

2024 Annual Monitoring Report South Baptiste Waste Disposal Site Environmental Compliance Approval No. A361602

Prepared for:

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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 2024 environmental monitoring and sampling program and prepare the 2024 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, 2024.

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 2024.

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 (MHHs). 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 Jaclyn Kalesnikoff, P.Geo., of BluMetric. Ms. Scholes is a Professional Geoscientist as designated by Professional Geoscientists Ontario (PGO).

Table 1: Contact Information

Role	Name	Address	Phone Number	Email
Site Owner/ Contact	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
CEP	Senior Environmental Engineer, BluMetric – Jaclyn Kalesnikoff, P.Geo.	1682 Woodward Drive, Ottawa, ON K2C 3R8	(877) 487-8436 ext. 339	jkalesnikoff@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 mbgs. 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 ranges from 2.4 m (MW7) to over 6.7 m (MW10) in thickness and consists primarily of sand. Overburden thickness was further confirmed at the two bedrock monitoring wells MW7 and MW11 that were drilled to depths of 2.4 mbgs and 4.5 mbgs, 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} metres per second (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, approximately 900 m northeast of the Site,
- Diamond Lake, approximately 1.2 km southwest of the Site, and
- A tributary stream to Baptiste Lake, approximately 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 April 29, July 10, (surface water monitoring only), and October 30, 2024.

3.1 Site Inspections and Operations Monitoring

Site inspections were completed on April 29 (spring event), July 10 (summer event), and October 30 (fall event), 2024. 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 nearing capacity;

- Segregated waste pile signage was observed to be knocked over during the fall Site visit; and
- Unauthorized human activity has been observed east of the active fill area in the forest (collecting recyclables, waste, and furniture).

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 periodically. The locations and descriptions of the groundwater monitoring wells are provided in Table 2. Sampling events occurred for the spring and fall events only, on April 29, 2024, and October 30, 2024, respectively.

Table 2: Groundwater Monitor Locations

Monitor Name	Northing	Easting	Relative Location
SB-MW2	4,996,511	734,458	Upgradient (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 except SB-MW11 which did not recover after purging. Groundwater samples were collected from all monitoring wells in the fall except for SB-MW2 and SB-MW11, which had insufficient water for sampling. The groundwater monitor locations are shown on Figures 02 through Figure 05. SB-MW11 is not listed within the ECA, however, it 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 Organic Compounds*	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 2029 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 2024 as required by the ECA.

During the 2024 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 historical 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 groundwater 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 screened within bedrock, while the other wells are screened within the overburden.

Table 4: Groundwater Elevation Data

Groundwater Monitor	Bottom Depth (mbTPVC)	Elevation of TPVC ¹ (masl)	Water Level 29-Apr-24 (mbTPVC)	Water Level 30-Oct-24 (mbTPVC)	GW Elevation 29-Apr-24 (masl)	GW Elevation 30-Oct-24 (masl)
Overburden Wells						
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

Groundwater Monitor	Bottom Depth (mbTPVC)	Elevation of TPVC ¹ (masl)	Water Level 29-Apr-24 (mbTPVC)	Water Level 30-Oct-24 (mbTPVC)	GW Elevation 29-Apr-24 (masl)	GW Elevation 30-Oct-24 (masl)
Bedrock Well						
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 towards the north to northeast towards Baptiste Lake.

3.2.2 Surface Water Monitoring

Three surface water sampling events were conducted in 2024. Samples were collected on May 4, August 9, and October 19, 2024. 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. Laboratory analytical results and chain of custody forms for surface water results are included in **Appendix D (D3)**.

Table 6: South Baptiste Surface Water Monitoring Suite

Category	Parameters
Biological Parameters	Biological Oxygen Demand (BOD ₅)
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: 2024 Surface Water Sampling Observations

Location	Discharge (m ³ /s) ¹	Description
April 29, 2024		
BAP-A	0.0114	Water was clear.
BAP-B	0.0662	Water was clear.
BAP-C	0.0336	Water was clear.
BAP-D	0.045	Water was clear with some suspended particulate.
July 10, 2024		
BAP-A	0.0484	Water was clear, light brown, with some sediment.
BAP-B	0.0399	Water was brown with sediment.
BAP-C	0.0284	Water was mostly clear, brown, with some sediments.
BAP-D	0.0134	Water was mostly clear, brown, with some sediments.
October 30, 2024		
BAP-A	0.0078	Water was clear.
BAP-B	0.0174	Water was clear.

Location	Discharge (m ³ /s) ¹	Description
October 30, 2024		
BAP-C	0.0297	Water was clear.
BAP-D	0.0088	Water was clear.

Notes:

m³/s – cubic metre per second

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 Bureau Veritas (BV) during the spring and fall sampling events. BV is accredited by the Standards Council of Canada (SCC). Groundwater samples were stored at approximately 4 degrees Celsius (° C) during shipment to BV 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 BV Laboratories during the spring, summer, and fall sampling events. Surface water samples were stored at approximately 4° C during shipment to BV 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 2024 did not coincide within 24 hours of a 10-millimetre (mm) precipitation event. The spring sampling event on April 29 was preceded by 3.1 mm on April 28 and 10.8 mm on the day of sampling. The summer sampling event occurred on July 10 and 0.0 mm of rain fell in the two days prior to the Site visit. The fall sampling event occurred on October 30 and 0.0 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 2024. 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 2024 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 2024 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 upgradient 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 2024 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 2024 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 2024 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	2024 Sampling Event(s)
SB-MW2 (Background)	Alkalinity (below criteria)	April
SB-MW3	None	None
SB-MW4	DOC Dissolved Manganese Nitrite Nitrate	October October April October
SB-MW5	DOC Dissolved Iron Dissolved Manganese	April, October April, October April, October
SB-MW6 (Leachate Well)	Alkalinity (above criteria) DOC TDS Dissolved Iron Dissolved Manganese	April, October April, October April, October April, October April, October
SB-MW7	Alkalinity (above criteria) DOC Dissolved Manganese TDS	April, October April, October April, October April, October
SB-MW8	None	None
SB-MW9	Alkalinity (below criteria)	October
SB-MW10	Alkalinity (above criteria) DOC Dissolved Manganese TDS	April April, October April, October April
SB-MW11	Sulphate TDS	April April

Note: Background alkalinity is typically below criteria.

Reasonable Use Values (RUVs)

The water quality results from 2006 to 2024 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.

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

Where:

- 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	260.5
Aluminum	0.005	0.1	0.5	0.053
Boron	0.005	5	0.25	1.25
Chloride	0.56	250	0.5	125.3
Copper	0.0015	1	0.5	0.501
Dissolved Organic Carbon (DOC)	1.4	5	0.5	3.2
Iron	0.015	0.3	0.5	0.1575
Manganese	0.005	0.05	0.5	0.0275
Nitrate	0.025	10	0.25	2.52
Sodium	1.2	200	0.5	100.6
Total Dissolved Solids (TDS)	38.0	500	0.5	269.0
Zinc	0.005	5	0.5	2.503

Notes:

* Metals results are for dissolved metals in groundwater

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 2024. 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*	2024 Sampling Event(s)
SB-MW2 (Background)	None	None
SB-MW3	None	None
SB-MW4	DOC Manganese	April, October October
SB-MW5	DOC Iron Manganese	April, October April, October April, October
SB-MW6R (Leachate Well)	Aluminum Alkalinity Boron DOC Iron Manganese TDS	October April, October April, October April, October April, October April, October April, October
SB-MW7	Alkalinity DOC Manganese TDS	April, October April, October April, October April, October
SB-MW8	Chloride TDS	April April
SB-MW9	None	None
SB-MW10	Alkalinity DOC Manganese TDS	April, October April, October April, October April, October
SB-MW11	Sodium TDS Boron Manganese	April April April April

Note:

* Metals results are for dissolved metals in groundwater

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 2024.

Table 11: Groundwater PWQO Parameter Exceedances

Groundwater Monitoring Location	Parameter	2024 Sampling Event(s)
SB-MW2 (Background)	Total Phosphorus Copper	April April
SB-MW3	Total Phosphorus Copper	April April
SB-MW4	Total Phosphorus Boron Cobalt Copper	April, October April, October October October
SB-MW5	Boron Total Phosphorus Iron	October April, October April, October
SB-MW6R (Leachate Well)	Boron Cobalt Copper Total Phosphorus Iron Phenols	April, October April, October April, October April, October April, October April, October
SB-MW7	Boron Cobalt Copper Nickel Total Phosphorus Zinc	April, October April, October April, October April, October April April, October
SB-MW8	Total Phosphorus Copper	April, October October
SB-MW9	Copper Total Phosphorus	October April, October
SB-MW10	Boron Cobalt Copper Nickel Total Phosphorus	April, October April, October April, October April April, October
SB-MW11	Boron Total Phosphorus	April April

Notes:

* Metals results are for dissolved metals in groundwater

Groundwater alkalinity concentrations at the Site are naturally low. The background well (SB-MW2) mean concentration (2006-2023 data) is 22.8 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.

Historical 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 2024. Samples were collected on April 29, July 19, and October 30, 2024. The 2024 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	2024 Sampling Event(s)
BAP-A	Boron Iron Cobalt Total Phosphorus	PWQO PWQO, Table A PWQO PWQO	April, July, October July July July
BAP-B	Iron	PWQO, Table A (October)	July, October
BAP-C	Iron	PWQO	April, July
BAP-D (Background)	Iron	PWQO, Table A (August)	April, July, October

Note:

* Metals results are for total metals in surface water

The average background (BAP-D) surface water concentration for alkalinity in 2024 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 2024.

The detection limit for total cadmium was above the Table B criteria for all surface water samples collected in 2024. Cadmium has only been above the detection limit on two occasions since monitoring began in 2006.

All toxicity samples collected in 2024 passed for single concentration acute lethality testing of *Daphnia magna* (48 hour) and rainbow trout (96 hour).

Historical surface water data up to and including 2024 is provided in **Appendix F (F-2)**.

4.3 Landfill Gas Monitoring

Landfill gas readings collected during the 2024 spring and fall samplings events are presented in Table 13 below.

Table 13: 2024 Landfill Gas Field Data

Location	Description of Location	April 29, 2024 (ppm)	October 30, 2024 (ppm)
Attendant's Building	RKI probe inserted through main door	0	0
SB-MW2	Well head	0	0
SB-MW3	Well head	0	0
SB-MW4	Well head	0	0
SB-MW5	Well head	0	25
SB-MW6R	Well head	5	15
SB-MW7	Well head	5	0
SB-MW8	Well head	0	5
SB-MW9	Well head	0	20
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 2024, 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, D6)**.

Exceedances of the RPD guidance criteria are as follows:

- Groundwater: TSS (RPD of 75%) in the spring.
- Surface water: Aluminum (RPD of 67%) in the summer.

The two RPD values in exceedance of the guideline criterion represent less than 1% of all analyzed parameters during the 2024 monitoring period. Therefore, the results of the 2024 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 (e.g., alkalinity, chloride, DOC, dissolved aluminum, dissolved iron, dissolved 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 2024 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. Dissolved iron and manganese are sporadically detected above ODWSOG and RUV criteria, however, there were also total phosphorus and dissolved copper exceedances during the spring 2024 sampling event. No sample was collected during the fall 2024 sampling event due to insufficient water. 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, and dissolved 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 (at the end of the report) 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, dissolved boron, and TDS as well as decreasing trends of dissolved aluminum and DOC. Concentrations at SB-MW5 have shown a slight increasing trend in chloride, dissolved manganese, and sodium while a slight decreasing trend is apparent for dissolved iron and DOC. Several trends are apparent at SB-MW6R including increasing trends of alkalinity and dissolved boron and iron. In addition, several decreasing trends are also apparent including TDS, chloride, dissolved manganese and 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 dissolved boron, iron, and manganese. In addition, several decreasing trends are apparent since approximately 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. No RUV exceedances were observed for either monitoring well during the spring or fall sampling event. Alkalinity was recorded below the ODWSOG during the fall sampling event at SB-MW9 and SB-MW8, however, was comparable to the alkalinity at background location SB-MW2. SB-MW9 had a PWQO General exceedance for dissolved silver during the spring sampling event. Total phosphorus exceedances for the PWQO General criteria were also observed at both wells during both sampling events. Due to the limited ODWSOG and PWQO 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 of the Site. Concentrations of surface water indicator parameters, such as alkalinity, boron, chloride, sodium, and sulphate, were elevated in both groundwater and surface water. A review of the groundwater trend graphs indicate that the concentrations of alkalinity and dissolved boron generally continue 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 was 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 for all but one (at SB-MW7 it was less than the RDL) of the groundwater samples collected in 2024 during the fall sampling event), including background monitoring well SB-MW2. Concentrations of total phosphorus in overburden monitoring wells ranged from 0.91 mg/L at SB-MW10 to 120 mg/L at SB-MW4. Other parameters that exceeded PWQO included phenols (at SB-MW6R), and dissolved 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 2024 monitoring and review of historical results, it is apparent that the WDS is impacting the nearby groundwater quality with elevated parameters and PWQO/ODWSOG 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, with no exceedances in 2024.

5.2 Surface Water Assessment

The surface water chemistry results from the monitoring events in 2024 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. Sample 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 and within the same creek but downstream from BAP-D and BAP-B.

Location BAP-A represents surface water that drains directly from the South Baptiste WDS property and 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 and continues in a northeast direction towards BAP-C.

Background surface water monitoring location BAP-D had PWQO exceedances for total iron during each of the monitoring events in 2024. 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 total iron and total phosphorus during the summer sampling event. In addition, Table A criteria for iron was exceeded during the summer sampling event. Concentrations of indicator parameters were generally comparable to background concentrations at BAP-D.

Surface water monitoring location BAP-A, located closest to the WDS, exceeded PWQO criteria for total phosphorus, and total boron, and iron. In general, nearly all monitored parameter concentrations are highest at BAP-A. Concentrations of parameters at BAP-A have generally remained within the historical range of results, with two exceptions: total boron has shown a steady increasing trend since monitoring began in 2008; and chloride has shown an increasing trend since 2010 but has been declining since 2019. The 2024 analytical results indicate that leachate from the landfill is impacting surface water quality in the immediate vicinity of the WDS.

The furthest downstream monitoring location is BAP-C, located downstream from the confluence of the creek where BAP-B and BAP-D are located and the creek flowing off-site where BAP-A is located. PWQO exceedances at BAP-C were limited to total iron and phenols during the spring sampling event, total phosphorus and iron during the summer sampling event, and no exceedances during the fall sampling event. Parameter concentrations at BAP-C tend to be the second highest among all surface water monitoring locations, after BAP-A. Parameter concentrations at BAP-C have generally remained within the historical range of results with the exception of total boron (which has shown a slight increasing trend) and chloride (which shows an increasing trend until 2019, then shows 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 2024 monitoring events and review of historical results, it is apparent that leachate from the South Baptiste WDS is impacting 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 2024 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 (i.e., 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 (Contingency Plan) for surface water was approved by MECP in the fall of 2019, and is provided in **Appendix G**. In accordance with the approved surface water Trigger Mechanisms and Contingency Plan, toxicity sampling was collected three times in 2024 at BAP-A, in conjunction with the surface water sampling events on May 4, August 9, and October 19, 2024. 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 2024 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 for alkalinity, dissolved boron, chloride, dissolved cobalt, dissolved 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 75th percentile of the historical data between May 2006 and May 2017 at BAP-D (the background location).

The Contingency Plan was triggered at SB-MW4 during the fall sampling event with exceedances of trigger parameters alkalinity, TDS, total boron, and total cobalt. The Contingency Plan was also triggered at SB-MW7 during the spring and fall 2024 sampling events with trigger parameter exceedances of alkalinity, TDS, total boron, and total cobalt. The Tier 1 response of the Contingency Plan includes 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 Contingency Plan be updated to only trigger following an exceedance of a new trigger parameter or when an emerging increasing trend is observed.

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 and extend the operational life of 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 Site is controlled via a locked steel security gate, residents may deposit garbage at the 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 2024 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. An average of 15 kg per bag, provided by the municipality, is used in the waste calculations.

Table 14: Annual Recycling and Waste Tonnages

Q1		Q2		Q3		Q4		Year end	
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
2024									
R	W	R	W	R	W	R	W	R	W
12.69	102.51	16.18	140.67	25.27	198.21	14.44	136.88	68.57	578.27

Based on the estimated numbers, 10.6% of the total waste tonnage disposed at the Site was separated for recycling in 2024, which is slightly lower than the 13% observed in the 2023 operating year. Recycling quantities have decreased by approximately 8% in 2024 compared to 2023 while the waste quantity at the South Baptiste WDS in 2024 was approximately 17.4% higher than the 2023 quantity.

It should be noted that these numbers are based on estimates. The 2024 and 2023 residential waste calculations are based on bag counts at the WDS. There were 28,664 bags of residential waste and 9,887 bags of industrial, commercial, and institutional waste deposited at the South Baptiste WDS in 2024. 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 2024.

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 2024 at the South Baptiste WDS are presented below.

- Scrap metal – 17.89 tonnes;
- Electronic waste – 5.46 tonnes;
- Leaf and yard waste – 1004 truck or trailer loads; and,
- 79 tires.

6.2 Emergency Situations and Complaints Summary

There were no emergency situations or complaints in 2024.

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 cubic metres (m³). Figure 06 shows Phase 1 of the cell development from 396 to 398 masl at the WDS and Figure 07 shows 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 453 (2015), 568.2 (2016), 398.5 (2017), 380.4 (2018), 342.5 (2019), 381.7 (2020), 359.3 (2021), 376.7 (2022), 492.6 (2023), and 578.27 (2024) tonnes, resulting in an average waste generation rate of 433 tonnes per year. The 433 tonnes are estimated to equate to 866 m³ of compacted waste per year (no soil cover), assuming a compaction density of 500 kilograms (kg)/m³. 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 1,082 m³ per year.

In 2024, it is estimated that 578.3 tonnes, or 1156.6 m³ by volume, of waste (residential and commercial) was deposited at the Site. Taking soil cover into consideration, this volume is estimated at 1445.7 m³.

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 is shown on 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 m³. This volume was considered within the remaining volumetric capacity and life expectancy calculations provided below. The Site will be resurveyed in 2025 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 ³
FBAL volume excavated into WDS:	1,349 m ³
<u>Estimated fill rate for 2023 (July to December) & 2024:</u>	<u>2,057 m³</u>
Remaining Capacity (2024)	11,927 m ³
Average annual fill rate	1,082 m ³
Life Expectancy:	11 years

Based on the remaining volumetric capacity at the Site, the life expectancy is 11 years. The remaining capacity (11,927 m³) 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 2024 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 2024. 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 on-site supervision for this work. Following the completion of the grading and compaction of the cover, a remotely piloted aircraft (i.e., drone) 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 2024 monitoring events, the groundwater flow direction is assumed to be northeast to northwest 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, and dissolved, 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 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 2029.

- 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 historical 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. During the 2024 monitoring period the higher elevated levels of phosphorus were observed at BAP-B, BAP-C, and BAP-D specifically during the summer sampling event. This is likely due to road refinishing that occurred during the summer sampling and not reflective of parameter trends or landfill impacts on the surface water. 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.
- Total 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.
- As for previous years, 2024 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 exceedances of trigger parameters including alkalinity, TDS, and dissolved boron and cobalt. The contingency plan was also triggered at SB-MW7 during the spring and fall 2024 sampling events with trigger parameter exceedances of alkalinity, TDS, and dissolved 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 Contingency Plan be updated to only trigger following an exceedance of a new trigger parameter or when an emerging increasing trend is observed.

7.5 Landfill Gas

- Gas readings collected in 2024 during the semi-annual sampling events ranged between 0 and 25 ppm, well below concentrations of concern.
- Gas concentrations should continue to be measured at all monitoring wells and within 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 m³. Based on the waste quantities from 2024, the remaining capacity is estimated to be 11,927 m³.
- The estimated remaining volumetric life expectancy of the South Baptiste WDS is approximately 11 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. Based on the increased waste rates for 2024 and relocation of waste from the FBAL area, the next site survey for landfill capacity should be done in 2025.
- 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.

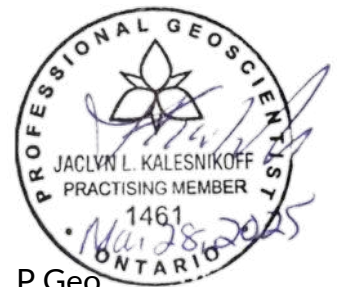
Respectfully submitted,
BluMetric Environmental Inc.



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Senior Hydrogeologist



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Tables

Table 15 - Municipality of Hastings Highlands Anions, Cations, General Chemistry and Metals in Groundwater						Site Name	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS
						Location	SB-MW2	SB-MW3	SB-MW3	SB-MW4	SB-MW4	SB-MW5	SB-MW5	SB-MW6R	SB-MW6R	SB-MW7
Parameter	Units	RUV-SB	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Sample ID	SB-MW2	SB-MW3	SB-MW3	SB-MW4	SB-MW4	SB-MW5	SB-MW5	SB-MW6R	SB-MW6R	SB-MW7
						Sample Date	2024-Apr-29	2024-Apr-29	2024-Oct-30	2024-Apr-29	2024-Oct-30	2024-Apr-29	2024-Oct-30	2024-Apr-29	2024-Oct-30	2024-Apr-29
Anions	Detection Limit															
Chloride	mg/L	125.3	250	-	-	1	<1	19	25	2.8	5.3	33	54	52	41	81
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	<0.1	0.53	0.21	4.82	11.6	<0.1	<0.1	1.78	0.13	1.45
Nitrate as N	mg/L	2.5	10	-	-	0.1	<0.1	0.53	0.21	3.57	11.2	<0.1	<0.1	1.69	0.11	1.45
Nitrite as N	mg/L	-	1	-	-	0.01	<0.01	<0.01	<0.01	1.25	0.444	0.013	0.023	0.084	0.015	<0.01
Sulphate	mg/L	-	500	-	-	1, 2	3.3	6.1	8.6	61	14	13	6	110	47	50
Cations																
Calcium (diss)	mg/L	-	-	-	-	0.2	5.1	13	20	35	38	31	45	190	230	150
Magnesium (diss)	mg/L	-	-	-	-	0.05	0.73	1.8	2.6	6	3.3	6	8.2	27	38	27
Potassium (diss)	mg/L	-	-	-	-	0.2	0.56	2.1	2.4	16	9.1	16	22	68	88	33
Sodium (diss)	mg/L	100.6	200	-	-	0.1	1.6	8.8	16	2.6	5.6	21	33	80	93	81
General Chemistry																
Alkalinity (as CaCO3)	mg/L	260.8	30 - 500	See Factsheet	-	1	22	29	54	67	94	110	170	690	1100	590
Ammonia as N	mg/L	-	-	-	-	0.05, 0.1, 0.25, 0.5	<0.05	<0.05	<0.05	9.5	2.3	0.57	0.98	53	53	16
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 8, 20	<4	<4	5.6	59	85	20	29	190	280	58
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4	1.2	1.4	1.7	5.5	4.3	4.8	7.3	40	62	21
Electrical Conductivity	uS/cm	-	-	-	-	1	44	140	220	380	330	360	540	1700	2100	1400
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.25	7.1	7.8	7.28	7.35	7.63	7.38	7.64	7.64	7.89
Phenols	mg/L	-	-	0.001	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.0017	<0.001
Total Dissolved Solids	mg/L	269	500	-	-	10	30	135	75	310	295	260	315	1300	1180	865
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.5, 1, 5	0.12	0.16	<0.1	9.9	2.7	0.88	1.3	51	60	17
Total Phosphorus	mg/L	-	-	0.03	-	0.02, 0.1, 0.2, 0.4	0.37	5.3	2	82	120	3.7	4.2	8.8	7.4	0.034
Total Suspended Solids	mg/L	-	-	-	-	10, 14, 20, 25, 33, 200, 500, 1000	170	2200	2000	83000	120000	2500	2400	140000	100000	52
Metals																
Aluminum (diss, 0.45 µm)	mg/L	0.1	0.1	-	Calculated	0.0049	0.0084	0.0074	0.0061	0.032	0.03	0.012	0.013	0.029	0.065	<0.0049
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
Barium (diss)	mg/L	-	1	-	-	0.002	0.004	0.013	0.02	0.31	0.2	0.04	0.065	0.19	0.29	0.18
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Boron (diss)	mg/L	1.3	5	-	0.2	0.01	<0.01	0.012	0.081	0.46	0.27	0.19	0.23	2	2.2	0.87
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	0.00035
Chromium (diss)	mg/L	-	0.05	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	<0.0005	<0.0005	<0.0005	0.00096	0.00066	<0.0005	<0.0005	0.031	0.061	0.019
Copper (diss)	mg/L	0.5	1	-	Calculated	0.0009	0.0013	0.00098	0.0014	0.0065	0.0066	<0.0009	<0.0009	0.0087	0.012	0.038
Iron (diss)	mg/L	0.2	0.3	0.3	-	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	3.2	3.4	20	69	<0.1
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
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002, 0.01	<0.002	<0.002	0.0053	0.13	0.14	1.3	1.7	2.2	4.1	12
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
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00052	0.00066	0.002	0.0035	0.0077
Nickel (diss)	mg/L	-	-	0.025	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0011	0.0059	0.01	0.03
Silicon (diss)	mg/L	-	-	-	-	0.05	5.4	5.3	5.9	2.6	3.5	6.2	6.8	3	4.3	6.9
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Strontium (diss)	mg/L	-	-	-	-	0.001	0.052	0.11	0.16	0.33	0.18	0.25	0.37	0.59	0.76	1.3
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	<0.00005	<0.00005	<0.00005	0.000079	0.000064	<0.00005	<0.00005	0.00025	0.00023	0.00014
Titanium (diss)	mg/L	-	-	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00068	0.00066	0.0012	0.0023	<0.0005
Zinc (diss)	mg/L	2.5	5	-	0.02	0.005	<0.005	<0.005	0.0066	0.015	0.014	<0.005	<0.005	<0.005	<0.005	0.05

Notes:

Detection Limit

DL exceeds criteria

Concentration exceeds RUV-SB

Concentration exceeds ODWQS-ALL-MERGED

Concentration exceeds PWQO-GENERAL

Concentration exceeds PWQO-INTERIM

DL: May vary between sample locations and events

Reasonable Use Values South Baptiste

Ontario Drinking Water Quality Standards All Types Merged

Provincial Water Quality Objectives General

Provincial Water Quality Objectives Interim

Table 15 - Municipality of Hastings Highlands Anions, Cations, General Chemistry and Metals in Groundwater						Site Name	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS
						Location	SB-MW7	SB-MW8	SB-MW8	SB-MW9	SB-MW9	SB-MW9	SB-MW10	SB-MW10
Parameter	Units	RUV-SB	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Sample ID	SB-MW7	SB-MW8	SB-MW8	SB-MW9	SB-QAQC-GW1 (SB-MW9)	SB-MW9	SB-MW10	SB-MW10
						Sample Date	2024-Oct-30	2024-Apr-29	2024-Oct-30	2024-Apr-29	2024-Apr-29	2024-Oct-30	2024-Apr-29	2024-Oct-30
Anions	Detection Limit													
Chloride	mg/L	125.3	250	-	-	1	110	42	42	3.7	4	24	92	79
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	0.15	0.67	<0.1	0.22	0.22	<0.1	<0.1	<0.1
Nitrate as N	mg/L	2.5	10	-	-	0.1	0.14	0.67	<0.1	0.22	0.22	<0.1	<0.1	<0.1
Nitrite as N	mg/L	-	1	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sulphate	mg/L	-	500	-	-	1, 2	54	2.6	4.6	4	4.1	3	30	23
Cations														
Calcium (diss)	mg/L	-	-	-	-	0.2	170	10	11	6.2	6.4	11	140	100
Magnesium (diss)	mg/L	-	-	-	-	0.05	30	1.2	1.1	0.76	0.79	1.3	26	18
Potassium (diss)	mg/L	-	-	-	-	0.2	51	1.3	1.4	0.77	0.79	1.2	48	40
Sodium (diss)	mg/L	100.6	200	-	-	0.1	98	29	26	9.1	9.1	13	72	53
General Chemistry														
Alkalinity (as CaCO3)	mg/L	260.8	30 - 500	See Factsheet	-	1	700	38	14	30	31	25	640	550
Ammonia as N	mg/L	-	-	-	-	0.05, 0.1, 0.25, 0.5	19	<0.05	<0.05	<0.05	<0.05	<0.05	19	16
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 8, 20	75	4	14	<4	<4	5.6	64	48
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4	27	1.5	1.9	1.1	1.1	1.4	22	17
Electrical Conductivity	uS/cm	-	-	-	-	1	1800	220	210	78	79	140	1500	1400
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.61	7.34	7.49	7.6	7.69	7.22	7.71	7.68
Phenols	mg/L	-	-	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	960	220	180	95	85	90	940	630
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.5, 1, 5	21	0.16	0.24	<0.1	0.18	<0.1	21	16
Total Phosphorus	mg/L	-	-	0.03	-	0.02, 0.1, 0.2, 0.4	<0.02	37	60	5.4	4.3	3.1	0.14	0.91
Total Suspended Solids	mg/L	-	-	-	-	10, 14, 20, 25, 33, 200, 500, 1000	13	17000	76000	2100	950	980	130	470
Metals														
Aluminum (diss, 0.45 µm)	mg/L	0.1	0.1	-	Calculated	0.0049	<0.0049	0.017	0.017	0.0052	<0.0049	0.0093	0.0066	0.0081
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
Barium (diss)	mg/L	-	1	-	-	0.002	0.24	0.01	0.01	0.0042	0.0043	0.0078	0.12	0.087
Beryllium (diss)	mg/L	-	-	Calculated	-	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Boron (diss)	mg/L	1.3	5	-	0.2	0.01	1	<0.01	<0.01	<0.01	0.01	<0.01	0.85	0.58
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.00009	0.00047	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	0.00025	0.00014
Chromium (diss)	mg/L	-	0.05	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0005	0.032	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.037	0.032
Copper (diss)	mg/L	0.5	1	-	Calculated	0.0009	0.056	0.0015	<0.0009	<0.0009	<0.0009	0.0028	0.047	0.036
Iron (diss)	mg/L	0.2	0.3	0.3	-	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00078
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002, 0.01	15	<0.002	<0.002	<0.002	<0.002	<0.002	15	11
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
Molybdenum (diss)	mg/L	-	-	-	0.04	0.0005	0.011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.01	0.0087
Nickel (diss)	mg/L	-	-	0.025	-	0.001	0.038	<0.001	<0.001	<0.001	<0.001	<0.001	0.031	0.023
Silicon (diss)	mg/L	-	-	-	-	0.05	7.3	5.4	4.8	5.7	5.7	5.5	6.7	6.5
Silver (diss)	mg/L	-	-	0.0001	-	0.00009	<0.00009	<0.00009	<0.00009	0.00018	0.00011	<0.00009	<0.00009	<0.00009
Strontium (diss)	mg/L	-	-	-	-	0.001	1.5	0.13	0.13	0.063	0.065	0.12	0.89	0.66
Thallium (diss)	mg/L	-	-	-	0.0003	0.00005	0.00017	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0002	0.00018
Titanium (diss)	mg/L	-	-	-	-	0.005	<0.005	<0.005	0.0052	<0.005	<0.005	<0.005	<0.005	<0.005
Vanadium (diss)	mg/L	-	-	-	0.006	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Zinc (diss)	mg/L	2.5	5	-	0.02	0.005	0.065	<0.005	<0.005	<0.005	<0.005	<0.005	0.017	0.019

Notes:

Detection Limit

DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds RUV-SB

Reasonable Use Values South Baptiste

Concentration exceeds ODWQS-ALL-MERGED

Ontario Drinking Water Quality Standards All Types Merged

Concentration exceeds PWQO-GENERAL

Provincial Water Quality Objectives General

Concentration exceeds PWQO-INTERIM

Provincial Water Quality Objectives Interim

Table 16 - Municipality of Hastings Highlands Anions, Cations, General Chemistry and Metals in Surface Water						Site Name Location	South Baptiste WDS BAP-A	South Baptiste WDS BAP-A	South Baptiste WDS BAP-A	South Baptiste WDS BAP-A	South Baptiste WDS BAP-A	South Baptiste WDS BAP-A	South Baptiste WDS BAP-B	South Baptiste WDS BAP-B
Parameter	Units	MECP-GD-TA	MECP-GD-TB	PWQO-GENERAL	PWQO-INTERIM	Sample ID	BAP-A	SB-QAQC-SW1 (BAP-A)	BAP-A	SB-QAQC-SW1 (BAP-A)	BAP-A	SB-QAQC-SW1 (BAP-A)	BAP-B	BAP-B
						Sample Date	2024-Apr-29	2024-Apr-29	2024-Jul-10	2024-Jul-10	2024-Oct-29	2024-Oct-29	2024-Apr-29	2024-Jul-10
Anions						Detection Limit								
Chloride	mg/L	180	128	-	-	1	43	43	35	35	40	40	4	4.7
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	2.15	2.32	1.17	1.12	-	-	<0.1	<0.1
Nitrate as N	mg/L	-	-	-	-	0.1	2.15	2.32	1.12	1.08	-	-	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.01	<0.01	0.051	0.044	-	-	<0.01	<0.01
Sulphate	mg/L	100	-	-	-	1	39	39	12	12	17	17	4.7	3.9
Cations														
Calcium (tot)	mg/L	-	-	-	-	0.2	51	52	43	45	50	50	23	27
Magnesium (tot)	mg/L	-	-	-	-	0.05	9.2	8.7	6.9	6.7	8	8.2	1	1.3
Potassium (tot)	mg/L	-	-	-	-	0.2	20	20	17	16	19	17	0.5	0.8
Sodium (tot)	mg/L	-	-	-	-	0.1	35	35	28	27	31	31	4.7	4.8
Field Parameters														
pH (Field)	pH units	-	-	-	-		7.03	7.03	6.87	6.87	-	-	6.47	6.36
Temperature	deg. C	-	-	-	-		6.2	6.2	15.6	15.6	-	-	6.3	12.8
General Chemistry														
Alkalinity (as CaCO3)	mg/L	-	-	See Factsheet	-	1	150	150	150	150	150	150	58	72
Ammonia as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	0.11	0.11	<0.05	<0.05	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	4	3	<2	<2	<2	<2
Colour	TCU	-	-	-	-	2	13	13	25	25	12	12	27	60
Electrical Conductivity	uS/cm	-	-	-	-	1	530	530	450	450	500	500	130	170
Hardness (as CaCO3)	mg/L	-	-	-	-	1	190	190	140	150	160	180	67	73
pH	pH units	6 - 9	-	6.5 - 8.5	-		8.42	8.08	7.87	7.92	7.86	7.89	7.95	7.74
Phenols	mg/L	0.04	0.004	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	320	320	215	210	335	290	100	80
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.25	0.13	0.49	0.49	-	-	0.21	0.33
Total Phosphorus	mg/L	-	-	0.03	-	0.02	<0.02	<0.02	0.032	0.034	<0.02	<0.02	<0.02	0.082
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	49
Turbidity	NTU	-	-	-	-	0.1	0.2	0.3	2	2	0.5	0.4	1	16
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
Metals														
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.005	<0.005	<0.005	0.006	0.006	<0.005	<0.005	0.021	0.02
Aluminum (tot)	mg/L	-	-	-	-	0.0049	0.0095	0.011	0.07	0.14	0.0083	0.011	0.065	0.47
Arsenic (tot)	mg/L	-	-	-	0.005	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (tot)	mg/L	3.55	1.5	-	0.2	0.01	0.31	0.3	0.27	0.25	0.22	0.21	<0.01	<0.01
Cadmium (tot)	mg/L	0.00021	0.000017	-	Calculated	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (tot)	mg/L	0.064	-	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (tot)	mg/L	-	-	-	0.0009	0.0005	<0.0005	<0.0005	<0.0005	0.00056	<0.0005	<0.0005	<0.0005	0.0014
Copper (tot)	mg/L	0.0069	-	-	Calculated	0.0009	<0.0009	0.0014	0.001	0.0012	<0.0009	<0.0009	0.00095	0.0026
Iron (tot)	mg/L	1	-	0.3	-	0.1	<0.1	<0.1	0.28	0.46	<0.1	<0.1	0.38	8.4
Lead (tot)	mg/L	0.002	-	-	Calculated	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.00078
Mercury (diss)	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	0.0014	0.0013	0.0016	0.0017	0.0015	0.0015	<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
Silver (tot)	mg/L	-	-	0.0001	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Zinc (tot)	mg/L	0.089	0.03	-	0.02	0.005	<0.005	0.0055	<0.005	<0.005	<0.005	<0.005	<0.005	0.0057

Notes:

Detection Limit

DL: May vary between sample locations and events

DL exceeds criteria

Concentration exceeds MECP-GD-TA

MECP Guidance Document Table A

Concentration exceeds MECP-GD-TB

MECP Guidance Document Table B

Concentration exceeds PWQO-GENERAL

Provincial Water Quality Objectives General

Concentration exceeds PWQO-INTERIM

Provincial Water Quality Objectives Interim

Table 16 - Municipality of Hastings Highlands Anions, Cations, General Chemistry and Metals in Surface Water						Site Name	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS	South Baptiste WDS
						Location	BAP-B	BAP-C	BAP-C	BAP-C	BAP-D	BAP-D	BAP-D
Parameter	Units	MECP-GD-TA	MECP-GD-TB	PWQO-GENERAL	PWQO-INTERIM	Sample ID	BAP-B	BAP-C	BAP-C	BAP-C	BAP-D	BAP-D	BAP-D
						Sample Date	2024-Oct-29	2024-Apr-29	2024-Jul-10	2024-Oct-29	2024-Apr-29	2024-Jul-10	2024-Oct-29
Anions						Detection Limit							
Chloride	mg/L	180	128	-	-	1	3.4	7.9	8.9	9.2	5	3.9	2.7
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	0.19	0.19	-	<0.1	<0.1	-
Nitrate as N	mg/L	-	-	-	-	0.1	-	0.19	0.19	-	<0.1	<0.1	-
Nitrite as N	mg/L	-	-	-	-	0.01	-	<0.01	<0.01	-	<0.01	<0.01	-
Sulphate	mg/L	100	-	-	-	1	5.5	8.3	5	6.6	3.7	3.6	4.3
Cations													
Calcium (tot)	mg/L	-	-	-	-	0.2	25	25	29	29	17	22	21
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.2	1.6	2	1.9	0.86	1.2	1.1
Potassium (tot)	mg/L	-	-	-	-	0.2	0.67	1.9	2.7	2.4	0.5	0.86	0.85
Sodium (tot)	mg/L	-	-	-	-	0.1	4.2	6.9	7.9	7	4.7	4.5	4.2
Field Parameters													
pH (Field)	pH units	-	-	-	-		-	6.62	6.32	-	6.66	6.82	-
Temperature	deg. C	-	-	-	-		-	6.2	13.1	-	6.7	14.2	-
General Chemistry													
Alkalinity (as CaCO3)	mg/L	-	-	See Factsheet	-	1	72	70	82	82	45	63	64
Ammonia as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	3	<2	<2	<2	<2
Colour	TCU	-	-	-	-	2	10	26	54	10	38	93	19
Electrical Conductivity	uS/cm	-	-	-	-	1	170	170	200	210	110	140	140
Hardness (as CaCO3)	mg/L	-	-	-	-	1	82	77	83	90	51	62	63
pH	pH units	6 - 9	-	6.5 - 8.5	-		7.86	8	7.82	7.87	7.65	7.65	7.7
Phenols	mg/L	0.04	0.004	0.001	-	0.001	<0.001	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	105	125	105	130	85	85	85
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	-	0.2	0.4	-	0.19	0.43	-
Total Phosphorus	mg/L	-	-	0.03	-	0.02	<0.02	<0.02	0.061	<0.02	<0.02	0.061	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	52	<10	10	36	23
Turbidity	NTU	-	-	-	-	0.1	1.2	0.9	14	1.1	1.3	31	2.1
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061	<0.00061
Metals													
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.005	0.006	0.02	0.019	0.006	0.026	0.027	0.008
Aluminum (tot)	mg/L	-	-	-	-	0.0049	0.013	0.065	0.44	0.021	0.096	0.29	0.022
Arsenic (tot)	mg/L	-	-	-	0.005	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (tot)	mg/L	3.55	1.5	-	0.2	0.01	<0.01	0.029	0.04	0.026	<0.01	<0.01	<0.01
Cadmium (tot)	mg/L	0.00021	0.000017	-	Calculated	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Chromium (tot)	mg/L	0.064	-	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cobalt (tot)	mg/L	-	-	-	0.0009	0.0005	<0.0005	<0.0005	0.0013	<0.0005	<0.0005	0.0013	<0.0005
Copper (tot)	mg/L	0.0069	-	-	Calculated	0.0009	<0.0009	0.00094	0.0025	<0.0009	0.0012	0.0015	<0.0009
Iron (tot)	mg/L	1	-	0.3	-	0.1	0.25	0.35	7.1	0.3	0.41	8.8	0.43
Lead (tot)	mg/L	0.002	-	-	Calculated	0.0005	<0.0005	<0.0005	0.00072	<0.0005	<0.0005	<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
Nickel (tot)	mg/L	-	-	0.025	-	0.001	<0.001	<0.001	0.0015	<0.001	<0.001	<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
Silver (tot)	mg/L	-	-	0.0001	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009
Zinc (tot)	mg/L	0.089	0.03	-	0.02	0.005	<0.005	<0.005	0.0058	<0.005	<0.005	<0.005	<0.005

Notes:

Detection Limit

DL exceeds criteria

Concentration exceeds MECP-GD-TA

Concentration exceeds MECP-GD-TB

Concentration exceeds PWQO-GENERAL

Concentration exceeds PWQO-INTERIM

DL: May vary between sample locations and events

MECP Guidance Document Table A

MECP Guidance Document Table B

Provincial Water Quality Objectives General

Provincial Water Quality Objectives Interim

Figures



LEGEND

Property Boundary (PA Miller, 2018)

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. 01,0002,000Metres 1:50,000				
CLIENT				
Municipality of Hasting 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				
PROJECT #		DATE		
240205-09		February 13, 2025		
DRAWN	CHECKED	FIG NO.	REV	
PB	NW	01	0	



LEGEND

- Groundwater Monitoring Location
- Decommissioned Monitoring Well
- Staff Gauge
- Surface Water Sampling Location
- Benchmark
- Road
- Site Property Boundary (PA Miller, 2018)
- 30 m Firebreak Buffer
- Approved Waste Footprint (1.9 ha)

Note: Primary Orthographic imagery collected by BluMetric RPA survey, July 2024

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES

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02550Metres

1:1,500

N

E

S

W

CLIENT

Municipality of Hasting Highlands

PROJECT

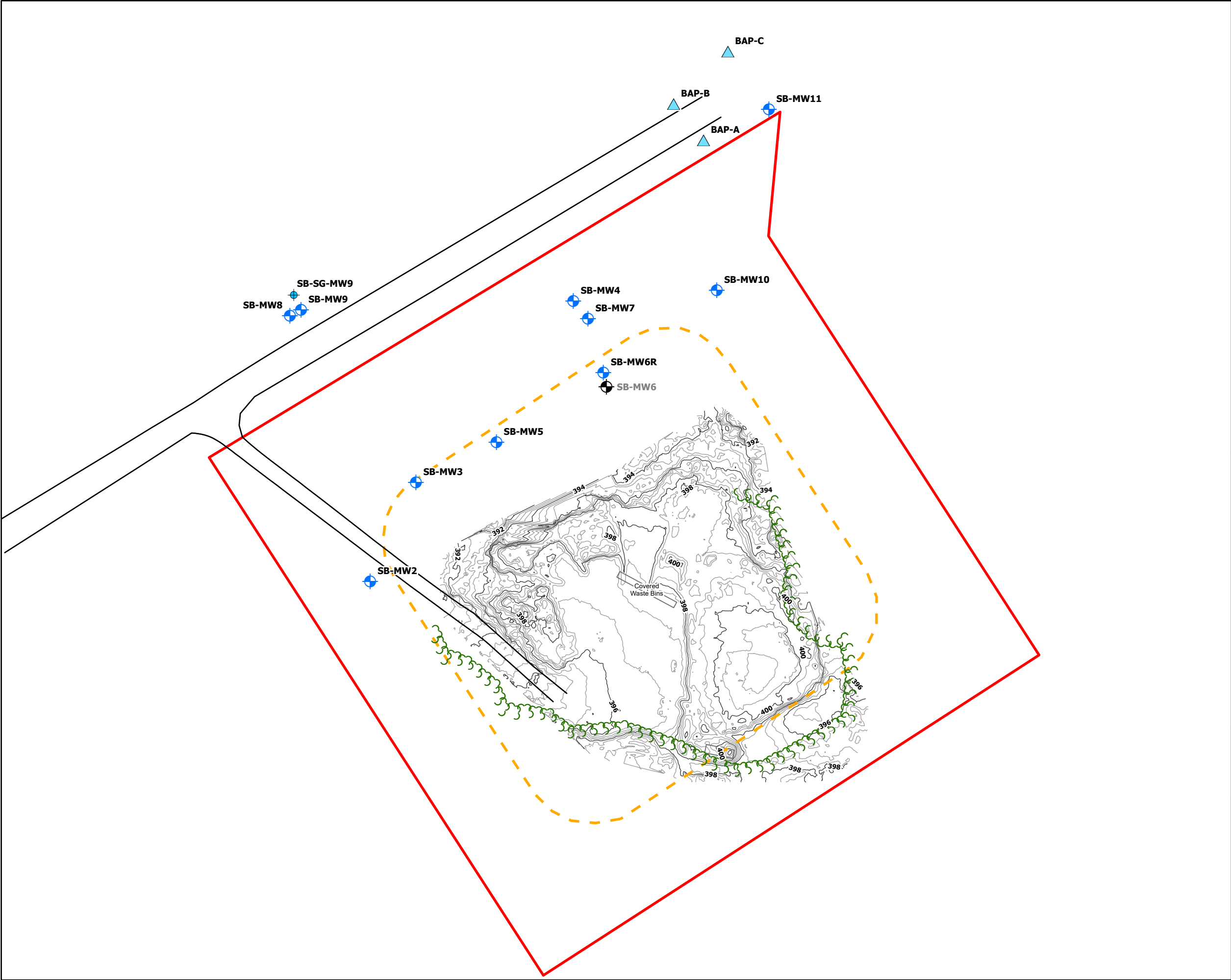
South Baptiste Waste Disposal Site

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>

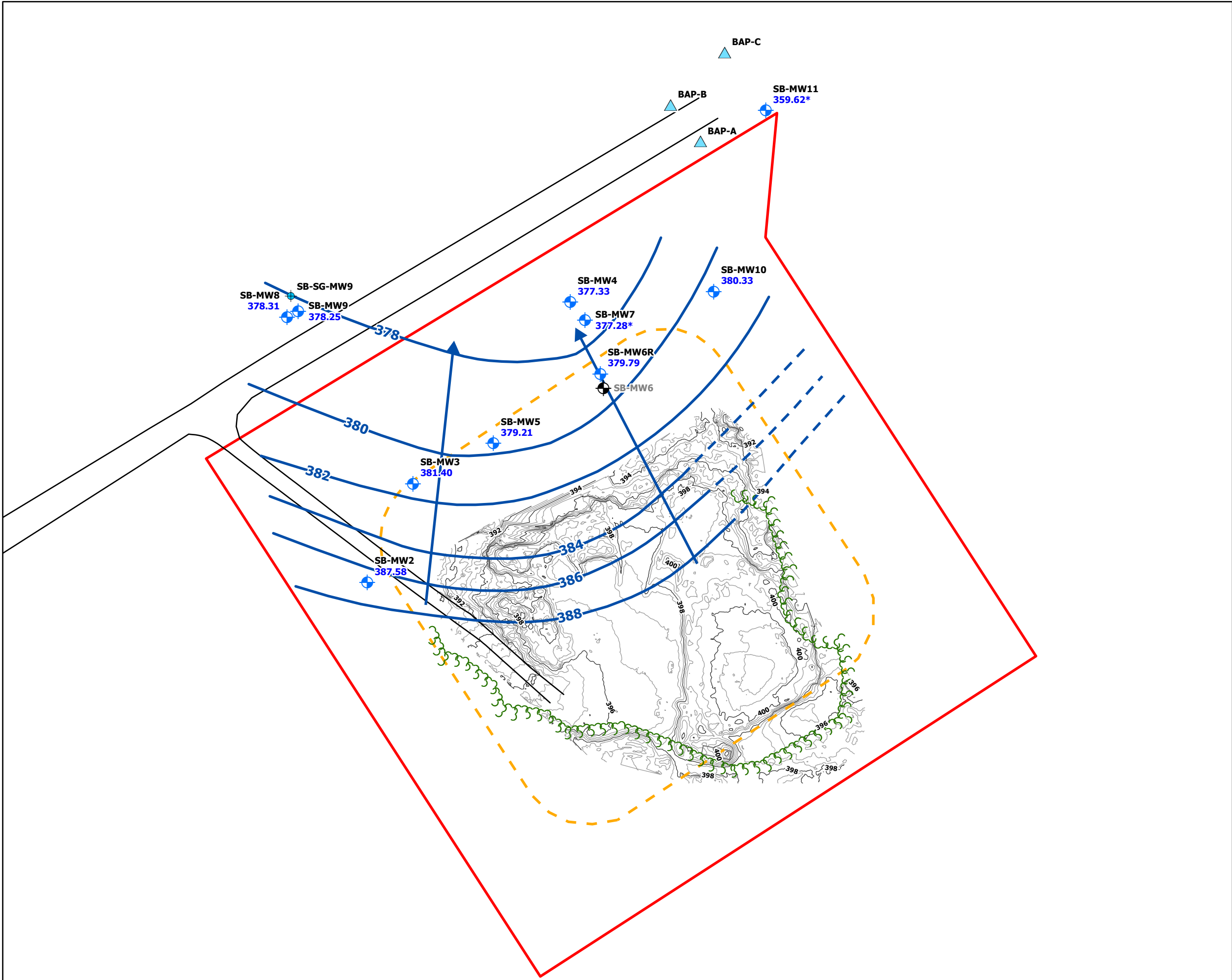
PROJECT # 240205-09		DATE February 13, 2025	
DRAWN PB	CHECKED NW	FIG NO. 02	REV 0



LEGEND

Groundwater Monitoring Location
 Decommissioned Monitoring Well
 Staff Gauge
 Surface Water Sampling Location
 Road
 Treeline
 Property Boundary (PA Miller, 2018)
 Approved Buffer Design (1996)
 2024 Topographic Contours (0.5 masl)
 2024 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.				
CLIENT Municipality of Hasting Highlands				
PROJECT South Baptiste Waste Disposal Site				
TITLE Topography (2024) 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				
PROJECT #		DATE		
240205-09		February 13, 2025		
DRAWN	CHECKED	FIG NO.	REV	
PB	NW	03	0	



LEGEND

380.64 Groundwater Elevation (Spring, 2024)

Groundwater Monitoring Location

Decommissioned Monitoring Well

Staff Gauge

Surface Water Sampling Location

Inferred Direction of Groundwater Flow

Inferred Groundwater Elevation Contour (masl)

Estimated Groundwater Elevation Contour (masl)

Road

Treeline

Property Boundary (PA Miller, 2018)

Approved Buffer Design (1996)

2024 Topographic Contours (0.5 masl)

2024 Topographic Contours (2 masl)

* Bedrock well not used to develop groundwater contours

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES

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1:1,300

CLIENT

Municipality of Hasting Highlands

PROJECT

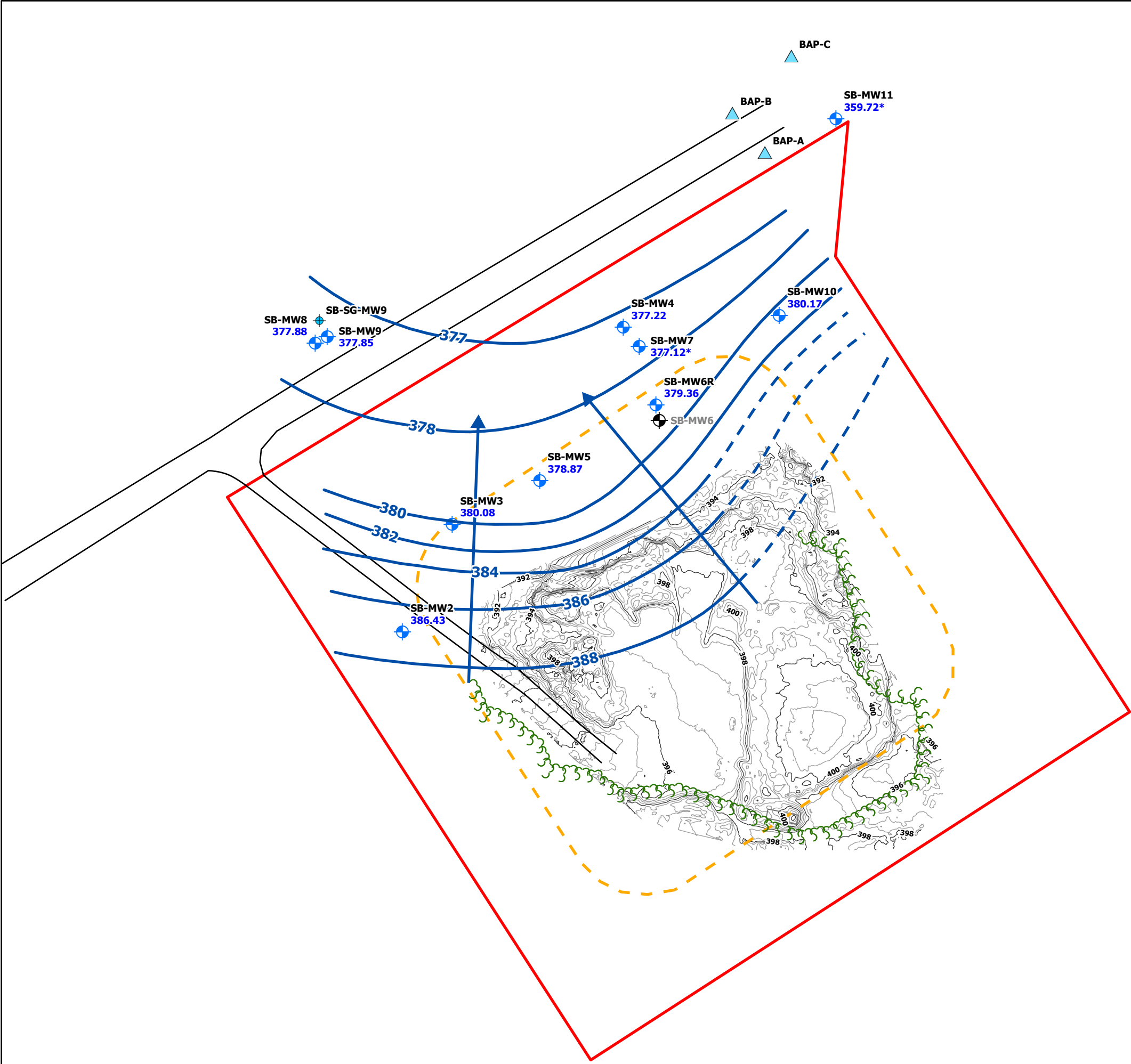
South Baptiste Waste Disposal Site

TITLE

Groundwater Flow Direction Spring 2024

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>

PROJECT #		DATE	
240205-09		March 07, 2025	
DRAWN	CHECKED	FIG NO.	REV
PB	NW	04	0



LEGEND

380.64 Groundwater Elevation (Fall, 2024)

Groundwater Monitoring Location

Decommissioned Monitoring Well

Staff Gauge

Surface Water Sampling Location

Inferred Direction of Groundwater Flow

Inferred Groundwater Elevation Contour (masl)

Estimated Groundwater Elevation Contour (masl)

Road

Treeline

Property Boundary (PA Miller, 2018)

Approved Buffer Design (1996)

2024 Topographic Contours (0.5 masl)

2024 Topographic Contours (2 masl)

* Bedrock well not used to develop groundwater contours

1				
REV.	DESCRIPTION	YY/MM/DD	BY	CHK

REFERENCES

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1:1,300

CLIENT

Municipality of Hasting Highlands

PROJECT

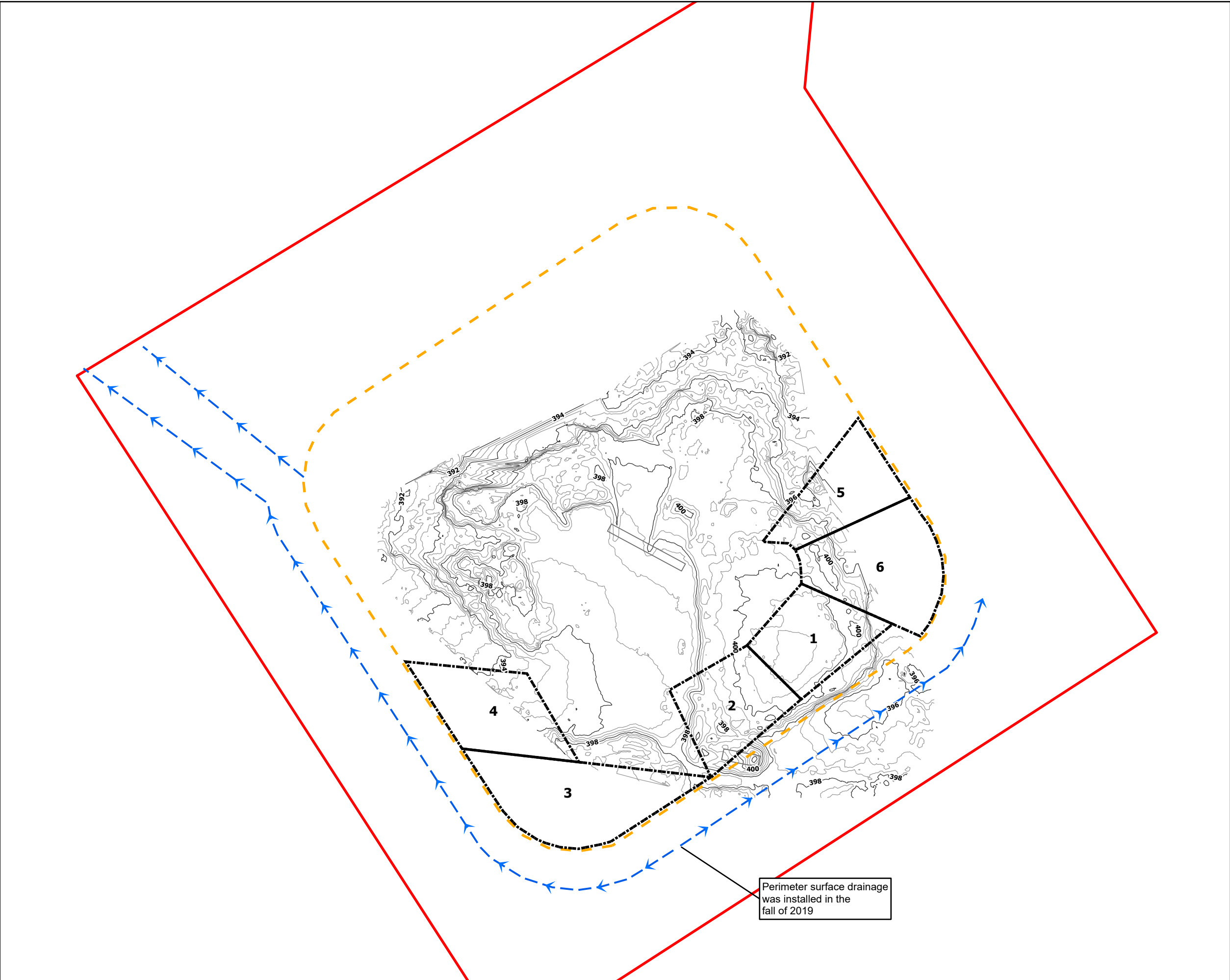
South Baptiste Waste Disposal Site

TITLE

**Groundwater Flow Direction
Fall 2024**

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>

PROJECT # 240205-09		DATE March 07, 2025	
DRAWN PB	CHECKED NW	FIG NO. 05	REV 0



LEGEND

	Property Boundary (PA Miller, 2018)
	Approved Buffer Design (1996)
	Cell Boundaries
	DrainageSwale
	2024 Topographic Contours (0.5 masl)
	2024 Topographic Contours (2 masl)

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

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.

02550

Metres

1:1,000

N

E

S

W

CLIENT

Municipality of Hasting Highlands

PROJECT

South Baptiste
Waste Disposal Site

TITLE

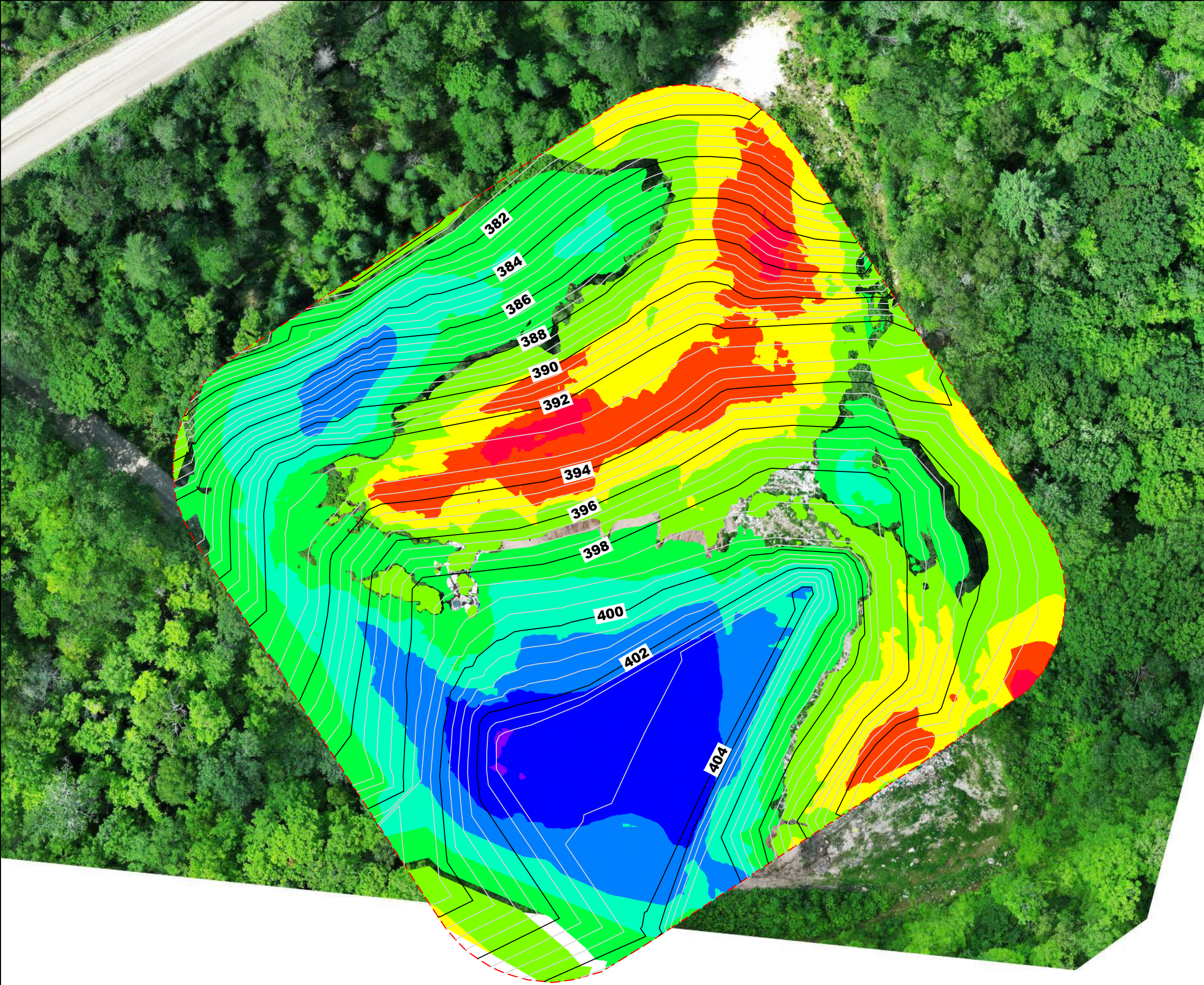
Cell Development - Phase 1
396 - 398 m asl

BluMetric

Environmental

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>

PROJECT # 240205-09		DATE February 13, 2025	
DRAWN PB	CHECKED NW	FIG NO. 06	REV 0



LEGEND

- 382 - Final Design Contours (0.5m)

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Volume	Color
1	-7.67	-6.00	96	
2	-6.00	-4.00	1675	
3	-4.00	-2.00	6146	
4	-2.00	-0.25	10593	
5	0.25	2.00	13673	
6	2.00	4.00	8877	
7	4.00	6.00	4115	
8	6.00	8.00	1531	
9	8.00	8.30	1	

Volumes Table - 2024 to Final Design Contours	
Cut	20,528 Cu. M.
Fill	30,749 Cu. M.
Net Fill	10,221 Cu. M.

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.

01530Metres

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CLIENT

Municipality of Hastings Highlands

PROJECT

South Baptiste Waste Disposal Site

TITLE

Remaining Fill Capacity
July 9, 2024



4 Cataraqui 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		
240205-09	February 13, 2025		
DRAWN	CHECKED	DWG NO.	REV
PB	NW	07	0

Site Photographs



Photo 1: Site entrance – April 29, 2024



Photo 2: Covered waste bins – April 29, 2024



Photo 3: Active landfill cell – April 29, 2024



Photo 4: Landfilling site, facing northwest – April 29, 2024



Photo 5: Bulky waste and tire pile – April 29, 2024



Photo 6: Downed signage – April 29, 2024



Photo 7: Scrap metal pile – April 29, 2024



Photo 8: Brush and yard waste pile – April 29, 2024



Photo 9: BAP-A – April 29, 2024



Photo 10: BAP-B – April 29, 2024



Photo 11: BAP-C – April 29, 2024



Photo 12: BAP-D – April 29, 2024



Photo 13: Bulky waste and tire pile – July 10, 2024



Photo 14: Bulky waste pile– July 10, 2024



Photo 15: Scrap metal pile – July 10, 2024



Photo 16: Brush and yard waste pile – July 10, 2024



Photo 17: BAP-A – July 10, 2024



Photo 18: BAP-B– July 10, 2024



Photo 19: BAP-C – July 10, 2024



Photo 20: BAP-D – July 10, 2024



Photo 25: Site entrance gate – October 30, 2024



Photo 26: Site entrance gate – October 30, 2024



Photo 27: Attendant's hut – October 30, 2024



Photo 28: Covered waste bins – October 30, 2024



Photo 29: Active landfill cell – October 30, 2024



Photo 30: Active landfill cell – October 30, 2024



Photo 31: Unauthorized human activity just outside active landfill area – October 30, 2024



Photo 32: Unauthorized human activity just outside active landfill area – October 30, 2024



Photo 33: Tire pile – October 30, 2024



Photo 34: Bulky waste pile – October 30, 2024



Photo 35: Scrap metal pile – October 30, 2024



Photo 36: Brush and yard waste pile – October 30, 2024



Photo 37: BAP-A – October 30, 2024



Photo 38: BAP-B – October 30, 2024

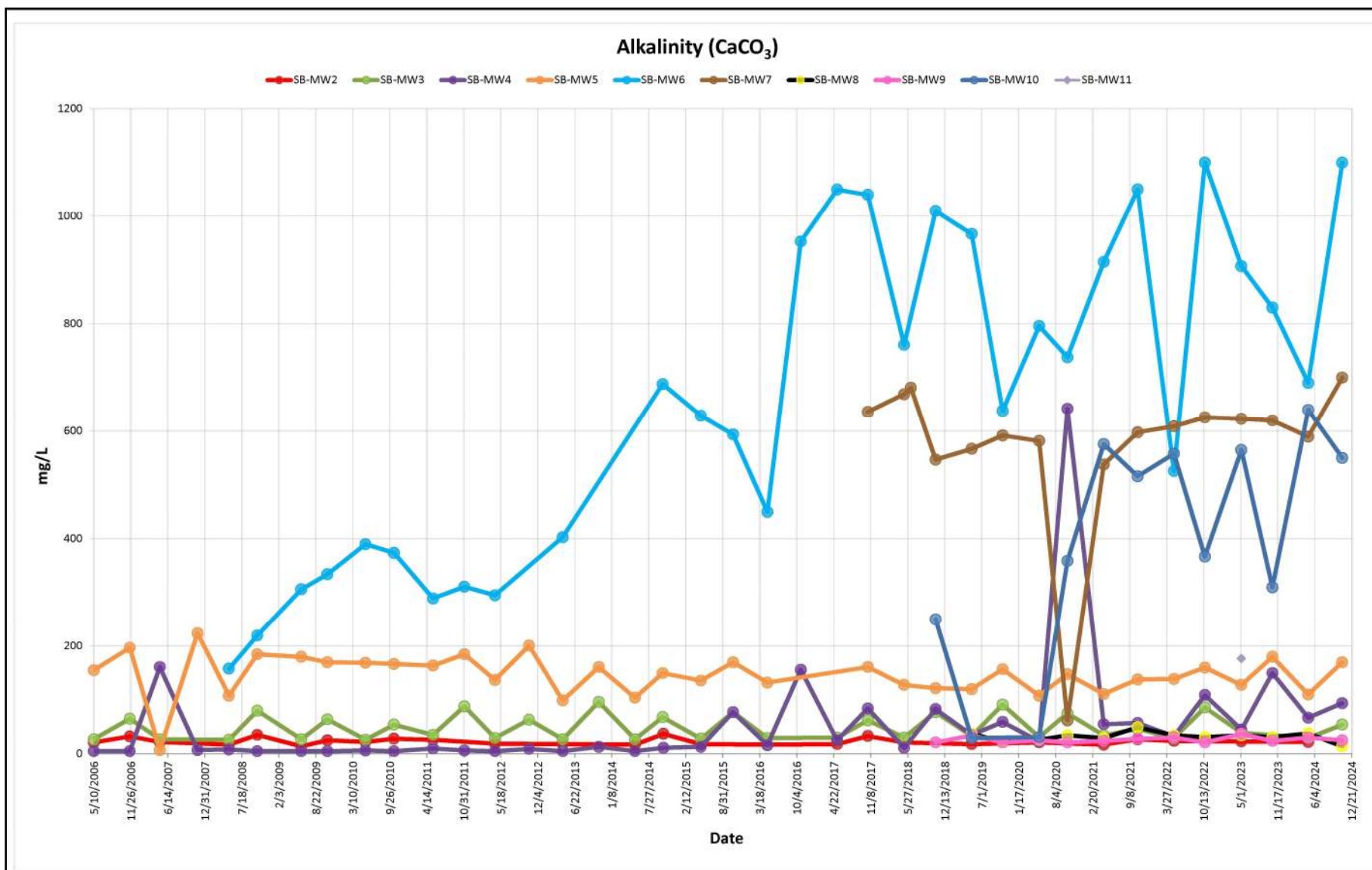


Photo 39: BAP-C – October 30, 2024



Photo 40: BAP-D – October 30, 2024

Chemistry Trend Graphs



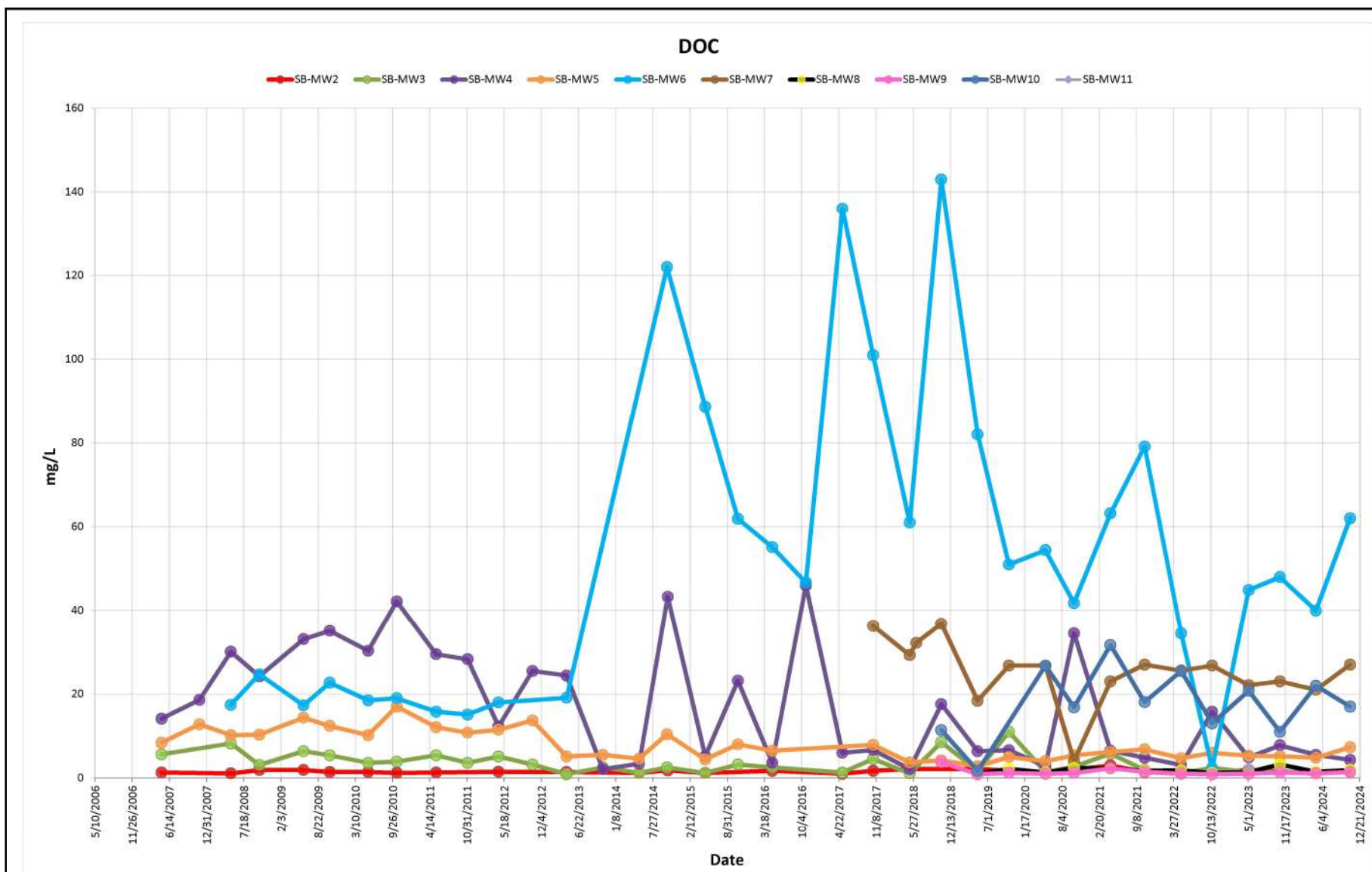
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 1
Alkalinity in Groundwater

Created by: LH
Checked by: CM





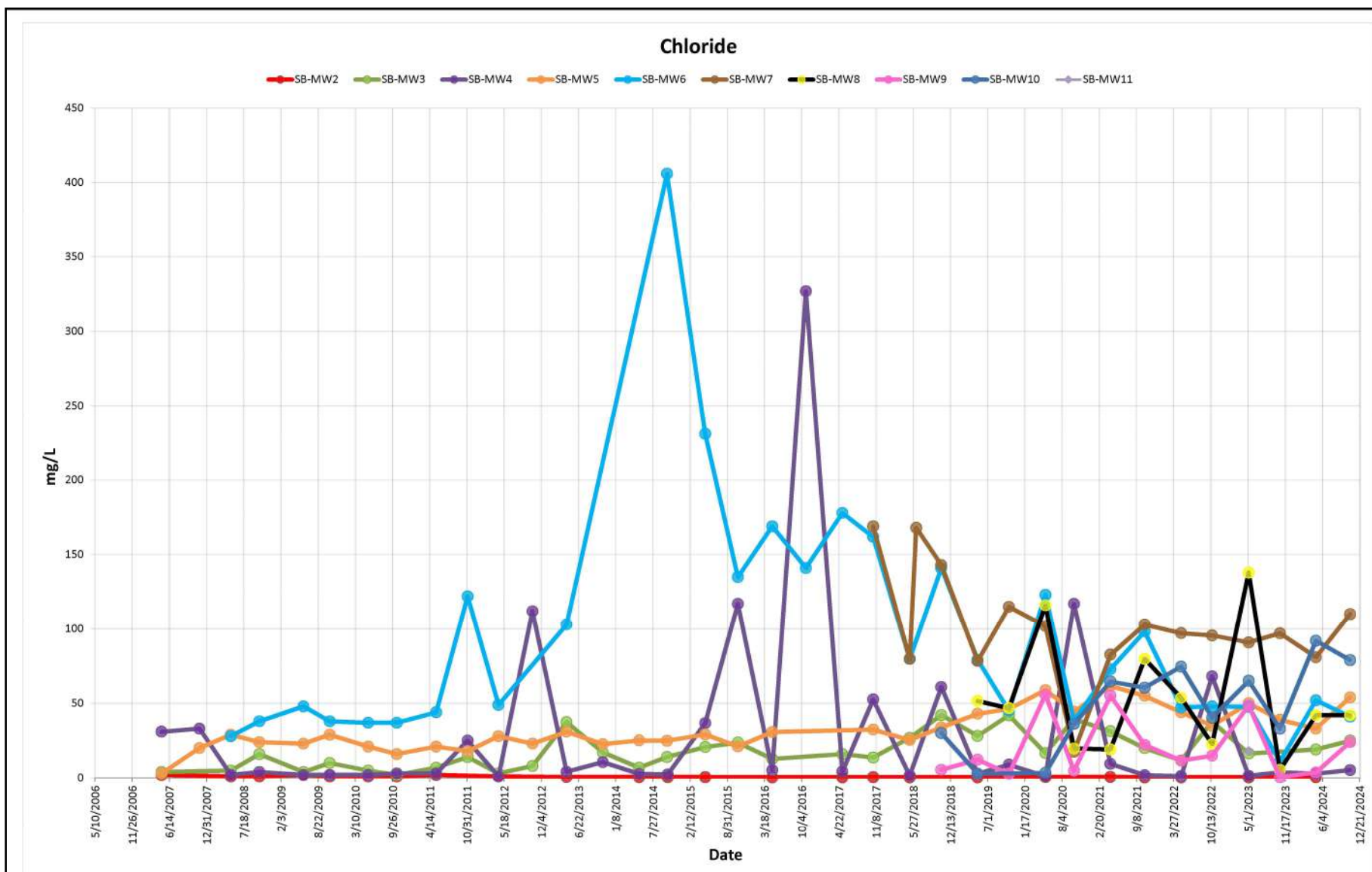
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 2
Dissolved Organic Carbon in Groundwater

Created by: LH
Checked by: CM





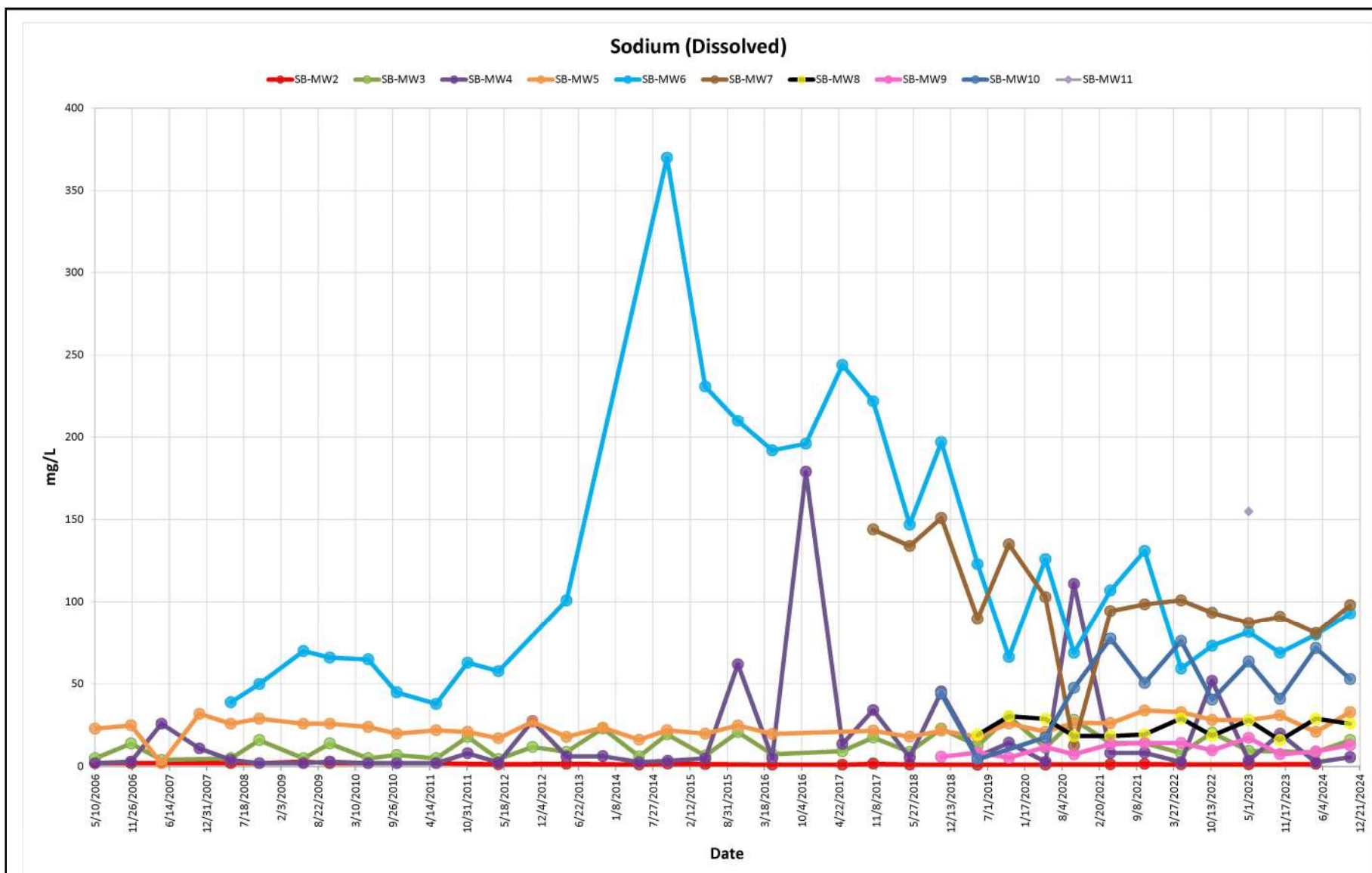
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 3
Chloride in Groundwater

Created by: LH
Checked by: CM





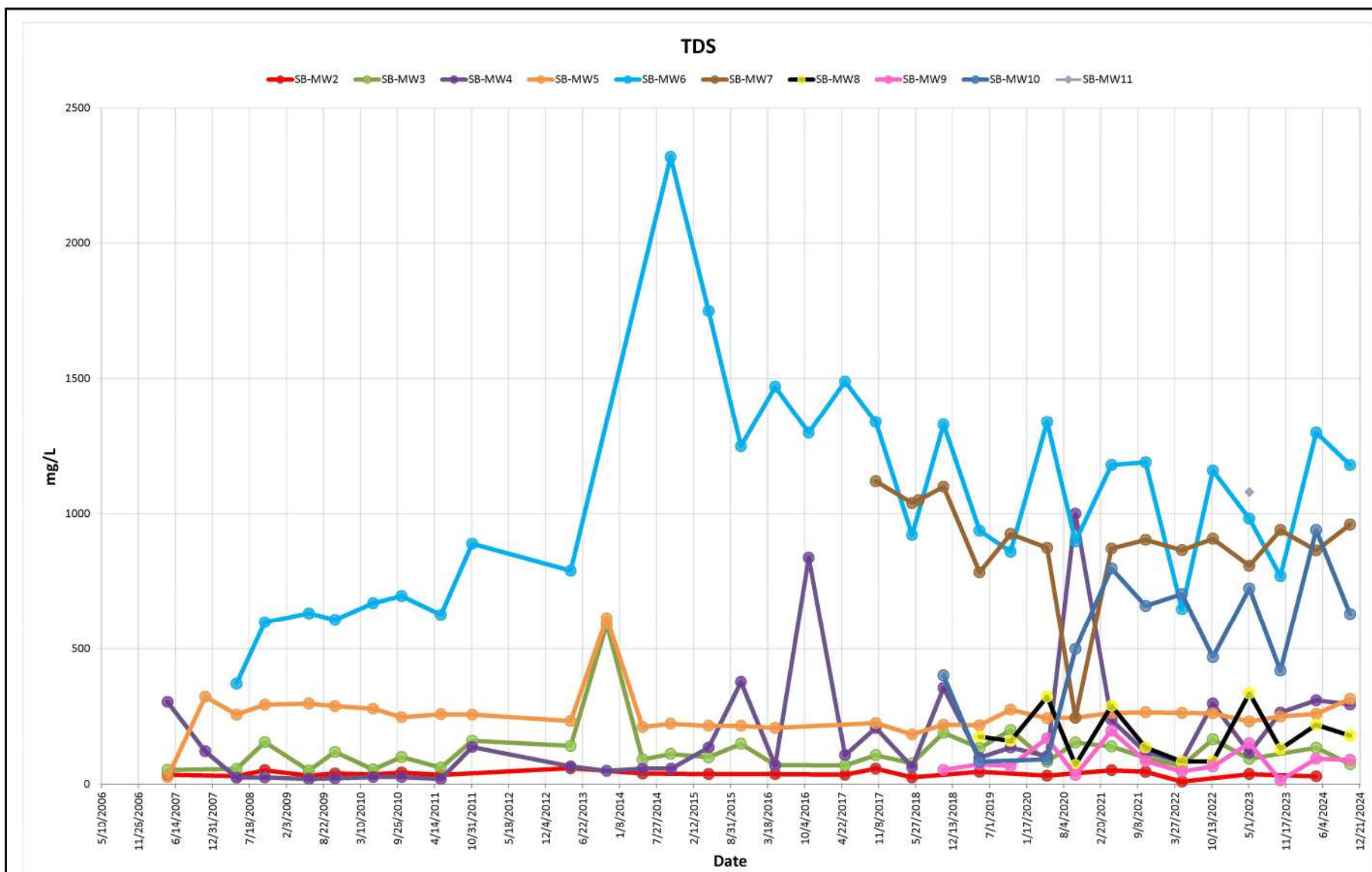
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 4
Dissolved Sodium in Groundwater

Created by: LH
Checked by: CM





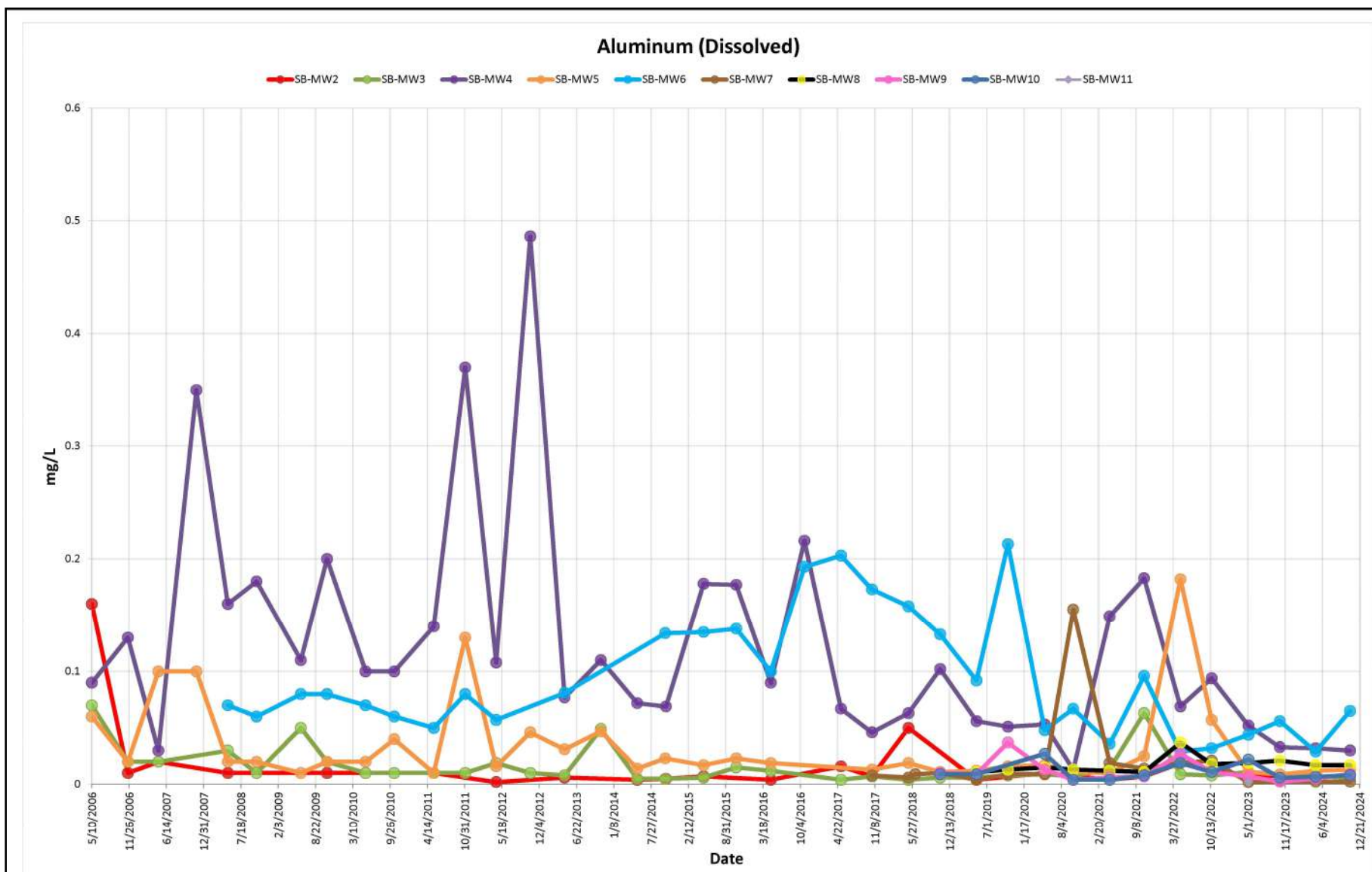
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 5
Total Dissolved Solids in Groundwater

Created by: LH
Checked by: CM





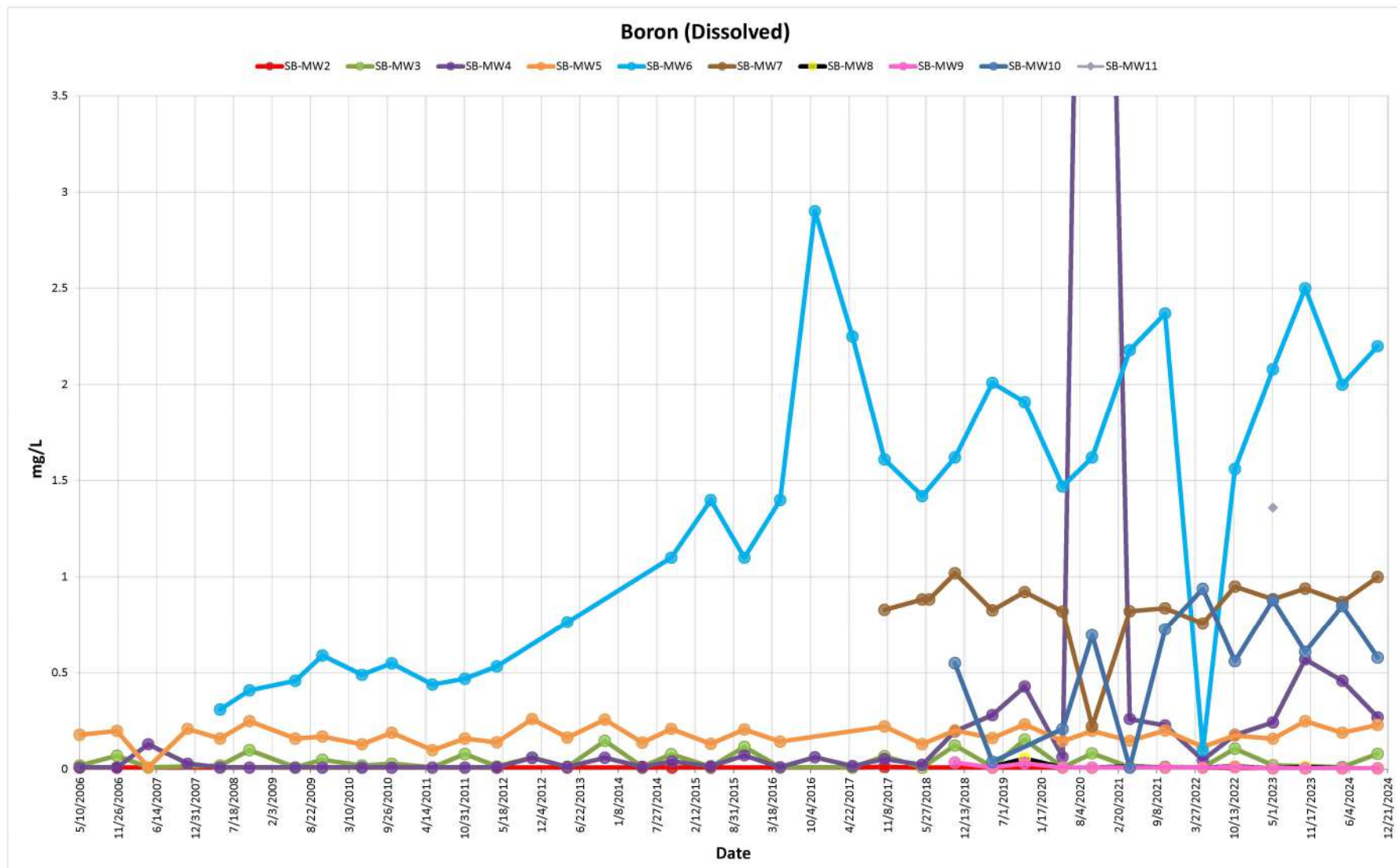
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 6
Dissolved Aluminum in Groundwater

Created by: LH
Checked by: CM





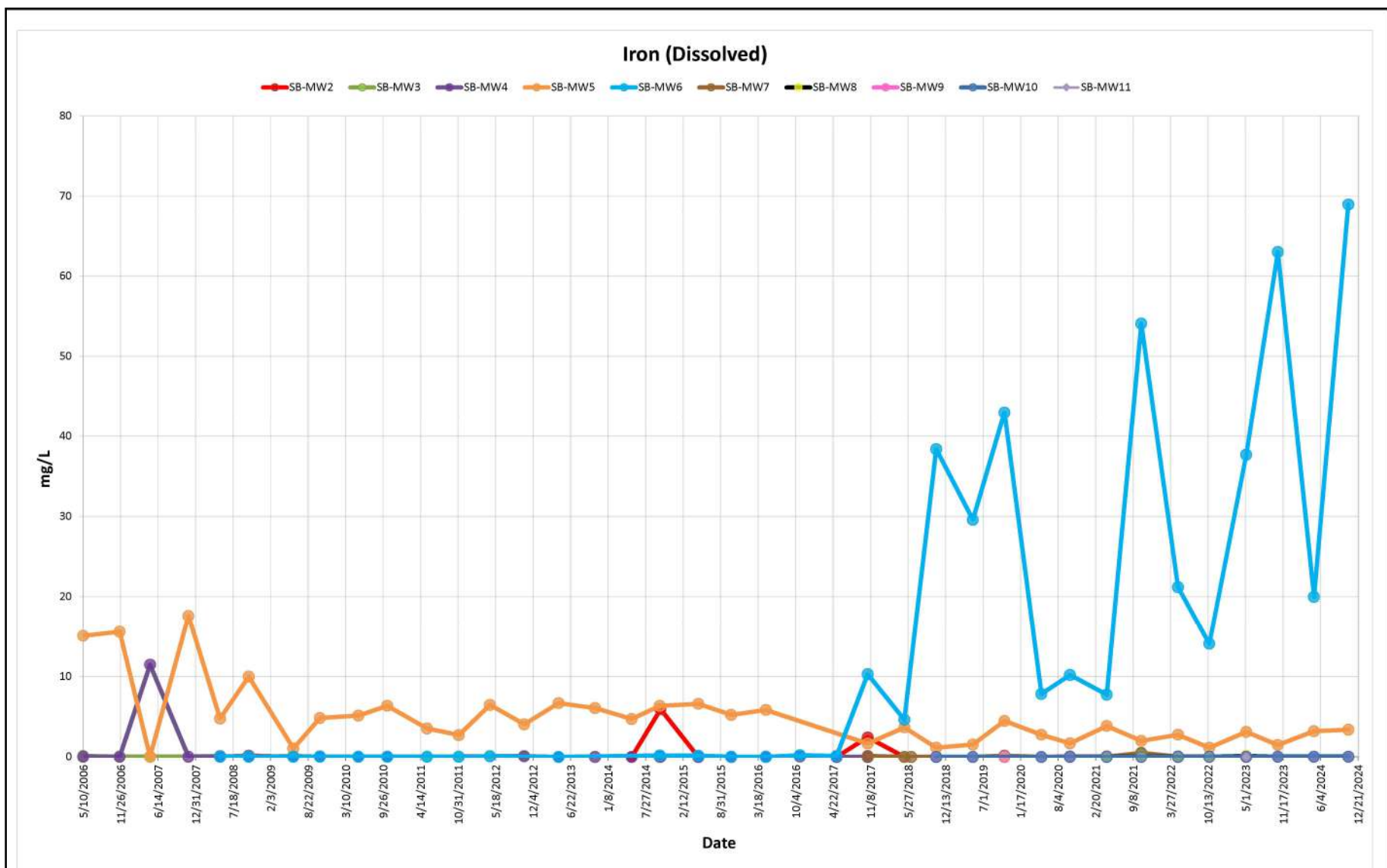
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 7
Dissolved Boron in Groundwater

Created by: LH
Checked by: CM





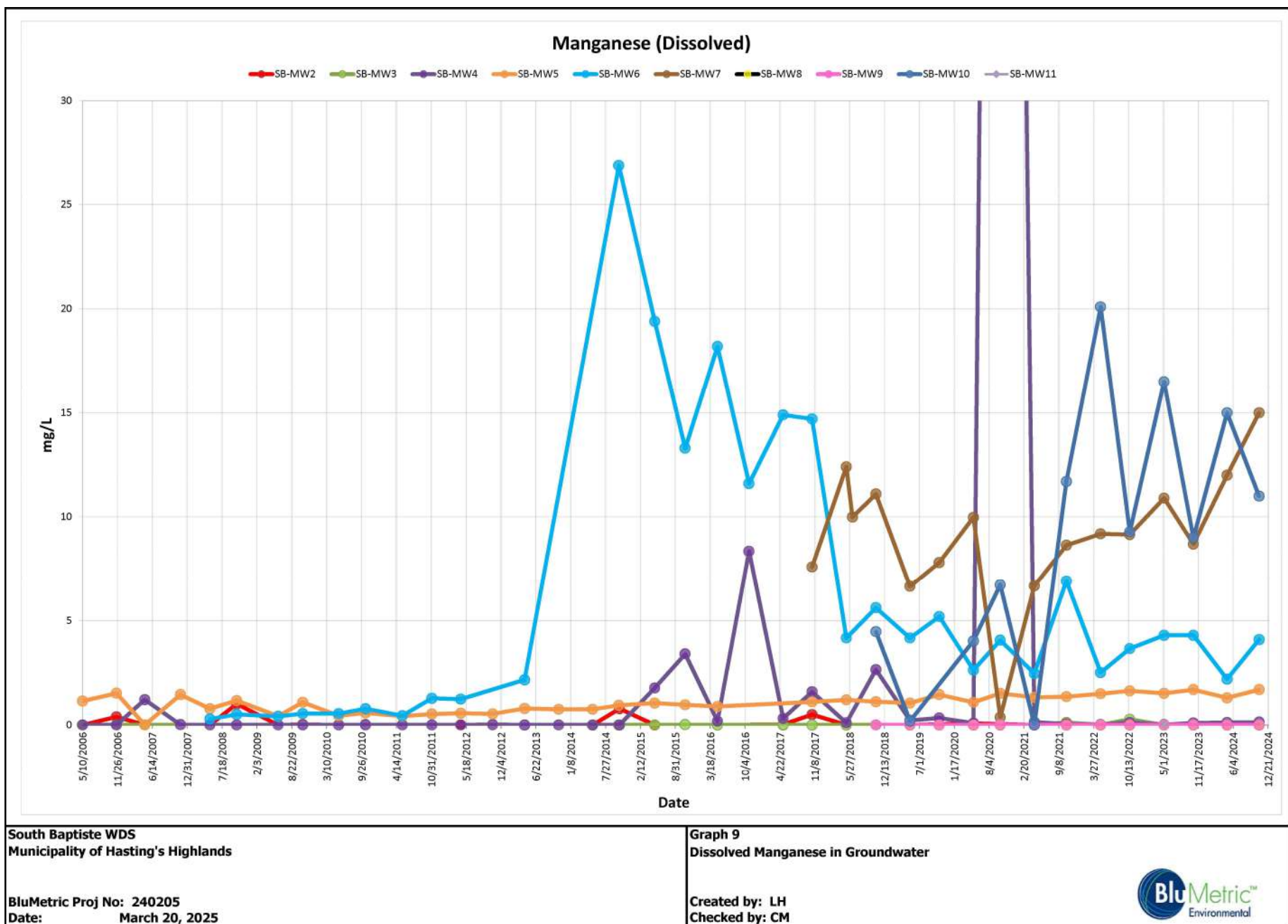
South Baptiste WDS
Municipality of Hasting's Highlands

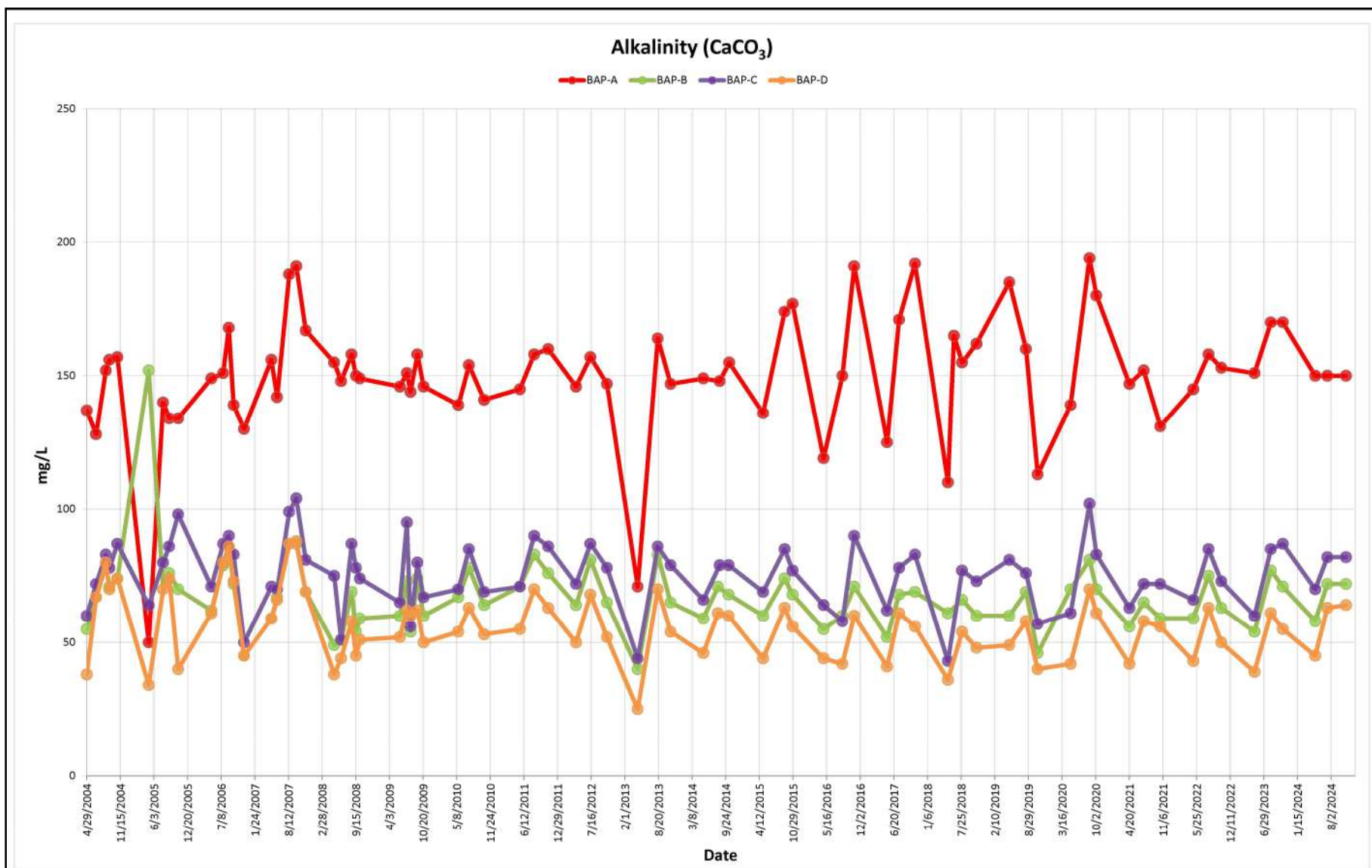
BluMetric Proj No: 240205
Date: March 20, 2025

Graph 8
Dissolved Iron in Groundwater

Created by: LH
Checked by: CM







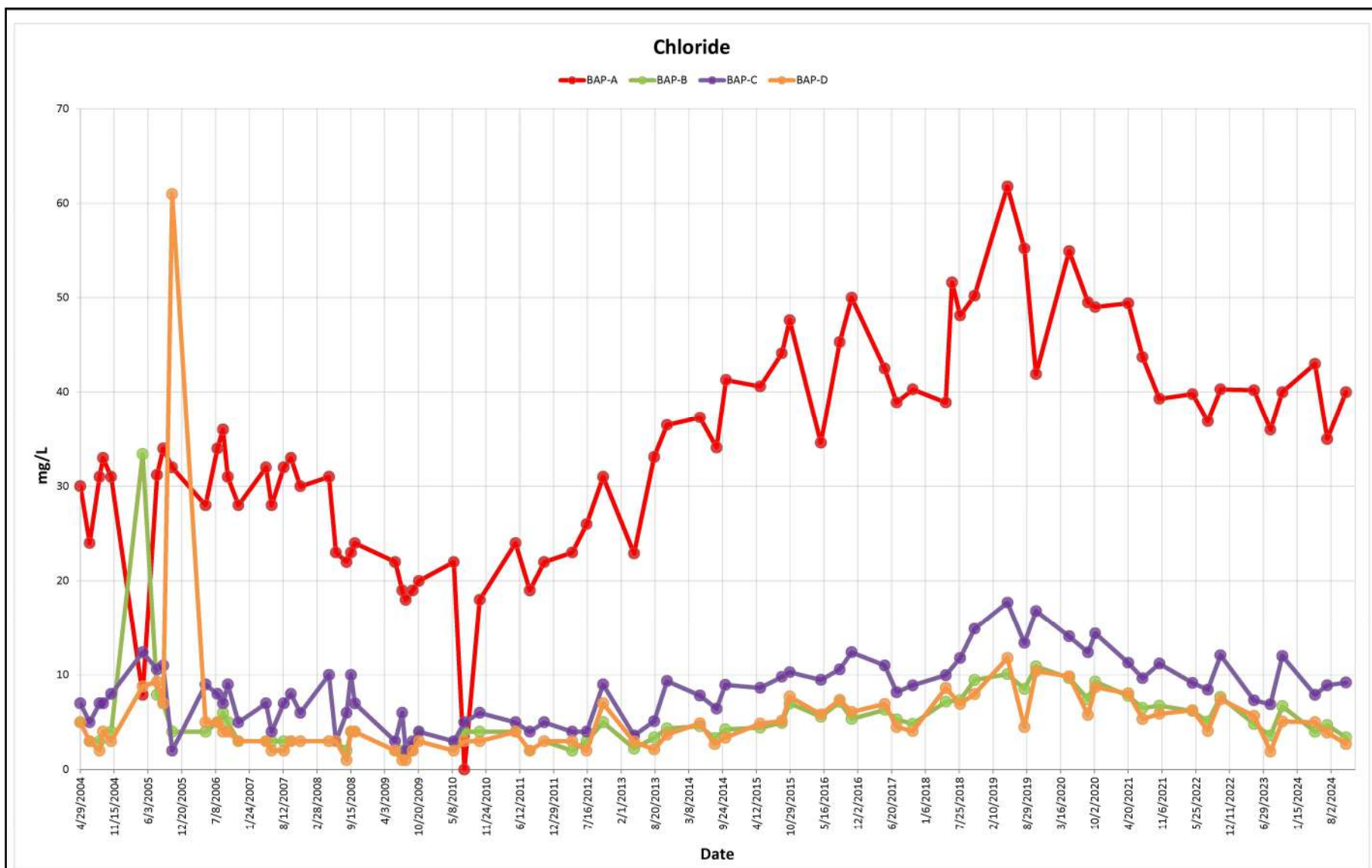
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 10
Alkalinity in Surface Water

Created by: LH
Checked by: CM





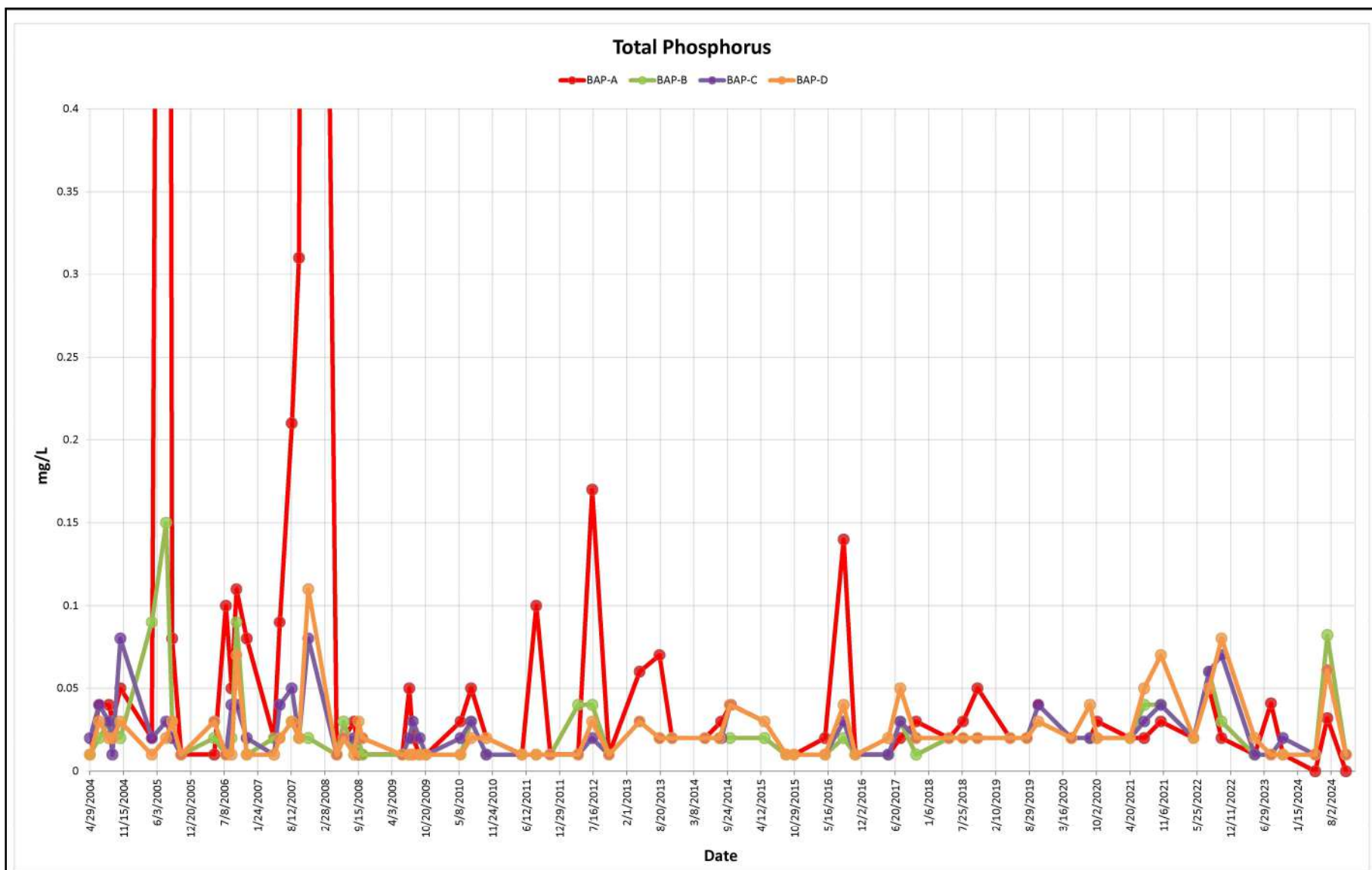
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 11
Chloride in Surface Water

Created by: LH
Checked by: CM





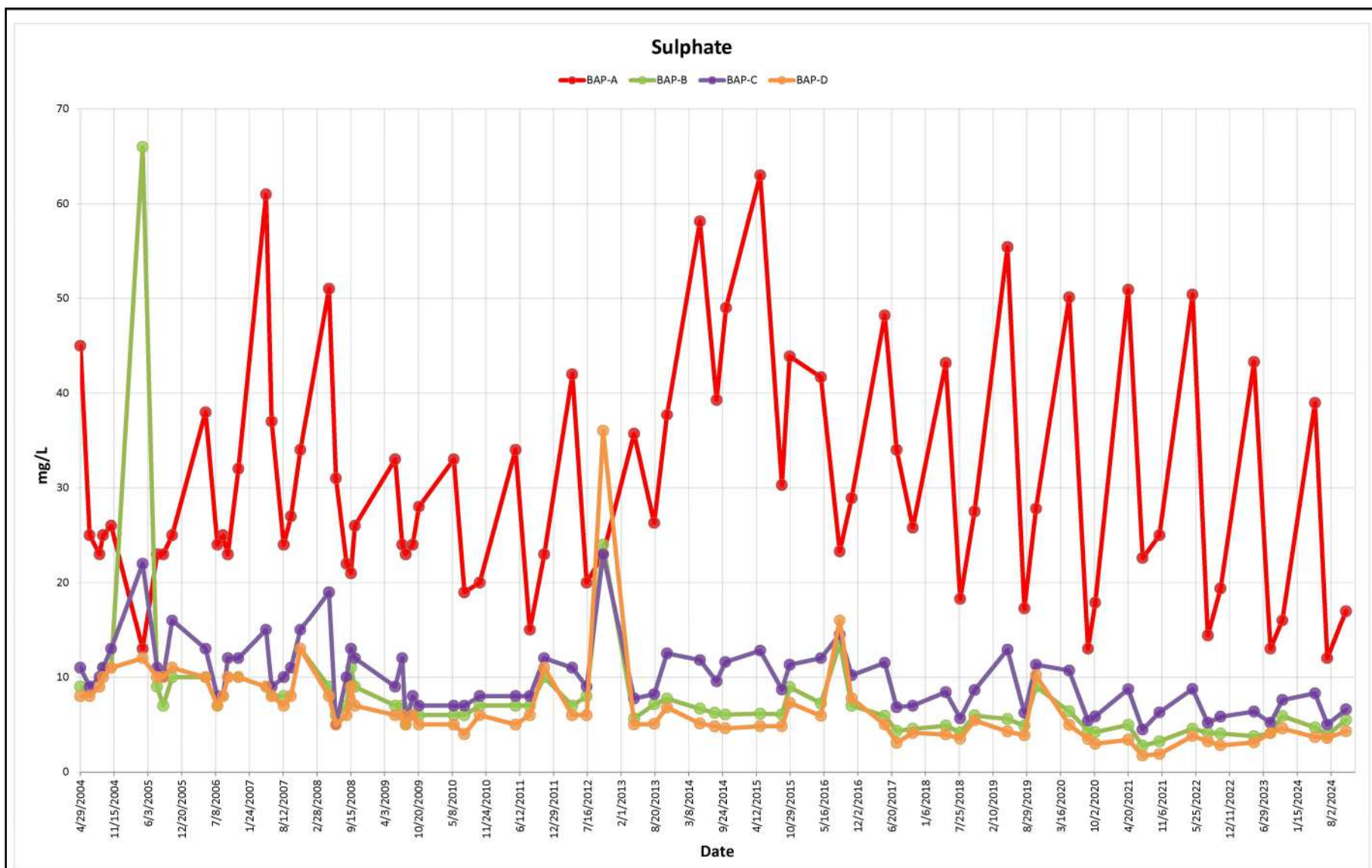
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 12
Total Phosphorus in Surface Water

Created by: LH
Checked by: CM





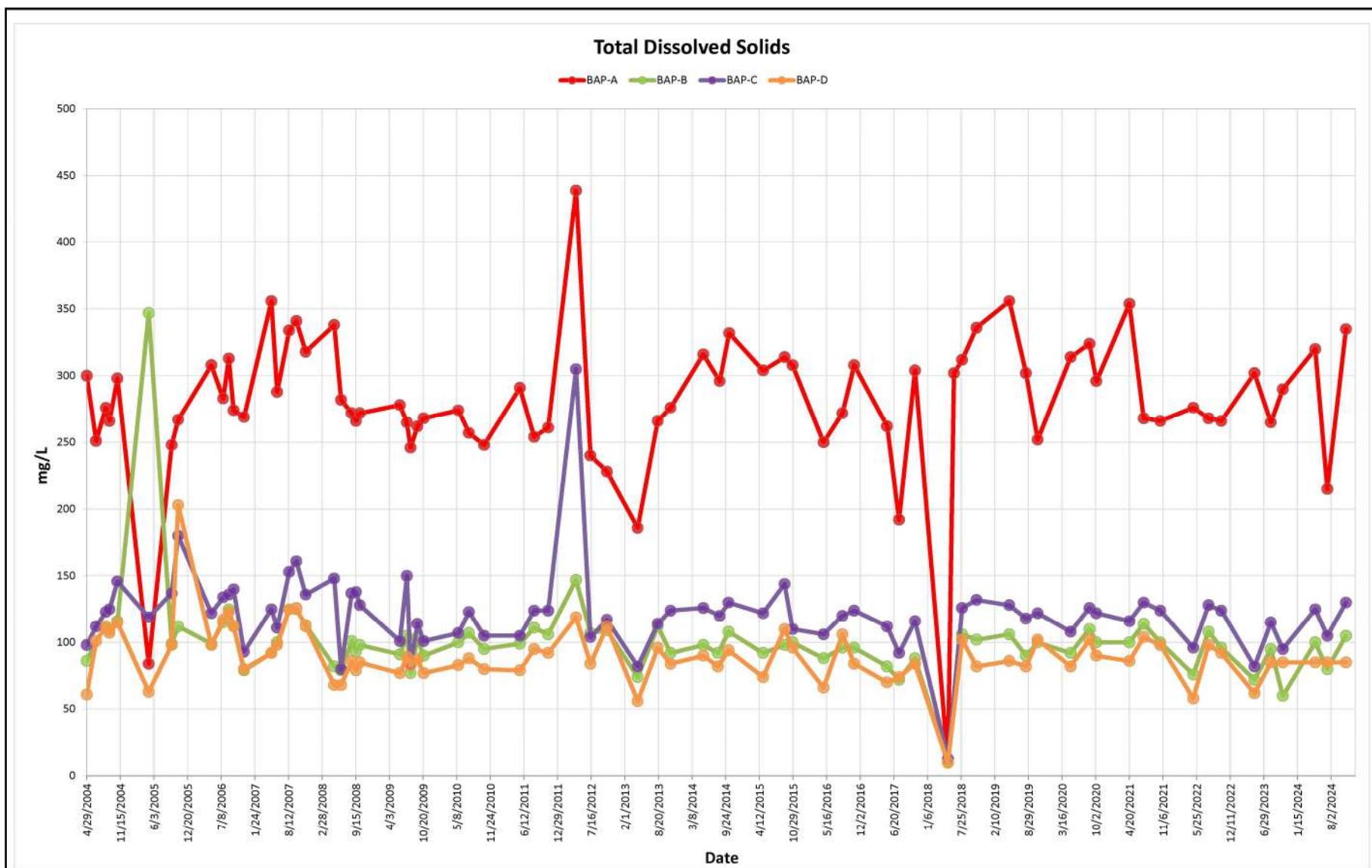
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 13
Sulphate in Surface Water

Created by: LH
Checked by: CM





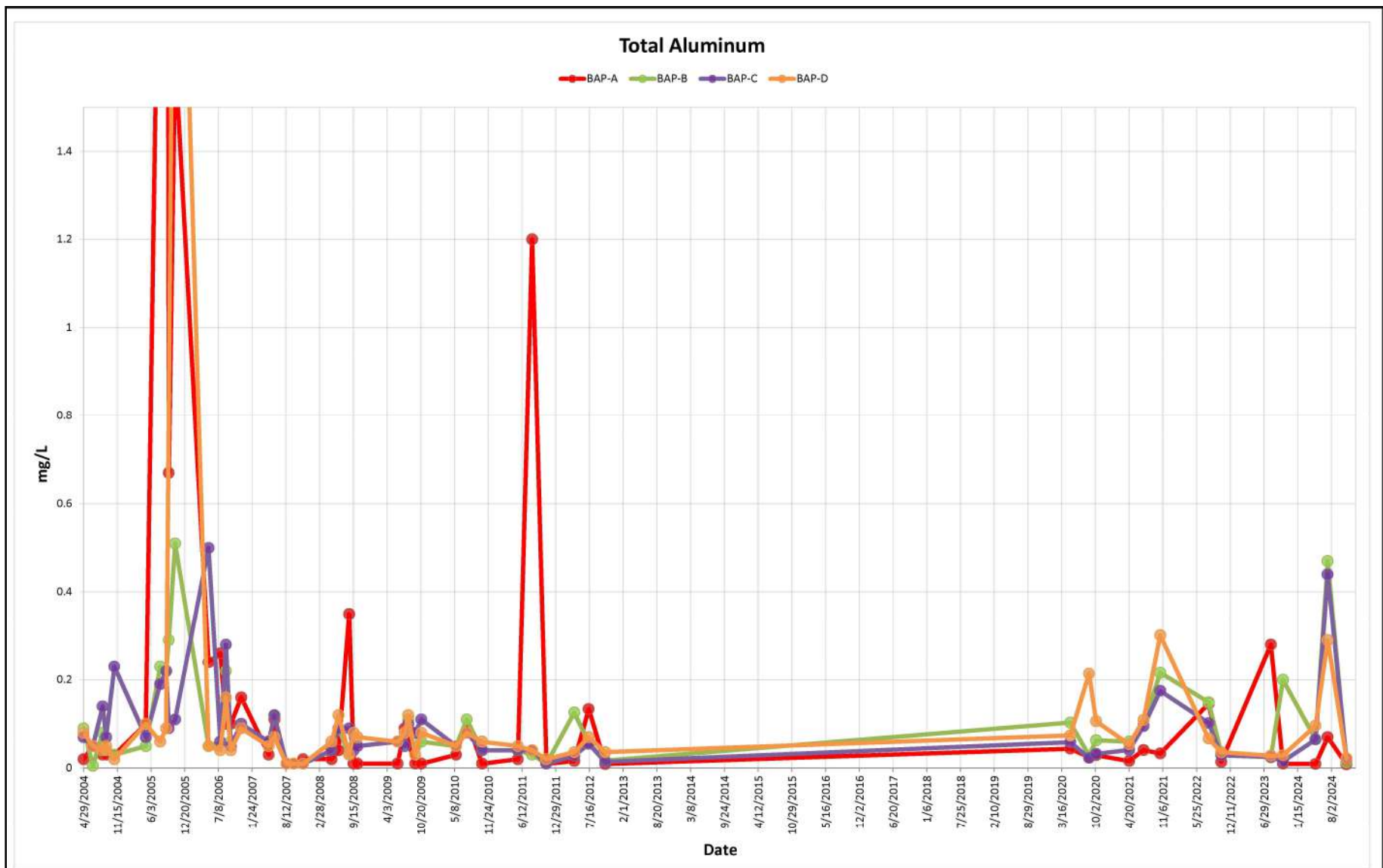
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 14
Total Dissolved Solids in Surface Water

Created by: LH
Checked by: CM





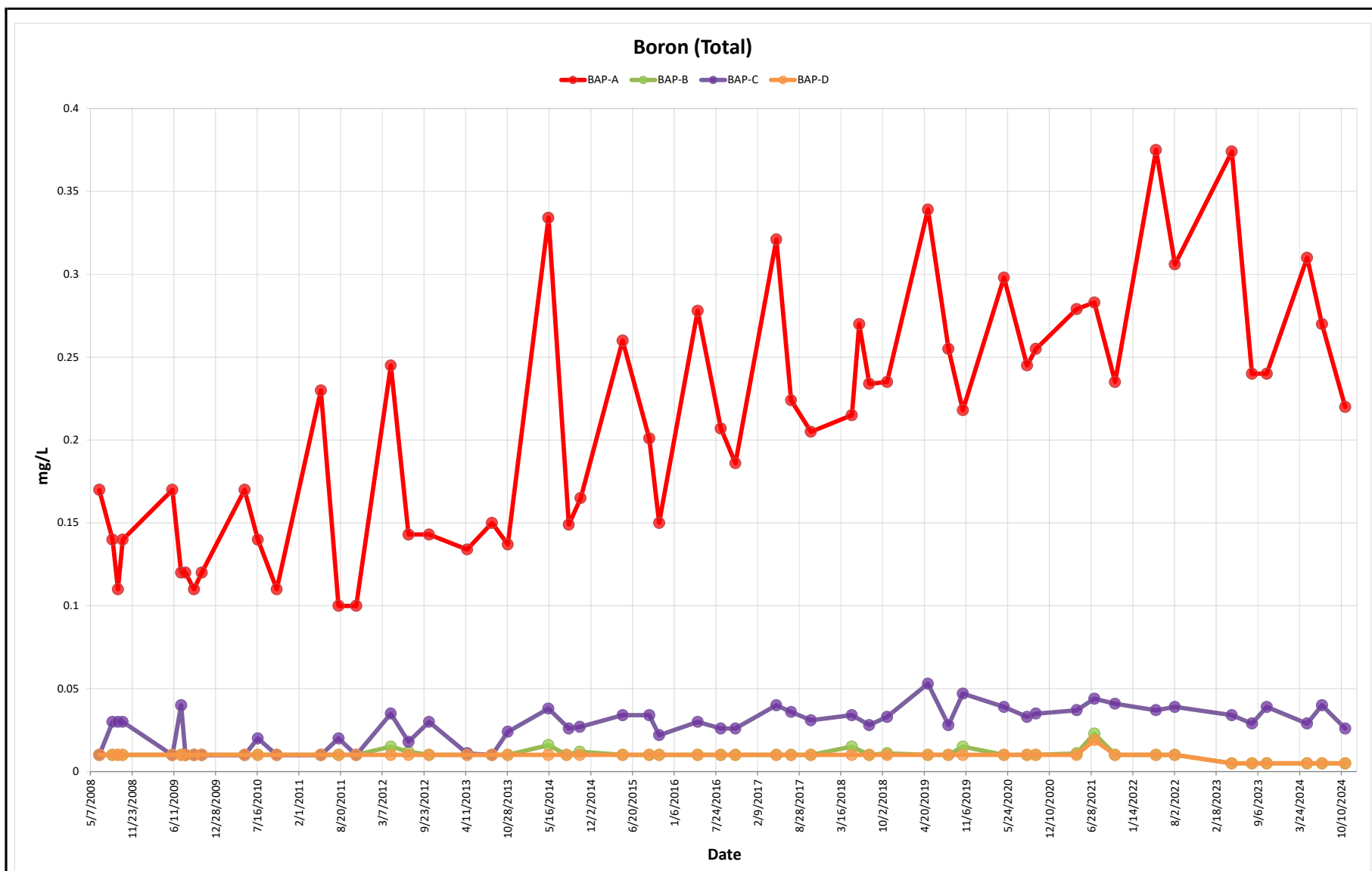
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 15
Total Aluminum in Surface Water

Created by: LH
Checked by: CM





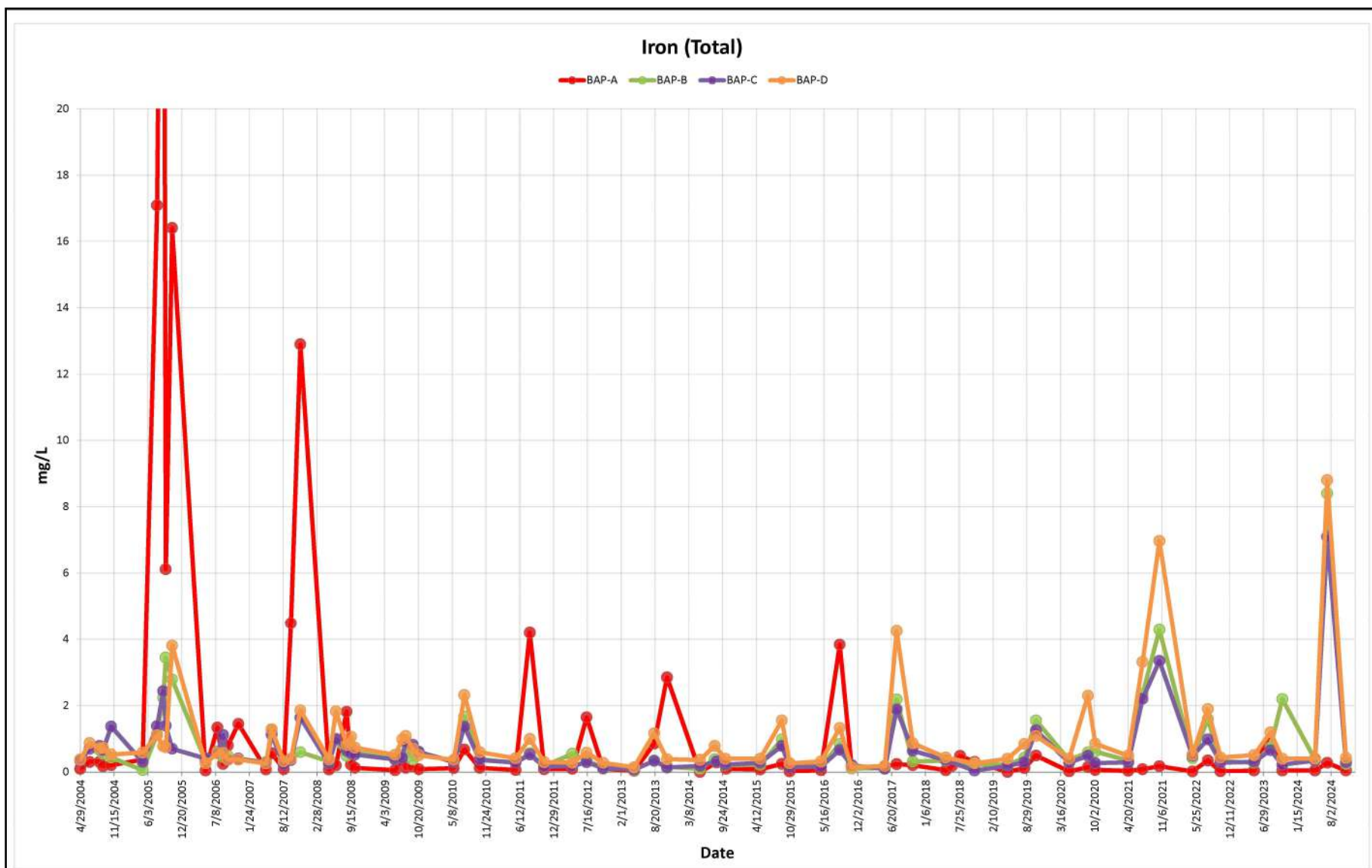
South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

Graph 16
Total Boron in Surface Water

Created by: LH
Checked by: CM





South Baptiste WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: March 20, 2025

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:
- relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement; or
 - 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:
- the ownership of the *Site*;
 - the *Operator* of the *Site*;
 - the address of the *Owner* or *Operator*; and
 - 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

- c. of refrigerants as required by Ontario Regulation 189/94 (O. Reg. 189/94); and 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 ₅), 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

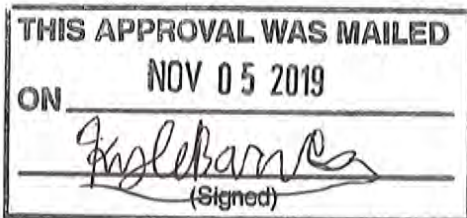
AND

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

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, 5th 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	=	\$ 1,564.00 + Administrative Fee + HST

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)

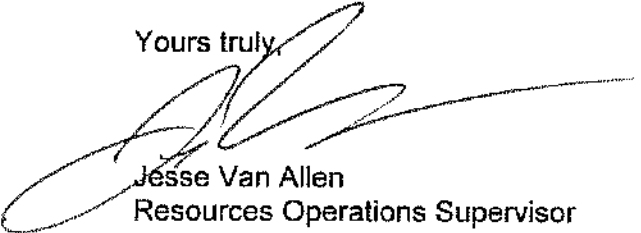
This Land Use Permit has been issued for a 10-year term, with a termination date of February 28, 2027. Your fees for the first year include administration fees of \$150.00 (plus HST), which will be removed in subsequent years. After the final phased-in increase is applied in 2020, your annual fees due 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



Land Use Permit
Public Lands Act

File: (FEB)

Permit No.
LUP1634-1004201

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
------------------------	--	--------------------------------------	---

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.		Signature of Applicant (Incl. Corporation Official) <i>[Signature]</i>	Date Signed June 20/17
I agree that this is the complete agreement between the parties hereto.			

Corporation Use Only

I have authority to bind the herein-named Corporation		
Initials and Surname of Corporation Official (Please Print) E. P. K. R. V. M.	Signature of Corporation Official <i>[Signature]</i>	Position Chairman June 20/17

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.

Monitoring Report and Site Information	
Waste Disposal Site Name	South Baptiste Waste Disposal Site
Location (e.g. street address, lot, concession)	2539 South Baptiste Lake Road
GPS Location (taken within the property boundary at front gate/ front entry)	734410 m E, 4996556 m N
Municipality	Municipality of Hasting Highlands (formerly Twp. of Herschel)
Client and/or Site Owner	The Corporation of Hasting Highlands
Monitoring Period (Year)	2024
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval Number:	A 361602
Director's Order No.:	
Provincial Officer's Order No.:	
Other:	

Report Submission Frequency	☒ Annual ☐ Other	March 31st of the following reporting period	
The site is: (Operation Status)	☒ Open ☐ Inactive ☐ Closed		
Does your Site have a Total Approved Capacity?	☒ Yes ☐ No		
If yes, please specify Total Approved Capacity	82,785	Units	Cubic Metres
Does your Site have a Maximum Approved Fill Rate?	☐ Yes ☒ No		
If yes, please specify Maximum Approved Fill Rate		Units	
Total Waste Received within Monitoring Period (Year)	578	Units	Tonnes
Total Waste Received within Monitoring Period (Year) Methodology	Estimation		
Estimated Remaining Capacity	11,927	Units	Cubic Metres
Estimated Remaining Capacity Methodology	Aerial Photogrammetry		
Estimated Remaining Capacity Date Last Determined	31-Dec-2023		
Non-Hazardous Approved Waste Types	☒ Domestic ☒ Industrial, Commercial & Institutional (IC&I) ☐ Source Separated Organics (Green Bin) ☒ Tires	☒ Contaminated Soil ☒ Wood Waste ☒ Blue Box Material ☐ Processed Organics ☒ Leaf and Yard Waste	☐ Food Processing/Preparation Operations Waste ☐ Hauled Sewage Other:
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial (separate waste classes by comma)			
Year Site Opened (enter the Calendar Year <u>only</u>)	1980	Current ECA Issue Date	24-Oct-2019
Is your Site required to submit Financial Assurance?	☐ Yes ☒ No		
Describe how your Landfill is designed.	☒ Natural Attenuation only ☐ Fully engineered Facility ☐ Partially engineered Facility		
Does your Site have an approved Contaminant Attenuation Zone?	☐ Yes ☒ No		

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:

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:	☒ Yes ☐ No	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.
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):	☒ Yes ☐ No ☐ Not Applicable	If no, list exceptions below or attach information.

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
SB-MW2	Dry	30-Oct-2024
SB-MW11	Dry	30-Oct-2024

3) a) Is landfill gas being monitored or controlled at the site?		☒ Yes ☐ 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?		☐ Yes ☒ 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:		☒ Yes ☐ No ☐ 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):	☒ Yes ☐ No		

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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.	☐ Yes ☒ No	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.	
6) The site meets compliance and assessment criteria.	☒ Yes ☐ No	Well nest SB-MW8 and SB-MW9 are located downgradient and off-site to the north of South Baptiste Lake Road.	
7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	☒ Yes ☐ No		
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.	☐ Yes ☒ No	Note which practice(s):	☐ (a) ☐ (b) ☐ (c)
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	☒ Yes ☐ No ☐ Not Applicable	Triggers have been exceeded, perimeter ditching has been put in place, and toxicity sampling is collected on a regular basis.	

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:

☐ No changes to the monitoring program are recommended ☒ The following change(s) to the monitoring program is/are recommended:	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.
☐ No Changes to site design and operation are recommended ☒ The following change(s) to the site design and operation is/are recommended:	Ensure operations and waste placement adhere to new D&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.

Name:	Jaclyn Kalesnikoff		
Seal:			
Signature:		Date:	28-Mar-2025
CEP Contact Information:			
Company:	BluMetric Environmental Inc.		
Address:	1682 Woodward Drive, Ottawa, ON K2C 3R8		
Telephone No.:	(877) 487-8436 ext. 339	Fax No. :	
E-mail Address:	jkalesnikoff@blumetric.ca		
Co-signers for additional expertise provided:			
Signature:		Date:	Select Date
Signature:		Date:	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):

Name (s)	South Baptiste Lake and the un-named creek (tributary to South Baptiste Lake)
Distance(s)	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:

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:	☒ Yes ☐ No	Field observations to identify potential impacts to background water sample should be made.
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):	☒ Yes ☐ No ☐ Not applicable (No C of A, authorizing / control document applies)	If no, specify below or provide details in an attachment.

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

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.		☐ Yes ☒ No ☐ Not Applicable	
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:		☐ Yes ☐ No ☒ Not Applicable	If no, specify below or provide details in an attachment.
Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date	
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):	☒ Yes ☐ No		

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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):	☐ Yes ☒ 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		
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)?	☐ Yes ☒ No	Boron exceedances are attributed to WDS activities, all other exceedances may be related to de-icing salt, road work activities, or natural conditions.

7) 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.	☐ Yes ☒ No	BAP-A and BAP-C are showing an increasing trend in boron.
8) 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)):	☒ Yes ☐ No ☐ Not Known ☐ Not Applicable	PWQO exceedances of phenols, total phosphorus, aluminum, boron, cadmium, cobalt, and iron were recorded in the groundwater monitoring wells adjacent to the WDS mound. Trigger Mechanisms and a Contingency Plan for surface water has been developed.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	☒ Yes ☐ No ☐ Not Applicable	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.

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:

☒ No Changes to the monitoring program are recommended ☐ The following change(s) to the monitoring program is/are recommended:	
☐ No changes to the site design and operation are recommended ☒ The following change(s) to the site design and operation is/are recommended:	Perimeter drainage diversion to be maintained.

CEP Signature		
Relevant Discipline		
Date:	28-Mar-2025	
CEP Contact Information:	Jaclyn Kalesnikoff	
Company:	BluMetric Environmental Inc.	
Address:	1682 Woodward Drive, Ottawa, ON K2C 3R8	
Telephone No.:	877-487-8436 x339	
Fax No. :		
E-mail Address:	jkalesnikoff@blumetric.ca	
Save As		Print Form

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 ss, tr si, an gravel cobbles, dry, loose sample 3.8-4.0m	110
2.5						109.5
3						109
3.6						108.5
4	4.27	4.27				108
4.5						107.5
5					Refusal on presumed bedrock	107
5.5						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.

103.41

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]
0.5		Bentonite seal	0.3		0.2 Blk topsoil	104
1				0.56		103.5
1.5	4	Sand	2		Red-br, f-m sa, tr-sm si rare (angular) pebbles, oxidized wet @ 0.45m sample 1.4-1.6m	103
2			2.06	2.06	2.13	102.5
2.5		Native drill cuttings			Red-br, m-f sa, <tr si rare pebbles, hard sample 2.2-2.4m	102
3	2.74	2.74			2.74	101.5
3.5					Refusal on presumed bedrock	101
4					3.74	100.5
4.5						100
5						99.5
5.5						99
6						98.5
						98

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 (in AMSL)

97.30

Vertical

40.0

Horizontal

Depth [m]	Hole	Annulus	Casing	Screen	Lithology	Elev. [m]
0.5		Bentonite seal 0.3			Blk topsoil & pent	97.5
1		Native drill cuttings 0.65			Yel-br, vf sa, sm si, soft wet @ 0.6m sample 1.2-1.5m	97
1.5	4	Bentonite seal 1.25	2	1.41		96.5
2		Sand				96
2.5					Br f sa, tr si, tr gvl gvl decrease w depth sample 2.1-2.4m	95.5
3	3.02	2.91 3.02	2.91	2.91		95
3.5						94.5
4					Refusal on presumed bedrock	94
4.5						93.5
5						93
5.5						92.5
6						92
						91.5

Well Log: Lithology & Construction

Well Ident **SB**
MW-4

Name

Drill. Method

auger

Drill. Dates

February 8, 1996

X

1129

Y

967

Z

94.93

Meas. Pt. Elev.

96.36

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

Scales (1: xxx)

Water Level (m AMSL)

93.54

Vertical

50.0

Horizontal

Depth [m]	Hole	Annulus	Casing	Screen	Lithology	Elev. [m]
0.5		Bentonite seal 0.3				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 1.9	2			93
2.5		2.3				92.5
3				2.68		92
3.5	4	Sand			Grey f sa (quicksand), tr of neff, wet at 1.85m sample 2.4-2.9m sample 4.5-4.8	91.5
4		4.18	4.185	4.18		91
4.5						90.5
5						90
5.5		Native drill cuttings				89.5
6					5.79	89
6.5	6.7	6.7			Br f sa and boulders auger broke, end of hole	88.5
7					6.7	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.

Water Level (m AMSL)

95.50

Scales (1: xxx)

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

Depth [m]	Hole	Annulus	Casing	Screen	Lithology	Elev. [m]
0.3					Blk topsoil, sandy	97.5
0.5					Red-br, f-vf sa, tr si, oxidized loose, sample 0.7-0.8m	97
0.82						96.5
1					Gr f-m sa, tr si, loose wet @ 2.3	96
1.5						95.5
2	2		2			95
2.35						94.5
2.5						94
3					Dark grey, v f sa, sm si no layering, saturated soft, hole sloughing sample 3.2-3.5m, wet on completion	93.5
3.5				3.58		93
4	4.18		4.18	4.18		92.5
4.18						92
4.5						
5						
5.5						
6						



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
-1									10 100 1000		
0		Ground Surface	0.00								0.825m PVC Stick-Up 4" Square Protector, Locked
1		OVERBURDEN Fine SAND, Brown, Dry	382.16								
2		OVERBURDEN Fine Silty SAND, Grey/Brown, Moist	1.52 380.64								3/8" Bentonite Holeplug 2" Solid PVC
3		OVERBURDEN Fine Silty SAND, Brown/Grey, Wet	3.05 379.11								#3 Silica Sand
4		OVERBURDEN Fine Silty SAND, Brown/Grey, Wet to Saturated	4.57 377.59								2" Slot 10 PVC
5											
6		End of borehole at 6.00 m	6.00 376.16								
7		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											
9											
10											
11											
Drill Date: 2017 September 13 Drilled By: Lantech Drilling Services Drilling Method: Hollow Stem Auger Hole Diameter: 0.20 m (OD)				Notes:						Sheet 1 of 1	



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
													5.5" Round Steel Casing, Locked
0		Ground Surface	0.00										
		OVERBURDEN Fine Silty SAND, Brown/Grey	379.90										
1													
2													
			2.41										3/8" Bentonite Holeplug
		Granite BEDROCK Broken, Fractured	377.49										
3													
		Granite BEDROCK	3.32										2" Solid PVC
		3.99m Possible Fracture	376.58										
4		4.39m Possible Fracture											
5		5.12m Possible Fracture											#3 Silica Sand
		5.49m Possible Fracture											
6		6.37m Possible Fracture											
7													
			7.89										2" Slot 10 PVC
8		Granite BEDROCK Possible Sediment Seams and Red Staining	372.01										
		Granite BEDROCK	8.50										
9			371.40										
		9.27m Large Fracture with Sediment and Red Staining											
10		End of borehole at 10.03 m	10.03										
			369.87										
11		Well Completion Details: Screened interval from 4.57 m to 10.03 m below surface Elevation at top of pipe (TOP) = 380.79 m											
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)					Notes:							Sheet 1 of 1	
Logged By: KS Checked By: BM													



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				Construction	Notes		
									10	100	1000	10000				
0		Ground Surface	0.00												50 mm solid PVC pipe	
1		Sand Silty Fine Sand, Soft, Grey-Brown, moist													50 mm solid PVC pipe	
2		Sand Silty Fine Sand, Soft, Moist, Grey-Brown, Water encountered at 2.10, saturated	2.10												GW = 377.31 m	
3		Sand Silty Fine Sand, Soft, Moist, Grey, saturated	2.74												50 mm 010 slot PVC pipe	
4																
5		End of borehole at 4.57 m	4.57													
6																
7																
Drill Date: 2018 October 23					Notes:										Sheet 1 of 1	
Drilled By: Dedicated Environmental Drilling																
Drilling Method: Hollow Stem Auger																
Hole Diameter: m (OD)					Logged By: AB					Checked By: AB						



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				Construction	Notes	
									(ppm)						
									10	100	1000	10000			
0		Ground Surface	0.00											50 mm solid PVC pipe	
		Sand Silty Fine Sand, Soft, dry													
1															
														50 mm solid PVC pipe	
2														GW = 377.32 m	
3															
			3.66												
4		Sand Silty Fine Sand, Soft, Wet, wet	4.00												
		Sand Silty Fine Sand, Soft, wet													
5														50 mm 010 slot PVC pipe	
6			6.10												
		End of borehole at 6.10 m													
7															
Drill Date: 2018 October 23 Drilled By: Dedicated Environmental Drilling Drilling Method: Hollow Stem Auger Hole Diameter: m (OD)					Notes:										Sheet 1 of 1
Logged By: AB Checked By: AB															



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				Construction	Notes
									10	100	1000	10000		
0		Ground Surface	0.00											50 mm solid PVC pipe
1		Sand Silty Fine Sand, Soft, dry												50 mm solid PVC pipe
2														
3														
4		Boulder Boulders and Cobbles, Sand mix, dry	3.57											50 mm solid PVC pipe
5		Cobbles Sand and gravel mix., moist	4.00											
6														
7		End of borehole at 6.71 m	6.71											silica sand
														GW = 376.36 m 50 mm 010 slot PVC pipe

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:

Sheet 1 of 1



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
-1									10 100		
0		Ground Surface	0.00 377.12								jplug Stickup is 0.80m
1		SAND and GRAVEL Fill used to create drill rig access	0.91 376.21								Cement
2		SAND Trace gravel									
3		Moist to wet below 3.05m	3.35 373.77								
4		SAND and GRAVEL With cobbles; wet to saturated	4.57 372.55								
5		BEDROCK Granite bedrock, dark grey to black									
6											
7											3/8" Bentonite seal
8											
9		Light grey below 9.1m									
Drill Date: 2020 September 9 Drilled By: Canadian Environmental Drilling Drilling Method: Hollow Stem Auger, Air Hammer Hole Diameter: 0.20 m (OD)				Notes:						Sheet 1 of 2	



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												
			18.49 358.63									
		End of borehole at 18.49 m										
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										
20												
Drill Date: 2020 September 9 Drilled By: Canadian Environmental Drilling Drilling Method: Hollow Stem Auger, Air Hammer Hole Diameter: 0.20 m (OD)				Notes:								Sheet 2 of 2

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

#3 Silica sand
38 mm 010 slot PVC pipe

end cap

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



Site Name: South Baptiste WDS, MHHs

Date: Apr 29, 2024

Weather Conditions:

Project #: 246205-09

BluMetric Staff: BM/MD

Overcast/Rainy 5-8°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 ☒ |

Reads depth hauling cover material

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 ☐ |

Waste area not covered

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 ☐ |

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 ☐ |
| ☐ Conducted at monitoring wells | Yes ☒ | No ☐ |

Attendant Building Oppm

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:

- Large areas of uncovered waste
- Recommend township should shape waste hill and apply interim cover
SEE Photos

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 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: July 10 th , 2024	Weather Conditions:
Project #: 240205 - 09	BluMetric Staff:	Overcast + 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 ☐ |
| ☐ Perimeter fencing and gate in good condition | Yes ☒ | No ☐ |
| ☐ Gate locked if closed | Yes ☐ | No ☐ |

Site Open

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 ☐ |

} Boundaries starting to mix,
recommend bigger/redone berm
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 ☐ |

* Not assessed this visit

LANDFILL GAS MONITORING

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

* Not assessed this visit

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.

SMALL LANDFILL OPERATION AND INSPECTION FORM



Site Name: South Baptiste WDS, MHHs	Date: Oct 30, 2024	Weather Conditions: 20°C Sunny + Clouds
Project #: 240205-09	BluMetric Staff: NW/BM	10 km/h SW

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

OVERALL INSPECTION AND OPERATION REVIEW

- | | | |
|--|---|---|
| ☒ Signage in good condition | Yes ☒ | No ☐ → No sign on brush pile |
| ☒ 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 ☐ → Open on arrival (site was open) |

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 ☐ → see above brush note |

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 ☐ |
- } Both piles are very large
- Not accepted

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 ☐ → Attendant building; RFI = 0 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.)

→ Human Activity observed behind active trench area → Garbage has been pulled out and piled/sorted (Unauthorized)
→ Extends down to ATV trail
→ See marked site plan

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:



→ Indicates approx. location of unauthorized human activity mentioned on site inspection form

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

Appendix D

D-2 2022 Groundwater Analytical Results



Your Project #: 240205-09
Site Location: South Baptiste
Your C.O.C. #: 880154

Attention: MHH Distribution

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

Report Date: 2024/05/10
Report #: R8143156
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4C9522

Received: 2024/05/01, 09:20

Sample Matrix: Water
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	10	N/A	2024/05/07	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	10	N/A	2024/05/07	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	10	N/A	2024/05/07	CAM SOP-00416	SM 24 5220 D m
Conductivity	10	N/A	2024/05/07	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	10	N/A	2024/05/02	CAM SOP-00446	SM 24 5310 B m
Dissolved Mercury in Water by CVAA	10	2024/05/06	2024/05/07	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	10	N/A	2024/05/02	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	10	N/A	2024/05/06	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	3	N/A	2024/05/02	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (2)	7	N/A	2024/05/03	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	10	2024/05/02	2024/05/07	CAM SOP-00413	SM 24th - 4500H+ B
Phenols (4AAP)	9	N/A	2024/05/02	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	1	N/A	2024/05/03	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Turbidimetry	10	N/A	2024/05/07	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	9	2024/05/02	2024/05/03	CAM SOP-00428	SM 24 2540C m
Total Dissolved Solids	1	2024/05/03	2024/05/04	CAM SOP-00428	SM 24 2540C m
Total Kjeldahl Nitrogen in Water	4	2024/05/02	2024/05/03	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	6	2024/05/02	2024/05/06	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2024/05/02	2024/05/04	CAM SOP-00407	SM 24 4500-P I
Total Phosphorus (Colourimetric)	1	2024/05/02	2024/05/06	CAM SOP-00407	SM 24 4500-P I
Total Phosphorus (Colourimetric)	2	2024/05/02	2024/05/07	CAM SOP-00407	SM 24 4500-P I
Total Phosphorus (Colourimetric)	4	2024/05/02	2024/05/08	CAM SOP-00407	SM 24 4500-P I
Total Suspended Solids	10	2024/05/02	2024/05/03	CAM SOP-00428	SM 24 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, EPA, APHA or the Quebec Ministry of Environment.

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



Your Project #: 240205-09
Site Location: South Baptiste
Your C.O.C. #: 880154

Attention: MHH Distribution

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

Report Date: 2024/05/10
Report #: R8143156
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4C9522

Received: 2024/05/01, 09:20

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.

(3) "The CCME method and Analytical Protocol (O. Reg. 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg. 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Christine Gipton, Senior Project Manager
Email: Christine.Gipton@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 #: C4C9522

Report Date: 2024/05/10

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ZAX406			ZAX406			ZAX407		
Sampling Date		2024/04/29 13:40			2024/04/29 13:40			2024/04/29 13:30		
COC Number		880154			880154			880154		
	UNITS	SB-MW2	RDL	QC Batch	SB-MW2 Lab-Dup	RDL	QC Batch	SB-MW3	RDL	QC Batch

Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9371990				ND	0.050	9371990
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	9370030	ND	4.0	9370030	ND	4.0	9370030
Conductivity	umho/cm	44	1.0	9369695				140	1.0	9369695
Total Dissolved Solids	mg/L	30	10	9369480				135	10	9369480
Total Kjeldahl Nitrogen (TKN)	mg/L	0.12	0.10	9369854				0.16	0.10	9369854
Dissolved Organic Carbon	mg/L	1.2	0.4	9370292				1.4	0.4	9370292
pH	pH	7.25		9369696				7.10		9369696
Phenols-4AAP	mg/L	ND	0.0010	9370728	ND	0.0010	9370728	ND	0.0010	9370728
Total Phosphorus	mg/L	0.37	0.020	9370235				5.3	0.020	9370235
Total Suspended Solids	mg/L	170	10	9368605				2200	10	9368605
Dissolved Sulphate (SO4)	mg/L	3.3	1.0	9370631				6.1	1.0	9370631
Alkalinity (Total as CaCO3)	mg/L	22	1.0	9369684				29	1.0	9369684
Dissolved Chloride (Cl-)	mg/L	ND	1.0	9370617				19	1.0	9370617
Nitrite (N)	mg/L	ND	0.010	9369708				ND	0.010	9369708
Nitrate (N)	mg/L	ND	0.10	9369708				0.53	0.10	9369708
Nitrate + Nitrite (N)	mg/L	ND	0.10	9369708				0.53	0.10	9369708

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 #: C4C9522

Report Date: 2024/05/10

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ZAX408		ZAX409			ZAX410		
Sampling Date		2024/04/29 13:05		2024/04/29 13:20			2024/04/29 12:55		
COC Number		880154		880154			880154		
	UNITS	SB-MW4	RDL	SB-MW5	RDL	QC Batch	SB-MW6R	RDL	QC Batch
Inorganics									
Total Ammonia-N	mg/L	9.5	0.050	0.57	0.050	9371990	53 (1)	0.50	9371990
Total Chemical Oxygen Demand (COD)	mg/L	59	4.0	20	4.0	9370030	190	8.0	9370030
Conductivity	umho/cm	380	1.0	360	1.0	9369695	1700	1.0	9369695
Total Dissolved Solids	mg/L	310	10	260	10	9369480	1300	10	9369480
Total Kjeldahl Nitrogen (TKN)	mg/L	9.9	1.0	0.88	0.10	9369854	51 (1)	5.0	9369854
Dissolved Organic Carbon	mg/L	5.5	0.4	4.8	0.4	9370292	40	0.4	9370292
pH	pH	7.28		7.63		9369696	7.64		9369696
Phenols-4AAP	mg/L	ND	0.0010	ND	0.0010	9370728	0.0010	0.0010	9370728
Total Phosphorus	mg/L	82	0.20	3.7	0.020	9369871	8.8	0.10	9369871
Total Suspended Solids	mg/L	83000	200	2500	14	9368605	140000	500	9368605
Dissolved Sulphate (SO ₄)	mg/L	61	1.0	13	1.0	9370631	110	1.0	9370631
Alkalinity (Total as CaCO ₃)	mg/L	67	1.0	110	1.0	9369684	690	1.0	9369684
Dissolved Chloride (Cl ⁻)	mg/L	2.8	1.0	33	1.0	9370617	52	1.0	9370617
Nitrite (N)	mg/L	1.25	0.010	0.013	0.010	9369705	0.084	0.010	9366694
Nitrate (N)	mg/L	3.57	0.10	ND	0.10	9369705	1.69	0.10	9366694
Nitrate + Nitrite (N)	mg/L	4.82	0.10	ND	0.10	9369705	1.78	0.10	9366694
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.									
(1) TKN < NH ₄ : Both values fall within acceptable RPD limits for duplicates and are likely equivalent.									



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ZAX411			ZAX412			ZAX413		
Sampling Date		2024/04/29 13:00			2024/04/29 12:00			2024/04/29 11:50		
COC Number		880154			880154			880154		
	UNITS	SB-MW7	RDL	QC Batch	SB-MW8	RDL	QC Batch	SB-MW9	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	16	0.10	9371990	ND	0.050	9371990	ND	0.050	9371990
Total Chemical Oxygen Demand (COD)	mg/L	58	4.0	9370030	4.0	4.0	9370030	ND	4.0	9370030
Conductivity	umho/cm	1400	1.0	9369695	220	1.0	9369695	78	1.0	9369695
Total Dissolved Solids	mg/L	865	10	9372175	220	10	9369480	95	10	9370150
Total Kjeldahl Nitrogen (TKN)	mg/L	17	1.0	9369854	0.16	0.10	9369854	ND	0.10	9369854
Dissolved Organic Carbon	mg/L	21	0.4	9370292	1.5	0.4	9370292	1.1	0.4	9370292
pH	pH	7.89		9369696	7.34		9369696	7.60		9369696
Phenols-4AAP	mg/L	ND	0.0010	9370728	ND	0.0010	9370728	ND	0.0010	9370728
Total Phosphorus	mg/L	0.034	0.020	9370235	37	0.10	9370235	5.4	0.020	9370235
Total Suspended Solids	mg/L	52	10	9368605	17000	20	9368605	2100	10	9368605
Dissolved Sulphate (SO4)	mg/L	50	2.0	9370631	2.6	1.0	9370631	4.0	1.0	9370631
Alkalinity (Total as CaCO3)	mg/L	590	1.0	9369684	38	1.0	9369684	30	1.0	9369684
Dissolved Chloride (Cl-)	mg/L	81	1.0	9370617	42	1.0	9370617	3.7	1.0	9370617
Nitrite (N)	mg/L	ND	0.010	9369705	ND	0.010	9366694	ND	0.010	9366694
Nitrate (N)	mg/L	1.45	0.10	9369705	0.67	0.10	9366694	0.22	0.10	9366694
Nitrate + Nitrite (N)	mg/L	1.45	0.10	9369705	0.67	0.10	9366694	0.22	0.10	9366694
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.										



RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ZAX414			ZAX415		
Sampling Date		2024/04/29 13:15			2024/04/29 11:50		
COC Number		880154			880154		
	UNITS	SB-MW10	RDL	QC Batch	SB-QAQC-GW1	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L	19	0.10	9371990	ND	0.050	9371990
Total Chemical Oxygen Demand (COD)	mg/L	64	4.0	9370030	ND	4.0	9370030
Conductivity	umho/cm	1500	1.0	9369695	79	1.0	9369695
Total Dissolved Solids	mg/L	940	10	9370150	85	10	9369480
Total Kjeldahl Nitrogen (TKN)	mg/L	21	1.0	9369854	0.18	0.10	9369854
Dissolved Organic Carbon	mg/L	22	0.4	9370292	1.1	0.4	9370292
pH	pH	7.71		9369696	7.69		9369696
Phenols-4AAP	mg/L	ND	0.0010	9370728	ND	0.0010	9370728
Total Phosphorus	mg/L	0.14	0.020	9370235	4.3	0.020	9369871
Total Suspended Solids	mg/L	130	10	9368605	950	10	9368605
Dissolved Sulphate (SO ₄)	mg/L	30	1.0	9370631	4.1	1.0	9370631
Alkalinity (Total as CaCO ₃)	mg/L	640	1.0	9369684	31	1.0	9369684
Dissolved Chloride (Cl ⁻)	mg/L	92	1.0	9370617	4.0	1.0	9370617
Nitrite (N)	mg/L	ND	0.010	9369708	ND	0.010	9369705
Nitrate (N)	mg/L	ND	0.10	9369708	0.22	0.10	9369705
Nitrate + Nitrite (N)	mg/L	ND	0.10	9369708	0.22	0.10	9369705
RDL = Reportable Detection Limit QC Batch = Quality Control Batch ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.							



ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		ZAX406		ZAX407			ZAX407		
Sampling Date		2024/04/29 13:40		2024/04/29 13:30			2024/04/29 13:30		
COC Number		880154		880154			880154		
	UNITS	SB-MW2	QC Batch	SB-MW3	RDL	QC Batch	SB-MW3 Lab-Dup	RDL	QC Batch
Metals									
Dissolved Mercury (Hg)	ug/L	ND	9375775	ND	0.10	9375776	ND	0.10	9375776
Dissolved Aluminum (Al)	ug/L	8.4	9369366	7.4	4.9	9369366			
Dissolved Arsenic (As)	ug/L	ND	9369366	ND	1.0	9369366			
Dissolved Barium (Ba)	ug/L	4.0	9369366	13	2.0	9369366			
Dissolved Beryllium (Be)	ug/L	ND	9369366	ND	0.40	9369366			
Dissolved Boron (B)	ug/L	ND	9369366	12	10	9369366			
Dissolved Cadmium (Cd)	ug/L	ND	9369366	ND	0.090	9369366			
Dissolved Calcium (Ca)	ug/L	5100	9369366	13000	200	9369366			
Dissolved Chromium (Cr)	ug/L	ND	9369366	ND	5.0	9369366			
Dissolved Cobalt (Co)	ug/L	ND	9369366	ND	0.50	9369366			
Dissolved Copper (Cu)	ug/L	1.3	9369366	0.98	0.90	9369366			
Dissolved Iron (Fe)	ug/L	ND	9369366	ND	100	9369366			
Dissolved Lead (Pb)	ug/L	ND	9369366	ND	0.50	9369366			
Dissolved Magnesium (Mg)	ug/L	730	9369366	1800	50	9369366			
Dissolved Manganese (Mn)	ug/L	ND	9369366	ND	2.0	9369366			
Dissolved Molybdenum (Mo)	ug/L	ND	9369366	ND	0.50	9369366			
Dissolved Nickel (Ni)	ug/L	ND	9369366	ND	1.0	9369366			
Dissolved Potassium (K)	ug/L	560	9369366	2100	200	9369366			
Dissolved Silicon (Si)	ug/L	5400	9369366	5300	50	9369366			
Dissolved Silver (Ag)	ug/L	ND	9369366	ND	0.090	9369366			
Dissolved Sodium (Na)	ug/L	1600	9369366	8800	100	9369366			
Dissolved Strontium (Sr)	ug/L	52	9369366	110	1.0	9369366			
Dissolved Thallium (Tl)	ug/L	ND	9369366	ND	0.050	9369366			
Dissolved Titanium (Ti)	ug/L	ND	9369366	ND	5.0	9369366			
Dissolved Vanadium (V)	ug/L	ND	9369366	ND	0.50	9369366			
Dissolved Zinc (Zn)	ug/L	ND	9369366	ND	5.0	9369366			
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 Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		ZAX408	ZAX409	ZAX410		ZAX411			ZAX411		
Sampling Date		2024/04/29 13:05	2024/04/29 13:20	2024/04/29 12:55		2024/04/29 13:00			2024/04/29 13:00		
COC Number		880154	880154	880154		880154			880154		
	UNITS	SB-MW4	SB-MW5	SB-MW6R	RDL	SB-MW7	RDL	QC Batch	SB-MW7 Lab-Dup	RDL	QC Batch

Metals											
Dissolved Mercury (Hg)	ug/L	ND	ND	ND	0.10	ND	0.10	9375775			
Dissolved Aluminum (Al)	ug/L	32	12	29	4.9	ND	4.9	9369366	ND	4.9	9369366
Dissolved Arsenic (As)	ug/L	ND	ND	ND	1.0	ND	1.0	9369366	ND	1.0	9369366
Dissolved Barium (Ba)	ug/L	310	40	190	2.0	180	2.0	9369366	180	2.0	9369366
Dissolved Beryllium (Be)	ug/L	ND	ND	ND	0.40	ND	0.40	9369366	ND	0.40	9369366
Dissolved Boron (B)	ug/L	460	190	2000	10	870	10	9369366	830	10	9369366
Dissolved Cadmium (Cd)	ug/L	ND	ND	ND	0.090	0.35	0.090	9369366	0.38	0.090	9369366
Dissolved Calcium (Ca)	ug/L	35000	31000	190000	200	150000	200	9369366	140000	200	9369366
Dissolved Chromium (Cr)	ug/L	ND	ND	ND	5.0	ND	5.0	9369366	ND	5.0	9369366
Dissolved Cobalt (Co)	ug/L	0.96	ND	31	0.50	19	0.50	9369366	19	0.50	9369366
Dissolved Copper (Cu)	ug/L	6.5	ND	8.7	0.90	38	0.90	9369366	39	0.90	9369366
Dissolved Iron (Fe)	ug/L	ND	3200	20000	100	ND	100	9369366	ND	100	9369366
Dissolved Lead (Pb)	ug/L	ND	ND	ND	0.50	ND	0.50	9369366	ND	0.50	9369366
Dissolved Magnesium (Mg)	ug/L	6000	6000	27000	50	27000	50	9369366	27000	50	9369366
Dissolved Manganese (Mn)	ug/L	130	1300	2200	2.0	12000	10	9369366	12000	10	9369366
Dissolved Molybdenum (Mo)	ug/L	ND	0.52	2.0	0.50	7.7	0.50	9369366	7.7	0.50	9369366
Dissolved Nickel (Ni)	ug/L	ND	ND	5.9	1.0	30	1.0	9369366	29	1.0	9369366
Dissolved Potassium (K)	ug/L	16000	16000	68000	200	33000	200	9369366	34000	200	9369366
Dissolved Silicon (Si)	ug/L	2600	6200	3000	50	6900	50	9369366	6700	50	9369366
Dissolved Silver (Ag)	ug/L	ND	ND	ND	0.090	ND	0.090	9369366	ND	0.090	9369366
Dissolved Sodium (Na)	ug/L	2600	21000	80000	100	81000	100	9369366	84000	100	9369366
Dissolved Strontium (Sr)	ug/L	330	250	590	1.0	1300	1.0	9369366	1300	1.0	9369366
Dissolved Thallium (Tl)	ug/L	0.079	ND	0.25	0.050	0.14	0.050	9369366	0.14	0.050	9369366
Dissolved Titanium (Ti)	ug/L	ND	ND	ND	5.0	ND	5.0	9369366	ND	5.0	9369366
Dissolved Vanadium (V)	ug/L	ND	0.68	1.2	0.50	ND	0.50	9369366	ND	0.50	9369366
Dissolved Zinc (Zn)	ug/L	15	ND	ND	5.0	50	5.0	9369366	49	5.0	9369366

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.



ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		ZAX412	ZAX413		ZAX414		ZAX415		
Sampling Date		2024/04/29 12:00	2024/04/29 11:50		2024/04/29 13:15		2024/04/29 11:50		
COC Number		880154	880154		880154		880154		
	UNITS	SB-MW8	SB-MW9	RDL	SB-MW10	RDL	SB-QAQC-GW1	RDL	QC Batch
Metals									
Dissolved Mercury (Hg)	ug/L	ND	ND	0.10	ND	0.10	ND	0.10	9375775
Dissolved Aluminum (Al)	ug/L	17	5.2	4.9	6.6	4.9	ND	4.9	9369366
Dissolved Arsenic (As)	ug/L	ND	ND	1.0	ND	1.0	ND	1.0	9369366
Dissolved Barium (Ba)	ug/L	10	4.2	2.0	120	2.0	4.3	2.0	9369366
Dissolved Beryllium (Be)	ug/L	ND	ND	0.40	ND	0.40	ND	0.40	9369366
Dissolved Boron (B)	ug/L	ND	ND	10	850	10	10	10	9369366
Dissolved Cadmium (Cd)	ug/L	ND	ND	0.090	0.25	0.090	ND	0.090	9369366
Dissolved Calcium (Ca)	ug/L	10000	6200	200	140000	200	6400	200	9369366
Dissolved Chromium (Cr)	ug/L	ND	ND	5.0	ND	5.0	ND	5.0	9369366
Dissolved Cobalt (Co)	ug/L	ND	ND	0.50	37	0.50	ND	0.50	9369366
Dissolved Copper (Cu)	ug/L	1.5	ND	0.90	47	0.90	ND	0.90	9369366
Dissolved Iron (Fe)	ug/L	ND	ND	100	ND	100	ND	100	9369366
Dissolved Lead (Pb)	ug/L	ND	ND	0.50	ND	0.50	ND	0.50	9369366
Dissolved Magnesium (Mg)	ug/L	1200	760	50	26000	50	790	50	9369366
Dissolved Manganese (Mn)	ug/L	ND	ND	2.0	15000	10	ND	2.0	9369366
Dissolved Molybdenum (Mo)	ug/L	ND	ND	0.50	10	0.50	ND	0.50	9369366
Dissolved Nickel (Ni)	ug/L	ND	ND	1.0	31	1.0	ND	1.0	9369366
Dissolved Potassium (K)	ug/L	1300	770	200	48000	200	790	200	9369366
Dissolved Silicon (Si)	ug/L	5400	5700	50	6700	50	5700	50	9369366
Dissolved Silver (Ag)	ug/L	ND	0.18	0.090	ND	0.090	0.11	0.090	9369366
Dissolved Sodium (Na)	ug/L	29000	9100	100	72000	100	9100	100	9369366
Dissolved Strontium (Sr)	ug/L	130	63	1.0	890	1.0	65	1.0	9369366
Dissolved Thallium (Tl)	ug/L	ND	ND	0.050	0.20	0.050	ND	0.050	9369366
Dissolved Titanium (Ti)	ug/L	ND	ND	5.0	ND	5.0	ND	5.0	9369366
Dissolved Vanadium (V)	ug/L	ND	ND	0.50	ND	0.50	ND	0.50	9369366
Dissolved Zinc (Zn)	ug/L	ND	ND	5.0	17	5.0	ND	5.0	9369366
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 Job #: C4C9522

Report Date: 2024/05/10

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAX406
Sample ID: SB-MW2
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369708	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9369480	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/08	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng

Bureau Veritas ID: ZAX406 Dup
Sample ID: SB-MW2
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal

Bureau Veritas ID: ZAX407
Sample ID: SB-MW3
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375776	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369708	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9369480	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAX407
Sample ID: SB-MW3
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/08	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng

Bureau Veritas ID: ZAX407 Dup
Sample ID: SB-MW3
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Mercury in Water by CVAA	CV/AA	9375776	2024/05/06	2024/05/07	Gagandeep Rai

Bureau Veritas ID: ZAX408
Sample ID: SB-MW4
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369705	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9369480	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/06	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9369871	2024/05/02	2024/05/04	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng

Bureau Veritas ID: ZAX409
Sample ID: SB-MW5
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAX409
Sample ID: SB-MW5
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369705	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9369480	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/06	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9369871	2024/05/02	2024/05/04	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng

Bureau Veritas ID: ZAX410
Sample ID: SB-MW6R
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9366694	N/A	2024/05/02	Samuel Law
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9369480	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/06	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9369871	2024/05/02	2024/05/04	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng

Bureau Veritas ID: ZAX411
Sample ID: SB-MW7
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAX411
Sample ID: SB-MW7
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369705	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9372175	2024/05/03	2024/05/04	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/06	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/07	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng

Bureau Veritas ID: ZAX411 Dup
Sample ID: SB-MW7
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul

Bureau Veritas ID: ZAX412
Sample ID: SB-MW8
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9366694	N/A	2024/05/02	Samuel Law
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9369480	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/08	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAX413
Sample ID: SB-MW9
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9366694	N/A	2024/05/02	Samuel Law
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9370150	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/06	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/07	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng

Bureau Veritas ID: ZAX414
Sample ID: SB-MW10
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369708	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/02	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9370150	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/06	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/08	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAX415
Sample ID: SB-QAQC-GW1
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9370030	N/A	2024/05/07	Neil Dassanayake
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9370292	N/A	2024/05/02	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Dissolved Metals by ICPMS	ICP/MS	9369366	N/A	2024/05/02	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9371990	N/A	2024/05/06	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369705	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370728	N/A	2024/05/03	Chandra Nandlal
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9369480	2024/05/02	2024/05/03	Darshan Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9369871	2024/05/02	2024/05/06	Muskan
Total Suspended Solids	BAL	9368605	2024/05/02	2024/05/03	Tina Teng



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

GENERAL COMMENTS

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

Package 1	6.3°C
Package 2	7.7°C
Package 3	7.3°C
Package 4	5.3°C
Package 5	5.3°C

Results relate only to the items tested.

BUREAU
VERITAS

Bureau Veritas Job #: C4C9522

Report Date: 2024/05/10

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

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
9366694	Nitrate (N)	2024/05/02	101	80 - 120	108	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9366694	Nitrite (N)	2024/05/02	97	80 - 120	100	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9368605	Total Suspended Solids	2024/05/03			95	80 - 120	ND, RDL=10	mg/L	NC	20		
9369366	Dissolved Aluminum (Al)	2024/05/02	101	80 - 120	94	80 - 120	ND, RDL=4.9	ug/L	NC	20		
9369366	Dissolved Arsenic (As)	2024/05/02	103	80 - 120	98	80 - 120	ND, RDL=1.0	ug/L	NC	20		
9369366	Dissolved Barium (Ba)	2024/05/02	99	80 - 120	97	80 - 120	ND, RDL=2.0	ug/L	0.32	20		
9369366	Dissolved Beryllium (Be)	2024/05/02	98	80 - 120	95	80 - 120	ND, RDL=0.40	ug/L	NC	20		
9369366	Dissolved Boron (B)	2024/05/02	NC	80 - 120	96	80 - 120	ND, RDL=10	ug/L	4.3	20		
9369366	Dissolved Cadmium (Cd)	2024/05/02	102	80 - 120	95	80 - 120	ND, RDL=0.090	ug/L	7.4	20		
9369366	Dissolved Calcium (Ca)	2024/05/02	NC	80 - 120	96	80 - 120	ND, RDL=200	ug/L	4.6	20		
9369366	Dissolved Chromium (Cr)	2024/05/02	96	80 - 120	93	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9369366	Dissolved Cobalt (Co)	2024/05/02	97	80 - 120	95	80 - 120	ND, RDL=0.50	ug/L	0.062	20		
9369366	Dissolved Copper (Cu)	2024/05/02	104	80 - 120	96	80 - 120	ND, RDL=0.90	ug/L	1.3	20		
9369366	Dissolved Iron (Fe)	2024/05/02	101	80 - 120	97	80 - 120	ND, RDL=100	ug/L	NC	20		
9369366	Dissolved Lead (Pb)	2024/05/02	100	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9369366	Dissolved Magnesium (Mg)	2024/05/02	NC	80 - 120	99	80 - 120	ND, RDL=50	ug/L	3.2	20		
9369366	Dissolved Manganese (Mn)	2024/05/02	NC	80 - 120	95	80 - 120	ND, RDL=2.0	ug/L	0.74	20		
9369366	Dissolved Molybdenum (Mo)	2024/05/02	104	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	0.43	20		
9369366	Dissolved Nickel (Ni)	2024/05/02	95	80 - 120	93	80 - 120	ND, RDL=1.0	ug/L	2.5	20		
9369366	Dissolved Potassium (K)	2024/05/02	NC	80 - 120	102	80 - 120	ND, RDL=200	ug/L	1.4	20		
9369366	Dissolved Silicon (Si)	2024/05/02	98	80 - 120	93	80 - 120	ND, RDL=50	ug/L	3.8	20		
9369366	Dissolved Silver (Ag)	2024/05/02	62 (1)	80 - 120	93	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9369366	Dissolved Sodium (Na)	2024/05/02	NC	80 - 120	98	80 - 120	ND, RDL=100	ug/L	3.5	20		
9369366	Dissolved Strontium (Sr)	2024/05/02	NC	80 - 120	95	80 - 120	ND, RDL=1.0	ug/L	1.7	20		
9369366	Dissolved Thallium (Tl)	2024/05/02	103	80 - 120	98	80 - 120	ND, RDL=0.050	ug/L	2.1	20		
9369366	Dissolved Titanium (Ti)	2024/05/02	101	80 - 120	96	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9369366	Dissolved Vanadium (V)	2024/05/02	102	80 - 120	95	80 - 120	ND, RDL=0.50	ug/L	NC	20		



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

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
9369366	Dissolved Zinc (Zn)	2024/05/02	98	80 - 120	96	80 - 120	ND, RDL=5.0	ug/L	1.6	20		
9369480	Total Dissolved Solids	2024/05/03			102	80 - 120	ND, RDL=10	mg/L	1.1	20		
9369684	Alkalinity (Total as CaCO3)	2024/05/07			102	85 - 115	ND, RDL=1.0	mg/L	0.15	20		
9369695	Conductivity	2024/05/07			102	85 - 115	ND, RDL=1.0	umho/cm	0.58	10		
9369696	pH	2024/05/07			102	98 - 103			0.83	N/A		
9369705	Nitrate (N)	2024/05/03	NC	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L	0.79	20		
9369705	Nitrite (N)	2024/05/03	93	80 - 120	94	80 - 120	ND, RDL=0.010	mg/L	1.7	20		
9369708	Nitrate (N)	2024/05/03	92	80 - 120	94	80 - 120	ND, RDL=0.10	mg/L	1.8	20		
9369708	Nitrite (N)	2024/05/03	95	80 - 120	92	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9369854	Total Kjeldahl Nitrogen (TKN)	2024/05/03	NC	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	3.1	20	100	80 - 120
9369871	Total Phosphorus	2024/05/04	98	80 - 120	100	80 - 120	ND, RDL=0.020	mg/L	3.5	20	94	80 - 120
9370030	Total Chemical Oxygen Demand (COD)	2024/05/07	98	80 - 120	102	80 - 120	ND, RDL=4.0	mg/L	NC	20		
9370150	Total Dissolved Solids	2024/05/03			100	80 - 120	ND, RDL=10	mg/L	0	20		
9370235	Total Phosphorus	2024/05/07	95	80 - 120	101	80 - 120	ND, RDL=0.020	mg/L	NC	20	96	80 - 120
9370292	Dissolved Organic Carbon	2024/05/02	95	80 - 120	98	80 - 120	ND, RDL=0.4	mg/L	9.6	20		
9370617	Dissolved Chloride (Cl-)	2024/05/07	NC	80 - 120	97	80 - 120	ND, RDL=1.0	mg/L	0.30	20		
9370631	Dissolved Sulphate (SO4)	2024/05/07	94	75 - 125	97	80 - 120	ND, RDL=1.0	mg/L	0.76	20		
9370728	Phenols-4AAP	2024/05/02	99	80 - 120	100	80 - 120	ND, RDL=0.0010	mg/L	NC	20		
9371990	Total Ammonia-N	2024/05/06	97	75 - 125	108	80 - 120	ND, RDL=0.050	mg/L	1.1	20		
9372175	Total Dissolved Solids	2024/05/04			95	80 - 120	ND, RDL=10	mg/L	0.98	20		
9375775	Dissolved Mercury (Hg)	2024/05/07	95	75 - 125	94	80 - 120	ND, RDL=0.10	ug/L	NC	20		



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

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
9375776	Dissolved Mercury (Hg)	2024/05/07	92	75 - 125	92	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). (1) Matrix Spike exceeds acceptance limits, probable matrix interference												



Bureau Veritas Job #: C4C9522
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink that reads "Cristina Carriere".

Cristina Carriere, Senior Scientific Specialist

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.

01-May-24 09:20

Christine Gripton



C4C9522

NPA

ENV-1686

Custody Tracking Form



T880154

When submitting the work instructions via eCOC (electronic Chain of Custody),
a Bureau Veritas eCOC confirmation number in the top right hand side. This
is 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			
Print Brad M. Callan	Sign <i>Brad M. Callan</i>	Date 2024/04/30	Time (24 HR) 07:30	Print SATTIA BASTIA	Sign <i>Sattia Bastia</i>	Date 2024/05/01	Time (24 HR) 09:20
Print	Sign	Date YYYY/MM/DD	Time (24 HR) HH:MM	Print	Sign	Date YYYY/MM/DD	Time (24 HR) HH:MM
Print	Sign	Date YYYY/MM/DD	Time (24 HR) HH:MM	Print	Sign	Date YYYY/MM/DD	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.

Triage Information

Sampled By (Print)

Brad M. Callan / Matthew DeGeer

of Coolers/Pkgs:

2

Rush ☐Immediate Test ☐Food Residue ☐Micro ☐Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Lab Comments:

Labeled By

Verified By

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
<i>Y</i>	<i>X</i>	<i>NPA 2024/05/01</i>	<i>5</i>	<i>5</i>	<i>6</i>
<i>Refer to ACTR</i>					
Drinking Water Metals Preservation Check Done (Circle) YES NO					

COR FCD-00383/4

Page 1 of 1



Your Project #: 240205-09
Site Location: South Baptiste GW
Your C.O.C. #: 971464

Attention: MHH Distribution

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

Report Date: 2024/11/08
Report #: R8397337
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4Y5018

Received: 2024/11/01, 10:10

Sample Matrix: Ground Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity	1	N/A	2024/11/07	CAM SOP-00448	SM 24 2320 B m
Alkalinity	8	N/A	2024/11/08	CAM SOP-00448	SM 24 2320 B m
Chloride by Automated Colourimetry	2	N/A	2024/11/05	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	6	N/A	2024/11/06	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	1	N/A	2024/11/08	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	9	N/A	2024/11/08	CAM SOP-00416	SM 24 5220 D m
Conductivity	1	N/A	2024/11/07	CAM SOP-00414	SM 24 2510 m
Conductivity	8	N/A	2024/11/08	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	5	N/A	2024/11/06	CAM SOP-00446	SM 24 5310 B m
Dissolved Organic Carbon (DOC) (1)	4	N/A	2024/11/07	CAM SOP-00446	SM 24 5310 B m
Dissolved Mercury in Water by CVAA	6	2024/11/05	2024/11/06	CAM SOP-00453	EPA 7470A m
Dissolved Mercury in Water by CVAA	3	2024/11/06	2024/11/07	CAM SOP-00453	EPA 7470A m
Dissolved Metals by ICPMS	5	N/A	2024/11/05	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	3	N/A	2024/11/06	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	1	N/A	2024/11/07	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	9	N/A	2024/11/07	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	9	N/A	2024/11/05	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	1	2024/11/04	2024/11/07	CAM SOP-00413	SM 24th - 4500H+ B
pH (3)	8	2024/11/04	2024/11/08	CAM SOP-00413	SM 24th - 4500H+ B
Phenols (4AAP)	9	N/A	2024/11/07	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Turbidimetry	2	N/A	2024/11/05	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	6	N/A	2024/11/06	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	1	N/A	2024/11/08	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	4	2024/11/06	2024/11/07	CAM SOP-00428	SM 24 2540C m
Total Dissolved Solids	5	2024/11/06	2024/11/08	CAM SOP-00428	SM 24 2540C m
Total Kjeldahl Nitrogen in Water	4	2024/11/06	2024/11/07	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	5	2024/11/06	2024/11/08	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	8	2024/11/06	2024/11/07	CAM SOP-00407	SM 24 4500-P I
Total Phosphorus (Colourimetric)	1	2024/11/06	2024/11/08	CAM SOP-00407	SM 24 4500-P I
Total Suspended Solids	1	2024/11/04	2024/11/05	CAM SOP-00428	SM 24 2540D m



Your Project #: 240205-09
Site Location: South Baptiste GW
Your C.O.C. #: 971464

Attention: MHH Distribution

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

Report Date: 2024/11/08
Report #: R8397337
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4Y5018

Received: 2024/11/01, 10:10

Sample Matrix: Ground Water
Samples Received: 9

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Suspended Solids	3	2024/11/04	2024/11/06	CAM SOP-00428	SM 24 2540D m
Total Suspended Solids	5	2024/11/04	2024/11/07	CAM SOP-00428	SM 24 2540D m
Volatile Organic Compounds in Water	1	N/A	2024/11/05	CAM SOP-00228	EPA 8260D

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, EPA, APHA or the Quebec Ministry of Environment.

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.

(3) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."



Your Project #: 240205-09
Site Location: South Baptiste GW
Your C.O.C. #: 971464

Attention: MHH Distribution

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

Report Date: 2024/11/08
Report #: R8397337
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4Y5018

Received: 2024/11/01, 10:10

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Elora Di Bratto, Project Manager
Email: Elora.Di-Bratto@bureauveritas.com
Phone# (905) 817-5700

=====

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 #: C4Y5018

Report Date: 2024/11/08

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste GW

Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHRL13			AHRL14			AHRL15		
Sampling Date		2024/10/30 16:36			2024/10/30 15:49			2024/10/30 16:28		
COC Number		971464			971464			971464		
	UNITS	SB-MW3	RDL	QC Batch	SB-MW4	RDL	QC Batch	SB-MW5	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9750550	2.3	0.050	9750550	0.98	0.050	9751424
Total Chemical Oxygen Demand (COD)	mg/L	5.6	4.0	9749506	85	4.0	9749506	29	4.0	9749506
Conductivity	umho/cm	220	1.0	9743822	330	1.0	9744610	540	1.0	9744610
Total Dissolved Solids	mg/L	75	10	9748695	295	10	9745913	315	10	9750044
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	0.10	9749377	2.7	0.50	9749299	1.3	0.10	9749377
Dissolved Organic Carbon	mg/L	1.7	0.4	9749862	4.3	0.4	9749819	7.3	0.4	9749862
pH	pH	7.80		9743827	7.35		9744613	7.38		9744613
Phenols-4AAP	mg/L	ND	0.0010	9752136	ND	0.0010	9752136	ND	0.0010	9752136
Total Phosphorus	mg/L	2.0	0.020	9749724	120	0.40	9749294	4.2	0.020	9749724
Total Suspended Solids	mg/L	2000	25	9743665	120000	1000	9743993	2400	33	9744241
Dissolved Sulphate (SO4)	mg/L	8.6	1.0	9748556	14	1.0	9748556	6.0	1.0	9748556
Alkalinity (Total as CaCO3)	mg/L	54	1.0	9743812	94	1.0	9744607	170	1.0	9744607
Dissolved Chloride (Cl-)	mg/L	25	1.0	9748544	5.3	1.0	9748544	54	1.0	9748544
Nitrite (N)	mg/L	ND	0.010	9743881	0.444	0.010	9743881	0.023	0.010	9743881
Nitrate (N)	mg/L	0.21	0.10	9743881	11.2	0.10	9743881	ND	0.10	9743881
Nitrate + Nitrite (N)	mg/L	0.21	0.10	9743881	11.6	0.10	9743881	ND	0.10	9743881
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 #: C4Y5018

Report Date: 2024/11/08

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste GW

Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHRL16			AHRL17			AHRL17		
Sampling Date		2024/10/30 16:18			2024/10/30 15:41			2024/10/30 15:41		
COC Number		971464			971464			971464		
	UNITS	SB-MW6R	RDL	QC Batch	SB-MW7	RDL	QC Batch	SB-MW7 Lab-Dup	RDL	QC Batch

Inorganics										
Total Ammonia-N	mg/L	53	0.25	9751424	21	0.10	9751424			
Total Chemical Oxygen Demand (COD)	mg/L	280	20	9749506	75	4.0	9749506			
Conductivity	umho/cm	2100	1.0	9743948	1800	1.0	9743822			
Total Dissolved Solids	mg/L	1180	10	9745913	975	10	9748695			
Total Kjeldahl Nitrogen (TKN)	mg/L	60	5.0	9749377	21	1.0	9749377			
Dissolved Organic Carbon	mg/L	62	0.4	9749819	29	0.4	9749862			
pH	pH	7.64		9743949	7.88		9743827			
Phenols-4AAP	mg/L	0.0017	0.0010	9752136	ND	0.0010	9752136			
Total Phosphorus	mg/L	7.4	0.10	9749724	ND	0.020	9749294			
Total Suspended Solids	mg/L	100000	500	9743993	13	10	9743665			
Dissolved Sulphate (SO4)	mg/L	47	1.0	9744755	52	1.0	9748556	61	1.0	9748556
Alkalinity (Total as CaCO3)	mg/L	1100	1.0	9743946	700	1.0	9743812			
Dissolved Chloride (Cl-)	mg/L	41	1.0	9744754	110	1.0	9748544	120	1.0	9748544
Nitrite (N)	mg/L	0.015	0.010	9743926	ND	0.010	9743881			
Nitrate (N)	mg/L	0.11	0.10	9743926	0.15	0.10	9743881			
Nitrate + Nitrite (N)	mg/L	0.13	0.10	9743926	0.15	0.10	9743881			

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 #: C4Y5018

Report Date: 2024/11/08

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste GW

Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHRL18			AHRL19			AHRL20		
Sampling Date		2024/10/30 14:51			2024/10/30 14:56			2024/10/30 15:58		
COC Number		971464			971464			971464		
	UNITS	SB-MW8	RDL	QC Batch	SB-MW9	RDL	QC Batch	SB-MW10	RDL	QC Batch
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9750550	ND	0.050	9750550	16	0.10	9751424
Total Chemical Oxygen Demand (COD)	mg/L	14	4.0	9749506	5.6	4.0	9749506	48	4.0	9749506
Conductivity	umho/cm	210	1.0	9743948	140	1.0	9743948	1400	1.0	9743948
Total Dissolved Solids	mg/L	180	10	9745913	90	10	9748693	630	10	9748695
Total Kjeldahl Nitrogen (TKN)	mg/L	0.24	0.10	9749377	ND	0.10	9749377	16	1.0	9749377
Dissolved Organic Carbon	mg/L	1.9	0.4	9749862	1.4	0.4	9749819	17	0.4	9749819
pH	pH	7.49		9743949	7.22		9743949	7.68		9743949
Phenols-4AAP	mg/L	ND	0.0010	9752136	ND	0.0010	9752136	ND	0.0010	9752136
Total Phosphorus	mg/L	60	0.20	9749724	3.1	0.020	9749724	0.91	0.020	9749724
Total Suspended Solids	mg/L	76000	500	9743993	980	10	9743665	470	10	9743665
Dissolved Sulphate (SO4)	mg/L	4.6	1.0	9744755	3.0	1.0	9748556	23	1.0	9744622
Alkalinity (Total as CaCO3)	mg/L	14	1.0	9743946	25	1.0	9743946	550	1.0	9743946
Dissolved Chloride (Cl-)	mg/L	42	1.0	9744754	24	1.0	9748544	79	1.0	9744620
Nitrite (N)	mg/L	ND	0.010	9743926	ND	0.010	9743926	ND	0.010	9743926
Nitrate (N)	mg/L	ND	0.10	9743926	ND	0.10	9743926	ND	0.10	9743926
Nitrate + Nitrite (N)	mg/L	ND	0.10	9743926	ND	0.10	9743926	ND	0.10	9743926
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 Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHRL21			AHRL21		
Sampling Date		2024/10/30 15:41			2024/10/30 15:41		
COC Number		971464			971464		
	UNITS	SB-QAQC-GW1	RDL	QC Batch	SB-QAQC-GW1 Lab-Dup	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L	19	0.10	9751424			
Total Chemical Oxygen Demand (COD)	mg/L	72	4.0	9749506			
Conductivity	umho/cm	1800	1.0	9744610			
Total Dissolved Solids	mg/L	960	10	9748695			
Total Kjeldahl Nitrogen (TKN)	mg/L	22	1.0	9749377			
Dissolved Organic Carbon	mg/L	27	0.4	9749819			
pH	pH	7.61		9744613			
Phenols-4AAP	mg/L	ND	0.0010	9752136			
Total Phosphorus	mg/L	ND	0.020	9749294	ND	0.020	9749294
Total Suspended Solids	mg/L	13	10	9743665			
Dissolved Sulphate (SO4)	mg/L	54	1.0	9748556			
Alkalinity (Total as CaCO3)	mg/L	720	1.0	9744607			
Dissolved Chloride (Cl-)	mg/L	110	1.0	9748544			
Nitrite (N)	mg/L	ND	0.010	9743881			
Nitrate (N)	mg/L	0.14	0.10	9743881			
Nitrate + Nitrite (N)	mg/L	0.14	0.10	9743881			
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.							



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VERITAS

Bureau Veritas Job #: C4Y5018

Report Date: 2024/11/08

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste GW

Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

Bureau Veritas ID		AHRL13		AHRL14	AHRL15	AHRL16		AHRL17		
Sampling Date		2024/10/30 16:36		2024/10/30 15:49	2024/10/30 16:28	2024/10/30 16:18		2024/10/30 15:41		
COC Number		971464		971464	971464	971464		971464		
	UNITS	SB-MW3	QC Batch	SB-MW4	SB-MW5	SB-MW6R	RDL	SB-MW7	RDL	QC Batch

Metals										
Dissolved Mercury (Hg)	ug/L	ND	9748830	ND	ND	ND	0.10	ND	0.10	9746538
Dissolved Aluminum (Al)	ug/L	6.1	9742962	30	13	65	4.9	17	4.9	9742962
Dissolved Arsenic (As)	ug/L	ND	9742962	ND	ND	ND	1.0	ND	1.0	9742962
Dissolved Barium (Ba)	ug/L	20	9742962	200	65	290	2.0	250	2.0	9742962
Dissolved Beryllium (Be)	ug/L	ND	9742962	ND	ND	ND	0.40	ND	0.40	9742962
Dissolved Boron (B)	ug/L	81	9742962	270	230	2200	10	990	10	9742962
Dissolved Cadmium (Cd)	ug/L	ND	9742962	ND	ND	ND	0.090	0.47	0.090	9742962
Dissolved Calcium (Ca)	ug/L	20000	9742962	38000	45000	230000	200	170000	200	9742962
Dissolved Chromium (Cr)	ug/L	ND	9742962	ND	ND	ND	5.0	ND	5.0	9742962
Dissolved Cobalt (Co)	ug/L	ND	9742962	0.66	ND	61	0.50	32	0.50	9742962
Dissolved Copper (Cu)	ug/L	1.4	9742962	6.6	ND	12	0.90	58	0.90	9742962
Dissolved Iron (Fe)	ug/L	ND	9742962	ND	3400	69000	100	ND	100	9742962
Dissolved Lead (Pb)	ug/L	ND	9742962	ND	ND	ND	0.50	ND	0.50	9742962
Dissolved Magnesium (Mg)	ug/L	2600	9742962	3300	8200	38000	50	32000	50	9742962
Dissolved Manganese (Mn)	ug/L	5.3	9742962	140	1700	4100	2.0	15000	10	9742962
Dissolved Molybdenum (Mo)	ug/L	ND	9742962	ND	0.66	3.5	0.50	11	0.50	9742962
Dissolved Nickel (Ni)	ug/L	ND	9742962	ND	1.1	10	1.0	39	1.0	9742962
Dissolved Potassium (K)	ug/L	2400	9742962	9100	22000	88000	200	51000	200	9742962
Dissolved Silicon (Si)	ug/L	5900	9742962	3500	6800	4300	50	7300	50	9742962
Dissolved Silver (Ag)	ug/L	ND	9742962	ND	ND	ND	0.090	ND	0.090	9742962
Dissolved Sodium (Na)	ug/L	16000	9742962	5600	33000	93000	100	100000	100	9742962
Dissolved Strontium (Sr)	ug/L	160	9742962	180	370	760	1.0	1500	1.0	9742962
Dissolved Thallium (Tl)	ug/L	ND	9742962	0.064	ND	0.23	0.050	0.20	0.050	9742962
Dissolved Titanium (Ti)	ug/L	ND	9742962	ND	ND	ND	5.0	ND	5.0	9742962
Dissolved Vanadium (V)	ug/L	ND	9742962	ND	0.66	2.3	0.50	ND	0.50	9742962
Dissolved Zinc (Zn)	ug/L	6.6	9742962	14	ND	ND	5.0	65	5.0	9742962

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 Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

Bureau Veritas ID		AHRL18		AHRL19			AHRL20		AHRL21		
Sampling Date		2024/10/30 14:51		2024/10/30 14:56			2024/10/30 15:58		2024/10/30 15:41		
COC Number		971464		971464			971464		971464		
	UNITS	SB-MW8	QC Batch	SB-MW9	RDL	QC Batch	SB-MW10	QC Batch	SB-QAQC-GW1	RDL	QC Batch

Metals											
Dissolved Mercury (Hg)	ug/L	ND	9746538	ND	0.10	9748830	ND	9746538	ND	0.10	9748830
Dissolved Aluminum (Al)	ug/L	17	9742962	9.3	4.9	9742962	8.1	9742962	ND	4.9	9742962
Dissolved Arsenic (As)	ug/L	ND	9742962	ND	1.0	9742962	ND	9742962	ND	1.0	9742962
Dissolved Barium (Ba)	ug/L	10	9742962	7.8	2.0	9742962	87	9742962	240	2.0	9742962
Dissolved Beryllium (Be)	ug/L	ND	9742962	ND	0.40	9742962	ND	9742962	ND	0.40	9742962
Dissolved Boron (B)	ug/L	ND	9742962	ND	10	9742962	580	9742962	1000	10	9742962
Dissolved Cadmium (Cd)	ug/L	ND	9742962	ND	0.090	9742962	0.14	9742962	0.60	0.090	9742962
Dissolved Calcium (Ca)	ug/L	11000	9742962	11000	200	9742962	100000	9742962	170000	200	9742962
Dissolved Chromium (Cr)	ug/L	ND	9742962	ND	5.0	9742962	ND	9742962	ND	5.0	9742962
Dissolved Cobalt (Co)	ug/L	ND	9742962	ND	0.50	9742962	32	9742962	32	0.50	9742962
Dissolved Copper (Cu)	ug/L	ND	9742962	2.8	0.90	9742962	36	9742962	56	0.90	9742962
Dissolved Iron (Fe)	ug/L	ND	9742962	ND	100	9742962	ND	9742962	ND	100	9742962
Dissolved Lead (Pb)	ug/L	ND	9742962	ND	0.50	9742962	0.78	9742962	ND	0.50	9742962
Dissolved Magnesium (Mg)	ug/L	1100	9742962	1300	50	9742962	18000	9742962	30000	50	9742962
Dissolved Manganese (Mn)	ug/L	ND	9742962	ND	2.0	9742962	11000	9742962	15000	10	9742962
Dissolved Molybdenum (Mo)	ug/L	ND	9742962	ND	0.50	9742962	8.7	9742962	11	0.50	9742962
Dissolved Nickel (Ni)	ug/L	ND	9742962	ND	1.0	9742962	23	9742962	38	1.0	9742962
Dissolved Potassium (K)	ug/L	1400	9742962	1200	200	9742962	40000	9742962	48000	200	9742962
Dissolved Silicon (Si)	ug/L	4800	9742962	5500	50	9742962	6500	9742962	7300	50	9742962
Dissolved Silver (Ag)	ug/L	ND	9742962	ND	0.090	9742962	ND	9742962	ND	0.090	9742962
Dissolved Sodium (Na)	ug/L	26000	9742962	13000	100	9742962	53000	9742962	98000	100	9742962
Dissolved Strontium (Sr)	ug/L	130	9742962	120	1.0	9742962	660	9742962	1400	1.0	9742962
Dissolved Thallium (Tl)	ug/L	ND	9742962	ND	0.050	9742962	0.18	9742962	0.17	0.050	9742962
Dissolved Titanium (Ti)	ug/L	5.2	9742962	ND	5.0	9742962	ND	9742962	ND	5.0	9742962
Dissolved Vanadium (V)	ug/L	ND	9742962	ND	0.50	9742962	ND	9742962	ND	0.50	9742962
Dissolved Zinc (Zn)	ug/L	ND	9742962	ND	5.0	9742962	19	9742962	60	5.0	9742962

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 Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

VOLATILE ORGANICS BY GC/MS (GROUND WATER)

Bureau Veritas ID		AHRL16		
Sampling Date		2024/10/30 16:18		
COC Number		971464		
	UNITS	SB-MW6R	RDL	QC Batch
Volatile Organics				
Benzene	ug/L	ND	2.0	9742991
1,4-Dichlorobenzene	ug/L	ND	4.0	9742991
Methylene Chloride(Dichloromethane)	ug/L	ND	20	9742991
Toluene	ug/L	ND	2.0	9742991
Vinyl Chloride	ug/L	ND	2.0	9742991
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	101		9742991
D4-1,2-Dichloroethane	%	107		9742991
D8-Toluene	%	94		9742991
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 Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHRL13
Sample ID: SB-MW3
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9743812	N/A	2024/11/08	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9748544	N/A	2024/11/06	Massarat Jan
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9743822	N/A	2024/11/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749862	N/A	2024/11/07	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9748830	2024/11/06	2024/11/07	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/05	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9750550	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743881	N/A	2024/11/05	Jinal Chavda
pH	AT	9743827	2024/11/04	2024/11/08	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9748556	N/A	2024/11/06	Massarat Jan
Total Dissolved Solids	BAL	9748695	2024/11/06	2024/11/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749377	2024/11/06	2024/11/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9749724	2024/11/06	2024/11/07	Shivani Shivani
Total Suspended Solids	BAL	9743665	2024/11/04	2024/11/07	Razieh Tabesh

Bureau Veritas ID: AHRL14
Sample ID: SB-MW4
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9744607	N/A	2024/11/07	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9748544	N/A	2024/11/06	Massarat Jan
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9744610	N/A	2024/11/07	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749819	N/A	2024/11/06	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9746538	2024/11/05	2024/11/06	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/05	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9750550	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743881	N/A	2024/11/05	Jinal Chavda
pH	AT	9744613	2024/11/04	2024/11/07	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9748556	N/A	2024/11/06	Massarat Jan
Total Dissolved Solids	BAL	9745913	2024/11/06	2024/11/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749299	2024/11/06	2024/11/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9749294	2024/11/06	2024/11/08	Shivani Shivani
Total Suspended Solids	BAL	9743993	2024/11/04	2024/11/06	Razieh Tabesh



Bureau Veritas Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHRL15
Sample ID: SB-MW5
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9744607	N/A	2024/11/08	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9748544	N/A	2024/11/06	Massarat Jan
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9744610	N/A	2024/11/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749862	N/A	2024/11/07	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9746538	2024/11/05	2024/11/06	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/05	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9751424	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743881	N/A	2024/11/05	Jinal Chavda
pH	AT	9744613	2024/11/04	2024/11/08	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9748556	N/A	2024/11/06	Massarat Jan
Total Dissolved Solids	BAL	9750044	2024/11/06	2024/11/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749377	2024/11/06	2024/11/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9749724	2024/11/06	2024/11/07	Shivani Shivani
Total Suspended Solids	BAL	9744241	2024/11/04	2024/11/05	Razieh Tabesh

Bureau Veritas ID: AHRL16
Sample ID: SB-MW6R
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9743946	N/A	2024/11/08	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9744754	N/A	2024/11/05	Massarat Jan
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9743948	N/A	2024/11/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749819	N/A	2024/11/06	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9746538	2024/11/05	2024/11/06	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/05	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9751424	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743926	N/A	2024/11/05	Jinal Chavda
pH	AT	9743949	2024/11/04	2024/11/08	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9744755	N/A	2024/11/05	Massarat Jan
Total Dissolved Solids	BAL	9745913	2024/11/06	2024/11/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749377	2024/11/06	2024/11/08	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9749724	2024/11/06	2024/11/07	Shivani Shivani
Total Suspended Solids	BAL	9743993	2024/11/04	2024/11/06	Razieh Tabesh
Volatile Organic Compounds in Water	GC/MS	9742991	N/A	2024/11/05	Manpreet Sarao



Bureau Veritas Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHRL17
Sample ID: SB-MW7
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9743812	N/A	2024/11/08	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9748544	N/A	2024/11/06	Massarat Jan
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9743822	N/A	2024/11/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749862	N/A	2024/11/07	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9746538	2024/11/05	2024/11/06	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/06	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9751424	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743881	N/A	2024/11/05	Jinal Chavda
pH	AT	9743827	2024/11/04	2024/11/08	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9748556	N/A	2024/11/06	Massarat Jan
Total Dissolved Solids	BAL	9748695	2024/11/06	2024/11/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749377	2024/11/06	2024/11/08	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9749294	2024/11/06	2024/11/07	Shivani Shivani
Total Suspended Solids	BAL	9743665	2024/11/04	2024/11/07	Razieh Tabesh

Bureau Veritas ID: AHRL17 Dup
Sample ID: SB-MW7
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	SKAL	9748544	N/A	2024/11/06	Massarat Jan
Sulphate by Automated Turbidimetry	SKAL	9748556	N/A	2024/11/06	Massarat Jan

Bureau Veritas ID: AHRL18
Sample ID: SB-MW8
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9743946	N/A	2024/11/08	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9744754	N/A	2024/11/05	Massarat Jan
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9743948	N/A	2024/11/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749862	N/A	2024/11/07	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9746538	2024/11/05	2024/11/06	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/06	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9750550	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743926	N/A	2024/11/05	Jinal Chavda
pH	AT	9743949	2024/11/04	2024/11/08	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9744755	N/A	2024/11/05	Massarat Jan
Total Dissolved Solids	BAL	9745913	2024/11/06	2024/11/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749377	2024/11/06	2024/11/08	Rajni Tyagi



Bureau Veritas Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHRL18
Sample ID: SB-MW8
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	SKAL/P	9749724	2024/11/06	2024/11/07	Shivani Shivani
Total Suspended Solids	BAL	9743993	2024/11/04	2024/11/06	Razieh Tabesh

Bureau Veritas ID: AHRL19
Sample ID: SB-MW9
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9743946	N/A	2024/11/08	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9748544	N/A	2024/11/06	Massarat Jan
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9743948	N/A	2024/11/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749819	N/A	2024/11/06	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9748830	2024/11/06	2024/11/07	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/05	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9750550	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743926	N/A	2024/11/05	Jinal Chavda
pH	AT	9743949	2024/11/04	2024/11/08	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9748556	N/A	2024/11/06	Massarat Jan
Total Dissolved Solids	BAL	9748693	2024/11/06	2024/11/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749377	2024/11/06	2024/11/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9749724	2024/11/06	2024/11/07	Shivani Shivani
Total Suspended Solids	BAL	9743665	2024/11/04	2024/11/07	Razieh Tabesh

Bureau Veritas ID: AHRL20
Sample ID: SB-MW10
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9743946	N/A	2024/11/08	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9744620	N/A	2024/11/08	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9743948	N/A	2024/11/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749819	N/A	2024/11/06	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9746538	2024/11/05	2024/11/06	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/06	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9751424	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743926	N/A	2024/11/05	Jinal Chavda
pH	AT	9743949	2024/11/04	2024/11/08	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9744622	N/A	2024/11/08	Alina Dobreanu
Total Dissolved Solids	BAL	9748695	2024/11/06	2024/11/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749377	2024/11/06	2024/11/08	Rajni Tyagi



Bureau Veritas Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHRL20
Sample ID: SB-MW10
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	SKAL/P	9749724	2024/11/06	2024/11/07	Shivani Shivani
Total Suspended Solids	BAL	9743665	2024/11/04	2024/11/07	Razieh Tabesh

Bureau Veritas ID: AHRL21
Sample ID: SB-QAQC-GW1
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9744607	N/A	2024/11/08	Nachiketa Gohil
Chloride by Automated Colourimetry	SKAL	9748544	N/A	2024/11/06	Massarat Jan
Chemical Oxygen Demand	SPEC	9749506	N/A	2024/11/08	Shivani Shivani
Conductivity	AT	9744610	N/A	2024/11/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9749819	N/A	2024/11/06	Gyulshen Idriz
Dissolved Mercury in Water by CVAA	CV/AA	9748830	2024/11/06	2024/11/07	Maitri PATIL
Dissolved Metals by ICPMS	ICP/MS	9742962	N/A	2024/11/07	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9751424	N/A	2024/11/07	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9743881	N/A	2024/11/05	Jinal Chavda
pH	AT	9744613	2024/11/04	2024/11/08	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9752136	N/A	2024/11/07	Sachi Patel
Sulphate by Automated Turbidimetry	SKAL	9748556	N/A	2024/11/06	Massarat Jan
Total Dissolved Solids	BAL	9748695	2024/11/06	2024/11/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9749377	2024/11/06	2024/11/08	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9749294	2024/11/06	2024/11/07	Shivani Shivani
Total Suspended Solids	BAL	9743665	2024/11/04	2024/11/07	Razieh Tabesh

Bureau Veritas ID: AHRL21 Dup
Sample ID: SB-QAQC-GW1
Matrix: Ground Water

Collected: 2024/10/30
Shipped:
Received: 2024/11/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	SKAL/P	9749294	2024/11/06	2024/11/07	Shivani Shivani



Bureau Veritas Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

GENERAL COMMENTS

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

Package 1	5.3°C
Package 2	5.3°C
Package 3	5.7°C

Sample AHRL16 [SB-MW6R] : VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Results relate only to the items tested.

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Bureau Veritas Job #: C4Y5018

Report Date: 2024/11/08

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste GW

Sampler Initials: BM

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
9742991	4-Bromofluorobenzene	2024/11/05	100	70 - 130	101	70 - 130	103	%				
9742991	D4-1,2-Dichloroethane	2024/11/05	103	70 - 130	100	70 - 130	103	%				
9742991	D8-Toluene	2024/11/05	102	70 - 130	103	70 - 130	94	%				
9742962	Dissolved Aluminum (Al)	2024/11/05	95	80 - 120	99	80 - 120	ND, RDL=4.9	ug/L	NC	20		
9742962	Dissolved Arsenic (As)	2024/11/05	96	80 - 120	98	80 - 120	ND, RDL=1.0	ug/L				
9742962	Dissolved Barium (Ba)	2024/11/05	97	80 - 120	99	80 - 120	ND, RDL=2.0	ug/L	12	20		
9742962	Dissolved Beryllium (Be)	2024/11/05	96	80 - 120	97	80 - 120	ND, RDL=0.40	ug/L				
9742962	Dissolved Boron (B)	2024/11/05	90	80 - 120	90	80 - 120	ND, RDL=10	ug/L	0.45	20		
9742962	Dissolved Cadmium (Cd)	2024/11/05	97	80 - 120	96	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9742962	Dissolved Calcium (Ca)	2024/11/05	NC	80 - 120	98	80 - 120	ND, RDL=200	ug/L	0.42	20		
9742962	Dissolved Chromium (Cr)	2024/11/05	95	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9742962	Dissolved Cobalt (Co)	2024/11/05	93	80 - 120	95	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9742962	Dissolved Copper (Cu)	2024/11/05	96	80 - 120	96	80 - 120	ND, RDL=0.90	ug/L				
9742962	Dissolved Iron (Fe)	2024/11/05	97	80 - 120	98	80 - 120	ND, RDL=100	ug/L	NC	20		
9742962	Dissolved Lead (Pb)	2024/11/05	95	80 - 120	97	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9742962	Dissolved Magnesium (Mg)	2024/11/05	94	80 - 120	94	80 - 120	ND, RDL=50	ug/L	1.0	20		
9742962	Dissolved Manganese (Mn)	2024/11/05	96	80 - 120	97	80 - 120	ND, RDL=2.0	ug/L	NC	20		
9742962	Dissolved Molybdenum (Mo)	2024/11/05	98	80 - 120	97	80 - 120	ND, RDL=0.50	ug/L				
9742962	Dissolved Nickel (Ni)	2024/11/05	93	80 - 120	94	80 - 120	ND, RDL=1.0	ug/L				
9742962	Dissolved Potassium (K)	2024/11/05	94	80 - 120	96	80 - 120	ND, RDL=200	ug/L				
9742962	Dissolved Silicon (Si)	2024/11/05	91	80 - 120	95	80 - 120	ND, RDL=50	ug/L				
9742962	Dissolved Silver (Ag)	2024/11/05	95	80 - 120	94	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9742962	Dissolved Sodium (Na)	2024/11/05	96	80 - 120	98	80 - 120	ND, RDL=100	ug/L	0.97	20		
9742962	Dissolved Strontium (Sr)	2024/11/05	96	80 - 120	98	80 - 120	ND, RDL=1.0	ug/L				
9742962	Dissolved Thallium (Tl)	2024/11/05	98	80 - 120	99	80 - 120	ND, RDL=0.050	ug/L				
9742962	Dissolved Titanium (Ti)	2024/11/05	93	80 - 120	94	80 - 120	ND, RDL=5.0	ug/L				
9742962	Dissolved Vanadium (V)	2024/11/05	96	80 - 120	97	80 - 120	ND, RDL=0.50	ug/L				
9742962	Dissolved Zinc (Zn)	2024/11/05	98	80 - 120	98	80 - 120	ND, RDL=5.0	ug/L	NC	20		

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Bureau Veritas Job #: C4Y5018

Report Date: 2024/11/08

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste GW

Sampler Initials: BM

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
9742991	1,4-Dichlorobenzene	2024/11/05	105	70 - 130	101	70 - 130	ND, RDL=0.40	ug/L	NC	30		
9742991	Benzene	2024/11/05	100	70 - 130	98	70 - 130	ND, RDL=0.20	ug/L	NC	30		
9742991	Methylene Chloride(Dichloromethane)	2024/11/05	97	70 - 130	94	70 - 130	ND, RDL=2.0	ug/L	NC	30		
9742991	Toluene	2024/11/05	101	70 - 130	100	70 - 130	ND, RDL=0.20	ug/L	NC	30		
9742991	Vinyl Chloride	2024/11/05	88	70 - 130	87	70 - 130	ND, RDL=0.20	ug/L				
9743665	Total Suspended Solids	2024/11/07			96	80 - 120	ND, RDL=10	mg/L	NC	20		
9743812	Alkalinity (Total as CaCO3)	2024/11/08			96	85 - 115	ND, RDL=1.0	mg/L	3.1	20		
9743822	Conductivity	2024/11/08			100	85 - 115	ND, RDL=1.0	umho/cm	3.2	10		
9743827	pH	2024/11/08			102	98 - 103			1.1	N/A		
9743881	Nitrate (N)	2024/11/05	90	80 - 120	93	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9743881	Nitrite (N)	2024/11/05	100	80 - 120	101	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9743926	Nitrate (N)	2024/11/05	89	80 - 120	95	80 - 120	ND, RDL=0.10	mg/L				
9743926	Nitrite (N)	2024/11/05	102	80 - 120	100	80 - 120	ND, RDL=0.010	mg/L				
9743946	Alkalinity (Total as CaCO3)	2024/11/08			96	85 - 115	ND, RDL=1.0	mg/L	0.083	20		
9743948	Conductivity	2024/11/08			99	85 - 115	ND, RDL=1.0	umho/cm	0.53	10		
9743949	pH	2024/11/08			102	98 - 103			0.43	N/A		
9743993	Total Suspended Solids	2024/11/06			98	80 - 120	ND, RDL=10	mg/L	9.5	20		
9744241	Total Suspended Solids	2024/11/05			95	80 - 120	ND, RDL=10	mg/L	18	20		
9744607	Alkalinity (Total as CaCO3)	2024/11/07			96	85 - 115	ND, RDL=1.0	mg/L	5.1	20		
9744610	Conductivity	2024/11/07			99	85 - 115	ND, RDL=1.0	umho/cm	2.3	10		
9744613	pH	2024/11/07			102	98 - 103			1.1	N/A		
9744620	Dissolved Chloride (Cl-)	2024/11/08	101	80 - 120	100	80 - 120	ND, RDL=1.0	mg/L	0.074	20		
9744622	Dissolved Sulphate (SO4)	2024/11/08	94	75 - 125	95	80 - 120	ND, RDL=1.0	mg/L	3.2	20		
9744754	Dissolved Chloride (Cl-)	2024/11/05	NC	80 - 120	95	80 - 120	ND, RDL=1.0	mg/L	1.2	20		
9744755	Dissolved Sulphate (SO4)	2024/11/05	NC	75 - 125	96	80 - 120	ND, RDL=1.0	mg/L	3.8	20		
9745913	Total Dissolved Solids	2024/11/07			95	80 - 120	ND, RDL=10	mg/L	0.40	20		
9746538	Dissolved Mercury (Hg)	2024/11/06	91	75 - 125	92	80 - 120	ND, RDL=0.10	ug/L				

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Bureau Veritas Job #: C4Y5018

Report Date: 2024/11/08

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste GW

Sampler Initials: BM

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
9748544	Dissolved Chloride (Cl-)	2024/11/06	NC	80 - 120	94	80 - 120	ND, RDL=1.0	mg/L	8.8	20		
9748556	Dissolved Sulphate (SO4)	2024/11/06	NC	75 - 125	97	80 - 120	ND, RDL=1.0	mg/L	16	20		
9748693	Total Dissolved Solids	2024/11/07			97	80 - 120	ND, RDL=10	mg/L	0	20		
9748695	Total Dissolved Solids	2024/11/08			98	80 - 120	ND, RDL=10	mg/L	7.1	20		
9748830	Dissolved Mercury (Hg)	2024/11/07	97	75 - 125	97	80 - 120	ND, RDL=0.10	ug/L	NC	20		
9749294	Total Phosphorus	2024/11/07	98	80 - 120	104	80 - 120	ND, RDL=0.020	mg/L	NC	20	101	80 - 120
9749299	Total Kjeldahl Nitrogen (TKN)	2024/11/07	99	80 - 120	96	80 - 120	ND, RDL=0.10	mg/L	9.5	20	96	80 - 120
9749377	Total Kjeldahl Nitrogen (TKN)	2024/11/07	102	N/A	96	80 - 120	ND, RDL=0.10	mg/L	NC	20	99	80 - 120
9749506	Total Chemical Oxygen Demand (COD)	2024/11/08	100	80 - 120	99	80 - 120	ND, RDL=4.0	mg/L	17	20		
9749724	Total Phosphorus	2024/11/07	102	80 - 120	107	80 - 120	ND, RDL=0.020	mg/L	NC	20	101	80 - 120
9749819	Dissolved Organic Carbon	2024/11/06	96	80 - 120	98	80 - 120	ND, RDL=0.4	mg/L	1.5	20		
9749862	Dissolved Organic Carbon	2024/11/07	97	80 - 120	103	80 - 120	ND, RDL=0.4	mg/L	2.2	20		
9750044	Total Dissolved Solids	2024/11/08			97	80 - 120	ND, RDL=10	mg/L	0.68	20		
9750550	Total Ammonia-N	2024/11/07	96	75 - 125	102	80 - 120	ND, RDL=0.050	mg/L	NC	20		
9751424	Total Ammonia-N	2024/11/07	NC	75 - 125	100	80 - 120	ND, RDL=0.050	mg/L	1.7	20		



Bureau Veritas Job #: C4Y5018
Report Date: 2024/11/08

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

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
9752136	Phenols-4AAP	2024/11/07	99	80 - 120	98	80 - 120	ND, RDL=0.0010	mg/L	4.9	20		
N/A = Not Applicable Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement. Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference. QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy. Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy. Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination. Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency. NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration) NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).												



Bureau Veritas Job #: C4Y5018
Report Date: 2024/11/08

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste GW
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink, reading 'Louise A. Harding'.

Louise Harding, Scientific Specialist

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



T971464

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	2024/10/31	<i>Asitha Subramanian</i>	<i>Asitha Subramanian</i>	Date	2024/11/01
		Time (24 HR)	0800			Time (24 HR)	0800
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
Print	Sign	Date	YYYY/MM/DD	Print	Sign	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.

Triage Information

Sampled By (Print)

of Coolers/Pkgs:

BM/ NW

2

Rush ☐

Immediate Test ☐

Food Residue ☐

Micro ☐

Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Lab Comments:

Labeled By

Verified By

01-Nov-24 10:10
Elora Di Bratto
C4Y5018

43P

ENV-1467

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	7	4	5
Y	Y	Y	6	5	5
Y	Y	Y	6	6	5
Drinking Water Metals Preservation Check Done (Circle)			YES	NO	

COR FCD-00383/4

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Appendix D

D-3 2022 Surface Water Analytical Results



Your Project #: 240205-09
Site Location: South Baptiste
Your C.O.C. #: 880151

Attention: MHH Distribution

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

Report Date: 2024/05/13
Report #: R8147382
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4C9090

Received: 2024/05/01, 09:10

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	2024/05/06	CAM SOP-00447	EPA 6020B m
Alkalinity	5	N/A	2024/05/07	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	5	2024/05/02	2024/05/07	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	1	N/A	2024/05/06	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	4	N/A	2024/05/07	CAM SOP-00463	SM 24 4500-Cl E m
Colour	5	N/A	2024/05/03	CAM SOP-00412	SM 24 2120C m
Conductivity	5	N/A	2024/05/07	CAM SOP-00414	SM 24 2510 m
Hardness (calculated as CaCO ₃)	5	N/A	2024/05/08	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Mercury in Water by CVAA	5	2024/05/06	2024/05/07	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	5	2024/05/06	2024/05/07	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	5	N/A	2024/05/07	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	3	N/A	2024/05/02	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (2)	2	N/A	2024/05/03	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	5	2024/05/02	2024/05/07	CAM SOP-00413	SM 24th - 4500H+ B
Phenols (4AAP)	4	N/A	2024/05/02	CAM SOP-00444	OMOE E3179 m
Phenols (4AAP)	1	N/A	2024/05/03	CAM SOP-00444	OMOE E3179 m
Field Measured pH (4)	5	N/A	2024/05/01		Field pH Meter
Sulphate by Automated Turbidimetry	4	N/A	2024/05/07	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	1	N/A	2024/05/09	CAM SOP-00464	SM 24 4500-SO42- E m
48-h Daphnia Magna Single Concentration (1)	1	N/A	N/A		
96-h Rainbow Trout Single Concentration (1)	1	N/A	N/A		
Total Dissolved Solids	5	2024/05/02	2024/05/03	CAM SOP-00428	SM 24 2540C m
Field Temperature (4)	5	N/A	2024/05/01		Field Thermometer
Total Kjeldahl Nitrogen in Water	5	2024/05/02	2024/05/03	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	5	2024/05/02	2024/05/07	CAM SOP-00407	SM 24 4500-P I
Total Suspended Solids	5	2024/05/02	2024/05/03	CAM SOP-00428	SM 24 2540D m
Turbidity	5	N/A	2024/05/02	CAM SOP-00417	SM 24 2130 B
Un-ionized Ammonia (5)	5	2024/05/01	2024/05/08	Auto Calc.	PWQO



Your Project #: 240205-09
Site Location: South Baptiste
Your C.O.C. #: 880151

Attention: MHH Distribution

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

Report Date: 2024/05/13

Report #: R8147382

Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4C9090

Received: 2024/05/01, 09:10

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, EPA, APHA or the Quebec Ministry of Environment.

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) This test was performed by Nautilus Environmental Company Inc, 11 Nicholas Beaver Rd Unit B, Puslinch, ON, N0B 2C0

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

(3) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

(4) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.

(5) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.



Your Project #: 240205-09
Site Location: South Baptiste
Your C.O.C. #: 880151

Attention: MHH Distribution

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

Report Date: 2024/05/13
Report #: R8147382
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4C9090

Received: 2024/05/01, 09:10

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Christine Gipton, Senior Project Manager
Email: Christine.Gipton@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 #: C4C9090

Report Date: 2024/05/13

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ZAU767			ZAU767			ZAU768		
Sampling Date		2024/04/29 11:15			2024/04/29 11:15			2024/04/29 11:05		
COC Number		880151			880151			880151		
	UNITS	BAP-A	RDL	QC Batch	BAP-A Lab-Dup	RDL	QC Batch	BAP-B	RDL	QC Batch

Calculated Parameters										
Hardness (CaCO ₃)	mg/L	190	1.0	9367443				67	1.0	9367443
Total Un-ionized Ammonia	mg/L	ND	0.00061	9366990				ND	0.00061	9366990
Field Measurements										
Field Temperature	Celsius	6.2	N/A	ONSITE				6.3	N/A	ONSITE
Field Measured pH	pH	7.03		ONSITE				6.47		ONSITE
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9372034				ND	0.050	9372034
Total BOD	mg/L	ND	2	9368665				ND	2	9368665
Colour	TCU	13	2	9370509				27	2	9370509
Conductivity	umho/cm	530	1.0	9369695				130	1.0	9369695
Total Dissolved Solids	mg/L	320	10	9370150	320	10	9370150	100	10	9370150
Total Kjeldahl Nitrogen (TKN)	mg/L	0.25	0.10	9369854				0.21	0.10	9369854
pH	pH	8.42		9369696				7.95		9369696
Phenols-4AAP	mg/L	ND	0.0010	9370595				ND	0.0010	9369807
Total Phosphorus	mg/L	ND	0.020	9370235	ND	0.020	9370235	ND	0.020	9370235
Total Suspended Solids	mg/L	ND	10	9368602				ND	10	9368602
Dissolved Sulphate (SO ₄)	mg/L	39	1.0	9370631				4.7	1.0	9370631
Turbidity	NTU	0.2	0.1	9370025	0.2	0.1	9370025	1.0	0.1	9368718
Alkalinity (Total as CaCO ₃)	mg/L	150	1.0	9369684				58	1.0	9369684
Dissolved Chloride (Cl ⁻)	mg/L	43	1.0	9370617				4.0	1.0	9370617
Nitrite (N)	mg/L	ND	0.010	9369705				ND	0.010	9366694
Nitrate (N)	mg/L	2.15	0.10	9369705				ND	0.10	9366694
Nitrate + Nitrite (N)	mg/L	2.15	0.10	9369705				ND	0.10	9366694

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 #: C4C9090

Report Date: 2024/05/13

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ZAU769			ZAU769			ZAU770		
Sampling Date		2024/04/29 10:55			2024/04/29 10:55			2024/04/29 00:10		
COC Number		880151			880151			880151		
	UNITS	BAP-C	RDL	QC Batch	BAP-C Lab-Dup	RDL	QC Batch	BAP-D	RDL	QC Batch

Calculated Parameters										
Hardness (CaCO ₃)	mg/L	77	1.0	9367443				51	1.0	9367443
Total Un-ionized Ammonia	mg/L	ND	0.00061	9366990				ND	0.00061	9366990
Field Measurements										
Field Temperature	Celsius	6.2	N/A	ONSITE				6.7	N/A	ONSITE
Field Measured pH	pH	6.62		ONSITE				6.66		ONSITE
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9372034				ND	0.050	9372034
Total BOD	mg/L	ND	2	9368665				ND	2	9368665
Colour	TCU	26	2	9370509				38	2	9370509
Conductivity	umho/cm	170	1.0	9369695				110	1.0	9369695
Total Dissolved Solids	mg/L	125	10	9370150				85	10	9370150
Total Kjeldahl Nitrogen (TKN)	mg/L	0.20	0.10	9369854				0.19	0.10	9369854
pH	pH	8.00		9369696				7.65		9369696
Phenols-4AAP	mg/L	0.0013	0.0010	9370595				ND	0.0010	9370595
Total Phosphorus	mg/L	ND	0.020	9370235				ND	0.020	9370235
Total Suspended Solids	mg/L	ND	10	9368602				10	10	9368602
Dissolved Sulphate (SO ₄)	mg/L	8.3	1.0	9382111				3.7	1.0	9370631
Turbidity	NTU	0.9	0.1	9370025				1.3	0.1	9368718
Alkalinity (Total as CaCO ₃)	mg/L	70	1.0	9369684				45	1.0	9369684
Dissolved Chloride (Cl ⁻)	mg/L	7.9	1.0	9370635				5.0	1.0	9370617
Nitrite (N)	mg/L	ND	0.010	9369708	ND	0.010	9369708	ND	0.010	9366694
Nitrate (N)	mg/L	0.19	0.10	9369708	0.19	0.10	9369708	ND	0.10	9366694
Nitrate + Nitrite (N)	mg/L	0.19	0.10	9369708	0.19	0.10	9369708	ND	0.10	9366694

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

Bureau Veritas ID		ZAU770			ZAU771		
Sampling Date		2024/04/29 00:10			2024/04/29 11:15		
COC Number		880151			880151		
	UNITS	BAP-D Lab-Dup	RDL	QC Batch	SB-QAQC-SW1	RDL	QC Batch
Calculated Parameters							
Hardness (CaCO ₃)	mg/L				190	1.0	9367443
Total Un-ionized Ammonia	mg/L				ND	0.00061	9366990
Field Measurements							
Field Temperature	Celsius				6.2	N/A	ONSITE
Field Measured pH	pH				7.03		ONSITE
Inorganics							
Total Ammonia-N	mg/L				ND	0.050	9372034
Total BOD	mg/L				ND	2	9368665
Colour	TCU				13	2	9370509
Conductivity	umho/cm	110	1.0	9369695	530	1.0	9369695
Total Dissolved Solids	mg/L				320	10	9370150
Total Kjeldahl Nitrogen (TKN)	mg/L				0.13	0.10	9369854
pH	pH	7.72		9369696	8.08		9369696
Phenols-4AAP	mg/L				ND	0.0010	9370595
Total Phosphorus	mg/L				ND	0.020	9370235
Total Suspended Solids	mg/L				ND	10	9368602
Dissolved Sulphate (SO ₄)	mg/L				39	1.0	9370631
Turbidity	NTU				0.3	0.1	9368718
Alkalinity (Total as CaCO ₃)	mg/L	45	1.0	9369684	150	1.0	9369684
Dissolved Chloride (Cl ⁻)	mg/L				43	1.0	9370617
Nitrite (N)	mg/L				ND	0.010	9366694
Nitrate (N)	mg/L				2.32	0.10	9366694
Nitrate + Nitrite (N)	mg/L				2.32	0.10	9366694
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 #: C4C9090

Report Date: 2024/05/13

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		ZAU767	ZAU768	ZAU769	ZAU770			ZAU770		
Sampling Date		2024/04/29 11:15	2024/04/29 11:05	2024/04/29 10:55	2024/04/29 00:10			2024/04/29 00:10		
COC Number		880151	880151	880151	880151			880151		
	UNITS	BAP-A	BAP-B	BAP-C	BAP-D	RDL	QC Batch	BAP-D Lab-Dup	RDL	QC Batch

Metals										
Dissolved (0.2u) Aluminum (Al)	ug/L	ND	21	20	26	5	9373097			
Dissolved Mercury (Hg)	ug/L	ND	ND	ND	ND	0.10	9375775	ND	0.10	9375775
Total Aluminum (Al)	ug/L	9.5	65	65	96	4.9	9375517			
Total Arsenic (As)	ug/L	ND	ND	ND	ND	1.0	9375517			
Total Boron (B)	ug/L	310	ND	29	ND	10	9375517			
Total Cadmium (Cd)	ug/L	ND	ND	ND	ND	0.090	9375517			
Total Calcium (Ca)	ug/L	51000	23000	25000	17000	200	9375517			
Total Chromium (Cr)	ug/L	ND	ND	ND	ND	5.0	9375517			
Total Cobalt (Co)	ug/L	ND	ND	ND	ND	0.50	9375517			
Total Copper (Cu)	ug/L	ND	0.95	0.94	1.2	0.90	9375517			
Total Iron (Fe)	ug/L	ND	380	350	410	100	9375517			
Total Lead (Pb)	ug/L	ND	ND	ND	ND	0.50	9375517			
Total Magnesium (Mg)	ug/L	9200	1000	1600	860	50	9375517			
Total Nickel (Ni)	ug/L	1.4	ND	ND	ND	1.0	9375517			
Total Potassium (K)	ug/L	20000	500	1900	500	200	9375517			
Total Selenium (Se)	ug/L	ND	ND	ND	ND	2.0	9375517			
Total Silver (Ag)	ug/L	ND	ND	ND	ND	0.090	9375517			
Total Sodium (Na)	ug/L	35000	4700	6900	4700	100	9375517			
Total Zinc (Zn)	ug/L	ND	ND	ND	ND	5.0	9375517			

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 #: C4C9090

Report Date: 2024/05/13

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		ZAU771		
Sampling Date		2024/04/29 11:15		
COC Number		880151		
	UNITS	SB-QAQC-SW1	RDL	QC Batch
Metals				
Dissolved (0.2u) Aluminum (Al)	ug/L	ND	5	9373097
Dissolved Mercury (Hg)	ug/L	ND	0.10	9375775
Total Aluminum (Al)	ug/L	11	4.9	9375517
Total Arsenic (As)	ug/L	ND	1.0	9375517
Total Boron (B)	ug/L	300	10	9375517
Total Cadmium (Cd)	ug/L	ND	0.090	9375517
Total Calcium (Ca)	ug/L	52000	200	9375517
Total Chromium (Cr)	ug/L	ND	5.0	9375517
Total Cobalt (Co)	ug/L	ND	0.50	9375517
Total Copper (Cu)	ug/L	1.4	0.90	9375517
Total Iron (Fe)	ug/L	ND	100	9375517
Total Lead (Pb)	ug/L	ND	0.50	9375517
Total Magnesium (Mg)	ug/L	8700	50	9375517
Total Nickel (Ni)	ug/L	1.3	1.0	9375517
Total Potassium (K)	ug/L	20000	200	9375517
Total Selenium (Se)	ug/L	ND	2.0	9375517
Total Silver (Ag)	ug/L	ND	0.090	9375517
Total Sodium (Na)	ug/L	35000	100	9375517
Total Zinc (Zn)	ug/L	5.5	5.0	9375517
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 Job #: C4C9090
Report Date: 2024/05/13

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAU767
Sample ID: BAP-A
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373097	N/A	2024/05/06	Indira HarryPaul
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9368665	2024/05/02	2024/05/07	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Colour	SPEC	9370509	N/A	2024/05/03	Gyulshen Idriz
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Hardness (calculated as CaCO3)		9367443	N/A	2024/05/08	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9375517	2024/05/06	2024/05/07	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372034	N/A	2024/05/07	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369705	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370595	N/A	2024/05/03	Chandra Nandlal
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
48-h Daphnia Magna Single Concentration		9385613	N/A		Christine Gripton
96-h Rainbow Trout Single Concentration		9385614	N/A		Christine Gripton
Total Dissolved Solids	BAL	9370150	2024/05/02	2024/05/03	Darshan Patel
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/07	Muskan
Total Suspended Solids	BAL	9368602	2024/05/03	2024/05/03	Madhav Somani
Turbidity	AT	9370025	N/A	2024/05/02	Taslina Aktar
Un-ionized Ammonia	CALC/NH3	9366990	2024/05/08	2024/05/08	Automated Statchk

Bureau Veritas ID: ZAU767 Dup
Sample ID: BAP-A
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	9370150	2024/05/02	2024/05/03	Darshan Patel
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/07	Muskan
Turbidity	AT	9370025	N/A	2024/05/02	Taslina Aktar

Bureau Veritas ID: ZAU768
Sample ID: BAP-B
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373097	N/A	2024/05/06	Indira HarryPaul
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9368665	2024/05/02	2024/05/07	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Colour	SPEC	9370509	N/A	2024/05/03	Gyulshen Idriz



Bureau Veritas Job #: C4C9090
Report Date: 2024/05/13

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAU768
Sample ID: BAP-B
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Hardness (calculated as CaCO ₃)		9367443	N/A	2024/05/08	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9375517	2024/05/06	2024/05/07	Indira HarryPaul
Total Ammonia-N	LACH/NH ₄	9372034	N/A	2024/05/07	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9366694	N/A	2024/05/02	Samuel Law
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9369807	N/A	2024/05/02	Chandra Nandlal
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9370150	2024/05/02	2024/05/03	Darshan Patel
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/07	Muskan
Total Suspended Solids	BAL	9368602	2024/05/03	2024/05/03	Madhav Somani
Turbidity	AT	9368718	N/A	2024/05/02	Gurparteek KAUR
Un-ionized Ammonia	CALC/NH ₃	9366990	2024/05/08	2024/05/08	Automated Statchk

Bureau Veritas ID: ZAU769
Sample ID: BAP-C
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373097	N/A	2024/05/06	Indira HarryPaul
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9368665	2024/05/02	2024/05/07	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9370635	N/A	2024/05/06	Massarat Jan
Colour	SPEC	9370509	N/A	2024/05/03	Gyulshen Idriz
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Hardness (calculated as CaCO ₃)		9367443	N/A	2024/05/08	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9375517	2024/05/06	2024/05/07	Indira HarryPaul
Total Ammonia-N	LACH/NH ₄	9372034	N/A	2024/05/07	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9369708	N/A	2024/05/03	Jinal Chavda
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370595	N/A	2024/05/02	Chandra Nandlal
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Sulphate by Automated Turbidimetry	SKAL	9382111	N/A	2024/05/09	Massarat Jan
Total Dissolved Solids	BAL	9370150	2024/05/02	2024/05/03	Darshan Patel
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/07	Muskan
Total Suspended Solids	BAL	9368602	2024/05/03	2024/05/03	Madhav Somani
Turbidity	AT	9370025	N/A	2024/05/02	Taslina Aktar



Bureau Veritas Job #: C4C9090
Report Date: 2024/05/13

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAU769
Sample ID: BAP-C
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Un-ionized Ammonia	CALC/NH3	9366990	2024/05/08	2024/05/08	Automated Statchk

Bureau Veritas ID: ZAU769 Dup
Sample ID: BAP-C
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate & Nitrite as Nitrogen in Water	LACH	9369708	N/A	2024/05/03	Jinal Chavda

Bureau Veritas ID: ZAU770
Sample ID: BAP-D
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373097	N/A	2024/05/06	Indira HarryPaul
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9368665	2024/05/02	2024/05/07	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Colour	SPEC	9370509	N/A	2024/05/03	Gyulshen Idriz
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Hardness (calculated as CaCO3)		9367443	N/A	2024/05/08	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9375517	2024/05/06	2024/05/07	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372034	N/A	2024/05/07	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9366694	N/A	2024/05/02	Samuel Law
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370595	N/A	2024/05/02	Chandra Nandlal
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9370150	2024/05/02	2024/05/03	Darshan Patel
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/07	Muskan
Total Suspended Solids	BAL	9368602	2024/05/03	2024/05/03	Madhav Somani
Turbidity	AT	9368718	N/A	2024/05/02	Gurparteek KAUR
Un-ionized Ammonia	CALC/NH3	9366990	2024/05/08	2024/05/08	Automated Statchk

Bureau Veritas ID: ZAU770 Dup
Sample ID: BAP-D
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai



Bureau Veritas Job #: C4C9090
Report Date: 2024/05/13

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZAU770 Dup
Sample ID: BAP-D
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai

Bureau Veritas ID: ZAU771
Sample ID: SB-QAQC-SW1
Matrix: Water

Collected: 2024/04/29
Shipped:
Received: 2024/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373097	N/A	2024/05/06	Indira HarryPaul
Alkalinity	AT	9369684	N/A	2024/05/07	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9368665	2024/05/02	2024/05/07	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9370617	N/A	2024/05/07	Alina Dobreanu
Colour	SPEC	9370509	N/A	2024/05/03	Gyulshen Idriz
Conductivity	AT	9369695	N/A	2024/05/07	Surinder Rai
Hardness (calculated as CaCO3)		9367443	N/A	2024/05/08	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9375775	2024/05/06	2024/05/07	Gagandeep Rai
Total Metals Analysis by ICPMS	ICP/MS	9375517	2024/05/06	2024/05/07	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372034	N/A	2024/05/07	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9366694	N/A	2024/05/02	Samuel Law
pH	AT	9369696	2024/05/02	2024/05/07	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9370595	N/A	2024/05/02	Chandra Nandlal
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Sulphate by Automated Turbidimetry	SKAL	9370631	N/A	2024/05/07	Alina Dobreanu
Total Dissolved Solids	BAL	9370150	2024/05/02	2024/05/03	Darshan Patel
Field Measured pH	PH	ONSITE	N/A	2024/05/01	Niral Patel
Total Kjeldahl Nitrogen in Water	SKAL	9369854	2024/05/02	2024/05/03	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9370235	2024/05/02	2024/05/07	Muskan
Total Suspended Solids	BAL	9368602	2024/05/03	2024/05/03	Madhav Somani
Turbidity	AT	9368718	N/A	2024/05/02	Gurparteek KAUR
Un-ionized Ammonia	CALC/NH3	9366990	2024/05/08	2024/05/08	Automated Statchk



Bureau Veritas Job #: C4C9090
Report Date: 2024/05/13

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste
Sampler Initials: BM

GENERAL COMMENTS

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

Package 1	6.7°C
Package 2	5.3°C

Results relate only to the items tested.

BUREAU
VERITAS

Bureau Veritas Job #: C4C9090

Report Date: 2024/05/13

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

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
9366694	Nitrate (N)	2024/05/02	101	80 - 120	108	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9366694	Nitrite (N)	2024/05/02	97	80 - 120	100	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9368602	Total Suspended Solids	2024/05/03			100	80 - 120	ND, RDL=10	mg/L	9.5	20		
9368665	Total BOD	2024/05/07					ND,RDL=2	mg/L	24	30	97	80 - 120
9368718	Turbidity	2024/05/02			99	80 - 120	ND, RDL=0.1	NTU	1.8	20		
9369684	Alkalinity (Total as CaCO3)	2024/05/07			102	85 - 115	ND, RDL=1.0	mg/L	0.15	20		
9369695	Conductivity	2024/05/07			102	85 - 115	ND, RDL=1.0	umho/cm	0.58	10		
9369696	pH	2024/05/07			102	98 - 103			0.83	N/A		
9369705	Nitrate (N)	2024/05/03	NC	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L	0.79	20		
9369705	Nitrite (N)	2024/05/03	93	80 - 120	94	80 - 120	ND, RDL=0.010	mg/L	1.7	20		
9369708	Nitrate (N)	2024/05/03	92	80 - 120	94	80 - 120	ND, RDL=0.10	mg/L	1.8	20		
9369708	Nitrite (N)	2024/05/03	95	80 - 120	92	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9369807	Phenols-4AAP	2024/05/02	100	80 - 120	102	80 - 120	ND, RDL=0.0010	mg/L	0	20		
9369854	Total Kjeldahl Nitrogen (TKN)	2024/05/03	NC	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	3.1	20	100	80 - 120
9370025	Turbidity	2024/05/02			99	80 - 120	ND, RDL=0.1	NTU	0.41	20		
9370150	Total Dissolved Solids	2024/05/03			100	80 - 120	ND, RDL=10	mg/L	0	20		
9370235	Total Phosphorus	2024/05/07	95	80 - 120	101	80 - 120	ND, RDL=0.020	mg/L	NC	20	96	80 - 120
9370509	Colour	2024/05/03			99	80 - 120	ND,RDL=2	TCU	NC	25		
9370595	Phenols-4AAP	2024/05/02	98	80 - 120	99	80 - 120	ND, RDL=0.0010	mg/L	NC	20		
9370617	Dissolved Chloride (Cl-)	2024/05/07	NC	80 - 120	97	80 - 120	ND, RDL=1.0	mg/L	0.30	20		
9370631	Dissolved Sulphate (SO4)	2024/05/07	94	75 - 125	97	80 - 120	ND, RDL=1.0	mg/L	0.76	20		
9370635	Dissolved Chloride (Cl-)	2024/05/06	NC	80 - 120	105	80 - 120	ND, RDL=1.0	mg/L	1.4	20		
9372034	Total Ammonia-N	2024/05/07	NC	75 - 125	98	80 - 120	ND, RDL=0.050	mg/L	1.0	20		
9373097	Dissolved (0.2u) Aluminum (Al)	2024/05/06	101	80 - 120	98	80 - 120	ND,RDL=5	ug/L	NC	20		

BUREAU
VERITAS

Bureau Veritas Job #: C4C9090

Report Date: 2024/05/13

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

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
9375517	Total Aluminum (Al)	2024/05/07	98	80 - 120	93	80 - 120	ND, RDL=4.9	ug/L	0.72	20		
9375517	Total Arsenic (As)	2024/05/07	103	80 - 120	100	80 - 120	ND, RDL=1.0	ug/L	NC	20		
9375517	Total Boron (B)	2024/05/07	102	80 - 120	98	80 - 120	ND, RDL=10	ug/L	NC	20		
9375517	Total Cadmium (Cd)	2024/05/07	99	80 - 120	99	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9375517	Total Calcium (Ca)	2024/05/07	99	80 - 120	96	80 - 120	ND, RDL=200	ug/L	1.0	20		
9375517	Total Chromium (Cr)	2024/05/07	102	80 - 120	99	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9375517	Total Cobalt (Co)	2024/05/07	101	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9375517	Total Copper (Cu)	2024/05/07	103	80 - 120	101	80 - 120	ND, RDL=0.90	ug/L	NC	20		
9375517	Total Iron (Fe)	2024/05/07	102	80 - 120	99	80 - 120	ND, RDL=100	ug/L	0.83	20		
9375517	Total Lead (Pb)	2024/05/07	99	80 - 120	99	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9375517	Total Magnesium (Mg)	2024/05/07	100	80 - 120	98	80 - 120	ND, RDL=50	ug/L	1.6	20		
9375517	Total Nickel (Ni)	2024/05/07	96	80 - 120	94	80 - 120	ND, RDL=1.0	ug/L	NC	20		
9375517	Total Potassium (K)	2024/05/07	103	80 - 120	99	80 - 120	ND, RDL=200	ug/L	5.2	20		
9375517	Total Selenium (Se)	2024/05/07	104	80 - 120	100	80 - 120	ND, RDL=2.0	ug/L	NC	20		
9375517	Total Silver (Ag)	2024/05/07	92	80 - 120	92	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9375517	Total Sodium (Na)	2024/05/07	103	80 - 120	101	80 - 120	ND, RDL=100	ug/L	4.0	20		
9375517	Total Zinc (Zn)	2024/05/07	104	80 - 120	100	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9375775	Dissolved Mercury (Hg)	2024/05/07	95	75 - 125	94	80 - 120	ND, RDL=0.10	ug/L	NC	20		
9382111	Dissolved Sulphate (SO4)	2024/05/09	NC	75 - 125	102	80 - 120	ND, RDL=1.0	mg/L	1.8	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 #: C4C9090

Report Date: 2024/05/13

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

Sampler Initials: BM

VALIDATION SIGNATURE PAGE

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

Christine Gripton, Senior Project Manager

Cristina Carriere, Senior Scientific Specialist

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.



01-May-24 09:10

Christine Gipton

C4C9090

NDA

ENV 727

Custody Tracking Form



T880151

When submitting the work instructions via eCOC (electronic Chain of Custody),
Bureau Veritas eCOC confirmation number in the top right hand side. This
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			
Brad McCallum	Brad McCallum	Date	2024/04/30	SATTA BASTOLA	Sign	Date	2024/05/01
		Time (24 HR)	07:30			Time (24 HR)	09:10
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
Print	Sign	Date	YYYY/MM/DD	Print	Sign	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.

Triage Information

Sampled By (Print)

Brad McCallum / Matthew DeGeer

of Coolers/Pkgs:

2

Rush ☐

Immediate Test ☐

Food Residue ☐

Micro ☐

Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Lab Comments:

Labeled By

Verified By

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	X	Y	7	7	8
Y	Y	Y	5	5	6
Drinking Water Metals Preservation Check Done (Circle)			YES	NO	

COR FCD-00383/4

Page 1 of 1



Your Project #: 240205-09
Site Location: South Baptiste
Your C.O.C. #: 921025

Attention: MHH Distribution

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

Report Date: 2024/07/19
Report #: R8241979
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4L3531

Received: 2024/07/12, 14:42

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	4	N/A	2024/07/17	CAM SOP-00447	EPA 6020B m
Dissolved Aluminum (0.2 u, clay free)	1	N/A	2024/07/18	CAM SOP-00447	EPA 6020B m
Alkalinity	5	N/A	2024/07/13	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	5	2024/07/13	2024/07/18	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	5	N/A	2024/07/18	CAM SOP-00463	SM 24 4500-Cl E m
Colour	5	N/A	2024/07/15	CAM SOP-00412	SM 24 2120C m
Conductivity	5	N/A	2024/07/13	CAM SOP-00414	SM 24 2510 m
Hardness (calculated as CaCO ₃)	1	N/A	2024/07/16	CAM SOP 00102/00408/00447	SM 2340 B
Hardness (calculated as CaCO ₃)	4	N/A	2024/07/18	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Mercury in Water by CVAA	5	2024/07/18	2024/07/18	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	5	2024/07/18	2024/07/18	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	5	N/A	2024/07/18	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (1)	5	N/A	2024/07/13	CAM SOP-00440	SM 24 4500-NO ₃ I/NO ₂ B
pH (2)	5	2024/07/13	2024/07/13	CAM SOP-00413	SM 24th - 4500H+ B
Phenols (4AAP)	5	N/A	2024/07/18	CAM SOP-00444	OMOE E3179 m
Field Measured pH (3)	5	N/A	2024/07/12		Field pH Meter
Sulphate by Automated Turbidimetry	5	N/A	2024/07/18	CAM SOP-00464	SM 24 4500-SO ₄ 2- E m
Total Dissolved Solids	5	2024/07/16	2024/07/18	CAM SOP-00428	SM 24 2540C m
Field Temperature (3)	5	N/A	2024/07/12		Field Thermometer
Total Kjeldahl Nitrogen in Water	5	2024/07/17	2024/07/18	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	4	2024/07/17	2024/07/18	CAM SOP-00407	SM 24 4500-P I
Total Phosphorus (Colourimetric)	1	2024/07/17	2024/07/19	CAM SOP-00407	SM 24 4500-P I
Total Suspended Solids	5	2024/07/16	2024/07/18	CAM SOP-00428	SM 24 2540D m
Turbidity	5	N/A	2024/07/13	CAM SOP-00417	SM 24 2130 B
Un-ionized Ammonia (4)	4	2024/07/12	2024/07/18	Auto Calc.	PWQO
Un-ionized Ammonia (4)	1	2024/07/12	2024/07/19	Auto Calc.	PWQO

Remarks:



Your Project #: 240205-09
Site Location: South Baptiste
Your C.O.C. #: 921025

Attention: MHH Distribution

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

Report Date: 2024/07/19

Report #: R8241979

Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4L3531

Received: 2024/07/12, 14:42

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, EPA, APHA or the Quebec Ministry of Environment.

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) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

(3) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas.

(4) Un-ionized ammonia is calculated using the total ammonia result and field data provided by the client for pH and temperature.



Your Project #: 240205-09
Site Location: South Baptiste
Your C.O.C. #: 921025

Attention: MHH Distribution

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

Report Date: 2024/07/19
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CERTIFICATE OF ANALYSIS

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Received: 2024/07/12, 14:42

Encryption Key

Please direct all questions regarding this Certificate of Analysis to:

Elora Di Bratto, Project Manager
Email: Elora.Di-Bratto@bureauveritas.com
Phone# (905) 817-5700

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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.



RESULTS OF ANALYSES OF WATER

Bureau Veritas ID		ZSD598			ZSD598			ZSD599		
Sampling Date		2024/07/10 12:55			2024/07/10 12:55			2024/07/10 12:40		
COC Number		921025			921025			921025		
	UNITS	BAP-A	RDL	QC Batch	BAP-A Lab-Dup	RDL	QC Batch	BAP-B	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO ₃)	mg/L	140	1.0	9511033				73	1.0	9511033
Total Un-ionized Ammonia	mg/L	ND	0.00061	9512701				ND	0.00061	9512701
Field Measurements										
Field Temperature	Celsius	15.6	N/A	ONSITE				12.8	N/A	ONSITE
Field Measured pH	pH	6.87		ONSITE				6.36		ONSITE
Inorganics										
Total Ammonia-N	mg/L	0.11	0.050	9519812				ND	0.050	9519973
Total BOD	mg/L	4	2	9513077				ND	2	9513077
Colour	TCU	25	2	9512704				60	2	9512704
Conductivity	umho/cm	450	1.0	9513341				170	1.0	9513341
Total Dissolved Solids	mg/L	215	10	9516780				80	10	9516780
Total Kjeldahl Nitrogen (TKN)	mg/L	0.49	0.10	9521211				0.33	0.10	9521211
pH	pH	7.87		9513343				7.74		9513343
Phenols-4AAP	mg/L	ND	0.0010	9522488				ND	0.0010	9522488
Total Phosphorus	mg/L	0.032	0.020	9521192				0.082	0.020	9521192
Total Suspended Solids	mg/L	ND	10	9516821				49	10	9516821
Dissolved Sulphate (SO ₄)	mg/L	12	1.0	9513730	13	1.0	9513730	3.9	1.0	9513730
Turbidity	NTU	2.0	0.1	9513322				16	0.1	9513324
Alkalinity (Total as CaCO ₃)	mg/L	150	1.0	9513329				72	1.0	9513329
Dissolved Chloride (Cl ⁻)	mg/L	35	1.0	9513729	36	1.0	9513729	4.7	1.0	9513729
Nitrite (N)	mg/L	0.051	0.010	9513318				ND	0.010	9513318
Nitrate (N)	mg/L	1.12	0.10	9513318				ND	0.10	9513318
Nitrate + Nitrite (N)	mg/L	1.17	0.10	9513318				ND	0.10	9513318
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

Bureau Veritas ID		ZSD600		ZSD601		ZSD602		
Sampling Date		2024/07/10 12:30		2024/07/10 13:10		2024/07/10 12:55		
COC Number		921025		921025		921025		
	UNITS	BAP-C	QC Batch	BAP-D	QC Batch	SB-QAQC-SW1	RDL	QC Batch
Calculated Parameters								
Hardness (CaCO ₃)	mg/L	83	9511033	62	9511033	150	1.0	9511033
Total Un-ionized Ammonia	mg/L	ND	9512701	ND	9512701	ND	0.00061	9512701
Field Measurements								
Field Temperature	Celsius	13.1	ONSITE	14.2	ONSITE	15.6	N/A	ONSITE
Field Measured pH	pH	6.32	ONSITE	6.82	ONSITE	6.87		ONSITE
Inorganics								
Total Ammonia-N	mg/L	ND	9519803	ND	9519812	0.11	0.050	9519803
Total BOD	mg/L	3	9513077	ND	9513077	3	2	9513077
Colour	TCU	54	9512704	93	9512704	25	2	9512704
Conductivity	umho/cm	200	9513341	140	9513341	450	1.0	9513341
Total Dissolved Solids	mg/L	105	9516780	85	9516780	210	10	9516780
Total Kjeldahl Nitrogen (TKN)	mg/L	0.40	9521211	0.43	9521211	0.49	0.10	9521211
pH	pH	7.82	9513343	7.65	9513343	7.92		9513343
Phenols-4AAP	mg/L	ND	9522488	ND	9522488	ND	0.0010	9522488
Total Phosphorus	mg/L	0.061	9521192	0.061	9521192	0.034	0.020	9521192
Total Suspended Solids	mg/L	52	9516821	36	9516821	ND	10	9516821
Dissolved Sulphate (SO ₄)	mg/L	5.0	9513730	3.6	9513730	12	1.0	9513730
Turbidity	NTU	14	9513322	31	9513324	2.0	0.1	9513322
Alkalinity (Total as CaCO ₃)	mg/L	82	9513329	63	9513329	150	1.0	9513329
Dissolved Chloride (Cl ⁻)	mg/L	8.9	9513729	3.9	9513729	35	1.0	9513729
Nitrite (N)	mg/L	ND	9513316	ND	9513318	0.044	0.010	9513316
Nitrate (N)	mg/L	0.19	9513316	ND	9513318	1.08	0.10	9513316
Nitrate + Nitrite (N)	mg/L	0.19	9513316	ND	9513318	1.12	0.10	9513316
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.								
N/A = Not Applicable								

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Bureau Veritas Job #: C4L3531

Report Date: 2024/07/19

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		ZSD598			ZSD598			ZSD599	ZSD600		
Sampling Date		2024/07/10 12:55			2024/07/10 12:55			2024/07/10 12:40	2024/07/10 12:30		
COC Number		921025			921025			921025	921025		
	UNITS	BAP-A	RDL	QC Batch	BAP-A Lab-Dup	RDL	QC Batch	BAP-B	BAP-C	RDL	QC Batch

Metals											
Dissolved (0.2u) Aluminum (Al)	ug/L	6	5	9521642	6	5	9521642	20	19	5	9518242
Dissolved Mercury (Hg)	ug/L	ND	0.10	9522440				ND	ND	0.10	9522440
Total Aluminum (Al)	ug/L	70	4.9	9522094	83	4.9	9522094	470	440	4.9	9522094
Total Arsenic (As)	ug/L	ND	1.0	9522094	ND	1.0	9522094	ND	ND	1.0	9522094
Total Boron (B)	ug/L	270	10	9522094	280	10	9522094	ND	40	10	9522094
Total Cadmium (Cd)	ug/L	ND	0.090	9522094	ND	0.090	9522094	ND	ND	0.090	9522094
Total Calcium (Ca)	ug/L	43000	200	9522094	44000	200	9522094	27000	29000	200	9522094
Total Chromium (Cr)	ug/L	ND	5.0	9522094	ND	5.0	9522094	ND	ND	5.0	9522094
Total Cobalt (Co)	ug/L	ND	0.50	9522094	ND	0.50	9522094	1.4	1.3	0.50	9522094
Total Copper (Cu)	ug/L	1.0	0.90	9522094	1.0	0.90	9522094	2.6	2.5	0.90	9522094
Total Iron (Fe)	ug/L	280	100	9522094	270	100	9522094	8400	7100	100	9522094
Total Lead (Pb)	ug/L	ND	0.50	9522094	ND	0.50	9522094	0.78	0.72	0.50	9522094
Total Magnesium (Mg)	ug/L	6900	50	9522094	6800	50	9522094	1300	2000	50	9522094
Total Nickel (Ni)	ug/L	1.6	1.0	9522094	1.6	1.0	9522094	ND	1.5	1.0	9522094
Total Potassium (K)	ug/L	17000	200	9522094	17000	200	9522094	800	2700	200	9522094
Total Selenium (Se)	ug/L	ND	2.0	9522094	ND	2.0	9522094	ND	ND	2.0	9522094
Total Silver (Ag)	ug/L	ND	0.090	9522094	ND	0.090	9522094	ND	ND	0.090	9522094
Total Sodium (Na)	ug/L	28000	100	9522094	27000	100	9522094	4800	7900	100	9522094
Total Zinc (Zn)	ug/L	ND	5.0	9522094	ND	5.0	9522094	5.7	5.8	5.0	9522094

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.



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Bureau Veritas Job #: C4L3531

Report Date: 2024/07/19

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Bureau Veritas ID		ZSD601	ZSD602		
Sampling Date		2024/07/10 13:10	2024/07/10 12:55		
COC Number		921025	921025		
	UNITS	BAP-D	SB-QAQC-SW1	RDL	QC Batch

Metals					
Dissolved (0.2u) Aluminum (Al)	ug/L	27	6	5	9518242
Dissolved Mercury (Hg)	ug/L	ND	ND	0.10	9522440
Total Aluminum (Al)	ug/L	290	140	4.9	9522094
Total Arsenic (As)	ug/L	ND	ND	1.0	9522094
Total Boron (B)	ug/L	ND	250	10	9522094
Total Cadmium (Cd)	ug/L	ND	ND	0.090	9522094
Total Calcium (Ca)	ug/L	22000	45000	200	9522094
Total Chromium (Cr)	ug/L	ND	ND	5.0	9522094
Total Cobalt (Co)	ug/L	1.3	0.56	0.50	9522094
Total Copper (Cu)	ug/L	1.5	1.2	0.90	9522094
Total Iron (Fe)	ug/L	8800	460	100	9522094
Total Lead (Pb)	ug/L	ND	ND	0.50	9522094
Total Magnesium (Mg)	ug/L	1200	6700	50	9522094
Total Nickel (Ni)	ug/L	ND	1.7	1.0	9522094
Total Potassium (K)	ug/L	860	16000	200	9522094
Total Selenium (Se)	ug/L	ND	ND	2.0	9522094
Total Silver (Ag)	ug/L	ND	ND	0.090	9522094
Total Sodium (Na)	ug/L	4500	27000	100	9522094
Total Zinc (Zn)	ug/L	ND	ND	5.0	9522094

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 Job #: C4L3531
Report Date: 2024/07/19

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste

TEST SUMMARY

Bureau Veritas ID: ZSD598
Sample ID: BAP-A
Matrix: Water

Collected: 2024/07/10
Shipped:
Received: 2024/07/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9521642	N/A	2024/07/18	Indira HarryPaul
Alkalinity	AT	9513329	N/A	2024/07/13	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9513077	2024/07/13	2024/07/18	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9513729	N/A	2024/07/18	Alina Dobreanu
Colour	SPEC	9512704	N/A	2024/07/15	Gyulshen Idriz
Conductivity	AT	9513341	N/A	2024/07/13	Nachiketa Gohil
Hardness (calculated as CaCO3)		9511033	N/A	2024/07/16	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9522440	2024/07/18	2024/07/18	Aswathy Neduveli Suresh
Total Metals Analysis by ICPMS	ICP/MS	9522094	2024/07/18	2024/07/18	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9519812	N/A	2024/07/18	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9513318	N/A	2024/07/13	Jinal Chavda
pH	AT	9513343	2024/07/13	2024/07/13	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9522488	N/A	2024/07/18	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Sulphate by Automated Turbidimetry	SKAL	9513730	N/A	2024/07/18	Alina Dobreanu
Total Dissolved Solids	BAL	9516780	2024/07/16	2024/07/18	Razieh Tabesh
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Total Kjeldahl Nitrogen in Water	SKAL	9521211	2024/07/17	2024/07/18	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9521192	2024/07/17	2024/07/18	Sachi Patel
Total Suspended Solids	BAL	9516821	2024/07/16	2024/07/18	Razieh Tabesh
Turbidity	AT	9513322	N/A	2024/07/13	Gurpartee KAUAR
Un-ionized Ammonia	CALC/NH3	9512701	2024/07/18	2024/07/18	Automated Statchk

Bureau Veritas ID: ZSD598 Dup
Sample ID: BAP-A
Matrix: Water

Collected: 2024/07/10
Shipped:
Received: 2024/07/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9521642	N/A	2024/07/18	Indira HarryPaul
Chloride by Automated Colourimetry	SKAL	9513729	N/A	2024/07/18	Alina Dobreanu
Total Metals Analysis by ICPMS	ICP/MS	9522094	2024/07/18	2024/07/18	Indira HarryPaul
Sulphate by Automated Turbidimetry	SKAL	9513730	N/A	2024/07/18	Alina Dobreanu

Bureau Veritas ID: ZSD599
Sample ID: BAP-B
Matrix: Water

Collected: 2024/07/10
Shipped:
Received: 2024/07/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9518242	N/A	2024/07/17	Azita Fazaali
Alkalinity	AT	9513329	N/A	2024/07/13	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9513077	2024/07/13	2024/07/18	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9513729	N/A	2024/07/18	Alina Dobreanu
Colour	SPEC	9512704	N/A	2024/07/15	Gyulshen Idriz
Conductivity	AT	9513341	N/A	2024/07/13	Nachiketa Gohil
Hardness (calculated as CaCO3)		9511033	N/A	2024/07/18	Automated Statchk



Bureau Veritas Job #: C4L3531
Report Date: 2024/07/19

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste

TEST SUMMARY

Bureau Veritas ID: ZSD599
Sample ID: BAP-B
Matrix: Water

Collected: 2024/07/10
Shipped:
Received: 2024/07/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Mercury in Water by CVAA	CV/AA	9522440	2024/07/18	2024/07/18	Aswathy Neduveli Suresh
Total Metals Analysis by ICPMS	ICP/MS	9522094	2024/07/18	2024/07/18	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9519973	N/A	2024/07/18	Yogesh Patel
Nitrate & Nitrite as Nitrogen in Water	LACH	9513318	N/A	2024/07/13	Jinal Chavda
pH	AT	9513343	2024/07/13	2024/07/13	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9522488	N/A	2024/07/18	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Sulphate by Automated Turbidimetry	SKAL	9513730	N/A	2024/07/18	Alina Dobreanu
Total Dissolved Solids	BAL	9516780	2024/07/16	2024/07/18	Razieh Tabesh
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Total Kjeldahl Nitrogen in Water	SKAL	9521211	2024/07/17	2024/07/18	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9521192	2024/07/17	2024/07/19	Sachi Patel
Total Suspended Solids	BAL	9516821	2024/07/16	2024/07/18	Razieh Tabesh
Turbidity	AT	9513324	N/A	2024/07/13	Gurpartee K AUR
Un-ionized Ammonia	CALC/NH3	9512701	2024/07/19	2024/07/19	Automated Statchk

Bureau Veritas ID: ZSD600
Sample ID: BAP-C
Matrix: Water

Collected: 2024/07/10
Shipped:
Received: 2024/07/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9518242	N/A	2024/07/17	Azita Fazaeli
Alkalinity	AT	9513329	N/A	2024/07/13	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9513077	2024/07/13	2024/07/18	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9513729	N/A	2024/07/18	Alina Dobreanu
Colour	SPEC	9512704	N/A	2024/07/15	Gyulshen Idriz
Conductivity	AT	9513341	N/A	2024/07/13	Nachiketa Gohil
Hardness (calculated as CaCO3)		9511033	N/A	2024/07/18	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9522440	2024/07/18	2024/07/18	Aswathy Neduveli Suresh
Total Metals Analysis by ICPMS	ICP/MS	9522094	2024/07/18	2024/07/18	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9519803	N/A	2024/07/18	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9513316	N/A	2024/07/13	Jinal Chavda
pH	AT	9513343	2024/07/13	2024/07/13	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9522488	N/A	2024/07/18	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Sulphate by Automated Turbidimetry	SKAL	9513730	N/A	2024/07/18	Alina Dobreanu
Total Dissolved Solids	BAL	9516780	2024/07/16	2024/07/18	Razieh Tabesh
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Total Kjeldahl Nitrogen in Water	SKAL	9521211	2024/07/17	2024/07/18	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9521192	2024/07/17	2024/07/18	Sachi Patel
Total Suspended Solids	BAL	9516821	2024/07/16	2024/07/18	Razieh Tabesh
Turbidity	AT	9513322	N/A	2024/07/13	Gurpartee K AUR
Un-ionized Ammonia	CALC/NH3	9512701	2024/07/18	2024/07/18	Automated Statchk



Bureau Veritas Job #: C4L3531
Report Date: 2024/07/19

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste

TEST SUMMARY

Bureau Veritas ID: ZSD601
Sample ID: BAP-D
Matrix: Water

Collected: 2024/07/10
Shipped:
Received: 2024/07/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9518242	N/A	2024/07/17	Azita Fazaeli
Alkalinity	AT	9513329	N/A	2024/07/13	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9513077	2024/07/13	2024/07/18	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9513729	N/A	2024/07/18	Alina Dobreanu
Colour	SPEC	9512704	N/A	2024/07/15	Gyulshen Idriz
Conductivity	AT	9513341	N/A	2024/07/13	Nachiketa Gohil
Hardness (calculated as CaCO3)		9511033	N/A	2024/07/18	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9522440	2024/07/18	2024/07/18	Aswathy Neduveli Suresh
Total Metals Analysis by ICPMS	ICP/MS	9522094	2024/07/18	2024/07/18	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9519812	N/A	2024/07/18	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9513318	N/A	2024/07/13	Jinal Chavda
pH	AT	9513343	2024/07/13	2024/07/13	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9522488	N/A	2024/07/18	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Sulphate by Automated Turbidimetry	SKAL	9513730	N/A	2024/07/18	Alina Dobreanu
Total Dissolved Solids	BAL	9516780	2024/07/16	2024/07/18	Razieh Tabesh
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Total Kjeldahl Nitrogen in Water	SKAL	9521211	2024/07/17	2024/07/18	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9521192	2024/07/17	2024/07/18	Sachi Patel
Total Suspended Solids	BAL	9516821	2024/07/16	2024/07/18	Razieh Tabesh
Turbidity	AT	9513324	N/A	2024/07/13	Gurpartee KAUAR
Un-ionized Ammonia	CALC/NH3	9512701	2024/07/18	2024/07/18	Automated Statchk

Bureau Veritas ID: ZSD602
Sample ID: SB-QAQC-SW1
Matrix: Water

Collected: 2024/07/10
Shipped:
Received: 2024/07/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9518242	N/A	2024/07/17	Azita Fazaeli
Alkalinity	AT	9513329	N/A	2024/07/13	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9513077	2024/07/13	2024/07/18	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9513729	N/A	2024/07/18	Alina Dobreanu
Colour	SPEC	9512704	N/A	2024/07/15	Gyulshen Idriz
Conductivity	AT	9513341	N/A	2024/07/13	Nachiketa Gohil
Hardness (calculated as CaCO3)		9511033	N/A	2024/07/18	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9522440	2024/07/18	2024/07/18	Aswathy Neduveli Suresh
Total Metals Analysis by ICPMS	ICP/MS	9522094	2024/07/18	2024/07/18	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9519803	N/A	2024/07/18	Massarat Jan
Nitrate & Nitrite as Nitrogen in Water	LACH	9513316	N/A	2024/07/13	Jinal Chavda
pH	AT	9513343	2024/07/13	2024/07/13	Nachiketa Gohil
Phenols (4AAP)	TECH/PHEN	9522488	N/A	2024/07/18	Chloe Pollock
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu
Sulphate by Automated Turbidimetry	SKAL	9513730	N/A	2024/07/18	Alina Dobreanu
Total Dissolved Solids	BAL	9516780	2024/07/16	2024/07/18	Razieh Tabesh
Field Measured pH	PH	ONSITE	N/A	2024/07/12	Jimmy Liu



Bureau Veritas Job #: C4L3531
Report Date: 2024/07/19

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste

TEST SUMMARY

Bureau Veritas ID: ZSD602
Sample ID: SB-QAQC-SW1
Matrix: Water

Collected: 2024/07/10
Shipped:
Received: 2024/07/12

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	9521211	2024/07/17	2024/07/18	Rajni Tyagi
Total Phosphorus (Colourimetric)	SKAL/P	9521192	2024/07/17	2024/07/18	Sachi Patel
Total Suspended Solids	BAL	9516821	2024/07/16	2024/07/18	Razieh Tabesh
Turbidity	AT	9513322	N/A	2024/07/13	Gurparteek KAUR
Un-ionized Ammonia	CALC/NH3	9512701	2024/07/18	2024/07/18	Automated Statchk



GENERAL COMMENTS

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

Package 1	7.3°C
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Turbidity analyzed past Hold Time.

Results relate only to the items tested.



Bureau Veritas Job #: C4L3531
Report Date: 2024/07/19

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc
Client Project #: 240205-09
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
9512704	Colour	2024/07/15			99	80 - 120	ND,RDL=2	TCU	NC	25		
9513077	Total BOD	2024/07/18					ND,RDL=2	mg/L	7.6	30	93	80 - 120
9513316	Nitrate (N)	2024/07/13	105	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9513316	Nitrite (N)	2024/07/13	106	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9513318	Nitrate (N)	2024/07/13	103	80 - 120	102	80 - 120	ND, RDL=0.10	mg/L	0.27	20		
9513318	Nitrite (N)	2024/07/13	103	80 - 120	102	80 - 120	ND, RDL=0.010	mg/L	NC	20		
9513322	Turbidity	2024/07/13			99	80 - 120	ND, RDL=0.1	NTU	NC	20		
9513324	Turbidity	2024/07/13			98	80 - 120	ND, RDL=0.1	NTU	3.3	20		
9513329	Alkalinity (Total as CaCO3)	2024/07/13			96	85 - 115	ND, RDL=1.0	mg/L	0.33	20		
9513341	Conductivity	2024/07/13			102	85 - 115	ND, RDL=1.0	umho/cm	0.72	10		
9513343	pH	2024/07/13			101	98 - 103			1.2	N/A		
9513729	Dissolved Chloride (Cl-)	2024/07/18	NC	80 - 120	101	80 - 120	ND, RDL=1.0	mg/L	0.12	20		
9513730	Dissolved Sulphate (SO4)	2024/07/18	100	75 - 125	101	80 - 120	ND, RDL=1.0	mg/L	2.6	20		
9516780	Total Dissolved Solids	2024/07/18			98	80 - 120	ND, RDL=10	mg/L	13	20		
9516821	Total Suspended Solids	2024/07/18			99	80 - 120	ND, RDL=10	mg/L	NC	20		
9518242	Dissolved (0.2u) Aluminum (Al)	2024/07/17	101	80 - 120	99	80 - 120	ND,RDL=5	ug/L	NC	20		
9519803	Total Ammonia-N	2024/07/18	94	75 - 125	95	80 - 120	ND, RDL=0.050	mg/L	NC	20		
9519812	Total Ammonia-N	2024/07/18	97	75 - 125	97	80 - 120	ND, RDL=0.050	mg/L	1.2	20		
9519973	Total Ammonia-N	2024/07/18	97	75 - 125	99	80 - 120	ND, RDL=0.050	mg/L	NC	20		
9521192	Total Phosphorus	2024/07/18	NC	80 - 120	101	80 - 120	ND, RDL=0.020	mg/L	0.95	20	103	80 - 120
9521211	Total Kjeldahl Nitrogen (TKN)	2024/07/18	100	80 - 120	99	80 - 120	ND, RDL=0.10	mg/L	2.4	20	98	80 - 120
9521642	Dissolved (0.2u) Aluminum (Al)	2024/07/18	93	80 - 120	102	80 - 120	ND,RDL=5	ug/L	5.0	20		
9522094	Total Aluminum (Al)	2024/07/18	105	80 - 120	101	80 - 120	ND, RDL=4.9	ug/L	17	20		
9522094	Total Arsenic (As)	2024/07/18	99	80 - 120	101	80 - 120	ND, RDL=1.0	ug/L	NC	20		
9522094	Total Boron (B)	2024/07/18	109	80 - 120	105	80 - 120	ND, RDL=10	ug/L	3.4	20		

BUREAU
VERITAS

Bureau Veritas Job #: C4L3531

Report Date: 2024/07/19

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 240205-09

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
9522094	Total Cadmium (Cd)	2024/07/18	102	80 - 120	100	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9522094	Total Calcium (Ca)	2024/07/18	NC	80 - 120	99	80 - 120	ND, RDL=200	ug/L	2.1	20		
9522094	Total Chromium (Cr)	2024/07/18	96	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9522094	Total Cobalt (Co)	2024/07/18	101	80 - 120	101	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9522094	Total Copper (Cu)	2024/07/18	104	80 - 120	105	80 - 120	ND, RDL=0.90	ug/L	0.78	20		
9522094	Total Iron (Fe)	2024/07/18	100	80 - 120	101	80 - 120	ND, RDL=100	ug/L	1.9	20		
9522094	Total Lead (Pb)	2024/07/18	97	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9522094	Total Magnesium (Mg)	2024/07/18	97	80 - 120	101	80 - 120	ND, RDL=50	ug/L	0.57	20		
9522094	Total Nickel (Ni)	2024/07/18	98	80 - 120	100	80 - 120	ND, RDL=1.0	ug/L	1.7	20		
9522094	Total Potassium (K)	2024/07/18	98	80 - 120	104	80 - 120	ND, RDL=200	ug/L	0.017	20		
9522094	Total Selenium (Se)	2024/07/18	106	80 - 120	104	80 - 120	ND, RDL=2.0	ug/L	NC	20		
9522094	Total Silver (Ag)	2024/07/18	99	80 - 120	96	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9522094	Total Sodium (Na)	2024/07/18	NC	80 - 120	102	80 - 120	ND, RDL=100	ug/L	2.5	20		
9522094	Total Zinc (Zn)	2024/07/18	99	80 - 120	102	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9522440	Dissolved Mercury (Hg)	2024/07/18	95	75 - 125	92	80 - 120	ND, RDL=0.10	ug/L	NC	20		
9522488	Phenols-4AAP	2024/07/18	93	80 - 120	102	80 - 120	ND, RDL=0.0010	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).



Bureau Veritas Job #: C4L3531
Report Date: 2024/07/19

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste

VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink, appearing to read "A. Hamanov", written over a horizontal line.

Anastassia Hamanov, Scientific Specialist

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.

IMMEDIATE



Custody Tracking Form



T921025

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			
Brad McCallum		Date	2024/07/11	DIRVLO		Date	2024/07/12
		Time (24 HR)	14:30			Time (24 HR)	14:42
Print	Sign	Date	YYYY/MM/DD	Print	Sign	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.

Triage Information			
Sampled By (Print)	# of Coolers/Pkgs:	Rush ☐	Food Residue ☐
Brad McCallum	1	Immediate Test ☐	Food Chemistry ☐
		Micro ☐	

*** LABORATORY USE ONLY ***						
Received At	Lab Comments:		Custody Seal		Cooling Media	Temperature °C
Labeled By	12-Jul-24 14:42		Present (Y/N)	Intact (Y/N)	Present (Y/N)	1 2 3
Verified By	Elora Di Bratto		Y	Y	Y	6 8 8
	C4L3531					
	RUK ENV-953					
			Drinking Water Metals Preservation Check Done (Circle) YES NO			

COR FCD-00383/4

Page 1 of 1



Your Project #: 240205-09
Site Location: South Baptiste SW
Your C.O.C. #: 971322

Attention: MHH Distribution

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

Report Date: 2024/11/06
Report #: R8393950
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4Y2463

Received: 2024/10/30, 09:25

Sample Matrix: Surface Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	5	N/A	2024/11/04	CAM SOP-00447	EPA 6020B m
Alkalinity	5	N/A	2024/11/04	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	5	2024/10/31	2024/11/05	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	4	N/A	2024/11/03	CAM SOP-00463	SM 24 4500-Cl E m
Chloride by Automated Colourimetry	1	N/A	2024/11/06	CAM SOP-00463	SM 24 4500-Cl E m
Colour	5	N/A	2024/11/06	CAM SOP-00412	SM 24 2120C m
Conductivity	5	N/A	2024/11/04	CAM SOP-00414	SM 24 2510 m
Hardness (calculated as CaCO ₃)	5	N/A	2024/11/05	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Mercury in Water by CVAA	5	2024/11/05	2024/11/05	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	2	2024/11/02	2024/11/04	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	2024/11/02	2024/11/05	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	5	N/A	2024/11/05	CAM SOP-00441	USGS I-2522-90 m
pH (1)	5	2024/11/01	2024/11/04	CAM SOP-00413	SM 24th - 4500H+ B
Phenols (4AAP)	5	N/A	2024/11/04	CAM SOP-00444	OMOE E3179 m
Field Measured pH (2)	5	N/A	2024/10/31		Field pH Meter
Sulphate by Automated Turbidimetry	4	N/A	2024/11/03	CAM SOP-00464	SM 24 4500-SO42- E m
Sulphate by Automated Turbidimetry	1	N/A	2024/11/06	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	4	2024/11/02	2024/11/04	CAM SOP-00428	SM 24 2540C m
Total Dissolved Solids	1	2024/11/02	2024/11/05	CAM SOP-00428	SM 24 2540C m
Field Temperature (2)	5	N/A	2024/10/31		Field Thermometer
Total Phosphorus (Colourimetric)	5	2024/11/04	2024/11/06	CAM SOP-00407	SM 24 4500-P I
Total Suspended Solids	5	2024/11/02	2024/11/05	CAM SOP-00428	SM 24 2540D m
Turbidity	5	N/A	2024/11/02	CAM SOP-00417	SM 24 2130 B
Un-ionized Ammonia (3)	5	2024/10/31	2024/11/06	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, EPA, APHA or the Quebec Ministry of Environment.



Your Project #: 240205-09
Site Location: South Baptiste SW
Your C.O.C. #: 971322

Attention: MHH Distribution

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

Report Date: 2024/11/06
Report #: R8393950
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4Y2463

Received: 2024/10/30, 09:25

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) "The CCME method and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) requires pH to be analyzed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME and Analytical Protocol (O. Reg 153/04, O. Reg. 406/19) holding time. Bureau Veritas endeavors to analyze samples as soon as possible after receipt."

(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:

Elora Di Bratto, Project Manager

Email: Elora.Di-Bratto@bureauveritas.com

Phone# (905) 817-5700

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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.



RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		AHMG49			AHMG49			AHMG50		
Sampling Date		2024/10/29 14:50			2024/10/29 14:50			2024/10/29 14:38		
COC Number		971322			971322			971322		
	UNITS	BAP-A	RDL	QC Batch	BAP-A Lab-Dup	RDL	QC Batch	BAP-B	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO ₃)	mg/L	160	1.0	9736228				82	1.0	9736228
Total Un-ionized Ammonia	mg/L	ND	0.00061	9736782				ND	0.00061	9736782
Field Measurements										
Field Temperature	Celsius	5.4	N/A	ONSITE				7.7	N/A	ONSITE
Field Measured pH	pH	7.19		ONSITE				7.42		ONSITE
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9741283				ND	0.050	9741283
Total BOD	mg/L	ND	2	9737544				ND	2	9737544
Colour	TCU	12	2	9742158				10	2	9742158
Conductivity	umho/cm	500	1.0	9740352				170	1.0	9740352
Total Dissolved Solids	mg/L	335	10	9741730	335	10	9741730	105	10	9741623
pH	pH	7.86		9740354				7.86		9740354
Phenols-4AAP	mg/L	ND	0.0010	9743882	ND	0.0010	9743882	ND	0.0010	9743882
Total Phosphorus	mg/L	ND	0.020	9743857				ND	0.020	9743857
Total Suspended Solids	mg/L	ND	10	9740084				ND	10	9740084
Dissolved Sulphate (SO ₄)	mg/L	17	1.0	9741234				5.5	1.0	9741234
Turbidity	NTU	0.5	0.1	9741170				1.2	0.1	9741170
Alkalinity (Total as CaCO ₃)	mg/L	150	1.0	9740349				72	1.0	9740349
Dissolved Chloride (Cl ⁻)	mg/L	40	1.0	9741232				3.4	1.0	9741232
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 #: C4Y2463

Report Date: 2024/11/06

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste SW

Sampler Initials: BM

RESULTS OF ANALYSES OF SURFACE WATER

Bureau Veritas ID		AHMG51			AHMG51			AHMG52		
Sampling Date		2024/10/29 14:28			2024/10/29 14:28			2024/10/29 15:12		
COC Number		971322			971322			971322		
	UNITS	BAP-C	RDL	QC Batch	BAP-C Lab-Dup	RDL	QC Batch	BAP-D	RDL	QC Batch

Calculated Parameters										
Hardness (CaCO ₃)	mg/L	90	1.0	9736228				63	1.0	9736228
Total Un-ionized Ammonia	mg/L	ND	0.00061	9736782				ND	0.00061	9736782

Field Measurements										
Field Temperature	Celsius	5.6	N/A	ONSITE				5.6	N/A	ONSITE
Field Measured pH	pH	7.69		ONSITE				7.18		ONSITE

Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9741283				ND	0.050	9741283
Total BOD	mg/L	ND	2	9737544				ND	2	9737544
Colour	TCU	10	2	9742158				19	2	9742158
Conductivity	umho/cm	210	1.0	9740352				140	1.0	9740352
Total Dissolved Solids	mg/L	130	10	9741623				85	10	9741623
pH	pH	7.87		9740354				7.70		9740354
Phenols-4AAP	mg/L	ND	0.0010	9743882				ND	0.0010	9743882
Total Phosphorus	mg/L	ND	0.020	9743857				ND	0.020	9743857
Total Suspended Solids	mg/L	ND	10	9740084				23	10	9740084
Dissolved Sulphate (SO ₄)	mg/L	6.6	1.0	9742141	6.5	1.0	9742141	4.3	1.0	9741234
Turbidity	NTU	1.1	0.1	9741170				2.1	0.1	9741170
Alkalinity (Total as CaCO ₃)	mg/L	82	1.0	9740349				64	1.0	9740349
Dissolved Chloride (Cl ⁻)	mg/L	9.2	1.0	9742140	9.1	1.0	9742140	2.7	1.0	9741232

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 SURFACE WATER

Bureau Veritas ID		AHMG52			AHMG53		
Sampling Date		2024/10/29 15:12			2024/10/29 14:50		
COC Number		971322			971322		
	UNITS	BAP-D Lab-Dup	RDL	QC Batch	SB-QAQC-SW1	RDL	QC Batch
Calculated Parameters							
Hardness (CaCO3)	mg/L				180	1.0	9736228
Total Un-ionized Ammonia	mg/L				ND	0.00061	9736782
Field Measurements							
Field Temperature	Celsius				5.4	N/A	ONSITE
Field Measured pH	pH				7.19		ONSITE
Inorganics							
Total Ammonia-N	mg/L				ND	0.050	9741283
Total BOD	mg/L				ND	2	9737544
Colour	TCU	19	2	9742158	12	2	9742158
Conductivity	umho/cm				500	1.0	9740352
Total Dissolved Solids	mg/L				290	10	9741623
pH	pH				7.89		9740354
Phenols-4AAP	mg/L				ND	0.0010	9743882
Total Phosphorus	mg/L				ND	0.020	9743857
Total Suspended Solids	mg/L				ND	10	9740084
Dissolved Sulphate (SO4)	mg/L				17	1.0	9741234
Turbidity	NTU				0.4	0.1	9741170
Alkalinity (Total as CaCO3)	mg/L				150	1.0	9740349
Dissolved Chloride (Cl-)	mg/L				40	1.0	9741232
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 #: C4Y2463
Report Date: 2024/11/06

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste SW
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (SURFACE WATER)

Bureau Veritas ID		AHMG49	AHMG50		AHMG51		AHMG52	AHMG53		
Sampling Date		2024/10/29 14:50	2024/10/29 14:38		2024/10/29 14:28		2024/10/29 15:12	2024/10/29 14:50		
COC Number		971322	971322		971322		971322	971322		
	UNITS	BAP-A	BAP-B	QC Batch	BAP-C	QC Batch	BAP-D	SB-QAQC-SW1	RDL	QC Batch
Metals										
Dissolved (0.2u) Aluminum (Al)	ug/L	ND	6	9741747	6	9741747	8	ND	5	9741747
Dissolved Mercury (Hg)	ug/L	ND	ND	9739107	ND	9739107	ND	ND	0.10	9739107
Total Aluminum (Al)	ug/L	8.3	13	9741591	21	9741587	22	11	4.9	9741591
Total Arsenic (As)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	1.0	9741591
Total Boron (B)	ug/L	220	ND	9741591	26	9741587	ND	210	10	9741591
Total Cadmium (Cd)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	0.090	9741591
Total Calcium (Ca)	ug/L	50000	25000	9741591	29000	9741587	21000	50000	200	9741591
Total Chromium (Cr)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	5.0	9741591
Total Cobalt (Co)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	0.50	9741591
Total Copper (Cu)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	0.90	9741591
Total Iron (Fe)	ug/L	ND	250	9741591	300	9741587	430	ND	100	9741591
Total Lead (Pb)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	0.50	9741591
Total Magnesium (Mg)	ug/L	8000	1200	9741591	1900	9741587	1100	8200	50	9741591
Total Nickel (Ni)	ug/L	1.5	ND	9741591	ND	9741587	ND	1.5	1.0	9741591
Total Potassium (K)	ug/L	19000	670	9741591	2400	9741587	850	17000	200	9741591
Total Selenium (Se)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	2.0	9741591
Total Silver (Ag)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	0.090	9741591
Total Sodium (Na)	ug/L	31000	4200	9741591	7000	9741587	4200	31000	100	9741591
Total Zinc (Zn)	ug/L	ND	ND	9741591	ND	9741587	ND	ND	5.0	9741591
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 Job #: C4Y2463
Report Date: 2024/11/06

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste SW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHMG49
Sample ID: BAP-A
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9741747	N/A	2024/11/04	Indira HarryPaul
Alkalinity	AT	9740349	N/A	2024/11/04	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9737544	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9741232	N/A	2024/11/03	Alina Dobreanu
Colour	SPEC	9742158	N/A	2024/11/06	Viorica Rotaru
Conductivity	AT	9740352	N/A	2024/11/04	Surinder Rai
Hardness (calculated as CaCO3)		9736228	N/A	2024/11/05	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9739107	2024/11/05	2024/11/05	Maitri PATIL
Total Metals Analysis by ICPMS	ICP/MS	9741591	2024/11/02	2024/11/05	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9741283	N/A	2024/11/05	Jinal Chavda
pH	AT	9740354	2024/11/01	2024/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9743882	N/A	2024/11/04	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Sulphate by Automated Turbidimetry	SKAL	9741234	N/A	2024/11/03	Alina Dobreanu
Total Dissolved Solids	BAL	9741730	2024/11/02	2024/11/05	Razieh Tabesh
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Total Phosphorus (Colourimetric)	SKAL/P	9743857	2024/11/04	2024/11/06	Vidhi Khatri
Total Suspended Solids	BAL	9740084	2024/11/02	2024/11/05	Razieh Tabesh
Turbidity	AT	9741170	N/A	2024/11/02	Kien Tran
Un-ionized Ammonia	CALC/NH3	9736782	2024/11/06	2024/11/06	Automated Statchk

Bureau Veritas ID: AHMG49 Dup
Sample ID: BAP-A
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	9743882	N/A	2024/11/04	Sachi Patel
Total Dissolved Solids	BAL	9741730	2024/11/02	2024/11/05	Razieh Tabesh

Bureau Veritas ID: AHMG50
Sample ID: BAP-B
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9741747	N/A	2024/11/04	Indira HarryPaul
Alkalinity	AT	9740349	N/A	2024/11/04	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9737544	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9741232	N/A	2024/11/03	Alina Dobreanu
Colour	SPEC	9742158	N/A	2024/11/06	Viorica Rotaru
Conductivity	AT	9740352	N/A	2024/11/04	Surinder Rai
Hardness (calculated as CaCO3)		9736228	N/A	2024/11/05	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9739107	2024/11/05	2024/11/05	Maitri PATIL
Total Metals Analysis by ICPMS	ICP/MS	9741591	2024/11/02	2024/11/04	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9741283	N/A	2024/11/05	Jinal Chavda



Bureau Veritas Job #: C4Y2463
Report Date: 2024/11/06

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste SW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHMG50
Sample ID: BAP-B
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	9740354	2024/11/01	2024/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9743882	N/A	2024/11/04	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Sulphate by Automated Turbidimetry	SKAL	9741234	N/A	2024/11/03	Alina Dobreanu
Total Dissolved Solids	BAL	9741623	2024/11/02	2024/11/04	Manowalage shanika GUNASEKARA
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Total Phosphorus (Colourimetric)	SKAL/P	9743857	2024/11/04	2024/11/06	Vidhi Khatri
Total Suspended Solids	BAL	9740084	2024/11/02	2024/11/05	Razieh Tabesh
Turbidity	AT	9741170	N/A	2024/11/02	Kien Tran
Un-ionized Ammonia	CALC/NH3	9736782	2024/11/06	2024/11/06	Automated Statchk

Bureau Veritas ID: AHMG51
Sample ID: BAP-C
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9741747	N/A	2024/11/04	Indira HarryPaul
Alkalinity	AT	9740349	N/A	2024/11/04	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9737544	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9742140	N/A	2024/11/06	Massarat Jan
Colour	SPEC	9742158	N/A	2024/11/06	Viorica Rotaru
Conductivity	AT	9740352	N/A	2024/11/04	Surinder Rai
Hardness (calculated as CaCO3)		9736228	N/A	2024/11/05	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9739107	2024/11/05	2024/11/05	Maitri PATIL
Total Metals Analysis by ICPMS	ICP/MS	9741587	2024/11/02	2024/11/04	Azita Fazaeli
Total Ammonia-N	SKAL/NH4	9741283	N/A	2024/11/05	Jinal Chavda
pH	AT	9740354	2024/11/01	2024/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9743882	N/A	2024/11/04	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Sulphate by Automated Turbidimetry	SKAL	9742141	N/A	2024/11/06	Massarat Jan
Total Dissolved Solids	BAL	9741623	2024/11/02	2024/11/04	Manowalage shanika GUNASEKARA
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Total Phosphorus (Colourimetric)	SKAL/P	9743857	2024/11/04	2024/11/06	Vidhi Khatri
Total Suspended Solids	BAL	9740084	2024/11/02	2024/11/05	Razieh Tabesh
Turbidity	AT	9741170	N/A	2024/11/02	Kien Tran
Un-ionized Ammonia	CALC/NH3	9736782	2024/11/06	2024/11/06	Automated Statchk

Bureau Veritas ID: AHMG51 Dup
Sample ID: BAP-C
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	SKAL	9742140	N/A	2024/11/06	Massarat Jan
Sulphate by Automated Turbidimetry	SKAL	9742141	N/A	2024/11/06	Massarat Jan



Bureau Veritas Job #: C4Y2463
Report Date: 2024/11/06

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste SW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHMG52
Sample ID: BAP-D
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9741747	N/A	2024/11/04	Indira HarryPaul
Alkalinity	AT	9740349	N/A	2024/11/04	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9737544	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9741232	N/A	2024/11/03	Alina Dobreanu
Colour	SPEC	9742158	N/A	2024/11/06	Viorica Rotaru
Conductivity	AT	9740352	N/A	2024/11/04	Surinder Rai
Hardness (calculated as CaCO3)		9736228	N/A	2024/11/05	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9739107	2024/11/05	2024/11/05	Maitri PATIL
Total Metals Analysis by ICPMS	ICP/MS	9741591	2024/11/02	2024/11/05	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9741283	N/A	2024/11/05	Jinal Chavda
pH	AT	9740354	2024/11/01	2024/11/04	Surinder Rai
Phenols (4AAP)	TECH/PHEN	9743882	N/A	2024/11/04	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Sulphate by Automated Turbidimetry	SKAL	9741234	N/A	2024/11/03	Alina Dobreanu
Total Dissolved Solids	BAL	9741623	2024/11/02	2024/11/04	Manowalage shanika GUNASEKARA
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Total Phosphorus (Colourimetric)	SKAL/P	9743857	2024/11/04	2024/11/06	Vidhi Khatri
Total Suspended Solids	BAL	9740084	2024/11/02	2024/11/05	Razieh Tabesh
Turbidity	AT	9741170	N/A	2024/11/02	Kien Tran
Un-ionized Ammonia	CALC/NH3	9736782	2024/11/06	2024/11/06	Automated Statchk

Bureau Veritas ID: AHMG52 Dup
Sample ID: BAP-D
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Colour	SPEC	9742158	N/A	2024/11/06	Viorica Rotaru

Bureau Veritas ID: AHMG53
Sample ID: SB-QAQC-SW1
Matrix: Surface Water

Collected: 2024/10/29
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9741747	N/A	2024/11/04	Indira HarryPaul
Alkalinity	AT	9740349	N/A	2024/11/04	Surinder Rai
Biochemical Oxygen Demand (BOD)	DO	9737544	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9741232	N/A	2024/11/03	Alina Dobreanu
Colour	SPEC	9742158	N/A	2024/11/06	Viorica Rotaru
Conductivity	AT	9740352	N/A	2024/11/04	Surinder Rai
Hardness (calculated as CaCO3)		9736228	N/A	2024/11/05	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	9739107	2024/11/05	2024/11/05	Maitri PATIL
Total Metals Analysis by ICPMS	ICP/MS	9741591	2024/11/02	2024/11/05	Indira HarryPaul
Total Ammonia-N	SKAL/NH4	9741283	N/A	2024/11/05	Jinal Chavda
pH	AT	9740354	2024/11/01	2024/11/04	Surinder Rai



Bureau Veritas Job #: C4Y2463
Report Date: 2024/11/06

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste SW
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHMG53
Sample ID: SB-QAQC-SW1
Matrix: Surface Water

Collected: 2024/10/29
Shipped: 2024/10/30
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	9743882	N/A	2024/11/04	Sachi Patel
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Sulphate by Automated Turbidimetry	SKAL	9741234	N/A	2024/11/03	Alina Dobreanu
Total Dissolved Solids	BAL	9741623	2024/11/02	2024/11/04	Manowalage shanika GUNASEKARA
Field Measured pH	PH	ONSITE	N/A	2024/10/31	Kamalpreet Kaur
Total Phosphorus (Colourimetric)	SKAL/P	9743857	2024/11/04	2024/11/06	Vidhi Khatri
Total Suspended Solids	BAL	9740084	2024/11/02	2024/11/05	Razieh Tabesh
Turbidity	AT	9741170	N/A	2024/11/02	Kien Tran
Un-ionized Ammonia	CALC/NH3	9736782	2024/11/06	2024/11/06	Automated Statchk



Bureau Veritas Job #: C4Y2463
Report Date: 2024/11/06

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste SW
Sampler Initials: BM

GENERAL COMMENTS

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

Package 1	7.3°C
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Results relate only to the items tested.

BUREAU
VERITAS

Bureau Veritas Job #: C4Y2463

Report Date: 2024/11/06

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste SW

Sampler Initials: BM

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
9737544	Total BOD	2024/11/05					ND,RDL=2	mg/L	NC	30	96	80 - 120
9739107	Dissolved Mercury (Hg)	2024/11/05	104	75 - 125	106	80 - 120	ND, RDL=0.10	ug/L				
9740084	Total Suspended Solids	2024/11/05			98	80 - 120	ND, RDL=10	mg/L	0	20		
9740349	Alkalinity (Total as CaCO3)	2024/11/04			97	85 - 115	ND, RDL=1.0	mg/L	0.089	20		
9740352	Conductivity	2024/11/04			101	85 - 115	ND, RDL=1.0	umho/cm	0.20	10		
9740354	pH	2024/11/04			102	98 - 103			0.97	N/A		
9741170	Turbidity	2024/11/02			101	80 - 120	ND, RDL=0.1	NTU	1.4	20		
9741232	Dissolved Chloride (Cl-)	2024/11/03	NC	80 - 120	90	80 - 120	ND, RDL=1.0	mg/L	1.2	20		
9741234	Dissolved Sulphate (SO4)	2024/11/03	97	75 - 125	92	80 - 120	ND, RDL=1.0	mg/L	3.9	20		
9741283	Total Ammonia-N	2024/11/05	99	75 - 125	96	80 - 120	ND, RDL=0.050	mg/L	NC	20		
9741587	Total Aluminum (Al)	2024/11/04	145 (1)	80 - 120	97	80 - 120	ND, RDL=4.9	ug/L	11	20		
9741587	Total Arsenic (As)	2024/11/04	103	80 - 120	101	80 - 120	ND, RDL=1.0	ug/L	NC	20		
9741587	Total Boron (B)	2024/11/04	104	80 - 120	98	80 - 120	ND, RDL=10	ug/L	5.0	20		
9741587	Total Cadmium (Cd)	2024/11/04	96	80 - 120	101	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9741587	Total Calcium (Ca)	2024/11/04	NC	80 - 120	96	80 - 120	ND, RDL=200	ug/L	2.4	20		
9741587	Total Chromium (Cr)	2024/11/04	99	80 - 120	97	80 - 120	ND, RDL=5.0	ug/L	NC	20		
9741587	Total Cobalt (Co)	2024/11/04	95	80 - 120	94	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9741587	Total Copper (Cu)	2024/11/04	94	80 - 120	97	80 - 120	ND, RDL=0.90	ug/L	NC	20		
9741587	Total Iron (Fe)	2024/11/04	97	80 - 120	97	80 - 120	ND, RDL=100	ug/L	0.80	20		
9741587	Total Lead (Pb)	2024/11/04	90	80 - 120	96	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9741587	Total Magnesium (Mg)	2024/11/04	NC	80 - 120	95	80 - 120	ND, RDL=50	ug/L	0.76	20		
9741587	Total Nickel (Ni)	2024/11/04	93	80 - 120	95	80 - 120	ND, RDL=1.0	ug/L	3.8	20		
9741587	Total Potassium (K)	2024/11/04	98	80 - 120	93	80 - 120	ND, RDL=200	ug/L	0.14	20		
9741587	Total Selenium (Se)	2024/11/04	102	80 - 120	104	80 - 120	ND, RDL=2.0	ug/L	NC	20		
9741587	Total Silver (Ag)	2024/11/04	94	80 - 120	97	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9741587	Total Sodium (Na)	2024/11/04	NC	80 - 120	96	80 - 120	ND, RDL=100	ug/L	1.4	20		
9741587	Total Zinc (Zn)	2024/11/04	94	80 - 120	103	80 - 120	ND, RDL=5.0	ug/L	8.7	20		

BUREAU
VERITAS

Bureau Veritas Job #: C4Y2463

Report Date: 2024/11/06

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc

Client Project #: 240205-09

Site Location: South Baptiste SW

Sampler Initials: BM

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
9741591	Total Aluminum (Al)	2024/11/05	NC	80 - 120	95	80 - 120	ND, RDL=4.9	ug/L	0.38	20		
9741591	Total Arsenic (As)	2024/11/05	NC (2)	80 - 120	101	80 - 120	ND, RDL=1.0	ug/L	4.9	20		
9741591	Total Boron (B)	2024/11/05	NC (2)	80 - 120	90	80 - 120	ND, RDL=10	ug/L	3.8	20		
9741591	Total Cadmium (Cd)	2024/11/05	NC (2)	80 - 120	98	80 - 120	ND, RDL=0.090	ug/L	1.1	20		
9741591	Total Calcium (Ca)	2024/11/05	NC (2)	80 - 120	94	80 - 120	ND, RDL=200	ug/L	2.1	20		
9741591	Total Chromium (Cr)	2024/11/05	NC (2)	80 - 120	95	80 - 120	ND, RDL=5.0	ug/L	4.5	20		
9741591	Total Cobalt (Co)	2024/11/05	NC (2)	80 - 120	102	80 - 120	ND, RDL=0.50	ug/L	1.8	20		
9741591	Total Copper (Cu)	2024/11/05	NC (2)	80 - 120	98	80 - 120	ND, RDL=0.90	ug/L	2.9	20		
9741591	Total Iron (Fe)	2024/11/05	NC (2)	80 - 120	98	80 - 120	ND, RDL=100	ug/L	6.2	20		
9741591	Total Lead (Pb)	2024/11/05	NC (2)	80 - 120	100	80 - 120	ND, RDL=0.50	ug/L	2.8	20		
9741591	Total Magnesium (Mg)	2024/11/05	NC (2)	80 - 120	98	80 - 120	ND, RDL=50	ug/L	3.3	20		
9741591	Total Nickel (Ni)	2024/11/05	NC (2)	80 - 120	94	80 - 120	ND, RDL=1.0	ug/L	3.4	20		
9741591	Total Potassium (K)	2024/11/05	NC (2)	80 - 120	99	80 - 120	ND, RDL=200	ug/L	4.6	20		
9741591	Total Selenium (Se)	2024/11/05	NC (2)	80 - 120	109	80 - 120	ND, RDL=2.0	ug/L	NC	20		
9741591	Total Silver (Ag)	2024/11/05	NC (2)	80 - 120	93	80 - 120	ND, RDL=0.090	ug/L	NC	20		
9741591	Total Sodium (Na)	2024/11/05	NC (2)	80 - 120	99	80 - 120	ND, RDL=100	ug/L	1.0	20		
9741591	Total Zinc (Zn)	2024/11/05	NC (2)	80 - 120	107	80 - 120	ND, RDL=5.0	ug/L	6.0	20		
9741623	Total Dissolved Solids	2024/11/04			100	80 - 120	ND, RDL=10	mg/L	5.8	20		
9741730	Total Dissolved Solids	2024/11/05			95	80 - 120	ND, RDL=10	mg/L	0	20		
9741747	Dissolved (0.2u) Aluminum (Al)	2024/11/04	NC	80 - 120	99	80 - 120	ND,RDL=5	ug/L	9.0	20		
9742140	Dissolved Chloride (Cl-)	2024/11/06	88	80 - 120	95	80 - 120	ND, RDL=1.0	mg/L	1.5	20		
9742141	Dissolved Sulphate (SO4)	2024/11/06	93	75 - 125	98	80 - 120	ND, RDL=1.0	mg/L	1.1	20		
9742158	Colour	2024/11/06			102	80 - 120	ND,RDL=2	TCU	0.40	25		
9743857	Total Phosphorus	2024/11/05	NC	80 - 120	99	80 - 120	ND, RDL=0.020	mg/L	2.5	20	100	80 - 120



Bureau Veritas Job #: C4Y2463
Report Date: 2024/11/06

QUALITY ASSURANCE REPORT(CONT'D)

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste SW
Sampler Initials: BM

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
9743882	Phenols-4AAP	2024/11/04	99	80 - 120	99	80 - 120	ND, RDL=0.0010	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). (1) Matrix Spike exceeds acceptance limits, probable matrix interference (2) The recovery in the matrix spike was not calculated (NC). Because of the high concentration of this analyte in the parent sample, the relative difference between the spiked and unspiked concentrations is not sufficiently significant to permit a reliable recovery calculation.												



Bureau Veritas Job #: C4Y2463
Report Date: 2024/11/06

BluMetric Environmental Inc
Client Project #: 240205-09
Site Location: South Baptiste SW
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink, appearing to read 'Anastassia Hamanov', written over a horizontal line.

Anastassia Hamanov, Supervisor-Afternoon Shift

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



T971322

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			
Brad McCallum	Braden Ldr	Date	2024/10/30	ASHI HIRAI	Blitha Sukevon	Date	2024/10/30
		Time (24 HR)	HH:MM			Time (24 HR)	09:25
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
Print	Sign	Date	YYYY/MM/DD	Print	Sign	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.

Triage Information

Sampled By (Print)

of Coolers/Pkgs:

BM/NW

1

Rush ☐

Immediate Test ☐

Food Residue ☐

Micro ☐

Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Lab Comments:

Labeled By

Verified By

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	7	7	8
Drinking Water Metals Preservation Check Done (Circle)			YES	NO	

30-Oct-24 09:25

Elora Di Bratto



C4Y2463

COR FCD-00383/4

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Appendix D

D-4 2022 Toxicity Test Results

Work Order : 254642

Sample Number : 82224

SAMPLE IDENTIFICATION

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2024-04-29
Job Number :	C4C9090	Sampling Time :	11:15
Substance :	BAP-A	Date Received :	2024-05-01
Sampling Method :	Grab	Time Received :	14:00
Sampled By :	B. McCallum	Temperature at Receipt :	15 °C
Sample Description :	Clear, colourless	Date Tested :	2024-05-02
Test Method :	Reference Method for Determining Acute Lethality of Effluents to <i>Daphnia magna</i> . 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 :	9.2 days
Organism Batch :	Dm24-07	Average Brood Size :	30.2
Culture Mortality :	0% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms per Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms per 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 :	2024-04-23	LC50 :	6.1 g/L
Organism Batch :	Dm24-07	95% Confidence Limits :	5.8 - 6.3 g/L
Analyst(s) :	SV, FM	Historical Mean LC50 :	6.3 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.9 - 6.8 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By : _____

Project Manager

Work Order : 254642

Sample Number : 82224

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*	Hardness (as CaCO ₃)
Initial Chemistry (100%) :	7.6	9.8	500	20	111	180 mg/L

0 HOURS

Date & Time : 2024-05-02 11:15

Analyst(s) : AA (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*	Hardness
100	A	0	0	8.1	8.8	497	20	101	180
100	B	0	0	8.1	8.8	497	20	101	180
100	C	0	0	8.1	8.8	497	20	101	180
Control	A	0	0	8.2	8.7	442	21	100	140
Control	B	0	0	8.2	8.7	442	21	100	140
Control	C	0	0	8.2	8.7	442	21	100	140

Notes:

24 HOURS

Date & Time : 2024-05-03 11:30

Analyst(s) : GR (SV)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	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 : 2024-05-04 11:35

Analyst(s) : JW

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	8.4	8.1	502	21
100	B	0	0	8.4	8.1	502	21
100	C	0	0	8.4	8.2	502	21
Control	A	0	0	8.3	8.2	452	21
Control	B	0	0	8.3	8.2	452	21
Control	C	0	0	8.3	8.2	453	21

Notes:

Number immobile does not include number dead.

"—" = not measured/not required

* adjusted for temperature and barometric pressure

 Test Data Reviewed By : EM

 Date : 2024-05-08

Work Order : 254642
 Sample Number : 82224

SAMPLE IDENTIFICATION

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2024-04-29
Job Number :	C4C9090	Sampling Time :	11:15
Substance :	BAP-A	Date Received :	2024-05-01
Sampling Method :	Grab	Time Received :	14:00
Sampled By :	B. McCallum	Temperature at Receipt :	15 °C
Sample Description :	Clear, colourless	Date Tested :	2024-05-02

 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, February 2016, and December 2023 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>	Mean Fork Length :	38.8 mm
Organism Batch :	T24-08	Range of Fork Lengths :	34 - 44 mm
Control Sample Size :	10	Mean Wet Weight :	0.5 g
Cumulative stock mortality rate :	0.2% (previous 7 days)	Organism Loading Rate :	0.3 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Test Type :	Single concentration	Number of Replicates :	1
Sample pH Adjustment :	None	Organisms Per Replicate :	10
Sample Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Sample Pre-Aeration :	30 minutes	Volume of Sample :	16 L
Control Pre-aeration/Aeration Rate :	6.5 ± 1 mL/L/min	Volume of Control :	17 L
Duration of Control Pre-aeration:	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T24-08	LC50 :	3661 mg/L
Date Tested :	2024-05-01	95% Confidence Limits :	3264 - 4089 mg/L
Analyst(s) :	AJS, FM, PC	Historical Mean LC50 :	4334 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	3413 - 5504 mg/L

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

 Approved By : _____
 Project Manager

Work Order : 254642

Sample Number : 82224

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%) ³
Initial Water Chemistry (100%) :	7.5	9.1	503	15	96
After 30 min pre-aeration :	7.7	9.1	504	15	96

0 HOURS

Date & Time	2024-05-02	10:00					
Analyst(s) :	PG/FM (AJS)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation ³
100%	0	0	7.7	9.1	504	15	96
Control	0	0	8.3	9.7	783	15	100

Notes:

24 HOURS

Date & Time	2024-05-03	8:35					
Analyst(s) :	FM (SF)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	14	
Control	0	0	—	—	—	14	

Notes:

48 HOURS

Date & Time	2024-05-04	9:40					
Analyst(s) :	PC						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	14	
Control	0	0	—	—	—	14	

Notes:

72 HOURS

Date & Time	2024-05-05	9:35					
Analyst(s) :	JW						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	14	
Control	0	0	—	—	—	14	

Notes:

96 HOURS

Date & Time	2024-05-06	9:15					
Analyst(s) :	FM (PG)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	8.3	9.1	506	14	
Control	0	0	8.3	8.9	702	14	

Notes:

"—" = not measured/not required

Number impaired does not include number dead.

³ adjusted for temperature and barometric pressure

Test Data Reviewed By : EM

Date : 2024-05-07

Work Order : 255302

Sample Number : 83124

SAMPLE IDENTIFICATION

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2024-07-09
Job Number :	C4L0584	Sampling Time :	15:00
Substance :	BAP-A	Date Received :	2024-07-11
Sampling Method :	Grab	Time Received :	14:15
Sampled By :	N. Wilson	Temperature at Receipt :	19 °C
Sample Description :	Clear, yellow.	Date Tested :	2024-07-13
Test Method :	Reference Method for Determining Acute Lethality of Effluents to <i>Daphnia magna</i> . 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 :	7.8 days
Organism Batch :	Dm24-13	Average Brood Size :	38.4
Culture Mortality :	0.3% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms per Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms per Test Level :	30
Duration of Pre-Aeration :	0 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 :	2024-07-16	LC50 :	6.3 g/L
Organism Batch :	Dm24-13	95% Confidence Limits :	5.8 - 6.8 g/L
Analyst(s) :	GR, JN, AA	Historical Mean LC50 :	6.3 g/L
Statistical Method :	Binomial	Warning Limits (± 2SD) :	5.9 - 6.8 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By : _____
 Project Manager

Work Order : 255302

Sample Number : 83124

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*	Hardness (as CaCO ₃)
Initial Chemistry (100%) :	7.6	8.5	462	21	100	160 mg/L

0 HOURS

Date & Time : 2024-07-13 9:50

Analyst(s) : VC/NP

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*	Hardness
100	A	0	0	7.6	8.5	462	21	100	160
100	B	0	0	7.6	8.5	462	21	100	160
100	C	0	0	7.6	8.5	462	21	100	160
Control	A	0	0	8.2	8.5	471	21	100	140
Control	B	0	0	8.2	8.5	471	21	100	140
Control	C	0	0	8.2	8.5	471	21	100	140

Notes:

24 HOURS

Date & Time : 2024-07-14 10:00

Analyst(s) : VC

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	—	0	—	—	—	20
100	B	—	0	—	—	—	20
100	C	—	0	—	—	—	20
Control	A	—	0	—	—	—	20
Control	B	—	0	—	—	—	20
Control	C	—	0	—	—	—	20

Notes: Some test organisms in the 100% exposures were floating but mobile.

48 HOURS

Date & Time : 2024-07-15 9:35

Analyst(s) : AA (JGR)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	8.4	8.4	460	21
100	B	0	0	8.4	8.4	459	21
100	C	0	0	8.4	8.4	459	21
Control	A	0	0	8.3	8.4	476	21
Control	B	0	0	8.3	8.4	475	21
Control	C	0	0	8.3	8.4	475	21

Notes:

Number immobile does not include number dead.

"—" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2024-07-16

Work Order : 255302
 Sample Number : 83124

SAMPLE IDENTIFICATION

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2024-07-09
Job Number :	C4L0584	Sampling Time :	15:00
Substance :	BAP-A	Date Received :	2024-07-11
Sampling Method :	Grab	Time Received :	14:15
Sampled By :	N. Wilson	Temperature at Receipt :	19 °C
Sample Description :	Clear, yellow.	Date Tested :	2024-07-12

 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, February 2016, and December 2023 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>	Mean Fork Length :	42.5 mm
Organism Batch :	T24-14	Range of Fork Lengths :	38 - 47 mm
Control Sample Size :	10	Mean Wet Weight :	0.6 g
Cumulative stock mortality rate :	0% (previous 7 days)	Organism Loading Rate :	0.3 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Test Type :	Single concentration	Number of Replicates :	1
Sample pH Adjustment :	None	Organisms Per Replicate :	10
Sample Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Sample Pre-Aeration :	30 minutes	Volume of Sample :	18 L
Control Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Volume of Control :	18 L
Duration of Control Pre-aeration:	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T24-14	LC50 :	3803 mg/L
Date Tested :	2024-07-01	95% Confidence Limits :	3330 - 4339 mg/L
Analyst(s) :	DT	Historical Mean LC50 :	4325 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	3594 - 5203 mg/L

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By :

Project Manager

Work Order : 255302
 Sample Number : 83124

TOXICITY TEST REPORT

Rainbow Trout

EPS 1/RM/13

Page 2 of 2

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%) ³
Initial Water Chemistry (100%) :	7.4	8.3	440	16	87
After 30 min pre-aeration :	7.4	8.8	441	16	92

0 HOURS

Date & Time	2024-07-12	9:45					
Analyst(s) :	NWP (DT)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation ³
100%	0	0	7.4	8.8	441	16	92
Control	0	0	8.1	9.6	746	15	100

Notes:

24 HOURS

Date & Time	2024-07-13	8:30					
Analyst(s) :	NP (AJS)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	15	
Control	0	0	—	—	—	15	

Notes:

48 HOURS

Date & Time	2024-07-14	10:10					
Analyst(s) :	AJS						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	15	
Control	0	0	—	—	—	15	

Notes:

72 HOURS

Date & Time	2024-07-15	8:30					
Analyst(s) :	DT						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	15	
Control	0	0	—	—	—	15	

Notes:

96 HOURS

Date & Time	2024-07-16	9:00					
Analyst(s) :	DT						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	8.3	9.2	448	15	
Control	0	0	8.2	9.1	738	15	

Notes:

"—" = not measured/not required

Number impaired does not include number dead.

³ adjusted for temperature and barometric pressure

 Test Data Reviewed By : JL

 Date : 2024-07-16

CHAIN OF CUSTODY RECORD



Nautilus Work Order No:

255302

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: C4L0584	+
Field Sampler Name (print): Nathan Wilson	
Signature:	
Affiliation:	
Sample Storage (prior to shipping):	
Custody Relinquished by:	
Date/Time Shipped:	

Client:	Bureau Veritas Laboratories
	6740 Campobello Road, Mississauga, Ontario, L5N 2L8
Phone:	
Fax:	
Contact:	Elora Di Bratto

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	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)	
2024-07-09	15:00	BAP-A	83124	19°C	✓		✓							✓		1 Pail 1x23L	

For Lab Use Only

Received By:	J/GR
Date:	2024-07-11
Time:	14:15 @ 2024-07-11
Storage Location:	
Storage Temp.(°C)	

Please list any special requests or instructions:

Grab as per pail label. Field Sampler name as per pail label
48 Hour single conc. Daphnia Magna
96 Hour single conc. using Rainbow Trout

Work Order : 256315

Sample Number : 84748

SAMPLE IDENTIFICATION

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2024-10-29
Job Number :	C4Y2212	Sampling Time :	10:35
Substance :	BAP-A	Date Received :	2024-10-31
Sampling Method :	Grab	Time Received :	14:15
Sampled By :	NW, BM	Temperature at Receipt :	16 °C
Sample Description :	Clear, grey.	Date Tested :	2024-11-02
Test Method :	Reference Method for Determining Acute Lethality of Effluents to <i>Daphnia magna</i> . 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 :	7.6 days
Organism Batch :	Dm24-21	Average Brood Size :	40.8
Culture Mortality :	0.7% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms per Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms per 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 :	2024-11-05	LC50 :	6.3 g/L
Organism Batch :	Dm24-21	95% Confidence Limits :	5.9 - 6.6 g/L
Analyst(s) :	JJ, MK, JGR	Historical Mean LC50 :	6.4 g/L
Statistical Method :	Linear Regression (MLE)	Warning Limits ($\pm$ 2SD) :	5.7 - 7.2 g/L

COMMENTS

- All test validity criteria as specified in the test method were satisfied.

Approved By :



Project Manager

 Conrad Neufeld
 I am approving this
 document
 Nautilus
 2024-11-19 12:35-05:00

Work Order : 256315

Sample Number : 84748

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*	Hardness (as CaCO ₃)
Initial Chemistry (100%) :	7.7	9.6	452	21	111	160 mg/L

0 HOURS

Date & Time : 2024-11-02 12:35

Analyst(s) : MK(SSF)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*	Hardness
100	A	0	0	8.2	8.6	449	20	99	160
100	B	0	0	8.2	8.6	449	20	99	160
100	C	0	0	8.2	8.6	449	20	99	160
Control	A	0	0	8.2	8.6	466	20	99	150
Control	B	0	0	8.2	8.6	466	20	99	150
Control	C	0	0	8.2	8.6	466	20	99	150

Notes:

24 HOURS

Date & Time : 2024-11-03 13:35

Analyst(s) : MK(SSF)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	—	0	—	—	—	20
100	B	—	0	—	—	—	20
100	C	—	0	—	—	—	20
Control	A	—	0	—	—	—	20
Control	B	—	0	—	—	—	20
Control	C	—	0	—	—	—	20

Notes:

48 HOURS

Date & Time : 2024-11-04 12:40

Analyst(s) : KP

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	8.5	8.5	452	20
100	B	0	0	8.5	8.5	452	20
100	C	0	0	8.5	8.5	461	20
Control	A	0	0	8.3	8.5	471	20
Control	B	0	0	8.4	8.5	471	20
Control	C	0	0	8.4	8.5	476	20

Notes:

Number immobile does not include number dead.

"—" = not measured/not required

* adjusted for temperature and barometric pressure

 Test Data Reviewed By : JL

 Date : 2024-11-06

Work Order : 256315
 Sample Number : 84748

SAMPLE IDENTIFICATION

Company :	Bureau Veritas Laboratories		
Location :	Mississauga ON	Sampling Date :	2024-10-29
Job Number :	C4Y2212	Sampling Time :	10:35
Substance :	BAP-A	Date Received :	2024-10-31
Sampling Method :	Grab	Time Received :	14:15
Sampled By :	NW, BM	Temperature at Receipt :	16 °C
Sample Description :	Clear, grey.	Date Tested :	2024-11-03

 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, February 2016, and December 2023 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>	Mean Fork Length :	38.0 mm
Organism Batch :	T24-22	Range of Fork Lengths :	35 - 41 mm
Control Sample Size :	10	Mean Wet Weight :	0.5 g
Cumulative stock mortality rate :	0% (previous 7 days)	Organism Loading Rate :	0.3 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Test Type :	Single concentration	Number of Replicates :	1
Sample pH Adjustment :	None	Organisms Per Replicate :	10
Sample Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Sample Pre-Aeration :	30 minutes	Volume of Sample :	18 L
Control Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Volume of Control :	19 L
Duration of Control Pre-aeration:	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T24-22	LC50 :	4561 mg/L
Date Tested :	2024-11-03	95% Confidence Limits :	4151 - 5011 mg/L
Analyst(s) :	GR, JGR, NWP	Historical Mean LC50 :	3487 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	2536 - 4793 mg/L

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By :



 Conrad Neufeld
 I am approving this
 document
 Nautilus
 2024-11-19 12:35:05:00

Project Manager

Work Order : 256315

Sample Number : 84748

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%) ³
Initial Water Chemistry (100%) :	7.2	8.7	469	14	87
After 30 min pre-aeration :	7.3	8.9	468	15	91

0 HOURS

Date & Time	2024-11-03	11:50					
Analyst(s) :	GR (SV)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation ³
100%	0	0	7.3	8.9	468	15	91
Control	0	0	8.2	9.8	742	14	100

Notes:

24 HOURS

Date & Time	2024-11-04	12:50					
Analyst(s) :	JGR						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	15	
Control	0	0	—	—	—	15	

Notes:

48 HOURS

Date & Time	2024-11-05	10:00					
Analyst(s) :	NWP						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	15	
Control	0	0	—	—	—	15	

Notes:

72 HOURS

Date & Time	2024-11-06	12:45					
Analyst(s) :	NWP						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	—	—	—	15	
Control	0	0	—	—	—	15	

Notes:

96 HOURS

Date & Time	2024-11-07	12:15					
Analyst(s) :	GR						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	8.4	9.6	468	15	
Control	0	0	8.5	9.4	686	15	

Notes:

"—" = not measured/not required

Number impaired does not include number dead.

³ adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2024-11-13



CHAIN OF CUSTODY RECORD

Nautilus Work Order No:

256315

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: 240205-09
Field Sampler Name (print):
Signature:
Affiliation:
Sample Storage (prior to shipping):
Custody Relinquished by:
Date/Time Shipped:

Client: Bureau Veritas 6740 Campobello Rd. Mississauga, ON L5N 2L8
Phone:
Fax:
Contact: Elora.di-bratto@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	Pseudokirchnerella subcapitata Growth	RIS Data Entry	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2024-10-29	10:35*	BAP-A	24748	16	✓		✓								✓		1 x20L

For Lab Use Only

Received By: KP/xd
Date: 2024-10-31
Time: 14:15
Storage Location:
Storage Temp. (°C):

Please list any special requests or instructions:

Reg TAT

* Sample time is 14:50 on pail label. (KP)
** Grab selected on pail label. (KP)

*** BV Job # C4Y2212 as per client email. CN 2024-11-01

Appendix D

D-5 QA/QC Results

Table D-5 - Municipality of Hastings Highlands Groundwater QA/QC		Site Name	South Baptiste WDS	South Baptiste WDS	RPD
		Location	SB-MW9	SB-MW9	
Parameter	Units	Sample ID	SB-MW9	SB-QAQC-GW1	
		Sample Date	2024-04-29	2024-04-29	
Anions		Detection Limit			
Chloride	mg/L	1	3.7	4	NC
Nitrate + Nitrite	mg/L	0.1	0.22	0.22	NC
Nitrate as N	mg/L	0.1	0.22	0.22	NC
Nitrite as N	mg/L	0.01	<0.01	<0.01	NC
Sulphate	mg/L	1	4	4.1	NC
Cations					
Calcium (diss)	mg/L	0.2	6.2	6.4	3%
Magnesium (diss)	mg/L	0.05	0.76	0.79	4%
Potassium (diss)	mg/L	0.2	0.77	0.79	NC
Sodium (diss)	mg/L	0.1	9.1	9.1	0%
General Chemistry					
Alkalinity (as CaCO3)	mg/L	1	30	31	3%
Ammonia as N	mg/L	0.05	<0.05	<0.05	NC
Chemical Oxygen Demand	mg/L	4	<4	<4	NC
Dissolved Organic Carbon	mg/L	0.4	1.1	1.1	NC
Electrical Conductivity	uS/cm	1	78	79	1%
Phenols	mg/L	0.001	<0.001	<0.001	NC
Total Dissolved Solids	mg/L	10	95	85	11%
Total Kjeldahl Nitrogen	mg/L	0.1	<0.1	0.18	NC
Total Phosphorus	mg/L	0.02	5.4	4.3	23%
Total Suspended Solids	mg/L	10	2100	950	75%
pH	pH units		7.6	7.69	1%
Metals					
Aluminum (diss, 0.45 µm)	mg/L	0.0049	0.0052	<0.0049	NC
Arsenic (diss)	mg/L	0.001	<0.001	<0.001	NC
Barium (diss)	mg/L	0.002	0.0042	0.0043	NC
Beryllium (diss)	mg/L	0.0004	<0.0004	<0.0004	NC
Boron (diss)	mg/L	0.01	<0.01	0.01	NC
Cadmium (diss)	mg/L	0.00009	<0.00009	<0.00009	NC
Chromium (diss)	mg/L	0.005	<0.005	<0.005	NC
Cobalt (diss)	mg/L	0.0005	<0.0005	<0.0005	NC
Copper (diss)	mg/L	0.0009	<0.0009	<0.0009	NC
Iron (diss)	mg/L	0.1	<0.1	<0.1	NC
Lead (diss)	mg/L	0.0005	<0.0005	<0.0005	NC
Manganese (diss)	mg/L	0.002	<0.002	<0.002	NC
Mercury (diss)	mg/L	0.0001	<0.0001	<0.0001	NC
Molybdenum (diss)	mg/L	0.0005	<0.0005	<0.0005	NC
Nickel (diss)	mg/L	0.001	<0.001	<0.001	NC
Silicon (diss)	mg/L	0.05	5.7	5.7	0%
Silver (diss)	mg/L	0.00009	0.00018	0.00011	NC
Strontium (diss)	mg/L	0.001	0.063	0.065	3%
Thallium (diss)	mg/L	0.00005	<0.00005	<0.00005	NC
Titanium (diss)	mg/L	0.005	<0.005	<0.005	NC
Vanadium (diss)	mg/L	0.0005	<0.0005	<0.0005	NC
Zinc (diss)	mg/L	0.005	<0.005	<0.005	NC

Notes:

Detection Limit

May vary between sample locations and events

RPD

Relative Percent Difference

No Calculation; the concentrations of at least one duplicate sample was non-detect

NC

or measured at a concentration less than 5 times the Detection Limit

Orange

RPD exceeds 10% for electrical conductivity, 20% for metals, and 40% for all other parameters

*Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment,

Volume 1 Guidance Manual, Canadian Council of Ministers of the Environment, 2016

Appendix D

D-6 Surface Water QA/QC Results

Table D-6 - Municipality of Hastings Highlands		Site Name	South Baptiste WDS	South Baptiste WDS	RPD	South Baptiste WDS	South Baptiste WDS	RPD	South Baptiste WDS	South Baptiste WDS	RPD
		Location	BAP-A	BAP-A		BAP-A	BAP-A		BAP-A	BAP-A	
		Sample ID	BAP-A	SB-QAQC-SW1		BAP-A	SB-QAQC-SW1		BAP-A	SB-QAQC-SW1	
		Sample Date	2024-04-29	2024-04-29		2024-07-10	2024-07-10		2024-10-29	2024-10-29	
Anions		Detection Limit									
Chloride	mg/L	1	43	43	0%	35	35	0%	40	40	0%
Nitrate + Nitrite	mg/L	0.1	2.15	2.32	8%	1.17	1.12	4%	-	-	-
Nitrate as N	mg/L	0.1	2.15	2.32	8%	1.12	1.08	4%	-	-	-
Nitrite as N	mg/L	0.01	<0.01	<0.01	NC	0.051	0.044	NC	-	-	-
Sulphate	mg/L	1	39	39	0%	12	12	0%	17	17	0%
Cations											
Calcium (tot)	mg/L	0.2	51	52	2%	43	45	5%	50	50	0%
Magnesium (tot)	mg/L	0.05	9.2	8.7	6%	6.9	6.7	3%	8	8.2	2%
Potassium (tot)	mg/L	0.2	20	20	0%	17	16	6%	19	17	11%
Sodium (tot)	mg/L	0.1	35	35	0%	28	27	4%	31	31	0%
Field Parameters											
Temperature	deg. C		6.2	6.2	0%	15.6	15.6	0%	-	-	-
pH (Field)	pH units		7.03	7.03	0%	6.87	6.87	0%	-	-	-
General Chemistry											
Alkalinity (as CaCO3)	mg/L	1	150	150	0%	150	150	0%	150	150	0%
Ammonia as N	mg/L	0.05	<0.05	<0.05	NC	0.11	0.11	NC	<0.05	<0.05	NC
Biochemical Oxygen Demand	mg/L	2	<2	<2	NC	4	3	NC	<2	<2	NC
Colour	TCU	2	13	13	0%	25	25	0%	12	12	0%
Electrical Conductivity	uS/cm	1	530	530	0%	450	450	0%	500	500	0%
Hardness (as CaCO3)	mg/L	1	190	190	0%	140	150	7%	160	180	12%
Phenols	mg/L	0.001	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC
Total Dissolved Solids	mg/L	10	320	320	0%	215	210	2%	335	290	14%
Total Kjeldahl Nitrogen	mg/L	0.1	0.25	0.13	NC	0.49	0.49	NC	-	-	-
Total Phosphorus	mg/L	0.02	<0.02	<0.02	NC	0.032	0.034	NC	<0.02	<0.02	NC
Total Suspended Solids	mg/L	10	<10	<10	NC	<10	<10	NC	<10	<10	NC
Turbidity	NTU	0.1	0.2	0.3	NC	2	2	0%	0.5	0.4	NC
Un-ionized Ammonia (Calc)	mg/L	0.00061	<0.00061	<0.00061	NC	<0.00061	<0.00061	NC	<0.00061	<0.00061	NC
pH	pH units		8.42	8.08	4%	7.87	7.92	1%	7.86	7.89	0%
Metals											
Aluminum (diss, 0.2 µm)	mg/L	0.005	<0.005	<0.005	NC	0.006	0.006	NC	<0.005	<0.005	NC
Aluminum (tot)	mg/L	0.0049	0.0095	0.011	NC	0.07	0.14	67%	0.0083	0.011	NC
Arsenic (tot)	mg/L	0.001	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC
Boron (tot)	mg/L	0.01	0.31	0.3	3%	0.27	0.25	8%	0.22	0.21	5%
Cadmium (tot)	mg/L	0.00009	<0.00009	<0.00009	NC	<0.00009	<0.00009	NC	<0.00009	<0.00009	NC
Chromium (tot)	mg/L	0.005	<0.005	<0.005	NC	<0.005	<0.005	NC	<0.005	<0.005	NC
Cobalt (tot)	mg/L	0.0005	<0.0005	<0.0005	NC	<0.0005	0.00056	NC	<0.0005	<0.0005	NC
Copper (tot)	mg/L	0.0009	<0.0009	0.0014	NC	0.001	0.0012	NC	<0.0009	<0.0009	NC
Iron (tot)	mg/L	0.1	<0.1	<0.1	NC	0.28	0.46	NC	<0.1	<0.1	NC
Lead (tot)	mg/L	0.0005	<0.0005	<0.0005	NC	<0.0005	<0.0005	NC	<0.0005	<0.0005	NC
Mercury (diss)	mg/L	0.0001	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC	<0.0001	<0.0001	NC
Nickel (tot)	mg/L	0.001	0.0014	0.0013	NC	0.0016	0.0017	NC	0.0015	0.0015	NC
Selenium (tot)	mg/L	0.002	<0.002	<0.002	NC	<0.002	<0.002	NC	<0.002	<0.002	NC
Silver (tot)	mg/L	0.00009	<0.00009	<0.00009	NC	<0.00009	<0.00009	NC	<0.00009	<0.00009	NC
Zinc (tot)	mg/L	0.005	<0.005	0.0055	NC	<0.005	<0.005	NC	<0.005	<0.005	NC

Notes:

Detection Limit May vary between sample locations and events

RPD Relative Percent Difference

NC No Calculation; the concentrations of at least one duplicate sample was non-detect or measured at a concentration less than 5 times the Detection Limit

Orange RPD exceeds 40% (Surface Water data quality objective*)

*Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment, Volume 1 Guidance Manual, Canadian Council of Ministers of the Environment, 2016

Appendix E

Climatic Data

ONTARIO

Current Station Operator: ECCC - MSC

Latitude:	45°04'17.000" N	Longitude:	77°52'44.000" W	Elevation:	330.70 m
Climate ID:	6161001	WMO ID:	71294	TC ID:	WRK

Related Data

No related data is available for this station

Additional Search Options

[Nearby Stations with Data](#)

[Historical Data Search](#)

Download Data

Daily Data (2024)

* CSV ☐ XML ☐ Metadata(xml)

Download Data

Get More Data

← Previous Month

2024 April Go

Next Month →

Daily Data Report for April 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Dsg Days	Cool Dsg 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
01	9.8	-4.2	2.8	15.2	0.0			0.0	0		
02	11.5	-6.0	2.7	15.3	0.0			0.0	0	8	45
03	5.2	0.3	2.7	15.3	0.0			23.4	0	12	40
04	0.5	-1.4	-0.4	18.4	0.0			7.8	5	9	33
05	4.0	-1.4	1.3	16.7	0.0			1.2	10	32	31
06	11.0	-2.1	4.4	13.6	0.0			0.0	3	36	37
07	16.1	-4.8	5.6	12.4	0.0			0.0	0		
08	17.0	-5.3	5.8	12.2	0.0			0.0	0		
09	23.0	-2.8	10.1	7.9	0.0			1.9	0		
10	17.8	1.1	9.5	8.5	0.0			0.0	0	31	31
11	13.8	0.2	7.0	11.0	0.0			20.5	0		
12	14.9	3.0	9.0	9.0	0.0			20.7	1	17	40
13	9.0	-0.2	4.4	13.6	0.0			1.9	0	33	49
14	8.8	-0.3	4.3	13.7	0.0			2.0	0		
15	14.7	-1.6	6.5	11.5	0.0			0.0	0	31	35
16	15.5	-3.9	5.8	12.2	0.0			0.0	0		
17	9.6	-1.9	3.9	14.1	0.0			4.8	0		
18	10.7	3.7	7.2	10.8	0.0			4.5	0		
19	11.6	1.6	6.6	11.4	0.0			4.4	0	25	32
20	7.1	-2.5	2.3	15.7	0.0			0.3	0	29	36
21	8.0	-2.7	2.7	15.3	0.0			1.8	0	30	47
22	12.3	-6.8	2.8	15.2	0.0			0.0	0	21	39
23	15.8	2.3	9.1	8.9	0.0			6.9	0	20	39
24	7.1	-6.5	0.3	17.7	0.0			0.0	0	2	40
25	10.2	-9.3	0.5	17.5	0.0			0.0	0		
26	14.6	-7.7	3.4	14.6	0.0			0.0	0		
27	12.2	-1.7	5.2	12.8	0.0			4.6	0		
28	21.9	7.9	14.9	3.1	0.0			1.0	1		
29	10.8	3.6	7.2	10.8	0.0			7.5	0		
30	11.4	6.1	8.7	9.3	0.0			14.1	0		
Sum				383.7	0.0			129.3			
Avg	11.9	-1.4	5.2								
Xtrm	23.0	-9.3				M	M	23.4		33△	49△

Summary, average and extreme values are based on the data above.

← Previous Month

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Next Month →

Notes on Data Quality.

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

Feedback

Date modified: 2025-02-26

Current Station Operator: KCCC--MSC

Latitude:45°04'17.000;" N

Longitude:77°52'44.000;" W

Elevation:330.70 m

Climate ID:6161001

WMO ID:71294

TC ID:WRK

Related Data

No related data is available for this station

Additional Search Options

Nearby Stations with Data

Historical Data Search

Download Data

Daily Data (2024)

CSV

XML

Metadata(xml)

Download Data

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Next Month →

Daily Data Report for July 2024

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	°C	°C			mm	cm	mm	cm	10's deg	km/h
01	24.9	6.5	15.7	2.3	0.0			0.0			
02	25.8	9.0	17.4	0.6	0.0			0.0			
03	M	M	M	M	M			M		M	M
04	M	M	M	M	M			M		M	M
05	29.1	15.5	22.3	0.0	4.3			0.0			
06	27.6	15.3	21.4	0.0	3.4			13.2		33	33
07	26.7	14.8	20.7	0.0	2.7			0.0			
08	28.0	13.6	20.8	0.0	2.8			0.0			
09	28.9	14.3	21.6	0.0	3.6			0.2			
10	19.1	14.7	16.9	1.1	0.0			31.5		6	35
11	25.7	14.0	19.9	0.0	1.9			25.0			
12	28.6	13.4	21.0	0.0	3.0			0.0			
13	28.0	14.3	21.1	0.0	3.1			0.0			
14	29.0	13.1	21.1	0.0	3.1			0.0			
15	28.4	16.2	22.3	0.0	4.3			47.2			
16	25.3	16.4	20.8	0.0	2.8			3.1			
17	26.4	14.2	20.3	0.0	2.3			0.0			
18	20.8	9.5	15.1	2.9	0.0			0.0			
19	24.5	8.1	16.3	1.7	0.0			0.0			
20	26.4	8.3	17.3	0.7	0.0			0.2		30	32
21	26.2	9.5	17.9	0.1	0.0			0.0			
22	26.9	7.0	16.9	1.1	0.0			0.0			
23	27.8	11.9	19.9	0.0	1.9			0.0			
24	25.5	16.0	20.8	0.0	2.8			24.3		32	31
25	22.2	10.6	16.4	1.6	0.0			0.0		30	38
26	25.8	8.0	16.9	1.1	0.0			0.0			
27	26.5	10.6	18.5	0.0	0.5			0.0			
28	28.3	10.3	19.3	0.0	1.3			0.0			
29	29.1	11.9	20.5	0.0	2.5			0.0			
30	29.7	13.9	21.8	0.0	3.8			1.5			
31	28.6	18.4	23.5	0.0	5.5			3.4			
Sum				13.2^	55.6^			149.6^			
Avg	26.5^	12.4^	19.5^								
Xtrm	29.7^	6.5^				M	M	47.2^		30^	38^

Summary, average and extreme values are based on the data above.

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Next Month →

Notes on Data Quality.

Legend

A = Accumulated

C = Precipitation occurred, amount uncertain

E = Estimated

F = Accumulated and estimated

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S = More than one occurrence

T = Trace

Y = Temperature missing but known to be < 0

[empty] = Indicates an unobserved value

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‡ = Data that is not subject to review by the National Climate Archives

Current Station Operator: KCCC--MSC

Latitude:45°04'17.000," N

Longitude:77°52'44.000," W

Elevation:330.70 m

Climate ID:6161001

WMO ID:71294

TC ID:WRK

Related Data

No related data is available for this station

Additional Search Options

Nearby Stations with Data

Historical Data Search

Download Data

Daily Data (2024)

☐ CSV

☒ XML

☐ Metadata(xml)

Download Data

Get More Data

Daily Data Report for October 2024

DAY	Max Temp °C	Min Temp °C	Mean Temp °C	Heat Dsg Days	Cool Dsg 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
01	20.2	5.7	12.9	5.1	0.0			6.1		32	35
02	16.7	2.6	9.6	8.4	0.0			2.8			
03	21.3	0.6	11.0	7.0	0.0			0.0			
04	19.2	3.0	11.1	6.9	0.0			0.0			
05	17.2	-0.1	8.6	9.4	0.0			0.0			
06	19.0	-0.9	9.1	8.9	0.0			9.7		19	43
07	13.2	-0.5	6.4	11.6	0.0			0.0		30	36
08	12.5	-1.9	5.3	12.7	0.0			0.0			
09	10.2	-1.8	4.2	13.8	0.0			0.4			
10	11.8	-1.9	5.0	13.0	0.0			0.0			
11	18.7	-2.1	8.3	9.7	0.0			0.0		35	44
12	13.6	3.3	8.5	9.5	0.0			0.0		34	41
13	11.5	2.6	7.0	11.0	0.0			0.0			
14	9.3	-2.1	3.6	14.4	0.0			0.0		34	37
15	6.9	-2.1	2.4	15.6	0.0			0.0		32	41
16	9.5	-4.4	2.6	15.4	0.0			0.1			
17	15.0	-5.4	4.8	13.2	0.0			0.0			
18	18.4	-4.4	7.0	11.0	0.0			0.0			
19	20.9	-4.1	8.4	9.6	0.0			0.0			
20	22.0	-2.2	9.9	8.1	0.0			0.0			
21	23.6	4.1	13.9	4.1	0.0			0.0			
22	24.5	3.1	13.8	4.2	0.0			0.0			
23	18.4	4.3	11.3	6.7	0.0			0.0		28	31
24	9.7	-4.2	2.7	15.3	0.0			0.0			
25	9.0	-5.9	1.6	16.4	0.0			0.3			
26	9.0	-4.7	2.1	15.9	0.0			0.0		32	35
27	9.4	-8.4	0.5	17.5	0.0			2.5			
28	7.0	-3.0	2.0	16.0	0.0			0.0			
29	11.0	-4.7	3.1	14.9	0.0			2.2			
30	21.9	9.2	15.6	2.4	0.0			0.0			
31	21.5	13.7	17.6	0.4	0.0			7.2		21	37
Sum				328.1	0.0			31.3			
Avg	15.2	-0.4	7.4								
Xtrm	24.5	-8.4				M	M	9.7		35^	44^

Summary, average and extreme values are based on the data above.

Notes on Data Quality.

Legend

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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
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
Anions						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
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
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
Sulphate	mg/L	500	-	-	-	0.1	7	7	7	6	5	6	7	6	6	6	5	5.51	5.02	2.52	5
Cations																					
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
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
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
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
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	21	32	22	17	35	14	25	22	28	26	19	18	17	37	18
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
Chemical Oxygen Demand	mg/L	-	-	-	-	4	-	-	<5	<5	5	<5	<5	<5	<5	5	18	<5	5	<5	<5
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	-	-	1.3	1.1	1.9	1.4	1.4	1.4	1.2	1.3	1.5	1.4	1.2	1.8	1.2
Electrical Conductivity	uS/cm	-	-	-	-	1	57	81	55	48	80	49	61	57	67	54	47	54	51	79	51
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
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
Total Dissolved Solids	mg/L	500	-	-	-	1	-	-	36	31	52	32	40	37	44	35	-	60	40	-	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
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
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
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	578	-	-	-	-
Metals																					
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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

-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	
						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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

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-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3
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-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3
						Sample Date	2016-Apr-28	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
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	0.44	0.43	0.48	0.38	0.4	0.6	0.76	0.46	0.37	0.45	-	-	4	5	16
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	<0.05	0.16	1.5	0.37	0.27	0.29
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	<0.05	-	-	<0.1	<0.1	<0.1
Sulphate	mg/L	500	-	-	-	0.1	5.04	4.79	3.15	3.87	3.75	3.89	3.82	4.2	3.82	3.54	8	23	8	9	12
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	5.21	4.86	8.9	5.06	4.5	5.44	5.76	6.57	6.2	5.54	8	20	8	10	22
Magnesium (diss)	mg/L	-	-	-	-	0.05	0.75	0.7	1.3	0.79	0.64	0.81	0.86	0.97	0.9	0.79	1	3	1	1	3
Potassium (diss)	mg/L	-	-	-	-	0.05	0.72	0.62	1.08	0.67	0.54	0.68	0.73	0.78	0.76	0.54	2	5	2	2	4
Sodium (diss)	mg/L	200	-	-	-	0.05	1.16	1.11	1.77	1.27	1.09	1.25	1.42	1.59	1.35	1.28	5	14	4	5	16
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	17	18	33	21	18	21	17	27	24	23	27	65	27	26	80
Ammonia as N	mg/L	-	-	-	-	0.02	<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
Chemical Oxygen Demand	mg/L	-	-	-	-	4	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	-	<5	20	10
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	1.7	1	1.7	2.1	2.2	1.2	3	1.4	1	1.9	-	-	5.6	8.2	3.1
Electrical Conductivity	uS/cm	-	-	-	-	1	45	47	64	42	39	58	47	57	51	44	84	226	83	88	240
pH	pH units	-	-	-	6.5 - 8.5		7.37	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
Phenols	mg/L	-	-	-	-	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	<0.001
Total Dissolved Solids	mg/L	500	-	-	-	1	38	36	58	26	46	32	52	46	<10	38	-	-	54	57	156
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		16.1	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
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.2	<0.1	0.22	0.38	<0.1	0.16	0.2	<0.1	0.12	0.15	-	-	0.19	0.37	0.25
Total Phosphorus	mg/L	-	-	-	-	0.02	0.36	0.36	0.26	0.39	0.31	1.24	0.43	0.33	0.24	0.54	-	-	6.23	5.81	0.95
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	196	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	<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
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	<0.003	<0.003	<0.05	<0.003	<0.003	0.009	<0.003	<0.003	<0.001	-	-	<0.001	<0.001	<0.001
Barium (diss)	mg/L	-	-	1	-	0.002	0.005	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
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<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
Boron (diss)	mg/L	-	5	-	-	0.01	<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
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.002	<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
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	<0.002	<0.001	0.001	<0.001	0.002	<0.001
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.001	<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
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.003	<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
Iron (diss)	mg/L	0.3	-	-	-	0.01	<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
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.002	<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
Manganese (diss)	mg/L	0.05	-	-	-	0.002	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
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
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<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	<0.003	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.25	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
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	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.05	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
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	<0.0001	<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	<0.002	0.004	<0.002	<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	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc (diss)	mg/L	5	-	-	-	0.005	<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

-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-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3
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-MW3	SB-MW3	SB-MW3	SB-MW3	SB-MW3
						Sample Date	2016-Apr-28	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
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

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	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	2015-May-04	2015-Oct-26	2016-Apr-28
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	4	10	5	2	7	14	3	8	37.4	17.2	6.83	14	20.7	23.7	12.7
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	0.15	0.46	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
Nitrite as N	mg/L	-	-	1	-	0.01	<0.1	<0.1	<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
Sulphate	mg/L	500	-	-	-	0.1	8	12	7	8	7	12	6	11	7.82	14.8	6.78	10.1	5.97	13.5	7
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	7	14	8	13	9	24	11.6	11.3	19.3	31.1	7.92	16.6	15.6	23	9.55
Magnesium (diss)	mg/L	-	-	-	-	0.05	1	2	1	4	1	4	1.29	2.65	2.79	4.29	1.14	2.27	2.12	3.37	1.32
Potassium (diss)	mg/L	-	-	-	-	0.05	2	4	3	4	2	6	2.04	3.6	3.5	6.23	2.4	3.22	3.66	5.45	2.02
Sodium (diss)	mg/L	200	-	-	-	0.05	5	14	5	7	5	18	4.54	11.9	8.91	23.1	6.05	19.5	6.6	20.9	7.4
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	27	64	26	54	35	88	29	63	27	96	27	68	28	77	29
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.06	<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
Chemical Oxygen Demand	mg/L	-	-	-	-	4	10	10	8	5	18	22	12	74	<5	9	10	<5	<5	16	<5
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	6.4	5.4	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
Electrical Conductivity	uS/cm	-	-	-	-	1	78	185	85	6	95	247	76	186	195	287	101	208	137	268	111
pH	pH units	-	-	-	6.5 - 8.5		6.72	6.87	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
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
Total Dissolved Solids	mg/L	500	-	-	-	1	51	120	55	101	62	161	-	-	142	592	92	112	100	150	72
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		21.6	43.2	24.1	48.2	26.6	76.4	34.3	39.1	59.7	95.3	24.5	50.8	47.7	71.3	29.3
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	<0.1	0.26	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
Total Phosphorus	mg/L	-	-	-	-	0.02	6.32	6.11	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
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	10100	9200	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.05	0.02	<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
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
Barium (diss)	mg/L	-	-	1	-	0.002	<0.01	0.02	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
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
Boron (diss)	mg/L	-	5	-	-	0.01	0.01	0.05	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
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
Chromium (diss)	mg/L	-	-	0.05	-	0.002	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
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.0002	0.0003	<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
Copper (diss)	mg/L	1	-	-	-	0.0009	0.002	0.023	0.003	0.002	0.001	0.004	0.0011	0.0019	<0.003	0.004	<0.003	<0.003	<0.003	-	<0.003
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.11	<0.03	<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
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
Manganese (diss)	mg/L	0.05	-	-	-	0.002	<0.01	0.01	<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
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
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
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.005	<0.005	<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
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.3	4.4	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
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
Strontium (diss)	mg/L	-	-	-	-	0.001	0.071	0.107	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
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
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<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
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	0.0006	0.0009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.005	0.007	<0.005	0.07	<0.005	<0.005	<0.005	0.01	0.01

-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	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	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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

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-MW4	SB-MW4
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-MW4	SB-MW4
						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	2006-May-10	2006-Nov-20
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	16	13.7	26.9	42.1	28.2	41.9	16.7	39.4	31.3	19.9	11.8	37.8	16.4	-	-
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	0.07	0.17	0.38	0.87	1.27	0.68	0.28	0.59	0.67	0.21	0.32	0.41	0.55	<0.1	<0.1
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	<0.05	<0.05	<0.05	<0.05	-	-
Sulphate	mg/L	500	-	-	-	0.1	6	9.49	5.97	9.4	23.1	9.96	15.1	11.3	13.9	9.55	12.2	13	13	8	13
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	9.6	15	14.1	33.8	19.6	28.5	12.4	28.7	17.4	13.2	12	34.2	16.9	3	6
Magnesium (diss)	mg/L	-	-	-	-	0.05	1.39	1.93	1.78	4.09	2.43	3.6	1.6	3.39	2.36	1.69	1.45	4.21	2.22	<1	1
Potassium (diss)	mg/L	-	-	-	-	0.05	2	2.74	2.52	4.35	3.14	3.57	1.82	3.63	5.75	2.6	1.82	3.37	2.46	<1	<1
Sodium (diss)	mg/L	200	-	-	-	0.05	9.3	17.6	8.89	22.9	12.5	30.2	11.4	28.3	14.1	14.2	8.14	20.5	9.46	<2	3
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	30	62	30	77	33	91	31	75	34	46	29	86	39	<5	<5
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	0.05	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.13	<0.02	0.02	<0.02	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	4	6	6	<5	<5	8	<5	<5	12	<5	<5	7	11	8	-	-
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	1.3	4.5	1.1	8.5	1.7	11	1.4	2.7	5.8	1.9	1.2	2.4	1.4	-	-
Electrical Conductivity	uS/cm	-	-	-	-	1	136	164	154	366	221	322	191	275	205	175	128	316	160	36	76
pH	pH units	-	-	-	6.5 - 8.5		7.53	7.35	6.62	7.32	6.77	7.33	6.54	-	6.51	6.8	6.48	7.55	6.83	6.15	6.01
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	0.003	<0.001	-	-
Total Dissolved Solids	mg/L	500	-	-	-	1	70	108	78	190	134	200	84	154	140	98	68	166	94	-	-
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		29.7	45.4	42.5	101.2	58.9	86	37.6	85.6	53.2	39.9	35.9	102.7	-	9.6	19.1
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.18	0.18	0.61	0.21	<0.1	0.15	0.11	0.21	0.46	0.14	0.12	0.49	0.31	-	-
Total Phosphorus	mg/L	-	-	-	-	0.02	9.9	2.22	6.59	3.54	8.82	0.87	3.11	1.06	11	5.56	16.9	1.78	7.4	-	-
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	5740	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	<0.004	0.007	<0.004	0.006	0.006	0.008	0.009	0.007	0.014	0.063	0.009	0.008	0.011	0.09	0.13
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	-	-
Barium (diss)	mg/L	-	-	1	-	0.002	0.01	0.016	0.016	0.039	0.026	0.034	0.013	0.025	0.024	0.016	0.012	0.026	0.014	<0.01	0.02
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	<0.001	<0.001
Boron (diss)	mg/L	-	5	-	-	0.01	0.01	0.068	<0.01	0.124	0.011	0.154	<0.01	0.083	0.012	0.014	<0.01	0.108	0.021	0.01	<0.01
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<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	<0.003	<0.003	<0.003	<0.002	<0.002	<0.001	0.001
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0015	<0.0005	0.0016	<0.0005	<0.0002	0.0002
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.003	<0.003	<0.003	<0.003	0.002	0.003	<0.002	<0.002	0.004	<0.002	<0.002	0.002	0.006	0.002	<0.001
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.521	0.019	0.047	0.017	<0.03	<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	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001
Manganese (diss)	mg/L	0.05	-	-	-	0.002	<0.002	0.004	<0.002	0.008	<0.002	0.007	<0.002	0.007	<0.002	0.128	0.024	0.28	0.003	<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	-	-
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	0.002	0.002	<0.005	<0.005
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.02	6	5.54	6.22	4.96	6.39	4.91	5.92	5.1	5.95	5.45	5.2	6.07	4.7	5.1
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	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.091	0.134	0.125	0.285	0.199	0.26	0.117	0.226	0.143	0.113	0.101	0.238	0.128	0.022	0.055
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.006	<0.006	<0.006	<0.006	<0.0003	<0.0003	<0.0003	0.0005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0001	<0.0001
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	0.01	<0.002	<0.002	<0.002	<0.01	<0.01
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	0.0018	-	-	-
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	<0.001	<0.001
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.008	<0.005	<0.005	0.01	0.012	<0.01	<0.01

-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
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	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
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	31	33	2	4	2	2	2	3	3	25	1	112	4.05	10.6	2.67
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	<0.1	0.68	<0.1	0.12	0.1	0.1	<0.1	<0.1	<0.1	8.42	<0.1	13.4	0.23	0.26	0.06
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
Sulphate	mg/L	500	-	-	-	0.1	23	19	9	7	6	7	8	8	7	15	11	67	17.9	9.48	10.6
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	44	13	3	4	2	3	3	3	2	20	3.05	37.3	5.33	7.95	3.4
Magnesium (diss)	mg/L	-	-	-	-	0.05	7	3	<1	<1	<1	<1	<1	<1	<1	4	0.491	14.1	1.07	1.41	0.63
Potassium (diss)	mg/L	-	-	-	-	0.05	18	<1	<1	<1	<1	<1	<1	<1	<1	1	0.111	1.14	0.44	0.95	0.55
Sodium (diss)	mg/L	200	-	-	-	0.05	26	11	4	<2	2	3	<2	<2	<2	8	2.52	27.6	6.17	6.38	2.77
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	161	7	8	<5	<5	<5	6	5	<10	6	<5	9	5	13	<5
Ammonia as N	mg/L	-	-	-	-	0.02	0.72	<0.02	<0.02	<0.02	0.02	0.05	<0.02	<0.02	<0.02	0.06	0.01	0.16	<0.02	<0.02	0.05
Chemical Oxygen Demand	mg/L	-	-	-	-	4	23	30	63	55	70	73	60	90	70	110	51	250	44	95	43
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	14.1	18.6	30.1	24.2	33.1	35.1	30.3	42.2	29.5	28.3	12.3	25.5	24.4	2.1	3.4
Electrical Conductivity	uS/cm	-	-	-	-	1	468	187	38	40	30	34	41	42	31	213	37	610	73	88	52
pH	pH units	-	-	-	6.5 - 8.5		6.91	5.89	6.17	6.17	6.06	5.95	6.32	6.34	6.15	5.35	5.4	5.6	6.54	6.82	6.53
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	0.003	<0.001	0.001	<0.001
Total Dissolved Solids	mg/L	500	-	-	-	1	304	122	25	26	20	22	27	27	20	138	-	-	66	50	58
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		138.7	44.8	9.6	12	7.1	9.6	9.6	9.6	7.1	66.4	9.6	151.2	17.7	25.7	11.1
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.92	0.25	0.49	0.32	0.56	0.53	0.64	0.99	0.39	0.22	1	2.1	0.41	2.1	0.56
Total Phosphorus	mg/L	-	-	-	-	0.02	3.51	73.7	72	55	106	187	101	86	55	34.4	40.3	42.8	112	29.8	2.17
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	113000	559000	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.03	0.35	0.16	0.18	0.11	0.2	0.1	0.1	0.14	0.37	0.108	0.486	0.077	0.11	0.072
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
Barium (diss)	mg/L	-	-	1	-	0.002	0.04	0.07	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.07	0.007	0.239	0.013	0.031	0.018
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<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
Boron (diss)	mg/L	-	5	-	-	0.01	0.13	0.03	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.011	0.059	0.013	0.06	0.014
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
Chromium (diss)	mg/L	-	-	0.05	-	0.002	0.002	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
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0005	0.0021	<0.001	<0.001	<0.001
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.001	0.002	0.002	0.001	<0.001	0.004	<0.001	<0.001	<0.001	0.004	0.0019	0.0103	<0.003	<0.003	<0.003
Iron (diss)	mg/L	0.3	-	-	-	0.01	11.5	<0.03	0.1	0.08	0.03	0.07	<0.03	<0.03	<0.03	<0.03	<0.1	<0.1	<0.01	<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	<0.0001	<0.002	<0.002	<0.002
Manganese (diss)	mg/L	0.05	-	-	-	0.002	1.22	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.005	0.027	0.003	0.008	0.004
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	0.0002	<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
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
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.8	5.5	4.2	5.4	4.4	4.7	4.5	4.5	3	3.7	2.98	4.83	2.71	4.01	3.39
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
Strontium (diss)	mg/L	-	-	-	-	0.001	0.255	0.228	0.02	0.023	0.022	0.023	0.024	0.024	0.021	0.138	0.025	0.612	0.077	0.113	0.09
Thallium (diss)	mg/L	-	-	-	-	0.00005	0.0003	<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
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	0.01	0.02	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	0.004	0.003	0.005
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	0.0008	<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	0.03	0.013	0.031	0.006	0.08	<0.005

-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
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	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	-	-	-	-	-	-	-	-	-	-	-	-	-
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

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	
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	
						Sample Date	2014-Oct-14	2015-May-04	2015-Oct-26	2016-Apr-28	2016-Oct-26	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
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	2.31	36.8	117	5.17	327	4.24	52.6	1.57	61	2.91	8.98	1.1	117	9.48	1.79
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	0.34	0.31	0.57	0.6	<0.25	2.35	0.5	1.11	10.4	2.04	1.31	1.81	0.56	4.38	0.84
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.05	<0.25	<0.05	<0.25	<0.05	<0.05	<0.05	<0.05	0.18	<0.05	<0.05	<0.25	0.14	<0.05
Sulphate	mg/L	500	-	-	-	0.1	9.2	6.26	13.3	15.9	97.8	33.8	26.2	13.6	18.1	15	25.7	21	156	63.3	22
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	6.25	16.5	31.6	6.5	68.9	8.1	26.1	3.68	36.3	6.27	16.2	5.59	154	30.3	14.9
Magnesium (diss)	mg/L	-	-	-	-	0.05	1.3	3.35	6.91	1.37	11.7	1.85	5.72	0.88	6.55	1.88	3.5	0.94	26	4.93	1.83
Potassium (diss)	mg/L	-	-	-	-	0.05	1.29	1.47	4.92	1.47	13.5	2.85	5.01	1.12	4.63	3.7	5.38	2.97	34	10.2	6.17
Sodium (diss)	mg/L	200	-	-	-	0.05	3.49	5	62	5.26	179	13.7	34.2	5.49	45.4	6.13	14.4	2.94	111	8.22	8.43
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	11	13	77	16	156	25	84	11	83	35	59	23	642	55	57
Ammonia as N	mg/L	-	-	-	-	0.02	0.1	<0.02	<0.02	0.71	5.87	2.38	0.75	0.37	0.83	4.72	3.1	1.91	12.6	4.56	0.23
Chemical Oxygen Demand	mg/L	-	-	-	-	4	117	99	156	<5	255	80	55	26	52	24	50	107	79	50	36
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	43.3	5.2	23.2	3.6	46	6	6.7	2.1	17.6	6.4	6.6	2.8	34.5	6.5	4.8
Electrical Conductivity	uS/cm	-	-	-	-	1	60	164	565	89	1510	176	337	66	551	128	207	141	1610	315	175
pH	pH units	-	-	-	6.5 - 8.5		6.61	6.81	6.86	7.29	6.11	7.34	7.22	6.33	7.02	6.79	7.07	6.47	-	6.61	6.83
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	0.002	<0.001	0.005	<0.001	<0.001	<0.001	0.003	<0.001	0.003	<0.001	0.016	<0.001	0.003
Total Dissolved Solids	mg/L	500	-	-	-	1	58	136	378	70	838	108	208	64	356	98	136	104	1000	238	118
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100	21	55	107.4	21.9	220.2	27.8	88.7	12.8	117.6	23.4	54.9	17.8	491.6	96	44.7	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	1.33	1.43	2.17	1.61	12.2	3.41	1.45	1	2.22	6.05	3.75	2.78	14.8	5.01	0.67
Total Phosphorus	mg/L	-	-	-	-	0.02	154	81.4	165	61.6	147	84.8	96	45.1	107	30	65	87	<0.02	40.1	42.4
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.069	0.178	0.177	0.09	0.216	0.067	0.046	0.063	0.102	0.056	0.051	0.053	0.013	0.149	0.183
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	<0.003	<0.003	<0.003	0.005	<0.003
Barium (diss)	mg/L	-	-	1	-	0.002	0.023	0.073	0.552	0.014	1.15	0.04	0.106	0.01	0.66	0.178	0.166	0.029	0.239	0.101	0.075
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
Boron (diss)	mg/L	-	5	-	-	0.01	0.042	0.016	0.073	0.011	0.063	0.017	0.054	0.023	0.197	0.281	0.43	0.064	9.32	0.261	0.228
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	<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	<0.003	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.001	<0.001	0.003	<0.001	0.005	<0.001	<0.001	<0.001	0.002	0.0011	0.0012	<0.0005	0.0318	0.0011	0.0006
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.003	<0.003	0.008	<0.003	0.012	<0.003	0.003	<0.003	0.005	0.004	0.007	<0.002	0.063	<0.002	0.004
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.025	<0.01	<0.01	0.029	0.065	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.017	<0.01	0.07
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<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
Manganese (diss)	mg/L	0.05	-	-	-	0.002	0.004	1.78	3.41	0.187	8.35	0.32	1.6	0.107	2.66	0.225	0.338	0.093	129.6	0.144	0.045
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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.002	<0.002
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.003	<0.003	0.006	<0.003	0.006	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.046	<0.003	<0.003
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.02	4.87	5.42	3.42	4.64	3.43	5.63	2.75	5.85	3.41	4.39	2.67	77.8	3.26	3.96
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.103	0.32	1.09	0.043	1.72	0.039	0.194	0.042	1.23	0.271	0.3	0.091	14.9	0.295	0.141
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.006	<0.006	<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
Titanium (diss)	mg/L	-	-	-	-	0.002	0.003	<0.002	<0.002	0.007	0.011	<0.002	<0.002	0.006	<0.002	0.003	0.002	<0.002	0.008	0.008	<0.002
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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.005	0.007	0.006	<0.005	0.021	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	0.087	0.006	<0.005

-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
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	2014-Oct-14	2015-May-04	2015-Oct-26	2016-Apr-28	2016-Oct-26	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
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW4	SB-MW4	SB-MW4	SB-MW4	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-MW4	SB MW4	SB MW4	SB-MW4	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5
						Sample Date	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2006-May-10	2006-Nov-20	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
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	1.31	68.1	1.41	3.9	-	-	3	20	29	24	23	29	21	16	21
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	2.64	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	2.16	2.08	3.16	1.58	<0.1	<0.1	<0.1	<0.1	0.22	0.26	0.16	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.05	0.32	1.07	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L	500	-	-	-	0.1	16.4	41.9	15.9	54	17	20	8	6	41	8	14	8	12	5	8
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	10.4	51	13.4	54	37	42	4	46	36	41	43	36	38	34	38
Magnesium (diss)	mg/L	-	-	-	-	0.05	1.31	6.39	1.82	4.8	6	7	<1	7	6	6	7	6	6	5	6
Potassium (diss)	mg/L	-	-	-	-	0.05	4.57	13.4	6.03	13	18	19	<1	21	17	20	22	18	16	18	17
Sodium (diss)	mg/L	200	-	-	-	0.05	2.78	52	3.58	20	23	25	<2	32	26	29	26	26	24	20	22
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	32	109	45	150	155	197	7	224	108	185	180	170	169	167	164
Ammonia as N	mg/L	-	-	-	-	0.02	1.34	0.44	4.02	4.4	-	-	<0.02	0.94	0.56	0.8	0.93	0.97	0.82	1.24	1.27
Chemical Oxygen Demand	mg/L	-	-	-	-	4	111	47	47	59	-	-	10	20	23	25	35	30	23	43	45
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	3.1	15.8	4.9	7.8	-	-	8.4	12.8	10.2	10.3	14.4	12.4	10.2	17	12.1
Electrical Conductivity	uS/cm	-	-	-	-	1	123	551	158	450	392	463	41	499	396	453	458	444	429	381	399
pH	pH units	-	-	-	6.5 - 8.5		6.35	6.91	7.03	7.4	7.18	7.18	6.05	7.33	7.46	7.3	7.14	7.27	7.27	7.23	7.75
Phenols	mg/L	-	-	-	-	0.001	<0.001	0.006	<0.001	<0.001	-	-	<0.001	<0.001	<0.001	<0.001	0.01	0.003	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	500	-	-	-	1	84	298	116	265	-	-	27	324	257	294	298	289	279	248	259
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		31.4	153.7	-	-	117.1	133.7	12	143.7	114.6	127.1	136.2	114.6	119.6	105.5	119.6
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	2.23	1.63	4.23	5.7	-	-	0.26	1.28	0.89	1.16	1.42	1.32	0.93	1.38	1.48
Total Phosphorus	mg/L	-	-	-	-	0.02	34.7	69	48.8	75	-	-	24	2	2.83	1.1	1.98	2.3	3.2	8.46	1.48
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	41400	67000	-	-	-	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.069	0.094	0.052	0.033	0.06	0.02	0.1	0.1	0.02	0.02	0.01	0.02	0.02	0.04	0.01
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<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
Barium (diss)	mg/L	-	-	1	-	0.002	0.05	0.488	0.096	0.49	0.05	0.05	<0.01	0.05	0.04	0.06	0.04	0.05	0.04	0.04	0.04
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.0005	<0.0005	<0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005
Boron (diss)	mg/L	-	5	-	-	0.01	0.049	0.178	0.244	0.57	0.18	0.2	<0.01	0.21	0.16	0.25	0.16	0.17	0.13	0.19	0.1
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	0.0001	<0.0001	<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
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.003	<0.002	<0.002	<0.005	0.001	0.001	<0.001	0.002	0.009	<0.001	0.001	0.002	<0.001	<0.001	0.002
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.0005	0.0013	0.0005	0.0013	0.0008	0.0007	<0.0002	0.0006	0.0013	0.0007	0.0009	0.0013	<0.0002	0.0003	<0.0002
Copper (diss)	mg/L	1	-	-	-	0.0009	0.002	0.004	0.004	0.01	<0.001	<0.001	0.003	<0.001	0.011	<0.001	0.001	0.001	0.002	0.001	<0.001
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.01	0.014	0.028	<0.1	15.1	15.6	0.04	17.6	4.79	10	1.06	4.84	5.17	6.39	3.56
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.031	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.05	-	-	-	0.002	0.02	0.129	0.023	0.1	1.15	1.53	<0.01	1.46	0.78	1.17	0.43	1.09	0.45	0.58	0.43
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
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	0.00052	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	0.0011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	3.21	4.92	2.93	3.5	7	7.2	4.3	7.1	5	8.1	3.4	6.8	5.7	6.6	5.4
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<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
Strontium (diss)	mg/L	-	-	-	-	0.001	0.079	0.501	0.102	0.28	0.275	0.373	0.022	0.272	0.237	0.273	0.197	0.311	0.393	0.333	0.313
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0003	<0.0003	<0.0003	0.000081	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	0.003	0.004	<0.005	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	-	<0.002	<0.0005	0.004	0.003	<0.001	0.004	0.001	0.003	0.001	0.003	0.001	0.002	0.001
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.005	0.006	<0.005	0.014	<0.01	<0.01	0.01	<0.01	0.04	<0.01	0.02	0.02	0.01	<0.01	<0.01

-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-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-MW4	SB MW4	SB MW4	SB-MW4	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5	SB-MW5
						Sample Date	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2006-May-10	2006-Nov-20	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
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

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
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	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-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	18	28	23	31	22.6	25.2	24.9	29.2	21.1	30.7	32.4	25.5	33.8	43	46.3
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	<0.1	<0.1	<0.1	<0.05	0.2	0.42	0.14	<0.05	<0.25	<0.1	<0.05	0.06	0.24	0.07	<0.05
Nitrite as N	mg/L	-	-	1	-	0.01	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	500	-	-	-	0.1	3	9	2	16.1	5.21	9.2	2.39	8.91	2.76	13.1	1.23	9.4	5.54	10.8	3.07
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	39	26.8	47.7	32.4	43.5	27.3	38.6	35.8	36.1	33.9	37.6	28.4	33.5	31.4	40
Magnesium (diss)	mg/L	-	-	-	-	0.05	7	5.59	7.24	5.48	6.85	4.6	6.14	6.06	5.79	5.96	5.88	4.95	5.5	5.21	6.92
Potassium (diss)	mg/L	-	-	-	-	0.05	20	16	19.7	17.3	23.1	14.9	21.5	18.9	22	19.2	20.3	14.6	20.5	16	21.1
Sodium (diss)	mg/L	200	-	-	-	0.05	21	17.2	27.1	18	23.6	16.3	22	19.9	24.9	19.8	21.8	18.1	21.8	18.2	26.1
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	185	137	201	99	161	104	150	136	170	132	161	128	122	120	157
Ammonia as N	mg/L	-	-	-	-	0.02	1.54	1.49	1.66	0.91	0.76	0.29	0.38	0.72	1	0.73	0.86	1.05	1.28	0.63	1.03
Chemical Oxygen Demand	mg/L	-	-	-	-	4	98	96	154	46	18	30	24	19	19	26	23	18	9	14	40
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	10.8	11.5	13.7	5.1	5.5	4.6	10.4	4.4	8	6.5	7.9	3.7	4.2	2.8	5
Electrical Conductivity	uS/cm	-	-	-	-	1	396	350	467	314	395	330	383	362	401	372	352	322	416	373	440
pH	pH units	-	-	-	6.5 - 8.5		6.67	6.8	7.2	7.88	7.69	7.59	7.6	7.37	7.57	7.7	7.73	7.33	7.6	7.18	7.27
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	0.002
Total Dissolved Solids	mg/L	500	-	-	-	1	257	-	-	234	614	212	224	216	216	208	226	184	220	218	276
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		126.2	89.9	148.9	103.5	136.8	87.1	121.7	114.3	114	109.2	118.1	91.3	106.3	99.9	128.4
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	2.53	2.3	3.2	1.33	1.18	0.78	1.27	1.13	1.33	1.24	1.16	1.83	1.61	0.92	1.54
Total Phosphorus	mg/L	-	-	-	-	0.02	6.81	2.54	6.01	19.4	1.46	0.74	4.42	1.94	3.75	0.79	1.6	4.15	8	2.23	25.4
Total Suspended Solids	mg/L	-	-	-	-	5	-	6820	10200	-	-	-	-	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.13	0.016	0.046	0.031	0.047	0.014	0.023	0.017	0.023	0.019	0.013	0.019	0.011	0.012	0.016
Arsenic (diss)	mg/L	-	0.01	-	-	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
Barium (diss)	mg/L	-	-	1	-	0.002	0.05	0.037	0.052	0.031	0.039	0.031	0.047	0.041	0.045	0.037	0.047	0.042	0.047	0.044	0.061
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<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	<0.0005	<0.0005
Boron (diss)	mg/L	-	5	-	-	0.01	0.16	0.141	0.261	0.165	0.258	0.139	0.21	0.132	0.207	0.144	0.223	0.131	0.201	0.162	0.233
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<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
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.0003	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Copper (diss)	mg/L	1	-	-	-	0.0009	0.003	<0.0005	0.0009	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.001	<0.001
Iron (diss)	mg/L	0.3	-	-	-	0.01	2.72	6.5	4.07	6.72	6.09	4.71	6.36	6.62	5.25	5.87	1.69	3.69	1.17	1.55	4.48
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.05	-	-	-	0.002	0.53	0.568	0.534	0.793	0.755	0.756	0.946	1.05	0.971	0.896	1.11	1.21	1.12	1.05	1.46
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	<0.005	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.002	<0.002	<0.002
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.005	0.001	0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.003	<0.003	<0.003
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	6.4	5.32	8.61	4.45	6.36	4.32	7.26	6.46	7.56	6.11	8.06	5.97	7.63	5.42	8.34
Silver (diss)	mg/L	-	-	-	-	0.00009	<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	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.373	0.32	0.394	0.304	0.327	0.264	0.347	0.305	0.357	0.269	0.346	0.276	0.288	0.308	0.368
Thallium (diss)	mg/L	-	-	-	-	0.00005	<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	<0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	0.01	<0.005	0.007	0.003	<0.002	<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	0.002	0.0028	0.0032	<0.002	<0.002	<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	0.02	<0.005	<0.005	<0.005	0.037	0.007	<0.005	<0.005	<0.005	0.007	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 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	
						Sample Date	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-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	
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	-	-	-	-	-	<0.0001	-	-	-	-	-	-	-	-	-	
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	-	-	<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	-	-	-	-	-	<0.0003	-	-	-	-	-	-	-	-	-	
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	-	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	
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	-	-	-	-	-	<0.00017	-	-	-	-	-	-	-	-	-	
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

-LEGEND-

Detection Limit

DL exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

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-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-MW5	SB-MW5	SB MW5	SB MW5	SB-MW5	SB MW5	SB MW5	SB-MW5	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6
						Sample Date	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	58.9	44.4	61.7	55	44	35	50.2	39	28	38	48	38	37	37	44
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	<0.05	0.18	0.06	0.11	<0.05	<0.05	0.11	<0.1	4.96	7	14.4	7.5	6.69	10.4	15.3
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.016	0.22	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L	500	-	-	-	0.1	8.36	8.47	13.1	11.1	13.1	6.97	11.2	3.7	61	147	58	58	61	98	75
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	30.6	33.6	31.9	33.6	34.4	38.1	34.8	42	49	64	79	69	83	101	96
Magnesium (diss)	mg/L	-	-	-	-	0.05	5.38	5.56	5.91	6.09	6.86	7.1	6.83	7.7	11	13	16	16	19	22	20
Potassium (diss)	mg/L	-	-	-	-	0.05	15.4	19.2	16.6	19.7	17.7	22.5	17.6	23	34	56	46	58	54	54	53
Sodium (diss)	mg/L	200	-	-	-	0.05	21.1	26.5	26.3	34	33	28.3	28.1	31	39	50	70	66	65	45	38
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	108	148	111	138	139	160	128	180	158	220	306	334	390	374	289
Ammonia as N	mg/L	-	-	-	-	0.02	0.52	0.88	0.51	0.62	0.88	1.49	0.54	1	0.17	5.63	2.05	5.23	3.46	6.03	5.76
Chemical Oxygen Demand	mg/L	-	-	-	-	4	49	75	44	41	122	8	29	20	48	60	45	53	40	45	38
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	4	5.4	6.2	6.8	4.7	6	5.3	5.2	17.4	24.7	17.3	22.7	18.5	19	15.8
Electrical Conductivity	uS/cm	-	-	-	-	1	506	406	440	476	451	457	428	490	573	922	972	935	1030	1070	965
pH	pH units	-	-	-	6.5 - 8.5		6.83	-	6.94	7.2	6.88	7.61	7.28	7.55	7.61	7.7	7.32	7.4	7.48	7.53	7.88
Phenols	mg/L	-	-	-	-	0.001	<0.001	0.001	0.003	0.017	0.009	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	500	-	-	-	1	244	246	264	266	264	262	232	250	372	599	632	608	670	696	627
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		98.6	106.8	104	109	114.1	124.4	-	-	167.7	213.3	263.2	238.2	285.5	342.8	322.1
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	1.02	2.16	1.08	1.59	1.57	2.13	1.26	1.4	0.7	6.91	2.83	5.69	4.66	6.53	7.1
Total Phosphorus	mg/L	-	-	-	-	0.02	12.3	26.6	17.5	33.9	20	22.9	5.92	8.6	0.02	0.01	0.15	0.02	0.06	0.02	<0.01
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	-	2590	2500	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.017	0.011	0.01	0.025	0.182	0.057	0.011	0.0089	0.07	0.06	0.08	0.08	0.07	0.06	0.05
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	<0.003	0.005	<0.003	<0.003	<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	0.043	0.052	0.043	0.051	0.049	0.051	0.04	0.06	0.04	0.06	0.06	0.07	0.08	0.08	0.07
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005
Boron (diss)	mg/L	-	5	-	-	0.01	0.147	0.2	0.149	0.202	0.117	0.176	0.159	0.25	0.31	0.41	0.46	0.59	0.49	0.55	0.44
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<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	<0.002	<0.002	<0.005	0.003	<0.001	0.002	0.004	<0.001	<0.001	0.003
Cobalt (diss)	mg/L	-	-	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0006	0.0009	0.0012	0.001	0.007	0.0008
Copper (diss)	mg/L	1	-	-	-	0.0009	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.001	<0.0009	0.011	0.006	0.009	0.007	0.006	0.01	0.006
Iron (diss)	mg/L	0.3	-	-	-	0.01	2.77	1.7	3.87	2.01	2.78	1.15	3.12	1.5	0.04	0.05	<0.03	<0.03	<0.03	<0.03	<0.03
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.05	-	-	-	0.002	1.09	1.52	1.32	1.36	1.5	1.64	1.52	1.7	0.29	0.51	0.42	0.55	0.55	0.78	0.45
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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.001	<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	<0.001	<0.001	<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	-	-	-	-	-	<0.001	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	5.65	6.76	5.71	6.25	5.25	6.63	6.63	7.5	0.9	1.2	1.4	2.1	1.4	1.6	1.6
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.29	0.299	0.26	0.338	0.301	0.308	0.282	0.36	0.185	0.242	0.369	0.444	0.437	0.502	0.471
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<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	0.004	0.005	<0.002	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
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	0.0012	<0.001	0.001	0.003	0.006	0.001	0.001	0.002
Zinc (diss)	mg/L	5	-	-	-	0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<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 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-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-MW5	SB-MW5	SB MW5	SB MW5	SB-MW5	SB MW5	SB MW5	SB MW5	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6
						Sample Date	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2008-May-09	2008-Oct-09	2009-Jun-04	2009-Oct-23	2010-May-17	2010-Oct-18	2011-May-18
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

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
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	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	2017-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	122	49	103	406	231	135	169	141	178	162	79.8	141	79.2	45.1	123
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	12.6	16.6	5.61	<0.5	1.5	1.7	1	<0.5	1.2	<0.25	2.7	<1	1	0.3	1.6
Nitrite as N	mg/L	-	-	1	-	0.01	<0.1	0.15	<0.25	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.25	<0.5	<1	<0.5	<0.25	<1
Sulphate	mg/L	500	-	-	-	0.1	171	55	150	481	282	283	380	130	151	51.2	82	18.9	35.5	128	258
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	148	104	87.1	209	148	122	124	94.4	113	140	86.8	153	103	141	190
Magnesium (diss)	mg/L	-	-	-	-	0.05	27	18	19.2	42.3	29.1	22.9	21.5	17.8	29.6	40.1	26.2	42.2	30.1	25.4	31.9
Potassium (diss)	mg/L	-	-	-	-	0.05	52	47	73.2	119	131	120	103	170	139	125	85.3	139	101	77.1	76.8
Sodium (diss)	mg/L	200	-	-	-	0.05	63	57.8	101	370	231	210	192	196	244	222	147	197	123	66.4	126
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	311	295	403	688	629	594	450	953	1050	1040	761	1010	967	638	796
Ammonia as N	mg/L	-	-	-	-	0.02	5.61	5.37	3.61	17.6	19.7	11.2	8.2	64.5	51.7	87	44	57.3	46.5	27.6	55.5
Chemical Oxygen Demand	mg/L	-	-	-	-	4	38	51	37	322	194	134	108	207	284	863	316	461	284	283	353
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	15.1	18	19.1	122	88.7	61.9	55.1	46.7	136	101	61	143	82	51	54.4
Electrical Conductivity	uS/cm	-	-	-	-	1	1370	831	1360	3310	2300	2010	1920	2420	2910	2080	1710	2780	1860	1460	2880
pH	pH units	-	-	-	6.5 - 8.5		6.99	7.3	7.54	7.26	7.16	8	8.03	7.43	7.95	7.82	7.72	7.73	7.58	7.4	6.85
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001	0.002	<0.001	0.003	0.002	0.013	0.005	0.01	0.01
Total Dissolved Solids	mg/L	500	-	-	-	1	890	-	790	2320	1750	1250	1470	1300	1490	1340	922	1330	938	860	1340
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		480.7	333.8	296.6	696.1	489.4	398.9	398.2	309	404.1	514.7	324.6	555.8	381.1	456.7	605.8
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	6.94	6.2	4.37	23.6	23.5	14.3	10.2	73.5	58	106	44.3	59.5	53	31.8	57
Total Phosphorus	mg/L	-	-	-	-	0.02	0.03	0.01	2.65	0.06	0.07	0.07	0.08	0.48	<0.1	374	22.2	52.6	19.2	13.8	21.2
Total Suspended Solids	mg/L	-	-	-	-	5	-	30	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.08	0.057	0.081	0.134	0.135	0.138	0.1	0.193	0.203	0.173	0.158	0.133	0.092	0.213	0.048
Arsenic (diss)	mg/L	-	0.01	-	-	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
Barium (diss)	mg/L	-	-	1	-	0.002	0.1	0.065	0.079	0.278	0.197	0.141	0.146	0.191	0.163	0.354	0.186	0.445	0.293	0.223	0.247
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001
Boron (diss)	mg/L	-	5	-	-	0.01	0.47	0.534	0.765	1.1	1.4	1.1	1.4	2.9	2.25	1.61	1.42	1.62	2.01	1.91	1.47
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	-	-	0.05	-	0.002	0.002	<0.001	0.003	0.005	0.003	<0.003	<0.003	0.004	<0.003	0.007	<0.003	0.004	0.011	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.0009	0.0009	0.001	0.005	0.015	0.005	0.005	0.009	0.011	0.102	0.093	0.111	0.0839	0.103	0.0558
Copper (diss)	mg/L	1	-	-	-	0.0009	0.008	0.0063	0.007	0.026	0.007	0.01	0.019	0.012	0.038	0.071	0.025	0.02	0.02	0.015	0.018
Iron (diss)	mg/L	0.3	-	-	-	0.01	<0.03	<0.1	<0.01	0.194	0.146	0.04	<0.01	0.233	0.127	10.3	4.64	38.4	29.6	43	7.84
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.0001	<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
Manganese (diss)	mg/L	0.05	-	-	-	0.002	1.28	1.24	2.17	26.9	19.4	13.3	18.2	11.6	14.9	14.7	4.18	5.63	4.18	5.21	2.64
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	<0.005	0.0013	<0.002	0.006	0.003	0.007	0.008	0.017	0.015	0.01	0.007	0.007	0.007	0.005	0.002
Nickel (diss)	mg/L	-	-	-	-	0.001	<0.005	0.004	0.004	0.006	0.007	0.006	<0.003	0.006	0.007	0.014	0.009	0.007	0.009	0.008	0.007
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	1.9	1.89	2.07	3.96	2.67	2.09	2.07	2.79	2.72	4.83	3.49	3.93	4.45	3.21	2.41
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.64	0.439	0.517	1.28	0.849	0.529	0.647	0.576	0.572	0.675	0.376	0.627	0.438	0.465	0.599
Thallium (diss)	mg/L	-	-	-	-	0.00005	0.0001	<0.0001	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.0004	0.0004	0.0004	0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.005	0.004	0.011	0.012	0.007	0.007	0.01	0.01	0.017	0.01	0.008	0.006	0.016	0.006
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	0.002	0.0031	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.003	0.003	0.002	<0.002
Zinc (diss)	mg/L	5	-	-	-	0.005	0.02	0.007	0.014	<0.005	<0.005	0.009	0.008	0.031	<0.005	0.008	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 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	
						Sample Date	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	2017-Oct-23	2018-May-07	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	
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	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-	<0.0004	-
Acetone	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.004	-
Benzene	mg/L	-	-	0.001	-	0.0002	-	-	-	<0.002	-	-	-	-	-	-	-	-	-	-	<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	-	-	-	<0.003	-	-	-	-	-	-	-	-	-	-	<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	-	-	-	<0.002	-	-	-	-	-	-	-	-	-	-	<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	-	-	-	<0.0017	-	-	-	-	-	-	-	-	-	-	<0.00068	-
Xylene Mixture	mg/L	0.02	-	0.09	-	0.0008	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0008	-

-LEGEND-

Detection Limit

DL exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW6	SB-MW6	SB-MW6	SB-MW6	SB-MW6R	SB-MW6R	SB-MW6R	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-MW6	SB MW6	SB-MW6	SB-MW6	SB MW6R	SB MW6R	SB-MW6R	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7
						Sample Date	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	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	38.5	73	98.2	47.3	48	47.7	11	169	79.8	168	143	78.4	115	102	17.6
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	0.12	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	0.33	1.6	<0.07	0.18	<0.07	0.34	<0.1	<0.25	2.7	-	<0.5	0.44	<0.25	<0.5	20.9
Nitrite as N	mg/L	-	-	1	-	0.01	<0.25	<0.5	<0.05	<0.05	0.58	<0.05	0.029	<0.25	<0.5	-	<0.5	<0.25	<0.25	<0.5	<0.05
Sulphate	mg/L	500	-	-	-	0.1	125	120	64.4	64	33.2	92.1	16	126	82	-	160	98.8	136	97.9	33.7
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	185	181	162	89.8	201	159	180	182	159	-	171	138	141	137	33
Magnesium (diss)	mg/L	-	-	-	-	0.05	24.4	36.1	40.9	18.8	29	30.7	29	29.8	29.1	-	29.4	20.9	25.8	24.8	4.52
Potassium (diss)	mg/L	-	-	-	-	0.05	72.4	89.6	107	50.4	70.4	74.2	84	33	39.9	-	46.6	13.4	41.9	32.1	9.85
Sodium (diss)	mg/L	200	-	-	-	0.05	69	107	131	59.4	73.2	81.6	69	144	134	-	151	89.7	135	103	12.7
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	738	915	1050	526	1100	907	830	636	669	681	547	567	592	582	62
Ammonia as N	mg/L	-	-	-	-	0.02	34.9	55	69.6	27.9	42.6	45.5	50	7.8	9.1	7.2	9.24	4.5	11.8	10.1	0.31
Chemical Oxygen Demand	mg/L	-	-	-	-	4	144	304	261	341	31	80	290	95	75	-	81	54	78	65	78
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	41.8	63.2	79.1	34.5	2.3	44.9	48	36.3	29.3	32.2	36.8	18.4	26.8	26.8	4.1
Electrical Conductivity	uS/cm	-	-	-	-	1	1550	2070	2270	1270	2170	1870	1800	1510	1700	-	1970	1270	1540	1920	386
pH	pH units	-	-	-	6.5 - 8.5		-	7.25	7.36	7.16	7.52	7.37	7.53	7.79	7.65	-	7.71	7.52	7.58	7.01	-
Phenols	mg/L	-	-	-	-	0.001	0.027	0.045	0.034	0.009	0.022	0.002	0.0011	<0.001	<0.001	-	0.005	0.002	0.008	0.003	0.001
Total Dissolved Solids	mg/L	500	-	-	-	1	898	1180	1190	648	1160	982	770	1120	1040	1050	1100	784	926	874	246
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		562.4	600.6	572.9	301.6	621.3	-	-	577.2	516.9	-	548.1	430.7	458.3	444.2	101
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	37.8	57.4	70.5	32	45.1	58.5	48	7.68	10.9	-	11.8	6.24	13.5	11.7	1.87
Total Phosphorus	mg/L	-	-	-	-	0.02	3.76	2.62	1.95	3.31	6.46	3.4	52	0.08	0.12	-	0.04	0.05	0.05	0.03	92.3
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	-	54300	120000	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.067	0.036	0.096	0.029	0.032	0.044	0.056	0.008	0.006	0.009	0.01	0.004	0.009	0.009	0.155
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.003	0.008	<0.003	<0.003	<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	0.218	0.173	0.308	0.129	0.22	0.18	0.27	0.221	0.221	-	0.239	0.174	0.184	0.18	0.229
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.001	<0.001	-	<0.001	<0.0005	<0.0005	<0.001	<0.001
Boron (diss)	mg/L	-	5	-	-	0.01	1.62	2.18	2.37	<0.1	1.56	2.08	2.5	0.83	0.883	0.883	1.02	0.827	0.922	0.821	0.224
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.002	0.0006	-	0.0005	0.0004	0.0003	0.0004	<0.0001
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.005	0.005	<0.003	-	<0.003	0.007	<0.003	<0.003	<0.003
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.0644	0.0357	0.0774	0.0238	0.0839	0.0369	0.045	0.015	0.022	-	0.027	0.0151	0.0192	0.0182	0.001
Copper (diss)	mg/L	1	-	-	-	0.0009	0.018	0.014	0.019	0.007	0.017	0.01	0.0089	0.043	0.056	-	0.069	0.044	0.041	0.046	0.004
Iron (diss)	mg/L	0.3	-	-	-	0.01	10.2	7.76	54.1	21.2	14.1	37.7	63	0.117	<0.01	0.011	<0.01	<0.01	0.145	<0.01	0.081
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.002	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.05	-	-	-	0.002	4.07	2.47	6.91	2.52	3.67	4.3	4.3	7.6	12.4	10	11.1	6.66	7.81	9.98	0.369
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	0.003	<0.002	0.007	0.002	<0.002	0.003	0.0061	0.005	0.008	-	0.006	0.007	0.005	0.007	<0.002
Nickel (diss)	mg/L	-	-	-	-	0.001	0.008	0.005	0.013	0.005	0.01	0.008	0.0084	0.039	0.045	-	0.043	0.035	0.036	0.037	<0.003
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	3.26	1.79	4.33	2.23	2.77	3.55	3.9	9.84	7.99	-	9.55	7.62	8.62	7.1	4.71
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.002	<0.002	-	<0.002	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.505	0.389	0.7	0.304	0.545	0.56	0.61	1.54	1.52	-	1.52	1.22	1.35	1.27	0.571
Thallium (diss)	mg/L	-	-	-	-	0.00005	0.0006	<0.0003	0.0005	<0.0003	<0.0003	<0.0003	0.0003	<0.006	<0.006	-	<0.006	<0.0003	<0.0003	<0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	0.002	<0.002	0.007	<0.002	0.002	0.01	<0.005	0.003	0.002	-	0.002	<0.002	0.002	<0.002	0.01
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	-	0.0051	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	0.003	<0.002	-	0.002	0.0028	<0.002	<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	0.069	0.096	-	0.125	0.061	0.06	0.06	0.006

-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-MW6R	SB-MW6R	SB-MW6R	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-MW6	SB MW6	SB-MW6	SB-MW6	SB MW6R	SB MW6R	SB-MW6R	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7	SB-MW7
						Sample Date	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	2018-Oct-24	2019-May-07	2019-Oct-22	2020-May-06	2020-Oct-06
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

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-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8
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-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	
						Sample Date	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	2020-Oct-06	2021-Apr-20	2021-Oct-21	2021-Oct-21	
Anions						Detection Limit																
Chloride	mg/L	250	-	-	-	0.1	82.7	103	97.1	95.6	90.9	97	90	51.7	46.8	116	19.7	19	79.8	53.7	21.7	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	0.28	0.28	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	10	-	0.05	1.14	0.34	0.49	0.31	0.32	0.28	0.28	0.44	0.2	0.05	0.06	0.06	0.13	<0.05	<0.05	
Nitrite as N	mg/L	-	-	1	-	0.01	<0.25	<0.05	<0.05	<0.05	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Sulphate	mg/L	500	-	-	-	0.1	90.2	99.3	81.6	96.2	67.5	72	66	4.53	5.67	3.62	4.85	4.82	2.63	5.26	5.47	
Cations																						
Calcium (diss)	mg/L	-	-	-	-	0.05	139	149	149	171	142	170	170	18.2	8.63	34.9	3.94	3.99	32	10.5	8.39	
Magnesium (diss)	mg/L	-	-	-	-	0.05	24.3	26.4	26.8	27.5	24.5	29	28	2.28	1.26	4.31	0.46	0.46	3.98	1.24	1	
Potassium (diss)	mg/L	-	-	-	-	0.05	24	31.6	34.2	33	33.9	29	28	1.65	1.57	2.31	1.09	1.15	2.12	1.57	1.11	
Sodium (diss)	mg/L	200	-	-	-	0.05	94.5	98.6	101	93.5	87.2	91	89	19.2	30.5	28.9	18.4	18.5	19.5	29.2	14.3	
General Chemistry																						
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	538	598	609	626	623	620	620	37	22	26	34	34	29	49	36	
Ammonia as N	mg/L	-	-	-	-	0.02	6.32	12.6	12.7	14.2	10.2	19	19	<0.02	0.06	<0.02	<0.02	0.02	<0.02	0.09	0.06	
Chemical Oxygen Demand	mg/L	-	-	-	-	4	32	62	69	67	51	75	76	8	<5	15	15	10	<5	<5	<5	
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	23	27	25.6	26.8	22.1	23	23	1.1	2.2	1.3	2.4	2.3	1.7	1.8	1.4	
Electrical Conductivity	uS/cm	-	-	-	-	1	1360	1550	1520	1620	1470	1500	1500	255	211	545	115	115	341	244	142	
pH	pH units	-	-	-	6.5 - 8.5		7.23	7.28	7.2	7.55	7.29	7.64	7.74	6.6	6.55	6.48	-	-	6.59	6.82	6.85	
Phenols	mg/L	-	-	-	-	0.001	0.022	0.041	0.072	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.002	0.001	
Total Dissolved Solids	mg/L	500	-	-	-	1	872	904	866	908	808	940	930	176	160	324	72	86	290	136	76	
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		447.2	480.8	482.4	540.2	-	-	-	54.8	26.7	104.9	11.7	11.9	96.3	31.3	25.1	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	7.5	14.5	14.8	14.4	10.7	18	19	<0.1	<0.1	0.22	0.23	0.27	0.17	0.12	<0.1	
Total Phosphorus	mg/L	-	-	-	-	0.02	0.2	<0.02	0.05	0.14	0.09	<0.02	0.029	11.9	20.4	57	31.7	30.2	31.4	45	3.1	
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	28	13	15	-	-	-	-	-	-	-	-	
Metals																						
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.019	0.014	0.019	0.021	<0.004	<0.0049	<0.0049	0.011	0.013	0.015	0.013	0.012	0.011	0.037	0.007	
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	0.006	<0.003	<0.003	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003	0.004	<0.003	<0.003	
Barium (diss)	mg/L	-	-	1	-	0.002	0.145	0.191	0.179	0.178	0.153	0.18	0.18	0.016	0.01	0.026	0.004	0.004	0.019	0.011	0.007	
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0004	<0.0004	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Boron (diss)	mg/L	-	5	-	-	0.01	0.822	0.838	0.758	0.95	0.885	0.94	0.94	0.013	0.056	<0.01	<0.01	<0.01	0.016	<0.01	<0.01	
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	0.0003	<0.0001	0.0003	0.0001	0.0004	0.00033	0.00038	<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	<0.002	<0.002	<0.005	<0.005	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.0142	0.0199	0.0206	0.0194	0.0177	0.015	0.014	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	
Copper (diss)	mg/L	1	-	-	-	0.0009	0.034	0.034	0.037	0.044	0.039	0.037	0.037	<0.001	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.027	0.496	0.044	0.035	0.024	<0.1	<0.1	<0.01	<0.01	<0.01	0.023	0.025	0.017	0.065	0.01	
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<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	
Manganese (diss)	mg/L	0.05	-	-	-	0.002	6.68	8.64	9.19	9.16	10.9	8.7	8.5	0.003	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<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	
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	0.005	0.007	0.008	0.007	0.008	0.006	0.0062	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Nickel (diss)	mg/L	-	-	-	-	0.001	0.027	0.037	0.033	0.031	0.035	0.028	0.028	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	
Silicon (diss)	mg/L	-	-	-	-	0.05	7.01	7.61	6.14	7.21	7.81	8.1	7.9	4.74	4.38	5.14	3.98	4.52	5.6	4.44	5.11	
Silver (diss)	mg/L	-	-	-	-	0.00009	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Strontium (diss)	mg/L	-	-	-	-	0.001	1.21	1.47	1.13	1.42	1.19	1.5	1.5	0.244	0.101	0.445	0.057	0.059	0.405	0.143	0.101	
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.00014	0.00014	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	0.004	<0.002	<0.002	<0.005	<0.005	<0.002	<0.002	<0.002	0.005	0.003	<0.002	0.007	<0.002	
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-	0.0634	-	-	-	-	-	-	-	-	-	-	-	
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	<0.002	-	<0.002	<0.0005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Zinc (diss)	mg/L	5	-	-	-	0.005	0.046	0.056	0.037	0.087	0.06	0.062	0.061	<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 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-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8
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-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW8
						Sample Date	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	2020-Oct-06	2021-Apr-20	2021-Oct-21	2021-Oct-21
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW8	SB MW8	SB MW8	SB-MW8	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9
						Sample Date	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2018-Oct-24	2019-May-07	2019-May-07	2019-May-07	2019-Oct-22	2019-Oct-22	2020-May-06	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Apr-20
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	22.7	24.9	138	5.4	5.42	12.2	12	2.74	2.72	55.8	55.4	4.87	55.2	55.2	22.2
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	0.05	0.05	0.15	<0.05	0.18	<0.05	0.2	0.2	<0.05	<0.05	0.11	0.11	<0.05	0.16	0.16	<0.05
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.05	<0.05	<0.01	<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	500	-	-	-	0.1	5.51	5.16	3.65	4.2	4.72	4.5	4.52	4.58	4.6	3.22	3.17	4.07	2.58	2.58	5.44
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	6.58	5.2	53.5	3	10.2	9.01	9.02	4.61	4.71	22	22	4.03	22.3	22.3	8.28
Magnesium (diss)	mg/L	-	-	-	-	0.05	0.76	0.55	5.89	0.3	1.19	1.2	1.26	0.62	0.63	2.83	2.83	0.48	2.91	2.94	1.04
Potassium (diss)	mg/L	-	-	-	-	0.05	1.18	1.2	2.34	0.77	1.32	1.08	1.12	0.73	0.7	1.51	1.56	0.78	1.59	1.63	1.13
Sodium (diss)	mg/L	200	-	-	-	0.05	18.7	12.9	28	16	6	8.53	8.46	5.4	5.3	11.9	11.9	7.42	13.6	13.5	14.2
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	34	31	34	31	21	34	34	21	21	25	25	21	24	26	28
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	<0.02	<0.05	0.02	<0.02	<0.02	0.07	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chemical Oxygen Demand	mg/L	-	-	-	-	4	9	<5	<5	12	<5	<5	<5	<5	<5	<5	<5	9	<5	<5	<5
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	1.2	2.7	1.4	3.2	3.8	0.9	0.8	1.2	1.1	0.7	1	1.2	2.3	1.6	1.5
Electrical Conductivity	uS/cm	-	-	-	-	1	147	154	537	91	80	112	112	57	57	299	301	60	237	235	142
pH	pH units	-	-	-	6.5 - 8.5		6.63	7.11	6.61	7.33	6.65	6.8	6.83	6.93	7.04	6.49	6.66	-	6.75	6.71	6.71
Phenols	mg/L	-	-	-	-	0.001	0.002	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
Total Dissolved Solids	mg/L	500	-	-	-	1	84	84	336	130	54	74	84	68	64	170	158	34	198	204	86
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		19.6	15.2	-	-	30.4	27.4	27.7	14.1	14.4	66.6	66.6	12	67.7	67.8	25
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.14	0.1	0.19	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	0.17	0.17	<0.1
Total Phosphorus	mg/L	-	-	-	-	0.02	41.8	19.4	27.9	36	7.9	1.25	1.2	4.79	4.85	5.19	5.5	2.35	5.98	8.6	4.33
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	8830	28000	-	-	-	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.018	0.005	0.019	0.021	0.01	0.009	0.006	0.037	0.011	0.01	0.013	<0.004	0.006	0.006	0.007
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<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	0.008	<0.003
Barium (diss)	mg/L	-	-	1	-	0.002	0.007	0.004	0.031	0.0029	0.005	0.008	0.008	0.005	0.004	0.015	0.015	0.003	0.014	0.014	0.007
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.001	<0.0005	<0.0005	<0.0004	<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (diss)	mg/L	-	5	-	-	0.01	<0.01	0.016	<0.01	0.013	0.035	<0.01	<0.01	0.032	0.021	<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	<0.00009	<0.0001	<0.0001	<0.0001	<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	<0.002	<0.002	<0.005	<0.003	<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	<0.0005	<0.0005	<0.0005	<0.0005	<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	0.002	0.001	0.001	0.0047	<0.003	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.026	0.019	0.116	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.026	<0.01	<0.01
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.001	<0.0005	0.0008	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.05	-	-	-	0.002	<0.002	<0.002	0.007	<0.002	0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<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	<0.002	<0.002	<0.002	0.00081	<0.002	<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	<0.001	<0.001	0.003	<0.001	<0.003	<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	-	<0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	6.3	4.34	5.66	4.2	6.6	5.13	5.09	5.5	5.48	5.71	5.75	4.69	5.56	6.39	5.16
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.0001	<0.0001	<0.00009	<0.002	<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	0.089	0.061	0.592	0.035	0.069	0.109	0.112	0.051	0.05	0.257	0.254	0.044	0.253	0.259	0.105
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.006	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.002	0.008	<0.002
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	-	<0.002	<0.0005	<0.002	<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	<0.005	<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

-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-MW8	SB-MW8	SB-MW8	SB-MW8	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB-MW8	SB MW8	SB MW8	SB-MW8	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9	SB-MW9
						Sample Date	2022-May-05	2022-Oct-19	2023-May-04	2023-Oct-19	2018-Oct-24	2019-May-07	2019-May-07	2019-May-07	2019-May-07	2019-May-07	2019-May-07	2019-May-07	2019-May-07	2019-May-07	2019-May-07
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	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	SB-MW10	SB-MW10
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	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	SB-MW10	SB-MW10
						Sample Date	2022-May-05	2022-May-05	2022-Oct-19	2022-Oct-19	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-May-04	2023-Oct-19
Anions						Detection Limit															
Chloride	mg/L	250	-	-	-	0.1	11.6	11.3	14.9	14.4	48.7	48.7	<1	30	2.81	3.4	36.2	64.6	60.5	74.6	40.4
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	0.13	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	10	-	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	0.25	0.26
Nitrite as N	mg/L	-	-	1	-	0.01	<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	<0.05	<0.05
Sulphate	mg/L	500	-	-	-	0.1	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	33.1	29.7
Cations																					
Calcium (diss)	mg/L	-	-	-	-	0.05	6.66	6.62	8.05	7.76	23.8	19.5	4.1	70.3	10.9	36	95.1	145	100	141	92.6
Magnesium (diss)	mg/L	-	-	-	-	0.05	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	27.3	15.4
Potassium (diss)	mg/L	-	-	-	-	0.05	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	59.7	35.9
Sodium (diss)	mg/L	200	-	-	-	0.05	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	76.2	40.6
General Chemistry																					
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	30	36	21	25	35	37	24	250	29	31	359	576	516	558	367
Ammonia as N	mg/L	-	-	-	-	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	18.5	7.36
Chemical Oxygen Demand	mg/L	-	-	-	-	4	<5	<5	25	<5	<5	<5	6.9	12	<5	<5	32	50	37	60	38
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	0.9	1	0.9	0.9	1	0.8	1.3	11.4	1.7	26.8	16.8	31.7	18.1	25.5	13
Electrical Conductivity	uS/cm	-	-	-	-	1	119	118	101	102	232	237	59	788	115	168	784	1310	1200	1340	923
pH	pH units	-	-	-	6.5 - 8.5		6.6	6.8	6.88	7.1	6.82	6.85	7.26	8	6.74	6.65	-	7.2	7.24	7.23	7.61
Phenols	mg/L	-	-	-	-	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	0.068	0.493
Total Dissolved Solids	mg/L	500	-	-	-	1	48	44	66	66	152	136	15	402	84	92	500	798	660	704	470
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		20	19.9	23.8	22.5	-	-	-	224.1	33.6	116.7	305.4	481.9	328.4	464.5	294.6
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	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	19.5	7.96
Total Phosphorus	mg/L	-	-	-	-	0.02	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	0.32	0.63
Total Suspended Solids	mg/L	-	-	-	-	5	-	-	-	-	3690	1820	1000	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	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	0.019	0.011
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<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	<0.003	<0.001
Barium (diss)	mg/L	-	-	1	-	0.002	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	0.119	0.072
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<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	<0.001	<0.0005
Boron (diss)	mg/L	-	5	-	-	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	0.939	0.561
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	<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	<0.0001	0.0001
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<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	<0.003	<0.002
Cobalt (diss)	mg/L	-	-	-	-	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	0.0593	0.0174
Copper (diss)	mg/L	1	-	-	-	0.0009	<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	0.061	0.028
Iron (diss)	mg/L	0.3	-	-	-	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	<0.01	0.027
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<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	<0.001	<0.0005
Manganese (diss)	mg/L	0.05	-	-	-	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	20.1	9.29
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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0005	0.01	<0.002	0.003	0.009	<0.002	0.009	0.015	0.007
Nickel (diss)	mg/L	-	-	-	-	0.001	<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	0.044	0.017
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	<0.001	0.001	-	-	-	-	-	-	-	-	-	-	<0.001
Silicon (diss)	mg/L	-	-	-	-	0.05	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	7.9	6.15
Silver (diss)	mg/L	-	-	-	-	0.00009	<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	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	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	0.895	0.569
Thallium (diss)	mg/L	-	-	-	-	0.00005	<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	0.0003	<0.0003
Titanium (diss)	mg/L	-	-	-	-	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	<0.002	<0.002
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	0.035
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.002	-	-	<0.002	<0.002	<0.0005	<0.002	<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	0.006	<0.005	<0.005	0.017	0.013	0.008	0.016	<0.005	0.011	0.016	0.013

-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-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	SB-MW10	SB-MW10
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	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	SB-MW10	SB-MW10
						Sample Date	2022-May-05	SB-QAQC GW1-E22 / SB	2022-Oct-19	SB-QAQC GW1-E22 / SB	2023-May-04	SB-QAQC GW1 / SB	2023-Oct-19	2018-Oct-24	2019-May-07	2020-May-06	2020-Oct-06	2021-Apr-20	2021-Oct-21	2022-May-05	2022-Oct-19
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 exceeds criteria

Concentration exceeds ODWQS-AO

Concentration exceeds ODWQS-IMAC

Concentration exceeds ODWQS-MAC

Concentration exceeds ODWQS-OG

DL: May vary between sample locations and events

Ontario Drinking Water Quality Standards Aesthetic Objective

Ontario Drinking Water Quality Standards Interim Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Maximum Acceptable Concentration

Ontario Drinking Water Quality Standards Operational Guideline

Appendix F-1: Historical Groundwater Chemistry						Location	SB-MW10	SB-MW10	SB-MW11
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB MW10	SB-MW10	SB MW11
						Sample Date	2023-May-04	2023-Oct-19	2023-May-04
Anions						Detection Limit			
Chloride	mg/L	250	-	-	-	0.1	65.1	33	18.2
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	0.45	-
Nitrate as N	mg/L	-	-	10	-	0.05	<0.05	0.45	0.42
Nitrite as N	mg/L	-	-	1	-	0.01	<0.05	<0.01	<0.05
Sulphate	mg/L	500	-	-	-	0.1	39.7	27	652
Cations									
Calcium (diss)	mg/L	-	-	-	-	0.05	121	86	173
Magnesium (diss)	mg/L	-	-	-	-	0.05	23.6	16	21.1
Potassium (diss)	mg/L	-	-	-	-	0.05	47.7	32	2.49
Sodium (diss)	mg/L	200	-	-	-	0.05	63.7	41	155
General Chemistry									
Alkalinity (as CaCO3)	mg/L	-	-	-	30 - 500	1	565	310	177
Ammonia as N	mg/L	-	-	-	-	0.02	15.5	6.1	<0.02
Chemical Oxygen Demand	mg/L	-	-	-	-	4	59	20	<5
Dissolved Organic Carbon	mg/L	5	-	-	-	0.4	20.8	11	2.7
Electrical Conductivity	uS/cm	-	-	-	-	1	1240	770	1520
pH	pH units	-	-	-	6.5 - 8.5		7.42	7.55	7.87
Phenols	mg/L	-	-	-	-	0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	500	-	-	-	1	724	420	1080
Total Hardness (as CaCO3)	mg/L	-	-	-	80 - 100		-	-	-
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	15.5	6.2	0.16
Total Phosphorus	mg/L	-	-	-	-	0.02	0.45	0.36	0.4
Total Suspended Solids	mg/L	-	-	-	-	5	164	980	409
Metals									
Aluminum (diss)	mg/L	-	-	-	0.1	0.004	0.022	0.0059	<0.004
Arsenic (diss)	mg/L	-	0.01	-	-	0.001	<0.001	<0.001	<0.001
Barium (diss)	mg/L	-	-	1	-	0.002	0.089	0.08	0.058
Beryllium (diss)	mg/L	-	-	-	-	0.0004	<0.0005	<0.0004	<0.0005
Boron (diss)	mg/L	-	5	-	-	0.01	0.879	0.61	1.36
Cadmium (diss)	mg/L	-	-	0.005	-	0.00009	0.0002	0.0002	<0.0001
Chromium (diss)	mg/L	-	-	0.05	-	0.002	<0.002	<0.005	<0.002
Cobalt (diss)	mg/L	-	-	-	-	0.0005	0.045	0.015	<0.0005
Copper (diss)	mg/L	1	-	-	-	0.0009	0.047	0.029	<0.001
Iron (diss)	mg/L	0.3	-	-	-	0.01	0.019	<0.1	<0.01
Lead (diss)	mg/L	-	-	0.01	-	0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.05	-	-	-	0.002	16.5	9	0.035
Mercury (diss)	mg/L	-	-	0.001	-	0.0001	<0.0001	<0.0001	<0.0001
Molybdenum (diss)	mg/L	-	-	-	-	0.0005	0.01	0.0072	0.036
Nickel (diss)	mg/L	-	-	-	-	0.001	0.034	0.015	0.002
Selenium (diss)	mg/L	-	-	0.05	-	0.001	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.05	7.51	6.5	4.9
Silver (diss)	mg/L	-	-	-	-	0.00009	<0.0001	<0.00009	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	0.744	0.6	8.21
Thallium (diss)	mg/L	-	-	-	-	0.00005	<0.0003	0.00013	<0.0003
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.002	<0.005	<0.002
Uranium (diss)	mg/L	-	-	0.02	-	0.0005	-	-	-
Vanadium (diss)	mg/L	-	-	-	-	0.0005	<0.002	<0.0005	<0.002
Zinc (diss)	mg/L	5	-	-	-	0.005	0.017	0.014	<0.005

-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-MW11
Parameter	Units	ODWQS-AO	ODWQS-IMAC	ODWQS-MAC	ODWQS-OG	Sample ID	SB MW10	SB-MW10	SB MW11
						Sample Date	2023-May-04	2023-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

F-2 Historical Surface Water Chemistry

Appendix F-2: Historical Surface Water Chemistry						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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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
						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
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	30	24	31	33	31	7.9	31.2	34	-	32	28	34	36	31	28
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
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
Sulphate	mg/L	-	-	100	-	0.1	45	25	23	25	26	13	23	23	-	25	38	24	25	23	32
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	49	42	47	49	49	21.7	53.6	68.9	-	56.6	46	49	51	49	43
Magnesium (tot)	mg/L	-	-	-	-	0.05	8	6	7	7	8	<0.00006	7.55	8.94	-	8.4	8	7	8	7	7
Potassium (tot)	mg/L	-	-	-	-	0.05	19	8	5	6	5	0.5	6.9	7.5	-	7	19	7	7	8	8
Sodium (tot)	mg/L	-	-	-	-	0.05	28	22	22	24	24	2.9	28.8	31.1	-	31.5	28	26	28	27	26
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	137	128	152	156	157	50	140	134	-	134	149	151	168	139	130
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
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	-	<1	-	2	-	-	9	17	1	3	<1	<1	1
Colour	TCU	-	-	-	-	2	19	15	14	20	11	30	7	18	-	11	15	17	19	35	14
Electrical Conductivity	uS/cm	-	-	-	-	1	462	386	425	409	458	128	304	406	375	404	474	435	481	421	414
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
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
Total Dissolved Solids	mg/L	-	-	-	-	10	300	251	276	266	298	84	-	-	248	267	308	283	313	274	269
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	155	130	146	151	155	54.2	165	209	-	176	148	151	160	151	136
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
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
Total Suspended Solids	mg/L	-	-	-	-	10	8	4	2	66	7	14	-	-	2640	510	2	118	12	27	110
Turbidity	NTU	-	-	-	-	0.1	1.3	1.6	2.3	2.5	1.9	-	-	-	-	-	0.4	16.2	3.4	7.2	12.9
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	-	-	-	-	-
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	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
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
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	<0.0005	<0.005	<0.001	<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
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
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
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
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
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
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
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
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
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

Notes:

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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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
						Sample Date	2007-May-02	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
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	32	28	32	33	30	31	23	22	23	24	22	19	18	19	20
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	1.58	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
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	61	37	24	27	34	51	31	22	21	26	33	24	23	24	28
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	53	45	62	55	49	50	43	48	44	44	39	43	43	43	38
Magnesium (tot)	mg/L	-	-	-	-	0.05	9	7	9	8	8	9	7	7	7	7	6	7	6	6	6
Potassium (tot)	mg/L	-	-	-	-	0.05	19	13	8	8	7	25	14	8	8	8	14	9	9	9	10
Sodium (tot)	mg/L	-	-	-	-	0.05	31	27	33	31	29	35	27	25	25	27	24	25	23	23	25
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	156	142	188	191	167	155	148	158	150	149	146	151	144	158	146
Ammonia as N	mg/L	-	-	-	-	0.02	0.03	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
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	<1	34	12	<1	3	2	1	<1	<1	3	2	-	<1
Colour	TCU	-	-	-	-	2	14	25	15	17	12	17	23	17	25	21	14	18	26	19	20
Electrical Conductivity	uS/cm	-	-	-	-	1	547	443	514	525	489	520	434	419	409	419	427	408	378	403	412
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.62	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
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	356	288	334	341	318	338	282	272	266	272	278	265	246	262	268
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	169	141	192	170	155	162	136	149	139	139	122	136	132	132	120
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.42	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
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.02	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
Total Suspended Solids	mg/L	-	-	-	-	10	34	10	12	284	1120	<2	4	215	<2	6	<2	9	8	<2	<2
Turbidity	NTU	-	-	-	-	0.1	4.4	2.3	4	14.7	>100	0.7	1.1	38.9	2.8	-	0.5	3.3	3.7	2.1	1
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	<0.02	-	-	-	-	0.00029139	0.00028609	0.00035292	-	0.000016
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.03	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	0.01
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
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
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<0.0001	<0.0001	0.001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (tot)	mg/L	-	-	0.064	-	0.003	0.001	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
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0003	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
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	0.001	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
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.08	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
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<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
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	0.0002	<0.0001	<0.0001
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<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
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
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	<0.01	<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

Notes:

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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A-Dup (BAP-A)	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A
						Sample Date	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	2012-Oct-17	2013-Apr-18	2013-Aug-15	2013-Oct-30	2014-May-13	2014-Aug-19
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	22	0.0006	18	24	19	22	-	23	26	31	22.9	33.1	36.5	37.3	34.1
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	0.1	<0.1	0.99	0.44	0.43	-	1.1	0.6	0.4	2	0.89	1.27	1.66	0.95
Nitrite as N	mg/L	-	-	-	-	0.01	0.82	0.48	0.41	<0.1	<0.1	<0.1	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.1
Sulphate	mg/L	-	-	100	-	0.1	33	19	20	34	15	23	-	42	20	23	35.7	26.3	37.7	58.1	39.3
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	39	42	40	42	46	48	48	39.4	47	46.7	29.7	47.4	52	50.9	50.8
Magnesium (tot)	mg/L	-	-	-	-	0.05	6	6	6	7	7	8	8	7.35	5.93	7.85	5.19	7.35	8.87	9.15	8.23
Potassium (tot)	mg/L	-	-	-	-	0.05	13	9	7	18	10	11	9	16.9	8.55	11.9	12.1	12	12.2	24.1	13.2
Sodium (tot)	mg/L	-	-	-	-	0.05	25	22	21	26	21	22	20	28	18.1	24.1	21.2	22.1	27.1	36.4	29.2
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	139	154	141	145	158	160	-	146	157	147	71	164	147	149	148
Ammonia as N	mg/L	-	-	-	-	0.02	0.09	0.16	0.11	0.06	0.2	0.09	-	0.17	0.27	0.12	0.1	0.21	<0.02	-	0.32
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	5	4	<1	<1	6	4	-	<2	3	<2	<5	<5	<5	<5	<5
Colour	TCU	-	-	-	-	2	13	23	17	15	17	15	-	12	11	12	43	19	12	20	19
Electrical Conductivity	uS/cm	-	-	-	-	1	421	395	382	447	390	401	-	489	434	418	300	504	483	549	530
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.97	7.82	7.83	8.16	7.86	7.02	-	7.9	7.8	7.8	7.82	7.61	7.81	7.97	7.93
Phenols	mg/L	0.001	-	0.04	0.004	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	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	274	257	248	291	254	261	-	439	240	228	186	266	276	316	296
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	122	130	125	134	144	153	152.8	128.6	141.8	148.9	95.5	149	166	165	161
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.53	0.29	0.16	0.24	0.87	<0.1	-	0.4	1.4	0.3	0.52	0.58	0.61	1.84	0.66
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.03	0.05	0.02	<0.01	0.1	<0.01	-	<0.01	0.17	<0.01	0.06	0.07	<0.02	<0.02	0.03
Total Suspended Solids	mg/L	-	-	-	-	10	5	16	55	2	183	78	-	3	15	58	16	35	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.1	0.9	4.3	1.2	1.4	17.4	4.5	-	0.9	3.3	4.1	14.3	9.4	21.4	0.5	16.6
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	0.0000235	0.00143064	0.000005	-	0.00010681	0.00100533	0.0000773	0.0000628	0.00078193	<0.0000129	0.000326	0.00225
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	8	-	-	0.038	0.021	0.016	0.01	0.009
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.03	0.11	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	<0.001	<0.001	<0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.17	0.14	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
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	<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
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.001	<0.001	<0.001	<0.001	<0.05	<0.001	<0.001	0.003	<0.001	<0.001	<0.003	<0.003	0.0011	<0.003	<0.003
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0003	0.0006	0.0002	0.0002	<0.01	0.0002	0.0003	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.003	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.001	0.001	<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
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.12	0.68	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
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<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
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
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	0.002	0.003	0.002	-	<0.003	<0.003	<0.003	<0.003
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.001	0.001	<0.001	<0.001	<0.05	<0.001	<0.001	0.001	<0.001	<0.001	<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	<0.01	<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	<0.05	<0.01	<0.01	<0.005	0.028	<0.005	0.012	0.007	0.059	<0.005	<0.005

Notes:

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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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
						Sample Date	2014-Oct-14	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	2018-May-07	2018-Jun-12	2018-Jul-30	2018-Oct-24	2019-May-07
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	41.3	40.6	44.1	47.6	34.6	45.3	50	42.5	38.9	40.3	38.9	51.6	48.1	50.2	61.8
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	0.5	1.62	0.51	0.58	1.24	0.38	0.88	2	1.22	0.88	1.21	-	1.29	1.5	2.37
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.1	<0.25	<0.1	<0.1	<0.25	<0.05	0.17	<0.1	<0.05	-	<0.1	<0.25	<0.05
Sulphate	mg/L	-	-	100	-	0.1	49	63	30.3	43.9	41.7	23.3	28.9	48.2	34	25.8	43.2	-	18.3	27.5	55.4
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	57.1	50.1	47.3	55.2	37.4	42.9	57.5	41.5	44.3	51.2	36.1	-	<0.003	50	49.2
Magnesium (tot)	mg/L	-	-	-	-	0.05	9.25	9.02	7.74	8.84	6.73	6.75	8.89	7.43	7.38	7.79	5.9	-	-	7.69	8.85
Potassium (tot)	mg/L	-	-	-	-	0.05	13.6	20	13.9	15.2	17.9	14.4	15.5	19.5	18.4	16.7	14.5	-	-	17.6	22.3
Sodium (tot)	mg/L	-	-	-	-	0.05	35.4	36.8	32	36.9	28.2	39.5	39.5	34.2	31.9	39.1	28.7	-	35.3	40.6	42.5
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	155	136	174	177	119	150	191	125	171	192	110	165	155	162	185
Ammonia as N	mg/L	-	-	-	-	0.02	0.1	0.16	0.12	0.2	0.04	0.17	0.15	0.07	0.2	0.48	0.24	0.22	0.43	0.52	0.82
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	<5	<5
Colour	TCU	-	-	-	-	2	22	18	<5	17	18	37	17	23	30	25	25	-	-	6	13
Electrical Conductivity	uS/cm	-	-	-	-	1	545	540	542	553	421	507	585	552	532	486	417	-	545	605	625
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.87	7.88	8.14	7.8	8.18	8	8.14	8.12	8.1	8.15	7.29	-	7.81	8.07	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	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	332	304	314	308	250	272	308	262	192	304	<10	302	312	336	356
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	181	162	150	174	121	135	180	134	141	160	114	-	158	157	159
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.32	0.73	0.6	0.66	0.49	1.29	0.57	0.55	0.68	0.93	0.84	-	0.79	1.22	1.47
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.04	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
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	26	<10	<10	252	-	17	32	<10
Turbidity	NTU	-	-	-	-	0.1	2.3	2	354	1.3	1.5	3.5	1.6	0.6	2.8	1.8	0.8	-	-	2.5	1.2
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.000305	0.00042396	0.0016	0.00002	0.0000332	0.0003549	0.00018	-	0.001302	0.00097	0.0000496	0.00070414	0.00099691	0.00137252	-
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	0.005	0.01	0.009	0.005	0.015	0.015	0.005	0.015	0.011	0.008	0.017	0.01	0.01	0.006	0.015
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.165	0.26	0.201	0.15	0.278	0.207	0.186	0.321	0.224	0.205	0.215	0.27	0.234	0.235	0.339
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
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	0.005	<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	<0.003	<0.0005	<0.0005	0.0022	<0.0005	<0.0005	0.0006	0.0008	<0.0005	-	0.0009	0.0009	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	<0.002	<0.002	<0.002	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	0.1	0.08	0.25	0.02	0.06	3.84	0.16	0.17	0.24	0.21	0.06	0.187	0.49	0.31	<0.01
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
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	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	<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
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
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
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.024	<0.005	0.011	0.012	0.006	<0.005	-	0.005	0.005	0.009

Notes:

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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-A	BAP-A	BAP-A	BAP-A-QAQC-S20 (BAP-A)	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	SB-QAQC SW-F21 (BAP-A)	BAP-A	SB-QAQC SW-S22 (BAP-A)	BAP-A	BAP-A
						Sample Date	2019-Aug-14	2019-Oct-22	2020-May-06	2020-May-06	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
Anions						Detection Limit														
Chloride	mg/L	-	-	180	128	0.1	55.2	41.9	54.7	54.9	49.5	49	49.4	43.7	39.3	39.1	39.8	39.7	36.9	40.3
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	1.55	0.45	2	2.1	1.21	1.52	1.97	0.94	1.12	1.18	1.94	1.92	1.04	1.83
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	17.3	27.8	49.6	50.1	13	17.9	50.9	22.6	25	24.9	50.4	50.4	14.4	19.4
Cations																				
Calcium (tot)	mg/L	-	-	-	-	0.00005	47	32.9	44.43	46.4	53.46	48.24	53	42	38.8	38.6	53.7	54.3	53.1	39.4
Magnesium (tot)	mg/L	-	-	-	-	0.05	7.18	5.55	7.94	8.61	8.42	7.62	10.2	7.2	7	6.83	9.44	9.52	8.02	8.22
Potassium (tot)	mg/L	-	-	-	-	0.05	16.7	15.5	18.77	19.21	18.16	17.38	20.8	16.7	17.8	17.7	21.5	21.5	19.6	17.8
Sodium (tot)	mg/L	-	-	-	-	0.05	37.2	33.1	36.22	37.35	38.49	36.68	41.7	33.3	30.8	31	35.9	35.9	42.6	38.8
General Chemistry																				
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	0.612
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	160	113	139	136	194	180	147	152	131	137	145	140	158	153
Ammonia as N	mg/L	-	-	-	-	0.02	0.15	0.58	0.09	0.1	<0.02	0.1	0.07	0.03	0.2	0.17	<0.02	<0.02	<0.02	0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<2	<5	<2	<2	3	<2	2	<2	2	<2
Colour	TCU	-	-	-	-	2	22	67	18	18	22	27	16	30	31	30	13.9	13.8	87.3	16.6
Electrical Conductivity	uS/cm	-	-	-	-	1	572	387	675	678	536	500	620	479	454	455	545	538	468	489
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.65	7.54	7.5	7.58	7.72	7.7	7.89	7.71	7.47	7.6	7.47	7.42	7.7	7.68
Phenols	mg/L	0.001	-	0.04	0.004	0.001	0.001	0.008	<0.001	<0.001	0.001	<0.001	0.001	0.002	0.003	0.002	0.002	0.002	0.003	0.006
Total Dissolved Solids	mg/L	-	-	-	-	10	302	252	314	284	324	296	354	268	266	262	276	304	268	266
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	147	105	144	151	168	152	174	135	126	125	173	175	166	132
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.64	0.92	0.57	0.59	0.6	0.63	0.62	0.33	0.62	0.65	0.41	0.55	0.52	0.67
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.02	0.04	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.05	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.1	3.5	9.3	0.9	0.8	2.1	1.6	1.6	1.6	3.4	2.1	<0.5	<0.5	2.6	<0.5
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	-	-	-	-	<0.000002	0.0642
Metals																				
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	0.005	0.031	<0.004	0.01	0.005	0.005	-	-	-	-	0.006	0.007	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	0.006	0.01	0.012	0.011	-	-	0.007	0.008
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	0.044	0.043	0.025	0.029	0.016	0.041	0.033	0.032	-	-	0.146	0.014
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
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.255	0.218	0.298	0.307	0.245	0.255	0.279	0.283	0.235	0.23	0.375	0.361	0.306	-
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
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	-
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0008	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	0.0006
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	<0.002	<0.002	0.003	<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	0.12	0.5	0.029	0.043	0.152	0.067	0.043	0.09	0.18	0.186	0.024	0.028	0.354	0.03
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
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	<0.002	<0.002	<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
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.008	0.009	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Notes:	
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-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-A	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-A	SB-QAQC-SW1 (BAP-A)	BAP-A	SB-QAQC-SW1 (BAP-A)	BAP-A	BAP-A	BAP-A	SB-QAQC-SW1 (BAP-A)	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B
						Sample Date	2023-May-03	2023-May-03	2023-May-04	2023-May-04	2023-Aug-09	2023-Oct-19	2024-Apr-29	2024-Apr-29	2004-Apr-29	2004-Jun-23	2004-Aug-20	2004-Sep-10	2004-Oct-28	2005-May-03	2005-Jul-27
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	-	-	40.2	39.6	36	40	43	43	5	3	3	4	4	33.4	7.9
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	1.33	1.62	2.15	2.32	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	-	-	1.88	1.92	1.31	1.62	2.15	2.32	<0.1	<0.1	<0.1	<0.1	<0.1	2.2	0.69
Nitrite as N	mg/L	-	-	-	-	0.01	-	-	<0.05	<0.05	0.023	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
Sulphate	mg/L	-	-	100	-	0.1	-	-	43.1	43.3	13	16	39	39	9	8	9	11	11	66	9
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	-	-	55	52.1	48	53	51	52	21	25	27	26	27	54.1	27.2
Magnesium (tot)	mg/L	-	-	-	-	0.05	-	-	10.1	9.74	7.4	8.9	9.2	8.7	1	1	1	1	1	9.77	1.37
Potassium (tot)	mg/L	-	-	-	-	0.05	-	-	21.9	21.5	17	20	20	20	<1	<1	<1	<1	1	24.1	0.7
Sodium (tot)	mg/L	-	-	-	-	0.05	-	-	37.4	37.4	30	35	35	35	3	3	3	3	3	30.8	2.5
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	-	-	147	151	170	170	150	150	55	67	79	71	74	152	70
Ammonia as N	mg/L	-	-	-	-	0.02	-	-	0.14	0.15	0.071	<0.05	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	0.02	0.27	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	-	-	<2	<2	5	<2	<2	<2	<1	<1	-	<1	-	<2	-
Colour	TCU	-	-	-	-	2	-	-	17.6	17.5	18	14	13	13	34	31	23	28	16	16	19
Electrical Conductivity	uS/cm	-	-	-	-	1	-	-	535	535	480	520	530	530	132	155	173	168	179	519	130
pH	pH units	6.5 - 8.5	-	6 - 9	-		-	-	7.76	7.87	7.84	8.06	8.42	8.08	6.71	7.39	7.53	7.35	7.35	-	7
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	-
Total Dissolved Solids	mg/L	-	-	-	-	10	-	-	302	298	265	290	320	320	86	101	112	109	116	347	-
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	-	-	179	170	150	160	190	190	57	67	72	69	72	175	74
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	-	-	0.49	0.54	0.27	0.24	0.25	0.13	0.27	0.3	0.19	0.14	0.15	1.1	0.6
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	7.3	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	-	-	<0.02	<0.02	0.041	<0.02	<0.02	<0.02	0.01	0.02	0.03	0.03	0.02	0.09	0.15
Total Suspended Solids	mg/L	-	-	-	-	10	-	-	<10	<10	34	10	<10	<10	6	6	8	6	4	12	-
Turbidity	NTU	-	-	-	-	0.1	-	-	2	1.6	1.3	0.5	0.2	0.3	1.5	2.3	2.8	2.5	4.3	-	-
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	0.000308	0.00033	<0.00061	<0.00061	<0.00061	<0.00061	<0.02	<0.1	<0.02	<0.02	<0.02	<0.05	<0.05
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	0.018	0.018	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	0.28	0.01	0.0095	0.011	0.09	0.005	0.08	0.04	0.03	0.05	0.23
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	-	-	<0.003	<0.003	<0.001	<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	-	-	0.374	0.364	0.24	0.24	0.31	0.3	-	-	-	-	-	-	-
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	-	-	<0.0001	<0.0001	<0.00009	<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	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0002	<0.002
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	-	-	<0.0005	<0.0005	0.0012	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	-	-	0.003	0.001	0.0013	<0.0009	<0.0009	0.0014	0.001	<0.001	<0.001	<0.001	<0.001	-	-
Iron (tot)	mg/L	0.3	-	1	-	0.01	-	-	0.046	0.05	1.2	<0.1	<0.1	<0.1	0.35	0.7	0.67	0.56	0.44	0.064	1.15
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	-	-	<0.001	<0.001	<0.0005	<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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	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	<0.00006	-
Nickel (tot)	mg/L	0.025	-	-	-	0.001	-	-	0.012	<0.003	0.0027	0.0018	0.0014	0.0013	<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	<0.001	<0.001	<0.001	<0.001	<0.001	<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	<0.00009	<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	0.011	<0.005	<0.005	0.0055	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.007

Notes:	
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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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
						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
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	7	-	4	4	5	6	5	3	3	3	3	3	3	3	3
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	0.6	-	0.3	<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	7	-	10	10	7	8	10	10	9	8	8	8	13	9	6
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	29.1	-	31.2	26	31	32	29	19	24	26	36	34	27	22	20
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.4	-	1.67	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
Sodium (tot)	mg/L	-	-	-	-	0.05	2.3	-	9.1	3	2	2	3	2	2	2	<2	3	3	<2	2
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	76	-	70	62	79	86	72	45	59	67	87	87	69	49	51
Ammonia as N	mg/L	-	-	-	-	0.02	0.05	-	0.08	<0.02	0.07	<0.02	0.02	0.06	0.09	0.1	0.03	<0.02	0.04	0.02	0.03
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	-	4	<2	1	2	<1	<1	<1	<1	1	<1	<1	<1	<1	2
Colour	TCU	-	-	-	-	2	41	-	12	26	32	23	24	46	37	57	19	20	15	42	71
Electrical Conductivity	uS/cm	-	-	-	-	1	168	150	170	152	177	193	173	121	141	153	193	192	174	126	122
pH	pH units	6.5 - 8.5	-	6 - 9	-		-	-	7.06	7.38	7.52	7.57	7.06	7.17	6.95	8.01	8.22	7.86	7.89	7.72	7.7
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	-	99	112	99	115	125	112	79	92	100	125	125	113	82	79
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	79	-	85	69	82	84	77	52	64	69	94	89	72	59	54
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.4	-	0.1	0.18	0.47	0.22	<0.05	0.27	0.1	0.21	0.16	<0.1	<0.1	0.38	0.21
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.03	-	<0.01	0.02	<0.01	0.02	0.09	<0.01	0.02	0.02	0.03	<0.02	<0.02	<0.01	0.03
Total Suspended Solids	mg/L	-	-	-	-	10	-	144	26	4	3	2	11	2	<2	11	4	<2	4	<2	6
Turbidity	NTU	-	-	-	-	0.1	-	-	-	1.7	3.2	2.6	3.3	1.7	1.7	4.9	2.1	1.9	3.5	1.1	2.2
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	<0.02	-
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.22	0.29	0.51	0.05	0.06	0.22	0.06	0.09	0.06	0.12	0.01	<0.01	<0.01	0.04	0.09
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
Boron (tot)	mg/L	-	0.2	3.55	1.5	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
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.002	<0.002	0.002	-	<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	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003
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	2.24	3.45	2.79	0.33	0.62	0.46	0.48	0.4	0.3	1.25	0.25	0.39	0.6	0.32	0.96
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
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
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<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	<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
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
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	0.007	<0.005	0.016	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Notes:	
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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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-Dup (BAP-B)
						Sample Date	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
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	2	4	4	2	2	2	2	4	3	4	4	4	2	3	-
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	-
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	-
Sulphate	mg/L	-	-	100	-	0.1	7	11	9	7	7	5	6	6	6	6	7	7	7	10	-
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	27	22	24	23	29	21	24	19	24	28	25	25	30	28	28
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Potassium (tot)	mg/L	-	-	-	-	0.05	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sodium (tot)	mg/L	-	-	-	-	0.05	4	2	2	3	<2	4	2	3	2	2	<2	2	2	<2	<2
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	69	54	59	60	73	54	74	60	67	78	64	71	83	76	-
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.02	0.05	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	<1	<1	<1	<1	-	<1	3	1	1	<1	<1	2	-
Colour	TCU	-	-	-	-	2	29	69	46	34	27	111	28	58	33	65	50	35	28	16	-
Electrical Conductivity	uS/cm	-	-	-	-	1	156	143	150	140	161	119	158	138	153	165	146	152	171	163	-
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.89	7.73	7.75	7.67	7.92	7.6	7.89	7.79	7.83	7.89	7.88	7.92	7.36	6.71	-
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	-
Total Dissolved Solids	mg/L	-	-	-	-	10	101	93	98	91	105	77	103	90	100	107	95	99	111	106	-
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	72	59	64	62	77	57	64	52	64	74	67	66	79	74	78.2
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.16	0.4	0.29	<0.1	<0.1	0.58	0.14	0.39	0.36	0.38	0.18	0.13	<0.1	<0.1	-
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	-
Total Suspended Solids	mg/L	-	-	-	-	10	8	2	5	3	7	6	<2	<2	2	9	<2	4	<2	3	-
Turbidity	NTU	-	-	-	-	0.1	3.6	3.4	-	1.5	2.8	3.4	2	2.5	1.4	8.7	2	1.2	3.2	1.3	-
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	<0.00009	<0.00011	<0.00009	-	0.0000247	-	-	-	0.0000047	0.00028022	0.0000006	-
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.03	0.05	0.05	0.06	0.05	0.11	0.03	0.06	0.05	0.11	0.04	0.04	0.03	<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
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
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	<0.001	<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	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.001	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
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.49	0.78	0.6	0.39	0.51	1.28	0.38	0.6	0.32	1.67	0.39	0.29	0.57	0.19	0.05
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (tot)	mg/L	0.0002	-	-	-	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
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
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
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	<0.01	<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

Notes:	
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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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
						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-08	2014-Oct-10	2015-May-04	2015-Sep-09	2015-Oct-26	2016-Apr-28	2016-Aug-17	2016-Oct-26
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	2	3	5	2.22	3.39	4.35	4.6	3.32	4.25	4.44	4.94	7.02	5.6	7.15	5.36
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<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	<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	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	7	8	24	5.64	7.14	7.74	6.69	6.24	6.06	6.16	6.09	8.96	7.26	13.6	6.99
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	23	19.3	19.4	19	28.4	26.8	24.8	29.6	26.5	25.2	25.4	26.7	20.7	21.5	26.7
Magnesium (tot)	mg/L	-	-	-	-	0.05	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	1.06	1.29
Potassium (tot)	mg/L	-	-	-	-	0.05	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	0.79	0.8
Sodium (tot)	mg/L	-	-	-	-	0.05	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	5.49	3.8
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	64	81	65	40	83	65	59	71	68	60	74	68	55	60	71
Ammonia as N	mg/L	-	-	-	-	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	<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
Colour	TCU	-	-	-	-	2	17	14	15	52	18	25	39	25	28	33	<5	31	32	82	13
Electrical Conductivity	uS/cm	-	-	-	-	1	166	192	193	101	194	159	146	7.98	162	149	178	167	135	159	173
pH	pH units	6.5 - 8.5	-	6 - 9	-		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	7.7	7.77
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	147	107	109	74	112	92	98	92	108	92	98	100	88	96	96
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	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	58.1	72
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	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	0.51	<0.1
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	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	0.02	<0.01
Total Suspended Solids	mg/L	-	-	-	-	10	17	10	3	13	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.1	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	3.7	1.2
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.0000111	0.00038356	0.0000084	<0.0000111	<0.000129	<0.0000169	0.000083	0.000478	0.000802	0.000063	0.0004	0.00003	0.0000128	0.00017742	0.00006
Metals																					
Aluminum (diss, 0.2 µm)	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	0.034	0.007
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.126	0.057	0.017	-	-	-	-	-	-	-	-	-	-	-	-
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
Boron (tot)	mg/L	-	0.2	3.55	1.5	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	<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
Chromium (tot)	mg/L	-	-	0.064	-	0.003	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	<0.003	<0.003
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.003	<0.0005	<0.0005	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	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	<0.002	<0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	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	0.85	0.11
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	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	<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
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
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
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	<0.005	<0.005	<0.005	0.036	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	0.014

Notes:	
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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B-QAQC-S19 (BAP-B)	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	SB-QAQC-SW-21 (BAP-B)
						Sample Date	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	2021-Apr-20
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	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	7.52
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	0.07
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
Sulphate	mg/L	-	-	100	-	0.1	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	4.79
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	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	24.8
Magnesium (tot)	mg/L	-	-	-	-	0.05	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	1.27
Potassium (tot)	mg/L	-	-	-	-	0.05	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	0.63
Sodium (tot)	mg/L	-	-	-	-	0.05	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	5.46
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	52	68	69	61	66	60	60	62	69	46	70	81	70	56	55
Ammonia as N	mg/L	-	-	-	-	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	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2	<5	<2	<2
Colour	TCU	-	-	-	-	2	42	102	31	58	-	<5	11	11	23	52	32	30	40	33	33
Electrical Conductivity	uS/cm	-	-	-	-	1	149	157	139	140	180	184	150	150	195	142	186	177	159	162	161
pH	pH units	6.5 - 8.5	-	6 - 9	-		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	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	0.005	<0.001	<0.001	<0.001	<0.001	0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	82	72	88	<10	106	102	106	92	90	100	92	110	100	100	98
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	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	67.2
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	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	0.21
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	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	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	10	<10	76	<10	<10	<10	<10	<10	18	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.1	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	2.1
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	0.0001235	0.00006	0.00035172	0.0000855	0.0000925	-	-	-	-	-	-	-	-	-
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	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	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.023	0.023
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	0.103	0.028	0.063	0.06	0.058
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	<0.01	<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	<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
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
Cobalt (tot)	mg/L	-	0.0009	-	-	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	<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
Iron (tot)	mg/L	0.3	-	1	-	0.01	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	0.388
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
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
Mercury (tot)	mg/L	0.0002	-	-	-	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
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
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	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	0.006

Notes:

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-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	BAP-C	BAP-C
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-B	BAP-B	BAP-B	BAP-B	BAP-B	SB-QAQC SW1-F22 (BAP-B)	BAP-B	BAP-B	BAP-B	BAP-B	SB-QAQC-SW1 (BAP-B)	BAP-B	BAP-C	BAP-C
						Sample Date	2021-Jul-14	2021-Oct-21	2022-May-03	2022-Aug-04	2022-Oct-18	2022-Oct-18	2023-May-03	2023-May-04	2023-Aug-09	2023-Oct-19	2023-Oct-19	2024-Apr-29	2004-Apr-29	2004-Jun-23
Anions						Detection Limit														
Chloride	mg/L	-	-	180	128	0.1	6.51	6.75	6.2	5.08	7.72	7.68	-	4.83	3.6	6.7	6.9	4	7	5
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.1	<0.1	<0.1	<0.1	0.11	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1
Sulphate	mg/L	-	-	100	-	0.1	2.78	3.24	4.58	4.14	4.07	3.83	-	3.79	4.1	5.9	6.1	4.7	11	9
Cations																				
Calcium (tot)	mg/L	-	-	-	-	0.00005	23.9	23.8	24.7	32.4	22.9	24	-	22.9	29	28	29	23	23	26
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.32	1.18	1.14	1.43	1.38	1.43	-	1.11	1.3	1.3	1.3	1	2	2
Potassium (tot)	mg/L	-	-	-	-	0.05	<0.58	1.81	<1.15	0.99	1.06	1.02	-	0.51	0.64	0.84	0.85	0.5	2	1
Sodium (tot)	mg/L	-	-	-	-	0.05	6.04	4.74	5.28	5.91	6.99	7.36	-	4.31	4.9	5.7	5.7	4.7	5	4
General Chemistry																				
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	0.846	4.07	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	65	59	59	75	63	62	-	54	77	71	71	58	60	72
Ammonia as N	mg/L	-	-	-	-	0.02	0.02	0.08	<0.02	<0.02	<0.02	0.05	-	0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<1	<1
Colour	TCU	-	-	-	-	2	110	46	22.5	57.7	23.7	23.5	-	32.9	25	15	13	27	33	30
Electrical Conductivity	uS/cm	-	-	-	-	1	151	148	154	176	165	166	-	129	170	170	180	130	150	173
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.4	7.31	7.13	7.53	7.66	7.69	-	7.57	7.81	8.05	7.95	7.95	6.66	7.37
Phenols	mg/L	0.001	-	0.04	0.004	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
Total Dissolved Solids	mg/L	-	-	-	-	10	114	100	76	108	96	96	-	72	95	60	90	100	98	112
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	65.1	64.3	66.4	86.8	62.9	65.8	-	61.8	81	74	75	67	66	73
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.87	0.35	0.26	0.39	0.29	0.36	-	0.19	0.16	0.18	<0.1	0.21	0.23	0.26
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.04	0.04	<0.02	0.06	0.03	<0.02	-	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.04
Total Suspended Solids	mg/L	-	-	-	-	10	<10	33	<10	12	<10	<10	-	<10	<10	12	<10	<10	11	3
Turbidity	NTU	-	-	-	-	0.1	7.6	17.5	0.9	8.8	1.5	1.5	-	1.4	3.6	1.2	1.2	1	1.8	1.9
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	<0.000002	<0.000002	0.0642	-	0.000028	<0.00061	<0.00061	<0.00061	<0.00061	<0.02	<0.02
Metals																				
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	0.011	-	-	-	-	0.026	0.01	0.006	0.006	0.021	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	0.034	0.021	-	0.015	0.014	0.011	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.097	0.216	-	0.149	0.029	0.034	-	-	0.024	0.2	0.021	0.065	0.07	0.05
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<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
Boron (tot)	mg/L	-	0.2	3.55	1.5	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	<0.00009	<0.00009	<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	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	-	<0.0005	<0.0005	0.00075	<0.0005	<0.0005	<0.0002	<0.0002
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.001	<0.0009	0.001	<0.0009	0.00095	0.001	<0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	2.36	4.29	0.419	1.6	0.339	0.361	-	0.282	0.75	2.2	0.25	0.38	0.35	0.71
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<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
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	-	-
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	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	-	<0.003	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005
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	<0.001	<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	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	<0.02	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01

Notes:	
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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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
						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
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	7	7	8	12.4	10.6	11	-	<2	9	8	7	9	5	7	4
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	<0.1	<0.1	0.71	0.86	0.6	-	0.5	<0.1	<0.1	<0.1	<0.1	0.12	0.19	<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
Sulphate	mg/L	-	-	100	-	0.1	10	11	13	22	11	10	-	16	13	8	8	12	12	15	9
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	28	28	33	26.2	29.1	34.8	-	38.9	28	33	33	36	21	27	27
Magnesium (tot)	mg/L	-	-	-	-	0.05	2	2	2	2.22	1.9	2.43	-	4.21	2	2	2	2	2	2	2
Potassium (tot)	mg/L	-	-	-	-	0.05	<1	1	2	3.5	1.2	1.8	-	3.3	3	1	<1	2	1	3	1
Sodium (tot)	mg/L	-	-	-	-	0.05	5	5	6	6.7	4.6	6.2	-	17.9	6	6	5	9	5	7	4
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	83	78	87	64	80	86	-	98	71	87	90	83	50	71	70
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	-	0.11	<0.02	0.03	<0.02	0.16	<0.02	0.03	0.08
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	-	<1	-	<2	-	-	2	-	<1	3	<1	<1	<1	<1	1
Colour	TCU	-	-	-	-	2	20	32	15	29	17	36	-	11	24	32	25	26	40	34	55
Electrical Conductivity	uS/cm	-	-	-	-	1	190	192	224	181	150	209	207	272	187	206	209	215	143	193	171
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.53	7.37	7.42	-	7.01	-	-	7.11	7.56	7.6	7.54	7.12	7.26	7.07	8.01
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	0.002	<0.001	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	123	125	146	119	-	-	137	180	122	134	136	140	93	125	111
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	78	78	91	75	81	97	-	114	78	91	91	98	61	76	76
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.07	0.31	0.26	0.6	0.5	0.4	-	0.2	0.15	0.29	0.44	0.19	0.23	0.18	0.36
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	5.3	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.03	<0.01	0.08	0.02	0.03	0.02	-	<0.01	0.03	<0.01	0.04	0.04	0.02	<0.01	0.04
Total Suspended Solids	mg/L	-	-	-	-	10	22	7	44	9	-	-	17	25	16	6	18	2	11	2	14
Turbidity	NTU	-	-	-	-	0.1	6.2	3.1	4.6	-	-	-	-	-	1.9	2.4	9.5	2.6	2.4	1.1	3.9
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	-	<0.05	-	-	-	-	-	-	-
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.14	0.07	0.23	0.07	0.19	0.22	0.09	0.11	0.5	0.06	0.28	0.05	0.1	0.06	0.12
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
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	<0.005	<0.005	<0.001	<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	0.002
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0002	<0.0002	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
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
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.79	0.66	1.37	0.305	1.39	2.44	1.4	0.704	0.41	0.58	1.12	0.37	0.41	0.27	1.13
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
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
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
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
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<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	<0.0001
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.01	<0.01	<0.02	<0.005	<0.005	<0.005	<0.005	0.024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Notes:	
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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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
						Sample Date	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
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	7	8	6	10	3	6	10	7	3	6	2	3	4	3	5
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	<0.1	<0.1	<0.1	0.43	<0.1	0.11	<0.1	<0.1	<0.1	0.11	<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	10	11	15	19	5	10	13	12	9	12	5	8	7	7	7
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	38	39	29	29	20	33	28	26	24	31	23	27	20	25	29
Magnesium (tot)	mg/L	-	-	-	-	0.05	2	3	2	3	1	2	3	2	1	3	1	1	1	1	2
Potassium (tot)	mg/L	-	-	-	-	0.05	2	2	1	6	<1	2	2	2	1	3	<1	1	1	1	1
Sodium (tot)	mg/L	-	-	-	-	0.05	7	9	6	11	<2	9	9	7	4	8	3	3	3	2	5
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	99	104	81	75	51	87	78	74	65	95	56	80	67	70	85
Ammonia as N	mg/L	-	-	-	-	0.02	0.05	0.04	0.04	0.06	0.02	0.02	0.06	0.07	<0.02	0.03	<0.02	<0.02	0.03	<0.02	0.09
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	1	-	1	3	2
Colour	TCU	-	-	-	-	2	18	20	17	37	55	27	69	42	38	28	110	27	55	35	61
Electrical Conductivity	uS/cm	-	-	-	-	1	235	248	209	228	123	210	212	197	155	231	127	176	155	164	189
pH	pH units	6.5 - 8.5	-	6 - 9	-		8.27	7.95	7.98	7.86	7.69	7.95	7.83	7.78	7.66	7.99	7.62	7.89	7.86	7.88	7.87
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	0.002
Total Dissolved Solids	mg/L	-	-	-	-	10	153	161	136	148	80	137	138	128	101	150	83	114	101	107	123
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	103	110	81	85	54	91	82	73	64	90	62	72	54	67	81
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.27	0.14	0.46	0.42	0.28	0.19	0.41	0.25	0.12	<0.1	0.5	0.38	0.39	0.23	0.37
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.05	<0.02	0.08	<0.01	0.02	0.02	0.02	0.02	<0.01	0.02	0.03	0.02	<0.01	0.02	0.03
Total Suspended Solids	mg/L	-	-	-	-	10	4	<2	27	3	9	42	<2	2	<2	4	5	2	3	<2	10
Turbidity	NTU	-	-	-	-	0.1	2	1.9	6.6	1.3	1.9	10.2	3	-	2	2.5	3.1	2.3	2.8	1.3	9.3
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	<0.02	-	-	-	-	<0.00015	0.00010054	<0.00008	-	0.000013	-	-
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.01	<0.01	<0.01	0.04	0.09	0.09	0.04	0.05	0.06	0.05	0.1	0.08	0.11	0.05	0.08
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
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
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	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0002	<0.0002	0.0006	<0.0002	0.0004	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	0.0003	0.0002	<0.0002	0.001
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	0.002	<0.001	0.001	<0.001	0.0003
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.22	0.36	1.64	0.26	1	0.65	0.57	0.53	0.38	0.43	1.14	0.83	0.61	0.3	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	<0.001	<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
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
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
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	<0.01	<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

Notes:	
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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C-Dup (BAP-C)	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C
						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-10	2015-May-04
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	6	5	4	5	-	4	4	9	3.61	5.11	9.36	7.83	6.44	8.95	8.64
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	0.22	0.07	0.21	0.18	0.1	<0.05	0.2
Nitrite as N	mg/L	-	-	-	-	0.01	<0.1	<0.1	<0.1	<0.1	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	8	8	8	12	-	11	9	23	7.76	8.21	12.5	11.8	9.57	11.6	12.8
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	25	24	34	31	30	25	20.4	48.9	20.5	29.9	31.1	28	31.9	30	28.2
Magnesium (tot)	mg/L	-	-	-	-	0.05	5	1	2	2	2	1.88	1.56	2.83	1.24	1.59	2.58	1.99	2.06	2.11	2.07
Potassium (tot)	mg/L	-	-	-	-	0.05	1	<1	1	2	2	2.34	1.12	3.15	1.36	1.29	2.71	3.09	1.86	2.21	2.95
Sodium (tot)	mg/L	-	-	-	-	0.05	4	2	5	6	5	5.42	3.78	7.93	3.4	3.98	7.58	6.88	5.82	7.11	7.37
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	69	71	90	86	-	72	87	78	44	86	79	66	79	79	69
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	0.04	0.03	0.03	-	0.02	0.06	0.02	<0.02	<0.02	<0.02	<0.02	0.15	0.06	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	3	<1	<1	2	-	<2	<2	<2	<5	<5	<5	<5	<5	<5	<5
Colour	TCU	-	-	-	-	2	47	34	28	16	-	16	9	16	45	17	22	18	27	29	34
Electrical Conductivity	uS/cm	-	-	-	-	1	161	162	190	190	-	202	213	230	116	213	213	187	215	214	197
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.85	7.89	7.44	6.78	-	7.7	7.8	7.8	7.63	7.35	7.75	7.78	8.01	7.88	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
Total Dissolved Solids	mg/L	-	-	-	-	10	105	105	124	124	-	305	104	117	82	114	124	126	120	130	122
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	71	64	93	86	83.1	70.2	57.4	133.8	56.3	81.2	88.3	78.1	88.1	83.6	78.9
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.17	0.13	<0.1	<0.1	-	0.1	0.2	0.1	0.28	0.12	0.11	1.5	0.23	0.25	0.4
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.01	<0.01	<0.01	<0.01	-	<0.01	0.02	<0.01	0.03	0.02	<0.02	<0.02	<0.02	0.04	0.03
Total Suspended Solids	mg/L	-	-	-	-	10	<2	5	4	<2	-	-	10	-	18	<10	<10	<10	<10	<10	<10
Turbidity	NTU	-	-	-	-	0.1	1.9	1.7	3	2.2	-	1	2.5	1	2.9	2.7	1.3	0.9	2.5	18.3	2.2
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	0.0000144	0.00043197	0.0000006	-	0.0000073	0.0006979	0.0000023	<0.0000073	<0.000233	<0.0000229	0.000085	0.000117	0.000273	0.000078
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	16	-	-	0.042	0.011	0.027	0.025	0.013	0.009	0.023
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.04	0.04	0.04	0.01	0.01	0.028	0.055	0.014	-	-	-	-	-	-	-
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.003	<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	0.02	0.01	0.02	0.035	0.018	0.03	0.011	0.01	0.024	0.038	0.026	0.027	0.034
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	<0.001	<0.001	<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
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.001	<0.001	<0.001	0.002	0.0007	0.0009	0.0006	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.37	0.29	0.53	0.16	0.04	0.19	0.298	0.116	0.08	0.34	0.14	0.19	0.33	0.23	0.28
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	0.0013	<0.0001	<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
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	0.002	<0.001	-	<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	<0.001	<0.001	<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	<0.01	<0.01	<0.01	<0.01	0.01	0.006	0.019	<0.005	0.011	<0.005	0.034	<0.005	<0.005	<0.005	<0.005

Notes:	
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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	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-QAQC-SU19 (BAP-C)	BAP-C
						Sample Date	2015-Sep-09	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-Jul-30	2018-Oct-24	2019-May-07	2019-Aug-14	2019-Aug-14	2019-Oct-22
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	9.81	10.3	9.48	10.6	12.4	11	8.18	8.9	9.98	11.8	14.9	17.7	13.4	13.3	16.8
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	0.06	0.06	0.18	0.06	0.11	0.26	0.11	0.11	0.12	0.13	0.2	0.37	0.16	0.16	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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	8.71	11.3	12	14.5	10.2	11.5	6.84	6.99	8.43	5.67	8.65	12.9	6.27	6.19	11.3
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	28	28.8	22.7	22.6	31.6	22.7	24	27.6	22.1	-	27.9	24.9	28.9	28.6	23.5
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.99	1.94	1.75	1.59	2.46	1.83	1.64	1.97	1.46	-	2.04	2.22	1.76	1.75	2.07
Potassium (tot)	mg/L	-	-	-	-	0.05	2.61	2.31	2.91	2.02	2.96	2.93	1.97	2.61	2	-	3.11	3.8	2.02	1.95	4.57
Sodium (tot)	mg/L	-	-	-	-	0.05	6.93	6.88	6.81	8.93	9.12	7.54	6.05	8.16	<0.005	-	9.62	10.7	7.58	7.43	11.4
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	85	77	64	58	90	62	78	83	43	77	73	81	76	76	57
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.1	0.05	<0.02	0.1	0.03	0.04	0.19
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Colour	TCU	-	-	-	-	2	6	28	30	75	12	38	94	32	48	-	<5	11	23	24	53
Electrical Conductivity	uS/cm	-	-	-	-	1	222	198	174	189	241	202	191	180	177	221	240	222	230	228	184
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.98	7.78	7.99	7.89	7.99	7.95	7.82	7.82	7.05	7.77	7.85	7.43	7.66	7.68	7.57
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	0.005
Total Dissolved Solids	mg/L	-	-	-	-	10	144	110	106	120	124	112	92	116	13	126	132	128	118	118	122
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	78.1	79.9	63.9	63	89	64.2	66.7	77	61.2	86.4	78.1	71.3	79.4	78.6	67.2
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.31	0.26	0.26	0.48	<0.1	0.23	0.3	0.27	0.49	0.17	0.13	<0.1	0.23	0.24	0.36
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	<10	94	<10	<10	<10	<10	<10	14
Turbidity	NTU	-	-	-	-	0.1	2.9	1.9	1.7	3.7	1.3	1.1	10.8	4.1	3	-	2.2	1.7	2.6	2.7	10.5
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.00025	0.00004	0.0000155	0.00024108	0.00005	-	0.0001144	0.00009	0.00024296	0.00023584	0.0000961	-	-	-	-
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	0.016	0.01	0.028	0.037	0.007	0.029	0.032	0.021	0.026	0.011	0.006	0.028	0.007	0.007	0.048
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	0.034	0.022	0.03	0.026	0.026	0.04	0.036	0.031	0.034	0.028	0.033	0.053	0.028	0.028	0.047
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	<0.003	<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	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<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
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.79	0.15	0.16	0.67	0.21	0.1	1.89	0.64	0.36	-	0.05	0.19	0.3	0.29	1.26
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
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury (diss)	mg/L	0.0002	-	-	-	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	<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
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
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	<0.005	0.008	0.005	<0.005	<0.005	0.006	<0.005	<0.005	-	<0.005	0.005	<0.005	<0.005	<0.005

Notes:

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-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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-C-QAQC-F19 (BAP-C)	BAP-C	BAP-C	BAP-C	BAP-C-QAQC-F20 (BAP-C)	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	BAP-C	SB-QAQC SW-SU22 (BAP-C)	BAP-C	BAP-C	BAP-C
						Sample Date	2019-Oct-22	2020-May-06	2020-Aug-25	2020-Oct-06	2020-Oct-06	2021-Apr-20	2021-Jul-14	2021-Oct-21	2022-May-03	2022-Aug-04	2022-Aug-04	2022-Oct-18	2023-May-03	2023-May-04	
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	15.5	14.1	12.4	14.4	14.3	11.3	9.65	11.2	9.15	8.44	8.33	12.1	-	-	7.33
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	0.08	0.2	0.15	0.16	0.16	0.18	0.09	0.18	0.18	0.12	0.12	0.19	-	-	0.12
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
Sulphate	mg/L	-	-	100	-	0.1	11	10.7	5.42	5.84	5.87	8.73	4.49	6.3	8.75	5.2	5.19	5.84	-	-	6.38
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	23.2	24.09	32.38	26.31	27.32	25.8	25.8	26.6	26.2	38.1	30.8	24.9	-	-	25.1
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.85	1.83	2.06	1.95	1.96	1.98	1.71	2.1	1.79	2.22	1.91	2.3	-	-	1.73
Potassium (tot)	mg/L	-	-	-	-	0.05	3.94	2.61	2.58	3.14	3.33	2.59	2.2	4.14	2.23	3.08	2.43	3.2	-	-	1.87
Sodium (tot)	mg/L	-	-	-	-	0.05	10.4	8.57	9.73	9.8	10.12	8.96	8.73	8.84	7.54	10.5	7.97	10.1	-	-	6.64
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	0.464	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	57	61	102	83	83	63	72	72	66	85	84	73	-	-	60
Ammonia as N	mg/L	-	-	-	-	0.02	0.16	0.03	<0.02	<0.02	<0.02	<0.02	0.02	0.09	<0.02	<0.02	<0.02	<0.02	-	-	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<2	<5	<5	<2	<2	<2	<2	<2	<2	<2	-	-	<2
Colour	TCU	-	-	-	-	2	49	31	28	41	40	31	102	41	21.5	60.8	60	22.8	-	-	31.1
Electrical Conductivity	uS/cm	-	-	-	-	1	180	234	218	202	203	206	181	194	190	204	204	202	-	-	156
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.56	7.45	7.1	7.24	7.23	7.71	7.4	7.41	7.16	7.63	7.6	7.77	-	-	7.6
Phenols	mg/L	0.001	-	0.04	0.004	0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	0.003	<0.001	-	-
Total Dissolved Solids	mg/L	-	-	-	-	10	118	108	126	122	124	116	130	124	96	128	126	124	-	-	82
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	65.5	67.7	89.3	73.7	76.3	72.6	71.5	75.1	72.8	104	84.8	71.6	-	-	69.8
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.36	0.25	0.25	0.29	0.28	0.37	0.38	0.32	0.17	0.33	0.45	0.38	-	-	0.22
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	0.03	0.04	<0.02	0.04	0.06	0.07	-	-	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	12	<10	<10	<10	<10	<10	<10	33	<10	<10	<10	<10	-	-	<10
Turbidity	NTU	-	-	-	-	0.1	12.3	2.1	3.4	2	1.8	1.6	7.4	13.6	0.9	5.8	5.4	2.1	-	-	1.2
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	-	<0.000002	<0.000002	<0.000002	-	-	<0.000002
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	0.048	<0.004	0.008	0.01	0.01	-	-	-	0.021	-	-	-	-	-	0.022
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	0.017	0.036	0.019	-	0.01	0.019	0.011	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	0.059	0.023	0.032	0.03	0.041	0.095	0.175	-	0.061	0.102	0.029	-	-	-
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
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.046	0.039	0.033	0.035	0.033	0.037	0.044	0.041	0.037	0.039	0.04	-	-	-	0.034
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
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
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	<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	0.005	<0.002	<0.002	<0.002	<0.002	0.006	<0.002	-	-	<0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	1.23	0.288	0.496	0.271	0.266	0.294	2.21	3.35	0.493	0.983	0.905	0.293	-	-	0.311
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
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	<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	<0.003	<0.003	<0.003	0.009	<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	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	<0.002
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	<0.0001	<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	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	<0.02

Notes:

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-C	BAP-C	BAP-C	BAP-C	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-C	SB-QAQC SW1 (BAP-C)	BAP-C	BAP-C	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	2023-Aug-09	2023-Aug-09	2023-Oct-19	2024-Apr-29	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	
Anions						Detection Limit																
Chloride	mg/L	-	-	180	128	0.1	6.9	6.9	12	7.9	5	3	2	4	3	8.8	9.3	7	-	61	5	
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	0.14	0.14	0.22	0.19	-	-	-	-	-	-	-	-	-	-	-	
Nitrate as N	mg/L	-	-	-	-	0.05	0.14	0.14	0.22	0.19	<0.1	<0.1	<0.1	<0.1	<0.1	0.47	0.83	0.6	-	1.8	<0.1	
Nitrite as N	mg/L	-	-	-	-	0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	<0.1	
Sulphate	mg/L	-	-	100	-	0.1	5.2	5.2	7.6	8.3	8	8	9	10	11	12	10	10	-	11	10	
Cations																						
Calcium (tot)	mg/L	-	-	-	-	0.00005	30	29	32	25	14	25	27	26	28	16.1	25.1	29.8	-	19.1	26	
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.8	1.7	2.3	1.6	<1	1	1	1	1	1.04	1.28	3.56	-	1.02	1	
Potassium (tot)	mg/L	-	-	-	-	0.05	2.1	2	3.3	1.9	<1	<1	<1	<1	1	0.5	1	0.9	-	2	<1	
Sodium (tot)	mg/L	-	-	-	-	0.05	7.3	7.2	10	6.9	3	3	3	3	3	3.6	3	2.3	-	54.2	2	
General Chemistry																						
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	86	85	87	70	38	67	80	70	74	34	70	74	-	40	61	
Ammonia as N	mg/L	-	-	-	-	0.02	<0.05	<0.05	<0.05	<0.05	<0.02	0.02	<0.02	<0.02	0.04	<0.05	0.06	0.09	-	0.42	<0.02	
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	12	<2	<2	<2	<1	<1	<1	<1	-	3	-	-	3	2	1	
Colour	TCU	-	-	-	-	2	23	23	13	26	48	36	20	28	17	56	59	37	-	65	27	
Electrical Conductivity	uS/cm	-	-	-	-	1	200	200	230	170	94	155	173	165	177	95	131	166	148	307	151	
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.81	7.79	8.01	8	6.53	7.26	7.49	7.32	7.26	-	6.45	-	-	6.26	7.37	
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	0.001	<0.001	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	0.07	<0.001	<0.001	
Total Dissolved Solids	mg/L	-	-	-	-	10	115	120	95	125	61	101	112	107	115	63	-	-	98	203	98	
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	89	84	88	77	37	67	72	69	74	45	68	89	-	52	69	
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.16	0.17	0.22	0.2	0.23	0.25	0.17	0.22	0.18	0.5	0.8	0.4	-	0.9	0.26	
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	5.8	-	-	-	-	-	
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.02	<0.02	0.02	<0.02	0.01	0.03	0.02	0.02	0.03	0.01	0.02	0.03	-	0.01	0.03	
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	8	7	3	2	5	12	-	-	18	559	4	
Turbidity	NTU	-	-	-	-	0.1	3	3	0.9	0.9	1.4	2.4	2.6	2.6	2.4	-	-	-	-	-	1.2	
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.00061	<0.00061	<0.00061	<0.00061	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	-	<0.05	-	
Metals																						
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	0.009	0.01	0.005	0.02	-	-	-	-	-	-	-	-	-	-	-	
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.025	0.021	0.015	0.065	0.08	0.05	0.04	0.05	0.02	0.1	0.06	0.09	-	2.59	0.05	
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	<0.03	<0.03	0.001	<0.001	<0.001	
Boron (tot)	mg/L	-	0.2	3.55	1.5	0.01	0.029	0.029	0.039	0.029	-	-	-	-	-	-	-	-	-	-	-	
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005	<0.005	<0.001	<0.0001	<0.0001	
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.002	<0.002	<0.002	0.004	-	
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	0.0002	<0.005	<0.005	<0.005	<0.0005	<0.0002	
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.0009	<0.0009	<0.0009	0.00094	0.002	<0.001	<0.001	<0.001	<0.001	-	-	-	-	-	<0.001	
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.66	0.63	0.23	0.35	0.38	0.88	0.72	0.73	0.53	0.593	1.11	0.784	0.753	3.81	0.27	
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.02	<0.02	<0.001	0.0001	<0.001	
Manganese (tot)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mercury (diss)	mg/L	0.0002	-	-	-	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	<0.00006	-	-	<0.00006	<0.00006	<0.0001	
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	-	<0.01	<0.005	
Selenium (tot)	mg/L	0.1	-	-	-	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	<0.001	<0.001	<0.001	
Silicon (tot)	mg/L	-	-	-	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Silver (tot)	mg/L	0.0001	-	-	-	0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.005	<0.005	<0.001	<0.0005	<0.0001	
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.007	0.011	<0.005	0.026	<0.01	

Notes:

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	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	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	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D
						Sample Date	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	2008-Sep-16	2008-Oct-09	2009-Jun-04
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	5	4	4	3	3	2	2	3	3	3	3	1	4	4	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
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	7	8	10	10	9	8	7	8	13	8	5	6	9	7	6
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	31	32	33	19	24	26	36	35	28	16	17	22	19	19	18
Magnesium (tot)	mg/L	-	-	-	-	0.05	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
Sodium (tot)	mg/L	-	-	-	-	0.05	2	<2	3	3	<2	2	<2	3	2	2	3	3	3	3	3
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	80	86	73	45	59	66	87	88	69	38	44	58	45	51	52
Ammonia as N	mg/L	-	-	-	-	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	0.02	0.07	0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	3	<1	<1	<1	<1	1	<1	<1	<1	<1	2	<1	<1	<1	<1
Colour	TCU	-	-	-	-	2	35	25	23	49	37	63	19	17	19	63	98	42	84	61	56
Electrical Conductivity	uS/cm	-	-	-	-	1	180	190	172	123	141	151	193	194	173	104	105	132	122	131	119
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.45	7.34	7.06	7.23	6.9	8	8.22	7.91	7.91	7.66	7.57	7.77	7.65	7.68	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	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	117	123	112	80	92	98	125	126	112	68	68	86	79	85	77
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	82	84	87	52	64	69	94	92	74	42	47	59	52	52	47
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.34	0.25	0.17	0.24	0.14	0.27	0.15	0.31	0.25	0.44	0.34	0.39	0.74	0.38	0.13
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<0.01	<0.01	0.07	0.01	<0.01	0.02	0.03	<0.02	0.11	<0.01	0.02	0.01	0.03	0.02	<0.01
Total Suspended Solids	mg/L	-	-	-	-	10	7	3	4	4	<2	<2	<2	<2	26	<2	8	4	3	15	<2
Turbidity	NTU	-	-	-	-	0.1	2.4	2.5	2.4	2.2	1.3	3.1	2	1.9	5.3	1.6	2.8	6.4	4	-	1.7
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	-	-	-	-	-	-	-	-	-	<0.02	-	-	-	-	0.00015823
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.04	0.16	0.04	0.09	0.05	0.07	0.01	<0.01	<0.01	0.06	0.12	0.03	0.08	0.07	0.06
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
Boron (tot)	mg/L	-	0.2	3.55	1.5	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
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
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	0.0005	<0.0002	0.0006	0.0002	0.0003	0.0003	0.0002
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<0.001	<0.001	<0.001	0.002	0.001	0.001	<0.001	<0.001	0.001	0.001	0.002	<0.001	0.002	0.001	<0.001
Iron (tot)	mg/L	0.3	-	1	-	0.01	0.57	0.58	0.38	0.38	0.26	1.29	0.33	0.4	1.86	0.39	1.83	0.82	1.07	0.74	0.52
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
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
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
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	<0.01	<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

Notes:

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	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	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	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D-Dup (BAP-D)	BAP-D	BAP-D	BAP-D	BAP-D
						Sample Date	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	2012-Oct-17	2013-Apr-18
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	1	1	2	3	2	3	3	4	2	3	-	3	2	7	2.95
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	0.16
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	-	<0.05	<0.05	<0.05	<0.05
Sulphate	mg/L	-	-	100	-	0.1	6	5	6	5	5	4	6	5	6	11	-	6	6	36	5.02
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	22	22	20	16	19	22	20	19	26	23	22	17.6	15.2	18.1	12.8
Magnesium (tot)	mg/L	-	-	-	-	0.05	1	<1	1	1	<1	1	1	<1	1	2	1	1.1	1.13	2.03	0.76
Potassium (tot)	mg/L	-	-	-	-	0.05	<1	<1	<1	1	<1	<1	<1	<1	<1	1	<1	0.643	0.504	1.9	0.67
Sodium (tot)	mg/L	-	-	-	-	0.05	2	4	3	3	4	<2	2	<2	2	3	2	2.88	3.22	6.29	2.47
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	62	60	62	50	54	63	53	55	70	63	-	50	68	52	25
Ammonia as N	mg/L	-	-	-	-	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	0.01	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<1	<1	-	<1	5	1	3	1	<1	2	-	<2	<2	<2	<5
Colour	TCU	-	-	-	-	2	39	109	43	78	46	100	74	45	47	29	-	28	22	26	64
Electrical Conductivity	uS/cm	-	-	-	-	1	137	127	134	118	127	136	123	121	146	142	-	136	162	201	75
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.8	7.63	7.81	7.69	7.74	7.67	7.73	7.63	7.1	6.57	-	7.5	7.5	7.7	7.38
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	0.002	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	89	83	87	77	83	88	80	79	95	92	-	119	84	112	56
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	59	57	54	44	49.5	59	54	49.5	69	66	59.1	48.5	42.6	53.6	35.1
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.24	0.44	0.48	0.47	0.16	0.39	0.31	0.14	<0.1	<0.1	-	0.1	0.2	0.2	0.19
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	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	<0.01	0.03
Total Suspended Solids	mg/L	-	-	-	-	10	16	8	<2	<2	<2	5	<2	8	<2	<2	-	119	84	112	10
Turbidity	NTU	-	-	-	-	0.1	6.2	4.6	5.1	2.6	1.4	11.5	2.7	2.5	6.8	2.3	-	1.2	4.5	1.5	1.4
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.00013	0.00030225	-	<0.000003	-	-	-	0.0000035	0.00024364	0.0000026	-	0.0000179	0.00003	0.0000107	<0.0000179
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	0.025	-	-	0.061
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	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	0.036	-
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	<0.003
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
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	0.001	<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	<0.003
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	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	<0.0005	<0.0005
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	<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	0.001	0.002
Iron (tot)	mg/L	0.3	-	1	-	0.01	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	0.281	0.15
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	<0.0001	0.0015	<0.0001	<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
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	<0.001	0.002	<0.001	-
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	<0.004
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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.032	<0.005	0.009

Notes:

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	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	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	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D
						Sample Date	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	2018-May-07
Anions						Detection Limit															
Chloride	mg/L	-	-	180	128	0.1	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	8.63
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	0.05	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	<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
Sulphate	mg/L	-	-	100	-	0.1	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	3.97
Cations																					
Calcium (tot)	mg/L	-	-	-	-	0.00005	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	15.5
Magnesium (tot)	mg/L	-	-	-	-	0.05	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	0.9
Potassium (tot)	mg/L	-	-	-	-	0.05	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	0.73
Sodium (tot)	mg/L	-	-	-	-	0.05	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	<0.005
General Chemistry																					
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	70	54	46	61	60	44	63	56	44	42	60	41	61	56	36
Ammonia as N	mg/L	-	-	-	-	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	0.62
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Colour	TCU	-	-	-	-	2	25	42	55	42	41	58	7	47	41	100	20	54	163	59	75
Electrical Conductivity	uS/cm	-	-	-	-	1	164	139	122	154	139	118	159	146	114	149	158	122	137	118	124
pH	pH units	6.5 - 8.5	-	6 - 9	-		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	7.08
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	96	84	90	82	94	74	110	96	66	106	84	70	74	84	<10
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	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	42.4
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	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	1.1
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<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	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	10	<10	<10	13	<10	74
Turbidity	NTU	-	-	-	-	0.1	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	2.2
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.0000599	<0.0000213	0.00005	0.00225	0.000235	0.0000799	0.00031	0.00003	0.0000073	0.0000557	0.00004	-	0.000089	0.00006	0.00167643
Metals																					
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	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	0.035
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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	<0.01	<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
Chromium (tot)	mg/L	-	-	0.064	-	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	<0.003
Cobalt (tot)	mg/L	-	0.0009	-	-	0.0005	<0.0005	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.003	<0.0005	<0.0005	<0.0005	<0.0005	0.0011	<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	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	0.44
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
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	0.087	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.02	<0.005	<0.005

Notes:

Detection Limit

DL exceeds criteria

Concentration exceeds PWQO-GENERAL

Concentration exceeds PWQO-INTERIM

Concentration exceeds MECP-GD-TA

Concentration exceeds MECP-GD-TB

DL: May vary between sample locations and events

Provincial Water Quality Objectives General

Provincial Water Quality Objectives Interim

MECP Guidance Document Table A

MECP Guidance Document Table B



Appendix F-2: Historical Surface Water Chemistry						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
Parameter	Units	PWQO-GENERAL	PWQO-INTERIM	MECP-GD-TA	MECP-GD-TB	Sample ID	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D	BAP-D-QAQC-SU20 (BAP-D)	BAP-D	BAP-D	BAP-D	SB-QAQC SW-SU21 (BAP-D)	BAP-D	BAP-D
						Sample Date	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
Anions						Detection Limit														
Chloride	mg/L	-	-	180	128	0.1	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
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate as N	mg/L	-	-	-	-	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
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
Sulphate	mg/L	-	-	100	-	0.1	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
Cations																				
Calcium (tot)	mg/L	-	-	-	-	0.00005	-	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
Magnesium (tot)	mg/L	-	-	-	-	0.05	-	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
Potassium (tot)	mg/L	-	-	-	-	0.05	-	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
Sodium (tot)	mg/L	-	-	-	-	0.05	-	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
General Chemistry																				
% Difference/ Ion Balance (%)	%	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	54	48	49	58	40	42	70	70	61	42	58	56	56	43
Ammonia as N	mg/L	-	-	-	-	0.02	<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
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<5	<5	<5	<5	<5	<5	<2	<2	<5	<2	<2	<2	<2	<2
Colour	TCU	-	-	-	-	2	-	<5	15	39	49	45	50	46	62	47	146	146	68	32
Electrical Conductivity	uS/cm	-	-	-	-	1	158	153	130	154	132	158	151	151	139	132	132	132	132	121
pH	pH units	6.5 - 8.5	-	6 - 9	-		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
Phenols	mg/L	0.001	-	0.04	0.004	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
Total Dissolved Solids	mg/L	-	-	-	-	10	102	82	86	82	102	82	102	108	90	86	104	116	98	58
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	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
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	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
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	<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
Total Suspended Solids	mg/L	-	-	-	-	10	34	<10	<10	<10	12	<10	<10	<10	<10	<10	<10	<10	48	<10
Turbidity	NTU	-	-	-	-	0.1	-	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
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	0.0000587	0.00010267	-	-	-	-	-	-	-	-	-	-	-	-
Metals																				
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	0.014	0.01	0.041	0.009	0.049	<0.004	0.015	0.015	0.016	-	-	-	-	0.02
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	-	-	-	-	-	-	0.027	0.049	0.048	0.031	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	-	-	-	-	-	0.074	0.18	0.214	0.106	0.054	0.109	0.108	0.301	-
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
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	0.019	0.013	<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
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
Cobalt (tot)	mg/L	-	0.0009	-	-	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
Copper (tot)	mg/L	-	Calculated	0.0069	-	0.0009	-	<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
Iron (tot)	mg/L	0.3	-	1	-	0.01	-	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
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
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
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	<0.003	<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	<0.002	<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
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	<0.02	<0.02

Notes:	
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	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	BAP-D	BAP-D	BAP-D
						Sample Date	2022-Aug-04	2022-Oct-18	2023-May-03	2023-May-04	2023-Aug-09	2023-Oct-19	2024-Apr-29
Anions						Detection Limit							
Chloride	mg/L	-	-	180	128	0.1	4.1	7.42	-	5.67	1.9	5.1	5
Nitrate + Nitrite	mg/L	-	-	-	-	0.1	-	-	-	-	<0.1	<0.1	<0.1
Nitrate as N	mg/L	-	-	-	-	0.05	0.05	<0.05	-	<0.05	<0.1	<0.1	<0.1
Nitrite as N	mg/L	-	-	-	-	0.01	<0.05	<0.05	-	<0.05	<0.01	<0.01	<0.01
Sulphate	mg/L	-	-	100	-	0.1	3.24	2.83	-	3.14	4.1	4.6	3.7
Cations													
Calcium (tot)	mg/L	-	-	-	-	0.00005	27	17.5	-	15.2	23	23	17
Magnesium (tot)	mg/L	-	-	-	-	0.05	1.41	1.28	-	0.86	1.2	1.3	0.86
Potassium (tot)	mg/L	-	-	-	-	0.05	0.85	1.18	-	<0.5	0.74	1	0.5
Sodium (tot)	mg/L	-	-	-	-	0.05	4.75	6.95	-	4.5	4.9	5.6	4.7
General Chemistry													
% Difference/ Ion Balance (%)	%	-	-	-	-		-	1.71	-	-	-	-	-
Alkalinity (as CaCO3)	mg/L	See Factsheet	-	-	-	1	63	50	-	39	61	55	45
Ammonia as N	mg/L	-	-	-	-	0.02	<0.02	<0.02	-	0.05	<0.05	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	2	<2	-	<2	<2	<2	<2
Colour	TCU	-	-	-	-	2	70.6	36.8	-	43.3	40	21	38
Electrical Conductivity	uS/cm	-	-	-	-	1	146	138	-	103	140	150	110
pH	pH units	6.5 - 8.5	-	6 - 9	-		7.47	7.61	-	7.4	7.67	7.83	7.65
Phenols	mg/L	0.001	-	0.04	0.004	0.001	<0.001	0.002	<0.001	-	<0.001	<0.001	<0.001
Total Dissolved Solids	mg/L	-	-	-	-	10	98	92	-	62	85	85	85
Total Hardness (as CaCO3)	mg/L	-	-	-	-	0.5	73.2	49	-	41.5	66	61	51
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	0.36	0.49	-	0.19	0.2	0.2	0.19
Total Organic Carbon	mg/L	-	-	-	-		-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.03	-	-	-	0.01	0.05	0.08	-	0.02	<0.02	<0.02	<0.02
Total Suspended Solids	mg/L	-	-	-	-	10	<10	<10	-	<10	<10	11	10
Turbidity	NTU	-	-	-	-	0.1	11	2.1	-	2.4	6.6	1.9	1.3
Unionized Ammonia (Calc)	mg/L	-	-	-	-	0.000002	<0.000002	<0.000002	-	0.000109	<0.00061	<0.00061	<0.00061
Metals													
Aluminum (diss, 0.2 µm)	mg/L	-	Calculated	-	-	0.004	-	-	-	0.043	0.014	0.008	0.026
Aluminum (diss, 0.45 µm)	mg/L	-	Calculated	-	-	0.004	0.022	0.016	-	-	-	-	-
Aluminum (tot)	mg/L	-	-	-	-	0.004	0.067	0.036	-	-	0.028	0.029	0.096
Arsenic (tot)	mg/L	-	0.005	-	-	0.001	<0.003	<0.003	-	<0.003	<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
Cadmium (tot)	mg/L	-	Calculated	0.00021	0.000017	0.00009	<0.0001	<0.0001	-	<0.0001	<0.00009	<0.00009	<0.00009
Chromium (tot)	mg/L	-	-	0.064	-	0.003	<0.003	-	-	<0.003	<0.005	<0.005	<0.005
Cobalt (tot)	mg/L	-	0.0009	-	-	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	-	0.001	<0.0009	<0.0009	0.0012
Iron (tot)	mg/L	0.3	-	1	-	0.01	1.9	0.444	-	0.513	1.2	0.4	0.41
Lead (tot)	mg/L	-	Calculated	0.002	-	0.0005	<0.001	<0.001	-	<0.001	<0.0005	<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	-	-	-	-	<0.0001	<0.0001	-
Nickel (tot)	mg/L	0.025	-	-	-	0.001	<0.003	<0.003	-	<0.003	<0.001	<0.001	<0.001
Selenium (tot)	mg/L	0.1	-	-	-	0.002	<0.002	<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	-	<0.0001	<0.00009	<0.00009	<0.00009
Zinc (tot)	mg/L	-	0.02	0.089	0.03	0.005	<0.02	<0.02	-	<0.02	<0.005	<0.005	<0.005

Notes:	
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 75th 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 th 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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