project Manager  
Email: Christine.Gripton@bureauveritas.com  
Phone# (519)652-9444

=====

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



BUREAU  
VERITAS

Bureau Veritas Job #: C3D0982  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### RESULTS OF ANALYSES OF WATER

<b>Bureau Veritas ID</b>		VTJ841	VTJ842	VTJ843	VTJ844	VTJ845	VTJ846	VTJ847		
<b>Sampling Date</b>		2023/05/04 10:52	2023/05/04 11:38	2023/05/04 11:10	2023/05/04 11:33	2023/05/04 11:25	2023/05/04 11:15	2023/05/04 09:54		
<b>COC Number</b>		n/a	n/a	n/a	n/a	n/a	n/a	n/a		
	<b>UNITS</b>	<b>SB-MW2</b>	<b>SB-MW3</b>	<b>SB-MW4</b>	<b>SB-MW5</b>	<b>SB-MW6R</b>	<b>SB-MW7</b>	<b>SB-MW8</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Inorganics</b>										
Phenols-4AAP	mg/L	ND	ND	ND	ND	0.0020	ND	ND	0.0010	8662652

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

<b>Bureau Veritas ID</b>		VTJ848	VTJ849	VTJ850		VTJ851	VTJ851		
<b>Sampling Date</b>		2023/05/04 10:02	2023/05/04 11:02	2023/05/04 12:10		2023/05/04 10:02	2023/05/04 10:02		
<b>COC Number</b>		n/a	n/a	n/a		n/a	n/a		
	<b>UNITS</b>	<b>SB-MW9</b>	<b>SB-MW10</b>	<b>SB-MW11</b>	<b>QC Batch</b>	<b>SB-QAQC-GW1</b>	<b>SB-QAQC-GW1 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Inorganics</b>										
Phenols-4AAP	mg/L	ND	ND	ND	8662652	ND	ND	0.0010	8662842	

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU  
VERITAS

Bureau Veritas Job #: C3D0982  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### TEST SUMMARY

**Bureau Veritas ID:** VTJ841  
**Sample ID:** SB-MW2  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ842  
**Sample ID:** SB-MW3  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ843  
**Sample ID:** SB-MW4  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ844  
**Sample ID:** SB-MW5  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ845  
**Sample ID:** SB-MW6R  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ846  
**Sample ID:** SB-MW7  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ847  
**Sample ID:** SB-MW8  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur





BUREAU  
VERITAS

Bureau Veritas Job #: C3D0982  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### TEST SUMMARY

**Bureau Veritas ID:** VTJ848  
**Sample ID:** SB-MW9  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ849  
**Sample ID:** SB-MW10  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ850  
**Sample ID:** SB-MW11  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662652	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ851  
**Sample ID:** SB-QAQC-GW1  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662842	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ851 Dup  
**Sample ID:** SB-QAQC-GW1  
**Matrix:** Water

**Collected:** 2023/05/04  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8662842	N/A	2023/05/12	Mandeep Kaur



BUREAU  
VERITAS

Bureau Veritas Job #: C3D0982  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### GENERAL COMMENTS

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

Package 1	8.0°C
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**Results relate only to the items tested.**



BUREAU  
VERITAS

Bureau Veritas Job #: C3D0982

Report Date: 2023/05/16

### QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Your P.O. #: 230301-00

Sampler Initials: BM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8662652	Phenols-4AAP	2023/05/12	103	80 - 120	101	80 - 120	ND, RDL=0.0010	mg/L	NC	20
8662842	Phenols-4AAP	2023/05/12	103	80 - 120	101	80 - 120	ND, RDL=0.0010	mg/L	NC	20

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 (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).



BUREAU  
VERITAS

Bureau Veritas Job #: C3D0982  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

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Cristina Carriere, Senior Scientific Specialist

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.



C.O.C.: -

REPORT No: 23-010836 - Rev. 0

**Report To:**  
 Blumetric Environmental  
 3108 Carp Rd  
 PO Box 430  
 Carp, ON K0A 1L0

**CADUCEON Environmental Laboratories**  
 285 Dalton Ave  
 Kingston, ON K7K 6Z1

**Attention: Cecilia Bandler**

DATE RECEIVED: 2023-May-05  
 DATE REPORTED: 2023-May-19  
 SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: South Baptise: 230225-09  
 P.O. NUMBER: 230301-00

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Phenols (Liquid)	11	KINGSTON	JMACINNES	2023-May-18	PHEN-01	MECP E3179

R.L. = Reporting Limit  
 NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an \*

Parameter	Units	R.L.	Client I.D.	Client I.D.	Client I.D.	Client I.D.	Client I.D.
			Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
			Date Collected	Date Collected	Date Collected	Date Collected	Date Collected
			SB-MW2	SB-MW3	SB-MW4	SB-MW5	SB-MW6R
			23-010836-1	23-010836-2	23-010836-3	23-010836-4	23-010836-5
			2023-05-04	2023-05-04	2023-05-04	2023-05-04	2023-05-04
			-	-	-	-	-
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Units	R.L.	Client I.D.	Client I.D.	Client I.D.	Client I.D.	Client I.D.
			Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
			Date Collected	Date Collected	Date Collected	Date Collected	Date Collected
			SB-MW7	SB-MW8	SB-MW9	SB-MW10	SB-MW11
			23-010836-6	23-010836-7	23-010836-8	23-010836-9	23-010836-10
			2023-05-04	2023-05-04	2023-05-04	2023-05-04	2023-05-04
			-	-	-	-	-
Phenolics	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001



**Richard Lecompte**  
 Laboratory Supervisor

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report  
REPORT No: 23-010836 - Rev. 0

		<b>Client I.D.</b>	SB-QAQC-GW1
		<b>Sample I.D.</b>	23-010836-11
		<b>Date Collected</b>	2023-05-04
<b>Parameter</b>	<b>Units</b>	<b>R.L.</b>	-
Phenolics	mg/L	0.001	<0.001



**Richard Lecompte**  
**Laboratory Supervisor**

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.



Your Project #: 230225-09  
 Site Location: South Baptiste  
 Your C.O.C. #: 781234

**Attention: Cecilia Bandler**

BluMetric Environmental Inc  
 The Tower - The Woolen Mill  
 4 Catarauqui St  
 Kingston, ON  
 CANADA K7K 1Z7

**Report Date: 2023/11/02**  
 Report #: R7891987  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3W8793**

**Received: 2023/10/21, 14:53**

Sample Matrix: Water  
 # Samples Received: 8

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Analytical Method</b>
Alkalinity	8	N/A	2023/10/25	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	1	N/A	2023/10/26	CAM SOP-00463	SM 23 4500-Cl E m
Chloride by Automated Colourimetry	7	N/A	2023/10/27	CAM SOP-00463	SM 23 4500-Cl E m
Chemical Oxygen Demand	8	N/A	2023/10/27	CAM SOP-00416	SM 23 5220 D m
Conductivity	8	N/A	2023/10/25	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	8	N/A	2023/10/27	CAM SOP-00446	SM 23 5310 B m
Dissolved Mercury in Water by CVAA	8	2023/10/24	2023/10/24	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	8	N/A	2023/10/24	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	6	N/A	2023/10/29	CAM SOP-00441	USGS I-2522-90 m
Total Ammonia-N	2	N/A	2023/10/30	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	8	N/A	2023/10/25	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	8	2023/10/23	2023/10/25	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	8	N/A	2023/10/26	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Turbidimetry	1	N/A	2023/10/26	CAM SOP-00464	SM 23 4500-SO42- E m
Sulphate by Automated Turbidimetry	7	N/A	2023/10/27	CAM SOP-00464	SM 23 4500-SO42- E m
Total Dissolved Solids	2	2023/10/27	2023/10/28	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	1	2023/10/27	2023/10/31	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	2	2023/10/28	2023/10/31	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	3	2023/10/30	2023/11/01	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	4	2023/10/25	2023/10/26	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	4	2023/10/25	2023/10/27	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2023/10/25	2023/10/26	CAM SOP-00407	SM 23 4500-P I
Total Phosphorus (Colourimetric)	6	2023/10/25	2023/10/27	CAM SOP-00407	SM 23 4500-P I
Total Suspended Solids	1	2023/10/27	2023/10/30	CAM SOP-00428	SM 23 2540D m
Total Suspended Solids	5	2023/10/27	2023/11/02	CAM SOP-00428	SM 23 2540D m
Total Suspended Solids	2	2023/10/28	2023/10/31	CAM SOP-00428	SM 23 2540D m

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCCFP, EPA, APHA.





Your Project #: 230225-09  
Site Location: South Baptiste  
Your C.O.C. #: 781234

**Attention: Cecilia Bandler**

BluMetric Environmental Inc  
The Tower - The Woolen Mill  
4 Cataraqui St  
Kingston, ON  
CANADA K7K 1Z7

**Report Date: 2023/11/02**  
Report #: R7891987  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3W8793**

**Received: 2023/10/21, 14:53**

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas 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. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas 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 Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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. When sampling is not conducted by Bureau Veritas, results relate to the supplied 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:

Christine Gripton, Senior Project Manager  
Email: Christine.Gripton@bureauveritas.com  
Phone# (519)652-9444

=====  
This report has been generated and distributed using a secure automated process.

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		XJD358		XJD359			XJD360		
Sampling Date		2023/10/19 15:55		2023/10/19 16:15			2023/10/19 16:00		
COC Number		781234		781234			781234		
	UNITS	SB-MW4	RDL	SB-MW5	RDL	QC Batch	SB-MW6R	RDL	QC Batch
<b>Inorganics</b>									
Total Ammonia-N	mg/L	4.4	0.050	1.0	0.050	9004023	50	0.50	9004023
Total Chemical Oxygen Demand (COD)	mg/L	59	4.0	20	4.0	9005673	290	12	9005673
Conductivity	umho/cm	450	1.0	490	1.0	8999884	1800	1.0	8999884
Total Dissolved Solids	mg/L	265	10	250	10	9013590	770	10	9011139
Total Kjeldahl Nitrogen (TKN)	mg/L	5.7	0.20	1.4	0.10	9006131	48	2.0	9006131
Dissolved Organic Carbon	mg/L	7.8	0.4	5.2	0.4	8999285	48	0.4	8999285
pH	pH	7.40		7.55		8999883	7.53		8999883
Phenols-4AAP	mg/L	ND	0.0010	ND	0.0010	9006440	0.0011	0.0010	9006440
Total Phosphorus	mg/L	75	0.20	8.6	0.020	9006644	52	0.20	9006644
Total Suspended Solids	mg/L	67000	200	2500	50	9011629	120000	1000	9013364
Dissolved Sulphate (SO4)	mg/L	54	1.0	3.7	1.0	8999834	16	1.0	8999911
Alkalinity (Total as CaCO3)	mg/L	150	1.0	180	1.0	8999879	830	1.0	8999879
Dissolved Chloride (Cl-)	mg/L	3.9	1.0	39	1.0	8999803	11	1.0	8999889
Nitrite (N)	mg/L	1.07	0.010	0.016	0.010	8998930	0.029	0.010	8998930
Nitrate (N)	mg/L	1.58	0.10	ND	0.10	8998930	ND	0.10	8998930
Nitrate + Nitrite (N)	mg/L	2.64	0.10	ND	0.10	8998930	0.12	0.10	8998930
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.									



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### RESULTS OF ANALYSES OF WATER

<b>Bureau Veritas ID</b>		XJD361			XJD361			XJD362		
<b>Sampling Date</b>		2023/10/19 15:45			2023/10/19 15:45			2023/10/19 15:00		
<b>COC Number</b>		781234			781234			781234		
	<b>UNITS</b>	<b>SB-MW7</b>	<b>RDL</b>	<b>QC Batch</b>	<b>SB-MW7 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>	<b>SB-MW8</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Inorganics</b>										
Total Ammonia-N	mg/L	19	0.050	9004023				ND	0.050	9004023
Total Chemical Oxygen Demand (COD)	mg/L	75	4.0	9005673				12	4.0	9005673
Conductivity	umho/cm	1500	1.0	8999884				91	1.0	8999884
Total Dissolved Solids	mg/L	940	10	9013589				130	10	9008301
Total Kjeldahl Nitrogen (TKN)	mg/L	18	0.50	9006131				0.12	0.10	9006131
Dissolved Organic Carbon	mg/L	23	0.4	8999285				3.2	0.4	8999285
pH	pH	7.64		8999883				7.33		8999883
Phenols-4AAP	mg/L	ND	0.0010	9006440				ND	0.0010	9006440
Total Phosphorus	mg/L	ND	0.020	9006644				36	0.20	9006644
Total Suspended Solids	mg/L	13	10	9011629				28000	100	9012166
Dissolved Sulphate (SO4)	mg/L	72	1.0	9000171	74	1.0	9000171	4.2	1.0	8999911
Alkalinity (Total as CaCO3)	mg/L	620	1.0	8999879				31	1.0	8999879
Dissolved Chloride (Cl-)	mg/L	97	1.0	9000165	97	1.0	9000165	5.4	1.0	8999889
Nitrite (N)	mg/L	ND	0.010	8999841				ND	0.010	8998930
Nitrate (N)	mg/L	0.28	0.10	8999841				0.18	0.10	8998930
Nitrate + Nitrite (N)	mg/L	0.28	0.10	8999841				0.18	0.10	8998930

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Lab-Dup = Laboratory Initiated Duplicate

ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		XJD363			XJD364			XJD364		
Sampling Date		2023/10/19 15:05			2023/10/19 16:10			2023/10/19 16:10		
COC Number		781234			781234			781234		
	UNITS	SB-MW9	RDL	QC Batch	SB-MW10	RDL	QC Batch	SB-MW10 Lab-Dup	RDL	QC Batch

Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9004023	6.1	0.050	9004023			
Total Chemical Oxygen Demand (COD)	mg/L	6.9	4.0	9005673	20	4.0	9005673	20	4.0	9005673
Conductivity	umho/cm	59	1.0	8999884	770	1.0	8999884	770	1.0	8999884
Total Dissolved Solids	mg/L	15	10	9011139	420	10	9013589			
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	0.10	9006131	6.2	0.20	9006131			
Dissolved Organic Carbon	mg/L	1.3	0.4	8999285	11	0.4	8999285			
pH	pH	7.26		8999883	7.55		8999883	7.56		8999883
Phenols-4AAP	mg/L	ND	0.0010	9006440	ND	0.0010	9006440			
Total Phosphorus	mg/L	3.8	0.020	9006644	0.36	0.020	9006644			
Total Suspended Solids	mg/L	1000	10	9013364	980	13	9011629			
Dissolved Sulphate (SO4)	mg/L	3.7	1.0	8999834	27	1.0	8999834			
Alkalinity (Total as CaCO3)	mg/L	24	1.0	8999879	310	1.0	8999879	320	1.0	8999879
Dissolved Chloride (Cl-)	mg/L	ND	1.0	8999803	33	1.0	8999803			
Nitrite (N)	mg/L	ND	0.010	8998930	ND	0.010	8998930			
Nitrate (N)	mg/L	0.13	0.10	8998930	0.45	0.10	8998930			
Nitrate + Nitrite (N)	mg/L	0.13	0.10	8998930	0.45	0.10	8998930			

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### RESULTS OF ANALYSES OF WATER

<b>Bureau Veritas ID</b>		XJD365			XJD365		
<b>Sampling Date</b>		2023/10/19 15:45			2023/10/19 15:45		
<b>COC Number</b>		781234			781234		
	<b>UNITS</b>	<b>SB-QAQC-GW1</b>	<b>RDL</b>	<b>QC Batch</b>	<b>SB-QAQC-GW1 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Inorganics</b>							
Total Ammonia-N	mg/L	19	0.050	9004023			
Total Chemical Oxygen Demand (COD)	mg/L	76	4.0	9005673			
Conductivity	umho/cm	1500	1.0	8999884			
Total Dissolved Solids	mg/L	930	10	9013589			
Total Kjeldahl Nitrogen (TKN)	mg/L	19	1.0	9006131	19	1.0	9006131
Dissolved Organic Carbon	mg/L	23	0.4	8999285			
pH	pH	7.74		8999883			
Phenols-4AAP	mg/L	ND	0.0010	9006440			
Total Phosphorus	mg/L	0.029	0.020	9006644			
Total Suspended Solids	mg/L	15	10	9011629			
Dissolved Sulphate (SO4)	mg/L	66	1.0	8999911			
Alkalinity (Total as CaCO3)	mg/L	620	1.0	8999879			
Dissolved Chloride (Cl-)	mg/L	90	1.0	8999889			
Nitrite (N)	mg/L	ND	0.010	8999841			
Nitrate (N)	mg/L	0.28	0.10	8999841			
Nitrate + Nitrite (N)	mg/L	0.28	0.10	8999841			

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		XJD358	XJD359	XJD360	XJD361	XJD362	XJD363	XJD364		
Sampling Date		2023/10/19 15:55	2023/10/19 16:15	2023/10/19 16:00	2023/10/19 15:45	2023/10/19 15:00	2023/10/19 15:05	2023/10/19 16:10		
COC Number		781234	781234	781234	781234	781234	781234	781234		
	UNITS	SB-MW4	SB-MW5	SB-MW6R	SB-MW7	SB-MW8	SB-MW9	SB-MW10	RDL	QC Batch

Metals										
Dissolved Mercury (Hg)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.10	9002508
Dissolved Aluminum (Al)	ug/L	33	8.9	56	ND	21	ND	5.9	4.9	8998920
Dissolved Arsenic (As)	ug/L	ND	ND	ND	ND	ND	ND	ND	1.0	8998920
Dissolved Barium (Ba)	ug/L	490	60	270	180	2.9	2.9	80	2.0	8998920
Dissolved Beryllium (Be)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.40	8998920
Dissolved Boron (B)	ug/L	570	250	2500	940	13	ND	610	10	8998920
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	0.33	ND	ND	0.20	0.090	8998920
Dissolved Calcium (Ca)	ug/L	54000	42000	180000	170000	3000	4100	86000	200	8998920
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	ND	ND	ND	ND	5.0	8998920
Dissolved Cobalt (Co)	ug/L	1.3	ND	45	15	ND	ND	15	0.50	8998920
Dissolved Copper (Cu)	ug/L	10	ND	8.9	37	4.7	2.5	29	0.90	8998920
Dissolved Iron (Fe)	ug/L	ND	1500	63000	ND	ND	ND	ND	100	8998920
Dissolved Lead (Pb)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.50	8998920
Dissolved Magnesium (Mg)	ug/L	4800	7700	29000	29000	300	490	16000	50	8998920
Dissolved Manganese (Mn)	ug/L	100	1700	4300	8700	ND	ND	9000	2.0	8998920
Dissolved Molybdenum (Mo)	ug/L	0.52	1.0	6.1	6.0	0.81	ND	7.2	0.50	8998920
Dissolved Nickel (Ni)	ug/L	1.1	ND	8.4	28	ND	ND	15	1.0	8998920
Dissolved Potassium (K)	ug/L	13000	23000	84000	29000	770	730	32000	200	8998920
Dissolved Silicon (Si)	ug/L	3500	7500	3900	8100	4200	5700	6500	50	8998920
Dissolved Silver (Ag)	ug/L	ND	ND	ND	ND	ND	ND	ND	0.090	8998920
Dissolved Sodium (Na)	ug/L	20000	31000	69000	91000	16000	7500	41000	100	8998920
Dissolved Strontium (Sr)	ug/L	280	360	610	1500	35	39	600	1.0	8998920
Dissolved Thallium (Tl)	ug/L	0.081	ND	0.30	0.14	ND	ND	0.13	0.050	8998920
Dissolved Titanium (Ti)	ug/L	ND	ND	ND	ND	ND	ND	ND	5.0	8998920
Dissolved Vanadium (V)	ug/L	ND	1.2	2.8	ND	ND	ND	ND	0.50	8998920
Dissolved Zinc (Zn)	ug/L	14	ND	ND	62	ND	ND	14	5.0	8998920

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

<b>Bureau Veritas ID</b>		XJD365		
<b>Sampling Date</b>		2023/10/19 15:45		
<b>COC Number</b>		781234		
	<b>UNITS</b>	<b>SB-QAQC-GW1</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Metals</b>				
Dissolved Mercury (Hg)	ug/L	ND	0.10	9002508
Dissolved Aluminum (Al)	ug/L	ND	4.9	8998920
Dissolved Arsenic (As)	ug/L	ND	1.0	8998920
Dissolved Barium (Ba)	ug/L	180	2.0	8998920
Dissolved Beryllium (Be)	ug/L	ND	0.40	8998920
Dissolved Boron (B)	ug/L	940	10	8998920
Dissolved Cadmium (Cd)	ug/L	0.38	0.090	8998920
Dissolved Calcium (Ca)	ug/L	170000	200	8998920
Dissolved Chromium (Cr)	ug/L	ND	5.0	8998920
Dissolved Cobalt (Co)	ug/L	14	0.50	8998920
Dissolved Copper (Cu)	ug/L	37	0.90	8998920
Dissolved Iron (Fe)	ug/L	ND	100	8998920
Dissolved Lead (Pb)	ug/L	ND	0.50	8998920
Dissolved Magnesium (Mg)	ug/L	28000	50	8998920
Dissolved Manganese (Mn)	ug/L	8500	2.0	8998920
Dissolved Molybdenum (Mo)	ug/L	6.2	0.50	8998920
Dissolved Nickel (Ni)	ug/L	28	1.0	8998920
Dissolved Potassium (K)	ug/L	28000	200	8998920
Dissolved Silicon (Si)	ug/L	7900	50	8998920
Dissolved Silver (Ag)	ug/L	ND	0.090	8998920
Dissolved Sodium (Na)	ug/L	89000	100	8998920
Dissolved Strontium (Sr)	ug/L	1500	1.0	8998920
Dissolved Thallium (Tl)	ug/L	0.14	0.050	8998920
Dissolved Titanium (Ti)	ug/L	ND	5.0	8998920
Dissolved Vanadium (V)	ug/L	ND	0.50	8998920
Dissolved Zinc (Zn)	ug/L	61	5.0	8998920
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.				



BUREAU  
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Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD358  
**Sample ID:** SB-MW4  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil
Chloride by Automated Colourimetry	KONE	8999803	N/A	2023/10/27	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8999285	N/A	2023/10/27	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9002508	2023/10/24	2023/10/24	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	8998920	N/A	2023/10/24	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/30	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8998930	N/A	2023/10/25	Chandra Nandlal
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9006440	N/A	2023/10/26	Chloe Pollock
Sulphate by Automated Turbidimetry	KONE	8999834	N/A	2023/10/27	Alina Dobreanu
Total Dissolved Solids	BAL	9013590	2023/10/28	2023/10/31	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/27	Sachi Patel
Total Suspended Solids	BAL	9011629	2023/10/27	2023/11/02	Tina Teng

**Bureau Veritas ID:** XJD359  
**Sample ID:** SB-MW5  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil
Chloride by Automated Colourimetry	KONE	8999803	N/A	2023/10/27	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8999285	N/A	2023/10/27	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9002508	2023/10/24	2023/10/24	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	8998920	N/A	2023/10/24	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8998930	N/A	2023/10/25	Chandra Nandlal
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9006440	N/A	2023/10/26	Chloe Pollock
Sulphate by Automated Turbidimetry	KONE	8999834	N/A	2023/10/27	Alina Dobreanu
Total Dissolved Solids	BAL	9013590	2023/10/28	2023/10/31	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/26	Sachi Patel
Total Suspended Solids	BAL	9011629	2023/10/27	2023/11/02	Tina Teng

**Bureau Veritas ID:** XJD360  
**Sample ID:** SB-MW6R  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil





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Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD360  
**Sample ID:** SB-MW6R  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	8999889	N/A	2023/10/27	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8999285	N/A	2023/10/27	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9002508	2023/10/24	2023/10/24	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	8998920	N/A	2023/10/24	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/30	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8998930	N/A	2023/10/25	Chandra Nandlal
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9006440	N/A	2023/10/26	Chloe Pollock
Sulphate by Automated Turbidimetry	KONE	8999911	N/A	2023/10/27	Alina Dobreanu
Total Dissolved Solids	BAL	9011139	2023/10/27	2023/10/28	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/27	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/27	Sachi Patel
Total Suspended Solids	BAL	9013364	2023/10/28	2023/10/31	Razieh Tabesh

**Bureau Veritas ID:** XJD361  
**Sample ID:** SB-MW7  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil
Chloride by Automated Colourimetry	KONE	9000165	N/A	2023/10/26	Massarat Jan
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8999285	N/A	2023/10/27	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9002508	2023/10/24	2023/10/24	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	8998920	N/A	2023/10/24	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8999841	N/A	2023/10/25	Chandra Nandlal
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9006440	N/A	2023/10/26	Chloe Pollock
Sulphate by Automated Turbidimetry	KONE	9000171	N/A	2023/10/26	Massarat Jan
Total Dissolved Solids	BAL	9013589	2023/10/30	2023/11/01	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/27	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/27	Sachi Patel
Total Suspended Solids	BAL	9011629	2023/10/27	2023/11/02	Tina Teng

**Bureau Veritas ID:** XJD361 Dup  
**Sample ID:** SB-MW7  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	9000165	N/A	2023/10/26	Massarat Jan
Sulphate by Automated Turbidimetry	KONE	9000171	N/A	2023/10/26	Massarat Jan



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Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD362  
**Sample ID:** SB-MW8  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil
Chloride by Automated Colourimetry	KONE	8999889	N/A	2023/10/27	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8999285	N/A	2023/10/27	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9002508	2023/10/24	2023/10/24	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	8998920	N/A	2023/10/24	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8998930	N/A	2023/10/25	Chandra Nandlal
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9006440	N/A	2023/10/26	Chloe Pollock
Sulphate by Automated Turbidimetry	KONE	8999911	N/A	2023/10/27	Alina Dobreanu
Total Dissolved Solids	BAL	9008301	2023/10/27	2023/10/31	Shaneil Hall
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/27	Sachi Patel
Total Suspended Solids	BAL	9012166	2023/10/27	2023/10/30	Tina Teng

**Bureau Veritas ID:** XJD363  
**Sample ID:** SB-MW9  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil
Chloride by Automated Colourimetry	KONE	8999803	N/A	2023/10/27	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8999285	N/A	2023/10/27	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9002508	2023/10/24	2023/10/24	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	8998920	N/A	2023/10/24	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8998930	N/A	2023/10/25	Chandra Nandlal
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9006440	N/A	2023/10/26	Chloe Pollock
Sulphate by Automated Turbidimetry	KONE	8999834	N/A	2023/10/27	Alina Dobreanu
Total Dissolved Solids	BAL	9011139	2023/10/27	2023/10/28	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/27	Sachi Patel
Total Suspended Solids	BAL	9013364	2023/10/28	2023/10/31	Razieh Tabesh

**Bureau Veritas ID:** XJD364  
**Sample ID:** SB-MW10  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil



BUREAU  
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Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD364  
**Sample ID:** SB-MW10  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	8999803	N/A	2023/10/27	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8999285	N/A	2023/10/27	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9002508	2023/10/24	2023/10/24	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	8998920	N/A	2023/10/24	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8998930	N/A	2023/10/25	Chandra Nandlal
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9006440	N/A	2023/10/26	Chloe Pollock
Sulphate by Automated Turbidimetry	KONE	8999834	N/A	2023/10/27	Alina Dobreanu
Total Dissolved Solids	BAL	9013589	2023/10/30	2023/11/01	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/27	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/27	Sachi Patel
Total Suspended Solids	BAL	9011629	2023/10/27	2023/11/02	Tina Teng

**Bureau Veritas ID:** XJD364 Dup  
**Sample ID:** SB-MW10  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil

**Bureau Veritas ID:** XJD365  
**Sample ID:** SB-QAQC-GW1  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	8999879	N/A	2023/10/25	Nachiketa Gohil
Chloride by Automated Colourimetry	KONE	8999889	N/A	2023/10/27	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9005673	N/A	2023/10/27	Nimarta Singh
Conductivity	AT	8999884	N/A	2023/10/25	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	8999285	N/A	2023/10/27	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9002508	2023/10/24	2023/10/24	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	8998920	N/A	2023/10/24	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	8999841	N/A	2023/10/25	Chandra Nandlal
pH	AT	8999883	2023/10/23	2023/10/25	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9006440	N/A	2023/10/26	Chloe Pollock
Sulphate by Automated Turbidimetry	KONE	8999911	N/A	2023/10/27	Alina Dobreanu
Total Dissolved Solids	BAL	9013589	2023/10/30	2023/11/01	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/27	Rajni Tyagi



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Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD365  
**Sample ID:** SB-QAQC-GW1  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/26	Sachi Patel
Total Suspended Solids	BAL	9011629	2023/10/27	2023/11/02	Tina Teng

**Bureau Veritas ID:** XJD365 Dup  
**Sample ID:** SB-QAQC-GW1  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/27	Rajni Tyagi



### GENERAL COMMENTS

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

Package 1	3.3°C
Package 2	3.3°C

TSS Analysis: Analysis was performed past sample holding time. This may increase the variability associated with these results.

TDS Analysis: Analysis was performed past sample holding time. This may increase the variability associated with these results.

Sample XJD358 [SB-MW4] : TSS Analysis: Due to the nature of the sample, a smaller than usual portion of the sample was used.

Sample XJD359 [SB-MW5] : TSS Analysis: Due to the nature of the sample, a smaller than usual portion of the sample was used.

Sample XJD360 [SB-MW6R] : TSS Analysis: Due to the nature of the sample, a smaller than usual portion of the sample was used. TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample XJD361 [SB-MW7] : TKN < Ammonia: Both values fall within the method uncertainty for duplicates and are likely equivalent.

Sample XJD362 [SB-MW8] : TSS Analysis: Due to the nature of the sample, a smaller than usual portion of the sample was used.

Sample XJD363 [SB-MW9] : TSS Analysis was performed past sample holding time. This may increase the variability associated with these results.

Sample XJD364 [SB-MW10] : TSS Analysis: Due to the nature of the sample, a smaller than usual portion of the sample was used.

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



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Bureau Veritas Job #: C3W8793

Report Date: 2023/11/02

### QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Client Project #: 230225-09

Site Location: South Baptiste

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8998920	Dissolved Aluminum (Al)	2023/10/24	105	80 - 120	100	80 - 120	ND, RDL=4.9	ug/L				
8998920	Dissolved Arsenic (As)	2023/10/24	99	80 - 120	99	80 - 120	ND, RDL=1.0	ug/L	1.5	20		
8998920	Dissolved Barium (Ba)	2023/10/24	104	80 - 120	102	80 - 120	ND, RDL=2.0	ug/L	0.94	20		
8998920	Dissolved Beryllium (Be)	2023/10/24	102	80 - 120	96	80 - 120	ND, RDL=0.40	ug/L				
8998920	Dissolved Boron (B)	2023/10/24	93	80 - 120	98	80 - 120	ND, RDL=10	ug/L	3.8	20		
8998920	Dissolved Cadmium (Cd)	2023/10/24	104	80 - 120	101	80 - 120	ND, RDL=0.090	ug/L	NC	20		
8998920	Dissolved Calcium (Ca)	2023/10/24	NC	80 - 120	101	80 - 120	ND, RDL=200	ug/L	4.8	20		
8998920	Dissolved Chromium (Cr)	2023/10/24	94	80 - 120	95	80 - 120	ND, RDL=5.0	ug/L	NC	20		
8998920	Dissolved Cobalt (Co)	2023/10/24	98	80 - 120	97	80 - 120	ND, RDL=0.50	ug/L				
8998920	Dissolved Copper (Cu)	2023/10/24	104	80 - 120	105	80 - 120	ND, RDL=0.90	ug/L	1.4	20		
8998920	Dissolved Iron (Fe)	2023/10/24	100	80 - 120	97	80 - 120	ND, RDL=100	ug/L	NC	20		
8998920	Dissolved Lead (Pb)	2023/10/24	100	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	NC	20		
8998920	Dissolved Magnesium (Mg)	2023/10/24	NC	80 - 120	99	80 - 120	ND, RDL=50	ug/L	1.4	20		
8998920	Dissolved Manganese (Mn)	2023/10/24	98	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	6.2	20		
8998920	Dissolved Molybdenum (Mo)	2023/10/24	109	80 - 120	106	80 - 120	ND, RDL=0.50	ug/L				
8998920	Dissolved Nickel (Ni)	2023/10/24	93	80 - 120	95	80 - 120	ND, RDL=1.0	ug/L				
8998920	Dissolved Potassium (K)	2023/10/24	105	80 - 120	108	80 - 120	ND, RDL=200	ug/L	1.8	20		
8998920	Dissolved Silicon (Si)	2023/10/24	109	80 - 120	103	80 - 120	ND, RDL=50	ug/L				
8998920	Dissolved Silver (Ag)	2023/10/24	96	80 - 120	102	80 - 120	ND, RDL=0.090	ug/L				
8998920	Dissolved Sodium (Na)	2023/10/24	NC	80 - 120	98	80 - 120	ND, RDL=100	ug/L	1.4	20		
8998920	Dissolved Strontium (Sr)	2023/10/24	101	80 - 120	101	80 - 120	ND, RDL=1.0	ug/L				
8998920	Dissolved Thallium (Tl)	2023/10/24	101	80 - 120	101	80 - 120	ND, RDL=0.050	ug/L				
8998920	Dissolved Titanium (Ti)	2023/10/24	106	80 - 120	101	80 - 120	ND, RDL=5.0	ug/L				
8998920	Dissolved Vanadium (V)	2023/10/24	99	80 - 120	96	80 - 120	ND, RDL=0.50	ug/L				
8998920	Dissolved Zinc (Zn)	2023/10/24	96	80 - 120	98	80 - 120	ND, RDL=5.0	ug/L	3.7	20		
8998930	Nitrate (N)	2023/10/25	97	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	20		
8998930	Nitrite (N)	2023/10/25	105	80 - 120	107	80 - 120	ND, RDL=0.010	mg/L	NC	20		
8999285	Dissolved Organic Carbon	2023/10/27	90	80 - 120	94	80 - 120	ND, RDL=0.4	mg/L	0.44	20		



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793

Report Date: 2023/11/02

### QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 230225-09

Site Location: South Baptiste

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8999803	Dissolved Chloride (Cl-)	2023/10/27	91	80 - 120	97	80 - 120	ND, RDL=1.0	mg/L	2.6	20		
8999834	Dissolved Sulphate (SO4)	2023/10/27	NC	75 - 125	96	80 - 120	ND, RDL=1.0	mg/L	6.0	20		
8999841	Nitrate (N)	2023/10/25	98	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	0.41	20		
8999841	Nitrite (N)	2023/10/25	105	80 - 120	107	80 - 120	ND, RDL=0.010	mg/L	NC	20		
8999879	Alkalinity (Total as CaCO3)	2023/10/25			96	85 - 115	ND, RDL=1.0	mg/L	0.30	20		
8999883	pH	2023/10/25			102	98 - 103			0.11	N/A		
8999884	Conductivity	2023/10/25			102	85 - 115	ND, RDL=1.0	umho/cm	0.39	10		
8999889	Dissolved Chloride (Cl-)	2023/10/27	90	80 - 120	94	80 - 120	ND, RDL=1.0	mg/L	NC	20		
8999911	Dissolved Sulphate (SO4)	2023/10/27	87	75 - 125	97	80 - 120	ND, RDL=1.0	mg/L	15	20		
9000165	Dissolved Chloride (Cl-)	2023/10/26	NC	80 - 120	99	80 - 120	ND, RDL=1.0	mg/L	0.53	20		
9000171	Dissolved Sulphate (SO4)	2023/10/26	NC	75 - 125	96	80 - 120	ND, RDL=1.0	mg/L	2.7	20		
9002508	Dissolved Mercury (Hg)	2023/10/24	101	75 - 125	102	80 - 120	ND, RDL=0.10	ug/L	NC	20		
9004023	Total Ammonia-N	2023/10/29	105	75 - 125	104	80 - 120	ND, RDL=0.050	mg/L	NC	20		
9005673	Total Chemical Oxygen Demand (COD)	2023/10/27	96	80 - 120	98	80 - 120	ND, RDL=4.0	mg/L	0	20		
9006131	Total Kjeldahl Nitrogen (TKN)	2023/10/27	NC	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	1.3	20	100	80 - 120
9006440	Phenols-4AAP	2023/10/26	99	80 - 120	97	80 - 120	ND, RDL=0.0010	mg/L	0	20		
9006644	Total Phosphorus	2023/10/26	99	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	1.9	20	101	80 - 120
9008301	Total Dissolved Solids	2023/10/31			100	90 - 110	ND, RDL=10	mg/L	2.5	20		
9011139	Total Dissolved Solids	2023/10/28			95	90 - 110	ND, RDL=10	mg/L	0	20		
9011629	Total Suspended Solids	2023/11/02			95	85 - 115	ND, RDL=10	mg/L	0	20		
9012166	Total Suspended Solids	2023/10/30			99	85 - 115	ND, RDL=10	mg/L	5.4	20		
9013364	Total Suspended Solids	2023/10/31			101	85 - 115	ND, RDL=10	mg/L	NC	20		
9013589	Total Dissolved Solids	2023/11/01			95	90 - 110	ND, RDL=10	mg/L	13	20		



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793

Report Date: 2023/11/02

### QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 230225-09

Site Location: South Baptiste

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9013590	Total Dissolved Solids	2023/10/31			97	90 - 110	ND, RDL=10	mg/L	13	20		

N/A = Not Applicable

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

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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

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

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).





BUREAU  
VERITAS

Bureau Veritas Job #: C3W8793  
Report Date: 2023/11/02

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

\_\_\_\_\_  
Anastassia Hamanov, Scientific Specialist

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



# Custody Tracking Form



T781234

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: SB-MW2  
Last Sample: SB-QAQC-GW1  
Sample Count: 11

Relinquished By				Received By			
Brad McCallum	<i>Brad McCallum</i>	Date	2023/10/20	AVISHK SHRESTHA	<i>[Signature]</i>	Date	2023/10/21
Print	Sign	Time (24 HR)	09:00	Print	Sign	Time (24 HR)	14:53
		Date	YYYY/MM/DD			Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
		Date	YYYY/MM/DD			Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at [www.bvna.com](http://www.bvna.com).

### Triage Information

Sampled By (Print)

Brad McCallum / Matt DeGeer

# of Coolers/Pkgs:

2

Rush

Immediate Test

Food Residue

Micro

Food Chemistry

### \*\*\* LABORATORY USE ONLY \*\*\*

Received At

Labeled By

Verified By

Lab Comments:

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	5	3	2
			4	3	3

Drinking Water Metals Preservation Check Done (Circle) YES NO

21-Oct-23 14:53  
Christine Gipton  
C3W8793  
JDK ENV-697

COR FCD-00383/4

Page 1 of 1

## **Appendix D**

D-3 2022 Surface Water Analytical Results

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.  
4 Cataraqui Street  
Kingston, ON K7K1Z7  
(613) 531-2725  
ATTENTION TO: Carolyn Miller  
PROJECT: 230225-09  
AGAT WORK ORDER: 23P021638  
WATER ANALYSIS REVIEWED BY: Chuandi Zhang, Lab Team Lead  
DATE REPORTED: May 26, 2023  
PAGES (INCLUDING COVER): 8  
VERSION\*: 2

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

**\*Notes**

VERSION 2:V2 issued 2023-05-26. Total Phenols data removed by client request. Supersedes previous version. (LB)

**Disclaimer:**

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.



## Certificate of Analysis

AGAT WORK ORDER: 23P021638

PROJECT: 230225-09

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

SAMPLING SITE: South Baptiste

ATTENTION TO: Carolyn Miller

SAMPLED BY:

### Surface Water Parameters

DATE RECEIVED: 2023-05-05

DATE REPORTED: 2023-05-26

Parameter	Unit	SAMPLE DESCRIPTION:		BAP-A	BAP-B	BAP-C	BAP-D	SB-QAQC-SW1
		G / S	RDL	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-05-04 08:58	2023-05-04 08:47	2023-05-04 08:34	2023-05-04 09:23	2023-05-04 08:58
				4968506	4968515	4968516	4968517	4968518
BOD (5)	mg/L		2	<2	<2	<2	<2	<2
BOD setup				2023/05/06	2023/05/06	2023/05/06	2023/05/06	2023/05/06
pH	pH Units		NA	7.76	7.57	7.60	7.40	7.87
Alkalinity (as CaCO3)	mg/L		5	147	54	60	39	151
Electrical Conductivity	µS/cm		2	535	129	156	103	535
Hardness (as CaCO3) (Calculated)	mg/L		0.5	179	61.8	69.8	41.5	170
Total Dissolved Solids	mg/L		10	302	72	82	62	298
Total Suspended Solids	mg/L		10	<10	<10	<10	<10	<10
Chloride	mg/L		0.10	40.2	4.83	7.33	5.67	39.6
Nitrate as N	mg/L		0.05	1.88	<0.05	0.12	<0.05	1.92
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L		0.10	43.1	3.79	6.38	3.14	43.3
Ammonia as N	mg/L		0.02	0.14	0.02	<0.02	0.05	0.15
Ammonia-Un-ionized (Calculated)	mg/L		0.000002	0.000308	0.000028	<0.000002	0.000109	0.000330
Total Kjeldahl Nitrogen	mg/L		0.10	0.49	0.19	0.22	0.19	0.54
Total Phosphorus	mg/L		0.02	<0.02	<0.02	<0.02	0.02	<0.02
True Colour	TCU		2.50	17.6	32.9	31.1	43.3	17.5
Total Calcium	mg/L		0.20	55.0	22.9	25.1	15.2	52.1
Total Magnesium	mg/L		0.10	10.1	1.11	1.73	0.86	9.74
Total Potassium	mg/L		0.50	21.9	0.51	1.87	<0.50	21.5
Total Sodium	mg/L		0.10	37.4	4.31	6.64	4.50	37.4
Aluminum-dissolved	mg/L		0.004	0.018	0.026	0.022	0.043	0.018
Total Arsenic	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Boron	mg/L		0.010	0.374	<0.010	0.034	<0.010	0.364
Total Cadmium	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Chromium	mg/L		0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Total Cobalt	mg/L		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Total Copper	mg/L		0.001	0.003	<0.001	<0.001	0.001	0.001
Total Iron	mg/L		0.010	0.046	0.282	0.311	0.513	0.050

Certified By:



## Certificate of Analysis

AGAT WORK ORDER: 23P021638

PROJECT: 230225-09

5835 COOPERS AVENUE  
MISSISSAUGA, ONTARIO  
CANADA L4Z 1Y2  
TEL (905)712-5100  
FAX (905)712-5122  
<http://www.agatlabs.com>

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

ATTENTION TO: Carolyn Miller

SAMPLING SITE: South Baptiste

SAMPLED BY:

### Surface Water Parameters

DATE RECEIVED: 2023-05-05

DATE REPORTED: 2023-05-26

Parameter	Unit	SAMPLE DESCRIPTION:						
		G / S	RDL	BAP-A	BAP-B	BAP-C	BAP-D	SB-QAQC-SW1
				Water	Water	Water	Water	Water
				2023-05-04 08:58	2023-05-04 08:47	2023-05-04 08:34	2023-05-04 09:23	2023-05-04 08:58
				4968506	4968515	4968516	4968517	4968518
Total Lead	mg/L		0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Mercury	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Nickel	mg/L		0.003	0.012	<0.003	<0.003	<0.003	<0.003
Total Selenium	mg/L		0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Silicon	mg/L		0.18	3.77	3.02	3.04	3.10	3.84
Total Silver	mg/L		0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Zinc	mg/L		0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Turbidity	NTU		0.5	2.0	1.4	1.2	2.4	1.6

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

4968506-4968518 Dilution required, RDL has been increased accordingly.

Un-ionized Ammonia detection limit is a calculated RDL. The calculation of Un-ionized Ammonia is based on the field temperature and pH. Values are reported as calculated.

Analysis performed at AGAT Toronto (unless marked by \*)

Certified By:

## Quality Assurance

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.  
 PROJECT: 230225-09  
 SAMPLING SITE: South Baptiste

AGAT WORK ORDER: 23P021638  
 ATTENTION TO: Carolyn Miller  
 SAMPLED BY:

Water Analysis																
RPT Date: May 26, 2023			DUPLICATE				Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Measured Value		Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits		
								Lower	Upper		Lower	Upper		Lower	Upper	

**Surface Water Parameters**

BOD (5)	4968506	4968506	<2	<2	NA	< 2	101%	75%	125%					
pH	4968094		7.66	7.70	0.5%	NA	100%	90%	110%					
Alkalinity (as CaCO3)	4968094		398	403	1.2%	< 5	103%	80%	120%					
Electrical Conductivity	4968094		1260	1260	0.0%	< 2	106%	90%	110%					
Total Dissolved Solids	4968480		846	820	3.1%	< 10	96%	80%	120%					
Total Suspended Solids	4965528		<10	<10	NA	< 10	98%	80%	120%					
Chloride	4968088		76.1	76.2	0.1%	< 0.10	98%	70%	130%	103%	80%	120%	105%	70%
Nitrate as N	4968088		2.60	2.61	0.4%	< 0.05	98%	70%	130%	97%	80%	120%	98%	70%
Nitrite as N	4968088		<0.05	<0.05	NA	< 0.05	98%	70%	130%	97%	80%	120%	100%	70%
Sulphate	4968088		344	343	0.3%	< 0.10	99%	70%	130%	101%	80%	120%	NA	70%
Ammonia as N	4968480		<0.02	<0.02	NA	< 0.02	114%	70%	130%	104%	80%	120%	87%	70%
Total Kjeldahl Nitrogen	4968484		0.17	0.16	NA	< 0.10	101%	70%	130%	98%	80%	120%	97%	70%
Total Phosphorus	4968519		0.02	<0.02	NA	< 0.02	94%	70%	130%	98%	80%	120%	97%	70%
True Colour	4964695		<2.50	<2.50	NA	< 2.5	107%	90%	110%					
Total Calcium	4968484		2.05	2.16	5.2%	< 0.20	105%	70%	130%	102%	80%	120%	105%	70%
Total Magnesium	4968484		0.54	0.50	7.7%	< 0.10	102%	70%	130%	103%	80%	120%	102%	70%
Total Potassium	4968484		0.86	0.81	NA	< 0.50	100%	70%	130%	100%	80%	120%	100%	70%
Total Sodium	4968484		1.03	0.99	4.0%	< 0.10	108%	70%	130%	104%	80%	120%	102%	70%
Aluminum-dissolved	4964639		0.072	0.070	2.8%	< 0.004	97%	70%	130%	89%	80%	120%	93%	70%
Total Arsenic	4968484		<0.003	<0.003	NA	< 0.003	98%	70%	130%	103%	80%	120%	98%	70%
Total Boron	4968484		<0.010	<0.010	NA	< 0.010	104%	70%	130%	104%	80%	120%	103%	70%
Total Cadmium	4968484		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	98%	80%	120%	98%	70%
Total Chromium	4968484		<0.003	<0.003	NA	< 0.003	98%	70%	130%	101%	80%	120%	100%	70%
Total Cobalt	4968484		<0.0005	<0.0005	NA	< 0.0005	98%	70%	130%	96%	80%	120%	100%	70%
Total Copper	4968484		0.001	0.001	NA	< 0.001	98%	70%	130%	100%	80%	120%	97%	70%
Total Iron	4968484		0.070	0.066	5.9%	< 0.010	103%	70%	130%	119%	80%	120%	104%	70%
Total Lead	4968484		<0.001	<0.001	NA	< 0.001	97%	70%	130%	96%	80%	120%	96%	70%
Dissolved Mercury	4978780		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	99%	80%	120%	92%	70%
Total Nickel	4968484		0.003	<0.003	NA	< 0.003	98%	70%	130%	92%	80%	120%	103%	70%
Total Selenium	4968484		<0.002	<0.002	NA	< 0.002	101%	70%	130%	102%	80%	120%	102%	70%
Total Silicon	4968484		3.39	3.32	2.1%	< 0.05	98%	70%	130%	98%	80%	120%	99%	70%
Total Silver	4968484		<0.0001	<0.0001	NA	< 0.0001	99%	70%	130%	95%	80%	120%	96%	70%
Total Zinc	4968484		<0.020	<0.020	NA	< 0.020	100%	70%	130%	99%	80%	120%	101%	70%
Turbidity	4968506	4968506	2.0	2.0	NA	< 0.5	99%	80%	120%					

Comments: NA signifies Not Applicable.  
 If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.  
 Matrix spike: Spike level < native concentration. Matrix spike acceptance limits do not apply.

## Quality Assurance

 CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.  
 PROJECT: 230225-09  
 SAMPLING SITE: South Baptiste

 AGAT WORK ORDER: 23P021638  
 ATTENTION TO: Carolyn Miller  
 SAMPLED BY:

### Water Analysis (Continued)

RPT Date: May 26, 2023			DUPLICATE			Method Blank	REFERENCE MATERIAL		METHOD BLANK SPIKE		MATRIX SPIKE				
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Certified By: \_\_\_\_\_





## Method Summary

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

AGAT WORK ORDER: 23P021638

PROJECT: 230225-09

ATTENTION TO: Carolyn Miller

SAMPLING SITE: South Baptiste

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
BOD (5)	INOR-93-6006	Modified from SM 5210 B	DO METER
BOD setup			
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Alkalinity (as CaCO <sub>3</sub> )	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Electrical Conductivity	INOR-93-6000	modified from SM 2510 B	PC TITRATE
Hardness (as CaCO <sub>3</sub> ) (Calculated)	MET-93-6105	modified from EPA SW-846 6010C & 200.7 & SM 2340 B	CALCULATION
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Total Suspended Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH <sub>3</sub> H	LACHAT FIA
Ammonia-Un-ionized (Calculated)		MOE REFERENCE, PWQOs Tab 2	CALCULATION
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
True Colour	INOR-93-6074	modified from SM 2120 B	LACHAT FIA
Total Calcium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Potassium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Sodium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Aluminum-dissolved	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Dissolved Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS

## Method Summary

CLIENT NAME: BLUMETRIC ENVIRONMENTAL INC.

AGAT WORK ORDER: 23P021638

PROJECT: 230225-09

ATTENTION TO: Carolyn Miller

SAMPLING SITE: South Baptiste

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Silicon	MET-93-6105	modified from EPA 6010D	ICP/OES
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Turbidity	INOR-93-6044	modified from SM 2130 B	NEPHELOMETER





Your P.O. #: 230301-00  
 Site#: 700  
 Your C.O.C. #: n/a

**Attention: Cecilia Bandler**

BluMetric Environmental Inc  
 The Tower - The Woolen Mill  
 4 Catarauqui St  
 Kingston, ON  
 CANADA K7K 1Z7

**Report Date: 2023/05/16**  
 Report #: R7630625  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3D0953**

**Received: 2023/05/09, 09:08**

Sample Matrix: Water  
 # Samples Received: 5

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Analytical Method</b>
Phenols (4AAP)	5	N/A	2023/05/12	CAM SOP-00444	OMOE E3179 m

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas 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. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas 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 Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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. When sampling is not conducted by Bureau Veritas, results relate to the supplied 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.



Your P.O. #: 230301-00  
Site#: 700  
Your C.O.C. #: n/a

**Attention: Cecilia Bandler**

BluMetric Environmental Inc  
The Tower - The Woolen Mill  
4 Cataraqui St  
Kingston, ON  
CANADA K7K 1Z7

**Report Date: 2023/05/16**  
Report #: R7630625  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3D0953**

**Received: 2023/05/09, 09:08**

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:  
Christine Gripton, Senior Project Manager  
Email: Christine.Gripton@bureauveritas.com  
Phone# (519)652-9444

=====

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BUREAU  
VERITAS

Bureau Veritas Job #: C3D0953  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		VTJ670	VTJ671	VTJ672	VTJ673	VTJ674		
Sampling Date		2023/05/03 08:58	2023/05/03 08:47	2023/05/03 08:34	2023/05/03 09:23	2023/05/03 08:58		
COC Number		n/a	n/a	n/a	n/a	n/a		
	<b>UNITS</b>	<b>BAP-A</b>	<b>BAP-B</b>	<b>BAP-C</b>	<b>BAP-D</b>	<b>SB-QAQC-SW1</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Inorganics</b>								
Phenols-4AAP	mg/L	ND	ND	ND	ND	ND	0.0010	8661921
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.								



BUREAU  
VERITAS

Bureau Veritas Job #: C3D0953  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### TEST SUMMARY

**Bureau Veritas ID:** VTJ670  
**Sample ID:** BAP-A  
**Matrix:** Water

**Collected:** 2023/05/03  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8661921	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ671  
**Sample ID:** BAP-B  
**Matrix:** Water

**Collected:** 2023/05/03  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8661921	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ672  
**Sample ID:** BAP-C  
**Matrix:** Water

**Collected:** 2023/05/03  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8661921	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ673  
**Sample ID:** BAP-D  
**Matrix:** Water

**Collected:** 2023/05/03  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8661921	N/A	2023/05/12	Mandeep Kaur

**Bureau Veritas ID:** VTJ674  
**Sample ID:** SB-QAQC-SW1  
**Matrix:** Water

**Collected:** 2023/05/03  
**Shipped:**  
**Received:** 2023/05/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	8661921	N/A	2023/05/12	Mandeep Kaur



BUREAU  
VERITAS

Bureau Veritas Job #: C3D0953  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### GENERAL COMMENTS

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

Package 1	8.0°C
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**Results relate only to the items tested.**





BUREAU  
VERITAS

Bureau Veritas Job #: C3D0953

Report Date: 2023/05/16

### QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Your P.O. #: 230301-00

Sampler Initials: BM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8661921	Phenols-4AAP	2023/05/12	102	80 - 120	102	80 - 120	ND, RDL=0.0010	mg/L	18	20

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.



BUREAU  
VERITAS

Bureau Veritas Job #: C3D0953  
Report Date: 2023/05/16

BluMetric Environmental Inc  
Your P.O. #: 230301-00  
Sampler Initials: BM

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

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Cristina Carriere, Senior Scientific Specialist

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by {0}, {1} responsible for {2} {3} laboratory operations.

Invoice Information		Report Information (if differs from invoice)		Project Information	
Company: #1192 BluMetric		Company: #5638 BluMetric		Quotation #: C30114	
Contact Name: Accounts Payable		Contact Name: Cecilia Bandler		P.O. #/AFER: 230301-00	
Street Address: 1682 Woodward Drive		Street Address:		Project #:	
City: Ottawa	Prov: ON	Postal Code: K2K 3R8	City:	Prov:	Postal Code:
Phone:		Phone: 613 929 1385		Site #: 700	
Email: ap@blumetric.ca		Email: cbandler@blumetric.ca		Site Location:	
Copies:		Copies:		Sampled By: BM/HO	

09-May-23 09:08  
 Christine Gripton  
  
**C3D0953**  
 AKO ENV-1231

Regulatory Criteria							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22										
<input type="checkbox"/> Table 1	<input type="checkbox"/> Res/Park	<input type="checkbox"/> Med/Fine	<input type="checkbox"/> CMME	<input type="checkbox"/> Reg 406, Table:																																		
<input type="checkbox"/> Table 2	<input type="checkbox"/> Ind/Comm	<input type="checkbox"/> Course	<input type="checkbox"/> Reg 556*	<input type="checkbox"/> Sanitary Sewer Bylaw																																		
<input type="checkbox"/> Table 3	<input type="checkbox"/> Agri/other	<input type="checkbox"/> For RSC	*min 3 day TAT	<input type="checkbox"/> Storm Sewer Bylaw																																		
<input type="checkbox"/> Table			<input type="checkbox"/> MISA	<input type="checkbox"/> Municipality																																		
			<input type="checkbox"/> PWQO	<input type="checkbox"/> Other:																																		
Include Criteria on Certificate of Analysis (check if yes):																																						
SAMPLES MUST BE KEPT COOL (<10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BUREAU VERITAS																																						
Sample Identification	Date Sampled			Time (24hr)		Matrix	FIELD FILTERED	FIELD PRESERVED	LAB FILTRATION REQUIRED	BTEX/F1	F2-F4	VOCs	Reg 153 metals and inorganics	Reg 153 ICPMS metals	Reg 153 metals (Reg. Cr.VI, ICPMS metals, HWS-B)	phenols (4AAP)															# OF CONTAINERS SUBMITTED	HOLD - DO NOT ANALYZE						
	YY	MM	DD	HH	MM																																	
1 BAP-A	23	05	04	08	58	SW																																
2 BAP-B	23	05	04	08	47	SW																																
3 BAP-C	23	05	04	08	34	SW																																
4 BAP-D	23	05	04	09	23	SW																																
5 SB-BACC-SW1	23	05	04	08	58	SW																																
6																																						
7																																						
8																																						
9																																						
10																																						
11																																						
12																																						

Regular Turnaround Time (TAT)  
 5 to 7 Day  10 Day

Rush Turnaround Time (TAT)  
 Surcharges apply  
 Same Day  1 Day  
 2 Day  3 Day  
 4 Day

Date Required: YY MM DD

Comments

\*UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BUREAU VERITAS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS AND CONDITIONS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVNA.COM/TERMS-AND-CONDITIONS OR BY CALLING THE LABORATORY LISTED ABOVE TO OBTAIN A COPY

LAB USE ONLY		Yes	No	°C	8	9	7	LAB USE ONLY		Yes	No	°C	LAB USE ONLY		Yes	No	°C	Temperature reading by:		
Seal present								Seal present					Seal present							
Seal intact								Seal intact					Seal intact							
Cooling media present				1	2	3	Cooling media present					1	2	3						
Relinquished by (Signature/Print)				Date		Time		Received by (Signature/Print)				Date		Time		Special instructions				
1 Brad M/Call / Brad M/Call				2023		05 08 09 00		1 [Signature]				2023		05 09 09 08						
2								2												

C.O.C.: -

REPORT No: 23-010834 - Rev. 0

**Report To:**

Blumetric Environmental  
 3108 Carp Rd  
 PO Box 430  
 Carp, ON K0A 1L0

**CADUCEON Environmental Laboratories**

285 Dalton Ave  
 Kingston, ON K7K 6Z1

**Attention: Cecilia Bandler**

DATE RECEIVED: 2023-May-05  
 DATE REPORTED: 2023-May-19  
 SAMPLE MATRIX: Surface Water

CUSTOMER PROJECT: South Baptiste: 230225-09  
 P.O. NUMBER: 230301-00

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Phenols (Liquid)	5	KINGSTON	JMACINNES	2023-May-18	PHEN-01	MECP E3179

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an \*

Parameter	Units	R.L.	Client I.D.					
			BAP-A	BAP-B	BAP-C	BAP-D	SB-QAQC-SW1	
			Sample I.D.	23-010834-1	23-010834-2	23-010834-3	23-010834-4	23-010834-5
			Date Collected	2023-05-04	2023-05-04	2023-05-04	2023-05-04	2023-05-04
				-	-	-	-	-
Phenolics	mg/L	0.001		<0.001	<0.001	<0.001	<0.001	<0.001



**Richard Lecompte**  
 Laboratory Supervisor



Your Project #: 230225-09  
 Site Location: South Baptiste  
 Your C.O.C. #: 732536

**Attention: Carolyn Miller**

BluMetric Environmental Inc  
 1682 Woodward Dr  
 Ottawa, ON  
 CANADA K2C 3R8

**Report Date: 2023/08/17**  
 Report #: R7768687  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C301561**

**Received: 2023/08/10, 09:18**

Sample Matrix: Water  
 # Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	5	N/A	2023/08/15	CAM SOP-00447	EPA 6020B m
Alkalinity	1	N/A	2023/08/12	CAM SOP-00448	SM 23 2320 B m
Alkalinity	4	N/A	2023/08/13	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	5	2023/08/11	2023/08/16	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	4	N/A	2023/08/11	CAM SOP-00463	SM 23 4500-Cl E m
Chloride by Automated Colourimetry	1	N/A	2023/08/16	CAM SOP-00463	SM 23 4500-Cl E m
Colour	5	N/A	2023/08/11	CAM SOP-00412	SM 23 2120C m
Conductivity	1	N/A	2023/08/12	CAM SOP-00414	SM 23 2510 m
Conductivity	4	N/A	2023/08/13	CAM SOP-00414	SM 23 2510 m
Hardness (calculated as CaCO3)	3	N/A	2023/08/15	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO3)	2	N/A	2023/08/16	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	4	2023/08/14	2023/08/15	CAM SOP-00453	EPA 7470A m
Mercury in Water by CVAA	1	2023/08/15	2023/08/15	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	5	2023/08/14	2023/08/14	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	5	N/A	2023/08/15	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	5	N/A	2023/08/11	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	1	2023/08/11	2023/08/12	CAM SOP-00413	SM 4500H+ B m
pH	4	2023/08/11	2023/08/13	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	3	N/A	2023/08/11	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	2	N/A	2023/08/14	CAM SOP-00444	OMOE E3179 m
Field Measured pH (2)	5	N/A	2023/08/10		Field pH Meter
Sulphate by Automated Turbidimetry	4	N/A	2023/08/11	CAM SOP-00464	SM 23 4500-SO42- E m
Sulphate by Automated Turbidimetry	1	N/A	2023/08/16	CAM SOP-00464	SM 23 4500-SO42- E m
Total Dissolved Solids	5	2023/08/14	2023/08/15	CAM SOP-00428	SM 23 2540C m
Field Temperature (2)	5	N/A	2023/08/11		Field Thermometer
Total Kjeldahl Nitrogen in Water	5	2023/08/14	2023/08/14	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	5	2023/08/14	2023/08/16	CAM SOP-00407	SM 23 4500-P I
Total Suspended Solids	5	2023/08/14	2023/08/15	CAM SOP-00428	SM 23 2540D m
Turbidity	5	N/A	2023/08/12	CAM SOP-00417	SM 23 2130 B m



Your Project #: 230225-09  
 Site Location: South Baptiste  
 Your C.O.C. #: 732536

**Attention: Carolyn Miller**

BluMetric Environmental Inc  
 1682 Woodward Dr  
 Ottawa, ON  
 CANADA K2C 3R8

**Report Date: 2023/08/17**  
 Report #: R7768687  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3O1561**

**Received: 2023/08/10, 09:18**

Sample Matrix: Water  
 # Samples Received: 5

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Un-ionized Ammonia (3)	5	2023/08/10	2023/08/16	Auto Calc.	PWQO

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCCFP, EPA, APHA.

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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. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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

(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.

(3) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.



Your Project #: 230225-09  
Site Location: South Baptiste  
Your C.O.C. #: 732536

**Attention: Carolyn Miller**

BluMetric Environmental Inc  
1682 Woodward Dr  
Ottawa, ON  
CANADA K2C 3R8

**Report Date: 2023/08/17**  
Report #: R7768687  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3O1561**

**Received: 2023/08/10, 09:18**

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:  
Christine Gripton, Senior Project Manager  
Email: Christine.Gripton@bureauveritas.com  
Phone# (519)652-9444

=====

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BUREAU  
VERITAS

Bureau Veritas Job #: C301561  
Report Date: 2023/08/17

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste  
Sampler Initials: CM

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		WQQ126			WQQ126			WQQ127		
Sampling Date		2023/08/09 13:50			2023/08/09 13:50			2023/08/09 13:38		
COC Number		732536			732536			732536		
	UNITS	BAP-A	RDL	QC Batch	BAP-A Lab-Dup	RDL	QC Batch	BAP-B	RDL	QC Batch
<b>Calculated Parameters</b>										
Hardness (CaCO <sub>3</sub> )	mg/L	150	1.0	8845716				81	1.0	8845716
Total Un-ionized Ammonia	mg/L	<0.00061	0.00061	8844160				<0.00061	0.00061	8844160
<b>Field Measurements</b>										
Field Temperature	Celsius	15.1	N/A	ONSITE				14	N/A	ONSITE
Field Measured pH	pH	6.8		ONSITE				6.94		ONSITE
<b>Inorganics</b>										
Total Ammonia-N	mg/L	0.071	0.050	8851688				<0.050	0.050	8851688
Total BOD	mg/L	5	2	8846124				<2	2	8846124
Colour	TCU	18	2	8845470				25	2	8845470
Conductivity	umho/cm	480	1.0	8846880				170	1.0	8846880
Total Dissolved Solids	mg/L	265	10	8850392				95	10	8850392
Total Kjeldahl Nitrogen (TKN)	mg/L	0.27	0.10	8850671				0.16	0.10	8850785
pH	pH	7.84		8846861				7.81		8846861
Phenols-4AAP	mg/L	<0.0010	0.0010	8847824				<0.0010	0.0010	8847824
Total Phosphorus	mg/L	0.041	0.020	8850656				<0.020	0.020	8850656
Total Suspended Solids	mg/L	34	10	8850320				<10	10	8850320
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	13	1.0	8846325				4.1	1.0	8849629
Turbidity	NTU	1.3	0.1	8846440	1.2	0.1	8846440	3.6	0.1	8846440
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	170	1.0	8846816				77	1.0	8846816
Dissolved Chloride (Cl <sup>-</sup> )	mg/L	36	1.0	8846320				3.6	1.0	8849632
Nitrite (N)	mg/L	0.023	0.010	8846514				<0.010	0.010	8846514
Nitrate (N)	mg/L	1.31	0.10	8846514				<0.10	0.10	8846514
Nitrate + Nitrite (N)	mg/L	1.33	0.10	8846514				<0.10	0.10	8846514
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable										





BUREAU  
VERITAS

Bureau Veritas Job #: C3O1561  
Report Date: 2023/08/17

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste  
Sampler Initials: CM

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		WQQ127			WQQ128		WQQ129		
Sampling Date		2023/08/09 13:38			2023/08/09 13:23		2023/08/09 14:14		
COC Number		732536			732536		732536		
	UNITS	BAP-B Lab-Dup	RDL	QC Batch	BAP-C	QC Batch	BAP-D	RDL	QC Batch
<b>Calculated Parameters</b>									
Hardness (CaCO3)	mg/L				89	8845716	66	1.0	8845716
Total Un-ionized Ammonia	mg/L				<0.00061	8844160	<0.00061	0.00061	8844160
<b>Field Measurements</b>									
Field Temperature	Celsius				13.9	ONSITE	14.5	N/A	ONSITE
Field Measured pH	pH				7.5	ONSITE	7.27		ONSITE
<b>Inorganics</b>									
Total Ammonia-N	mg/L				<0.050	8851688	<0.050	0.050	8851688
Total BOD	mg/L				12	8846124	<2	2	8846124
Colour	TCU				23	8845470	40	2	8845470
Conductivity	umho/cm				200	8846880	140	1.0	8846880
Total Dissolved Solids	mg/L				115	8850392	85	10	8850392
Total Kjeldahl Nitrogen (TKN)	mg/L	0.20	0.10	8850785	0.16	8850671	0.20	0.10	8850785
pH	pH				7.81	8846861	7.67		8846861
Phenols-4AAP	mg/L				<0.0010	8847824	<0.0010	0.0010	8851062
Total Phosphorus	mg/L				<0.020	8850656	<0.020	0.020	8850665
Total Suspended Solids	mg/L				<10	8850320	<10	10	8850320
Dissolved Sulphate (SO4)	mg/L				5.2	8846325	4.1	1.0	8846325
Turbidity	NTU				3.0	8846440	6.6	0.1	8846440
Alkalinity (Total as CaCO3)	mg/L				86	8846816	61	1.0	8846816
Dissolved Chloride (Cl-)	mg/L				6.9	8846320	1.9	1.0	8846320
Nitrite (N)	mg/L				<0.010	8846514	<0.010	0.010	8846514
Nitrate (N)	mg/L				0.14	8846514	<0.10	0.10	8846514
Nitrate + Nitrite (N)	mg/L				0.14	8846514	<0.10	0.10	8846514
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable									



BUREAU  
VERITAS

Bureau Veritas Job #: C3O1561  
Report Date: 2023/08/17

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste  
Sampler Initials: CM

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		WQQ130			WQQ130		
Sampling Date		2023/08/09 13:23			2023/08/09 13:23		
COC Number		732536			732536		
	UNITS	SB-QAQC SW1	RDL	QC Batch	SB-QAQC SW1 Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>							
Hardness (CaCO <sub>3</sub> )	mg/L	84	1.0	8845716			
Total Un-ionized Ammonia	mg/L	<0.00061	0.00061	8844160			
<b>Field Measurements</b>							
Field Temperature	Celsius	13.9	N/A	ONSITE			
Field Measured pH	pH	7.5		ONSITE			
<b>Inorganics</b>							
Total Ammonia-N	mg/L	<0.050	0.050	8851688			
Total BOD	mg/L	<2	2	8846124			
Colour	TCU	23	2	8845470			
Conductivity	umho/cm	200	1.0	8846880			
Total Dissolved Solids	mg/L	120	10	8850392			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.17	0.10	8850671			
pH	pH	7.79		8846861			
Phenols-4AAP	mg/L	0.0010	0.0010	8851062			
Total Phosphorus	mg/L	<0.020	0.020	8850665	<0.020	0.020	8850665
Total Suspended Solids	mg/L	<10	10	8850320			
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	5.2	1.0	8846325			
Turbidity	NTU	3.0	0.1	8846440			
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	85	1.0	8846816			
Dissolved Chloride (Cl <sup>-</sup> )	mg/L	6.9	1.0	8846320			
Nitrite (N)	mg/L	<0.010	0.010	8846514			
Nitrate (N)	mg/L	0.14	0.10	8846514			
Nitrate + Nitrite (N)	mg/L	0.14	0.10	8846514			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							



BUREAU  
VERITAS

Bureau Veritas Job #: C3O1561  
Report Date: 2023/08/17

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste  
Sampler Initials: CM

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		WQQ126			WQQ126			WQQ127		
Sampling Date		2023/08/09 13:50			2023/08/09 13:50			2023/08/09 13:38		
COC Number		732536			732536			732536		
	UNITS	BAP-A	RDL	QC Batch	BAP-A Lab-Dup	RDL	QC Batch	BAP-B	RDL	QC Batch

Metals										
Dissolved (0.2u) Aluminum (Al)	ug/L	<5	5	8844412				10	5	8844412
Mercury (Hg)	mg/L	<0.00010	0.00010	8850972	<0.00010	0.00010	8850972	<0.00010	0.00010	8850972
Total Aluminum (Al)	ug/L	280	4.9	8850464				24	4.9	8850464
Total Arsenic (As)	ug/L	<1.0	1.0	8850464				<1.0	1.0	8850464
Total Boron (B)	ug/L	240	10	8850464				<10	10	8850464
Total Cadmium (Cd)	ug/L	<0.090	0.090	8850464				<0.090	0.090	8850464
Total Calcium (Ca)	ug/L	48000	200	8850464				29000	200	8850464
Total Chromium (Cr)	ug/L	<5.0	5.0	8850464				<5.0	5.0	8850464
Total Cobalt (Co)	ug/L	1.2	0.50	8850464				<0.50	0.50	8850464
Total Copper (Cu)	ug/L	1.3	0.90	8850464				<0.90	0.90	8850464
Total Iron (Fe)	ug/L	1200	100	8850464				750	100	8850464
Total Lead (Pb)	ug/L	<0.50	0.50	8850464				<0.50	0.50	8850464
Total Magnesium (Mg)	ug/L	7400	50	8850464				1300	50	8850464
Total Nickel (Ni)	ug/L	2.7	1.0	8850464				<1.0	1.0	8850464
Total Potassium (K)	ug/L	17000	200	8850464				640	200	8850464
Total Selenium (Se)	ug/L	<2.0	2.0	8850464				<2.0	2.0	8850464
Total Silver (Ag)	ug/L	<0.090	0.090	8850464				<0.090	0.090	8850464
Total Sodium (Na)	ug/L	30000	100	8850464				4900	100	8850464
Total Zinc (Zn)	ug/L	11	5.0	8850464				<5.0	5.0	8850464

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate



BUREAU  
VERITAS

Bureau Veritas Job #: C3O1561  
Report Date: 2023/08/17

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste  
Sampler Initials: CM

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		WQQ128		WQQ129	WQQ130		
Sampling Date		2023/08/09 13:23		2023/08/09 14:14	2023/08/09 13:23		
COC Number		732536		732536	732536		
	UNITS	BAP-C	QC Batch	BAP-D	SB-QAQC SW1	RDL	QC Batch
<b>Metals</b>							
Dissolved (0.2u) Aluminum (Al)	ug/L	9	8844412	14	10	5	8844412
Mercury (Hg)	mg/L	<0.00010	8852826	<0.00010	<0.00010	0.00010	8850972
Total Aluminum (Al)	ug/L	25	8850464	28	21	4.9	8850464
Total Arsenic (As)	ug/L	<1.0	8850464	<1.0	<1.0	1.0	8850464
Total Boron (B)	ug/L	29	8850464	<10	29	10	8850464
Total Cadmium (Cd)	ug/L	<0.090	8850464	<0.090	<0.090	0.090	8850464
Total Calcium (Ca)	ug/L	30000	8850464	23000	29000	200	8850464
Total Chromium (Cr)	ug/L	<5.0	8850464	<5.0	<5.0	5.0	8850464
Total Cobalt (Co)	ug/L	<0.50	8850464	<0.50	<0.50	0.50	8850464
Total Copper (Cu)	ug/L	<0.90	8850464	<0.90	<0.90	0.90	8850464
Total Iron (Fe)	ug/L	660	8850464	1200	630	100	8850464
Total Lead (Pb)	ug/L	<0.50	8850464	<0.50	<0.50	0.50	8850464
Total Magnesium (Mg)	ug/L	1800	8850464	1200	1700	50	8850464
Total Nickel (Ni)	ug/L	<1.0	8850464	<1.0	<1.0	1.0	8850464
Total Potassium (K)	ug/L	2100	8850464	740	2000	200	8850464
Total Selenium (Se)	ug/L	<2.0	8850464	<2.0	<2.0	2.0	8850464
Total Silver (Ag)	ug/L	<0.090	8850464	<0.090	<0.090	0.090	8850464
Total Sodium (Na)	ug/L	7300	8850464	4900	7200	100	8850464
Total Zinc (Zn)	ug/L	<5.0	8850464	<5.0	<5.0	5.0	8850464
RDL = Reportable Detection Limit							
QC Batch = Quality Control Batch							



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VERITAS

Bureau Veritas Job #: C3O1561  
Report Date: 2023/08/17

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste  
Sampler Initials: CM

### GENERAL COMMENTS

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

Package 1	4.3°C
Package 2	6.7°C
Package 3	2.0°C

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



BUREAU  
VERITAS

Bureau Veritas Job #: C301561

Report Date: 2023/08/17

### QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Client Project #: 230225-09

Site Location: South Baptiste

Sampler Initials: CM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8844412	Dissolved (0.2u) Aluminum (Al)	2023/08/15	107	80 - 120	99	80 - 120	<5	ug/L	NC	20		
8845470	Colour	2023/08/11			100	80 - 120	<2	TCU	NC	25		
8846124	Total BOD	2023/08/16					<2	mg/L	7.1	30	93	80 - 120
8846320	Dissolved Chloride (Cl-)	2023/08/11	NC	80 - 120	96	80 - 120	<1.0	mg/L	2.0	20		
8846325	Dissolved Sulphate (SO4)	2023/08/11	NC	75 - 125	100	80 - 120	<1.0	mg/L	1.2	20		
8846440	Turbidity	2023/08/12			100	80 - 120	<0.1	NTU	8.8	20		
8846514	Nitrate (N)	2023/08/11	98	80 - 120	98	80 - 120	<0.10	mg/L	NC	20		
8846514	Nitrite (N)	2023/08/11	103	80 - 120	102	80 - 120	<0.010	mg/L	NC	20		
8846816	Alkalinity (Total as CaCO3)	2023/08/12			96	85 - 115	<1.0	mg/L	0.0016	20		
8846861	pH	2023/08/12			102	98 - 103			0.027	N/A		
8846880	Conductivity	2023/08/12			101	85 - 115	<1.0	umho/cm	1.0	10		
8847824	Phenols-4AAP	2023/08/11	103	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20		
8849629	Dissolved Sulphate (SO4)	2023/08/16	96	75 - 125	101	80 - 120	<1.0	mg/L	0.69	20		
8849632	Dissolved Chloride (Cl-)	2023/08/16	94	80 - 120	98	80 - 120	<1.0	mg/L	NC	20		
8850320	Total Suspended Solids	2023/08/15			95	85 - 115	<10	mg/L	NC	20		
8850392	Total Dissolved Solids	2023/08/15			98	90 - 110	<10	mg/L	8.7	20		
8850464	Total Aluminum (Al)	2023/08/14	99	80 - 120	98	80 - 120	<4.9	ug/L	2.1	20		
8850464	Total Arsenic (As)	2023/08/14	101	80 - 120	99	80 - 120	<1.0	ug/L	NC	20		
8850464	Total Boron (B)	2023/08/14	101	80 - 120	101	80 - 120	<10	ug/L	NC	20		
8850464	Total Cadmium (Cd)	2023/08/14	98	80 - 120	96	80 - 120	<0.090	ug/L	NC	20		
8850464	Total Calcium (Ca)	2023/08/14	94	80 - 120	96	80 - 120	<200	ug/L	0.40	20		
8850464	Total Chromium (Cr)	2023/08/14	96	80 - 120	94	80 - 120	<5.0	ug/L	NC	20		
8850464	Total Cobalt (Co)	2023/08/14	95	80 - 120	93	80 - 120	<0.50	ug/L	NC	20		
8850464	Total Copper (Cu)	2023/08/14	97	80 - 120	97	80 - 120	<0.90	ug/L	NC	20		
8850464	Total Iron (Fe)	2023/08/14	96	80 - 120	94	80 - 120	<100	ug/L	0.92	20		
8850464	Total Lead (Pb)	2023/08/14	95	80 - 120	94	80 - 120	<0.50	ug/L	NC	20		
8850464	Total Magnesium (Mg)	2023/08/14	97	80 - 120	97	80 - 120	<50	ug/L	3.9	20		
8850464	Total Nickel (Ni)	2023/08/14	95	80 - 120	93	80 - 120	<1.0	ug/L	NC	20		
8850464	Total Potassium (K)	2023/08/14	97	80 - 120	96	80 - 120	<200	ug/L	0.65	20		
8850464	Total Selenium (Se)	2023/08/14	102	80 - 120	103	80 - 120	<2.0	ug/L	NC	20		



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Bureau Veritas Job #: C301561

Report Date: 2023/08/17

### QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 230225-09

Site Location: South Baptiste

Sampler Initials: CM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
8850464	Total Silver (Ag)	2023/08/14	97	80 - 120	94	80 - 120	<0.090	ug/L	NC	20		
8850464	Total Sodium (Na)	2023/08/14	NC	80 - 120	97	80 - 120	<100	ug/L	0.29	20		
8850464	Total Zinc (Zn)	2023/08/14	99	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
8850656	Total Phosphorus	2023/08/16	96	80 - 120	101	80 - 120	<0.020	mg/L	3.8	20	98	80 - 120
8850665	Total Phosphorus	2023/08/16	101	80 - 120	100	80 - 120	<0.020	mg/L	NC	20	100	80 - 120
8850671	Total Kjeldahl Nitrogen (TKN)	2023/08/14	108	80 - 120	101	80 - 120	<0.10	mg/L	11	20	101	80 - 120
8850785	Total Kjeldahl Nitrogen (TKN)	2023/08/14	101	80 - 120	101	80 - 120	<0.10	mg/L	NC	20	98	80 - 120
8850972	Mercury (Hg)	2023/08/15	103	75 - 125	108	80 - 120	<0.00010	mg/L	NC	20		
8851062	Phenols-4AAP	2023/08/14	106	80 - 120	104	80 - 120	<0.0010	mg/L	9.5	20		
8851688	Total Ammonia-N	2023/08/15	99	75 - 125	96	80 - 120	<0.050	mg/L	NC	20		
8852826	Mercury (Hg)	2023/08/15	103	75 - 125	105	80 - 120	<0.00010	mg/L	NC	20		

N/A = Not Applicable

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

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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

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

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).



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Bureau Veritas Job #: C3O1561  
Report Date: 2023/08/17

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste  
Sampler Initials: CM

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

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Christine Gripton, Senior Project Manager

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Cristina Carriere, Senior Scientific Specialist

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Your Project #: 230225-09  
 Site Location: South Baptiste  
 Your C.O.C. #: 781235

**Attention: Cecilia Bandler**

BluMetric Environmental Inc  
 The Tower - The Woolen Mill  
 4 Cataragui St  
 Kingston, ON  
 CANADA K7K 1Z7

**Report Date: 2023/11/14**  
 Report #: R7911274  
 Version: 3 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3W8851**

**Received: 2023/10/21, 10:55**

Sample Matrix: Water  
 # Samples Received: 5

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Analytical Method</b>
Dissolved Aluminum (0.2 u, clay free)	3	N/A	2023/10/25	CAM SOP-00447	EPA 6020B m
Dissolved Aluminum (0.2 u, clay free)	2	N/A	2023/10/26	CAM SOP-00447	EPA 6020B m
Alkalinity	5	N/A	2023/10/27	CAM SOP-00448	SM 23 2320 B m
Biochemical Oxygen Demand (BOD)	5	2023/10/23	2023/10/28	CAM SOP-00427	SM 23 5210B m
Chloride by Automated Colourimetry	5	N/A	2023/10/26	CAM SOP-00463	SM 23 4500-Cl E m
Colour	5	N/A	2023/10/25	CAM SOP-00412	SM 23 2120C m
Conductivity	5	N/A	2023/10/27	CAM SOP-00414	SM 23 2510 m
Hardness (calculated as CaCO3)	5	N/A	2023/10/26	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Mercury in Water by CVAA	5	2023/11/09	2023/11/09	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	5	2023/10/26	2023/10/27	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	5	N/A	2023/10/29	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	5	N/A	2023/10/26	CAM SOP-00440	SM 23 4500-NO3I/NO2B
pH	5	2023/10/24	2023/10/27	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	5	N/A	2023/10/26	CAM SOP-00444	OMOE E3179 m
Field Measured pH (2)	5	N/A	2023/10/21		Field pH Meter
Sulphate by Automated Turbidimetry	5	N/A	2023/10/26	CAM SOP-00464	SM 23 4500-SO42- E m
Total Dissolved Solids	2	2023/10/27	2023/10/28	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	1	2023/10/28	2023/10/31	CAM SOP-00428	SM 23 2540C m
Total Dissolved Solids	2	2023/10/30	2023/11/01	CAM SOP-00428	SM 23 2540C m
Field Temperature (2)	5	N/A	2023/11/13		Field Thermometer
Total Kjeldahl Nitrogen in Water	4	2023/10/25	2023/10/26	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	1	2023/10/25	2023/10/27	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2023/10/25	2023/10/26	CAM SOP-00407	SM 23 4500-P I
Total Phosphorus (Colourimetric)	2	2023/10/25	2023/10/27	CAM SOP-00407	SM 23 4500-P I
Total Suspended Solids	1	2023/10/27	2023/10/30	CAM SOP-00428	SM 23 2540D m
Total Suspended Solids	3	2023/10/27	2023/11/02	CAM SOP-00428	SM 23 2540D m
Total Suspended Solids	1	2023/10/28	2023/10/31	CAM SOP-00428	SM 23 2540D m
Turbidity	5	N/A	2023/10/24	CAM SOP-00417	SM 23 2130 B m
Un-ionized Ammonia (3)	5	2023/10/21	2023/11/13	Auto Calc.	PWQO



Your Project #: 230225-09  
Site Location: South Baptiste  
Your C.O.C. #: 781235

**Attention: Cecilia Bandler**

BluMetric Environmental Inc  
The Tower - The Woolen Mill  
4 Cataraqui St  
Kingston, ON  
CANADA K7K 1Z7

**Report Date: 2023/11/14**  
Report #: R7911274  
Version: 3 - Final

**CERTIFICATE OF ANALYSIS**

**BUREAU VERITAS JOB #: C3W8851**

**Received: 2023/10/21, 10:55**

**Remarks:**

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCCFP, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas 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. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas 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 Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

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. When sampling is not conducted by Bureau Veritas, results relate to the supplied 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) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.

(3) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.

**Encryption Key**

Please direct all questions regarding this Certificate of Analysis to:

Christine Gripton, Senior Project Manager  
Email: Christine.Gripton@bureauveritas.com  
Phone# (519)652-9444

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		XJD679			XJD679			XJD680		
Sampling Date		2023/10/19 14:15			2023/10/19 14:15			2023/10/19 14:00		
COC Number		781235			781235			781235		
	UNITS	BAP-A	RDL	QC Batch	BAP-A Lab-Dup	RDL	QC Batch	BAP-B	RDL	QC Batch

Calculated Parameters										
Hardness (CaCO3)	mg/L	160	1.0	8998229				74	1.0	8998229
Total Un-ionized Ammonia	mg/L	ND	0.00061	8997645				ND	0.00061	8997645
Field Measurements										
Field Temperature	Celsius	9.3	N/A	ONSITE				8.6	N/A	ONSITE
Field Measured pH	pH	6.96		ONSITE				7.05		ONSITE
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9004023				ND	0.050	9004023
Total BOD	mg/L	ND	2	9000470				ND	2	9000470
Colour	TCU	14	2	9002044				15	2	9002880
Conductivity	umho/cm	520	1.0	9003363				170	1.0	9003363
Total Dissolved Solids	mg/L	290	10	9013589				60	10	9011139
Total Kjeldahl Nitrogen (TKN)	mg/L	0.24	0.10	9006618				0.18	0.10	9006131
pH	pH	8.06		9003359				8.05		9003359
Phenols-4AAP	mg/L	ND	0.0010	9007776	ND	0.0010	9007776	ND	0.0010	9007776
Total Phosphorus	mg/L	ND	0.020	9006644				ND	0.020	9006644
Total Suspended Solids	mg/L	10	10	9011629				12	10	9008253
Dissolved Sulphate (SO4)	mg/L	16	1.0	9003414				5.9	1.0	9003414
Turbidity	NTU	0.5	0.1	9002753				1.2	0.1	9002753
Alkalinity (Total as CaCO3)	mg/L	170	1.0	9003340				71	1.0	9003340
Dissolved Chloride (Cl-)	mg/L	40	1.0	9003410				6.7	1.0	9003410
Nitrite (N)	mg/L	ND	0.010	9002715				ND	0.010	9002715
Nitrate (N)	mg/L	1.62	0.10	9002715				ND	0.10	9002715
Nitrate + Nitrite (N)	mg/L	1.62	0.10	9002715				ND	0.10	9002715

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.  
 N/A = Not Applicable



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		XJD681		XJD682			XJD682		
Sampling Date		2023/10/19 13:35		2023/10/19 14:30			2023/10/19 14:30		
COC Number		781235		781235			781235		
	UNITS	BAP-C	QC Batch	BAP-D	RDL	QC Batch	BAP-D Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>									
Hardness (CaCO3)	mg/L	88	8998229	61	1.0	8998229			
Total Un-ionized Ammonia	mg/L	ND	8997645	ND	0.00061	8997645			
<b>Field Measurements</b>									
Field Temperature	Celsius	8.5	ONSITE	8.6	N/A	ONSITE			
Field Measured pH	pH	7.33	ONSITE	7		ONSITE			
<b>Inorganics</b>									
Total Ammonia-N	mg/L	ND	9004023	ND	0.050	9004023	ND	0.050	9004023
Total BOD	mg/L	ND	9000470	ND	2	9000470			
Colour	TCU	13	9002880	21	2	9002880			
Conductivity	umho/cm	230	9003363	150	1.0	9003363			
Total Dissolved Solids	mg/L	95	9011139	85	10	9013590			
Total Kjeldahl Nitrogen (TKN)	mg/L	0.22	9006131	0.20	0.10	9006085			
pH	pH	8.01	9003359	7.83		9003359			
Phenols-4AAP	mg/L	ND	9007776	ND	0.0010	9007776			
Total Phosphorus	mg/L	0.020	9006644	ND	0.020	9006644			
Total Suspended Solids	mg/L	ND	9013364	11	10	9011629			
Dissolved Sulphate (SO4)	mg/L	7.6	9003414	4.6	1.0	9003414			
Turbidity	NTU	0.9	9002753	1.9	0.1	9002753			
Alkalinity (Total as CaCO3)	mg/L	87	9003340	55	1.0	9003340			
Dissolved Chloride (Cl-)	mg/L	12	9003410	5.1	1.0	9003410			
Nitrite (N)	mg/L	ND	9002715	ND	0.010	9002715			
Nitrate (N)	mg/L	0.22	9002715	ND	0.10	9002715			
Nitrate + Nitrite (N)	mg/L	0.22	9002715	ND	0.10	9002715			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate ND = Not Detected at a concentration equal or greater than the indicated Detection Limit. N/A = Not Applicable									



**RESULTS OF ANALYSES OF WATER**

<b>Bureau Veritas ID</b>		XJD683			XJD683		
<b>Sampling Date</b>		2023/10/19 14:00			2023/10/19 14:00		
<b>COC Number</b>		781235			781235		
	<b>UNITS</b>	<b>SB-QAQC-SW1</b>	<b>RDL</b>	<b>QC Batch</b>	<b>SB-QAQC-SW1 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>							
Hardness (CaCO3)	mg/L	75	1.0	8998229			
Total Un-ionized Ammonia	mg/L	ND	0.00061	8997645			
<b>Field Measurements</b>							
Field Temperature	Celsius	8.6	N/A	ONSITE			
Field Measured pH	pH	7.05		ONSITE			
<b>Inorganics</b>							
Total Ammonia-N	mg/L	ND	0.050	9004023			
Total BOD	mg/L	ND	2	9000470	ND	2	9000470
Colour	TCU	13	2	9002880			
Conductivity	umho/cm	180	1.0	9003363			
Total Dissolved Solids	mg/L	90	10	9013589			
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	0.10	9006618			
pH	pH	7.95		9003359			
Phenols-4AAP	mg/L	ND	0.0010	9007776			
Total Phosphorus	mg/L	ND	0.020	9006644			
Total Suspended Solids	mg/L	ND	10	9011629			
Dissolved Sulphate (SO4)	mg/L	6.1	1.0	9003414			
Turbidity	NTU	1.2	0.1	9002753			
Alkalinity (Total as CaCO3)	mg/L	71	1.0	9003340			
Dissolved Chloride (Cl-)	mg/L	6.9	1.0	9003410			
Nitrite (N)	mg/L	ND	0.010	9002715			
Nitrate (N)	mg/L	ND	0.10	9002715			
Nitrate + Nitrite (N)	mg/L	ND	0.10	9002715			
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate ND = Not Detected at a concentration equal or greater than the indicated Detection Limit. N/A = Not Applicable							



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

<b>Bureau Veritas ID</b>		XJD679	XJD680		XJD681			XJD681		
<b>Sampling Date</b>		2023/10/19 14:15	2023/10/19 14:00		2023/10/19 13:35			2023/10/19 13:35		
<b>COC Number</b>		781235	781235		781235			781235		
	<b>UNITS</b>	<b>BAP-A</b>	<b>BAP-B</b>	<b>QC Batch</b>	<b>BAP-C</b>	<b>RDL</b>	<b>QC Batch</b>	<b>BAP-C Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Metals</b>										
Dissolved (0.2u) Aluminum (Al)	ug/L	ND	6	9002541	5	5	9002562	5	5	9002562
Dissolved Mercury (Hg)	ug/L	ND	ND	9037815	ND	0.10	9037815	ND	0.10	9037815
Total Aluminum (Al)	ug/L	10	200	9007561	15	4.9	9007561			
Total Arsenic (As)	ug/L	ND	ND	9007561	ND	1.0	9007561			
Total Boron (B)	ug/L	240	ND	9007561	39	10	9007561			
Total Cadmium (Cd)	ug/L	ND	ND	9007561	ND	0.090	9007561			
Total Calcium (Ca)	ug/L	53000	28000	9007561	32000	200	9007561			
Total Chromium (Cr)	ug/L	ND	ND	9007561	ND	5.0	9007561			
Total Cobalt (Co)	ug/L	ND	0.75	9007561	ND	0.50	9007561			
Total Copper (Cu)	ug/L	ND	1.0	9007561	ND	0.90	9007561			
Total Iron (Fe)	ug/L	ND	2200	9007561	230	100	9007561			
Total Lead (Pb)	ug/L	ND	ND	9007561	ND	0.50	9007561			
Total Magnesium (Mg)	ug/L	8900	1300	9007561	2300	50	9007561			
Total Nickel (Ni)	ug/L	1.8	ND	9007561	ND	1.0	9007561			
Total Potassium (K)	ug/L	20000	840	9007561	3300	200	9007561			
Total Selenium (Se)	ug/L	ND	ND	9007561	ND	2.0	9007561			
Total Silver (Ag)	ug/L	ND	ND	9007561	ND	0.090	9007561			
Total Sodium (Na)	ug/L	35000	5700	9007561	10000	100	9007561			
Total Zinc (Zn)	ug/L	ND	ND	9007561	ND	5.0	9007561			

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		XJD682		XJD683			XJD683		
Sampling Date		2023/10/19 14:30		2023/10/19 14:00			2023/10/19 14:00		
COC Number		781235		781235			781235		
	UNITS	BAP-D	QC Batch	SB-QAQC-SW1	RDL	QC Batch	SB-QAQC-SW1 Lab-Dup	RDL	QC Batch

Metals									
Dissolved (0.2u) Aluminum (Al)	ug/L	8	9002562	6	5	9002541			
Dissolved Mercury (Hg)	ug/L	ND	9037815	ND	0.10	9037815			
Total Aluminum (Al)	ug/L	29	9007561	21	4.9	9007561	21	4.9	9007561
Total Arsenic (As)	ug/L	ND	9007561	ND	1.0	9007561	ND	1.0	9007561
Total Boron (B)	ug/L	ND	9007561	ND	10	9007561	ND	10	9007561
Total Cadmium (Cd)	ug/L	ND	9007561	ND	0.090	9007561	ND	0.090	9007561
Total Calcium (Ca)	ug/L	23000	9007561	29000	200	9007561	28000	200	9007561
Total Chromium (Cr)	ug/L	ND	9007561	ND	5.0	9007561	ND	5.0	9007561
Total Cobalt (Co)	ug/L	ND	9007561	ND	0.50	9007561	ND	0.50	9007561
Total Copper (Cu)	ug/L	ND	9007561	ND	0.90	9007561	ND	0.90	9007561
Total Iron (Fe)	ug/L	400	9007561	250	100	9007561	250	100	9007561
Total Lead (Pb)	ug/L	ND	9007561	ND	0.50	9007561	ND	0.50	9007561
Total Magnesium (Mg)	ug/L	1300	9007561	1300	50	9007561	1300	50	9007561
Total Nickel (Ni)	ug/L	ND	9007561	ND	1.0	9007561	ND	1.0	9007561
Total Potassium (K)	ug/L	1000	9007561	850	200	9007561	870	200	9007561
Total Selenium (Se)	ug/L	ND	9007561	ND	2.0	9007561	ND	2.0	9007561
Total Silver (Ag)	ug/L	ND	9007561	ND	0.090	9007561	ND	0.090	9007561
Total Sodium (Na)	ug/L	5600	9007561	5700	100	9007561	5800	100	9007561
Total Zinc (Zn)	ug/L	ND	9007561	ND	5.0	9007561	ND	5.0	9007561

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch  
 Lab-Dup = Laboratory Initiated Duplicate  
 ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD679  
**Sample ID:** BAP-A  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9002541	N/A	2023/10/25	Nan Raykha
Alkalinity	AT	9003340	N/A	2023/10/27	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9000470	2023/10/23	2023/10/28	Frank Zhang
Chloride by Automated Colourimetry	KONE	9003410	N/A	2023/10/26	Massarat Jan
Colour	SPEC	9002044	N/A	2023/10/25	Viorica Rotaru
Conductivity	AT	9003363	N/A	2023/10/27	Nachiketa Gohil
Hardness (calculated as CaCO3)		8998229	N/A	2023/10/26	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9037815	2023/11/09	2023/11/09	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9007561	2023/10/26	2023/10/27	Nan Raykha
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	9002715	N/A	2023/10/26	Chandra Nandlal
pH	AT	9003359	2023/10/24	2023/10/27	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9007776	N/A	2023/10/26	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2023/10/21	Harmanpreet Kaur
Sulphate by Automated Turbidimetry	KONE	9003414	N/A	2023/10/26	Massarat Jan
Total Dissolved Solids	BAL	9013589	2023/10/30	2023/11/01	Razieh Tabesh
Field Temperature	PH	ONSITE	N/A	2023/11/13	Christine Gripton
Total Kjeldahl Nitrogen in Water	SKAL	9006618	2023/10/25	2023/10/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/26	Sachi Patel
Total Suspended Solids	BAL	9011629	2023/10/27	2023/11/02	Tina Teng
Turbidity	AT	9002753	N/A	2023/10/24	Leily Karimi
Un-ionized Ammonia	CALC/NH3	8997645	2023/11/13	2023/11/13	Automated Statchk

**Bureau Veritas ID:** XJD679 Dup  
**Sample ID:** BAP-A  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	9007776	N/A	2023/10/26	Chloe Pollock

**Bureau Veritas ID:** XJD680  
**Sample ID:** BAP-B  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9002541	N/A	2023/10/25	Nan Raykha
Alkalinity	AT	9003340	N/A	2023/10/27	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9000470	2023/10/23	2023/10/28	Frank Zhang
Chloride by Automated Colourimetry	KONE	9003410	N/A	2023/10/26	Massarat Jan
Colour	SPEC	9002880	N/A	2023/10/25	Viorica Rotaru
Conductivity	AT	9003363	N/A	2023/10/27	Nachiketa Gohil
Hardness (calculated as CaCO3)		8998229	N/A	2023/10/26	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9037815	2023/11/09	2023/11/09	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9007561	2023/10/26	2023/10/27	Nan Raykha
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani





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VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD680  
**Sample ID:** BAP-B  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate & Nitrite as Nitrogen in Water	LACH	9002715	N/A	2023/10/26	Chandra Nandlal
pH	AT	9003359	2023/10/24	2023/10/27	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9007776	N/A	2023/10/26	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2023/10/21	Harmanpreet Kaur
Sulphate by Automated Turbidimetry	KONE	9003414	N/A	2023/10/26	Massarat Jan
Total Dissolved Solids	BAL	9011139	2023/10/27	2023/10/28	Darshan Patel
Field Temperature	PH	ONSITE	N/A	2023/11/13	Christine Gripton
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/27	Sachi Patel
Total Suspended Solids	BAL	9008253	2023/10/27	2023/10/30	Tina Teng
Turbidity	AT	9002753	N/A	2023/10/24	Leily Karimi
Un-ionized Ammonia	CALC/NH3	8997645	2023/11/13	2023/11/13	Automated Statchk

**Bureau Veritas ID:** XJD681  
**Sample ID:** BAP-C  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9002562	N/A	2023/10/26	Azita Fazaeli
Alkalinity	AT	9003340	N/A	2023/10/27	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9000470	2023/10/23	2023/10/28	Frank Zhang
Chloride by Automated Colourimetry	KONE	9003410	N/A	2023/10/26	Massarat Jan
Colour	SPEC	9002880	N/A	2023/10/25	Viorica Rotaru
Conductivity	AT	9003363	N/A	2023/10/27	Nachiketa Gohil
Hardness (calculated as CaCO3)		8998229	N/A	2023/10/26	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9037815	2023/11/09	2023/11/09	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9007561	2023/10/26	2023/10/27	Nan Raykha
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	9002715	N/A	2023/10/26	Chandra Nandlal
pH	AT	9003359	2023/10/24	2023/10/27	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9007776	N/A	2023/10/26	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2023/10/21	Harmanpreet Kaur
Sulphate by Automated Turbidimetry	KONE	9003414	N/A	2023/10/26	Massarat Jan
Total Dissolved Solids	BAL	9011139	2023/10/27	2023/10/28	Darshan Patel
Field Temperature	PH	ONSITE	N/A	2023/11/13	Christine Gripton
Total Kjeldahl Nitrogen in Water	SKAL	9006131	2023/10/25	2023/10/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/27	Sachi Patel
Total Suspended Solids	BAL	9013364	2023/10/28	2023/10/31	Razieh Tabesh
Turbidity	AT	9002753	N/A	2023/10/24	Leily Karimi
Un-ionized Ammonia	CALC/NH3	8997645	2023/11/13	2023/11/13	Automated Statchk



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD681 Dup  
**Sample ID:** BAP-C  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9002562	N/A	2023/10/26	Azita Fazaeli
Dissolved Mercury in Water by CVAA	CV/AA	9037815	2023/11/09	2023/11/09	Gagandeep Rai

**Bureau Veritas ID:** XJD682  
**Sample ID:** BAP-D  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9002562	N/A	2023/10/26	Azita Fazaeli
Alkalinity	AT	9003340	N/A	2023/10/27	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9000470	2023/10/23	2023/10/28	Frank Zhang
Chloride by Automated Colourimetry	KONE	9003410	N/A	2023/10/26	Massarat Jan
Colour	SPEC	9002880	N/A	2023/10/25	Viorica Rotaru
Conductivity	AT	9003363	N/A	2023/10/27	Nachiketa Gohil
Hardness (calculated as CaCO3)		8998229	N/A	2023/10/26	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9037815	2023/11/09	2023/11/09	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9007561	2023/10/26	2023/10/27	Nan Raykha
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	9002715	N/A	2023/10/26	Chandra Nandlal
pH	AT	9003359	2023/10/24	2023/10/27	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9007776	N/A	2023/10/26	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2023/10/21	Harmanpreet Kaur
Sulphate by Automated Turbidimetry	KONE	9003414	N/A	2023/10/26	Massarat Jan
Total Dissolved Solids	BAL	9013590	2023/10/28	2023/10/31	Razieh Tabesh
Field Temperature	PH	ONSITE	N/A	2023/11/13	Christine Gripton
Total Kjeldahl Nitrogen in Water	SKAL	9006085	2023/10/25	2023/10/27	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/26	Sachi Patel
Total Suspended Solids	BAL	9011629	2023/10/27	2023/11/02	Tina Teng
Turbidity	AT	9002753	N/A	2023/10/24	Leily Karimi
Un-ionized Ammonia	CALC/NH3	8997645	2023/11/13	2023/11/13	Automated Statchk

**Bureau Veritas ID:** XJD682 Dup  
**Sample ID:** BAP-D  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani

**Bureau Veritas ID:** XJD683  
**Sample ID:** SB-QAQC-SW1  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9002541	N/A	2023/10/25	Nan Raykha
Alkalinity	AT	9003340	N/A	2023/10/27	Nachiketa Gohil



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### TEST SUMMARY

**Bureau Veritas ID:** XJD683  
**Sample ID:** SB-QAQC-SW1  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	9000470	2023/10/23	2023/10/28	Frank Zhang
Chloride by Automated Colourimetry	KONE	9003410	N/A	2023/10/26	Massarat Jan
Colour	SPEC	9002880	N/A	2023/10/25	Viorica Rotaru
Conductivity	AT	9003363	N/A	2023/10/27	Nachiketa Gohil
Hardness (calculated as CaCO3)		8998229	N/A	2023/10/26	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9037815	2023/11/09	2023/11/09	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9007561	2023/10/26	2023/10/27	Nan Raykha
Total Ammonia-N	LACH/NH4	9004023	N/A	2023/10/29	Shivani Shivani
Nitrate & Nitrite as Nitrogen in Water	LACH	9002715	N/A	2023/10/26	Chandra Nandlal
pH	AT	9003359	2023/10/24	2023/10/27	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9007776	N/A	2023/10/26	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2023/10/21	Harmanpreet Kaur
Sulphate by Automated Turbidimetry	KONE	9003414	N/A	2023/10/26	Massarat Jan
Total Dissolved Solids	BAL	9013589	2023/10/30	2023/11/01	Razieh Tabesh
Field Temperature	PH	ONSITE	N/A	2023/11/13	Christine Gripton
Total Kjeldahl Nitrogen in Water	SKAL	9006618	2023/10/25	2023/10/26	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9006644	2023/10/25	2023/10/26	Sachi Patel
Total Suspended Solids	BAL	9011629	2023/10/27	2023/11/02	Tina Teng
Turbidity	AT	9002753	N/A	2023/10/24	Leily Karimi
Un-ionized Ammonia	CALC/NH3	8997645	2023/11/13	2023/11/13	Automated Statchk

**Bureau Veritas ID:** XJD683 Dup  
**Sample ID:** SB-QAQC-SW1  
**Matrix:** Water

**Collected:** 2023/10/19  
**Shipped:**  
**Received:** 2023/10/21

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Biochemical Oxygen Demand (BOD)	DO	9000470	2023/10/23	2023/10/28	Frank Zhang
Total Metals Analysis by ICPMS	ICP/MS	9007561	2023/10/26	2023/10/27	Nan Raykha



### GENERAL COMMENTS

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

Package 1	3.7°C
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Sample XJD679 [BAP-A] : TDS Analysis: Analysis was performed past sample holding time. This may increase the variability associated with these results.

Sample XJD680 [BAP-B] : TSS Analysis: Analysis was performed past sample holding time. This may increase the variability associated with these results.

Sample XJD681 [BAP-C] : TSS Analysis: Analysis was performed past sample holding time. This may increase the variability associated with these results.

Sample XJD683 [SB-QAQC-SW1] : TDS Analysis: Analysis was performed past sample holding time. This may increase the variability associated with these results.

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



BUREAU  
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Bureau Veritas Job #: C3W8851

Report Date: 2023/11/14

### QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Client Project #: 230225-09

Site Location: South Baptiste

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9000470	Total BOD	2023/10/28					ND,RDL=2	mg/L	NC	30	95	80 - 120
9002044	Colour	2023/10/25			97	80 - 120	ND,RDL=2	TCU	0.098	25		
9002541	Dissolved (0.2u) Aluminum (Al)	2023/10/25	99	80 - 120	101	80 - 120	ND,RDL=5	ug/L	NC	20		
9002562	Dissolved (0.2u) Aluminum (Al)	2023/10/26	98	80 - 120	97	80 - 120	ND,RDL=5	ug/L	0.66	20		
9002715	Nitrate (N)	2023/10/26	97	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9002715	Nitrite (N)	2023/10/26	104	80 - 120	108	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9002753	Turbidity	2023/10/24			102	80 - 120	ND, RDL=0.1	NTU	1.6	20		
9002880	Colour	2023/10/25			99	80 - 120	ND,RDL=2	TCU	0.99	25		
9003340	Alkalinity (Total as CaCO3)	2023/10/27			98	85 - 115	ND, RDL=1.0	mg/L	0.36	20		
9003359	pH	2023/10/27			102	98 - 103			0.050	N/A		
9003363	Conductivity	2023/10/27			103	85 - 115	ND, RDL=1.0	umho/cm	0.47	10		
9003410	Dissolved Chloride (Cl-)	2023/10/26	NC	80 - 120	99	80 - 120	ND, RDL=1.0	mg/L	0.039	20		
9003414	Dissolved Sulphate (SO4)	2023/10/26	NC	75 - 125	96	80 - 120	ND, RDL=1.0	mg/L	0.35	20		
9004023	Total Ammonia-N	2023/10/29	105	75 - 125	104	80 - 120	ND, RDL=0.050	mg/L	NC	20		
9006085	Total Kjeldahl Nitrogen (TKN)	2023/10/27	113	80 - 120	101	80 - 120	ND, RDL=0.10	mg/L	18	20	97	80 - 120
9006131	Total Kjeldahl Nitrogen (TKN)	2023/10/27	NC	80 - 120	100	80 - 120	ND, RDL=0.10	mg/L	1.3	20	100	80 - 120
9006618	Total Kjeldahl Nitrogen (TKN)	2023/10/26	112	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	3.9	20	102	80 - 120
9006644	Total Phosphorus	2023/10/26	99	80 - 120	102	80 - 120	ND, RDL=0.020	mg/L	1.9	20	101	80 - 120
9007561	Total Aluminum (Al)	2023/10/27	104	80 - 120	104	80 - 120	ND, RDL=4.9	ug/L	2.6	20		
9007561	Total Arsenic (As)	2023/10/27	98	80 - 120	98	80 - 120	ND, RDL=1.0	ug/L	NC	20		
9007561	Total Boron (B)	2023/10/27	94	80 - 120	98	80 - 120	ND, RDL=10	ug/L	NC	20		
9007561	Total Cadmium (Cd)	2023/10/27	97	80 - 120	96	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9007561	Total Calcium (Ca)	2023/10/27	NC	80 - 120	102	80 - 120	ND, RDL=200	ug/L	1.5	20		
9007561	Total Chromium (Cr)	2023/10/27	101	80 - 120	100	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9007561	Total Cobalt (Co)	2023/10/27	100	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9007561	Total Copper (Cu)	2023/10/27	100	80 - 120	101	80 - 120	ND, RDL=0.90	ug/L	NC	20		
9007561	Total Iron (Fe)	2023/10/27	97	80 - 120	96	80 - 120	ND, RDL=100	ug/L	1.8	20		



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Bureau Veritas Job #: C3W8851

Report Date: 2023/11/14

### QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 230225-09

Site Location: South Baptiste

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9007561	Total Lead (Pb)	2023/10/27	102	80 - 120	100	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9007561	Total Magnesium (Mg)	2023/10/27	100	80 - 120	101	80 - 120	ND, RDL=50	ug/L	2.2	20		
9007561	Total Nickel (Ni)	2023/10/27	97	80 - 120	97	80 - 120	ND, RDL=1.0	ug/L	NC	20		
9007561	Total Potassium (K)	2023/10/27	100	80 - 120	100	80 - 120	ND, RDL=200	ug/L	2.2	20		
9007561	Total Selenium (Se)	2023/10/27	103	80 - 120	103	80 - 120	ND, RDL=2.0	ug/L	NC	20		
9007561	Total Silver (Ag)	2023/10/27	96	80 - 120	97	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9007561	Total Sodium (Na)	2023/10/27	100	80 - 120	102	80 - 120	ND, RDL=100	ug/L	1.3	20		
9007561	Total Zinc (Zn)	2023/10/27	99	80 - 120	100	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9007776	Phenols-4AAP	2023/10/26	103	80 - 120	100	80 - 120	ND, RDL=0.0010	mg/L	NC	20		
9008253	Total Suspended Solids	2023/10/30			100	85 - 115	ND, RDL=10	mg/L	NC	20		
9011139	Total Dissolved Solids	2023/10/28			95	90 - 110	ND, RDL=10	mg/L	0	20		
9011629	Total Suspended Solids	2023/11/02			95	85 - 115	ND, RDL=10	mg/L	0	20		
9013364	Total Suspended Solids	2023/10/31			101	85 - 115	ND, RDL=10	mg/L	NC	20		
9013589	Total Dissolved Solids	2023/11/01			95	90 - 110	ND, RDL=10	mg/L	13	20		
9013590	Total Dissolved Solids	2023/10/31			97	90 - 110	ND, RDL=10	mg/L	13	20		
9037815	Dissolved Mercury (Hg)	2023/11/09	111	75 - 125	110	80 - 120	ND, RDL=0.10	ug/L	NC	20		

N/A = Not Applicable

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

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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

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

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).



BUREAU  
VERITAS

Bureau Veritas Job #: C3W8851  
Report Date: 2023/11/14

BluMetric Environmental Inc  
Client Project #: 230225-09  
Site Location: South Baptiste

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist

Christine Gripton, Senior Project Manager

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Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.



# Custody Tracking Form



T781235

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: BAP-A  
Last Sample: SB-QAQC-SW1  
Sample Count: 5

Relinquished By				Received By			
<i>Brad McCallum</i>	<i>Brad McCallum</i>	Date	2023/10/20	<i>AVSHEIL SHEETHA</i>	<i>[Signature]</i>	Date	2023/10/21
Print	Sign	Time (24 HR)	09:00	Print	Sign	Time (24 HR)	10:55
		Date	YYYY/MM/DD			Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
		Date	YYYY/MM/DD			Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at [www.bvna.com](http://www.bvna.com).

### Triage Information

Sampled By (Print)

# of Coolers/Pkgs:

*Brad McCallum / Matt DeGeer*

*1*

Rush

Immediate Test

Food Residue

Micro

Food Chemistry

### \*\*\* LABORATORY USE ONLY \*\*\*

Received At

Lab Comments:

Labeled By

Verified By

21-Oct-23 10:55  
Christine Gripton  
C3W8851  
JDK ENV-1302

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
<i>Y</i>	<i>Y</i>	<i>Y</i>	<i>4</i>	<i>2</i>	<i>5</i>
Drinking Water Metals Preservation Check Done (Circle)			YES	NO	

COR FCD-00383/4

Page 1 of 1



## **Appendix D**

D-4 2022 Toxicity Test Results

### Certificate of Analysis

#### ACUTE LETHALITY BIOASSAY REPORT (Single-Concentration Test)

**CLIENT:**

BluMetric Environmental, 4 Cataraqui St., Kingston, ON K7K 1Z7

**TEST RESULTS:**

Sample Name <sup>1</sup>	Sample Number	Date Collected	Date Received	Date Tested	Test Species <sup>2</sup>	Percent Mortality <sup>3</sup>	Method Deviations
BAP-A	6500-0012306	04-May-23	08-May-23	08-May-23 08-May-23	RBT DM	0% 0%	None None

1 - Results relate only to the sample tested. Tested as received from client.

 2 - Test Type and Species RBT = Rainbow Trout 96-hour 100% Effluent Concentration Acute Lethality Test  
 DM = *Daphnia magna* 48-hour 100% Effluent Concentration Acute Lethality Test

 3 - Most regulations regard  $\leq 50\%$  mortality to be a "pass". Check your applicable regulatory requirements.

**TEST PROTOCOLS:**

Environment Canada, "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/13 Second Edition - December 2000, including May 2007 and February 2016 Amendments. (Nautilus Test Method RT-SC-R1.7)

 Environment Canada, "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/14 Second Edition - December 2000, including February 2016 Amendment. (Nautilus Test Method DM-SC-R1.7)

**REFERENCE/HEALTH DATA:**
**Trout**
**Date Reference Test Initiated:** 05-May-23 **Reference Chemical:** Phenol **Fish Lot #:** LF120423

**96-Hour LC50:** 7.58 mg/L **95% Confidence Limits:** 6.65 mg/L; 8.64 mg/L

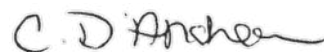
**Historic Geometric Mean LC50:** 8.94 mg/L **Historic Warning Limits ( $\pm 2$  SD):** 6.69 mg/L; 11.95 mg/L

***Daphnia magna***
**Date Reference Test Initiated:** 02-May-23 **Reference Chemical:** Zinc

**48-Hour LC50:** 0.84 mg/L **95% Confidence Limits:** 0.73 mg/L; 0.98 mg/L

**Historic Geometric Mean LC50:** 1.02 mg/L **Historic Warning Limits ( $\pm 2$  SD):** 0.39 mg/L; 2.63 mg/L

**TEST RESULTS APPROVED BY:**
**Date:** May 18, 2023


**Carol D'Andrea**  
**Laboratory Supervisor**

Y:\bioassays\2023\6000\6500-001\6500-0012306 TD

**NAUTILUS ENVIRONMENTAL RAINBOW TROUT TOXICITY TEST BENCH SHEET**

<b>Sample Information</b>		Sam: Method: Composite <u>Grab</u> Other	<b>Test Information</b>		Te type: <u>Single Concentration</u> LC50 TIE Screen
Account <u>6500-001</u>	Sample Number <u>6500-001 2306</u>	Date/Time Started <u>08-05-23</u>	<u>15:30</u>	Analyst Starting Test <u>KK</u>	
Client <u>Blu Metric</u>	Sample Name <u>BAP-A</u>	Date/Time Ended <u>12-05-23</u>	<u>1550</u>	Fish Lot # <u>r4 LF120123-1</u>	
Person Collecting Sample <u>N/A</u>	Temperature Upon Receipt <u>14.9 °C</u>	Test Volume <u>20 L Per Vessel</u>	Number of Fish Per Vessel <u>10</u>	Number of Vessels Per Conc. <u>(1) 2</u>	
Date/Time Collected <u>04-05-23</u>	<u>1 08:58</u>	Pre-Aeration <u>No</u> <u>Yes</u>	Pre-Aeration Duration <u>30 min</u>	Pre-Aeration Rate <u>6.5 ±0.26 ml/min·L<sup>-1</sup></u>	
Date/Time Received in Lab <u>08-05-23</u>	<u>1 14:30</u>	Rate of Aeration During Test <u>6.5 ±0.26 ml/min·L<sup>-1</sup></u>	Dilution Water <u>Dechlor</u>	Sample pH Adjustment <u>(No) Yes</u>	
Sample Description <u>clear yellow = debris</u>		Sample Type Description <u>water, <del>N/A</del> surface water</u>	Sample Point Description: <u>MISA</u> <u>(Other)</u>	Storage Temperature <u>None</u> °C	

Initial Sample Measurements Before Aeration - Cond.: 546 µmhos    D.O.: 9.4 mg/L 96% Temp: 16 °C    pH: 7.4    Air Flow Meter Reading: 0.150 L/min.  
 Instrument Identification- M/P #: 7/8    M/P #: 7/5    M/P #: 13/91    Meter #: 7

TOXICANT	CONC %	TOTAL NUMBER DEAD # OF HOURS FROM START OF TEST				Initial Measurements After Pre-Aeration					Meter/Probe			Initials	Final Measurements						Meter/Probe		Initials			
		—	24	48	72	96	Time	Cond (umhos)	D.O. (mg/L)%	°C	pH (units)	Cond	D.O/Temp		pH	Date	Time	°C	D.O. (mg/L)%	pH (units)	D.O./Temp	pH				
Control		0	0	0	0	0	15:30	234	10.0	100	15	7.7	7/8	7/5	13/91	KK	12-05-23	1550	15	9.6	97	7.7	7/5	13/91	g	
1	100	0	0	0	0	0	↓	575	9.7	99	16	7.4	↓	↓	↓	KK	↓	↓	15	8.9	90	7.8	↓	↓	↓	
Time Initials	17:00 KK	08:30 S	9:45 KK	1:00 CF	15:15 S	Number of Control Fish Showing Atypical Behaviour: <24h: <u>0</u> 24h: <u>0</u> 48h: <u>0</u> 72h: <u>0</u> 96h: <u>0</u>																				

Percent Mortality	<u>0</u> %	LENGTH (mm)	WEIGHT (g)	Initials: <u>DS</u>	Holding Mortalities 7-days Preceding Test	Number of Fish in Batch at Day (-)7 <u>1131</u>
LC50 (Lower; Upper Limit)	-	Mean (SD) <u>37.8 ( 1.8 )</u>	Mean (SD) <u>0.42 ( 0.06 )</u>		Number Dead (recorded daily for 7 days)	Total Number Dead for 7 days Preceding Test
Method	-	Min/Max <u>34 1 40</u>	Min/Max <u>0.33 1 0.53</u>		<u>0 + 0 + 0 + 0 + 0 + 0 + 0</u>	= <u>0</u>
Verified By (initials)	<u>DS</u>	Sample Size <u>10</u>	Loading Density <u>0.21</u> g/L		7-Day Holding Mortality ((total number dead/number of fish in batch) x 100)	<u>0</u>

Observations and notes:

# Nautilus *Daphnia magna* Toxicity Test Bench Sheet

<b>Sample Information</b>		Sample Method: Composite <input checked="" type="radio"/> <del>Grab</del> Other		<b>Test Information</b>		Test Type: <input checked="" type="radio"/> Single Concentration		LC50	TIE	Screen
Account Number <u>6500.001</u>	Sample # <u>6500.0012306</u>	Date Started/Time <u>08.05.23</u> <u>11600</u>		Analyst Starting Test <u>ET</u>		Date Ended/Time <u>10.05.23</u> <u>11600</u>		#Neonates/Vessel <u>10</u>		
Client <u>BlaMetric</u>	Sample Name <u>BAP-A</u>	Temperature Upon Receipt <u>14.9 °C</u>		Test Volume <u>250 mL/Vessel</u>		mL Solution/Daphnid <u>25</u> mL				
Person Collecting Sample <u>N/A</u>	Date/Time Sampled <u>04.05.23</u> <u>08:58</u>	Pre-aeration <u>no</u> <input checked="" type="radio"/> <u>yes</u>		Pre-aeration Duration <u>30</u> min		Date/Time Received <u>08.05.23</u> <u>1430</u>		Pre-aeration Rate <u>40.8 ±2 mL/min L'</u>		Sample Hardness Adjustment <input checked="" type="radio"/> <u>no</u> <u>yes</u>
Sample Description <u>clear yellow with debris</u>	Sample Type Description <u>surface water</u>	Dilution H <sub>2</sub> O # <u>DW2337</u>		Sample pH Adjustment <input checked="" type="radio"/> <u>no</u> <u>yes</u>		Sample Point Description: MISA <input checked="" type="radio"/> <u>other</u>		Storage Temperature <u>none</u> °C		
LC50 Randomization Template: <u>N/A</u>	Test Row(s): <u>2</u>									

Initial Sample Measurements: pH 7.4 Dissolved O<sub>2</sub> 9.5 mg/L 105 % Conductivity 581 µmhos Temperature 20 °C  
 Instrument Identification: Meter/Probe # 1319 Meter/Probe # 715 Meter/Probe # 718 Meter/Probe # 715

Concentration (% Volume)	pH			Dissolved Oxygen					Cond. (µmhos)	Hard. (mg/L)	Temperature (°C)		
	Initial	Final	Final M/P	Initial		Final		Final M/P	Initial	Initial	Initial	Final	Final M/P
				(mg/L)	(%)	(mg/L)	(%)						
Control	8.0	7.9	<u>13/91</u>	8.5	97%	8.3	94%	<u>7/5</u>	729	184	21	21	<u>7/5</u>
<u>100%</u>	7.4	8.3	↓	9.0	100%	8.2	93%	↓	583	152	20	21	↓
Initials	<u>ET</u>	<u>ET</u>		<u>ET</u>		<u>ET</u>			<u>ET</u>	<u>ET</u>	<u>ET</u>	<u>ET</u>	<u>ET</u>

*- pH reading accurate, adjusted*

### BROOD CULTURE HEALTH INFORMATION

Brood Culture #	<u>91<sup>D</sup> 92<sup>B</sup></u>			
Culture age (days)	<u>20</u> →			
Days to 1 <sup>st</sup> Brood (≤12)	<u>8</u> →			
Average # of Neonates/Brood (≥15)	<u>225</u> →			
Previous 7 Days Mortality in Culture (≤25%)	<u>0</u> →			

### NEONATE SOURCE AND OBSERVATIONS OF NUMBER IMMOBILE AND DEAD

	Control				<u>100%</u>								Init			
	A	B	C	D	A	B	C	D	A	B	C	D				
Brood culture #	<u>91<sup>D</sup> 92<sup>B</sup></u>	<u>92<sup>B</sup></u>	→		<u>91<sup>D</sup> 92<sup>B</sup></u>	<u>92<sup>B</sup></u>	→									
24-Hr. # Immobile	0	0	0		0	0	0									<u>ET</u>
48-Hr. # Immobile	0	0	0		0	0	0									<u>ET</u>
48-Hr. # Dead	0	0	0		0	0	0									<u>ET</u>
Total # Immobile	0				0											
Total # Dead	0				0											

Percent Mortality 0 % Standard Deviation of Control Survival 0 Standard Deviation of Test Survival 0 Verified By (Initials) GP Notes

### Certificate of Analysis

#### ACUTE LETHALITY BIOASSAY REPORT (Single-Concentration Test)

**CLIENT:**

BluMetric Environmental, 4 Cataraqui St., Kingston, ON K7K 1Z7

**TEST RESULTS:**

Sample Name <sup>1</sup>	Sample Number	Date Collected	Date Received	Date Tested	Test Species <sup>2</sup>	Percent Mortality <sup>3</sup>	Method Deviations
BAP-A	6500-0012309	09-Aug-23	10-Aug-23	11-Aug-23 10-Aug-23	RBT DM	0% 0%	None None

1 - Results relate only to the sample tested. Tested as received from client.

 2 - Test Type and Species RBT = Rainbow Trout 96-hour 100% Effluent Concentration Acute Lethality Test  
 DM = *Daphnia magna* 48-hour 100% Effluent Concentration Acute Lethality Test

 3 - Most regulations regard  $\leq 50\%$  mortality to be a "pass". Check your applicable regulatory requirements.

**TEST PROTOCOLS:**

Environment Canada, "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/13 Second Edition - December 2000, including May 2007 and February 2016 Amendments. (Nautilus Test Method RT-SC-R1.7)

 Environment Canada, "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/14 Second Edition - December 2000, including February 2016 Amendment. (Nautilus Test Method DM-SC-R1.7)

**REFERENCE/HEALTH DATA:**
**Trout**
**Date Reference Test Initiated:** 11-Aug-23 **Reference Chemical:** Phenol **Fish Lot #:** LF250723

**96-Hour LC50:** 6.60 mg/L **95% Confidence Limits:** 5.78 mg/L; 7.52 mg/L

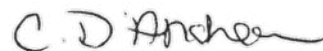
**Historic Geometric Mean LC50:** 8.73 mg/L **Historic Warning Limits ( $\pm 2$  SD):** 6.55 mg/L; 11.64 mg/L

***Daphnia magna***
**Date Reference Test Initiated:** 31-Jul-23 **Reference Chemical:** Zinc

**48-Hour LC50:** 0.58 mg/L **95% Confidence Limits:** N/A mg/L; N/A mg/L

**Historic Geometric Mean LC50:** 0.97 mg/L **Historic Warning Limits ( $\pm 2$  SD):** 0.40 mg/L; 2.37 mg/L

**TEST RESULTS APPROVED BY:**
**Date:** August 23, 2023


**Carol D'Andrea**  
 Laboratory Supervisor

Y:\bioassays\2023\6000\6500-001\6500-0012309 TD

**NAUTILUS ENVIRONMENTAL RAINBOW TROUT TOXICITY TEST BENCH SHEET**

<b>Sample Information</b>		Sam Method: Composite <input checked="" type="checkbox"/> Other	<b>Test Information</b>		Te /pe: Single Concentration	LC50	TIE	Screen	
Account 6500.001	Sample Number 6500.0012309	Date/Time Started 11.08.23	1	12:25	Analyst Starting Test DS				
Client Blumetric - WESA	Sample Name BAP-A	Date/Time Ended 15/08/23	1	1245	Fish Lot # 71/LF250725				
Person Collecting Sample Am/mo	Temperature Upon Receipt 24.0 °C	Test Volume 30 L Per Vessel	Number of Fish Per Vessel 10		Number of Vessels Per Conc. ① 2				
Date/Time Collected 09.08.23	Pre-Aeration No <input checked="" type="checkbox"/> Yes	Pre-Aeration Duration 30 min		Pre-Aeration Rate 6.5 ±0.26 ml/min·L <sup>-1</sup>					
Date/Time Received in Lab 10.08.23	1 1115	Rate of Aeration During Test 6.5 ±0.26 ml/min·L <sup>-1</sup>		Dilution Water Dechlor		Sample pH Adjustment <input checked="" type="checkbox"/> No Yes			
Sample Description Clear light Tan		Sample Type Description — other		Sample Point Description: MISA Other			Storage Temperature 15 ± 1 °C		

Initial Sample Measurements Before Aeration - Cond.: 505 µmhos D.O.: 7.3 mg/L 75% Temp: 16 °C pH: 7.3 Air Flow Meter Reading: 0.21 L/min.  
 Instrument Identification- M/P #: 713 M/P #: 715 M/P #: 13/91 Meter #:

TOXICANT	CONC %	TOTAL NUMBER DEAD # OF HOURS FROM START OF TEST				Initial Measurements After Pre-Aeration					Meter/Probe			Initials	Final Measurements					Meter/Probe		Initials		
		—	24	48	72	96	Time	Cond (umhos)	D.O. (mg/L)%	°C	pH (units)	Cond	D.O./Temp		pH	Date	Time	°C	D.O. (mg/L)%	pH (units)	D.O./Temp		pH	
Control		0	0	0	0	12:10	235	9.5	97	15	8.0	7.8	7.5	13.91	DS	15/08/23	1245	16	9.3	96	7.9	7.5	13.91	SO
①	100%	0	0	0	0	↓	502	8.4	87	16	7.6	↓	↓	↓	↓	↓	↓	16	9.4	96	8.2	↓	↓	↓
Time Initials		0670 DS	0900 DS	1000 SO	1245 SO	Number of Control Fish Showing Atypical Behaviour: <24h: — 24h: 0 48h: 0 72h: 0 96h: 0																		

Percent Mortality 0 %	LENGTH (mm)	WEIGHT (g)	Initials: SO	Holding Mortalities 7-days Preceding Test	Number of Fish in Batch at Day (-) 7 2000
LC50 (Lower; Upper Limit) —	Mean (SD) 38.1 (3.05)	Mean (SD) 0.43 (0.106)		Number Dead (recorded daily for 7 days)	Total Number Dead for 7 days Preceding Test
Method —	Min/Max 35 140	Min/Max 0.30 0.47		1 + 0 + 0 + 3 + 1 + 1 + 0 = 6	5
Verified By (initials) GP	Sample Size 10	Loading Density 0.14 g/L		7-Day Holding Mortality ((total number dead/number of fish in batch] x 100) 0.252 = 0.37%	

Observations and notes:

# Nautilus *Daphnia magna* Toxicity Test Bench Sheet

Sample Information		Sample Method: Composite <u>Grab</u> Other		Test Information		Test Type: <u>Single Concentration</u>		LC50	TIL	Screen
Account Number <u>6500-001</u>		Sample # <u>6500-0012309</u>		Date Started/Time <u>10/08/23 11355</u>		Analyst Starting Test <u>SD</u>				
Client <u>Blumetric-wesa</u>		Sample Name <u>BAP-A</u>		Date Ended/Time <u>12-08-23 11355</u>		#Neonates/Vessel <u>10</u>				
Person Collecting Sample <u>AM/MD</u>		Temperature Upon Receipt <u>24.0 °C</u>		Test Volume <u>250</u> mL/Vessel		mL Solution/Daphnid <u>25</u> mL				
Date/Time Sampled <u>09/08/23</u>		<u>1 N/A</u>		Pre-aeration <u>no</u> yes		Pre-aeration Duration <u>—</u> min				
Date/Time Received <u>10/09/23</u>		<u>1 1115</u>		Pre-aeration Rate <u>—</u> ±2 mL/min L'		Sample Hardness Adjustment <u>no</u> yes				
Sample Description <u>clear light-tan</u>				Dilution H <sub>2</sub> O # <u>DW2367</u>		Sample pH Adjustment <u>no</u> yes				
Sample Type Description <u>other</u>				Sample Point Description: MISA <u>other</u>		Storage Temperature <u>none</u> °C				
LC50 Randomization Template: <u>—</u>				Test Row(s): <u>5</u>						

Initial Sample Measurements: pH 7.2 <sup>13/91</sup> Dissolved O<sub>2</sub> 6.5 mg/L 76 % Conductivity 491 µmhos Temperature 21 °C  
 Instrument Identification: Meter/Probe # 775 <sup>50</sup> Meter/Probe # 715 Meter/Probe # 718 Meter/Probe # 715

Concentration (% Volume)	pH			Dissolved Oxygen			Cond. (µmhos)	Hard. (mg/L)	Temperature (°C)		
	Initial	Final	Final M/P	Initial (mg/L)	Final (%)	Final M/P	Initial	Initial	Initial	Final	Final M/P
Control	8.1	8.1	13/91	8.1	95	715	637	188	21	21	715
100	7.2	8.3	↓	6.5	76	↓	491	138	21	21	↓
Initials	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD

### BROOD CULTURE HEALTH INFORMATION

Brood Culture #	<u>82<sub>A</sub></u>			
Culture age (days)	<u>24</u>			
Days to 1 <sup>st</sup> Brood (≤12)	<u>8</u>			
Average # of Neonates/Brood (≥15)	<u>42</u> <u>57</u>			
Previous 7 Days Mortality in Culture (≤25%)	<u>0</u>			

### NEONATE SOURCE AND OBSERVATIONS OF NUMBER IMMOBILE AND DEAD

	Control				100								Init
	A	B	C	D	A	B	C	D	A	B	C	D	
Brood culture #	<u>82<sub>A</sub> →</u>				<u>82<sub>A</sub> →</u>								<u>SD</u>
24-Hr. # Immobile	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	/				<u>SD</u>
48-Hr. # Immobile	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	/				
48-Hr. # Dead	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	/				
Total # Immobile	<u>0</u>				<u>0</u>								<u>SD</u>
Total # Dead	<u>0</u>				<u>0</u>								

Percent Mortality 0 % Standard Deviation of Control Survival 0 Standard Deviation of Test Survival 0 Verified By (Initials) SD Notes \_\_\_\_\_

Work Order : 253057  
 Sample Number : 79945

**SAMPLE IDENTIFICATION**

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2023-10-19
Job Number :	C3W8851	Sampling Time :	14:15
Substance :	BAP-A	Date Received :	2023-10-23
Sampling Method :	Grab	Time Received :	14:05
Sampled By :	B. McCallum	Temperature at Receipt :	8 °C
Sample Description :	Clear, dark brown, contains settled solids	Date Tested :	2023-10-24

 Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* .  
 Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

**48-HOUR TEST RESULTS**

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

**TEST ORGANISM**

Species :	<i>Daphnia magna</i>	Time to First Brood :	9.8 days
Organism Batch :	Dm23-20	Average Brood Size :	34.3
Culture Mortality :	0.3% (previous 7 days)		

**TEST CONDITIONS**

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	30 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

**REFERENCE TOXICANT DATA**

Toxicant :	Sodium Chloride		
Date Tested :	2023-10-25	LC50 :	6.0 g/L
Organism Batch :	Dm23-20	95% Confidence Limits :	5.7 - 6.3 g/L
Analyst(s) :	SSF, NM	Historical Mean LC50 :	6.4 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.6 - 7.4 g/L

**COMMENTS**

- All test validity criteria as specified in the test method were satisfied.

Approved By : \_\_\_\_\_

Project Manager



Work Order : 253057  
 Sample Number : 79945

**TEST DATA**

	pH	Dissolved O <sub>2</sub> (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O <sub>2</sub> Saturation (%)*	Hardness (as CaCO <sub>3</sub> )
<b>Initial Chemistry (100%) :</b>	7.4	8.5	460	21	101	170 mg/L

**0 HOURS**

 Date & Time : 2023-10-24 10:20  
 Analyst(s) : SV/AW

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O <sub>2</sub>	Conductivity	Temperature	O <sub>2</sub> Saturation*	Hardness
100	A	0	0	7.7	8.3	460	21	99	170
100	B	0	0	7.7	8.3	460	21	99	170
100	C	0	0	7.7	8.3	460	21	99	170
Control	A	0	0	8.3	8.4	446	21	99	150
Control	B	0	0	8.3	8.4	446	21	99	150
Control	C	0	0	8.3	8.4	446	21	99	150

Notes:

**24 HOURS**

 Date & Time : 2023-10-25 10:20  
 Analyst(s) : FM (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O <sub>2</sub>	Conductivity	Temperature
100	A	-	0	-	-	-	21
100	B	-	0	-	-	-	21
100	C	-	0	-	-	-	21
Control	A	-	0	-	-	-	21
Control	B	-	0	-	-	-	21
Control	C	-	0	-	-	-	21

Notes:

**48 HOURS**

 Date & Time : 2023-10-26 10:20  
 Analyst(s) : SSF (NM)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O <sub>2</sub>	Conductivity	Temperature
100	A	0	0	8.5	8.3	475	20
100	B	0	0	8.4	8.3	464	20
100	C	0	0	8.4	8.3	465	20
Control	A	0	0	8.3	8.3	460	20
Control	B	0	0	8.3	8.3	460	20
Control	C	0	0	8.3	8.4	466	20

Notes:

Number immobile does not include number dead.

"-" = not measured/not required

\* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2023-11-01

Work Order : 253057

Sample Number : 79945

**SAMPLE IDENTIFICATION**

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2023-10-19
Job Number :	C3W8851	Sampling Time :	14:15
Substance :	BAP-A	Date Received :	2023-10-23
Sampling Method :	Grab	Time Received :	14:05
Sampled By :	B. McCallum	Temperature at Receipt :	8 °C
Sample Description :	Clear, dark brown, contains settled solids	Date Tested :	2023-10-24

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

**96-HOUR TEST RESULTS**

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested and as received.

**TEST ORGANISM**

Test Organism :	<i>Oncorhynchus mykiss</i>	Average Fork Length ( $\pm$ 2 SD) :	38.3 mm ( $\pm$ 7.5)
Organism Batch :	T23-22	Range of Fork Lengths :	31 - 44 mm
Control Sample Size :	10	Average Wet Weight ( $\pm$ 2 SD) :	0.5 g ( $\pm$ 0.3)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.3 - 0.8 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.2 g/L

**TEST CONDITIONS**

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 $\pm$ 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

**REFERENCE TOXICANT DATA**

Toxicant :	Potassium Chloride		
Organism Batch :	T23-22	LC50 :	3277 mg/L
Date Tested :	2023-10-18	95% Confidence Limits :	2932 - 3675 mg/L
Analyst(s) :	DT, JGR	Historical Mean LC50 :	3551 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits ( $\pm$ 2SD) :	2852 - 4421 mg/L

**COMMENTS**

•All test validity criteria as specified in the test method were satisfied.

Approved By : \_\_\_\_\_

Project Manager

Work Order : 253057

Sample Number : 79945

**TEST DATA**

	pH	Dissolved O <sub>2</sub> (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O <sub>2</sub> Saturation (%) <sup>3</sup>
Initial Water Chemistry (100%) :	7.3	9.0	435	15	95
After 30 min pre-aeration :	7.4	9.2	435	15	97

**0 HOURS**

Date & Time	2023-10-24	11:00					
Analyst(s) :	CN						
Concentration	Dead	Impaired	pH	Dissolved O <sub>2</sub>	Conductivity	Temperature	O <sub>2</sub> Saturation <sup>3</sup>
100%	0	0	7.4	9.2	435	15	97
Control	0	0	8.3	9.6	639	14	98

Notes:

**24 HOURS**

Date & Time	2023-10-25	11:00				
Analyst(s) :	NM					
Concentration	Dead	Impaired	pH	Dissolved O <sub>2</sub>	Conductivity	Temperature
100%	0	0	-	-	-	15
Control	0	0	-	-	-	15

Notes:

**48 HOURS**

Date & Time	2023-10-26	11:00				
Analyst(s) :	DT (KP)					
Concentration	Dead	Impaired	pH	Dissolved O <sub>2</sub>	Conductivity	Temperature
100%	0	0	-	-	-	14
Control	0	0	-	-	-	14

Notes:

**72 HOURS**

Date & Time	2023-10-27	11:00				
Analyst(s) :	DT (AJS)					
Concentration	Dead	Impaired	pH	Dissolved O <sub>2</sub>	Conductivity	Temperature
100%	0	0	-	-	-	14
Control	0	0	-	-	-	14

Notes:

**96 HOURS**

Date & Time	2023-10-28	11:00				
Analyst(s) :	JGR					
Concentration	Dead	Impaired	pH	Dissolved O <sub>2</sub>	Conductivity	Temperature
100%	0	0	8.3	9.2	435	16
Control	0	0	8.3	9.2	632	16

Notes:

"-" = not measured/not required

Number impaired does not include number dead.

<sup>3</sup> adjusted for temperature and barometric pressure

 Test Data Reviewed By : FS

 Date : 2023-10-29

## CHAIN OF CUSTODY RECORD



Nautilus Work Order No:

253057

**Shipping Address:** Nautilus Environmental Guelph,  
B-11 Nicholas Beaver Road  
Puslinch, Ontario Canada N0B 2J0

**Voice:** (519) 763-4412

**Fax:** (519) 763-4419

P.O. Number: C3W8851	+
Field Sampler Name (print): Blumetric - Brad McCallum	
Signature:	
Affiliation:	
Sample Storage (prior to shipping):	
Custody Relinquished by:	
Date/Time Shipped:	

<b>Client:</b> Bureau Veritas 6740 Campobello Rd, Mississauga, ON	
<b>Phone:</b> (905) 817-5700	
<b>Fax:</b>	
<b>Contact:</b> Christine Gripton christine.gripton@bureauveritas.com	

Sample Identification				Analyses Requested										Sample Method and Volume			
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	Nautilus Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	Daphnia magna Single Concentration	Daphnia magna LC50	Fathead Minnow Survival & Growth	Ceriodaphnia dubia Survival & Reproduction	Lemna minor Growth	Pseudokirchneriella subcapitata Growth	RISS Data Entry	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-10-19	14:15	BAP-A	79945	8	✓		✓								✗		1 x 20L

<b>For Lab Use Only</b>	
Received By:	VC
Date:	2023-10-23
Time:	14:05
Storage Location:	
Storage Temp.(°C):	

Please list any special requests or instructions:

\*Grab' as per pail label (C) 2023-10-23

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## **Appendix D**

D-5 QA/QC Results

**2023 Groundwater Sampling Quality Assurance and Quality Control  
Spring**

Sample Description		RDL	SB-MW9	SB-QAQC GW1	Relative Percent Difference
Date Sampled			04-May-23	04-May-23	
Parameter	Unit				
pH	pH Units	0.01	6.82	6.85	0%
Alkalinity (as CaCO3)	mg/L	1	35	37	6%
Electrical Conductivity	uS/cm	1	232	237	2%
Total Dissolved Solids	mg/L	10	152	136	11%
<b>Total Suspended Solids</b>	<b>mg/L</b>	<b>10</b>	<b>3690</b>	<b>1820</b>	<b>68%</b>
Chloride	mg/L	0.10	48.7	48.7	0%
Nitrate as N	mg/L	0.05	0.16	0.18	NA
Nitrite as N	mg/L	0.05	<0.05	<0.05	NA
Sulphate	mg/L	0.10	3.21	3.57	11%
Ammonia as N	mg/L	0.02	<0.02	<0.02	NA
Total Kjeldahl Nitrogen	mg/L	0.10	<0.1	<0.1	NA
Total Phosphorus	mg/L	0.02	3.72	3.84	3%
Chemical Oxygen Demand	mg/L	5	<5	<5	NA
Dissolved Organic Carbon	mg/L	0.4	1	0.8	NA
Phenols	mg/L	0.001	<0.001	<0.001	NA
<b>Dissolved Calcium</b>	<b>mg/L</b>	<b>0.05</b>	<b>23.8</b>	<b>19.5</b>	<b>20%</b>
Dissolved Magnesium	mg/L	0.05	2.75	2.49	10%
Dissolved Potassium	mg/L	0.2	1.6	1.45	10%
Dissolved Sodium	mg/L	0.05	17.5	15	15%
Dissolved Aluminum	mg/L	0.004	0.007	0.007	NA
Dissolved Arsenic	mg/L	0.001	<0.001	<0.001	NA
Dissolved Barium	mg/L	0.002	0.014	0.012	15%
Dissolved Beryllium	mg/L	0.0005	<0.0005	<0.0005	NA
Dissolved Boron	mg/L	0.01	<0.01	<0.01	NA
Dissolved Cadmium	mg/L	0.0001	<0.0001	<0.0001	NA
Dissolved Chromium	mg/L	0.002	<0.002	<0.002	NA
Dissolved Cobalt	mg/L	0.0005	<0.0005	<0.0005	NA
Dissolved Copper	mg/L	0.001	<0.001	<0.001	NA
Dissolved Lead	mg/L	0.01	<0.01	<0.01	NA
Dissolved Iron	mg/L	0.0005	<0.0005	<0.0005	NA
Dissolved Manganese	mg/L	0.002	<0.002	<0.002	NA
Dissolved Mercury	mg/L	0.0001	<0.0001	<0.0001	NA
Dissolved Molybdenum	mg/L	0.002	<0.002	<0.002	NA
Dissolved Nickel	mg/L	0.001	0.001	<0.001	NA
Dissolved Silicon	mg/L	0.05	6.52	6.61	1%
Dissolved Silver	mg/L	0.0001	<0.0001	<0.0001	NA
Dissolved Strontium	mg/L	0.001	0.221	0.198	11%
Dissolved Thallium	mg/L	0.0003	<0.0003	<0.0003	NA
Dissolved Titanium	mg/L	0.002	<0.002	<0.002	NA
Dissolved Vanadium	mg/L	0.002	<0.002	<0.002	NA
Dissolved Zinc	mg/L	0.005	0.006	<0.005	NA

**Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:**

- 10% for electrical conductivity
- 20% for metals and inorganics
- 30% for BTEX and PHC.

**2023 Surface Water Sampling Quality Assurance and Quality Control  
Spring**

Sample Description		RDL	BAP-A	SB-QAQC SW1	Relative Percent Difference
Date Sampled			03-May-22	03-May-22	
Parameter	Unit				
pH	pH Units	0.01	7.76	7.87	1%
Alkalinity (as CaCO <sub>3</sub> )	mg/L	1	147	151	3%
Electrical Conductivity	uS/cm	1	535	535	0%
Hardness (as CaCO <sub>3</sub> ) (Calculated)	mg/L	0.5	179	170	5%
Total Dissolved Solids	mg/L	10	302	298	1%
Total Suspended Solids	mg/L	10	<10	<10	NA
Chloride	mg/L	0.10	40.2	39.6	2%
Nitrate as N	mg/L	0.05	1.88	1.92	2%
Nitrite as N	mg/L	0.05	<0.05	<0.05	NA
Sulphate	mg/L	0.10	43.1	43.3	0%
Ammonia as N	mg/L	0.02	0.14	0.15	7%
Total Kjeldahl Nitrogen	mg/L	0.10	0.49	0.54	10%
Total Phosphorus	mg/L	0.02	<0.02	<0.02	NA
Phenols	mg/L	0.001	<0.001	<0.001	NA
True Colour	TCU	2	17.6	17.5	1%
<b>Turbidity</b>	<b>NTU</b>	<b>0.1</b>	<b>2</b>	<b>1.6</b>	<b>22%</b>
Total Calcium	mg/L	0.2	55	52.1	5%
Total Magnesium	mg/L	0.05	10.1	9.74	4%
Total Potassium	mg/L	0.2	21.9	21.5	2%
Total Sodium	mg/L	0.1	37.4	37.4	0%
Aluminum-dissolved	mg/L	0.004	0.018	0.018	NA
Total Arsenic	mg/L	0.003	<0.003	<0.003	NA
Total Boron	mg/L	0.001	0.374	0.364	3%
Total Cadmium	mg/L	0.0001	<0.0001	<0.0001	NA
Total Chromium	mg/L	0.003	<0.003	<0.003	NA
Total Cobalt	mg/L	0.0005	<0.0005	<0.0005	NA
Total Copper	mg/L	0.001	0.003	0.001	NA
Total Iron	mg/L	0.010	0.046	0.05	NA
Total Lead	mg/L	0.001	<0.001	<0.001	NA
Dissolved Mercury	mg/L	0.0001	<0.0001	<0.0001	NA
Total Nickel	mg/L	0.003	0.012	<0.003	NA
Total Selenium	mg/L	0.002	<0.002	<0.002	NA
Total Silver	mg/L	0.0001	<0.0001	<0.0001	NA
Total Silicon	mg/L	0.18	3.77	3.84	NA
Total Zinc	mg/L	0.020	<0.02	<0.02	NA
Biochemical Oxygen Demand, Total	mg/L	2	<2	<2	NA

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

- 10% for electrical conductivity
- 20% for metals and inorganics
- 30% for BTEX and PHC.

**2023 Surface Water Sampling Quality Assurance and Quality Control  
Summer**

Sample Description		RDL	BAP-C	SB-QAQC SW1	Relative Percent Difference
Date Sampled			09-Aug-23	09-Aug-23	
Parameter	Unit				
pH	pH Units	0.01	7.81	7.79	0%
Alkalinity (as CaCO <sub>3</sub> )	mg/L	1	86	85	1%
Electrical Conductivity	uS/cm	1	200	200	0%
Hardness (as CaCO <sub>3</sub> ) (Calculated)	mg/L	0.5	89	84	6%
Total Dissolved Solids	mg/L	10	115	120	4%
Total Suspended Solids	mg/L	10	<10	<10	NA
Chloride	mg/L	0.10	6.9	6.9	0%
Nitrate as N	mg/L	0.05	0.14	0.14	NA
Nitrite as N	mg/L	0.01	<0.01	<0.01	NA
Sulphate	mg/L	0.10	5.2	5.2	0%
Ammonia as N	mg/L	0.05	<0.05	<0.05	NA
Total Kjeldahl Nitrogen	mg/L	0.10	0.16	0.17	NA
Total Phosphorus	mg/L	0.02	<0.02	<0.02	NA
Phenols	mg/L	0.001	<0.001	0.001	NA
True Colour	TCU	2	23	23	0%
Turbidity	NTU	0.1	3	3	0%
Total Calcium	mg/L	0.2	30	29	3%
Total Magnesium	mg/L	0.05	1.8	1.7	6%
Total Potassium	mg/L	0.2	2.1	2	5%
Total Sodium	mg/L	0.1	7.3	7.2	1%
Aluminum-dissolved	mg/L	0.004	0.009	0.01	NA
Total Arsenic	mg/L	0.001	<0.001	<0.001	NA
Total Boron	mg/L	0.001	0.029	0.029	0%
Total Cadmium	mg/L	0.00009	<0.00009	<0.00009	NA
Total Chromium	mg/L	0.005	<0.005	<0.005	NA
Total Cobalt	mg/L	0.0005	<0.0005	<0.0005	NA
Total Copper	mg/L	0.0009	<0.0009	<0.0009	NA
Total Iron	mg/L	0.010	0.66	0.63	5%
Total Lead	mg/L	0.0005	<0.0005	<0.0005	NA
Dissolved Mercury	mg/L	0.0001	<0.0001	<0.0001	NA
Total Nickel	mg/L	0.001	<0.001	<0.001	NA
Total Selenium	mg/L	0.002	<0.002	<0.002	NA
Total Silver	mg/L	0.00009	<0.00009	<0.00009	NA
Total Zinc	mg/L	0.005	<0.005	<0.005	NA
Biochemical Oxygen Demand, Total	mg/L	2	12	<2	NA

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

- 10% for electrical conductivity
- 20% for metals and inorganics
- 30% for BTEX and PHC.



**2023 Groundwater Sampling Quality Assurance and Quality Control**

Fall

Sample Description		RDL	SB-MW7	SB-QAQC GW1	Relative Percent Difference
Date Sampled			19-Oct-23	19-Oct-23	
Parameter	Unit				
pH	pH Units	0.01	7.64	7.74	1%
Alkalinity (as CaCO3)	mg/L	1	620	620	0%
Electrical Conductivity	uS/cm	1	1500	1500	0%
Total Dissolved Solids	mg/L	10	940	930	1%
Total Suspended Solids	mg/L	10	13	15	NA
Chloride	mg/L	0.10	97	90	7%
Nitrate as N	mg/L	0.05	0.28	0.28	0%
Nitrite as N	mg/L	0.01	<0.01	<0.01	NA
Sulphate	mg/L	0.10	72	66	9%
Ammonia as N	mg/L	0.02	19	19	0%
Total Kjeldahl Nitrogen	mg/L	0.10	18	19	5%
Total Phosphorus	mg/L	0.02	<0.02	0.029	NA
Chemical Oxygen Demand	mg/L	5	75	76	1%
Dissolved Organic Carbon	mg/L	0.4	23	23	0%
Phenols	mg/L	0.001	<0.001	<0.001	NA
Dissolved Calcium	mg/L	0.05	170	170	0%
Dissolved Magnesium	mg/L	0.05	29	28	4%
Dissolved Potassium	mg/L	0.2	29	28	4%
Dissolved Sodium	mg/L	0.05	91	89	2%
Dissolved Aluminum	mg/L	0.0049	<0.0049	<0.0049	NA
Dissolved Arsenic	mg/L	0.001	<0.001	<0.001	NA
Dissolved Barium	mg/L	0.002	0.18	0.18	0%
Dissolved Beryllium	mg/L	0.0005	<0.0004	<0.0004	NA
Dissolved Boron	mg/L	0.01	0.94	0.94	0%
Dissolved Cadmium	mg/L	0.0001	0.00033	0.00038	NA
Dissolved Chromium	mg/L	0.002	<0.005	<0.005	NA
Dissolved Cobalt	mg/L	0.0005	0.015	0.014	7%
Dissolved Copper	mg/L	0.001	0.037	0.037	0%
Dissolved Lead	mg/L	0.01	<0.1	<0.1	NA
Dissolved Iron	mg/L	0.0005	<0.0005	<0.0005	NA
Dissolved Manganese	mg/L	0.002	8.7	8.5	2%
Dissolved Mercury	mg/L	0.0001	<0.0001	<0.0001	NA
Dissolved Molybdenum	mg/L	0.002	0.006	0.0062	NA
Dissolved Nickel	mg/L	0.001	0.028	0.028	0%
Dissolved Silicon	mg/L	0.05	8.1	7.9	2%
Dissolved Silver	mg/L	0.0001	<0.00009	<0.00009	NA
Dissolved Strontium	mg/L	0.001	1.5	1.5	0%
Dissolved Thallium	mg/L	0.0003	0.00014	0.00014	NA
Dissolved Titanium	mg/L	0.002	<0.005	<0.005	NA
Dissolved Vanadium	mg/L	0.002	<0.0005	<0.0005	NA
Dissolved Zinc	mg/L	0.005	0.062	0.061	2%

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

10% for electrical conductivity

20% for metals and inorganics

30% for BTEX and PHC.

**2023 Surface Water Sampling Quality Assurance and Quality Control**

Fall

Sample Description		RDL	BAP-B	SB-QAQC SW1	Relative Percent Difference
Date Sampled			19-Oct-23	19-Oct-23	
Parameter	Unit				
pH	pH Units	0.01	8.05	7.95	1%
Alkalinity (as CaCO <sub>3</sub> )	mg/L	1	71	71	0%
Electrical Conductivity	uS/cm	1	170	180	6%
Hardness (as CaCO <sub>3</sub> ) (Calculated)	mg/L	0.5	74	75	1%
<b>Total Dissolved Solids</b>	<b>mg/L</b>	<b>10</b>	<b>60</b>	<b>90</b>	<b>40%</b>
Total Suspended Solids	mg/L	10	12	<10	NA
Chloride	mg/L	0.10	6.7	6.9	3%
Nitrate as N	mg/L	0.05	<0.1	<0.1	NA
Nitrite as N	mg/L	0.01	<0.01	<0.01	NA
Sulphate	mg/L	0.10	5.9	6.1	3%
Ammonia as N	mg/L	0.05	<0.05	<0.05	NA
Total Kjeldahl Nitrogen	mg/L	0.10	0.18	<0.1	NA
Total Phosphorus	mg/L	0.02	<0.02	<0.02	NA
Phenols	mg/L	0.001	<0.001	<0.001	NA
True Colour	TCU	2	15	13	14%
Turbidity	NTU	0.1	1.2	1.2	0%
Total Calcium	mg/L	0.2	28	29	4%
Total Magnesium	mg/L	0.05	1.3	1.3	0%
Total Potassium	mg/L	0.2	0.84	0.85	NA
Total Sodium	mg/L	0.1	5.7	5.7	0%
Aluminum-dissolved	mg/L	0.004	0.006	0.006	NA
Total Arsenic	mg/L	0.001	<0.001	<0.001	NA
Total Boron	mg/L	0.001	<0.01	<0.01	NA
Total Cadmium	mg/L	0.00009	<0.00009	<0.00009	NA
Total Chromium	mg/L	0.005	<0.005	<0.005	NA
Total Cobalt	mg/L	0.0005	0.00075	<0.0005	NA
Total Copper	mg/L	0.0009	0.001	<0.0009	NA
<b>Total Iron</b>	<b>mg/L</b>	<b>0.010</b>	<b>2.2</b>	<b>0.25</b>	<b>159%</b>
Total Lead	mg/L	0.0005	<0.0005	<0.0005	NA
Dissolved Mercury	mg/L	0.0001	<0.0001	<0.0001	NA
Total Nickel	mg/L	0.001	<0.001	<0.001	NA
Total Selenium	mg/L	0.002	<0.002	<0.002	NA
Total Silver	mg/L	0.00009	<0.00009	<0.00009	NA
Total Zinc	mg/L	0.005	<0.005	<0.005	NA
Biochemical Oxygen Demand, Total	mg/L	2	<2	<2	NA

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

10% for electrical conductivity

20% for metals and inorganics

30% for BTEX and PHC.

# Appendix E

Climatic Data



Daily Data Report for May 2023

BANCROFT AUTO ONTARIO Current Station Operator: ECCC - MSC

Table with station metadata: Latitude (45°04'17.000" N), Longitude (77°52'44.000" W), Elevation (330.70 m), Climate ID (616I001), WMO ID (71294), TC ID (WRK)

Main data table with 12 columns: DAY, Max Temp (°C), Min Temp (°C), Mean Temp (°C), Heat Deg Days, Cool Deg Days, Total Rain (mm), Total Snow (cm), Total Precip (mm), Snow on Grnd (cm), Dir of Max Gust (10's deg), Spd of Max Gust (km/h). Rows 01-16.

DAY	Max Temp	Min Temp	Mean Temp	Heat Deg Days	Cool Deg Days	Total Rain	Total Snow	Total Precip	Snow on Grnd	Dir of Max Gust	Spd of Max Gust
	°C °F	°C °F	°C °F			mm 	cm 	mm 	cm 	10's deg 	km/h 
<u>17</u>	9.5	-3.6	3.0	15.0	0.0			0.0		31	34
<u>18</u>	16.5	-5.7	5.4	12.6	0.0			0.0			
<u>19</u>	23.1	0.1	11.6	6.4	0.0			2.9		18	34
<u>20</u>	14.4	8.6	11.5	6.5	0.0			29.8			
<u>21</u>	21.4	4.0	12.7	5.3	0.0			1.0			
<u>22</u>	18.4	-0.2	9.1	8.9	0.0			0.0			
<u>23</u>	23.8	-0.2	11.8	6.2	0.0			0.0			
<u>24</u>	11.7	0.8	6.2	11.8	0.0			3.5		4	38
<u>25</u>	16.5	-0.4	8.1	9.9	0.0			0.0			
<u>26</u>	22.7	-1.7	10.5	7.5	0.0			0.0			
<u>27</u>	26.7	2.9	14.8	3.2	0.0			0.0			
<u>28</u>	29.7	3.6	16.6	1.4	0.0			0.0			
<u>29</u>	25.5	5.8	15.6	2.4	0.0			0.0			
<u>30</u>	28.9	2.7	15.8	2.2	0.0			0.0			
<u>31</u>	31.0	7.4	19.2	0.0	1.2			0.0			
<b>Sum</b>				216.0 <sup>^</sup>	1.2 <sup>^</sup>			69.5 <sup>^</sup>			
<b>Avg</b>	19.4 <sup>^</sup>	1.8 <sup>^</sup>	10.6 <sup>^</sup>								
<b>Xtrm</b>	31.0 <sup>^</sup>	-5.7 <sup>^</sup>				<u>M</u>	<u>M</u>	29.8 <sup>^</sup>		32 <sup>^</sup>	52 <sup>^</sup>
<b>Summary, average and extreme values are based on the data above.</b>											

### Legend

- A = Accumulated
- C = Precipitation occurred, amount uncertain
- E = Estimated
- F = Accumulated and estimated
- L = Precipitation may or may not have occurred
- M = Missing
- N = Temperature missing but known to be > 0
- S = More than one occurrence
- T = Trace
- Y = Temperature missing but known to be < 0
- [empty] = Indicates an unobserved value
- ^ = The value displayed is based on incomplete data
- † = Data that is not subject to review by the National Climate Archives

### Date modified:

2024-01-30



Daily Data Report for August 2023

BANCROFT AUTO ONTARIO Current Station Operator: ECCC - MSC

Latitude: 45°04'17.000" N
Longitude: 77°52'44.000" W
Elevation: 330.70 m
Climate ID: 616I001
WMO ID: 71294
TC ID: WRK

Table with 12 columns: DAY, Max Temp (°C), Min Temp (°C), Mean Temp (°C), Heat Deg Days, Cool Deg Days, Total Rain (mm), Total Snow (cm), Total Precip (mm), Snow on Grnd (cm), Dir of Max Gust (10's deg), Spd of Max Gust (km/h). Rows 01 to 23.

<b>DAY</b>	<b>Max Temp °C</b>	<b>Min Temp °C</b>	<b>Mean Temp °C</b>	<b>Heat Deg Days</b>	<b>Cool Deg Days</b>	<b>Total Rain mm</b>	<b>Total Snow cm</b>	<b>Total Precip mm</b>	<b>Snow on Grnd cm</b>	<b>Dir of Max Gust 10's deg</b>	<b>Spd of Max Gust km/h</b>
<u>24</u>	18.6	10.5	14.5	3.5	0.0			0.8			
<u>25</u>	22.7	15.2	19.0	0.0	1.0			0.0			
<u>26</u>	19.5	6.0	12.8	5.2	0.0			0.2			
<u>27</u>	22.2	5.2	13.7	4.3	0.0			0.0			
<u>28</u>	24.4	7.4	15.9	2.1	0.0			0.0			
<u>29</u>	25.1	6.2	15.7	2.3	0.0			0.0			
<u>30</u>	16.0	5.9	11.0	7.0	0.0			2.1		30	31
<u>31</u>	22.2	1.9	12.0	6.0	0.0			0.0			
<b>Sum</b>				57.7	7.2			45.4			
<b>Avg</b>	23.0	9.7	16.4								
<b>Xtrm</b>	26.8	1.9				<u>M</u>	<u>M</u>	16.8		31 <sup>^</sup>	40 <sup>^</sup>
<b>Summary, average and extreme values are based on the data above.</b>											

### Legend

- A = Accumulated
- C = Precipitation occurred, amount uncertain
- E = Estimated
- F = Accumulated and estimated
- L = Precipitation may or may not have occurred
- M = Missing
- N = Temperature missing but known to be > 0
- S = More than one occurrence
- T = Trace
- Y = Temperature missing but known to be < 0
- [empty] = Indicates an unobserved value
- ^ = The value displayed is based on incomplete data
- † = Data that is not subject to review by the National Climate Archives

### Date modified:

2024-01-30



Daily Data Report for October 2023

BANCROFT AUTO ONTARIO Current Station Operator: ECCC - MSC

Latitude: 45°04'17.000" N
Longitude: 77°52'44.000" W
Elevation: 330.70 m
Climate ID: 616I001
WMO ID: 71294
TC ID: WRK

Table with 12 columns: DAY, Max Temp (°C), Min Temp (°C), Mean Temp (°C), Heat Deg Days, Cool Deg Days, Total Rain (mm), Total Snow (cm), Total Precip (mm), Snow on Grnd (cm), Dir of Max Gust (10's deg), Spd of Max Gust (km/h). Rows 01 to 23.



<b>DAY</b>	<b>Max Temp °C</b>	<b>Min Temp °C</b>	<b>Mean Temp °C</b>	<b>Heat Deg Days</b>	<b>Cool Deg Days</b>	<b>Total Rain mm</b>	<b>Total Snow cm</b>	<b>Total Precip mm</b>	<b>Snow on Grnd cm</b>	<b>Dir of Max Gust 10's deg</b>	<b>Spd of Max Gust km/h</b>
<u>24</u>	14.2	5.2	9.7	8.3	0.0			0.8			
<u>25</u>	20.3	12.9	16.6	1.4	0.0			0.0			
<u>26</u>	15.8	13.5	14.7	3.3	0.0			4.0			
<u>27</u>	17.6	14.0	15.8	2.2	0.0			4.2			
<u>28</u>	17.9	2.9	10.4	7.6	0.0			0.0		30	39
<u>29</u>	4.7	0.1	2.4	15.6	0.0			3.4			
<u>30</u>	4.1	-4.8	-0.3	18.3	0.0			3.5			
<u>31</u>	2.3	-7.4	-2.5	20.5	0.0			0.3			
<b>Sum</b>				275.2	5.2			86.0			
<b>Avg</b>	14.4	4.2	9.3								
<b>Xtrm</b>	30.3	-7.4				<u>M</u>	<u>M</u>	19.3		30 <sup>^</sup>	39 <sup>^</sup>
<b>Summary, average and extreme values are based on the data above.</b>											

### Legend

- A = Accumulated
- C = Precipitation occurred, amount uncertain
- E = Estimated
- F = Accumulated and estimated
- L = Precipitation may or may not have occurred
- M = Missing
- N = Temperature missing but known to be > 0
- S = More than one occurrence
- T = Trace
- Y = Temperature missing but known to be < 0
- [empty] = Indicates an unobserved value
- ^ = The value displayed is based on incomplete data
- † = Data that is not subject to review by the National Climate Archives

### Date modified:

2024-01-30

## **Appendix F**

Historical Water Chemistry Data

## **Appendix F**

### F-1 Historical Groundwater Chemistry

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	
						Sample Date	2006-May-10	2006-Nov-20	2007-May-02	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18	2012-Apr-17	2013-Apr-18	2014-May-13	2014-Oct-14	2015-May-04	2016-Apr-28	
<b>Anions</b>						Detection Limit																	
Chloride	mg/L	250	-	-	-	0.1	-	-	2	1	1	2	1	1	1	2	<1	0.61	0.52	0.56	0.47	0.44	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	<0.1	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	
Nitrite as N	mg/L	-	-	1	-	0.01	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Sulphate	mg/L	500	-	-	-	0.1	7	7	7	6	5	6	7	6	6	6	5	5.51	5.02	2.52	5	5.04	
<b>Cations</b>																							
Calcium (diss)	mg/L	-	-	-	-	0.05	7	9	7	6	9	6	6	7	7	6	8.39	6.7	5.5	11.8	6.78	5.21	
Magnesium (diss)	mg/L	-	-	-	-	0.05	1	1	1	<1	1	<1	<1	<1	<1	<1	0.955	1.01	0.81	1.64	0.94	0.75	
Potassium (diss)	mg/L	-	-	-	-	0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	0.708	0.67	0.79	1.01	0.76	0.72	
Sodium (diss)	mg/L	200	-	-	-	0.05	<2	<2	<2	<2	<2	3	<2	<2	<2	<2	1.4	1.69	1.2	1.77	1.48	1.16	
<b>General Chemistry</b>																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	21	32	22	17	35	14	25	22	28	26	19	18	17	37	18	17	
Ammonia as N	mg/L	-	-	-	-	0.02	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	0.12	<0.02	<0.02	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	-	-	<5	<5	5	<5	<5	<5	<5	5	18	<5	5	<5	<5	<5	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	-	-	1.3	1.1	1.9	1.9	1.4	1.4	1.2	1.3	1.5	1.4	1.2	1.8	1.2	1.7	
Electrical Conductivity	uS/cm	-	-	-	-	1	57	81	55	48	80	49	61	57	67	54	47	54	51	79	51	45	
pH	pH units	-	-	-	6.5 - 8.5		6.64	6.78	6.4	6.98	7.08	6.64	6.83	7.05	6.83	6.92	6.5	6.99	7.2	7.49	6.93	7.37	
Phenols	mg/L	-	-	-	-	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Total Dissolved Solids	mg/L	500	-	-	-	1	-	-	36	31	52	32	40	37	44	35	-	60	40	-	38	38	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		21.6	26.6	21.6	17	26.6	17	17	19.5	19.5	17	24.9	20.9	17.1	36.2	20.8	16.1	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	-	-	0.15	0.14	0.25	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.49	0.19	0.2	
Total Phosphorus	mg/L	-	-	-	-	0.02	-	-	0.6	0.73	0.54	0.23	0.36	0.35	0.24	0.34	0.62	0.56	0.72	0.67	0.4	0.36	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	578	-	-	-	-	-	
<b>Metals</b>																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.16	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.002	0.006	<0.004	0.005	0.007	<0.004	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	
Barium (diss)	mg/L	-	-	1	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.005	0.005	0.005	0.011	0.006	0.005	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.0002	0.0032	<0.0002	<0.0002	0.0131	<0.0002	0.0005	<0.0002	0.0003	<0.0002	<0.0005	<0.001	<0.001	0.02	<0.001	<0.001	
Copper (diss)	mg/L	1	-	-	-	0.0009	0.002	0.002	0.001	0.003	0.005	0.002	0.002	0.001	0.001	<0.001	0.0009	<0.003	<0.003	<0.003	<0.003	<0.003	
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.03	<0.03	<0.03	<0.03	0.16	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1	<0.01	<0.01	5.94	<0.01	<0.01	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	<0.01	0.39	<0.01	<0.01	1.01	<0.01	0.03	<0.01	0.02	<0.01	<0.005	0.011	0.003	0.784	0.003	0.002	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	6.4	6.4	5.5	5.4	7.7	5.8	6.9	6	6.4	5.9	4.94	3.89	4.79	7.28	5.59	5.25	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.069	0.083	0.067	0.052	0.096	0.067	0.073	0.071	0.079	0.063	0.065	0.066	0.063	0.112	0.066	0.05	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.006	<0.006	<0.006	<0.006	<0.006	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.01	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2
						Sample Date	2006-May-10	2006-Nov-20	2007-May-02	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18	2012-Apr-17	2013-Apr-18	2014-May-13	2014-Oct-14	2015-May-04
VOCs																					
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	<0.0004	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	<0.004	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria
- Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	SB-MW2	
						Sample Date	2017-May-10	2017-Oct-23	2018-May-07	2019-May-07	2020-May-06	2021-Apr-20	2021-Oct-21	2022-May-05	2023-May-04	2006-May-10	2006-Nov-20	2007-May-02	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	
						Detection Limit																	
<b>Anions</b>																							
Chloride	mg/L	250	-	-	-	0.1	0.43	0.48	0.38	0.4	0.6	0.76	0.46	0.37	0.45	-	-	4	5	16	4	10	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.16	1.5	0.37	0.27	0.29	0.15	0.46	
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	
Sulphate	mg/L	500	-	-	-	0.1	4.79	3.15	3.87	3.75	3.89	3.82	4.2	3.82	3.54	8	23	8	9	12	8	12	
<b>Cations</b>																							
Calcium (diss)	mg/L	-	-	-	-	0.05	4.86	8.9	5.06	4.5	5.44	5.76	6.57	6.2	5.54	8	20	8	10	22	7	14	
Magnesium (diss)	mg/L	-	-	-	-	0.05	0.7	1.3	0.79	0.64	0.81	0.86	0.97	0.9	0.79	1	3	1	1	3	1	2	
Potassium (diss)	mg/L	-	-	-	-	0.05	0.62	1.08	0.67	0.54	0.68	0.73	0.78	0.76	0.54	2	5	2	2	4	2	4	
Sodium (diss)	mg/L	200	-	-	-	0.05	1.11	1.77	1.27	1.09	1.25	1.42	1.59	1.35	1.28	5	14	4	5	16	5	14	
<b>General Chemistry</b>																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	18	33	21	18	21	17	27	24	23	27	65	27	26	80	27	64	
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	-	-	<0.02	0.02	0.04	<0.02	0.06	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	<5	20	10	10	10	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	1	1.7	2.1	2.2	1.2	3	1.4	1	1.9	-	-	5.6	8.2	3.1	6.4	5.4	
Electrical Conductivity	uS/cm	-	-	-	-	1	47	64	42	39	58	47	57	51	44	84	226	83	88	240	78	185	
pH	pH units	-	-	-	6.5 - 8.5	-	7.14	7.04	6.51	6.65	6.7	6.86	6.71	6.6	6.99	6.68	6.93	6.43	7	6.9	6.72	6.87	
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	
Total Dissolved Solids	mg/L	500	-	-	-	1	36	58	26	46	32	52	46	<10	38	-	-	54	57	156	51	120	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100	-	15	27.6	15.9	13.9	16.9	17.9	20.4	19.2	-	24.1	62.3	24.1	29.1	67.3	21.6	43.2	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	<0.1	0.22	0.38	<0.1	0.16	0.2	<0.1	0.12	0.15	-	-	0.19	0.37	0.25	<0.1	0.26	
Total Phosphorus	mg/L	-	-	-	-	0.02	0.36	0.26	0.39	0.31	1.24	0.43	0.33	0.24	0.54	-	-	6.23	5.81	0.95	6.32	6.11	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	196	-	-	-	-	-	-	-	
<b>Metals</b>																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.016	0.007	<0.05	0.004	0.01	<0.004	0.007	0.019	0.007	0.07	0.02	0.02	0.03	<0.01	0.05	0.02	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	<0.003	<0.05	<0.003	<0.003	0.009	<0.003	<0.003	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium (diss)	mg/L	-	-	1	-	0.002	0.005	0.009	0.005	0.005	0.004	0.004	<0.002	0.005	0.004	0.01	0.03	<0.01	0.01	0.04	<0.01	0.02	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	<0.01	0.013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.07	0.01	0.02	0.1	0.01	0.05	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.001	0.001	<0.001	0.002	<0.001	0.001	<0.001	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.001	0.014	<0.001	<0.0005	0.0013	<0.0005	0.0015	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	0.0003	
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.003	<0.003	<0.003	<0.001	<0.002	<0.002	<0.002	<0.002	0.005	0.002	0.004	0.002	0.004	0.004	0.002	0.023	
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.01	2.44	<0.01	<0.01	<0.01	0.064	0.177	0.058	0.019	0.12	0.04	<0.03	0.1	<0.03	0.11	<0.03	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	0.027	0.506	0.003	0.008	0.081	0.003	0.082	<0.002	<0.002	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.003	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	5.55	7.6	5.26	4.5	5.59	5.65	5.88	6.07	5.56	5.9	5.8	5.2	5	7.3	5.3	4.4	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.051	0.12	0.056	0.052	0.062	0.069	0.074	0.065	0.052	0.073	0.222	0.074	0.063	0.166	0.071	0.107	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.006	<0.006	<0.006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.09	



Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	
						Sample Date	2010-May-17	2010-Oct-18	2011-May-18	2011-Nov-03	2012-Apr-17	2012-Oct-17	2013-Apr-18	2013-Oct-30	2014-May-13	2014-Oct-10	2015-May-04	2015-Oct-26	2016-Apr-28	2017-May-10	2017-Oct-23	2018-May-07	
Anions						Detection Limit																	
Chloride	mg/L	250	-	-	-	0.1	5	2	7	14	3	8	37.4	17.2	6.83	14	20.7	23.7	12.7	16	13.7	26.9	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	0.15	1.37	<0.1	2.09	0.2	0.9	0.32	2.09	0.1	0.21	0.18	1.44	0.19	0.07	0.17	0.38	
Nitrite as N	mg/L	-	-	1	-	0.01	<0.1	<0.1	0.16	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	
Sulphate	mg/L	500	-	-	-	0.1	7	8	7	12	6	11	7.82	14.8	6.78	10.1	5.97	13.5	7	6	9.49	5.97	
Cations																							
Calcium (diss)	mg/L	-	-	-	-	0.05	8	13	9	24	11.6	11.3	19.3	31.1	7.92	16.6	15.6	23	9.55	9.6	15	14.1	
Magnesium (diss)	mg/L	-	-	-	-	0.05	1	4	1	4	1.29	2.65	2.79	4.29	1.14	2.27	2.12	3.37	1.32	1.39	1.93	1.78	
Potassium (diss)	mg/L	-	-	-	-	0.05	3	4	2	6	2.04	3.6	3.5	6.23	2.4	3.22	3.66	5.45	2.02	2	2.74	2.52	
Sodium (diss)	mg/L	200	-	-	-	0.05	5	7	5	18	4.54	11.9	8.91	23.1	6.05	19.5	6.6	20.9	7.4	9.3	17.6	8.89	
General Chemistry																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	26	54	35	88	29	63	27	96	27	68	28	77	29	30	62	30	
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.08	<0.02	0.08	0.01	0.02	<0.02	0.04	0.06	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	8	5	18	22	12	74	<5	9	<5	<5	<5	16	<5	6	6	<5	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	3.6	3.9	5.4	3.6	5.1	3.2	0.9	2.5	1.2	2.5	1.2	3.2	2.5	1.3	4.5	1.1	
Electrical Conductivity	uS/cm	-	-	-	-	1	85	6	95	247	76	186	195	287	101	208	137	268	111	136	164	154	
pH	pH units	-	-	-	6.5 - 8.5		6.89	7.11	6.96	6.45	6.4	6.9	7.33	7.42	7.37	7.39	6.95	7.29	7.63	7.53	7.35	6.62	
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Total Dissolved Solids	mg/L	500	-	-	-	1	55	101	62	161	-	-	142	592	92	112	100	150	72	70	108	78	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		24.1	48.9	26.6	76.4	34.3	39.1	59.7	95.3	24.5	50.8	47.7	71.3	29.3	29.7	45.4	42.5	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.22	0.27	<0.1	0.31	1.4	1	<0.1	0.46	0.89	0.21	0.28	0.41	0.45	0.18	0.18	0.61	
Total Phosphorus	mg/L	-	-	-	-	0.02	4.22	3.39	2.8	2.4	10.2	5.38	15.6	3.58	8.01	3.2	7.16	8.4	16.8	9.9	2.22	6.59	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	10100	9200	-	-	-	-	-	-	-	-	-	-	
Metals																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	<0.01	<0.01	<0.01	0.01	0.019	0.01	0.008	0.049	0.005	0.005	0.006	0.015	0.012	<0.004	0.007	<0.004	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Barium (diss)	mg/L	-	-	1	-	0.002	0.01	0.02	<0.01	0.03	0.009	0.021	0.02	0.034	0.009	0.022	0.017	0.039	0.011	0.01	0.016	0.016	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	0.02	0.03	<0.01	0.08	0.015	0.062	0.014	0.148	0.013	0.078	0.013	0.117	<0.01	0.01	0.068	<0.01	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.0002	<0.0002	<0.0002	0.0002	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper (diss)	mg/L	1	-	-	-	0.0009	0.003	0.002	0.001	0.004	0.0011	0.0019	<0.003	0.004	<0.003	<0.003	<0.003	-	<0.003	<0.003	<0.003	<0.003	
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.03	<0.03	<0.03	<0.03	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	<0.01	<0.01	<0.01	0.01	<0.005	<0.005	<0.002	0.009	<0.002	0.004	<0.002	0.018	<0.002	<0.002	0.004	<0.002	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	5.3	6.2	4.8	5.5	4.35	6.63	3.58	5.71	4.06	5.64	5.25	6.19	4.89	5.02	6	5.54	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.074	0.147	0.075	0.216	0.073	0.154	0.171	0.254	0.077	0.163	0.126	0.238	0.091	0.091	0.134	0.125	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.001	<0.001	<0.001	<0.001	0.0006	0.0009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.01	<0.01	<0.01	<0.01	<0.005	0.007	<0.005	0.07	<0.005	<0.005	0.01	0.01	<0.005	<0.005	<0.005	<0.005	



Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3
						Sample Date	2010-May-17	2010-Oct-18	2011-May-18	2011-Nov-03	2012-Apr-17	2012-Oct-17	2013-Apr-18	2013-Oct-30	2014-May-13	2014-Oct-10	2015-May-04	2015-Oct-26	2016-Apr-28	2017-May-10	2017-Oct-23
VOCs																					
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria
- Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline



Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3	
						Sample Date	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2006-May-10	2006-Nov-20	2007-May-02	2007-Nov-22	2008-May-09	2008-Oct-09
VOCs																						
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0004	<0.0004	
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0005	<0.0005
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.004	<0.004	
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0005	<0.0005	
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002	<0.0002	
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

-LEGEND-

Detection Limit DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective

Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	
						Sample Date	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18	2011-Nov-03	2012-Apr-17	2012-Oct-17	2013-Apr-18	2013-Oct-30	2014-May-13	2014-Oct-14	2015-May-04	2015-Oct-26	2016-Apr-28	2016-Oct-26	
						Detection Limit																	
<b>Anions</b>																							
Chloride	mg/L	250	-	-	-	0.1	2	2	2	3	3	25	1	112	4.05	10.6	2.67	2.31	36.8	117	5.17	327	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	0.1	0.1	<0.1	<0.1	<0.1	8.42	<0.1	13.4	0.23	0.26	0.06	0.34	0.31	0.57	0.6	<0.25	
Nitrite as N	mg/L	-	-	1	-	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.05	
Sulphate	mg/L	500	-	-	-	0.1	6	7	8	8	7	15	11	67	17.9	9.48	10.6	9.2	6.26	13.3	15.9	97.8	
<b>Cations</b>																							
Calcium (diss)	mg/L	-	-	-	-	0.05	2	3	3	3	2	20	3.05	37.3	5.33	7.95	3.4	6.25	16.5	31.6	6.5	68.9	
Magnesium (diss)	mg/L	-	-	-	-	0.05	<1	<1	<1	<1	<1	4	0.491	14.1	1.07	1.41	0.63	1.3	3.35	6.91	1.37	11.7	
Potassium (diss)	mg/L	-	-	-	-	0.05	<1	<1	<1	<1	<1	1	0.111	1.14	0.44	0.95	0.55	1.29	1.47	4.92	1.47	13.5	
Sodium (diss)	mg/L	200	-	-	-	0.05	2	3	<2	<2	<2	8	2.52	27.6	6.17	6.38	2.77	3.49	5	62	5.26	179	
<b>General Chemistry</b>																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	<5	<5	6	5	<10	6	<5	9	5	13	<5	11	13	77	16	156	
Ammonia as N	mg/L	-	-	-	-	0.02	0.02	0.05	<0.02	<0.02	<0.02	0.06	0.01	0.16	<0.02	<0.02	0.05	0.1	<0.02	<0.02	0.71	5.87	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	70	73	60	90	70	110	51	250	44	95	43	117	99	156	<5	255	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	33.1	35.1	30.3	42.2	29.5	28.3	12.3	25.5	24.4	2.1	3.4	43.3	5.2	23.2	3.6	46	
Electrical Conductivity	uS/cm	-	-	-	-	1	30	34	41	42	31	213	37	610	73	88	52	60	164	565	89	1510	
pH	pH units	-	-	-	6.5 - 8.5		6.06	5.95	6.32	6.34	6.15	5.35	5.4	5.6	6.54	6.82	6.53	6.61	6.81	6.86	7.29	6.11	
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.005	
Total Dissolved Solids	mg/L	500	-	-	-	1	20	22	27	27	20	138	-	-	66	50	58	58	136	378	70	838	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		7.1	9.6	9.6	9.6	7.1	66.4	9.6	151.2	17.7	25.7	11.1	21	55	107.4	21.9	220.2	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.56	0.53	0.64	0.99	0.39	0.22	1	2.1	0.41	2.1	0.56	1.33	1.43	2.17	1.61	12.2	
Total Phosphorus	mg/L	-	-	-	-	0.02	106	187	101	86	55	34.4	40.3	42.8	112	29.8	2.17	154	81.4	165	61.6	147	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	113000	559000	-	-	-	-	-	-	-	-	
<b>Metals</b>																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.11	0.2	0.1	0.1	0.14	0.37	0.108	0.486	0.077	0.11	0.072	0.069	0.178	0.177	0.09	0.216	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Barium (diss)	mg/L	-	-	1	-	0.002	<0.01	0.01	<0.01	<0.01	<0.01	0.07	0.007	0.239	0.013	0.031	0.018	0.023	0.073	0.552	0.014	1.15	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.011	0.059	0.013	0.06	0.014	0.042	0.016	0.073	0.011	0.063		
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.003	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0005	0.0021	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	0.005	
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.001	0.004	<0.001	<0.001	<0.001	0.004	0.0019	0.0103	<0.003	<0.003	<0.003	<0.003	<0.003	0.008	<0.003	0.012	
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.03	0.07	<0.03	<0.03	<0.03	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	0.025	<0.01	<0.01	0.029	0.065	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.005	0.027	0.003	0.008	0.004	0.004	1.78	3.41	0.187	8.35	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	0.002	<0.003	<0.003	<0.003	<0.003	0.006	<0.003	<0.003	0.006	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	4.4	4.7	4.5	4.5	3	3.7	2.98	4.83	2.71	4.01	3.39	5.02	4.87	5.42	3.42	4.64	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.022	0.023	0.024	0.024	0.021	0.138	0.025	0.612	0.077	0.113	0.09	0.103	0.32	1.09	0.043	1.72	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	0.004	0.003	0.005	0.003	<0.002	<0.002	0.007	0.011	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	0.0008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.01	0.02	<0.01	<0.01	<0.01	0.03	0.013	0.031	0.006	0.08	<0.005	<0.005	0.007	0.006	<0.005	0.021	

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4
						Sample Date	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18	2011-Nov-03	2012-Apr-17	2012-Oct-17	2013-Apr-18	2013-Oct-30	2014-May-13	2014-Oct-14	2015-May-04	2015-Oct-26	2016-Apr-28
VOCs																					
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria
- Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW5	SB-MW5	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW5	SB-MW5	
						Sample Date	2017-May-10	2017-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2006-May-10	2006-Nov-20	
						Detection Limit																	
<b>Anions</b>																							
Chloride	mg/L	250	-	-	-	0.1	4.24	52.6	1.57	61	2.91	8.98	1.1	117	9.48	1.79	1.31	68.1	1.41	3.9	-	-	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	2.64	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	2.35	0.5	1.11	10.4	2.04	1.31	1.81	0.56	4.38	0.84	2.16	2.08	3.16	1.58	<0.1	<0.1	
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.05	<0.05	<0.05	0.18	<0.05	<0.05	<0.25	0.14	<0.05	<0.05	<0.05	0.32	1.07	-	-	
Sulphate	mg/L	500	-	-	-	0.1	33.8	26.2	13.6	18.1	15	25.7	21	156	63.3	22	16.4	41.9	15.9	54	17	20	
<b>Cations</b>																							
Calcium (diss)	mg/L	-	-	-	-	0.05	8.1	26.1	3.68	36.3	6.27	16.2	5.59	154	30.3	14.9	10.4	51	13.4	54	37	42	
Magnesium (diss)	mg/L	-	-	-	-	0.05	1.85	5.72	0.88	6.55	1.88	3.5	0.94	26	4.93	1.83	1.31	6.39	1.82	4.8	6	7	
Potassium (diss)	mg/L	-	-	-	-	0.05	2.85	5.01	1.12	4.63	3.7	5.38	2.97	34	10.2	6.17	4.57	13.4	6.03	13	18	19	
Sodium (diss)	mg/L	200	-	-	-	0.05	13.7	34.2	5.49	45.4	6.13	14.4	2.94	111	8.22	8.43	2.78	52	3.58	20	23	25	
<b>General Chemistry</b>																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	25	84	11	83	35	59	23	642	55	57	32	109	45	150	155	197	
Ammonia as N	mg/L	-	-	-	-	0.02	2.38	0.75	0.37	0.83	4.72	3.1	1.91	12.6	4.56	0.23	1.34	0.44	4.02	4.4	-	-	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	80	55	26	52	24	50	107	79	50	36	111	47	47	59	-	-	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	6	6.7	2.1	17.6	6.4	6.6	2.8	34.5	6.5	4.8	3.1	15.8	4.9	7.8	-	-	
Electrical Conductivity	uS/cm	-	-	-	-	1	176	337	66	551	128	207	141	1610	315	175	123	551	158	450	392	463	
pH	pH units	-	-	-	6.5 - 8.5	-	7.34	7.22	6.33	7.02	6.79	7.07	6.47	-	6.61	6.83	6.35	6.91	7.03	7.4	7.18	7.18	
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	0.003	<0.001	0.003	<0.001	0.016	<0.001	0.003	<0.001	0.006	<0.001	<0.001	<0.001	-	
Total Dissolved Solids	mg/L	500	-	-	-	1	108	208	64	356	98	136	104	1000	238	118	84	298	116	265	-	-	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100	-	27.8	88.7	12.8	117.6	23.4	54.9	17.8	491.6	96	44.7	31.4	153.7	-	-	117.1	133.7	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	3.41	1.45	1	2.22	6.05	3.75	2.78	14.8	5.01	0.67	2.23	1.63	4.23	5.7	-	-	
Total Phosphorus	mg/L	-	-	-	-	0.02	84.8	96	45.1	107	30	65	87	<0.02	40.1	42.4	34.7	69	48.8	75	-	-	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	41400	67000	-	
<b>Metals</b>																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.067	0.046	0.063	0.102	0.056	0.051	0.053	0.013	0.149	0.183	0.069	0.094	0.052	0.033	0.06	0.02	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.005	<0.003	<0.003	<0.001	<0.001	<0.001	-	-	
Barium (diss)	mg/L	-	-	1	-	0.002	0.04	0.106	0.01	0.66	0.178	0.166	0.029	0.239	0.101	0.075	0.05	0.488	0.096	0.49	0.05	0.05	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	0.017	0.054	0.023	0.197	0.281	0.43	0.064	9.32	0.261	0.228	0.049	0.178	0.244	0.57	0.18	0.2	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.00009	<0.0001	<0.0001	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	0.001	0.001	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.001	<0.001	<0.001	0.002	0.0011	0.0012	<0.0005	0.0318	0.0011	0.0006	<0.0005	0.0013	0.0005	0.0013	0.0008	0.0007	
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.003	0.003	<0.003	0.005	0.004	0.007	<0.002	0.063	<0.002	0.004	0.002	0.004	0.004	0.01	<0.001	<0.001	
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.017	<0.01	0.07	<0.01	0.014	0.028	<0.1	15.1	15.6	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	0.32	1.6	0.107	2.66	0.225	0.338	0.093	129.6	0.144	0.045	0.02	0.129	0.023	0.1	1.15	1.53	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.002	0.00052	<0.005	<0.005	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.046	<0.003	<0.003	<0.001	<0.001	<0.001	0.0011	<0.005	<0.005	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	3.43	5.63	2.75	5.85	3.41	4.39	2.67	77.8	3.26	3.96	3.21	4.92	2.93	3.5	7	7.2	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.0001	<0.0001	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.039	0.194	0.042	1.23	0.271	0.3	0.091	14.9	0.295	0.141	0.079	0.501	0.102	0.28	0.275	0.373	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.006	<0.006	<0.006	<0.006	<0.0003	<0.0003	<0.0003	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.000081	<0.0001	<0.0001	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	0.006	<0.002	0.003	0.002	<0.002	0.008	0.008	<0.002	<0.002	0.003	0.004	<0.005	<0.01	<0.01	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	<0.0005	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.0005	0.004	0.003	
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	0.087	0.006	<0.005	<0.005	0.006	<0.005	0.014	<0.01	<0.01	

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW5	SB-MW5
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW4	SB-MW5	SB-MW5
						Sample Date	2017-May-10	2017-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2006-May-10	2006-Nov-20
VOCs																						
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria
- Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	
						Sample Date	2007-May-02	2007-Nov-22	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18	2011-Nov-03	2012-Apr-17	2012-Oct-17	2013-Apr-18	2013-Oct-30	2014-May-13	2014-Oct-10	
<b>Anions</b>						Detection Limit																	
Chloride	mg/L	250	-	-	-	0.1	3	20	29	24	23	29	21	16	21	18	28	23	31	22.6	25.2	24.9	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	<0.1	<0.1	0.22	0.26	0.16	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	0.2	0.42	0.14	
Nitrite as N	mg/L	-	-	1	-	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Sulphate	mg/L	500	-	-	-	0.1	8	6	41	8	14	8	12	5	8	3	9	2	16.1	5.21	9.2	2.39	
<b>Cations</b>																							
Calcium (diss)	mg/L	-	-	-	-	0.05	4	46	36	41	43	36	38	34	38	39	26.8	47.7	32.4	43.5	27.3	38.6	
Magnesium (diss)	mg/L	-	-	-	-	0.05	<1	7	6	6	7	6	6	5	6	7	5.59	7.24	5.48	6.85	4.6	6.14	
Potassium (diss)	mg/L	-	-	-	-	0.05	<1	21	17	20	22	18	16	18	17	20	16	19.7	17.3	23.1	14.9	21.5	
Sodium (diss)	mg/L	200	-	-	-	0.05	<2	32	26	29	26	26	24	20	22	21	17.2	27.1	18	23.6	16.3	22	
<b>General Chemistry</b>																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	7	224	108	185	180	170	169	167	164	185	137	201	99	161	104	150	
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.94	0.56	0.8	0.93	0.97	0.82	1.24	1.27	1.54	1.49	1.66	0.91	0.76	0.29	0.38	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	10	20	23	25	35	30	23	43	45	98	96	154	46	18	30	24	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	8.4	12.8	10.2	10.3	14.4	12.4	10.2	17	12.1	10.8	11.5	13.7	5.1	5.5	4.6	10.4	
Electrical Conductivity	uS/cm	-	-	-	-	1	41	499	396	453	458	444	429	381	399	396	350	467	314	395	330	383	
pH	pH units	-	-	-	6.5 - 8.5		6.05	7.33	7.46	7.3	7.14	7.27	7.27	7.23	7.75	6.67	6.8	7.2	7.88	7.69	7.59	7.6	
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	<0.001	0.01	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	
Total Dissolved Solids	mg/L	500	-	-	-	1	27	324	257	294	298	289	279	248	259	257	-	-	234	614	212	224	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		12	143.7	114.6	127.1	136.2	114.6	119.6	105.5	119.6	126.2	89.9	148.9	103.5	136.8	87.1	121.7	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.26	1.28	0.89	1.16	1.42	1.32	0.93	1.38	1.48	2.53	2.3	3.2	1.33	1.18	0.78	1.27	
Total Phosphorus	mg/L	-	-	-	-	0.02	24	2	2.83	1.1	1.98	2.3	3.2	8.46	1.48	6.81	2.54	6.01	19.4	1.46	0.74	4.42	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	6820	10200	-	-	-	-	
<b>Metals</b>																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.1	0.1	0.02	0.02	0.01	0.02	0.02	0.04	0.01	0.13	0.016	0.046	0.031	0.047	0.014	0.023	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	
Barium (diss)	mg/L	-	-	1	-	0.002	<0.01	0.05	0.04	0.06	0.04	0.05	0.04	0.04	0.04	0.05	0.037	0.052	0.031	0.039	0.031	0.047	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	<0.01	0.21	0.16	0.25	0.16	0.17	0.13	0.19	0.1	0.16	0.141	0.261	0.165	0.258	0.139	0.21	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.001	0.002	0.009	<0.001	0.001	0.002	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.0002	0.0006	0.0013	0.0007	0.0009	0.0013	<0.0002	0.0003	<0.0002	0.0003	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	
Copper (diss)	mg/L	1	-	-	-	0.0009	0.003	<0.001	0.011	<0.001	0.001	0.001	0.002	0.001	<0.001	0.003	<0.0005	0.0009	<0.003	<0.003	<0.003	<0.003	
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.04	17.6	4.79	10	1.06	4.84	5.17	6.39	3.56	2.72	6.5	4.07	6.72	6.09	4.71	6.36	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	0.031	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	<0.01	1.46	0.78	1.17	0.43	1.09	0.45	0.58	0.43	0.53	0.568	0.534	0.793	0.755	0.756	0.946	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.001	0.002	<0.003	<0.003	<0.003	<0.003	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	4.3	7.1	5	8.1	3.4	6.8	5.7	6.6	5.4	6.4	5.32	8.61	4.45	6.36	4.32	7.26	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.022	0.272	0.237	0.273	0.197	0.311	0.393	0.333	0.313	0.373	0.32	0.394	0.304	0.327	0.264	0.347	
Thallium (diss)	mg/L	-	-	-	-	0.00005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.006	<0.006	<0.006	<0.006	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.005	0.007	0.003	<0.002	<0.002	<0.002	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.001	0.004	0.001	0.003	0.001	0.003	0.001	0.002	0.001	0.002	0.0028	0.0032	<0.002	<0.002	<0.002	<0.002	
Zinc (diss)	mg/L	5	-	-	-	0.005	0.01	<0.01	0.04	<0.01	0.02	0.02	0.01	<0.01	<0.01	0.02	<0.005	<0.005	<0.005	0.037	0.007	<0.005	



Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5
						Sample Date	2007-May-02	2007-Nov-22	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18	2011-Nov-03	2012-Apr-17	2012-Oct-17	2013-Apr-18	2013-Oct-30	2014-May-13
VOCs																					
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	<0.0004	<0.0004	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	<0.004	<0.004	-	-	-	-	-	-	-	-	-	-	-	-	<0.0003
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	<0.0002	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	<0.00017
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria
- Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	
						Sample Date	2015-May-04	2015-Oct-26	2016-Apr-28	2017-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	
<b>Anions</b>						Detection Limit																	
Chloride	mg/L	250	-	-	-	0.1	29.2	21.1	30.7	32.4	25.5	33.8	43	46.3	58.9	44.4	61.7	55	44	35	50.2	39	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	
Nitrate as N	mg/L	-	-	10	-	0.05	<0.05	<0.25	<0.1	<0.05	0.06	0.24	0.07	<0.05	<0.05	0.18	0.06	0.11	<0.05	<0.05	0.11	<0.1	
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.25	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.016	
Sulphate	mg/L	500	-	-	-	0.1	8.91	2.76	13.1	1.23	9.4	5.54	10.8	3.07	8.36	8.47	13.1	11.1	13.1	6.97	11.2	3.7	
<b>Cations</b>																							
Calcium (diss)	mg/L	-	-	-	-	0.05	35.8	36.1	33.9	37.6	28.4	33.5	31.4	40	30.6	33.6	31.9	33.6	34.4	38.1	34.8	42	
Magnesium (diss)	mg/L	-	-	-	-	0.05	6.06	5.79	5.96	5.88	4.95	5.5	5.21	6.92	5.38	5.56	5.91	6.09	6.86	7.1	6.83	7.7	
Potassium (diss)	mg/L	-	-	-	-	0.05	18.9	22	19.2	20.3	14.6	20.5	16	21.1	15.4	19.2	16.6	19.7	17.7	22.5	17.6	23	
Sodium (diss)	mg/L	200	-	-	-	0.05	19.9	24.9	19.8	21.8	18.1	21.8	18.2	26.1	21.1	26.5	26.3	34	33	28.3	28.1	31	
<b>General Chemistry</b>																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	136	170	132	161	128	122	120	157	108	148	111	138	139	160	128	180	
Ammonia as N	mg/L	-	-	-	-	0.02	0.72	1	0.73	0.86	1.05	1.28	0.63	1.03	0.52	0.88	0.51	0.62	0.88	1.49	0.54	1	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	19	19	26	23	18	9	14	40	49	75	44	41	122	8	29	20	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	4.4	8	6.5	7.9	3.7	4.2	2.8	5	4	5.4	6.2	6.8	4.7	6	5.3	5.2	
Electrical Conductivity	uS/cm	-	-	-	-	1	362	401	372	352	322	416	373	440	506	406	440	476	451	457	428	490	
pH	pH units	-	-	-	6.5 - 8.5		7.37	7.57	7.7	7.73	7.33	7.6	7.18	7.27	6.83	-	6.94	7.2	6.88	7.61	7.28	7.55	
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.001	0.003	0.017	0.009	0.003	<0.001	<0.001	
Total Dissolved Solids	mg/L	500	-	-	-	1	216	216	208	226	184	220	218	276	244	246	264	266	264	262	232	250	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		114.3	114	109.2	118.1	91.3	106.3	99.9	128.4	98.6	106.8	104	109	114.1	124.4	-	-	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	1.13	1.33	1.24	1.16	1.83	1.61	0.92	1.54	1.02	2.16	1.08	1.59	1.57	2.13	1.26	1.4	
Total Phosphorus	mg/L	-	-	-	-	0.02	1.94	3.75	0.79	1.6	4.15	8	2.23	25.4	12.3	26.6	17.5	33.9	20	22.9	5.92	8.6	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2590	2500	
<b>Metals</b>																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.017	0.023	0.019	0.013	0.019	0.011	0.012	0.016	0.017	0.011	0.01	0.025	0.182	0.057	0.011	0.0089	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.005	<0.003	<0.001	<0.001	<0.001	<0.001	
Barium (diss)	mg/L	-	-	1	-	0.002	0.041	0.045	0.037	0.047	0.042	0.047	0.044	0.061	0.043	0.052	0.043	0.051	0.049	0.051	0.04	0.06	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0004	
Boron (diss)	mg/L	-	5	-	-	0.01	0.132	0.207	0.144	0.223	0.131	0.201	0.162	0.233	0.147	0.2	0.149	0.202	0.117	0.176	0.159	0.25	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.001	<0.0009	
Iron (diss)	mg/L	0.3	-	-	-	0.01	6.62	5.25	5.87	1.69	3.69	1.17	1.55	4.48	2.77	1.7	3.87	2.01	2.78	1.15	3.12	1.5	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	1.05	0.971	0.896	1.11	1.21	1.12	1.05	1.46	1.09	1.52	1.32	1.36	1.5	1.64	1.52	1.7	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.001	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	6.46	7.56	6.11	8.06	5.97	7.63	5.42	8.34	5.65	6.76	5.71	6.25	5.25	6.63	6.63	7.5	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.305	0.357	0.269	0.346	0.276	0.288	0.308	0.368	0.29	0.299	0.26	0.338	0.301	0.308	0.282	0.36	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	0.005	<0.002	<0.005	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0017	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	0.0012	
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.005	<0.005	0.007	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5
						Sample Date	2015-May-04	2015-Oct-26	2016-Apr-28	2017-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04
VOCs																					
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria
- Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	
						Sample Date	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18	2011-Nov-03	2012-Apr-17	2013-Apr-18	2014-Oct-10	2015-May-04	2015-Oct-26	2016-Apr-28	2016-Oct-26	2017-May-10	
<b>Anions</b>						Detection Limit																	
Chloride	mg/L	250	-	-	-	0.1	28	38	48	38	37	37	44	122	49	103	406	231	135	169	141	178	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	4.96	7	14.4	7.5	6.69	10.4	15.3	12.6	16.6	5.61	<0.5	1.5	1.7	1	<0.5	1.2	
Nitrite as N	mg/L	-	-	1	-	0.01	0.22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.15	<0.25	<0.5	<0.5	<1	<0.5	<0.5	<0.5	
Sulphate	mg/L	500	-	-	-	0.1	61	147	58	58	61	98	75	171	55	150	481	282	283	380	130	151	
<b>Cations</b>																							
Calcium (diss)	mg/L	-	-	-	-	0.05	49	64	79	69	83	101	96	148	104	87.1	209	148	122	124	94.4	113	
Magnesium (diss)	mg/L	-	-	-	-	0.05	11	13	16	16	19	22	20	27	18	19.2	42.3	29.1	22.9	21.5	17.8	29.6	
Potassium (diss)	mg/L	-	-	-	-	0.05	34	56	46	58	54	54	53	52	47	73.2	119	131	120	103	170	139	
Sodium (diss)	mg/L	200	-	-	-	0.05	39	50	70	66	65	45	38	63	57.8	101	370	231	210	192	196	244	
<b>General Chemistry</b>																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	158	220	306	334	390	374	289	311	295	403	688	629	594	450	953	1050	
Ammonia as N	mg/L	-	-	-	-	0.02	0.17	5.63	2.05	5.23	3.46	6.03	5.76	5.61	5.37	3.61	17.6	19.7	11.2	8.2	64.5	51.7	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	48	60	45	53	40	45	38	38	51	37	322	194	134	108	207	284	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	17.4	24.7	17.3	22.7	18.5	19	15.8	15.1	18	19.1	122	88.7	61.9	55.1	46.7	136	
Electrical Conductivity	uS/cm	-	-	-	-	1	573	922	972	935	1030	1070	965	1370	831	1360	3310	2300	2010	1920	2420	2910	
pH	pH units	-	-	-	6.5 - 8.5		7.61	7.7	7.32	7.4	7.48	7.53	7.88	6.99	7.3	7.54	7.26	7.16	8	8.03	7.43	7.95	
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001	0.002	<0.001	
Total Dissolved Solids	mg/L	500	-	-	-	1	372	599	632	608	670	696	627	890	-	790	2320	1750	1250	1470	1300	1490	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		167.7	213.3	263.2	238.2	285.5	342.8	322.1	480.7	333.8	296.6	696.1	489.4	398.9	398.2	309	404.1	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.7	6.91	2.83	5.69	4.66	6.53	7.1	6.94	6.2	4.37	23.6	23.5	14.3	10.2	73.5	58	
Total Phosphorus	mg/L	-	-	-	-	0.02	0.02	0.01	0.15	0.02	0.06	0.02	<0.01	0.03	0.01	2.65	0.06	0.07	0.07	0.08	0.48	<0.1	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	30	-	-	-	-	-	-	-	
<b>Metals</b>																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.07	0.06	0.08	0.08	0.07	0.06	0.05	0.08	0.057	0.081	0.134	0.135	0.138	0.1	0.193	0.203	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Barium (diss)	mg/L	-	-	1	-	0.002	0.04	0.06	0.06	0.07	0.08	0.08	0.07	0.1	0.065	0.079	0.278	0.197	0.141	0.146	0.191	0.163	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	0.31	0.41	0.46	0.59	0.49	0.55	0.44	0.47	0.534	0.765	1.1	1.4	1.1	1.4	2.9	2.25	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	0.003	<0.001	0.002	0.004	<0.001	<0.001	0.003	0.002	<0.001	0.003	0.005	0.003	<0.003	<0.003	0.004	<0.003	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.0006	0.0006	0.0009	0.0012	0.001	0.007	0.0008	0.0009	0.0009	0.001	0.005	0.015	0.005	0.005	0.009	0.011	
Copper (diss)	mg/L	1	-	-	-	0.0009	0.011	0.006	0.009	0.007	0.006	0.01	0.006	0.008	0.0063	0.007	0.026	0.007	0.01	0.019	0.012	0.038	
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.04	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1	<0.01	0.194	0.146	0.04	<0.01	0.233	0.127		
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	0.29	0.51	0.42	0.55	0.55	0.78	0.45	1.28	1.24	2.17	26.9	19.4	13.3	18.2	11.6	14.9	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0013	<0.002	0.006	0.003	0.007	0.008	0.017	0.015	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.004	0.004	0.006	0.007	0.006	<0.003	0.006	0.007	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	0.9	1.2	1.4	2.1	1.4	1.6	1.6	1.9	1.89	2.07	3.96	2.67	2.09	2.07	2.79	2.72	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Strontium (diss)	mg/L	-	-	-	-	0.001	0.185	0.242	0.369	0.444	0.437	0.502	0.471	0.64	0.439	0.517	1.28	0.849	0.529	0.647	0.576	0.572	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.004	0.011	0.012	0.007	0.007	0.01	0.01	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.001	0.001	0.003	0.006	0.001	0.001	0.002	0.002	0.0031	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.007	0.014	<0.005	<0.005	0.009	0.008	0.031	<0.005	

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6
						Sample Date	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18	2011-Nov-03	2012-Apr-17	2013-Apr-18	2014-Oct-10	2015-May-04	2015-Oct-26	2016-Apr-28	2016-Oct-26
VOCs																					
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	<0.0004	-	-	-	-	-	-	-	-	<0.001	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	<0.0005	-	-	-	-	-	-	-	-	<0.002	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	<0.004	-	-	-	-	-	-	-	-	<0.003	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	0.0005	-	-	-	-	-	-	-	-	<0.002	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	<0.0002	-	-	-	-	-	-	-	-	<0.0017	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria
- Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6R	SB-MW6R	SB-MW6R	SB-MW7	SB-MW7	SB-MW7	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6R	SB-MW6R	SB-MW6R	SB-MW7	SB-MW7	SB-MW7	
						Sample Date	2017-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2017-Oct-23	2018-May-07	2018-Jun-12
<b>Anions</b>						Detection Limit																
Chloride	mg/L	250	-	-	-	0.1	162	79.8	141	79.2	45.1	123	38.5	73	98.2	47.3	48	47.7	11	169	79.8	168
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	0.12	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	<0.25	2.7	<1	1	0.3	1.6	0.33	1.6	<0.07	0.18	<0.07	0.34	<0.1	<0.25	2.7	-
Nitrite as N	mg/L	-	-	1	-	0.01	<0.25	<0.5	<1	<0.5	<0.25	<1	<0.25	<0.5	<0.05	<0.05	0.58	<0.05	0.029	<0.25	<0.5	-
Sulphate	mg/L	500	-	-	-	0.1	51.2	82	18.9	35.5	128	258	125	120	64.4	64	33.2	92.1	16	126	82	-
<b>Cations</b>																						
Calcium (diss)	mg/L	-	-	-	-	0.05	140	86.8	153	103	141	190	185	181	162	89.8	201	159	180	182	159	-
Magnesium (diss)	mg/L	-	-	-	-	0.05	40.1	26.2	42.2	30.1	25.4	31.9	24.4	36.1	40.9	18.8	29	30.7	29	29.8	29.1	-
Potassium (diss)	mg/L	-	-	-	-	0.05	125	85.3	139	101	77.1	76.8	72.4	89.6	107	50.4	70.4	74.2	84	33	39.9	-
Sodium (diss)	mg/L	200	-	-	-	0.05	222	147	197	123	66.4	126	69	107	131	59.4	73.2	81.6	69	144	134	-
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	1040	761	1010	967	638	796	738	915	1050	526	1100	907	830	636	669	681
Ammonia as N	mg/L	-	-	-	-	0.02	87	44	57.3	46.5	27.6	55.5	34.9	55	69.6	27.9	42.6	45.5	50	7.8	9.1	7.2
Chemical Oxygen Demand	mg/L	-	-	-	-	4	863	316	461	284	283	353	144	304	261	341	31	80	290	95	75	-
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	101	61	143	82	51	54.4	41.8	63.2	79.1	34.5	2.3	44.9	48	36.3	29.3	32.2
Electrical Conductivity	uS/cm	-	-	-	-	1	2080	1710	2780	1860	1460	2880	1550	2070	2270	1270	2170	1870	1800	1510	1700	-
pH	pH units	-	-	-	6.5 - 8.5		7.82	7.72	7.73	7.58	7.4	6.85	-	7.25	7.36	7.16	7.52	7.37	7.53	7.79	7.65	-
Phenols	mg/L	-	-	-	-	0.001	0.003	0.002	0.013	0.005	0.01	0.01	0.027	0.045	0.034	0.009	0.022	0.002	0.0011	<0.001	<0.001	-
Total Dissolved Solids	mg/L	500	-	-	-	1	1340	922	1330	938	860	1340	898	1180	1190	648	1160	982	770	1120	1040	1050
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		514.7	324.6	555.8	381.1	456.7	605.8	562.4	600.6	572.9	301.6	621.3	-	-	577.2	516.9	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	106	44.3	59.5	53	31.8	57	37.8	57.4	70.5	32	45.1	58.5	48	7.68	10.9	-
Total Phosphorus	mg/L	-	-	-	-	0.02	374	22.2	52.6	19.2	13.8	21.2	3.76	2.62	1.95	3.31	6.46	3.4	52	0.08	0.12	-
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	54300	120000	-	-	-
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.173	0.158	0.133	0.092	0.213	0.048	0.067	0.036	0.096	0.029	0.032	0.044	0.056	0.008	0.006	0.009
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.008	<0.003	<0.003	<0.001	<0.001	<0.001	<0.003	<0.003	-
Barium (diss)	mg/L	-	-	1	-	0.002	0.354	0.186	0.445	0.293	0.223	0.247	0.218	0.173	0.308	0.129	0.22	0.18	0.27	0.221	0.221	-
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.001	<0.001	-
Boron (diss)	mg/L	-	5	-	-	0.01	1.61	1.42	1.62	2.01	1.91	1.47	1.62	2.18	2.37	<0.1	1.56	2.08	2.5	0.83	0.883	0.883
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0009	<0.002	0.0006	-
Chromium (diss)	mg/L	-	-	0.05	-	0.002	0.007	<0.003	0.004	0.011	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	0.005	<0.003	-
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.102	0.093	0.111	0.0839	0.103	0.0558	0.0644	0.0357	0.0774	0.0238	0.0839	0.0369	0.045	0.015	0.022	-
Copper (diss)	mg/L	1	-	-	-	0.0009	0.071	0.025	0.02	0.02	0.015	0.018	0.018	0.014	0.019	0.007	0.017	0.01	0.0089	0.043	0.056	-
Iron (diss)	mg/L	0.3	-	-	-	0.01	10.3	4.64	38.4	29.6	43	7.84	10.2	7.76	54.1	21.2	14.1	37.7	63	0.117	<0.01	0.011
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.001	-
Manganese (diss)	mg/L	0.05	-	-	-	0.002	14.7	4.18	5.63	4.18	5.21	2.64	4.07	2.47	6.91	2.52	3.67	4.3	4.3	7.6	12.4	10
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	0.01	0.007	0.007	0.007	0.005	0.002	0.003	<0.002	0.007	0.002	<0.002	0.003	0.0061	0.005	0.008	-
Nickel (diss)	mg/L	-	-	-	-	0.001	0.014	0.009	0.007	0.009	0.008	0.007	0.008	0.005	0.013	0.005	0.01	0.008	0.0084	0.039	0.045	-
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	0.002	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	4.83	3.49	3.93	4.45	3.21	2.41	3.26	1.79	4.33	2.23	2.77	3.55	3.9	9.84	7.99	-
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0009	<0.002	<0.002	-
Strontium (diss)	mg/L	-	-	-	-	0.001	0.675	0.376	0.627	0.438	0.465	0.599	0.505	0.389	0.7	0.304	0.545	0.56	0.61	1.54	1.52	-
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.006	<0.006	<0.006	0.0004	0.0004	0.0003	0.0006	<0.0003	0.0005	<0.0003	<0.0003	<0.0003	0.0003	<0.006	<0.006	-
Titanium (diss)	mg/L	-	-	-	-	0.002	0.017	0.01	0.008	0.006	0.016	0.006	0.002	<0.002	0.007	<0.002	0.002	0.01	<0.005	0.003	0.002	-
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	0.0051	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	0.003	<0.002	0.003	0.003	0.002	<0.002	<0.002	<0.002	0.003	<0.002	-	0.002	0.0028	<0.002	<0.002	-
Zinc (diss)	mg/L	5	-	-	-	0.005	0.008	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.069	0.096	-

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6R	SB-MW6R	SB-MW6R	SB-MW7	SB-MW7	SB-MW7
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6R	SB-MW6R	SB-MW6R	SB-MW7	SB-MW7	SB-MW7	
						Sample Date	2017-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2017-Oct-23	2018-May-07
VOCs																					
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	<0.0012	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	<0.0012	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	<0.0012	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	<0.004	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	-	-	-	<0.0012	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	<0.004	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	<0.004	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	<0.0004	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	<0.0012	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	<0.0016	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	-	-	-	<0.00068	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	<0.0008	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria
- Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	
						Sample Date	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2023-Oct-19	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06	
						Detection Limit																	
<b>Anions</b>																							
Chloride	mg/L	250	-	-	-	0.1	143	78.4	115	102	17.6	82.7	103	97.1	95.6	90.9	97	90	51.7	46.8	116	19.7	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	0.28	0.28	-	-	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	<0.5	0.44	<0.25	<0.5	20.9	1.14	0.34	0.49	0.31	0.32	0.28	0.28	0.44	0.2	0.05	0.06	
Nitrite as N	mg/L	-	-	1	-	0.01	<0.5	<0.25	<0.25	<0.5	<0.05	<0.25	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	
Sulphate	mg/L	500	-	-	-	0.1	160	98.8	136	97.9	33.7	90.2	99.3	81.6	96.2	67.5	72	66	4.53	5.67	3.62	4.85	
<b>Cations</b>																							
Calcium (diss)	mg/L	-	-	-	-	0.05	171	138	141	137	33	139	149	149	171	142	170	170	18.2	8.63	34.9	3.94	
Magnesium (diss)	mg/L	-	-	-	-	0.05	29.4	20.9	25.8	24.8	4.52	24.3	26.4	26.8	27.5	24.5	29	28	2.28	1.26	4.31	0.46	
Potassium (diss)	mg/L	-	-	-	-	0.05	46.6	13.4	41.9	32.1	9.85	24	31.6	34.2	33	33.9	29	28	1.65	1.57	2.31	1.09	
Sodium (diss)	mg/L	200	-	-	-	0.05	151	89.7	135	103	12.7	94.5	98.6	101	93.5	87.2	91	89	19.2	30.5	28.9	18.4	
<b>General Chemistry</b>																							
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	547	567	592	582	62	538	598	609	626	623	620	620	37	22	26	34	
Ammonia as N	mg/L	-	-	-	-	0.02	9.24	4.5	11.8	10.1	0.31	6.32	12.6	12.7	14.2	10.2	19	19	<0.02	0.06	<0.02	<0.02	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	81	54	78	65	78	32	62	69	67	51	75	76	8	<5	15	15	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	36.8	18.4	26.8	26.8	4.1	23	27	25.6	26.8	22.1	23	23	1.1	2.2	1.3	2.4	
Electrical Conductivity	uS/cm	-	-	-	-	1	1970	1270	1540	1920	386	1360	1550	1520	1620	1470	1500	1500	255	211	545	115	
pH	pH units	-	-	-	6.5 - 8.5	-	7.71	7.52	7.58	7.01	-	7.23	7.28	7.2	7.55	7.29	7.64	7.74	6.6	6.55	6.48	-	
Phenols	mg/L	-	-	-	-	0.001	0.005	0.002	0.008	0.003	0.001	0.022	0.041	0.072	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Total Dissolved Solids	mg/L	500	-	-	-	1	1100	784	926	874	246	872	904	866	908	808	940	930	176	160	324	72	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100	-	548.1	430.7	458.3	444.2	101	447.2	480.8	482.4	540.2	-	-	-	54.8	26.7	104.9	11.7	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	11.8	6.24	13.5	11.7	1.87	7.5	14.5	14.8	14.4	10.7	18	19	<0.1	<0.1	0.22	0.23	
Total Phosphorus	mg/L	-	-	-	-	0.02	0.04	0.05	0.05	0.03	92.3	0.2	<0.02	0.05	0.14	0.09	<0.02	0.029	11.9	20.4	57	31.7	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	28	13	15	-	-	-	-	
<b>Metals</b>																							
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.01	0.004	0.009	0.009	0.155	0.019	0.014	0.019	0.021	<0.004	<0.0049	<0.0049	0.011	0.013	0.015	0.013	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	0.006	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	
Barium (diss)	mg/L	-	-	1	-	0.002	0.239	0.174	0.184	0.18	0.229	0.145	0.191	0.179	0.178	0.153	0.18	0.18	0.016	0.01	0.026	0.004	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.0004	<0.0005	<0.0005	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	1.02	0.827	0.922	0.821	0.224	0.822	0.838	0.758	0.95	0.885	0.94	0.94	0.013	0.056	<0.01	<0.01	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	0.0005	0.0004	0.0003	0.0004	<0.0001	0.0003	<0.0001	0.0003	0.0001	0.0004	0.00033	0.00038	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.003	0.007	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	<0.005	0.003	<0.003	<0.003	<0.003	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.027	0.0151	0.0192	0.0182	0.001	0.0142	0.0199	0.0206	0.0194	0.0177	0.015	0.014	<0.0005	<0.0005	<0.0005	<0.0005	
Copper (diss)	mg/L	1	-	-	-	0.0009	0.069	0.044	0.041	0.046	0.004	0.034	0.034	0.037	0.044	0.039	0.037	0.037	<0.001	0.002	<0.002	0.002	
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.01	<0.01	0.145	<0.01	0.081	0.027	0.496	0.044	0.035	0.024	<0.1	<0.1	<0.01	<0.01	<0.01	0.023	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	11.1	6.66	7.81	9.98	0.369	6.68	8.64	9.19	9.16	10.9	8.7	8.5	0.003	<0.002	0.003	<0.002	
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	0.006	0.007	0.005	0.007	<0.002	0.005	0.007	0.008	0.007	0.008	0.006	0.0062	<0.002	<0.002	<0.002	<0.002	
Nickel (diss)	mg/L	-	-	-	-	0.001	0.043	0.035	0.036	0.037	<0.003	0.027	0.037	0.033	0.031	0.035	0.028	0.028	<0.003	<0.003	<0.003	<0.003	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	9.55	7.62	8.62	7.1	4.71	7.01	7.61	6.14	7.21	7.81	8.1	7.9	4.74	4.38	5.14	3.98	
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	
Strontium (diss)	mg/L	-	-	-	-	0.001	1.52	1.22	1.35	1.27	0.571	1.21	1.47	1.13	1.42	1.19	1.5	1.5	0.244	0.101	0.445	0.057	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.00014	0.00014	<0.0003	<0.0003	<0.0003	<0.0003	
Titanium (diss)	mg/L	-	-	-	-	0.002	0.002	<0.002	0.002	<0.002	0.01	<0.002	<0.002	0.004	<0.002	<0.002	<0.005	<0.005	<0.002	<0.002	<0.002	0.005	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	0.0634	-	-	-	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	
Zinc (diss)	mg/L	5	-	-	-	0.005	0.125	0.061	0.06	0.06	0.006	0.046	0.056	0.037	0.087	0.06	0.062	0.061	<0.005	<0.005	0.005	<0.005	









Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW10	SB-MW10	SB-MW10	SB-MW10	SB-MW10	SB-MW10
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB MW9	QC GW-S21 (SB-MW9)	SB MW9	SB-MW9	QC GW-S22 (SB-MW9)	SB MW9	QC GW1-F22 (SB-MW9)	SB MW9	AQC-GW1 (SB-MW9)	SB-MW9	SB-MW10	SB-MW10	SB MW10	SB MW10	SB MW10	SB MW10
						Sample Date	2021-Apr-20	2021-Apr-20	2021-Oct-21	2022-May-05	2022-May-05	2022-Oct-19	2022-Oct-19	2023-May-04	2023-May-04	2023-Oct-19	2018-Oct-24	2019-May-07	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21
Anions						Detection Limit																
Chloride	mg/L	250	-	-	-	0.1	55.2	55.2	22.2	11.6	11.3	14.9	14.4	48.7	48.7	<1	30	2.81	3.4	36.2	64.6	60.5
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	0.13	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	0.16	0.16	<0.05	0.05	0.05	0.1	0.1	0.16	0.18	0.13	0.44	0.53	2.38	0.37	<0.25	<0.05
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.25	<0.05	<0.05	<0.1	<0.25	<0.05
Sulphate	mg/L	500	-	-	-	0.1	2.58	2.58	5.44	7.31	7.26	3.38	3.43	3.21	3.57	3.7	45.1	19.3	15.7	35.9	41.7	31.6
Cations																						
Calcium (diss)	mg/L	-	-	-	-	0.05	22.3	22.3	8.28	6.66	6.62	8.05	7.76	23.8	19.5	4.1	70.3	10.9	36	95.1	145	100
Magnesium (diss)	mg/L	-	-	-	-	0.05	2.91	2.94	1.04	0.82	0.83	0.9	0.76	2.75	2.49	0.49	11.8	1.56	6.5	16.5	29.1	19.1
Potassium (diss)	mg/L	-	-	-	-	0.05	1.59	1.63	1.13	1	1.01	1.12	1.15	1.6	1.45	0.73	23.4	2.32	11.9	37.3	56.2	40.2
Sodium (diss)	mg/L	200	-	-	-	0.05	13.6	13.5	14.2	14.1	14.3	9.88	9.8	17.5	15	7.5	44.1	4.36	17.7	47.8	77.7	50.7
General Chemistry																						
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	24	26	28	30	36	21	25	35	37	24	250	29	31	359	576	516
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.05	3.9	0.22	0.11	6.81	17.9	11.5
Chemical Oxygen Demand	mg/L	-	-	-	-	4	<5	<5	<5	<5	<5	25	<5	<5	<5	6.9	12	<5	<5	32	50	37
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	2.3	1.6	1.5	0.9	1	0.9	0.9	1	0.8	1.3	11.4	1.7	26.8	16.8	31.7	18.1
Electrical Conductivity	uS/cm	-	-	-	-	1	237	235	142	119	118	101	102	232	237	59	788	115	168	784	1310	1200
pH	pH units	-	-	-	6.5 - 8.5		6.75	6.71	6.71	6.6	6.8	6.88	7.1	6.82	6.85	7.26	8	6.74	6.65	-	7.2	7.24
Phenols	mg/L	-	-	-	-	0.001	<0.001	0.001	0.001	0.001	0.002	<0.001	0.004	<0.001	-	<0.001	0.001	<0.001	<0.001	0.004	0.018	0.042
Total Dissolved Solids	mg/L	500	-	-	-	1	198	204	86	48	44	66	66	152	136	15	402	84	92	500	798	660
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		67.7	67.8	25	20	19.9	23.8	22.5	-	-	-	224.1	33.6	116.7	305.4	481.9	328.4
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.17	0.17	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	4.09	0.3	0.57	8.05	17.3	12.3
Total Phosphorus	mg/L	-	-	-	-	0.02	5.98	8.6	4.33	6.94	5.39	3.72	4.24	3.72	3.84	3.8	1.51	0.59	0.72	1.02	1.3	0.91
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	3690	1820	1000	-	-	-	-	-	-
Metals																						
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.006	0.006	0.007	0.019	0.027	<0.004	0.011	0.007	0.007	<0.0049	0.009	0.009	0.027	<0.004	<0.004	0.008
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	0.003	0.008	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Barium (diss)	mg/L	-	-	1	-	0.002	0.014	0.014	0.007	0.005	0.005	0.005	0.005	0.014	0.012	0.0029	0.097	0.025	0.03	0.085	<0.002	0.071
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.001	<0.0005	<0.001	<0.001	<0.001	<0.001
Boron (diss)	mg/L	-	5	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	0.012	<0.01	<0.01	<0.01	0.551	0.039	0.209	0.697	<0.01	0.728
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	0.0002	<0.0001	<0.0001	0.0002	<0.0001	0.0002
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.002	<0.002	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.008	0.0011	0.0092	0.023	<0.0005	0.0291
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	0.001	<0.001	<0.001	0.0025	0.014	0.002	0.015	0.034	<0.002	0.041
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.026	<0.01	<0.01	0.015	<0.01	<0.01	0.013	<0.01	<0.01	<0.1	<0.01	<0.01	<0.01	0.033	<0.01	0.021
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.05	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	4.48	0.185	4.03	6.73	<0.002	11.7
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	0.01	<0.002	0.003	0.009	<0.002	0.009	
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.015	<0.003	0.01	0.025	<0.003	0.025
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	<0.001	0.001	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.56	6.39	5.16	6.2	6.06	5	5.64	6.52	6.61	5.7	6.19	4.78	5.6	7.01	<0.05	6.28
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.253	0.259	0.105	0.079	0.066	0.064	0.069	0.221	0.198	0.039	0.61	0.117	0.299	0.751	<0.005	0.684
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.006	<0.0003	<0.0003	0.0004	<0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	0.008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002	<0.002	0.005	<0.002	<0.002
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	<0.002	<0.002	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	0.017	0.013	0.008	0.016	<0.005	0.011

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW10	SB-MW10	SB-MW10	SB-MW10	SB-MW10	SB-MW10	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB MW9	QC GW-S21 (SB-MW9)	SB MW9	SB-MW9	QC GW-S22 (SB-MW9)	SB MW9	QC GW1-F22 (SB-MW9)	SB MW9	AQC-GW1 (SB-MW9)	SB-MW9	SB-MW10	SB-MW10	SB MW10	SB MW10	SB MW10	SB MW10	SB MW10
						Sample Date	2021-Apr-20	2021-Apr-20	2021-Oct-21	2022-May-05	2022-May-05	2022-Oct-19	2022-Oct-19	2023-May-04	2023-May-04	2023-Oct-19	2018-Oct-24	2019-May-07	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	
<b>VOCs</b>																							
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

- Detection Limit DL: May vary between sample locations and events
- DL exceeds criteria**
- Concentration exceeds ODWQS-AO** Ontario Drinking Water Quality Standards Aesthetic Objective
- Concentration exceeds ODWQS-IMAC** Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration
- Concentration exceeds ODWQS-MAC** Ontario Drinking Water Quality Standards Maximum Acceptable Concentration
- Concentration exceeds ODWQS-OG** Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW10	SB-MW10	SB-MW10	SB-MW10	SB-MW11
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW10	SB-MW10	SB-MW10	SB-MW10	SB-MW11
						Sample Date	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2023-May-04
<b>Anions</b>						Detection Limit					
Chloride	mg/L	250	-	-	-	0.1	74.6	40.4	65.1	33	18.2
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	0.45	-
Nitrate as N	mg/L	-	-	10	-	0.05	0.25	0.26	<0.05	0.45	0.42
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.05	<0.05	<0.01	<0.05
Sulphate	mg/L	500	-	-	-	0.1	33.1	29.7	39.7	27	652
<b>Cations</b>											
Calcium (diss)	mg/L	-	-	-	-	0.05	141	92.6	121	86	173
Magnesium (diss)	mg/L	-	-	-	-	0.05	27.3	15.4	23.6	16	21.1
Potassium (diss)	mg/L	-	-	-	-	0.05	59.7	35.9	47.7	32	2.49
Sodium (diss)	mg/L	200	-	-	-	0.05	76.2	40.6	63.7	41	155
<b>General Chemistry</b>											
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	558	367	565	310	177
Ammonia as N	mg/L	-	-	-	-	0.02	18.5	7.36	15.5	6.1	<0.02
Chemical Oxygen Demand	mg/L	-	-	-	-	4	60	38	59	20	<5
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	25.5	13	20.8	11	2.7
Electrical Conductivity	uS/cm	-	-	-	-	1	1340	923	1240	770	1520
pH	pH units	-	-	-	6.5 - 8.5		7.23	7.61	7.42	7.55	7.87
Phenols	mg/L	-	-	-	-	0.001	0.068	0.493	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	500	-	-	-	1	704	470	724	420	1080
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		464.5	294.6	-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	19.5	7.96	15.5	6.2	0.16
Total Phosphorus	mg/L	-	-	-	-	0.02	0.32	0.63	0.45	0.36	0.4
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	164	980	409
<b>Metals</b>											
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.019	0.011	0.022	0.0059	<0.004
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	<0.001	<0.001	<0.001	<0.001
Barium (diss)	mg/L	-	-	1	-	0.002	0.119	0.072	0.089	0.08	0.058
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.0005	<0.0005	<0.0004	<0.0005
Boron (diss)	mg/L	-	5	-	-	0.01	0.939	0.561	0.879	0.61	1.36
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	0.0001	0.0002	0.0002	<0.0001
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.003	<0.002	<0.002	<0.005	<0.002
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.0593	0.0174	0.045	0.015	<0.0005
Copper (diss)	mg/L	1	-	-	-	0.0009	0.061	0.028	0.047	0.029	<0.001
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.01	0.027	0.019	<0.1	<0.01
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.05	-	-	-	0.002	20.1	9.29	16.5	9	0.035
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	0.015	0.007	0.01	0.0072	0.036
Nickel (diss)	mg/L	-	-	-	-	0.001	0.044	0.017	0.034	0.015	0.002
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	<0.001	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	7.9	6.15	7.51	6.5	4.9
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.00009	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.895	0.569	0.744	0.6	8.21
Thallium (diss)	mg/L	-	-	-	-	0.00005	0.0003	<0.0003	<0.0003	0.00013	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	<0.002	<0.005	<0.002
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	0.035	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	-	<0.002	<0.0005	<0.002
Zinc (diss)	mg/L	5	-	-	-	0.005	0.016	0.013	0.017	0.014	<0.005

Appendix F-1: Historical Groundwater Chemistry					Location	SB-MW10	SB-MW10	SB-MW10	SB-MW10	SB-MW11	
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW10	SB MW10	SB MW10	SB-MW10	SB MW11
						Sample Date	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2023-May-04
<b>VOCs</b>											
1,1,1,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-
1,1,1-Trichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-
1,1,2-Trichloroethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-
1,1-Dichloroethane	mg/L	-	-	-	-	0.0012	-	-	-	-	-
1,1-Dichloroethylene	mg/L	-	-	0.014	-	0.0012	-	-	-	-	-
1,2-Dichlorobenzene	mg/L	0.003	-	0.2	-	0.0004	-	-	-	-	-
1,2-Dichloroethane	mg/L	-	0.005	-	-	0.0008	-	-	-	-	-
1,2-Dichloropropane	mg/L	-	-	-	-	0.0008	-	-	-	-	-
1,3-Dichlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-
1,4-Dichlorobenzene	mg/L	0.001	-	0.005	-	0.0001	-	-	-	-	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-
Bromodichloromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-
Bromoform	mg/L	-	-	-	-	0.0004	-	-	-	-	-
Bromomethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-
Carbon Tetrachloride	mg/L	-	-	0.002	-	0.0008	-	-	-	-	-
Chlorobenzene	mg/L	-	-	-	-	0.0004	-	-	-	-	-
Chloroform	mg/L	-	-	-	-	0.0008	-	-	-	-	-
cis-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-
cis-1,3-Dichloropropene	mg/L	-	-	-	-	0.0008	-	-	-	-	-
Dibromochloromethane	mg/L	-	-	-	-	0.0004	-	-	-	-	-
Dichlorodifluoromethane	mg/L	-	-	-	-	0.0008	-	-	-	-	-
Ethylbenzene	mg/L	0.0016	-	0.14	-	0.0004	-	-	-	-	-
Ethylene Dibromide	mg/L	-	-	-	-	0.0004	-	-	-	-	-
m & p-Xylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-
Methylene Chloride	mg/L	-	-	-	-	0.0003	-	-	-	-	-
Methyl Ethyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-
Methyl Isobutyl Ketone	mg/L	-	-	-	-	0.004	-	-	-	-	-
Methyl tertiary-butyl ether (MTBE)	mg/L	0.015	-	-	-	0.0008	-	-	-	-	-
n-Hexane	mg/L	-	-	-	-	0.0008	-	-	-	-	-
o-Xylene	mg/L	-	-	-	-	0.0004	-	-	-	-	-
Styrene	mg/L	-	-	-	-	0.0004	-	-	-	-	-
Tetrachloroethylene	mg/L	-	-	0.01	-	0.0008	-	-	-	-	-
Toluene	mg/L	0.024	-	0.06	-	0.0002	-	-	-	-	-
trans-1,2-Dichloroethylene	mg/L	-	-	-	-	0.0008	-	-	-	-	-
trans-1,3-Dichloropropene	mg/L	-	-	-	-	0.0012	-	-	-	-	-
Trichloroethylene	mg/L	-	-	0.005	-	0.0008	-	-	-	-	-
Trichlorofluoromethane	mg/L	-	-	-	-	0.0016	-	-	-	-	-
Vinyl Chloride	mg/L	-	-	0.001	-	0.00017	-	-	-	-	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-

-LEGEND-

Detection Limit DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds ODWQS-AO Ontario Drinking Water Quality Standards Aesthetic Objective

Concentration exceeds ODWQS-IMAC Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Concentration exceeds ODWQS-MAC Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

Concentration exceeds ODWQS-OG Ontario Drinking Water Quality Standards Operational Guideline

## **Appendix F**

F-2 Historical Surface Water Chemistry



Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A					
						Sample ID	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A
						Sample Date	2004-Apr-29	2004-Jun-23	2004-Aug-20	2004-Sep-10	2004-Oct-28	2005-May-03	2005-Jul-27	2005-Sep-01	2005-Sep-16	2005-Oct-24	2006-May-10	2006-Jul-19	2006-Aug-21	2006-Sep-19	2006-Nov-20	2007-May-02				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	30	24	31	33	31	7.9	31.2	34	-	32	28	34	36	31	28	32				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	1.15	<0.1	0.29	0.25	0.29	0.48	0.87	0.8	-	0.4	0.6	0.24	0.27	<0.1	0.54	1.58				
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
Sulphate	mg/L	-	-	100	-	0.1	45	25	23	25	26	13	23	23	-	25	38	24	25	23	32	61				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	49	42	47	49	49	21.7	53.6	68.9	-	56.6	46	49	51	49	43	53				
Magnesium (tot)	mg/L	-	-	-	-	0.05	8	6	7	7	8	<0.00006	7.55	8.94	-	8.4	8	7	8	7	7	9				
Potassium (tot)	mg/L	-	-	-	-	0.05	19	8	5	6	5	0.5	6.9	7.5	-	7	19	7	7	8	8	19				
Sodium (tot)	mg/L	-	-	-	-	0.05	28	22	22	24	24	2.9	28.8	31.1	-	31.5	28	26	28	27	26	31				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	137	128	152	156	157	50	140	134	-	134	149	151	168	139	130	156				
Ammonia as N	mg/L	-	-	-	-	0.02	0.04	0.04	0.06	0.04	0.03	<0.05	<0.05	<0.05	-	0.12	<0.02	0.24	0.1	0.04	0.12	0.03				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	-	<1	-	2	-	-	9	17	1	3	<1	<1	1	<1				
Colour	TCU	-	-	-	-	2	19	15	14	20	11	30	7	18	-	11	15	17	19	35	14	14				
Electrical Conductivity	uS/cm	-	-	-	-	1	462	386	425	409	458	128	304	406	375	404	474	435	481	421	414	547				
pH	pH units	6.5 - 8.5	-	6 - 9	-	6.93	7.37	7.52	7.23	7.25	-	6.83	-	-	-	6.85	7.98	7.57	7.68	7.29	7.89	7.62				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001				
Total Dissolved Solids	mg/L	-	-	-	-	10	300	251	276	266	298	84	-	-	248	267	308	283	313	274	269	356				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	155	130	146	151	155	54.2	165	209	-	176	148	151	160	151	136	169				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.38	0.35	0.23	0.42	0.31	0.6	11	0.6	-	0.6	0.52	0.89	0.34	0.4	0.58	0.42				
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	3.9	-	-	-	-	-	-	-	-	-	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.01	0.04	0.04	0.03	0.05	0.02	1.8	0.08	-	0.01	0.01	0.1	0.05	0.11	0.08	0.02				
Total Suspended Solids	mg/L	-	-	-	-	10	8	4	2	66	7	14	-	-	2640	510	2	118	12	27	110	34				
Turbidity	NTU	-	-	-	-	0.1	1.3	1.6	2.3	2.5	1.9	-	-	-	-	0.4	16.2	3.4	7.2	12.9	4.4	4.4				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	-	<0.05	-	-	-	-	-	-				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.02	0.05	0.03	0.03	0.03	0.1	2.19	4.85	0.67	1.62	0.24	0.26	0.1	0.1	0.16	0.03				
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.03	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005	<0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	0.001	0.002	<0.001	<0.0002	0.004	0.007	0.002	0.004	-	<0.001	-	-	0.001	0.001				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0003	0.0003	0.0003	0.0002	0.0003	0.0002	<0.005	<0.005	<0.005	<0.0005	0.0002	0.0009	0.0003	0.0004	0.0007	0.0003				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	-	<0.001	0.001	<0.001	<0.001	<0.001	0.001	0.001				
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.1	0.31	0.31	0.18	0.21	0.384	17.1	38	6.12	16.4	0.05	1.34	0.25	0.8	1.45	0.08				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.02	0.03	0.003	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	<0.00006	<0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005	<0.005	<0.001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.092	0.201	0.045	0.076	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A					
						Sample ID	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A
						Sample Date	2007-Jun-04	2007-Aug-15	2007-Sep-27	2007-Nov-22	2008-May-09	2008-Jun-19	2008-Aug-21	2008-Sep-16	2008-Oct-09	2009-Jun-04	2009-Jul-16	2009-Aug-06	2009-Sep-16	2009-Oct-23	2010-May-17	2010-Jul-19				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	28	32	33	30	31	23	22	23	24	22	19	18	19	20	22	0.0006				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	0.3	0.33	0.21	0.37	1.68	0.46	0.5	0.35	0.28	0.8	0.42	0.37	0.5	0.42	<0.1	0.1				
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.82	0.48			
Sulphate	mg/L	-	-	100	-	0.1	37	24	27	34	51	31	22	21	26	33	24	23	24	28	33	19				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	45	62	55	49	50	43	48	44	44	39	43	43	43	38	39	42				
Magnesium (tot)	mg/L	-	-	-	-	0.05	7	9	8	8	9	7	7	7	7	6	7	6	6	6	6	6				
Potassium (tot)	mg/L	-	-	-	-	0.05	13	8	8	7	25	14	8	8	8	14	9	9	9	10	13	9				
Sodium (tot)	mg/L	-	-	-	-	0.05	27	33	31	29	35	27	25	25	27	24	25	23	23	25	25	22				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	142	188	191	167	155	148	158	150	149	146	151	144	158	146	139	154				
Ammonia as N	mg/L	-	-	-	-	0.02	0.03	0.22	0.08	0.15	0.27	0.11	0.11	0.14	0.12	0.08	0.09	0.14	0.17	0.18	0.09	0.16				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	34	12	<1	3	2	1	<1	3	2	-	<1	5	4					
Colour	TCU	-	-	-	-	2	25	15	17	12	17	23	17	25	21	14	18	26	19	20	13	23				
Electrical Conductivity	uS/cm	-	-	-	-	1	443	514	525	489	520	434	419	409	419	427	408	378	403	412	421	395				
pH	pH units	6.5 - 8.5	-	6 - 9	-		8.14	8.27	7.79	7.81	8.06	7.94	7.94	7.85	7.78	7.84	8	7.74	8.22	7.87	7.97	7.82				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002				
Total Dissolved Solids	mg/L	-	-	-	-	10	288	334	341	318	338	282	272	266	272	278	265	246	262	268	274	257				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	141	192	170	155	162	136	149	139	139	122	136	132	132	120	122	130				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.24	0.77	2.17	0.53	0.98	2.01	0.34	0.37	0.31	0.2	0.48	0.33	0.26	0.16	0.53	0.29				
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.09	0.21	0.31	1.63	<0.01	0.02	0.03	0.01	<0.01	<0.01	0.05	0.02	<0.01	<0.01	0.03	0.05				
Total Suspended Solids	mg/L	-	-	-	-	10	10	12	284	1120	<2	4	215	<2	6	<2	9	8	<2	<2	5	16				
Turbidity	NTU	-	-	-	-	0.1	2.3	4	14.7	>100	0.7	1.1	38.9	2.8	-	0.5	3.3	3.7	2.1	1	0.9	4.3				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	<0.02	-	-	-	-	0.000291392	0.000286091	0.000352918	-	0.000016	-	-				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.11	0.01	<0.01	0.02	0.02	0.04	0.35	<0.01	0.01	0.01	0.09	0.06	0.01	0.03	0.11					
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	-	-	-	-	-	0.17	0.14	0.11	0.14	0.17	0.12	0.12	0.11	0.12	0.17	0.14				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	<0.001	0.002	0.001	0.002	0.001	<0.001	<0.001				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0005	0.0003	0.0018	0.011	0.0003	0.0003	0.0012	0.0003	0.0005	0.0003	0.0004	0.0004	0.0003	0.0003	0.0003	0.0006				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.001	<0.001	0.003	0.016	0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001				
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.57	0.09	4.49	12.9	0.08	0.2	1.82	0.23	0.13	0.06	0.45	0.31	0.18	0.09	0.12	0.68				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	0.02	0.15	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A					
						Sample ID	BAP-A	BAP-A	BAP-A	BAP-A	AP-A-Dup (BAP-A)	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A
						Sample Date	2010-Oct-18	2011-May-18	2011-Aug-11	2011-Nov-03	2011-Nov-03	2012-Apr-17	2012-Jul-11	2012-Oct-17	2013-Apr-18	2013-Aug-15	2013-Oct-30	2014-May-13	2014-Aug-19	2014-Oct-14	2015-May-04	2015-Sep-09				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	18	24	19	22	-	23	26	31	22.9	33.1	36.5	37.3	34.1	41.3	40.6	44.1				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	0.99	0.44	0.43	-	1.1	0.6	0.4	2	0.89	1.27	1.66	0.95	0.5	1.62	0.51				
Nitrite as N	mg/L	-	-	-	-	0.01	0.41	<0.1	<0.1	<0.1	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1				
Sulphate	mg/L	-	-	100	-	0.1	20	34	15	23	-	42	20	23	35.7	26.3	37.7	58.1	39.3	49	63	30.3				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	40	42	46	48	48	39.4	47	46.7	29.7	47.4	52	50.9	50.8	57.1	50.1	47.3				
Magnesium (tot)	mg/L	-	-	-	-	0.05	6	7	7	8	8	7.35	5.93	7.85	5.19	7.35	8.87	9.15	8.23	9.25	9.02	7.74				
Potassium (tot)	mg/L	-	-	-	-	0.05	7	18	10	11	9	16.9	8.55	11.9	12.1	12	12.2	24.1	13.2	13.6	20	13.9				
Sodium (tot)	mg/L	-	-	-	-	0.05	21	26	21	22	20	28	18.1	24.1	21.2	22.1	27.1	36.4	29.2	35.4	36.8	32				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	141	145	158	160	-	146	157	147	71	164	147	149	148	155	136	174				
Ammonia as N	mg/L	-	-	-	-	0.02	0.11	0.06	0.2	0.09	-	0.17	0.27	0.12	0.1	0.21	<0.02	-	0.32	0.1	0.16	0.12				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	6	4	-	<2	3	<2	<5	<5	<5	<5	<5	<5	<5	<5				
Colour	TCU	-	-	-	-	2	17	15	17	15	-	12	11	12	43	19	12	20	19	22	18	<5				
Electrical Conductivity	uS/cm	-	-	-	-	1	382	447	390	401	-	489	434	418	300	504	483	549	530	545	540	542				
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.83	8.16	7.86	7.02	-	7.9	7.8	7.8	7.82	7.61	7.81	7.97	7.93	7.87	7.88	8.14				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001				
Total Dissolved Solids	mg/L	-	-	-	-	10	248	291	254	261	-	439	240	228	186	266	276	316	296	332	304	314				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	125	134	144	153	152.8	128.6	141.8	148.9	95.5	149	166	165	161	181	162	150				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.16	0.24	0.87	<0.1	-	0.4	1.4	0.3	0.52	0.58	0.61	1.84	0.66	0.32	0.73	0.6				
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.02	<0.01	0.1	<0.01	-	<0.01	0.17	<0.01	0.06	0.07	<0.02	<0.02	0.03	0.04	0.03	<0.01				
Total Suspended Solids	mg/L	-	-	-	-	10	55	2	183	78	-	3	15	58	16	35	<10	<10	<10	<10	<10	<10				
Turbidity	NTU	-	-	-	-	0.1	1.2	1.4	17.4	4.5	-	0.9	3.3	4.1	14.3	9.4	21.4	0.5	16.6	2.3	2	354				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	0.0000235	0.001430641	0.000005	-	0.00010681	0.001005334	0.0000773	0.0000628	0.000781927	<0.0000129	0.000326	0.00225	0.000305	0.000423958	0.0016				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	8	-	-	0.038	0.021	0.016	0.01	0.009	0.005	0.01	0.009				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.01	0.02	1.2	<0.01	<0.01	0.016	0.134	0.009	-	-	-	-	-	-	-	-				
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.11	0.23	0.1	0.1	0.13	0.245	0.143	0.143	0.134	0.15	0.137	0.334	0.149	0.165	0.26	0.201				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	<0.05	<0.001	<0.001	0.003	<0.001	<0.003	<0.003	<0.003	0.0011	<0.003	<0.003	<0.003	<0.003	<0.003				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0002	0.0002	<0.01	0.0002	0.0003	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.001	0.001	<0.01	<0.001	0.002	0.001	0.0013	<0.0005	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002				
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.13	0.07	4.2	0.09	0.04	<0.1	1.65	0.109	0.04	0.86	2.85	<0.01	0.29	0.1	0.08	0.25				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.01	<0.001	<0.001	<0.0001	0.0016	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.01	<0.005	<0.005	0.002	0.003	0.002	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.05	<0.001	<0.001	0.001	<0.001	<0.001	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.05	<0.01	<0.01	<0.005	0.028	<0.005	0.012	0.007	0.059	<0.005	<0.005	<0.005	<0.005	<0.005				

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	
						Sample ID	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A
						Sample Date	2015-Oct-26	2016-Apr-28	2016-Aug-17	2016-Oct-26	2017-May-10	2017-Jul-20	2017-Oct-23	2018-May-07	2018-Jun-12	2018-Jul-30	2018-Oct-24	2019-May-07	2019-Aug-14	2019-Oct-22	2020-May-06	2020-May-06
						Detection Limit																
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	47.6	34.6	45.3	50	42.5	38.9	40.3	38.9	51.6	48.1	50.2	61.8	55.2	41.9	54.7	54.9
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	0.58	1.24	0.38	0.88	2	1.22	0.88	1.21	-	1.29	1.5	2.37	1.55	0.45	2	2.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.25	<0.1	<0.1	<0.25	<0.05	0.17	<0.1	<0.05	-	<0.1	<0.25	<0.05	<0.05	<0.05	<0.1	<0.1
Sulphate	mg/L	-	-	100	-	0.1	43.9	41.7	23.3	28.9	48.2	34	25.8	43.2	-	18.3	27.5	55.4	17.3	27.8	49.6	50.1
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	55.2	37.4	42.9	57.5	41.5	44.3	51.2	36.1	-	<0.003	50	49.2	47	32.9	44.43	46.4
Magnesium (tot)	mg/L	-	-	-	-	0.05	8.84	6.73	6.75	8.89	7.43	7.38	7.79	5.9	-	-	7.69	8.85	7.18	5.55	7.94	8.61
Potassium (tot)	mg/L	-	-	-	-	0.05	15.2	17.9	14.4	15.5	19.5	18.4	16.7	14.5	-	-	17.6	22.3	16.7	15.5	18.77	19.21
Sodium (tot)	mg/L	-	-	-	-	0.05	36.9	28.2	39.5	39.5	34.2	31.9	39.1	28.7	-	35.3	40.6	42.5	37.2	33.1	36.22	37.35
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	177	119	150	191	125	171	192	110	165	155	162	185	160	113	139	136
Ammonia as N	mg/L	-	-	-	-	0.02	0.2	0.04	0.17	0.15	0.07	0.2	0.48	0.24	0.22	0.43	0.52	0.82	0.15	0.58	0.09	0.1
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<5
Colour	TCU	-	-	-	-	2	17	18	37	17	23	30	25	25	-	-	6	13	22	67	18	18
Electrical Conductivity	uS/cm	-	-	-	-	1	553	421	507	585	552	532	486	417	-	545	605	625	572	387	675	678
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.8	8.18	8	8.14	8.12	8.1	8.15	7.29	-	7.81	8.07	7.58	7.65	7.54	7.5	7.58
Phenols	mg/L	0.001	-	0.04	0.004	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	0.001	0.008	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	308	250	272	308	262	192	304	<10	302	312	336	356	302	252	314	284
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	174	121	135	180	134	141	160	114	-	158	157	159	147	105	144	151
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.66	0.49	1.29	0.57	0.55	0.68	0.93	0.84	-	0.79	1.22	1.47	0.64	0.92	0.57	0.59
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.01	0.02	0.14	0.01	0.01	0.02	0.03	<0.02	-	0.03	0.05	<0.02	<0.02	0.04	<0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	26	<10	<10	252	-	17	32	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.1	1.3	1.5	3.5	1.6	0.6	2.8	1.8	0.8	-	-	2.5	1.2	3.5	9.3	0.9	0.8
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.00002	0.0000332	0.000354902	0.00018	-	0.001302	0.00097	0.0000496	0.00070414	0.000996907	0.001372522	-	-	-	-	-
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	0.005	0.015	0.015	0.005	0.015	0.011	0.008	0.017	0.01	0.01	0.006	0.015	0.005	0.031	<0.004	0.01
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	0.044	0.043	
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.15	0.278	0.207	0.186	0.321	0.224	0.205	0.215	0.27	0.234	0.235	0.339	0.255	0.218	0.298	0.307
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.003	0.005	<0.003	<0.003	<0.003	<0.003	-	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	0.0022	<0.0005	<0.0005	0.0006	0.0008	<0.0005	-	0.0009	0.0009	<0.0005	0.0008	0.0006	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.02	0.06	3.84	0.16	0.17	0.24	0.21	0.06	0.187	0.49	0.31	<0.01	0.12	0.5	0.029	0.043
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	-	-	-	-	
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	-	-	<0.003	<0.003	0.003	<0.003	<0.003	<0.003
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	0.006	0.024	<0.005	0.011	0.012	0.006	<0.005	-	0.005	0.005	0.009	0.005	<0.005	<0.005	<0.005

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-B	BAP-B	
						Sample ID	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	AQC SW-F21 (BAP-A)	BAP-A	AQC SW-S22 (BAP-A)	BAP-A	BAP-A	BAP-A	QAQC-SW1 (BAP-A)	BAP-A	BAP-A	BAP-A	BAP-A
						Sample Date	2020-Aug-25	2020-Oct-06	2021-Apr-20	2021-Jul-14	2021-Oct-21	2021-Oct-21	2022-May-03	2022-May-03	2022-Aug-04	2022-Oct-18	2023-May-04	2023-May-04	2023-Aug-09	2023-Oct-19	2004-Apr-29	2004-Jun-23
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	49.5	49	49.4	43.7	39.3	39.1	39.8	39.7	36.9	40.3	40.2	39.6	36	40	5	3
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	1.33	1.62	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	1.21	1.52	1.97	0.94	1.12	1.18	1.94	1.92	1.04	1.83	1.88	1.92	1.31	1.62	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.023	<0.01	<0.1	<0.1
Sulphate	mg/L	-	-	100	-	0.1	13	17.9	50.9	22.6	25	24.9	50.4	50.4	14.4	19.4	43.1	43.3	13	16	9	8
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	53.46	48.24	53	42	38.8	38.6	53.7	54.3	53.1	39.4	55	52.1	48	53	21	25
Magnesium (tot)	mg/L	-	-	-	-	0.05	8.42	7.62	10.2	7.2	7	6.83	9.44	9.52	8.02	8.22	10.1	9.74	7.4	8.9	1	1
Potassium (tot)	mg/L	-	-	-	-	0.05	18.16	17.38	20.8	16.7	17.8	17.7	21.5	21.5	19.6	17.8	21.9	21.5	17	20	<1	<1
Sodium (tot)	mg/L	-	-	-	-	0.05	38.49	36.68	41.7	33.3	30.8	31	35.9	35.9	42.6	38.8	37.4	37.4	30	35	3	3
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	194	180	147	152	131	137	145	140	158	153	147	151	170	170	55	67
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.1	0.07	0.03	0.2	0.17	<0.02	<0.02	<0.02	0.05	0.14	0.15	0.071	<0.05	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<5	<2	<2	3	<2	2	<2	2	<2	<2	<2	5	<2	<1	<1
Colour	TCU	-	-	-	-	2	22	27	16	30	31	30	13.9	13.8	87.3	16.6	17.6	17.5	18	14	34	31
Electrical Conductivity	uS/cm	-	-	-	-	1	536	500	620	479	454	455	545	538	468	489	535	535	480	520	132	155
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.72	7.7	7.89	7.71	7.47	7.6	7.47	7.42	7.7	7.68	7.76	7.87	7.84	8.06	6.71	7.39
Phenols	mg/L	0.001	-	0.04	0.004	0.001	0.001	<0.001	0.001	0.002	0.003	0.002	0.002	0.002	0.003	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	324	296	354	268	266	262	276	304	268	266	302	298	265	290	86	101
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	168	152	174	135	126	125	173	175	166	132	179	170	150	160	57	67
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.6	0.63	0.62	0.33	0.62	0.65	0.41	0.55	0.52	0.67	0.49	0.54	0.27	0.24	0.27	0.3
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.02	0.03	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	0.041	<0.02	0.01	0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	34	10	6	6
Turbidity	NTU	-	-	-	-	0.1	2.1	1.6	1.6	1.6	3.4	2.1	<0.5	<0.5	2.6	<0.5	2	1.6	1.3	0.5	1.5	2.3
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	<0.000002	0.0642	0.000308	0.00033	<0.00061	<0.00061	<0.02	<0.1
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	0.005	0.005	0.006	0.01	0.012	0.011	0.006	0.007	0.007	0.008	-	-	-	-	-	-
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	0.018	0.018	<0.005	<0.005	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.025	0.029	0.016	0.041	0.033	0.032	-	-	0.146	0.014	-	-	0.28	0.01	0.09	0.005
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.245	0.255	0.279	0.283	0.235	0.23	0.375	0.361	0.306	-	0.374	0.364	0.24	0.24	-	-
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	-	<0.003	<0.003	<0.005	<0.005	<0.001	<0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	0.0006	<0.0005	<0.0005	0.0012	<0.0005	<0.0002	<0.0002
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.001	0.0013	<0.0009	0.001	<0.001	<0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.152	0.067	0.043	0.09	0.18	0.186	0.024	0.028	0.354	0.03	0.046	0.05	1.2	<0.1	0.35	0.7
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	0.094	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.012	<0.003	0.0027	0.0018	<0.005	<0.005
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	3.77	3.84	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	<0.005	0.008	0.009	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.011	<0.005	<0.01	<0.01

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B		
						Sample ID	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B
						Sample Date	2004-Aug-20	2004-Sep-10	2004-Oct-28	2005-May-03	2005-Jul-27	2005-Sep-01	2005-Sep-16	2005-Oct-24	2006-May-10	2006-Jul-19	2006-Aug-21	2006-Sep-19	2006-Nov-20	2007-May-02	2007-Jun-04	2007-Aug-15
						Detection Limit																
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	3	4	4	33.4	7.9	7	-	4	4	5	6	5	3	3	3	3
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	<0.1	<0.1	2.2	0.69	0.6	-	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L	-	-	100	-	0.1	9	11	11	66	9	7	-	10	10	7	8	10	10	9	8	8
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	27	26	27	54.1	27.2	29.1	-	31.2	26	31	32	29	19	24	26	36
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	1	1	9.77	1.37	1.4	-	1.67	1	1	1	1	1	1	1	1
Potassium (tot)	mg/L	-	-	-	-	0.05	<1	<1	1	24.1	0.7	-	-	1.1	<1	<1	<1	<1	<1	<1	<1	<1
Sodium (tot)	mg/L	-	-	-	-	0.05	3	3	3	30.8	2.5	2.3	-	9.1	3	2	2	3	2	2	2	<2
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	79	71	74	152	70	76	-	70	62	79	86	72	45	59	67	87
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	0.02	0.27	<0.05	0.05	-	0.08	<0.02	0.07	<0.02	0.02	0.06	0.09	0.1	0.03
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	-	<1	-	<2	-	-	4	<2	1	2	<1	<1	<1	<1	1	<1
Colour	TCU	-	-	-	-	2	23	28	16	16	19	41	-	12	26	32	23	24	46	37	57	19
Electrical Conductivity	uS/cm	-	-	-	-	1	173	168	179	519	130	168	150	170	152	177	193	173	121	141	153	193
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.53	7.35	7.35	-	7	-	-	7.06	7.38	7.52	7.57	7.06	7.17	6.95	8.01	8.22
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	112	109	116	347	-	-	99	112	99	115	125	112	79	92	100	125
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	72	69	72	175	74	79	-	85	69	82	84	77	52	64	69	94
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.19	0.14	0.15	1.1	0.6	0.4	-	0.1	0.18	0.47	0.22	<0.05	0.27	0.1	0.21	0.16
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	7.3	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.03	0.03	0.02	0.09	0.15	0.03	-	<0.01	0.02	<0.01	0.02	0.09	<0.01	0.02	0.02	0.03
Total Suspended Solids	mg/L	-	-	-	-	10	8	6	4	12	-	-	144	26	4	3	2	11	2	<2	11	4
Turbidity	NTU	-	-	-	-	0.1	2.8	2.5	4.3	-	-	-	-	1.7	3.2	2.6	3.3	1.7	1.7	1.7	4.9	2.1
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	-	<0.05	-	-	-	-	-	-	-	-
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.08	0.04	0.03	0.05	0.23	0.22	0.29	0.51	0.05	0.06	0.22	0.06	0.09	0.06	0.12	0.01
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.03	<0.03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	<0.001	<0.0002	<0.002	<0.002	<0.002	0.002	-	<0.001	-	-	<0.001	<0.001	0.001	<0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0002	<0.0002	<0.0002	0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	0.002	0.001	0.001	<0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.67	0.56	0.44	0.064	1.15	2.24	3.45	2.79	0.33	0.62	0.46	0.48	0.4	0.3	1.25	0.25
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.0005	<0.02	<0.02	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.00006	-	-	<0.00006	<0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005	<0.001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.01	<0.005	0.007	0.007	<0.005	0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B		
						Sample ID	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B
						Sample Date	2007-Sep-27	2007-Nov-22	2008-May-09	2008-Jun-19	2008-Aug-21	2008-Sep-16	2008-Oct-09	2009-Jun-04	2009-Jul-16	2009-Aug-06	2009-Sep-16	2009-Oct-23	2010-May-17	2010-Jul-19	2010-Oct-18	2011-May-18
						Detection Limit																
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	3	3	3	3	2	4	4	2	2	2	2	4	3	4	4	4
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L	-	-	100	-	0.1	8	13	9	6	7	11	9	7	7	5	6	6	6	6	7	7
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	34	27	22	20	27	22	24	23	29	21	24	19	24	28	25	25
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Potassium (tot)	mg/L	-	-	-	-	0.05	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sodium (tot)	mg/L	-	-	-	-	0.05	3	3	<2	2	4	2	2	3	<2	4	2	3	2	2	<2	2
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	87	69	49	51	69	54	59	60	73	54	74	60	67	78	64	71
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.04	0.02	0.03	<0.02	0.02	0.05	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	-	<1	3	1	1	<1
Colour	TCU	-	-	-	-	2	20	15	42	71	29	69	46	34	27	111	28	58	33	65	50	35
Electrical Conductivity	uS/cm	-	-	-	-	1	192	174	126	122	156	143	150	140	161	119	158	138	153	165	146	152
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.86	7.89	7.72	7.7	7.89	7.73	7.75	7.67	7.92	7.6	7.89	7.79	7.83	7.89	7.88	7.92
Phenols	mg/L	0.001	-	0.04	0.004	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	125	113	82	79	101	93	98	91	105	77	103	90	100	107	95	99
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	89	72	59	54	72	59	64	62	77	57	64	52	64	74	67	66
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	<0.1	<0.1	0.38	0.21	0.16	0.4	0.29	<0.1	<0.1	0.58	0.14	0.39	0.36	0.38	0.18	0.13
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.02	<0.02	<0.01	0.03	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01
Total Suspended Solids	mg/L	-	-	-	-	10	<2	4	<2	6	8	2	5	3	7	6	<2	<2	2	9	<2	4
Turbidity	NTU	-	-	-	-	0.1	1.9	3.5	1.1	2.2	3.6	3.4	-	1.5	2.8	3.4	2	2.5	1.4	8.7	2	1.2
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	<0.02	-	-	-	-	<0.00009	<0.00011	<0.00009	-	0.0000247	-	-	-	0.0000047
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	<0.01	<0.01	0.04	0.09	0.03	0.05	0.05	0.06	0.05	0.11	0.03	0.06	0.05	0.11	0.04	0.04
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.001	<0.001	0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	0.001	<0.001	<0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.39	0.6	0.32	0.96	0.49	0.78	0.6	0.39	0.51	1.28	0.38	0.6	0.32	1.67	0.39	0.29
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

-LEGEND-

Detection Limit DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General

Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim

Concentration exceeds MECP-GD-TA MECP Guidance Document Table A

Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B					
						Sample ID	BAP-B	BAP-B	AP-B-Dup (BAP-B)	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B
						Sample Date	2011-Aug-11	2011-Nov-03	2011-Nov-03	2012-Apr-17	2012-Jul-11	2012-Oct-17	2013-Apr-18	2013-Aug-15	2013-Oct-30	2014-May-13	2014-Aug-08	2014-Oct-10	2015-May-04	2015-Sep-09	2015-Oct-26	2016-Apr-28				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	2	3	-	2	3	5	2.22	3.39	4.35	4.6	3.32	4.25	4.44	4.94	7.02	5.6				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	<0.1	-	<0.1	<0.1	<0.1	0.09	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05				
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05				
Sulphate	mg/L	-	-	100	-	0.1	7	10	-	7	8	24	5.64	7.14	7.74	6.69	6.24	6.06	6.16	6.09	8.96	7.26				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	30	28	28	23	19.3	19.4	19	28.4	26.8	24.8	29.6	26.5	25.2	25.4	26.7	20.7				
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	1	2	1.2	1.26	1.85	0.92	1.22	1.44	1.17	1.29	1.2	1.18	1.21	1.35	1				
Potassium (tot)	mg/L	-	-	-	-	0.05	<1	<1	<1	0.597	0.55	1.31	0.54	0.53	0.9	0.7	0.59	0.75	0.73	1.09	1.34	0.63				
Sodium (tot)	mg/L	-	-	-	-	0.05	2	<2	<2	2.6	2.67	4.6	1.98	2.69	3.75	3.34	3.08	3.4	3.18	3.61	4.38	3.43				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	83	76	-	64	81	65	40	83	65	59	71	68	60	74	68	55				
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	-	0.02	0.06	<0.01	<0.02	<0.02	<0.02	<0.02	0.04	0.15	<0.02	<0.02	<0.02	<0.02				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	2	-	<2	<2	<2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5				
Colour	TCU	-	-	-	-	2	28	16	-	17	14	15	52	18	25	39	25	28	33	<5	31	32				
Electrical Conductivity	uS/cm	-	-	-	-	1	171	163	-	166	192	193	101	194	159	146	7.98	162	149	178	167	135				
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.36	6.71	-	7.7	7.7	7.8	7.62	7.36	7.67	7.71	7.98	7.8	7.77	7.84	7.55	7.83				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001				
Total Dissolved Solids	mg/L	-	-	-	-	10	111	106	-	147	107	109	74	112	92	98	92	108	92	98	100	88				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	79	74	78.2	62.4	53.4	56.1	51.2	75.9	72.8	66.7	79.2	71.1	67.8	68.4	72.2	55.8				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	<0.1	<0.1	-	0.2	0.1	0.1	0.18	<0.1	0.24	1.46	0.12	0.23	0.31	0.27	0.22	0.23				
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.01	<0.01	-	0.04	0.04	<0.01	0.03	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.01	0.01	<0.01				
Total Suspended Solids	mg/L	-	-	-	-	10	<2	3	-	17	10	3	13	<10	<10	<10	<10	<10	<10	<10	<10	<10				
Turbidity	NTU	-	-	-	-	0.1	3.2	1.3	-	3.4	2	1.1	1.2	2.4	1.4	0.7	2.9	1.9	2.2	29.5	2.3	1.4				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.000280221	0.0000006	-	0.0000111	0.000383557	0.0000084	<0.0000111	<0.000129	<0.0000169	0.000083	0.000478	0.000802	0.000063	0.0004	0.00003	0.0000128				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	17	-	-	0.034	0.031	0.015	0.037	0.013	0.011	0.023	0.016	0.013	0.029				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.03	<0.01	<0.01	0.126	0.057	0.017	-	-	-	-	-	-	-	-	-	-				
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	<0.01	<0.01	0.015	0.012	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	0.012	<0.01	<0.01	<0.01	<0.01				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.003	<0.003	<0.0005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.001	<0.001	<0.001	0.0011	0.0009	0.0007	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002				
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.57	0.19	0.05	0.552	0.354	0.143	0.07	0.35	0.16	0.1	0.39	0.21	0.22	0.99	0.21	0.17				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	0.0002	0.0009	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	<0.001	0.002	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.01	<0.005	0.014	<0.005	<0.005	<0.005	0.036	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007				

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B



Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	
						Sample ID	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B
						Sample Date	2016-Aug-17	2016-Oct-26	2017-May-10	2017-Jul-20	2017-Oct-23	2018-May-07	2018-Jul-30	2018-Oct-24	2019-May-07	2019-May-07	2019-Aug-14	2019-Oct-22	2020-May-06	2020-Aug-25	2020-Oct-06	2021-Apr-20
<b>Anions</b>						Detection Limit																
Chloride	mg/L	-	-	180	128	0.1	7.15	5.36	6.33	5.3	4.85	7.17	7.35	9.46	10.1	10	8.53	10.9	9.67	7.44	9.3	7.79
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	13.6	6.99	5.94	4.35	4.56	4.89	4.2	5.96	5.58	5.59	4.89	9.01	6.41	4.42	4.22	4.97
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	21.5	26.7	19.9	21.7	24.4	20.7	-	24.2	20.7	20.7	26.7	21	22.27	30.07	23.99	24.4
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.06	1.29	0.98	1.09	1.21	1	-	1.19	1.04	1.04	1.2	1.12	1.08	1.36	1.27	1.27
Potassium (tot)	mg/L	-	-	-	-	0.05	0.79	0.8	0.53	0.38	0.72	0.61	-	1.03	0.61	0.59	0.52	1.91	0.72	0.86	1.23	<0.58
Sodium (tot)	mg/L	-	-	-	-	0.05	5.49	3.8	3.6	3.57	4.3	<0.005	-	4.91	5.11	5.09	4.32	6.14	5.13	5.91	6.44	5.48
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	60	71	52	68	69	61	66	60	60	62	69	46	70	81	70	56
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2	<5	<2
Colour	TCU	-	-	-	-	2	82	13	42	102	31	58	-	<5	11	11	23	52	32	30	40	33
Electrical Conductivity	uS/cm	-	-	-	-	1	159	173	149	157	139	140	180	184	150	150	195	142	186	177	159	162
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.7	7.77	7.74	7.58	7.56	6.99	7.61	7.63	7.18	7.32	7.62	7.31	7.44	6.99	7.01	7.66
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	96	96	82	72	88	<10	106	102	106	92	90	100	92	110	100	100
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	58.1	72	53.7	58.7	65.9	55.8	77.5	65.3	56	56	71.6	57	60.1	80.7	65.1	66.2
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.51	<0.1	0.22	0.29	0.16	0.45	<0.1	<0.1	<0.1	<0.1	0.12	0.28	0.2	0.26	0.26	0.35
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.02	<0.01	<0.01	0.03	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	0.02	<0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	10	<10	76	<10	<10	<10	<10	<10	18	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.1	3.7	1.2	1.1	12.2	3.2	2.5	-	2.7	2	2.3	2.9	12.6	1.7	3.8	3.3	2.9
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.000177423	0.00006	-	0.0001235	0.00006	0.000351718	0.0000855	0.0000925	-	-	-	-	-	-	-	-
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	0.034	0.007	0.03	0.032	0.014	0.026	0.008	0.006	0.031	0.032	0.007	0.043	0.016	0.01	0.014	0.02
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	0.103	0.028	0.063	0.06
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.015	<0.01	0.011	<0.01	<0.01	<0.01	0.015	<0.01	<0.01	<0.01	0.011
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.85	0.11	0.13	2.19	0.32	0.35	-	0.22	0.22	0.24	0.43	1.56	0.362	0.602	0.618	0.35
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	0.014	0.006	0.016	0.005	<0.005	-	<0.005	<0.005	<0.005	0.015	<0.005	<0.005	<0.005	<0.005	<0.005

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-C	BAP-C	BAP-C	BAP-C		
						Sample ID	QAQC-SW-21 (BA	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	QAQC SW1-F22 (B	BAP-B	BAP-B	BAP-B	BAP-B	QAQC-SW1 (BA	BAP-C	BAP-C	BAP-C
						Sample Date	2021-Apr-20	2021-Jul-14	2021-Oct-21	2022-May-03	2022-Aug-04	2022-Oct-18	2022-Oct-18	2023-May-04	2023-Aug-09	2023-Oct-19	2023-Oct-19	2004-Apr-29	2004-Jun-23	2004-Aug-20	2004-Sep-10	2004-Oct-28
						Detection Limit																
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	7.52	6.51	6.75	6.2	5.08	7.72	7.68	4.83	3.6	6.7	6.9	7	5	7	7	8
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L	-	-	100	-	0.1	4.79	2.78	3.24	4.58	4.14	4.07	3.83	3.79	4.1	5.9	6.1	11	9	10	11	13
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	24.8	23.9	23.8	24.7	32.4	22.9	24	22.9	29	28	29	23	26	28	28	33
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.27	1.32	1.18	1.14	1.43	1.38	1.43	1.11	1.3	1.3	1.3	2	2	2	2	2
Potassium (tot)	mg/L	-	-	-	-	0.05	0.63	<0.58	1.81	<1.15	0.99	1.06	1.02	0.51	0.64	0.84	0.85	2	1	<1	1	2
Sodium (tot)	mg/L	-	-	-	-	0.05	5.46	6.04	4.74	5.28	5.91	6.99	7.36	4.31	4.9	5.7	5.7	5	4	5	5	6
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	55	65	59	59	75	63	62	54	77	71	71	60	72	83	78	87
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.02	0.08	<0.02	<0.02	<0.02	0.05	0.02	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1	<1	-	<1	-
Colour	TCU	-	-	-	-	2	33	110	46	22.5	57.7	23.7	23.5	32.9	25	15	13	33	30	20	32	15
Electrical Conductivity	uS/cm	-	-	-	-	1	161	151	148	154	176	165	166	129	170	170	180	150	173	190	192	224
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.62	7.4	7.31	7.13	7.53	7.66	7.69	7.57	7.81	8.05	7.95	6.66	7.37	7.53	7.37	7.42
Phenols	mg/L	0.001	-	0.04	0.004	0.001	0.001	<0.001	0.001	0.001	0.002	0.002	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	98	114	100	76	108	96	96	72	95	60	90	98	112	123	125	146
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	67.2	65.1	64.3	66.4	86.8	62.9	65.8	61.8	81	74	75	66	73	78	78	91
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.21	0.87	0.35	0.26	0.39	0.29	0.36	0.19	0.16	0.18	<0.1	0.23	0.26	0.07	0.31	0.26
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.02	0.04	0.04	<0.02	0.06	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.04	0.03	<0.01	0.08
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	33	<10	12	<10	<10	<10	<10	12	<10	11	3	22	7	44
Turbidity	NTU	-	-	-	-	0.1	2.1	7.6	17.5	0.9	8.8	1.5	1.5	1.4	3.6	1.2	1.2	1.8	1.9	6.2	3.1	4.6
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	<0.000002	<0.000002	0.0642	0.000028	<0.00061	<0.00061	<0.00061	<0.02	<0.02	<0.02	<0.02	<0.02
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	0.023	0.034	0.021	0.011	0.015	0.014	0.011	-	-	-	-	-	-	-	-	-
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	0.026	0.01	0.006	0.006	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.058	0.097	0.216	-	0.149	0.029	0.034	-	0.024	0.2	0.021	0.07	0.05	0.14	0.07	0.23
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	0.023	0.01	<0.01	<0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	-	-	<0.003	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00075	<0.0005	<0.0002	<0.0002	0.0002	<0.0002	0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.0009	0.001	<0.0009	0.001	<0.001	<0.001	<0.001	0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.388	2.36	4.29	0.419	1.6	0.339	0.361	0.282	0.75	2.2	0.25	0.35	0.71	0.79	0.66	1.37
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	0.019	0.021	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.004	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	3.02	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	0.006	<0.005	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.02

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C					
						Sample ID	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C
						Sample Date	2005-May-03	2005-Jul-27	2005-Sep-01	2005-Sep-16	2005-Oct-24	2006-May-10	2006-Jul-19	2006-Aug-21	2006-Sep-19	2006-Nov-20	2007-May-02	2007-Jun-04	2007-Aug-15	2007-Sep-27	2007-Nov-22	2008-May-09				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	12.4	10.6	11	-	<2	9	8	7	9	5	7	4	7	8	6	10				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	0.71	0.86	0.6	-	0.5	<0.1	<0.1	<0.1	<0.1	0.12	0.19	<0.1	<0.1	<0.1	<0.1	0.43				
Nitrite as N	mg/L	-	-	-	-	0.01	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				
Sulphate	mg/L	-	-	100	-	0.1	22	11	10	-	16	13	8	8	12	12	15	9	10	11	15	19				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	26.2	29.1	34.8	-	38.9	28	33	33	36	21	27	27	38	39	29	29				
Magnesium (tot)	mg/L	-	-	-	-	0.05	2.22	1.9	2.43	-	4.21	2	2	2	2	2	2	2	2	3	2	3				
Potassium (tot)	mg/L	-	-	-	-	0.05	3.5	1.2	1.8	-	3.3	3	1	<1	2	1	3	1	2	2	1	6				
Sodium (tot)	mg/L	-	-	-	-	0.05	6.7	4.6	6.2	-	17.9	6	6	5	9	5	7	4	7	9	6	11				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	64	80	86	-	98	71	87	90	83	50	71	70	99	104	81	75				
Ammonia as N	mg/L	-	-	-	-	0.02	<0.05	<0.05	0.14	-	0.11	<0.02	0.03	<0.02	0.16	<0.02	0.03	0.08	0.05	0.04	0.04	0.06				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	-	-	2	-	<1	3	<1	<1	<1	<1	1	<1	<1	<1	<1				
Colour	TCU	-	-	-	-	2	29	17	36	-	11	24	32	25	26	40	34	55	18	20	17	37				
Electrical Conductivity	uS/cm	-	-	-	-	1	181	150	209	207	272	187	206	209	215	143	193	171	235	248	209	228				
pH	pH units	6.5 - 8.5	-	6 - 9	-	-	-	7.01	-	-	7.11	7.56	7.6	7.54	7.12	7.26	7.07	8.01	8.27	7.95	7.98	7.86				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	-	-	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Total Dissolved Solids	mg/L	-	-	-	-	10	119	-	-	137	180	122	134	136	140	93	125	111	153	161	136	148				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	75	81	97	-	114	78	91	91	98	61	76	76	103	110	81	85				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.6	0.5	0.4	-	0.2	0.15	0.29	0.44	0.19	0.23	0.18	0.36	0.27	0.14	0.46	0.42				
Total Organic Carbon	mg/L	-	-	-	-	-	5.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.02	0.03	0.02	-	<0.01	0.03	<0.01	0.04	0.04	0.02	<0.01	0.04	0.05	<0.02	0.08	<0.01				
Total Suspended Solids	mg/L	-	-	-	-	10	9	-	-	17	25	16	6	18	2	11	2	14	4	<2	27	3				
Turbidity	NTU	-	-	-	-	0.1	-	-	-	-	1.9	2.4	9.5	2.6	2.4	1.1	3.9	2	1.9	6.6	1.3	-				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.05	<0.05	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	<0.02				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.07	0.19	0.22	0.09	0.11	0.5	0.06	0.28	0.05	0.1	0.06	0.12	0.01	<0.01	<0.01	0.04				
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.03	<0.03	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.005	<0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.0002	<0.002	<0.002	<0.002	<0.002	-	<0.001	-	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	0.002				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0002	<0.005	<0.005	<0.005	<0.0005	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	0.0006	<0.0002				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	-	-	-	-	<0.001	<0.001	0.001	<0.001	0.002	0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001				
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.305	1.39	2.44	1.4	0.704	0.41	0.58	1.12	0.37	0.41	0.27	1.13	0.22	0.36	1.64	0.26				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.0005	<0.02	<0.02	<0.001	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.00006	-	-	<0.00006	<0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.005	<0.005	<0.001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	<0.005	<0.005	<0.005	0.024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C						
						Sample ID	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	
						Sample Date	2008-Jun-19	2008-Aug-21	2008-Sep-16	2008-Oct-09	2009-Jun-04	2009-Jul-16	2009-Aug-06	2009-Sep-16	2009-Oct-23	2010-May-17	2010-Jul-19	2010-Oct-18	2011-May-18	2011-Aug-11	2011-Nov-03	2011-Nov-03				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	3	6	10	7	3	6	2	3	4	3	5	6	5	4	5	-				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	0.11	<0.1	<0.1	<0.1	0.11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-				
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-				
Sulphate	mg/L	-	-	100	-	0.1	5	10	13	12	9	12	5	8	7	7	7	8	8	8	12	-				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	20	33	28	26	24	31	23	27	20	25	29	25	24	34	31	30				
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	2	3	2	1	3	1	1	1	1	2	5	1	2	2	2				
Potassium (tot)	mg/L	-	-	-	-	0.05	<1	2	2	2	1	3	<1	1	1	1	1	1	<1	1	2	2				
Sodium (tot)	mg/L	-	-	-	-	0.05	<2	9	9	7	4	8	3	3	3	2	5	4	2	5	6	5				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	51	87	78	74	65	95	56	80	67	70	85	69	71	90	86	-				
Ammonia as N	mg/L	-	-	-	-	0.02	0.02	0.02	0.06	0.07	<0.02	0.03	<0.02	<0.02	0.03	<0.02	0.09	<0.02	0.04	0.03	0.03	-				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	2	<1	<1	<1	<1	1	-	1	3	2	3	<1	<1	<1	2	-				
Colour	TCU	-	-	-	-	2	55	27	69	42	38	28	110	27	55	35	61	47	34	28	16	-				
Electrical Conductivity	uS/cm	-	-	-	-	1	123	210	212	197	155	231	127	176	155	164	189	161	162	190	190	-				
pH	pH units	6.5 - 8.5	-	6 - 9	-	7.69	7.95	7.83	7.78	7.66	7.99	7.62	7.89	7.86	7.88	7.87	7.85	7.89	7.44	6.78	6.78	-				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	-				
Total Dissolved Solids	mg/L	-	-	-	-	10	80	137	138	128	101	150	83	114	101	107	123	105	105	124	124	-				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	54	91	82	73	64	90	62	72	54	67	81	71	64	93	86	83.1				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.28	0.19	0.41	0.25	0.12	<0.1	0.5	0.38	0.39	0.23	0.37	0.17	0.13	<0.1	<0.1	-				
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.02	0.02	0.02	0.02	<0.01	0.02	0.03	0.02	<0.01	0.02	0.03	0.01	<0.01	<0.01	<0.01	-				
Total Suspended Solids	mg/L	-	-	-	-	10	9	42	<2	2	<2	4	5	2	3	<2	10	<2	5	4	<2	-				
Turbidity	NTU	-	-	-	-	0.1	1.9	10.2	3	-	2	2.5	3.1	2.3	2.8	1.3	9.3	1.9	1.7	3	2.2	-				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	<0.00015	0.000100539	<0.00008	-	0.000013	-	-	-	0.0000144	0.000431967	0.0000006	-				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.09	0.09	0.04	0.05	0.06	0.05	0.1	0.08	0.11	0.05	0.08	0.04	0.04	0.04	0.01	0.01				
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	0.03	0.03	0.03	0.01	0.04	<0.01	0.01	0.01	0.01	0.02	0.01	<0.01	0.02	0.01	0.02				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0004	0.0003	<0.0002	<0.0002	<0.0002	0.0003	0.0003	0.0002	<0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	0.0003	<0.001	<0.001	<0.001	<0.001	0.002				
Iron (tot)	mg/L	0.3	-	1	-	0.01	1	0.65	0.57	0.53	0.38	0.43	1.14	0.83	0.61	0.3	1.37	0.37	0.29	0.53	0.16	0.04				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01				

-LEGEND-

Detection Limit DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General

Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim

Concentration exceeds MECP-GD-TA MECP Guidance Document Table A

Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C					
						Sample ID	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C
						Sample Date	2012-Apr-17	2012-Jul-11	2012-Oct-17	2013-Apr-18	2013-Aug-15	2013-Oct-30	2014-May-13	2014-Aug-19	2014-Oct-10	2015-May-04	2015-Sep-09	2015-Oct-26	2016-Apr-28	2016-Aug-17	2016-Oct-26	2017-May-10				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	4	4	9	3.61	5.11	9.36	7.83	6.44	8.95	8.64	9.81	10.3	9.48	10.6	12.4	11				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	0.1	<0.1	<0.1	0.22	0.07	0.21	0.18	0.1	<0.05	0.2	0.06	0.06	0.18	0.06	0.11	0.26				
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
Sulphate	mg/L	-	-	100	-	0.1	11	9	23	7.76	8.21	12.5	11.8	9.57	11.6	12.8	8.71	11.3	12	14.5	10.2	11.5				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	25	20.4	48.9	20.5	29.9	31.1	28	31.9	30	28.2	28	28.8	22.7	22.6	31.6	22.7				
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.88	1.56	2.83	1.24	1.59	2.58	1.99	2.06	2.11	2.07	1.99	1.94	1.75	1.59	2.46	1.83				
Potassium (tot)	mg/L	-	-	-	-	0.05	2.34	1.12	3.15	1.36	1.29	2.71	3.09	1.86	2.21	2.95	2.61	2.31	2.91	2.02	2.96	2.93				
Sodium (tot)	mg/L	-	-	-	-	0.05	5.42	3.78	7.93	3.4	3.98	7.58	6.88	5.82	7.11	7.37	6.93	6.88	6.81	8.93	9.12	7.54				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	72	87	78	44	86	79	66	79	79	69	85	77	64	58	90	62				
Ammonia as N	mg/L	-	-	-	-	0.02	0.02	0.06	0.02	<0.02	<0.02	<0.02	<0.02	0.15	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5				
Colour	TCU	-	-	-	-	2	16	9	16	45	17	22	18	27	29	34	6	28	30	75	12	38				
Electrical Conductivity	uS/cm	-	-	-	-	1	202	213	230	116	213	213	187	215	214	197	222	198	174	189	241	202				
pH	pH units	6.5 - 8.5	-	6 - 9	-	7.7	7.8	7.8	7.63	7.35	7.75	7.78	8.01	7.88	7.83	7.98	7.78	7.99	7.89	7.99	7.99	7.95				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Total Dissolved Solids	mg/L	-	-	-	-	10	305	104	117	82	114	124	126	120	130	122	144	110	106	120	124	112				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	70.2	57.4	133.8	56.3	81.2	88.3	78.1	88.1	83.6	78.9	78.1	79.9	63.9	63	89	64.2				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.1	0.2	0.1	0.28	0.12	0.11	1.5	0.23	0.25	0.4	0.31	0.26	0.26	0.48	<0.1	0.23				
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.01	0.02	<0.01	0.03	0.02	<0.02	<0.02	<0.02	0.04	0.03	<0.01	<0.01	<0.01	0.03	<0.01	<0.01				
Total Suspended Solids	mg/L	-	-	-	-	10	-	10	-	18	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10				
Turbidity	NTU	-	-	-	-	0.1	1	2.5	1	2.9	2.7	1.3	0.9	2.5	18.3	2.2	2.9	1.9	1.7	3.7	1.3	1.1				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.0000073	0.0006979	0.000023	<0.000073	<0.000233	<0.000229	0.000085	0.000117	0.000273	0.000078	0.00025	0.00004	0.000155	0.000241078	0.00005	-				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	16	-	-	0.042	0.011	0.027	0.025	0.013	0.009	0.023	0.016	0.01	0.028	0.037	0.007	0.029				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.028	0.055	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-				
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.035	0.018	0.03	0.011	0.01	0.024	0.038	0.026	0.027	0.034	0.034	0.022	0.03	0.026	0.026	0.04				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.0007	0.0009	0.0006	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002				
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.19	0.298	0.116	0.08	0.34	0.14	0.19	0.33	0.23	0.28	0.79	0.15	0.16	0.67	0.21	0.1				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.0001	0.0013	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.001	0.002	<0.001	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	0.006	0.019	<0.005	0.011	<0.005	0.034	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	0.005	<0.005	<0.005				

-LEGEND-

Detection Limit DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General

Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim

Concentration exceeds MECP-GD-TA MECP Guidance Document Table A

Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	
						Sample ID	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C
						Sample Date	2017-Jul-20	2017-Oct-23	2018-May-07	2018-Jul-30	2018-Oct-24	2019-May-07	2019-Aug-14	2019-Aug-14	2019-Oct-22	2019-Oct-22	2020-May-06	2020-Aug-25	2020-Oct-06	2020-Oct-06	2021-Apr-20	2021-Jul-14
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	8.18	8.9	9.98	11.8	14.9	17.7	13.4	13.3	16.8	15.5	14.1	12.4	14.4	14.3	11.3	9.65
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	0.11	0.11	0.12	0.13	0.2	0.37	0.16	0.16	0.1	0.08	0.2	0.15	0.16	0.16	0.18	0.09
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	6.84	6.99	8.43	5.67	8.65	12.9	6.27	6.19	11.3	11	10.7	5.42	5.84	5.87	8.73	4.49
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	24	27.6	22.1	-	27.9	24.9	28.9	28.6	23.5	23.2	24.09	32.38	26.31	27.32	25.8	25.8
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.64	1.97	1.46	-	2.04	2.22	1.76	1.75	2.07	1.85	1.83	2.06	1.95	1.96	1.98	1.71
Potassium (tot)	mg/L	-	-	-	-	0.05	1.97	2.61	2	-	3.11	3.8	2.02	1.95	4.57	3.94	2.61	2.58	3.14	3.33	2.59	2.2
Sodium (tot)	mg/L	-	-	-	-	0.05	6.05	8.16	<0.005	-	9.62	10.7	7.58	7.43	11.4	10.4	8.57	9.73	9.8	10.12	8.96	8.73
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	78	83	43	77	73	81	76	76	57	57	61	102	83	83	63	72
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.04	0.1	0.05	<0.02	0.1	0.03	0.04	0.19	0.16	0.03	<0.02	<0.02	<0.02	<0.02	0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2	<5	<5	<2	<2
Colour	TCU	-	-	-	-	2	94	32	48	-	<5	11	23	24	53	49	31	28	41	40	31	102
Electrical Conductivity	uS/cm	-	-	-	-	1	191	180	177	221	240	222	230	228	184	180	234	218	202	203	206	181
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.82	7.82	7.05	7.77	7.85	7.43	7.66	7.68	7.57	7.56	7.45	7.1	7.24	7.23	7.71	7.4
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	92	116	13	126	132	128	118	118	122	118	108	126	122	124	116	130
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	66.7	77	61.2	86.4	78.1	71.3	79.4	78.6	67.2	65.5	67.7	89.3	73.7	76.3	72.6	71.5
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.3	0.27	0.49	0.17	0.13	<0.1	0.23	0.24	0.36	0.36	0.25	0.25	0.29	0.28	0.37	0.38
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	0.03
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	94	<10	<10	<10	<10	<10	14	12	<10	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.1	10.8	4.1	3	-	2.2	1.7	2.6	2.7	10.5	12.3	2.1	3.4	2	1.8	1.6	7.4
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.0001144	0.00009	0.000242959	0.000235835	0.0000961	-	-	-	-	-	-	-	-	-	-	-
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	0.032	0.021	0.026	0.011	0.006	0.028	0.007	0.007	0.048	0.048	<0.004	0.008	0.01	0.01	0.017	0.036
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	0.059	0.023	0.032	0.03	0.041	0.095
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.036	0.031	0.034	0.028	0.033	0.053	0.028	0.028	0.047	0.046	0.039	0.033	0.035	0.033	0.037	0.044
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0006	<0.0005	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	<0.002	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	1.89	0.64	0.36	-	0.05	0.19	0.3	0.29	1.26	1.23	0.288	0.496	0.271	0.266	0.294	2.21
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	<0.003	<0.003	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.009	<0.003
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.004	<0.004	<0.004	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.002
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	0.006	<0.005	<0.005	-	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D					
						Sample ID	BAP-C	BAP-C	BAP-C	AQC SW-SU22 (B)	BAP-C	BAP-C	BAP-C	QAQC SW1 (BA)	BAP-C	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	
						Sample Date	2021-Oct-21	2022-May-03	2022-Aug-04	2022-Aug-04	2022-Oct-18	2023-May-04	2023-Aug-09	2023-Aug-09	2023-Oct-19	2004-Apr-29	2004-Jun-23	2004-Aug-20	2004-Sep-10	2004-Oct-28	2005-May-03	2005-Jul-27				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	11.2	9.15	8.44	8.33	12.1	7.33	6.9	6.9	12	5	3	2	4	3	8.8	9.3				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	0.14	0.14	0.22	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	0.18	0.18	0.12	0.12	0.19	0.12	0.14	0.14	0.22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.47	0.83			
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-			
Sulphate	mg/L	-	-	100	-	0.1	6.3	8.75	5.2	5.19	5.84	6.38	5.2	5.2	7.6	8	8	9	10	11	12	10				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	26.6	26.2	38.1	30.8	24.9	25.1	30	29	32	14	25	27	26	28	16.1	25.1				
Magnesium (tot)	mg/L	-	-	-	-	0.05	2.1	1.79	2.22	1.91	2.3	1.73	1.8	1.7	2.3	<1	1	1	1	1	1.04	1.28				
Potassium (tot)	mg/L	-	-	-	-	0.05	4.14	2.23	3.08	2.43	3.2	1.87	2.1	2	3.3	<1	<1	<1	<1	1	0.5	1				
Sodium (tot)	mg/L	-	-	-	-	0.05	8.84	7.54	10.5	7.97	10.1	6.64	7.3	7.2	10	3	3	3	3	3	3.6	3				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	72	66	85	84	73	60	86	85	87	38	67	80	70	74	34	70				
Ammonia as N	mg/L	-	-	-	-	0.02	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.02	0.02	<0.02	<0.02	0.04	<0.05	0.06				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2	<2	<2	12	<2	<2	<1	<1	-	<1	-	3	-				
Colour	TCU	-	-	-	-	2	41	21.5	60.8	60	22.8	31.1	23	23	13	48	36	20	28	17	56	59				
Electrical Conductivity	uS/cm	-	-	-	-	1	194	190	204	204	202	156	200	200	230	94	155	173	165	177	95	131				
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.41	7.16	7.63	7.6	7.77	7.6	7.81	7.79	8.01	6.53	7.26	7.49	7.32	7.26	-	6.45				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	0.002	0.002	0.003	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-				
Total Dissolved Solids	mg/L	-	-	-	-	10	124	96	128	126	124	82	115	120	95	61	101	112	107	115	63	-				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	75.1	72.8	104	84.8	71.6	69.8	89	84	88	37	67	72	69	74	45	68				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.32	0.17	0.33	0.45	0.38	0.22	0.16	0.17	0.22	0.23	0.25	0.17	0.22	0.18	0.5	0.8				
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.8	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.04	<0.02	0.04	0.06	0.07	<0.02	<0.02	<0.02	0.02	0.01	0.03	0.02	0.02	0.03	0.01	0.02				
Total Suspended Solids	mg/L	-	-	-	-	10	33	<10	<10	<10	<10	<10	<10	<10	<10	8	7	3	2	5	12	-				
Turbidity	NTU	-	-	-	-	0.1	13.6	0.9	5.8	5.4	2.1	1.2	3	3	0.9	1.4	2.4	2.6	2.6	2.4	-	-				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002	<0.00061	<0.00061	<0.00061	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	0.019	0.021	0.01	0.019	0.011	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	0.022	0.009	0.01	0.005	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.175	-	0.061	0.102	0.029	-	0.025	0.021	0.015	0.08	0.05	0.04	0.05	0.02	0.1	0.06				
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.03				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.041	0.037	0.039	0.04	-	0.034	0.029	0.029	0.039	-	-	-	-	-	-	-				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.003	<0.003	-	<0.003	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.002				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	0.0002	<0.005				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	<0.002	0.006	<0.002	<0.001	<0.0009	<0.0009	<0.0009	0.002	<0.001	<0.001	<0.001	<0.001	-	-				
Iron (tot)	mg/L	0.3	-	1	-	0.01	3.35	0.493	0.983	0.905	0.293	0.311	0.66	0.63	0.23	0.38	0.88	0.72	0.73	0.53	0.593	1.11				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.02				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	0.026	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00006	-				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	3.04	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.007				

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	
						Sample ID	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D
						Sample Date	2005-Sep-01	2005-Sep-16	2005-Oct-24	2006-May-10	2006-Jul-19	2006-Aug-21	2006-Sep-19	2006-Nov-20	2007-May-02	2007-Jun-04	2007-Aug-15	2007-Sep-27	2007-Nov-22	2008-May-09	2008-Jun-19	2008-Aug-21
						Detection Limit																
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	7	-	61	5	5	4	4	3	3	2	2	3	3	3	3	1
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	-	-	0.05	0.6	-	1.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Nitrite as N	mg/L	-	-	-	-	0.01	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Sulphate	mg/L	-	-	100	-	0.1	10	-	11	10	7	8	10	10	9	8	7	8	13	8	5	6
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	29.8	-	19.1	26	31	32	33	19	24	26	36	35	28	16	17	22
Magnesium (tot)	mg/L	-	-	-	-	0.05	3.56	-	1.02	1	1	1	1	1	1	1	1	1	1	<1	1	1
Potassium (tot)	mg/L	-	-	-	-	0.05	0.9	-	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sodium (tot)	mg/L	-	-	-	-	0.05	2.3	-	54.2	2	2	<2	3	3	<2	2	<2	3	2	2	3	3
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	74	-	40	61	80	86	73	45	59	66	87	88	69	38	44	58
Ammonia as N	mg/L	-	-	-	-	0.02	0.09	-	0.42	<0.02	0.1	<0.02	0.02	0.02	0.02	0.09	0.04	0.02	0.03	<0.02	0.03	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	-	3	2	1	3	<1	<1	<1	<1	1	<1	<1	<1	<1	2	<1
Colour	TCU	-	-	-	-	2	37	-	65	27	35	25	23	49	37	63	19	17	19	63	98	42
Electrical Conductivity	uS/cm	-	-	-	-	1	166	148	307	151	180	190	172	123	141	151	193	194	173	104	105	132
pH	pH units	6.5 - 8.5	-	6 - 9	-	-	-	-	6.26	7.37	7.45	7.34	7.06	7.23	6.9	8	8.22	7.91	7.91	7.66	7.57	7.77
Phenols	mg/L	0.001	-	0.04	0.004	0.001	-	0.07	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	-	98	203	98	117	123	112	80	92	98	125	126	112	68	68	86
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	89	-	52	69	82	84	87	52	64	69	94	92	74	42	47	59
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.4	-	0.9	0.26	0.34	0.25	0.17	0.24	0.14	0.27	0.15	0.31	0.25	0.44	0.34	0.39
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.03	-	0.01	0.03	<0.01	<0.01	0.07	0.01	<0.01	0.02	0.03	<0.02	0.11	<0.01	0.02	0.01
Total Suspended Solids	mg/L	-	-	-	-	10	-	18	559	4	7	3	4	4	<2	<2	<2	<2	26	<2	8	4
Turbidity	NTU	-	-	-	-	0.1	-	-	-	1.2	2.4	2.5	2.4	2.2	1.3	3.1	2	1.9	5.3	1.6	2.8	6.4
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	<0.02	-	-
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.09	-	2.59	0.05	0.04	0.16	0.04	0.09	0.05	0.07	0.01	<0.01	<0.01	0.06	0.12	0.03
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.03	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.005	<0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.002	<0.002	0.004	-	<0.001	-	-	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.005	<0.005	<0.0005	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	0.0005	<0.0002	0.0006	0.0002
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	-	-	-	<0.001	<0.001	<0.001	<0.001	0.002	0.001	0.001	<0.001	<0.001	0.001	0.001	0.002	<0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.784	0.753	3.81	0.27	0.57	0.58	0.38	0.38	0.26	1.29	0.33	0.4	1.86	0.39	1.83	0.82
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.02	<0.001	0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	-	<0.00006	<0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.01	-	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.005	<0.001	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	0.011	<0.005	0.026	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B



Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	
						Sample ID	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D
						Sample Date	2008-Sep-16	2008-Oct-09	2009-Jun-04	2009-Jul-16	2009-Aug-06	2009-Sep-16	2009-Oct-23	2010-May-17	2010-Jul-19	2010-Oct-18	2011-May-18	2011-Aug-11	2011-Nov-03	2011-Nov-03	2012-Apr-17	2012-Jul-11
						Detection Limit																
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	4	4	2	1	1	2	3	2	3	3	4	2	3	-	3	2
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	9	7	6	6	5	6	5	5	4	6	5	6	11	-	6	6
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	19	19	18	22	22	20	16	19	22	20	19	26	23	22	17.6	15.2
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	1	<1	1	<1	1	1	<1	1	1	<1	1	2	1	1.1	1.13
Potassium (tot)	mg/L	-	-	-	-	0.05	<1	1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	1	<1	0.643	0.504
Sodium (tot)	mg/L	-	-	-	-	0.05	3	3	3	2	4	3	3	4	<2	2	<2	2	3	2	2.88	3.22
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	45	51	52	62	60	62	50	54	63	53	55	70	63	-	50	68
Ammonia as N	mg/L	-	-	-	-	0.02	0.02	0.07	0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	0.02	0.01
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	<1	<1	-	<1	5	1	3	1	<1	2	-	<2	<2	<2
Colour	TCU	-	-	-	-	2	84	61	56	39	109	43	78	46	100	74	45	47	29	-	28	22
Electrical Conductivity	uS/cm	-	-	-	-	1	122	131	119	137	127	134	118	127	136	123	121	146	142	-	136	162
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.65	7.68	7.58	7.8	7.63	7.81	7.69	7.74	7.67	7.73	7.63	7.1	6.57	-	7.5	7.5
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	
Total Dissolved Solids	mg/L	-	-	-	-	10	79	85	77	89	83	87	77	83	88	80	79	95	92	-	119	84
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	52	52	47	59	57	54	44	49.5	59	54	49.5	69	66	59.1	48.5	42.6
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.74	0.38	0.13	0.24	0.44	0.48	0.47	0.16	0.39	0.31	0.14	<0.1	<0.1	-	0.1	0.2
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.02	<0.01	<0.01	<0.01	-	<0.01	0.03
Total Suspended Solids	mg/L	-	-	-	-	10	3	15	<2	16	8	<2	<2	<2	5	<2	8	<2	<2	-	119	84
Turbidity	NTU	-	-	-	-	0.1	4	-	1.7	6.2	4.6	5.1	2.6	1.4	11.5	2.7	2.5	6.8	2.3	-	1.2	4.5
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	0.000158232	<0.00013	0.000302247	-	<0.00003	-	-	-	0.0000035	0.000243643	0.0000026	-	0.0000179	0.00003
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.025	-
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.08	0.07	0.06	0.08	0.12	0.03	0.08	0.05	0.08	0.06	0.05	0.04	0.02	0.02	0.036	0.07
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0003	0.0003	0.0002	0.0003	0.0007	0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.002	0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0007	0.0011
Iron (tot)	mg/L	0.3	-	1	-	0.01	1.07	0.74	0.52	0.99	1.6	0.71	0.66	0.37	2.32	0.6	0.42	1	0.3	0.07	0.288	0.586
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	0.0015
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	0.002
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.032

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																										
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D					
						Sample ID	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D
						Sample Date	2012-Oct-17	2013-Apr-18	2013-Aug-15	2013-Oct-30	2014-May-13	2014-Aug-08	2014-Oct-10	2015-May-04	2015-Sep-09	2015-Oct-26	2016-Apr-28	2016-Aug-17	2016-Oct-26	2017-May-10	2017-Jul-20	2017-Oct-23				
						Detection Limit																				
<b>Anions</b>																										
Chloride	mg/L	-	-	180	128	0.1	7	2.95	2.12	3.7	4.89	2.69	3.38	4.86	5.16	7.72	5.85	7.37	6.09	6.93	4.5	4.08				
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	0.16	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05				
Sulphate	mg/L	-	-	100	-	0.1	36	5.02	5.1	6.82	5.13	4.83	4.62	4.85	4.85	7.3	5.93	16	7.78	5.01	3.09	4.15				
<b>Cations</b>																										
Calcium (tot)	mg/L	-	-	-	-	0.00005	18.1	12.8	22.8	22.8	20.5	24.3	22.8	19.3	22.8	21.3	16.3	18.4	23.2	14.8	18.8	19.9				
Magnesium (tot)	mg/L	-	-	-	-	0.05	2.03	0.76	1.16	1.48	1.12	1.28	1.3	1.03	1.23	1.35	0.95	1.08	1.41	0.89	1.08	1.22				
Potassium (tot)	mg/L	-	-	-	-	0.05	1.9	0.67	0.6	1.1	0.79	0.64	0.96	0.71	1.32	1.86	0.67	0.92	1.18	0.55	0.44	0.8				
Sodium (tot)	mg/L	-	-	-	-	0.05	6.29	2.47	2.94	4.03	3.75	3.42	3.72	3.4	3.95	4.82	3.65	6.43	4.53	4.21	3.75	4.52				
<b>General Chemistry</b>																										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	52	25	70	54	46	61	60	44	63	56	44	42	60	41	61	56				
Ammonia as N	mg/L	-	-	-	-	0.02	0.01	<0.02	<0.02	<0.02	<0.02	0.14	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02				
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5				
Colour	TCU	-	-	-	-	2	26	64	25	42	55	42	41	58	7	47	41	100	20	54	163	59				
Electrical Conductivity	uS/cm	-	-	-	-	1	201	75	164	139	122	154	139	118	159	146	114	149	158	122	137	118				
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.7	7.38	7.11	7.19	7.52	7.83	7.75	7.64	7.87	7.61	7.81	7.72	7.84	7.72	7.58	7.6				
Phenols	mg/L	0.001	-	0.04	0.004	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Total Dissolved Solids	mg/L	-	-	-	-	10	112	56	96	84	90	82	94	74	110	96	66	106	84	70	74	84				
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	53.6	35.1	61.7	63	55.8	65.9	62.3	52.4	62	58.7	44.6	50.4	63.7	40.6	51.4	54.7				
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.2	0.19	0.13	0.2	0.83	0.29	0.22	0.42	0.42	0.29	0.26	0.59	0.12	0.25	0.43	0.34				
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.01	0.03	<0.02	<0.02	<0.02	<0.02	0.04	0.03	<0.01	0.01	<0.01	0.04	0.01	0.02	0.05	0.02				
Total Suspended Solids	mg/L	-	-	-	-	10	112	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	<10	<10	13	<10				
Turbidity	NTU	-	-	-	-	0.1	1.5	1.4	7.6	1.6	2.3	5.3	2.7	3.6	0.6	2.7	1.8	8.2	5	1.5	22.9	5.4				
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.0000107	<0.0000179	<0.0000599	<0.0000213	0.000005	0.00225	0.000235	0.0000799	0.00031	0.00003	0.0000073	0.0000557	0.00004	-	0.000089	0.00006				
<b>Metals</b>																										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	-	0.061	0.016	0.028	0.033	0.017	0.018	0.033	0.024	0.022	0.038	0.043	0.011	0.042	0.049	0.018				
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.036	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01				
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.003	<0.003	<0.0005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002				
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.281	0.15	1.17	0.39	0.37	0.79	0.4	0.4	1.56	0.27	0.32	1.33	0.15	0.19	4.25	0.87				
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.0001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.001	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003				
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004				
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	0.009	<0.005	0.087	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.02	<0.005				

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry																						
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Location	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	
						Sample ID	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D
						Sample Date	2018-May-07	2018-Jul-30	2018-Oct-24	2019-May-07	2019-Aug-14	2019-Oct-22	2020-May-06	2020-Aug-25	2020-Aug-25	2020-Oct-06	2021-Apr-20	2021-Jul-14	2021-Jul-14	2021-Oct-21	2022-May-03	2022-Aug-04
						Detection Limit																
<b>Anions</b>																						
Chloride	mg/L	-	-	180	128	0.1	8.63	6.94	7.99	11.8	4.48	10.4	9.86	5.78	5.78	8.7	8.04	5.32	5.35	5.89	6.26	4.1
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	0.06	<0.05	<0.05	0.07	<0.05	<0.05	0.07	0.07	<0.05	0.07	<0.05	<0.05	<0.05	<0.05	0.05
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	3.97	3.52	5.46	4.29	3.88	10.2	4.98	3.46	3.5	3	3.42	1.68	1.75	1.9	3.82	3.24
<b>Cations</b>																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	15.5	-	18.7	16	20.3	18.1	16.01	24.45	24.68	19.88	18.9	21.9	25.4	21.7	19.1	27
Magnesium (tot)	mg/L	-	-	-	-	0.05	0.9	-	1.18	1	1.12	1.2	0.92	1.42	1.42	1.23	1.11	1.21	1.54	1.37	1.05	1.41
Potassium (tot)	mg/L	-	-	-	-	0.05	0.73	-	1.45	0.67	0.62	2.52	0.72	0.99	0.83	1.53	0.69	0.87	1.2	2.25	<1.15	0.85
Sodium (tot)	mg/L	-	-	-	-	0.05	<0.005	-	4.9	5.88	4.31	6.66	5.03	6.12	6.16	6.74	5.95	6.26	7.31	4.48	5.15	4.75
<b>General Chemistry</b>																						
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	36	54	48	49	58	40	42	70	70	61	42	58	56	56	43	63
Ammonia as N	mg/L	-	-	-	-	0.02	0.62	<0.02	<0.02	<0.02	0.07	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.03	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<2	<2	<5	<2	<2	<2	<2	<2	2
Colour	TCU	-	-	-	-	2	75	-	<5	15	39	49	45	50	46	62	47	146	146	68	32	70.6
Electrical Conductivity	uS/cm	-	-	-	-	1	124	158	153	130	154	132	158	151	151	139	132	132	132	132	132	146
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.08	7.64	7.69	7.15	7.52	7.38	7.32	6.88	6.9	7.04	7.49	7.31	7.31	7.29	6.98	7.47
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	<10	102	82	86	82	102	82	102	108	90	86	104	116	98	58	98
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	42.4	56.7	51.6	44.1	55.3	50.1	43.8	66.9	67.5	54.7	51.8	59.7	69.8	59.8	52	73.2
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	1.1	0.31	0.24	<0.1	0.17	0.36	0.25	0.31	0.29	0.37	0.3	0.43	0.38	0.5	0.25	0.36
Total Organic Carbon	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	0.04	0.03	<0.02	<0.02	0.04	0.05	0.07	<0.02	0.05
Total Suspended Solids	mg/L	-	-	-	-	10	74	34	<10	<10	<10	12	<10	<10	<10	<10	<10	<10	<10	48	<10	<10
Turbidity	NTU	-	-	-	-	0.1	2.2	-	3.6	3.5	9.1	9.7	2.1	9.8	12.2	11.3	2.1	12.9	13	26.9	<0.5	11
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.001676429	0.0000587	0.000102674	-	-	-	-	-	-	-	-	-	-	-	-	<0.000002
<b>Metals</b>																						
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	0.035	0.014	0.01	0.041	0.009	0.049	<0.004	0.015	0.015	0.016	0.027	0.049	0.048	0.031	0.02	0.022
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	0.074	0.18	0.214	0.106	0.054	0.109	0.108	0.301	-	0.067
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	0.013	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	0.0007	<0.0005	<0.0005	0.0006	0.0007	0.0019	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	-	<0.002	<0.002	<0.002	<0.002	0.002	0.003	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.44	-	0.27	0.4	0.85	1.09	0.412	2.3	2.34	0.855	0.495	3.32	3.13	6.97	0.528	1.9
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.004	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.02	<0.02	<0.02

-LEGEND-  
Detection Limit DL: May vary between sample locations and events  
DL exceeds criteria  
Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General  
Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim  
Concentration exceeds MECP-GD-TA MECP Guidance Document Table A  
Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

Appendix F-2: Historical Surface Water Chemistry						Location	BAP-D	BAP-D	BAP-D	BAP-D
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-D	BAP-D	BAP-D	BAP-D
						Sample Date	2022-Oct-18	2023-May-04	2023-Aug-09	2023-Oct-19
<b>Anions</b>						Detection Limit				
Chloride	mg/L	-	-	180	128	0.1	7.42	5.67	1.9	5.1
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	<0.1	<0.1
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.01	<0.01
Sulphate	mg/L	-	-	100	-	0.1	2.83	3.14	4.1	4.6
<b>Cations</b>										
Calcium (tot)	mg/L	-	-	-	-	0.00005	17.5	15.2	23	23
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.28	0.86	1.2	1.3
Potassium (tot)	mg/L	-	-	-	-	0.05	1.18	<0.5	0.74	1
Sodium (tot)	mg/L	-	-	-	-	0.05	6.95	4.5	4.9	5.6
<b>General Chemistry</b>										
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	50	39	61	55
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.05	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2
Colour	TCU	-	-	-	-	2	36.8	43.3	40	21
Electrical Conductivity	uS/cm	-	-	-	-	1	138	103	140	150
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.61	7.4	7.67	7.83
Phenols	mg/L	0.001	-	0.04	0.004	0.001	0.002	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	92	62	85	85
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	49	41.5	66	61
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.49	0.19	0.2	0.2
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.08	0.02	<0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	11
Turbidity	NTU	-	-	-	-	0.1	2.1	2.4	6.6	1.9
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.000002	0.000109	<0.00061	<0.00061
<b>Metals</b>										
Aluminum (diss)	mg/L	-	Calculated	-	-	0.004	0.016	-	-	-
Aluminum (diss, PWQO)	mg/L	-	Calculated	-	-	0.004	-	0.043	0.014	0.008
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.036	-	0.028	0.029
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	<0.001	<0.001
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	-	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.00009	<0.00009
Chromium (tot)	mg/L	-	-	0.064	-	0.003	-	<0.003	<0.005	<0.005
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	0.001	<0.0009	<0.0009
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.444	0.513	1.2	0.4
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.0005	<0.0005
Manganese (tot)	mg/L	-	-	-	-	0.002	0.016	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Mercury (tot)	mg/L	0.0002	-	-	-	0.0001	-	-	-	-
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	<0.003	<0.001	<0.001
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002
Silicon (tot)	mg/L	-	-	-	-	0.18	-	3.1	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.0001	<0.0001	<0.00009	<0.00009
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.02	<0.02	<0.005	<0.005

-LEGEND-

Detection Limit DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds PWQO-GENERAL Provincial Water Quality Objectives General

Concentration exceeds PWQO-INTERIM Provincial Water Quality Objectives Interim

Concentration exceeds MECP-GD-TA MECP Guidance Document Table A

Concentration exceeds MECP-GD-TB MECP Guidance Document Table B

## **Appendix G**

### Trigger Mechanisms and Contingency Plan

**SOUTH BAPTISTE LAKE WASTE DISPOSAL SITE  
TRIGGER MECHANISMS - (ACCEPTED 25-JUNE-2018 REV.01-AUG 2019)**

**OBJECTIVE AND BACKGROUND**

The objective of the trigger mechanisms and contingency plan for the South Baptiste Lake Waste Disposal Site (WDS) is to identify the off-site migration of leachate impacted groundwater, and ensure timely action to prevent and mitigate any adverse impacts to the environment.

**OBJECTIVE 1: SURFACE WATER IMPACTS**

To identify migration of leachate impacted groundwater discharging to adjacent surface water bodies; to identify impacts to surface water bodies; and ensure timely action to prevent and mitigate any adverse impacts to the environment.

**Northeast Property Boundary-Surface Water**

Assessment Points- BAP-A

Trigger Parameter- Toxicity test (Single Concentration – Acute Lethality) collected from the assessment point.

Frequency-Sampling three times per year (Spring, Summer and Fall)

Contingency Plan is activated if test results are greater than 50% mortality and is deemed a “failure” of the test.

References:

1. Environment Canada, "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/13 Second Edition - December 2000, including May 2007 and February 2016 Amendments.
2. Environment Canada, "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia magna", Environmental Technology Centre, Ottawa, Ontario, Report EPS 1/RM/14 Second Edition - December 2000, including February 2016 Amendments.

**Northeast Property Boundary-Surface Water**

Assessment Points- MW-4, MW-7

Trigger Parameter- Toxicity test (Single Concentration – Acute Lethality) collected from the assessment point BAP-A.

Frequency-Sampling twice per year (Spring and Fall)

Contingency Plan is activated if three or more of the following triggers occur at the assessment point during one sampling event:

- Alkalinity, Boron, Chloride, Cobalt, Iron and TDS exceeds the Trigger Values identified in Table 1 below.



- Un-ionized ammonia exceeds the Provincial Water Quality Objectives (PWQO). At the assessment point during one sampling event.

The Trigger Values are based on the PWQO, Canadian Water Quality Guidelines (CWQG), or the 75<sup>th</sup> percentile of results from May 2006 to May 2017 for BAP-D (background) sampling location and are provided in Tables 1.

**Table 1: BAP-A Trigger Values for Select Parameters**

Parameter	PWQO mg/L	CWQG mg/L	75 <sup>th</sup> Percentile Concentration mg/L
Alkalinity	<i>Lower limit 45 – Upper Limit 75</i>		
Boron	<i>0.20</i>		
Chloride		<i>128</i>	
Cobalt	<i>0.0009</i>		
Iron			<i>0.93</i>
TDS			<i>107</i>
Unionized Ammonia	<i>0.02</i>		

## CONTINGENCY PLAN – SURFACE WATER

**Tier 1:** The tri-annual toxicity test results at BAP-A will serve as the first sampling event for the Tier 1 Contingency Plan for the MW-4 and MW7 assessment points in addition to the surface water BAP-A assessment point. If the tri-annual toxicity tests results fail at BAP-A proceed with Tier 2 measures.

**Tier 2:** If the exceedances are confirmed through Tier 1 sampling then the following measures will be implemented depending on the nature of the trigger activation:

1. A second toxicity test (Single Concentration – Acute Lethality) sample will be collected within one week to confirm the impacts to surface water at BAP-A. If the toxicity test passes then no additional mitigation measures will be required. If toxicity tests fail then proceed with:
  - a. Identification of other potential causes for elevated concentrations through additional studies to be completed within two months of the second failed toxicity test. Following the three months and if no other potential causes for the elevated concentrations have been identified proceed to Tier 3 measures.



**Tier 3:** If the increased sampling and/or additional studies indicate a continuing issue resulting in impacts or potential significant impacts to the environment, then mitigation/remediation measures will be implemented to prevent further impact. These measures would be aimed at intercepting or diverting the impacted surface water/groundwater before it reaches a receptor. The specifics of the plan will be dependent on the nature of the impact.







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