2024 Annual Monitoring Report
East Lake WDS
Environmental Compliance Approval
No. A361115

Prepared for:

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Executive Summary

BluMetric Environmental Inc. (BluMetric®) is pleased to provide a summary of the 2024 environmental monitoring at the East Lake Waste Disposal Site (WDS), herein referred to as "the Site", in Maynooth, Ontario. This summary is presented as a plain language summary to be used in addition to the final report titled "2024 Annual Monitoring Report East Lake Waste Disposal Site, Environmental Compliance Approval No. A361115" (BluMetric, 2025).

It should be noted that this summary provides an overview of the main findings of the report to which it pertains. This summary does not provide a comprehensive report, and its review should not be considered a substitute for reading the report in its entirety.

Summary Statements, Conclusions, and Recommendations

Site visits were made on April 30 and October 28, 2024. Generally, the WDS was observed to be in good condition at the time of all site visits.

Site Operations

Waste is currently transferred to the Site from three other WDSs operated by the Municipality of Hastings Highlands (Sand Bay, Wolf Creek, and North Baptiste). The East Lake WDS also receives the majority of the construction and demolition waste generated in the Municipality. The Site has segregated collection areas for scrap metal, tires, large bulky items (couches and mattresses), electronic waste recycling and a recycling transfer station (8 cubic yard bin) for household blue box recyclable containers (aluminum cans, metal cans, plastic bottles) and fibre (paper and cardboard).

In 2024, the East Lake WDS received 37.40 tonnes of recyclable material and 309.76 tonnes of waste. In addition, a total of 289.01 tonnes of waste from Sand Bay, Wolf Creek, and North Baptiste, three transfer stations within the municipality, was transferred to the East Lake WDS in 2024. In total, the East Lake WDS received 598.77 tonnes of waste in 2024.

The remaining volumetric capacity of Phase 1 at the end of 2024 is 47,343 m^3, which gives an estimated volumetric life expectancy for Phase 1 of 26 years. A UAV survey was conducted on June 29, 2023, to determine the remaining Site capacity and contours.

There were no documented complaints, rejected waste, or emergency situations reported for the Site in 2024.

Groundwater

The flow direction based on the spring and fall 2024 data is northeast.

Analytical results from groundwater monitoring wells have indicated Guideline B-7 compliance along the northern property boundary and southern property boundary. Compliance with Guideline B-7 along the western property boundary is assumed. The Site is not compliant with Guideline B-7 along the eastern property boundary based on the results from EL-MW3. There appears to be sufficient natural attenuation occurring between the leachate well and the downgradient wells.

Groundwater monitoring should continue on a semi-annual basis for the parameters identified in Table 3, or Schedule B of the Amended ECA.

Trigger Mechanisms and Contingency Plan

The Groundwater Trigger Mechanism and Contingency Plan was initially submitted to the MECP in 2018 with the D&O Plan, which was approved in the amended ECA received in 2018. However, in March 2022, MECP comments were received indicating that a trigger plan for the Site had not been submitted. A copy of the plan is provided in Appendix F. The trigger plan is still considered to be in draft until MECP comments are received.

While not required, groundwater quality at the proposed trigger location (EL-MW1) has been assessed for compliance with the proposed groundwater trigger plan. The groundwater chemical results in 2024 did not trigger the Tier 1 Contingency Plan response for groundwater.

Landfill Gas

The RKI Eagle gas monitoring results for 2024 (0 to 15 ppm) indicated methane gas concentrations are well below the concentrations of concern as identified above for the subsurface, buildings and structures on-site.

Routine landfill gas monitoring within any buildings or structures should continue to be monitored voluntarily at the Site.

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1 Introduction

BluMetric Environmental Inc. (BluMetric®) was retained by The Municipality of Hastings Highlands (MHHs or Municipality) to conduct the 2024 environmental monitoring and sampling program and prepare the 2024 Annual Report. This report provides a summary and analysis of environmental monitoring activities at the East Lake Waste Disposal Site (WDS), near Maynooth, Ontario. The WDS, as shown in Figure 01 is herein referred to as the "Site".

This report is prepared in accordance with Condition 6 of the Environmental Compliance Approval (ECA) A361115 for the Site, amended on August 9, 2018, to approve the Development and Operations (D&O) Plan (BluMetric, 2018). The amended ECA is included in **Appendix A (A1).** The report covers all work and activities carried out for the period from January 1 to December 31, 2024.

The MECP Technical Review on the 2020 Annual Monitoring Report (dated March 2021) and the Proposed Monitoring Plan (dated February 2019) was received in March 2022, and is appended as **Appendix A (A2)**. The reviewer indicated that future reports should include a discussion of groundwater-surface water interaction and potential impacts on Cardwell Lake. They also recommended the installation of the remaining proposed monitoring wells, to the east, northeast and southeast, to determine the lateral and vertical extents of the leachate impacts. Nested monitoring wells to the east were installed in 2021.

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 through 2024.

1.1 Location

The WDS is located off Cardwell Road travelling north off East Lake Road, and it is located on land designated as Crown land in the MHHs (Figure 01). The civic address is 59 Cardwell Road, Maynooth, Ontario. The total site area is 4.05 hectares (ha), which includes a 2.3 ha landfilling area, located on Part of Lot 29, Concession 3 (formerly Wicklow Township), and now part of the MHHs. There are no buffer or other lands designated as Contaminant Attenuation Zone (CAZ), within the total site area.

The facility layout, current topography (2023), road network, and site features are shown on Figure 02.

1.2 Ownership and Key Personnel

The facility is operated by the MHHs, with the Municipal office located in Maynooth, Ontario. The property is owned by the Crown and administered by the Ministry of Natural Resources (MNR). The MNR leases the property to MHHs for use as a WDS under a Land Use Permit (LUP). The current LUP for the (No. LUP1634-1004216) dated October 1, 2016, identifies the correct geographic location of the Site and is in effect until September 30, 2026. A copy of the LUP is provided in **Appendix A (A3)**.

The facility's operational representative is responsible for all activities on-site. The Site contact is David Stewart and the Competent Environmental Practitioner (CEP) for both groundwater and surface water is Mark Somers, P.Eng., of BluMetric. Mr. Somers is a Professional Engineer as designated by Professional Engineers Ontario (PEO).

Contact information is outlined in Table 1.

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	Mark Somers, P.Eng., BluMetric Environmental	1682 Woodward Dr, Ottawa, ON K2C 3R8	(877) 487-8436 ext. 246	msomers@blumetric.ca

1.3 Description and Development of the WDS

The Site is approved for a 2.3 ha landfilling and transfer area within a total area of 4.05 ha. The East Lake WDS is operated in accordance with the approved D&O Plan (BluMetric, 2018). In addition to domestic waste, East Lake WDS 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 East Lake WDS for the collection of Electrical and Electronic Equipment (EEE) wastes. Regulations came into effect in 2020 with respect to this material, now referred to as 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.

1.4 Monitoring and Reporting Program and Objectives and Requirements

The objectives of the monitoring and reporting program are to identify and mitigate impacts to the environment caused by the municipal solid WDS. The monitoring and reporting program are designed to adhere to the WDS Technical Guidance and the ECA for the Site. The ECA identified routine groundwater monitoring and sampling but does not identify routine monitoring for explosive methane gas; however, under standard practice, it is voluntarily conducted at all buildings or structures the Site.

2 Physical Setting

2.1 Geology and Hydrogeology

2.1.1 Surficial Geology

The surficial geology of the area is glaciofluvial outwash deposits of sand and gravel and undifferentiated till (sand and sand-silt which may contain high clay content) (MNDM, Map 2556). The immediate area of the Site is characterized by generally sandy overburden with a thickness ranging to depths over 5.5 m below ground surface (mbgs).

Well records for nine wells located within 1.0 km of the Site and along Cardwell Lake were obtained from the MECP website and are provided in **Appendix C (C1)**. The well records indicate the overburden ranges from approximately 17 mbgs to 22 mbgs and generally consists of sand and gravel with some silt and clay layers.

Monitoring wells EL-MW1 and EL-MW2 at the East Lake WDS were drilled and installed in 2005 to bottom depths of 5.33 mbgs and 5.79 mbgs, respectively, and each well was intended to screen a water-bearing medium grained sand unit, however EL-MW2 has generally not produced sufficient water for sampling since it was drilled. Monitoring wells EL-MW2R (replacement well for EL-MW2), EL-MW3 and EL-MW4 were drilled and installed in August 2019 by BluMetric. Monitoring wells EL-MW2R and EL-MW3 were drilled until sufficient groundwater was encountered, while EL-MW4 was intended to reach the bedrock surface to monitor groundwater just above the bedrock between the WDS and domestic wells southeast of the Site. Since bedrock was not encountered at a depth of 24.48 mbgs and a low permeable unit (dense fine silty sand was encountered between 5.5 and 14.5 mbgs) was present above the till, it was decided to screen the till below the lower permeable unit to monitor the impacts to the till unit which is presumably above the bedrock surface. Nested monitoring wells EL-MW5.1-21 and EL-MW5.2-21 were drilled and installed in September 2021 by BluMetric to characterize downgradient groundwater quality to the east of the WDS. Deep monitoring well EL-MW5.1-21 was drilled to 12.5 mbgs and screened in a sand and gravel unit. Shallow monitoring well EL-MW5.2-21 was drilled to 6.1 mbgs and screened across a sand and gravel unit. Groundwater was measured in both wells.

Monitor depths range from 6.1 mbgs (EL-MW2R) to 24.38 mbgs (EL-MW4). The monitoring well logs are included in **Appendix C (C2).**

2.1.2 Overburden Hydrogeology

On October 24, 2019, slug-bail testing was carried out on monitoring wells EL-MW3 and EL-MW4. The results of the field testing were analyzed using the Hvorslev method and resulted in 5.25 x 10^{-5} m/s and 6.42 10^{-5} m/s in the dense sand overburden at EL-MW3 and 5.25 x 10^{-5} m/s and 4.24 x 10^{-5} m/s in the sand till at EL-MW4.

2.1.3 Bedrock Geology

The East Lake WDS is located within the Grenville geological province, on Precambrian bedrock. Bedrock is described as Felsic igneous rocks such as tonalite, granodiorite, monzonite, granite, syenite; and derived gneisses (Map 2544, MNDM). Well records identify the bedrock as granite. Based on the geology, surface water features, and historic data, the shallow aquifer is assumed to flow northeast to east toward Cardwell Lake.

2.2 Surface Water Features

There is currently no surface water monitoring completed at the East Lake WDS as there are no surface water features located in the immediate vicinity of the Site. The nearest surface waterbody is Cardwell Lake located 250 m to the east of the WDS. Figure 03 illustrates the surface topography and drainage patterns at the Site (July 2017).

3 Description of Monitoring Program

3.1 Site Inspections and Operations Monitoring

Site visits to the East Lake WDS were made on April 30 and October 28, 2024. Generally, site conditions were found to be good. The detailed site checklists are provided in **Appendix D (D-1)**. Key items requiring attention are noted below.

The following items were noted during the spring site visit:

- The active area was uncovered and not compacted.
- More interim cover required in waste areas.
- Skids should be removed from clean brush pile.
- Boulders have been added at the entrance to prevent illegal access.

The following items were noted during the fall site visit:

- Sign missing from scrap metal pile.
- The bulky waste pile was getting large.

The MHHs addressed each item listed above in a timely fashion. 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 six groundwater monitoring wells located at the Site. The location and descriptions of the groundwater monitoring wells, along with the coordinates are provided in Table 2, while the monitoring well logs are provided in **Appendix C (C2).**

Table 2: Groundwater Monitor Well Details

Sample Location	Northing	Easting	Location Description
EL-MW1	5016091	270145	Located on the north limit of the 2.30 ha waste footprint, near the northeast corner
EL-MW2R	5015893	270068	Background, located off, approximately 45 m southwest of historic buried waste
EL-MW3	5016002	270232	Downgradient (leachate), located 30 m east of the 2.30 ha waste footprint
EL-MW4	5015954	270222	Downgradient, located near the southeast corner of the 2.30 ha waste footprint
EL-MW5.1-21	5016010	270380	Downgradient, located off site, approximately 175 m east of the 2.30 ha waste footprint
EL-MW5.2-21	5016010	270378	Downgradient, located off site, approximately 175 m east of the 2.30 ha waste footprint
EL-MW6.1-23	5016150	270307	Downgradient, located off site, approximately 140 m northeast of the 2.30 ha waste footprint
EL-MW6.2-23	5016153	270303	Downgradient, located off site, approximately 140 m northeast of the 2.30 ha waste footprint

Note: UTM Zone 18, NAD 83

Monitoring wells EL-MW6.1-23 and EL-MW6.2-23 were drilled in 2023 on the east-northeast property boundary.

Groundwater samples were collected during the spring and fall 2024 sampling events and analyzed to characterize the groundwater quality at the Site. Table 3 lists the groundwater quality monitoring parameters that were analyzed.

Table 3: Groundwater Quality Monitoring Parameters

Category	Parameters
Organic Parameters	Biological Oxygen Demand (BOD_5), Dissolved Organic Carbon (DOC)
Inorganic Parameters	Ammonia, Chloride, Major Ions (Alkalinity, Calcium, Magnesium, Potassium, Sodium, Sulphate), Nitrate, Total Kjeldahl Nitrogen (TKN)
Dissolved Metals	Aluminum, Barium, Boron, Iron, Manganese, Lead
Physical/Chemical Parameters	Chemical Oxygen Demand (COD), Conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Hardness

Lead was inadvertently omitted from the groundwater quality monitoring parameter suite from 2017 to spring 2023. Lead was analyzed at all groundwater monitoring locations beginning in fall 2023, as required by the ECA.

Volatile Organic Compounds (VOCs) are listed as a parameter in Schedule B of the ECA, however, as per MECP correspondence (March 2022), sampling of VOCs every five years is acceptable if no VOCs are detected during analysis. VOC sampling was conducted in 2019 at the leachate monitor, EL-MW3, and all results were below detectable limits. The next VOC sampling event was scheduled to occur in 2024 but based on MECP correspondence (March 2022), this will occur in 2025.

Field measurements of groundwater, pH, temperature, and conductivity are collected at the time of sampling.

During the spring and fall site visits, the groundwater monitoring wells were inspected and any repairs such as new locks, labels or well caps, were made as necessary. Watertight casings and seals remain in place at all wells to ensure that surface water or foreign materials cannot enter groundwater monitoring wells. All groundwater monitoring wells are fitted with a vermin-proof cap to meet the requirements of Ontario Regulation 903 and are locked to provide protection against vandalism.

3.2.1.1 Groundwater Elevation and Flow Monitoring

During each monitoring event, groundwater elevations were collected from the monitoring wells. Groundwater level measurements were collected using an electronic water level meter prior to purging/sampling activity. Groundwater elevation data are summarized in Table 4.

Table 4: Groundwater Elevation Data

Groundwater Monitor	Elevation (masl) (TPVC)	Water Level 30-Apr-24 (mbtpvc[1])	Water Level 28-Oct-24 (mbtpvc)	Groundwater 30-Apr-24 (masl)	Groundwater 28-Oct-24 (masl)
EL-MW1	407.10	5.19	5.44	401.91	401.66
EL-MW2R	418.22	9.635	8.94	408.585	409.28
EL-MW3	404.41	4.34	4.91	400.07	399.50
EL-MW4	404.44	3.33	3.86	401.11	400.58
EL-MW5.1-21	395.98	2.95	3.44	393.03	392.54
EL-MW5.2-21	396.07	1.68	2.49	394.39	393.58
EL-MW6.1-23	396.31	5.115	5.33	391.195	390.98
EL-MW6.2-23	396.31	5.25	5.43	391.06	390.88

Note:
[1] mbtpvc = metres below top of PVC

3.2.1.2 Groundwater Gradients and Flow Direction

The horizontal hydraulic gradient is calculated based on flow direction and groundwater elevations shown on Figure 04 and 05.

The flow direction based on the spring 2024 data in Figure 04 is northeast with a horizontal gradient of 0.052 m/m. Similarly, flow direction based on the fall 2024 data in Figure 05 is primarily northeast with a horizontal gradient of 0.055 m/m.

The vertical hydraulic gradient at the nested well (EL-MW5.1-21 and EL-MW5.2-21) was calculated to be 0.21 m/m in the spring and 0.16 m/m in the fall, both in a downward direction.

3.2.2 Surface Water Monitoring

Surface water monitoring is not required at the East Lake WDS.

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. The methane concentration limits, as per Regulation 232/98, 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 conducted voluntarily at the Site.

3.3 Monitoring Procedures and Methods

3.3.1 Groundwater Monitoring

Groundwater monitoring wells were purged a minimum of three well volumes or until purged dry. In the case where a well 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 multi-meter. The instrument was calibrated as per the manufacturer's instructions prior to the Site visit. Samples were field filtered for dissolved organic carbon (DOC) and dissolved metals. An additional bottle was filled and filtered by the laboratory for analysis of aluminum for comparison to the Provincial Water Quality Objectives (PWQO).

Samples were collected in laboratory-prepared and supplied bottles and submitted to Bureau Veritas Laboratories in Kingston, Ontario for analysis. Bureau Veritas is an accredited member of the Canadian Association of Laboratory Accreditation (CALA). Groundwater samples were stored at approximately 4° Celsius during shipment to laboratory. Hold times for samples conformed to 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 COC forms are compiled in **Appendix D (D-2)**.

3.3.2 Landfill Gas Monitoring

Landfill gas monitoring is not required as part of the ECA requirements for this site but was voluntarily completed. 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 2024 sampling events. Gas monitoring measurements were taken from the building by inserting the intake of the gas monitor through a small opening 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 monitor in the monitoring well and creating a seal around the well opening and the gas intake.

3.3.3 Field QA/QC Program

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 are capable of yielding reproducible results. Field duplicates were collected concurrently with the original sample. Field duplicates were collected at a 10% frequency during the sampling program 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 readable 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 and 20% for metals and inorganics.

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 is capable of producing repeatable results.

One blind field duplicate was sampled and submitted for analyses per sampling event. 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

Groundwater quality has been compared to the Ontario Drinking Water Standards and Operational Guidelines (ODWSOG), the calculated Reasonable Use Values (RUVs), and the Provincial Water Quality Objectives (PWQO).

Field Measurements

The summary of the field measurements of groundwater pH, temperature, and conductivity are presented in Table 8.

Table 5: Groundwater Quality Field Measurements

Groundwater Monitor	pH		Temperature (°C)		Conductivity (µS/cm)	
	30-Apr-24	28-Oct-24	30-Apr-24	28-Oct-24	30-Apr-24	28-Oct-24
EL-MW1	6.40	N/A	6.4	N/A	245	N/A
EL-MW2R	6.14	6.41	7.0	7.0	98	58
EL-MW3	5.89	5.96	9.3	9.1	2589	2643
EL-MW4	7.07	6.28	6.6	7.1	137	129
EL-MW5.1-21	6.53	6.22	5.8	7.2	65	58
EL-MW5.2-21	5.61	5.49	3.4	9.8	39	35
EL-MW6.1-23	7.89	8.03	6.0	6.4	112	107
EL-MW6.2-23	6.52	6.60	5.8	6.6	272	290

Note:
[1] EL-MW1 no recovery after purging dry in fall 2024 sampling

Ontario Drinking Water Standards and Operational Guidelines (ODWSOG)

A summary of the 2024 groundwater parameters exceeding the Ontario Drinking Water Standards, Objectives and Guidelines (ODWSOG) criteria is included in Table 9. The full laboratory results are presented in Table 12 at the end of the report.

Table 6: Groundwater Quality Results Not Meeting ODWSOG Criteria

Location	Parameters	2024 Sampling Event(s)
EL-MW1	Alkalinity (lower limit) Hardness	*Spring *Spring
EL-MW2R	Alkalinity (lower limit) Hardness (lower limit)	Spring, Fall Spring, Fall
EL-MW3	Sulphate DOC TDS Hardness (upper limit) Boron Manganese	Spring, Fall Spring, Fall Spring, Fall Spring, Fall Spring, Fall Spring, Fall
EL-MW4	Hardness (lower limit)	Spring, Fall
EL-MW5.1-21	Alkalinity (lower limit) Hardness (lower limit)	Spring, Fall Spring, Fall
EL-MW5.2-21	Alkalinity (lower limit) Hardness (lower limit) pH (lower limit)	Spring, Fall Spring, Fall Fall
EL-MW6.1-23	Hardness (lower limit) Manganese	Spring, Fall Spring, Fall
EL-MW6.2-23	Manganese	Spring

Note:
*- EL-MW1 no recovery after purging dry in fall 2024 sampling

PWQO

At the request of the MECP, groundwater results were compared to the PWQO criteria. The only parameters that are tested at the Site and have surface water criteria under the PWQO are alkalinity, pH, dissolved aluminum, boron, and iron.

The PWQO exceedances are summarized in Table 7 below. The full laboratory results are presented in Table 12 at the end of the report.

Table 7: Groundwater Quality Parameters Exceeding PWQO

Location	Parameters	2024 Sampling Event(s)
EL-MW1	None	N/A
EL-MW2R	None	N/A
EL-MW3	Boron	Spring, Fall
EL-MW4	None	N/A
EL-MW5.1-21	None	N/A
EL-MW5.2-21	None	N/A
EL-MW6.1-23	None	N/A
EL-MW6.2-23	None	N/A

Groundwater alkalinity concentrations at the Site are naturally low. The average concentration at the background location using data from 2019 to 2024 is 16 mg/L. PWQO criteria states that alkalinity cannot be decreased by more than 25% of the natural concentration. Alkalinity concentrations have been observed to remain stable or increase therefore the downgradient wells do not exceed the PWQO for this parameter.

Reasonable Use Values (RUVs)

The water quality results for background groundwater monitoring well EL-MW2R from 2019 to 2024 were used to calculate Reasonable Use Values (RUV), as per the guidance offered by MECP Procedures B-7 and B-7-1 using the following equation.

$$Cm = Cb + x\,(Cr - Cb)$$

Where:

- Cm: is the maximum allowable concentration in groundwater beneath adjacent property (Reasonable Use Value);
- Cb: is the median background concentration before any effects from human activity;
- Cr: is the maximum concentration that should be present based on use (ODWSOG); and
- x: is the constant that reduces the contamination to a level considered by the MECP 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 8 summarizes the data that were used to calculate Cm values (RUV), for the parameters of interest.

Table 8: Reasonable Use Calculations

Parameter	Units	ODWSOG		Historical Median	x	RUV
		Type	Cr	Cb		Cm
Alkalinity as CaCO3 (upper)	mg/L	OG	500	15	0.5	256.50
Boron	mg/L	IMAC	5.0	0.028	0.50	0.2
Chloride	mg/L	AO	250	0.52	0.5	125.26
DOC	mg/L	AO	5	1.3	0.5	3.15
Iron	mg/L	AO	0.3	0.032	0.5	0.3
Manganese	mg/L	AO	0.05	0.006	0.5	0.03
N-NO3 (Nitrate)	mg/L	MAC	10	0.1	0.25	2.58
Sodium	mg/L	AO	200	2.59	0.5	101.30
Sulphate	mg/L	AO	500	8.92	0.5	254.46
TDS	mg/L	AO	500	48	0.5	274.00

A comparison of the groundwater chemistry results against the RUVs is provided in Table 12, at the end of the report. Table 9 below summarizes the parameters that exceeded the RUVs in 2024. It should be that 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 9: Groundwater Quality Results Exceeding RUV Criteria

Location	Parameters	2024 Sampling Event(s)
EL-MW1	None	None
EL-MW2R	None	None
EL-MW3	Sulphate Sodium Alkalinity DOC TDS Boron Manganese	Spring, Fall Spring, Fall Spring, Fall Spring, Fall Spring, Fall Spring, Fall Spring, Fall
EL-MW4	None	None
EL-MW5.1-21	None	None
EL-MW5.2-21	None	None
EL-MW6.1-23	Manganese	Spring, Fall
EL-MW6.2-23	Manganese	Spring, Fall

4.2 Landfill Gas Monitoring

Landfill gas readings collected during the 2024 spring and fall sampling events are presented in Table 10 below.

Table 10: 2024 Landfill Gas Field Data

Location	Description of Reading Location	Spring 2024 Reading (ppm)	Fall 2024 Reading (ppm)
Attendant's building	Through the door	0	0
EL-MW1	Well head	0	5
EL-MW2R	Well head	0	15
EL-MW3	Well head	0	5
EL-MW4	Well head	0	5
EL-MW5.1-21	Well head	0	0
EL-MW5.2-21	Well head	0	0
EL-MW6.1-23	Well head	0	0
EL-MW6.2-23	Well head	0	0

4.3 QA/QC Results

One groundwater duplicate sample was collected during each sampling event in 2024. The consistency of the results was evaluated based on the relative percentage difference (RPD) of each field duplicate pair. No field duplicate pairs exceeded the recommended percentage difference. The QA/QC comparison calculations are provided in **Appendix D, Item D-3.**

5 Assessment, Interpretation, and Discussion

5.1 Groundwater Assessment

The groundwater chemistry results for the six monitoring wells sampled during the spring and fall monitoring events at the East Lake WDS in 2024, are presented in Table 12 at the end of the report. Parameters with concentrations that fell outside the RUVs, ODWSOG, and/or PWQO criteria are highlighted. The laboratory reports and chain of custody records are included in **Appendix D (D-2)**.

The historical groundwater quality results from the East Lake WDS are presented in **Appendix E (E-1 and E-2)**, and chemistry trend graphs for select parameters are provided following the tables, figures, and photographs, at the end of this report. Graphs demonstrate an increasing trend at monitoring well EL-MW3 for alkalinity, boron, and DOC while the other parameters at this location are observed to be generally stable or decreasing. An increasing trend in nitrate concentrations is apparent at EL-MW2R since monitoring began in 2019; however, nitrate concentrations remain well below those replaced at EL-MW2. Concentrations at EL-MW1 and EL-MW4 are stable, with fluctuations reported within their typical range. However, it is important to note there is insufficient data to properly assess trends at the monitoring wells installed in 2019. It is anticipated that at least five years of semi-annual data will be required prior to analysing trends at these newer wells (i.e. 2025). No trends were established for the two wells installed in 2021.

Monitoring well EL-MW2R is located just outside the property boundary by the southwest corner and is considered to be the background well of the site. All groundwater quality parameters met the ODWSOG criteria during both spring and fall sampling events for EL-MW2R except for alkalinity and hardness, both of which were below the lower limit of their respective ODWSOG criteria. This is consistent with historical results reported at this location. EL-MW2R represents background conditions for the Site, and low alkalinity, hardness, and pH are considered to be naturally occurring. There were no RUV exceedances reported at this location.

Monitoring well EL-MW4 is located east-northeast of the background well, near the southeast corner of the approximate buried waste, within the property boundary. There were no ODWSOG or RUV exceedances reported at this location, other than an exceedance of the lower ODWSOG limit for hardness which is considered to be naturally occurring. This well is not considered to be impacted by the landfill.

Monitoring well EL-MW3 is located east (downgradient) of the approximate buried waste within the property boundary and is intended to be used as the leachate well of the Site. The groundwater quality was compared to the RUV criteria, and several parameters exceeded during both the spring and fall sampling events (sulphate, sodium, alkalinity, DOC, TDS, boron, and manganese). Five of those parameters also exceeded the ODWSOG guidelines during both sampling events (sulphate, DOC, TDS, boron, and manganese) along with an ODWSOG exceedance for hardness in the spring and fall. One parameter (boron) also exceeded the PWQO guideline during both sampling events. This well is considered to be impacted by the landfill and is representative of leachate quality.

Monitoring well EL-MW1 is located north of the approximate buried waste, within the property boundary. There were no ODWSOG exceedances other than low alkalinity and low hardness, which are considered to be naturally occurring and are consistent with historical results. No RUV exceedances were reported at this location. This well is not considered to be impacted by the landfill.

Nested monitoring wells EL-MW5.1-21 and EL-MW5.2-21 are located the furthest east, outside of the property boundary and downgradient of the approximate buried waste. There were no ODWSOG exceedances other than low alkalinity and hardness reported at both wells during both sampling events, and low pH reported at EL-MW5.2-21 during the fall sampling event. These exceedances are considered to be naturally occurring and are consistent with historical results. No RUV exceedances were reported at either well. These wells are not considered to be impacted by the landfill.

Nested monitoring wells EL-MW6.1-23 and EL-MW6.2-23 are located northeast, outside of the property boundary and downgradient of the approximate buried waste. There were no ODWSOG exceedances other than low hardness at EL-MW6.1-23 and manganese exceedances at both wells. The exceedance of hardness is considered to be naturally occurring. These wells should continue to be monitored to determine whether they are impacted by the landfill. A minimum of two years of data is required from these wells before including them in the CAZ assessment.

Analytical results from groundwater monitoring wells have indicated Guideline B-7 compliance along the northern property boundary and southern property boundary. Former monitoring well EL-MW2 was located the western property boundary, while replacement well EL-MW2R is located approximately 20 m west of the property boundary. Based on the inferred direction of groundwater flow to the northeast-east and the groundwater quality at EL-MW2R, the western property boundary is assumed to be compliant with Guideline B-7.

The Site is not compliant with Guideline B-7 along the eastern property boundary based on the results from EL-MW3. There appears to be sufficient natural attenuation occurring between the leachate well and the nested wells installed in 2021 further east. However, the actual distance to attenuate groundwater is unknown and may be less than the distance between EL-MW3 and the nested wells (approximately 145 m). Monitoring wells EL-MW5.1-21 and EL-MW5.2-21 are located 115 m east of the property limit. Monitoring wells EL-MW6.1-23 and EL-MW6.2-23 were added to the east-northeast in 2023 as per Phase 3 of the proposed monitoring program. The required CAZ boundary will be reassessed based on the results of these new boundary wells after a minimum of 2 years of data collection. Once the CAZ re-assessment has been approved by the MECP, the municipality should take steps to acquire the necessary CAZ lands around Site.

5.2 Groundwater and Surface Water Interaction

As per the MECP correspondence dated March 23, 2022, groundwater-surface water interaction and potential impacts on Cardwell Lake, which is located approximately 250 m east of the Site, will now be discussed. The groundwater chemistry results from all six monitoring wells were compared to the PWQO criteria. Low pH, below the PWQO range, was reported at EL-MW5.2-21, and a boron exceedance was reported at EL-MW3. While the boron PWQO exceedances at the leachate well (EL-MW3) are likely related to the WDS, there were no boron exceedances reported at the downgradient

nested wells. These wells are located approximately 115 m east of the property boundary, which places them between the East Lake WDS and Cardwell Lake. There appears to be sufficient natural attenuation occurring between the leachate well (EL-MW3) and the nested wells, and therefore surface water impacts to Cardwell Lake are unlikely.

5.3 Landfill Gas Assessment

The RKI Eagle gas monitoring results for 2024 (0 to 15 ppm) indicated methane gas concentrations are well below the concentrations of concern as identified above for the subsurface, buildings and structures on-site.

5.4 Trigger Mechanisms and Contingency Plan

The Groundwater Trigger Mechanism and Contingency Plan was initially submitted to the MECP in 2018 with the D&O Plan, which was approved in the amended ECA received in 2018. However, in March 2022, MECP comments were received indicating that a trigger plan for the Site had not been submitted. A copy of the plan is provided in **Appendix F.** The trigger plan is still considered to be in draft until MECP comments are received.

The proposed trigger assessment points for groundwater are EL-MW1 along the north property boundary along with newly installed wells EL-MW6.1-23 and EL-MW6.2-23 to be future trigger assessment points. The assessment criteria include alkalinity, boron, chloride, DOC, iron, manganese, and TDS. The Contingency Plan is triggered if four or more of the trigger parameters exceed the trigger limit, which is equal to the RUVs, for one assessment point for one sampling event.

While not required, groundwater quality at the proposed trigger location (EL-MW1) has been assessed for compliance with the proposed groundwater trigger plan. The groundwater chemical results in 2024 did not trigger the Tier 1 Contingency Plan response for groundwater.

6 On-Site Operations

6.1 Site Operations

Waste is currently transferred to the Site from three other WDS/WTSs operated by MHHs (Sand Bay, Wolf Creek, and North Baptiste). The East Lake WDS also receives the majority of the construction and demolition waste generated in the Municipality.

The Site has segregated collection areas for scrap metal, tires, large bulky items (couches and mattresses), electronic waste recycling and a recycling transfer station (8 cubic yard bin) for household blue box recyclable containers (aluminum cans, metal cans, plastic bottles) and fibre (paper and cardboard). The Municipality implemented a clear bag policy in October 2014 to facilitate increased waste diversion to extend the operational life of their 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.

6.2 Annual Waste Summary

Although access to the Site is controlled via a locked security gate, residents occasionally deposit garbage at the disposal site outside of the landfill's normal operating hours. Estimated volumes for the Site are provided below and are based on a combination of the contractors' tonnages and estimations based on the number of vehicles and/or containers. The quantities below include recyclables (R) and waste (W) from both the residential and commercial sources within the municipality. The annual waste and recycling tonnages for 2023 and 2024 are tabulated below in Table 11. An average of 15 kg per bag, provided by the Municipality, is used in the waste calculations.

Table 11: Annual Recycling and Waste Tonnages

Q1		Q2		Q3		Q4		Total Annual	
R	W	R	W	R	W	R	W	R	W
2023									
6.65	51.81	10.49	68.52	9.95	85.53	8.33	66.63	**35.42**	**272.49**
2024									
8.25	65.91	8.82	74.72	12.21	93.68	8.12	75.45	**37.40**	**309.76**

Based on these reported quantities, the mass of recyclables collected in 2024 is 5.3% higher than what was collected in 2023, while the quantity of waste received at the Site is 12.1% higher than what was received in 2023. Based on those numbers, 10.77% of the total waste received was recycled in 2023, this is lower than the 13.00% calculated in 2023.

A total of 289.01 tonnes of waste from Sand Bay, Wolf Creek, and North Baptiste, three transfer stations within the municipality, was transferred to the East Lake WDS in 2024. In total, the East Lake WDS received 598.77 tonnes of waste in 2024.

In addition, 2,240 tonnes of construction and demolition (C&D) waste was received at the East Lake WDS in 2024. The approved D&O Plan (2018) states that the clean untreated and unpainted construction and demolition waste is to be ground every two years for use as cover material at this Site. According to the ECA, a ratio of 40% soil and 60% chipped wood is acceptable as cover material. Chipping the wood is recommended as it can substantially reduce the bulk of some wood waste. Alternatively, this material can be burned on site following the proper guidelines. A UAV topographical survey was conducted in June 2023 to assess the current landfill contours and include the actual volume of C&D waste deposited in the WDS. C&D volume has been estimates since the previous survey was done in 2017.

6.2.1 Summary of Segregated Materials Removed

Segregated materials are collected at each of the nine WDSs/WTSs in Hastings Highlands. In 2024, a total of 29.73 tonnes of scrap metal, 65.93 tonnes of bulky waste, 5.46 tonnes of electrical and electronic waste, and 245 tires was collected from the Site.

Household hazardous wastes are not collected at the East Lake WDS. The Municipality however does ensure household batteries inadvertently left at the WDS are disposed of properly. Battery quantities were not tracked by site, but a total of 975 kg was received at all nine sites.

6.3 Annual Complaints & Emergency Situations Summary

There were no documented complaints, rejected waste, or emergency situations report at the East Lake WDS in 2024.

6.4 Capacity

The East Lake WDS has a total area of 4.05 hectares (ha), of which 2.3 ha is designated as approved landfilling area. According to the amended ECA dated August 9, 2018, the approved final volume of the WDS is 147,546 m^3, including daily interim cover, intermediate cover, and final cover. The ECA states the maximum capacity for Phase 1 is 85,546 m^3.

Figure 06 presents the remaining fill capacity captured during the June 29, 2023, topographical survey. According to the most recent topographical survey data from June 2023, plus the amount of waste received from June to December, the remaining capacity for Phase 1 was estimated to be 48,838 m^3. As required per the D&O, approximately 8,270 m^3 of the remaining capacity will be used for a 600 mm thick final cap material. The remaining volume for waste, interim and intermediate cover following the 2023 survey was therefore estimated to be 40,568 m^3.

The last five annual monitoring reports for the Site have recorded annual waste generation rates of 588.39 (2020), 604.04 (2021), 569.64 (2022) 550.59 (2023), and 598.77 (2024) tonnes; resulting in an average waste generation rate of 582.29 tonnes per year. With a compaction density assumption of 500 kg/m3, this equates to 1164.57 m^3 of compacted waste per year. Including 25% volume of daily interim cover, the average annual fill rate at the East Lake WDS is expected to be approximately 1455.71 m^3 per year.

The remaining volumetric capacity and life expectancy for the East Lake WDS was calculated as follows:

Net fill available on June 29, 2023:	49,135 m^3
Waste and cover deposited from July 2023 to Dec 2024:	1,792 m^3
Remaining Capacity including final cap (2024):	47,343 m^3
Final cap material volume:	8,270 m^3
Remaining Capacity including excluding final cap (2024):	39,073 m^3
Average annual fill rate:	1,500 m^3/year
Life Expectancy:	**26 years**

Using the 2024 remaining capacity of Phase 1 and the average fill rate for the last five years, the life expectancy of Phase 1 of the WDS was calculated to be 26 years. This number is an overestimate as it does not consider intermediate soil cover, or the C&D waste deposited on Site. Assuming the average annual fill rate remains constant, the lifespan of the landfill including all phases was overestimated at 67 years, not considering intermediate cover. The completion of Phase 2 and 3 is dependant on the approval of an updated D&O. Several factors, such as waste generation rates, waste compaction rates, closure of other municipal WDS, environmental impacts, etc. may influence the lifespan of the Site.

An updated D&O Plan is required to be submitted two years prior to the anticipated Closure of Phase 1, and a Closure Plan is required to be submitted two years prior to the anticipated closure of the Site as identified in Conditions 3.7 and 3.8 of the ECA. A UAV survey was conducted on June 29, 2023, to determine the remaining Site capacity and contours. Topographical surveys are required every 5 years as per the ECA, Section 6.4 (b)(i).

7 Summary Statements, Conclusions, and Recommendations

The following statements are based on the results of the 2024 monitoring program:

7.1 Site Operations

- A Development and Operations (D&O) Plan for the Site was prepared and finalized in February 2018. The D&O Plan was approved under the amended ECA (August 9, 2018).
- There were no records of public concerns/complaints and emergency situations occurrences in 2024 at the East Lake WDS. Should they occur in the future, the complaint and the Municipality's response is to be documented.
- It is recommended that periodic inspections be performed and documented by the Municipality to ensure proper burning practices are being followed.
- It is recommended that waste transferred to the Site continues to be accounted for and documented by tracking the number of loads of waste and/or bags deposited at the Site. Detailed descriptions and quantities of rejected waste should continue to be documented.

- Public education with respect to waste reduction and recycling should be an ongoing effort by the Municipality.

7.2 Groundwater

- Groundwater monitoring should continue on a semi-annual basis for the parameters identified in Table 3, or Schedule B of the Amended ECA.
- VOCs were sampled in 2019 at the leachate monitor, EL-MW3, and were found to be below detectable limits. The next VOCs sampling event will occur in 2025.
- Graphs demonstrate an increasing trend at monitoring well EL-MW3 for alkalinity, boron, and DOC while the other parameters at this location are observed to be generally stable or decreasing. An increasing trend in nitrate concentrations is apparent at EL-MW2R since monitoring began in 2019. Concentrations at EL-MW1 and EL-MW4 are stable, with fluctuations reported within their typical range. There is insufficient data to properly assess trends at the monitoring wells installed in 2019, 2021 and 2023. It is anticipated that at least five years of semi-annual data will be required prior to analysing trends at these newer wells.
- Analytical results from groundwater monitoring wells have indicated Guideline B-7 compliance along the northern property boundary and southern property boundary. Compliance with Guideline B-7 along the western property boundary is assumed based on groundwater quality at EL-MW2R and the inferred direction of groundwater flow. The Site is not compliant with Guideline B-7 along the eastern property boundary based on the results from EL-MW3. There appears to be sufficient natural attenuation occurring between the leachate well and the downgradient wells. However, the actual distance to attenuate groundwater is unknown and may be less than the distance between EL-MW3 and the nested wells (EL-MW5.1-21 and EL-MW5.2-21) which is approximately 145 m east. Monitoring wells EL-MW5.1-21 and EL-MW5.2-21 are located 115 m east of the property limit.
- Two additional wells (EL-MW6.1-23 and EL-MW6.2-23) serving as the east-northeast property boundary were installed in 2023 as per Phase 3 of the proposed monitoring program. The required CAZ boundary will need be reassessed based on the results of these new boundary wells. Once the CAZ re-assessment has been approved by the MECP, the municipality should take steps to acquire the necessary CAZ lands around Site.

- While not required, groundwater quality at the proposed trigger location (EL-MW1) has been assessed for compliance with the proposed groundwater trigger plan. The groundwater chemical results in 2024 did not trigger the Tier 1 Contingency Plan response for groundwater.

7.3 Groundwater and Surface Water interaction

- There appears to be sufficient natural attenuation occurring between the leachate well EL-MW3 where a PWQO exceedance was reported and the downgradient nested wells. Surface water impacts to Cardwell Lake are unlikely.

7.4 Landfill Gas

- The RKI Eagle gas monitoring results for 2024 (0 to 15 ppm) indicated methane gas concentrations are well below the concentrations of concern as identified above for the subsurface, buildings and structures on-site.

7.5 Site Capacity and Life Expectancy

- The remaining volumetric capacity of Phase 1 at the end of 2024 is 39,073 m^3, which gives an estimated volumetric life expectancy for Phase 1 of 26 years.
- The estimated life expectancy is an overestimate as it does not consider intermediate soil cover, or the construction and demolition waste deposited on Site.
- A UAV survey was conducted on June 29, 2023, to determine the remaining Site capacity and contours.
- An updated D&O Plan is required to be submitted two years prior to the anticipated Closure of Phase 1, and a Closure Plan is required to be submitted two years prior to the anticipated closure of the Site as identified in the ECA Items 3.7 and 3.8.

8 Limiting Conditions

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

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

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

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

Respectfully submitted,
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9 References

BluMetric, 2018. Development and Operations Plan East Lake WDS – 2018. Submitted to the Corporation of the Municipality of Hastings Highlands, February 2018.

BluMetric, 2022. *East Lake WDS 2021 Annual Report.* Submitted to The Corporation of the Municipality of Hastings Highlands, March 2022.

BluMetric, 2023. *East Lake WDS 2022 Annual Report.* Submitted to The Corporation of the Municipality of Hastings Highlands, March 2023.

BluMetric, 2024. *East Lake WDS 2023 Annual Report.* Submitted to The Corporation of the Municipality of Hastings Highlands, March 2024.

BluMetric, 2019. *East Lake WDS Proposed Monitoring Plan.* Submitted to The Corporation of the Municipality of Hastings Highlands, February 2019

CCME (Canadian Council of Ministers of the Environment), 2011. *Protocols Manual For Water Quality Sampling in Canada.* 186p. http://www.ccme.ca/files/Resources/water/protocols_document_e_final_101.pdf

Groundwater Information Network, http://gw-info.net/, April 2015.

Ministry of the Environment (MOE). Procedure B-7-1: *Determination of Contaminant Limits and Attenuation Zones.* Ministry of Environment, Government of Ontario. 9pp.

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

Ministry of Northern Development and Mines (MNDM). Map 2556, Quaternary Geology of Ontario, Southern Sheet, 1991.

Ministry of Northern Development and Mines (MNDM). Map 2554, Bedrock Geology of Ontario, Southern Sheet, 1991.

Table

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.2-21	EL-MW5.2-21	EL-MW6.1-23	EL-MW6.1-23	EL-MW6.2-23	EL-MW6.2-23	ELMW1	ELMW2R	ELMW2R	ELMW3	ELMW3
						Sample ID	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.2-21	EL-MW5.2-21	EL-MW6.1-23	EL-MW6.1-23	EL-MW6.2-23	EL-MW6.2-23	EL-MW1	EL-MW2R	EL-MW2R	EL-MW3	EL-QAQC-GW1 (ELMW3)
						Sample Date	2024-Apr-30	2024-Oct-28	2024-Apr-30	2024-Oct-28	2024-Apr-30	2024-Oct-28	2024-Apr-30	2024-Oct-28	2024-Apr-30	2024-Apr-30	2024-Oct-28	2024-Apr-30	2024-Apr-30
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number	C4D1233	C4Y1997	C4D1233	C4Y1997	C4D1233	C4Y1997	C4D1233	C4Y1997	C4D1233	C4D1233	C4Y1997	C4D1233	C4D1233
						Lab Sample ID	ZBG715	AHLD66	ZBG716	AHLD67	ZBG717	AHLD68	ZBG718	AHLD69	ZBG711	ZBG712	AHLD63	ZBG713	ZBG719
Anions						Detection Limit													
Chloride	mg/L	125.3	250	-	-	1	1.4	1.9	1.8	2.4	<1	<1	6.2	12	4.9	<1	<1	110	110
Nitrate as N	mg/L	2.6	10	-	-	0.1	0.13	<0.1	0.12	<0.1	<0.1	<0.1	2.37	2.17	1.25	0.1	0.11	0.16	0.15
Sulphate	mg/L	254.4	500	-	-	1, 5, 10	5.7	5.4	4.1	3.4	15	15	27	29	14	8.1	8	1100	1100
Cations																			
Calcium (diss)	mg/L	-	-	-	-	0.2	4.8	4.8	2.7	2.9	11	11	27	28	5.6	5.5	5.2	420	410
Magnesium (diss)	mg/L	-	-	-	-	0.05	1.3	1.2	0.6	0.62	3.3	3.3	7.8	7.8	1.3	1.1	1	33	34
Potassium (diss)	mg/L	-	-	-	-	0.2	0.88	0.83	0.39	0.52	2	1.9	2.9	2.7	0.9	0.75	0.72	8.4	8.3
Sodium (diss)	mg/L	101.3	200	-	-	0.1	2.6	2.4	1.3	1.4	3.5	3.3	14	14	3.8	2.6	2.7	170	180
General Chemistry																			
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1	23	14	9.9	4.4	43	36	91	89	8.1	22	14	260	250
Ammonia as N	mg/L	-	-	-	-	0.05	<0.05	<0.05	0.054	<0.05	0.095	0.059	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	0.19
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 8	<4	4.1	<4	<4	<4	<4	<4	14	<4	7.1	<4	130	130
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4	0.9	1.4	1.8	1.7	0.9	0.9	1.6	1.3	1.3	1.1	1.4	47	48
Electrical Conductivity	uS/cm	-	-	-	-	1	54	53	30	35	110	110	280	300	80	56	58	2500	2500
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	17	17	9.1	9.9	41	40	100	100	20	18	17	1200	1200
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.49	7.14	6.98	6.46	7.99	7.61	7.67	7.3	6.93	7.49	7.14	7.07	7.34
Total Dissolved Solids	mg/L	274	500	-	-	10	50	30	60	55	145	45	215	235	125	65	30	2290	2270
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	<0.1	<0.1	<0.1	1.8	1.8
Total Suspended Solids	mg/L	-	-	-	-	10, 20, 50, 200	800	340	90	210	39000	7400	610	2400	5100	1100	650	480	400
Metals																			
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.005, 0.03	<0.005	<0.005	0.023	0.028	0.01	0.012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.0049	<0.0049	<0.0049	0.031	0.039	0.028	0.015	<0.0049	<0.0049	0.0093	<0.0049	<0.0049	<0.0049	<0.0049
Barium (diss)	mg/L	-	1	-	-	0.002	0.0053	0.0056	0.01	0.014	0.0077	0.0078	0.02	0.02	<0.002	0.0043	0.0038	0.04	0.037
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.05	<0.01	<0.01	<0.01	0.021	<0.01	0.016	0.082	0.095	<0.01	<0.01	<0.01	9.1	8.9
Iron (diss)	mg/L	0.15	0.3	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	<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	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	<0.002	<0.002	<0.002	0.0075	0.084	0.093	0.055	0.04	<0.002	0.0025	0.003	3	3

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet for all Calculated criteria/guidelines.

Result — Calculated Criteria result could not be determined. Please see Factsheet and calculate manually.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	ELMW3	ELMW3	ELMW4	ELMW4
						Sample ID	EL-MW3	EL-QAQC-GW1 (ELMW3)	EL-MW4	EL-MW4
						Sample Date	2024-Oct-28	2024-Oct-28	2024-Apr-30	2024-Oct-28
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number	C4Y1997	C4Y1997	C4D1233	C4Y1997
						Lab Sample ID	AHLD64	AHLD70	ZBG714	AHLD65
Anions						Detection Limit				
Chloride	mg/L	125.3	250	-	-	1	92	97	5.5	6.3
Nitrate as N	mg/L	2.6	10	-	-	0.1	<0.1	<0.1	0.31	0.36
Sulphate	mg/L	254.4	500	-	-	1, 5, 10	1100	1100	9.4	9
Cations										
Calcium (diss)	mg/L	-	-	-	-	0.2	450	450	10	11
Magnesium (diss)	mg/L	-	-	-	-	0.05	40	39	4.2	4.5
Potassium (diss)	mg/L	-	-	-	-	0.2	8.7	8.4	1.2	1.2
Sodium (diss)	mg/L	101.3	200	-	-	0.1	180	180	4.6	4.4
General Chemistry										
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1	260	260	46	39
Ammonia as N	mg/L	-	-	-	-	0.05	0.21	0.2	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 8	160	160	<4	<4
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4	47	48	1	1.3
Electrical Conductivity	uS/cm	-	-	-	-	1	2400	2600	120	130
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	1300	1300	42	46
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.61	6.99	7.83	7.61
Total Dissolved Solids	mg/L	274	500	-	-	10	2140	2330	105	60
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1	2	2	<0.1	<0.1
Total Suspended Solids	mg/L	-	-	-	-	10, 20, 50, 200	430	430	1100	1400
Metals										
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.005, 0.03	<0.03	<0.03	<0.005	<0.005
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.0049	0.0049	<0.0049	<0.0049	<0.0049
Barium (diss)	mg/L	-	1	-	-	0.002	0.033	0.033	0.005	0.0055
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.05	12	11	<0.01	<0.01
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.1	0.13	0.14	<0.1	<0.1
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	6	5.8	<0.002	<0.002

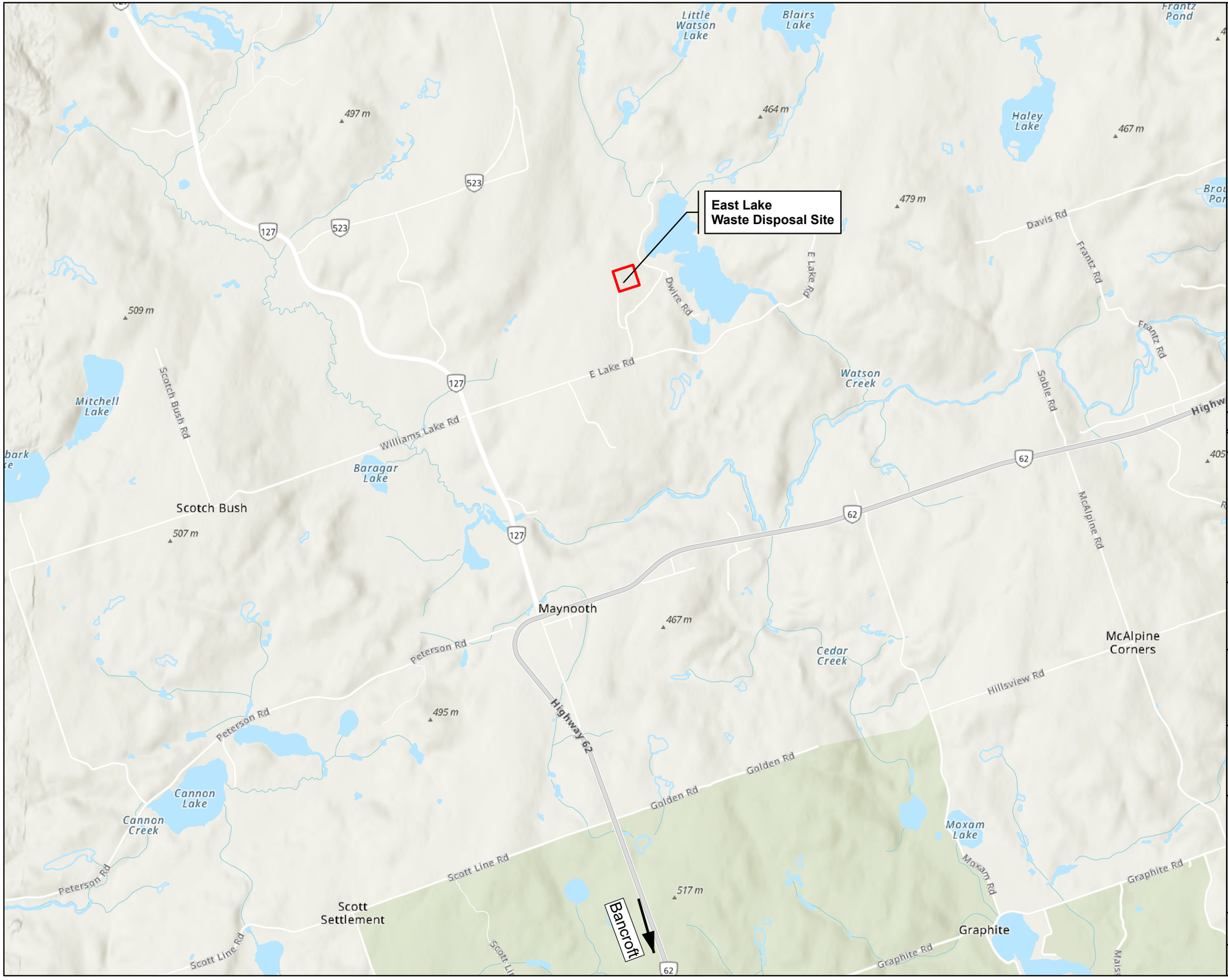
-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet for all Calculated criteria/guidelines.	
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manually.

Figures



LEGEND

Waste Disposal Site

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

CLIENT

Municipality of Hastings Highlands

PROJECT

East Lake
Waste Disposal Site

TITLE

Site Location Map

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	DATE
240205-06	February 14, 2025

DRAWN	CHECKED	FIG NO.	REV
EB	MW	01	0

LEGEND

- Decomissioned Groundwater Monitoring Location
- Groundwater Monitoring Location
- Benchmark Location
- Total Site Area (4.05 ha) (P.A. Miller, 2013)

Note: Coordinates are displayed in UTM Nad 83 Zone 18

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 20 40 Meters

CLIENT

Municipality of Hastings Highlands

PROJECT

East Lake
Waste Disposal Site

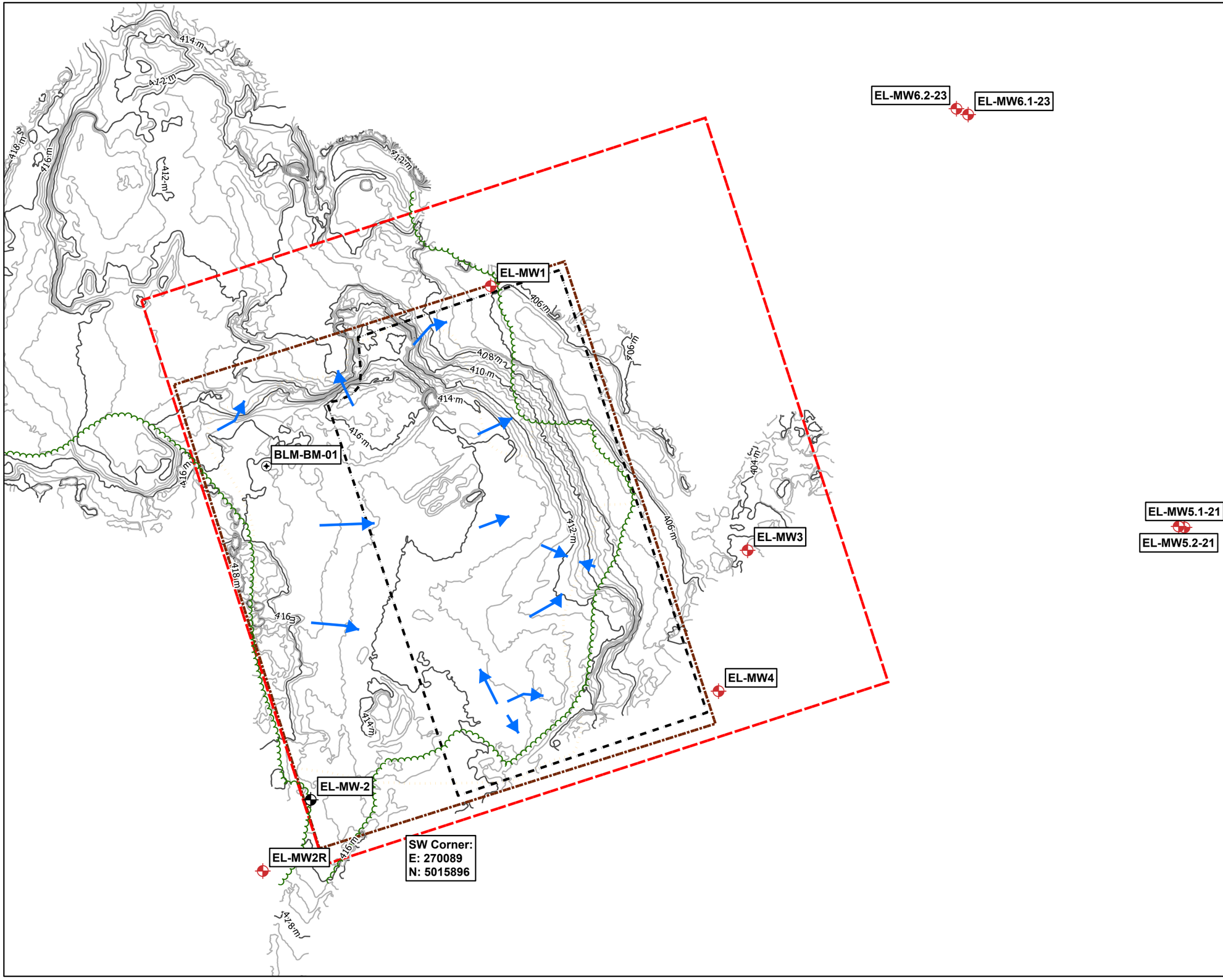
TITLE

Site Plan

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	DATE
0230225-06	February 14, 2025

DRAWN	CHECKED	FIG NO.	REV
EB	MW	02	0



LEGEND

- Decomissioned Groundwater Monitoring Location
- Groundwater Monitoring Location
- Benchmark Location
- Surface Water Drainage Direction
- Treeline
- Approximate Outline of Buried Waste
- Approved Waste Fill Area (2.3 ha)
- Total Site Area (4.05 ha) (P.A. Miller, 2013)
- Proposed Mound Outline

2023 Elevation

- Minor Contour (0.5 masl)
- Major Contour (2.0 masl)

Notes:
Coordinates are in UTM Nad83 CSRS Zone 18

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

N W E S

0 20 40 Meters

CLIENT

Municipality of Hastings Highlands

PROJECT

East Lake
Waste Disposal Site

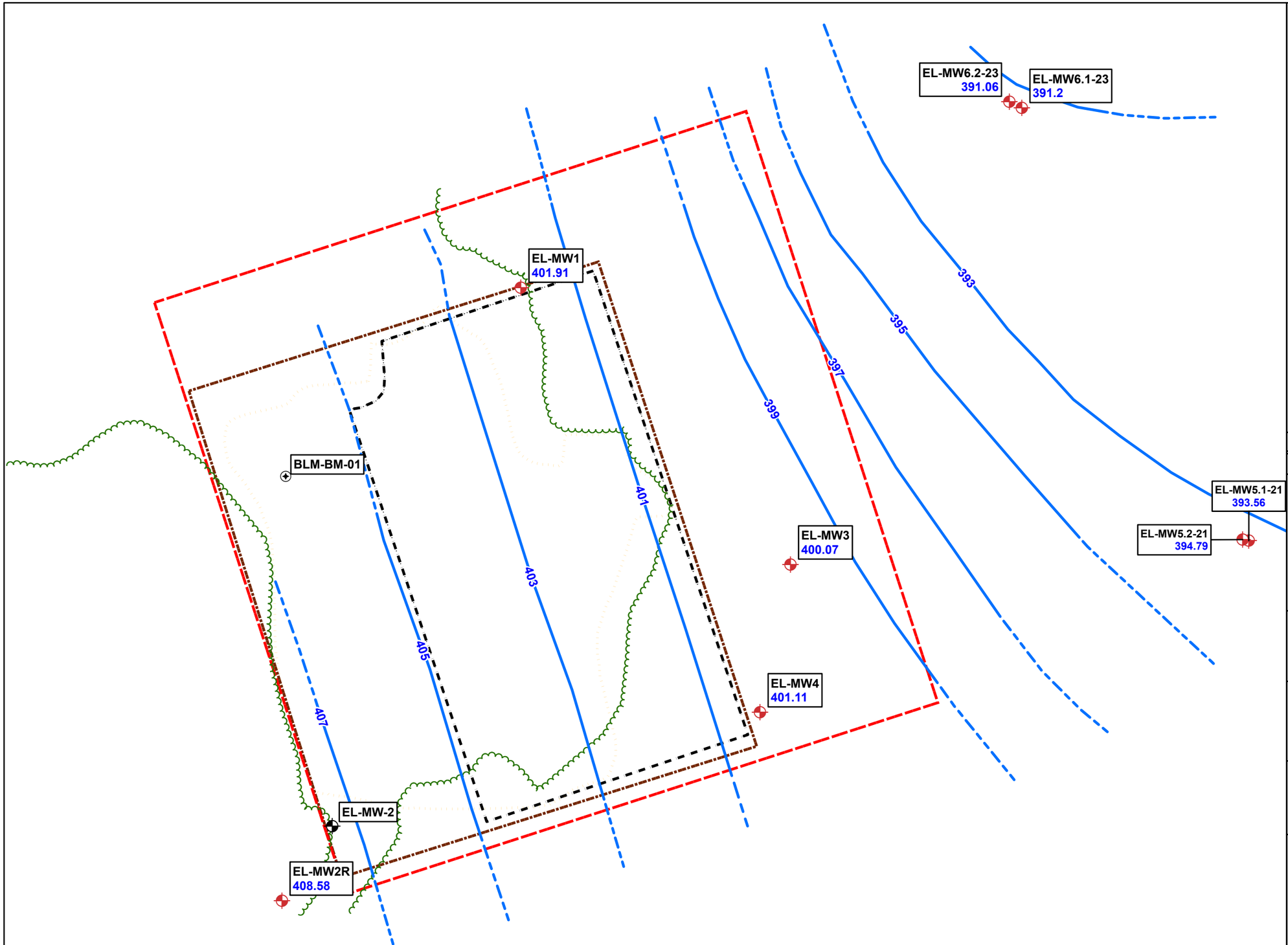
TITLE

Topography as of 2023 and Surface Water Flow Direction

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	DATE
240205-06	February 14, 2025

DRAWN	CHECKED	FIG NO.	REV
EB	MW	03	0



LEGEND

- Decomissioned Groundwater Monitoring Location
- Benchmark Location
- Treeline
- Approximate Outline of Buried Waste
- Approved Waste Fill Area (2.3 ha)
- Total Site Area (4.05 ha) (P.A. Miller, 2013)
- Proposed Mound Outline
- Groundwater Monitoring Location
- Groundwater Contour (1 m)
- Inferred Groundwater Contour
- 402.79 Groundwater Elevation (masl) (Spring, 2024)

Notes:
Coordinates are in UTM Nad83 CSRS Zone 18

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

DO NOT SCALE DRAWING.
THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

N W E S

0 20 40 Meters

CLIENT

Municipality of Hastings Highlands

PROJECT

East Lake
Waste Disposal Site

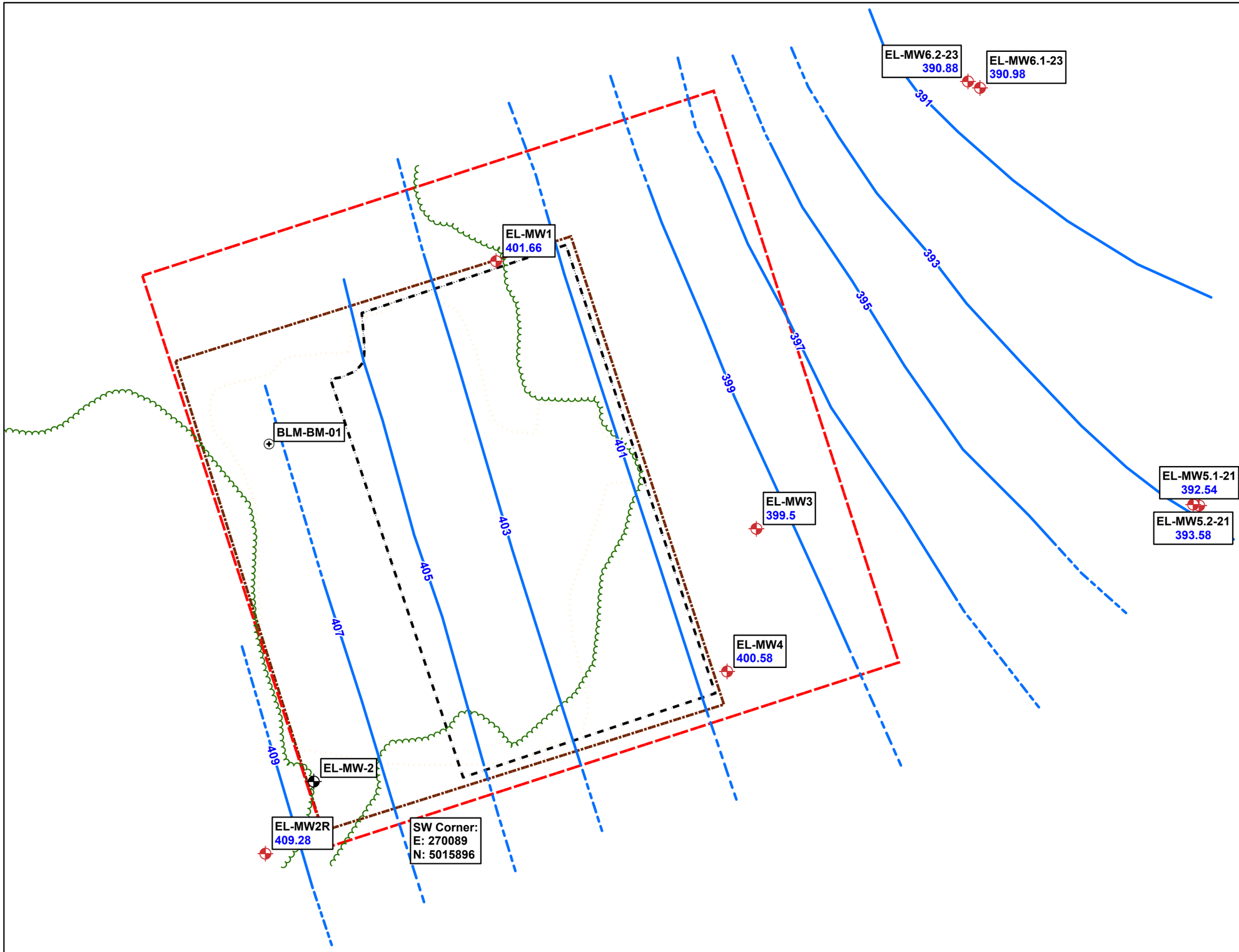
TITLE

Groundwater Elevations and Contours - Spring 2024

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	DATE
240205-06	February 14, 2025

DRAWN	CHECKED	FIG NO.	REV
EB	MW	04	0



LEGEND

- Decomissioned Groundwater Monitoring Location
- Benchmark Location
- Treeline
- Approximate Outline of Buried Waste
- Approved Waste Fill Area (2.3 ha)
- Total Site Area (4.05 ha) (P.A. Miller, 2013)
- Proposed Mound Outline
- Groundwater Monitoring Location
- Groundwater Contour (1 m)
- Inferred Groundwater Contour
- 402.01 Groundwater Elevation (masl) (Fall, 2024)

Notes:
Coordinates are in UTM Nad83 CSRS Zone 18

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

THIS DRAWING MAY HAVE BEEN REDUCED. ALL SCALE NOTATIONS INDICATED ARE BASED ON 11"x17" FORMAT DRAWINGS.

0 20 40 Meters

N W E S

CLIENT

Municipality of Hastings Highlands

PROJECT

East Lake
Waste Disposal Site

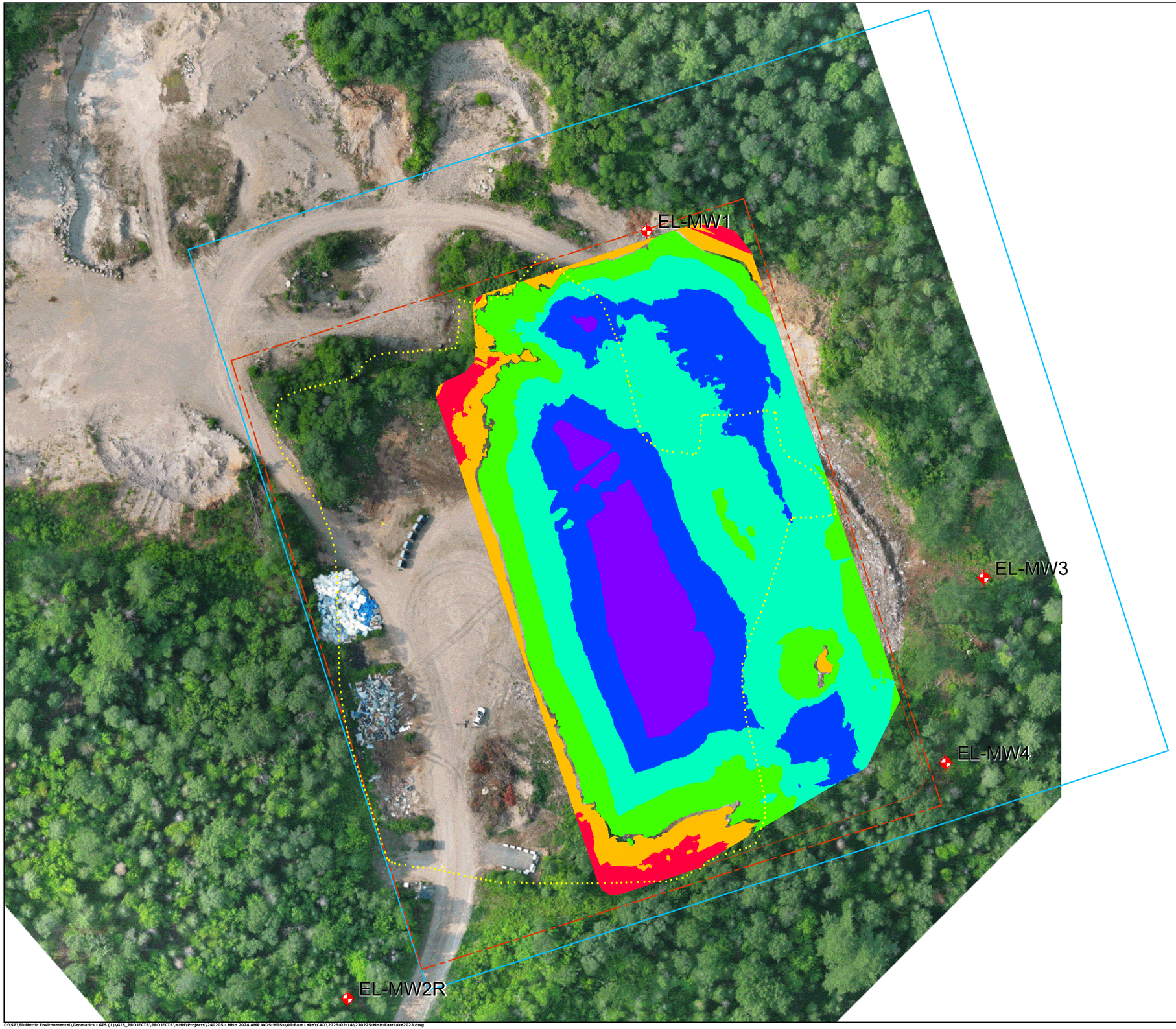
TITLE

Groundwater Elevations and Contours - Fall 2024

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	DATE
240205-06	February 14, 2025

DRAWN	CHECKED	FIG NO.	REV
EB	MW	05	0



LEGEND

- Monitoring Well Location
- Approved Waste Fill Area (2.3 ha)
- Total Site Area (4.05 ha) (P.A. Miller, 2013)
- Approximate Outline of Buried Waste

Volumes to Table - 2023 to Phase I Design Contours	
Cut	423.00 Cu. M
Fill	49557.94 Cu. M.
Net	49134.94 Cu. M.

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Volume	Color
1	−2.59	−2.00	3	
2	−2.00	−0.25	280	
3	0.25	2.00	19959	
4	2.00	4.00	16978	
5	4.00	6.00	7388	
6	6.00	8.00	2060	
7	8.00	8.60	51	

REV.	DESCRIPTION	YY/MM/DD	BY	CHK
1				

REFERENCES

0 20 40 Metres
1:1000

N W E S

CLIENT

Municipality of Hastings Highlands

PROJECT

East Lake Waste Disposal Site

TITLE

Remaining Fill Capacity 29 June, 2023

BluMetric™ Environmental
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
240205-06	February 14, 2025

DRAWN	CHECKED	DWG NO.	REV
EB	MW	06	0

C:\SP\BluMetric Environmental\Geomatics - GIS (1)\GIS_PROJECTS\PROJECTS\MHH\Projects\240205 - MHH 2024 AMR WDS-WTSs\06-East Lake\CAD\2025-02-14\230225-MHH-EastLake2023.dwg

Site Photographs

Photo 1: Site entrance – April 30, 2024.

Photo 2: Site hours and signage – April 30, 2024.

Photo 3: General site from entrance – April 30, 2024.

Photo 4: General site and waste bins – April 30, 2024.

Photo 5: Boulders to prevent trespassing vehicles – April 30, 2024.

Photo 6: Operator's hut – April 30, 2024.

Photo 7: Construction & Demolition waste area – April 30, 2024.

Photo 8: Additional construction waste – April 30, 2024.

Photo 9: Styrofoam and mattresses – October 28, 2024.

Photo 10: Bulk Waste – October 28, 2024.

Photo 11: Wood/brush pile – October 28, 2024.

Photo 12: Metals pile – October 28, 2024.

Photo 13: Tires Pile – April 30, 2024.

Photo 14: Refrigerators– October 28, 2024.

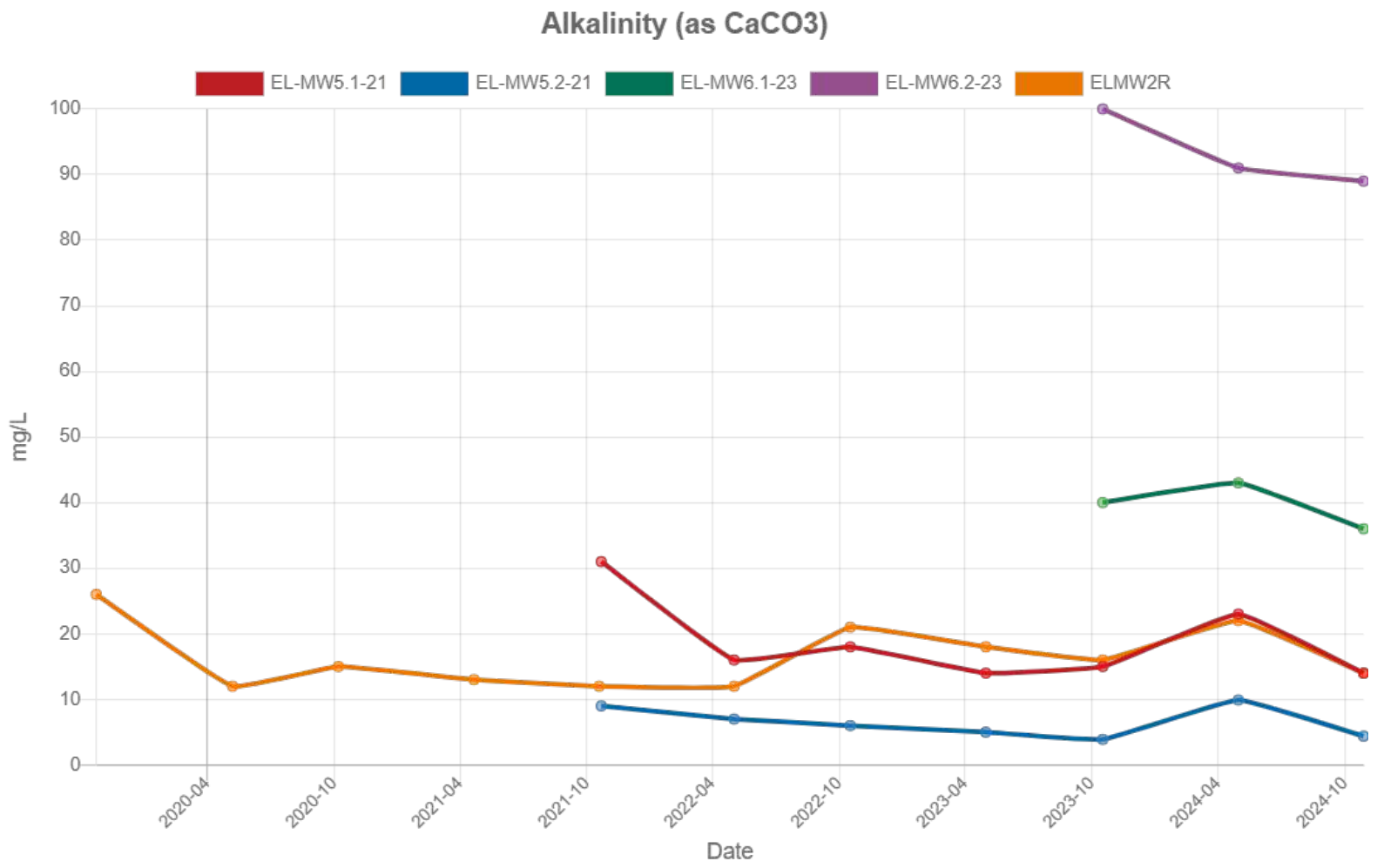
Photo 15: Electrical and Electronic Equipment – October 28, 2024.

Photo 16: Active landfill site – April 30, 2024.

Photo 17: Waste mound facing southwest – October 28, 2024.

Photo 18: Waste mound facing west – October 28, 2024.

Chemistry Trend Graphs

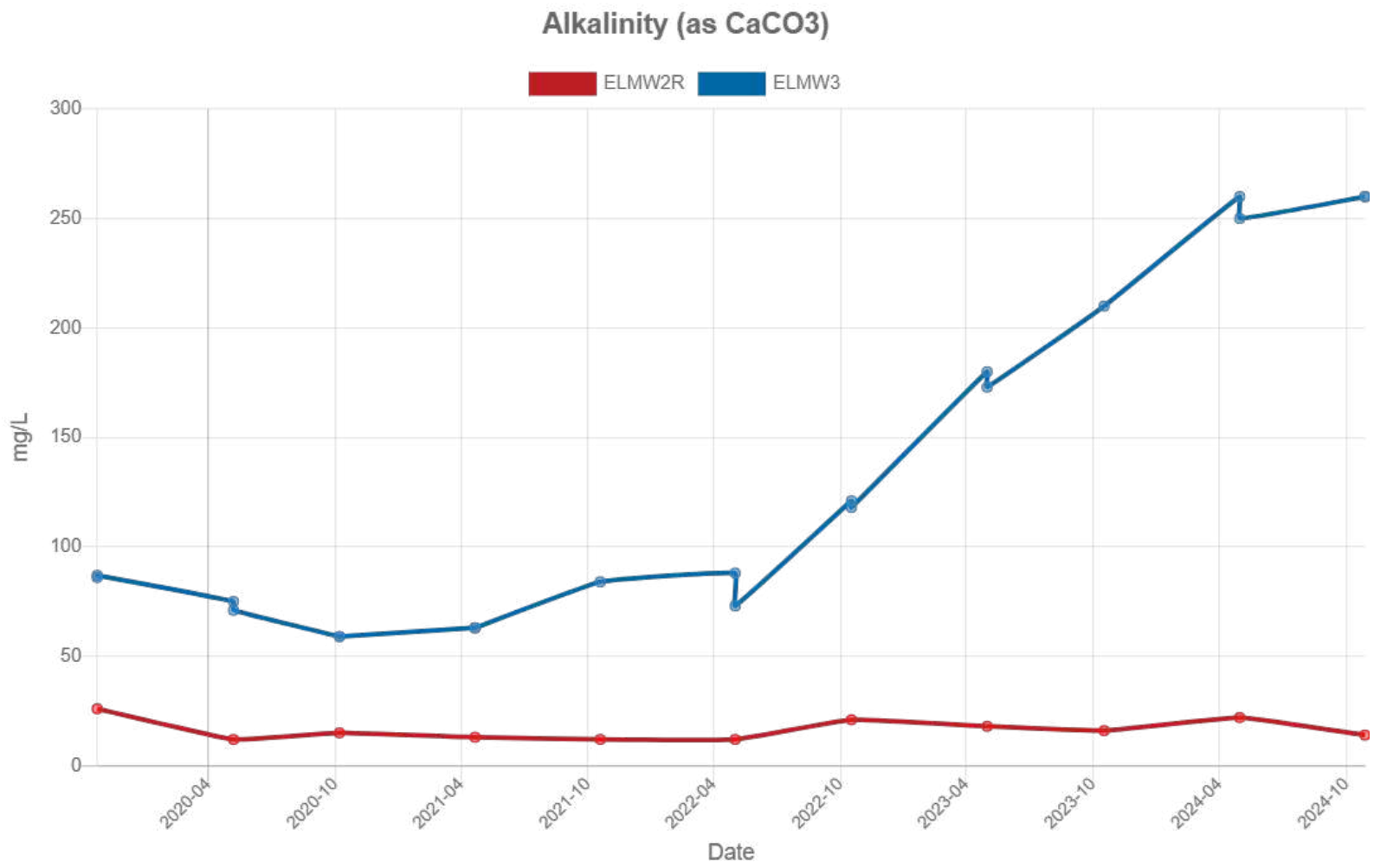


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 1
Alkalinity in Groundwater – Downgradient Wells

Created by: Megan Williamson

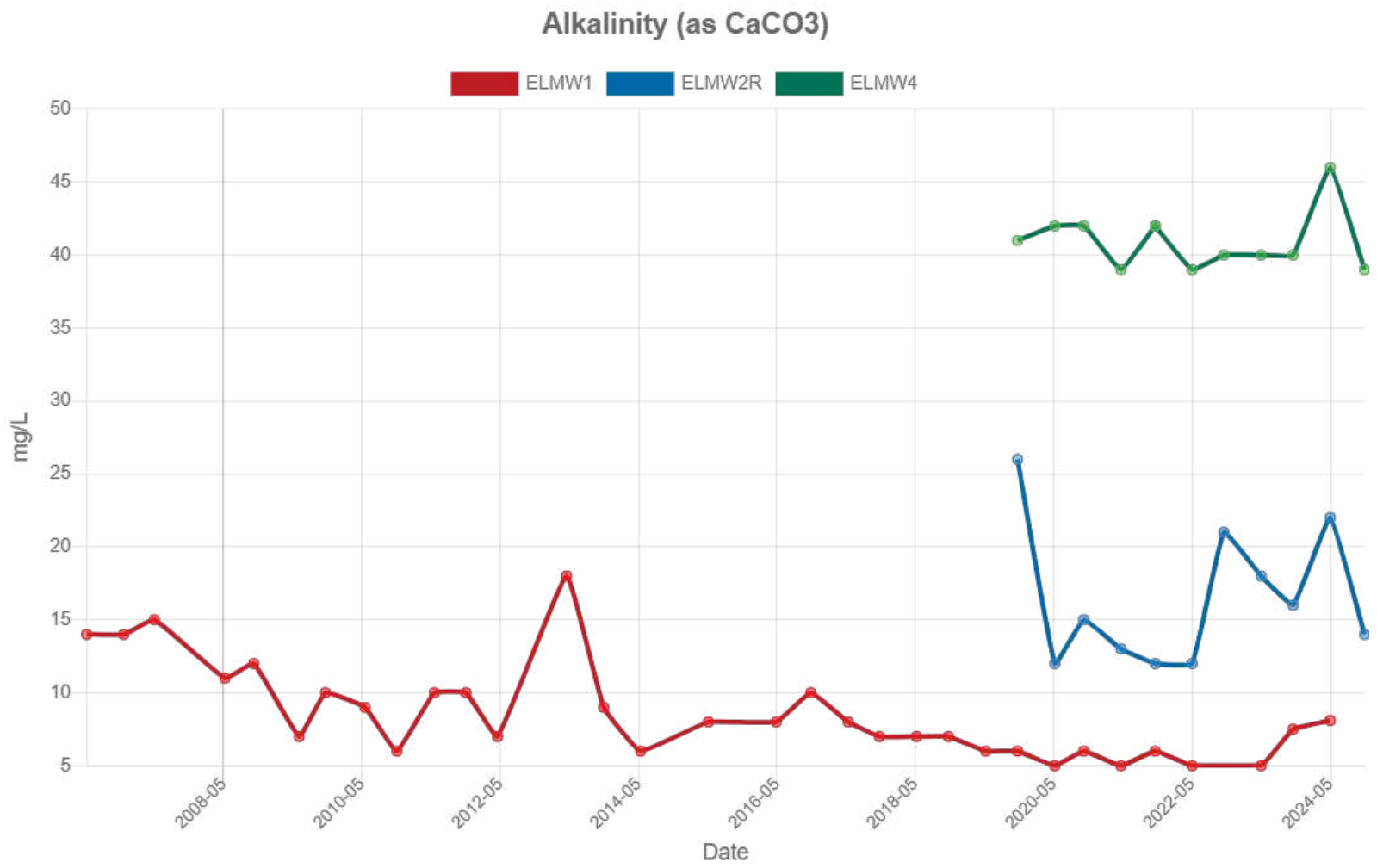


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 2
Alkalinity in Groundwater – Leachate Well

Created by: Megan Williamson

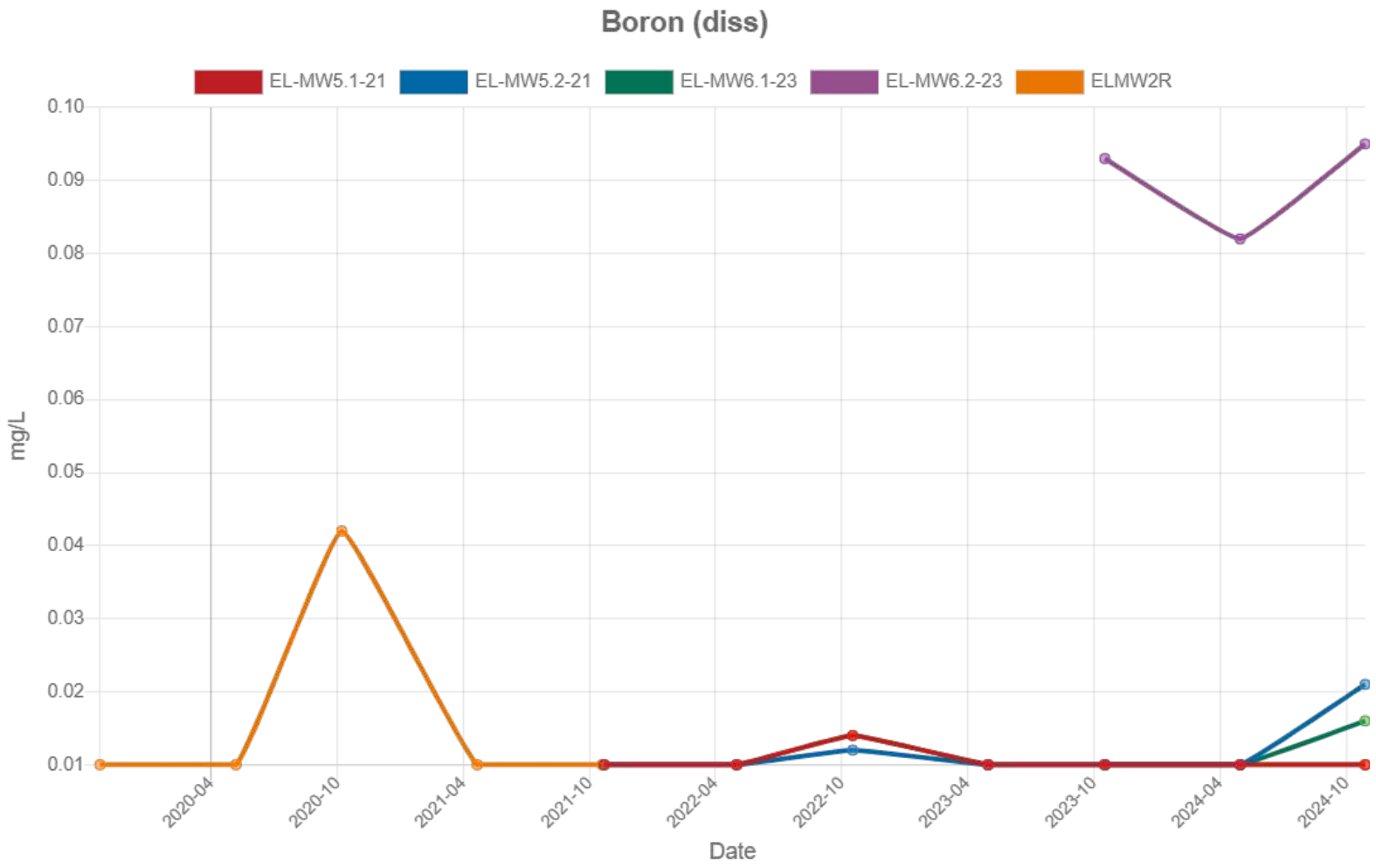


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 3
Alkalinity in Groundwater – Upgradient Wells

Created by: Megan Williamson

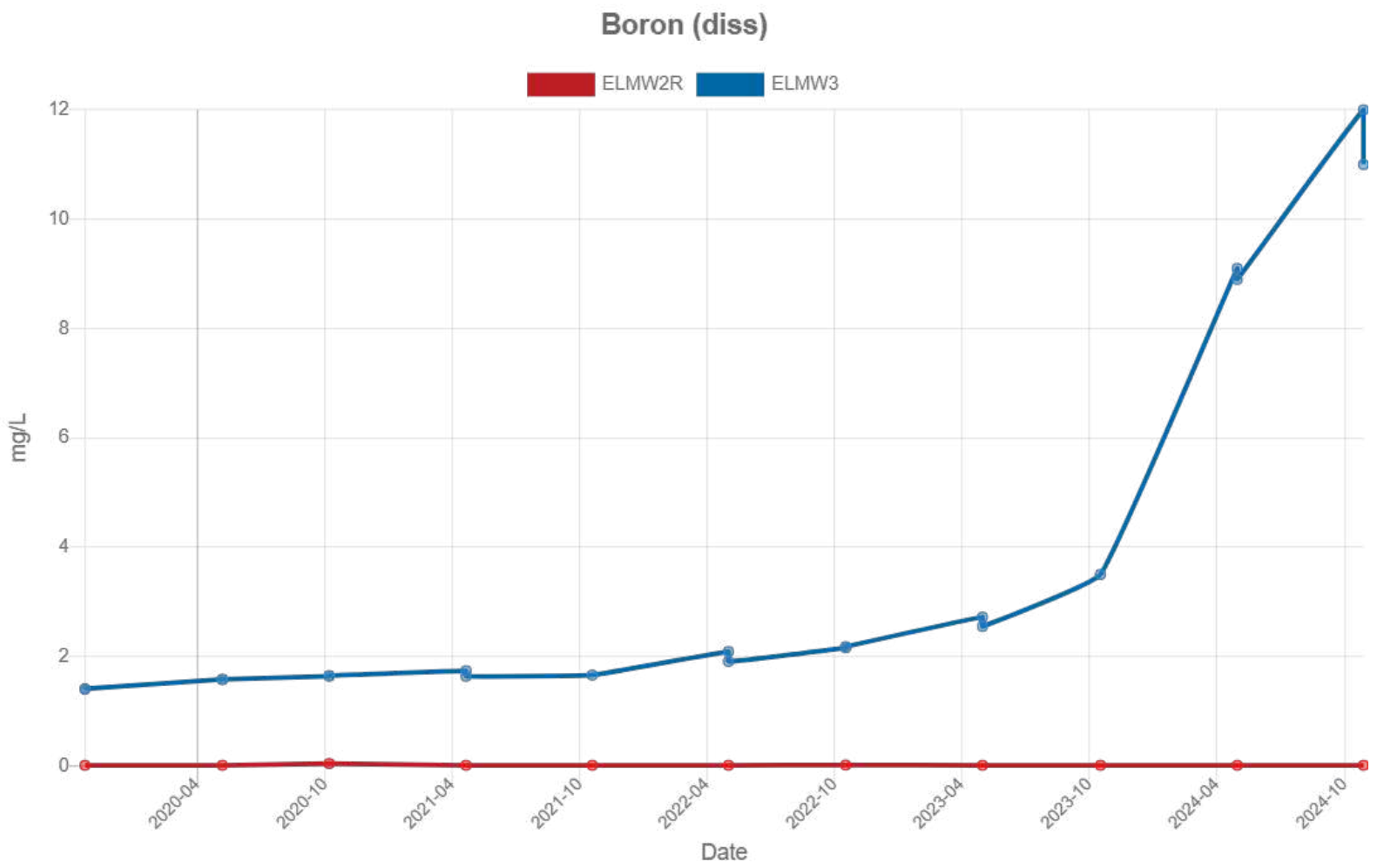


East Lake WDS
Municipality of Hasting's Highlands

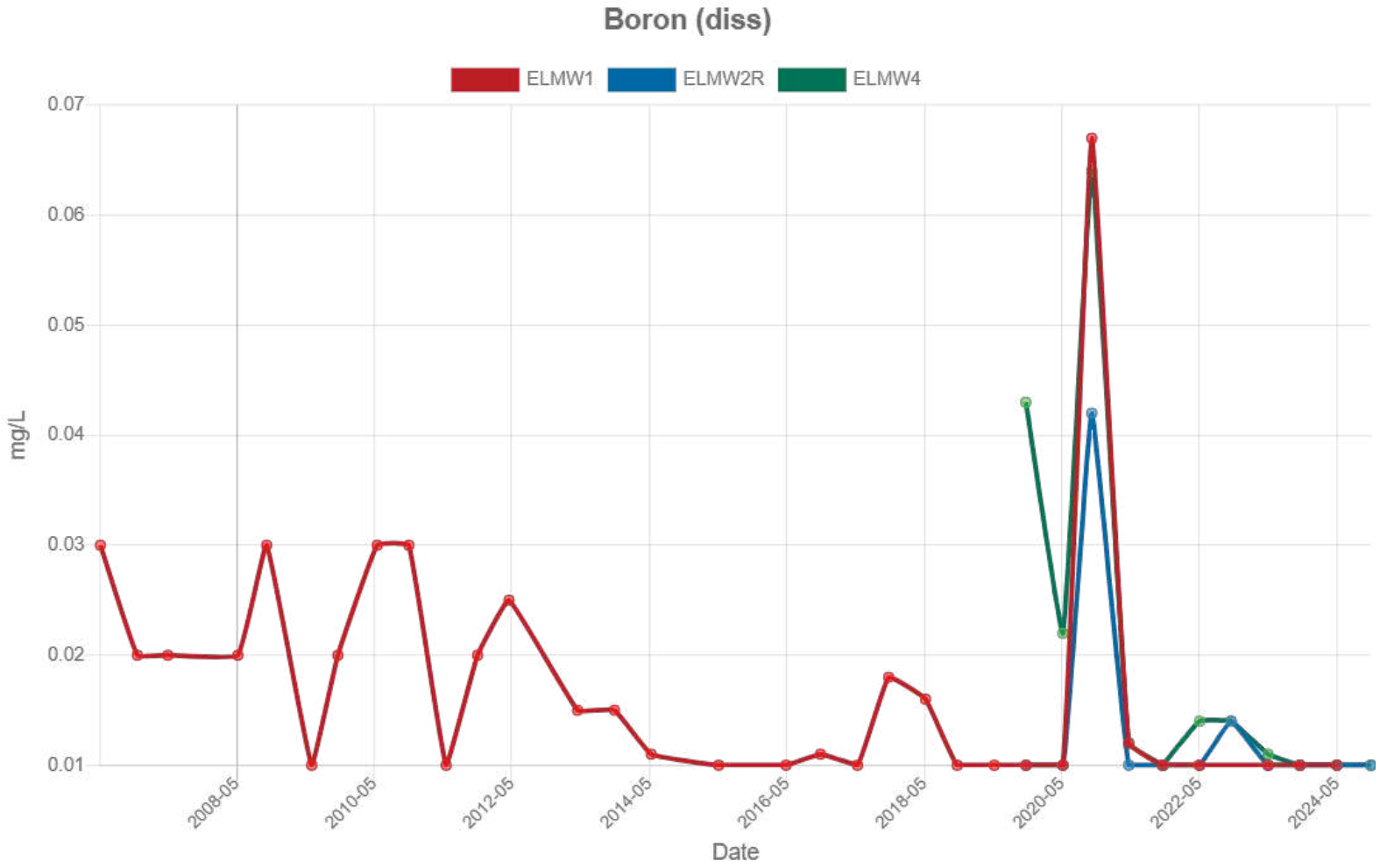
BluMetric Proj No: 240205
Date: February 12, 2025

Graph 4
Boron in Groundwater – Downgradient Wells

Created by: Megan Williamson



East Lake WDS **Municipality of Hasting's Highlands**	**Graph 5** **Boron in Groundwater – Leachate Well**
BluMetric Proj No: 240205 **Date: February 12, 2025**	**Created by: Megan Williamson**

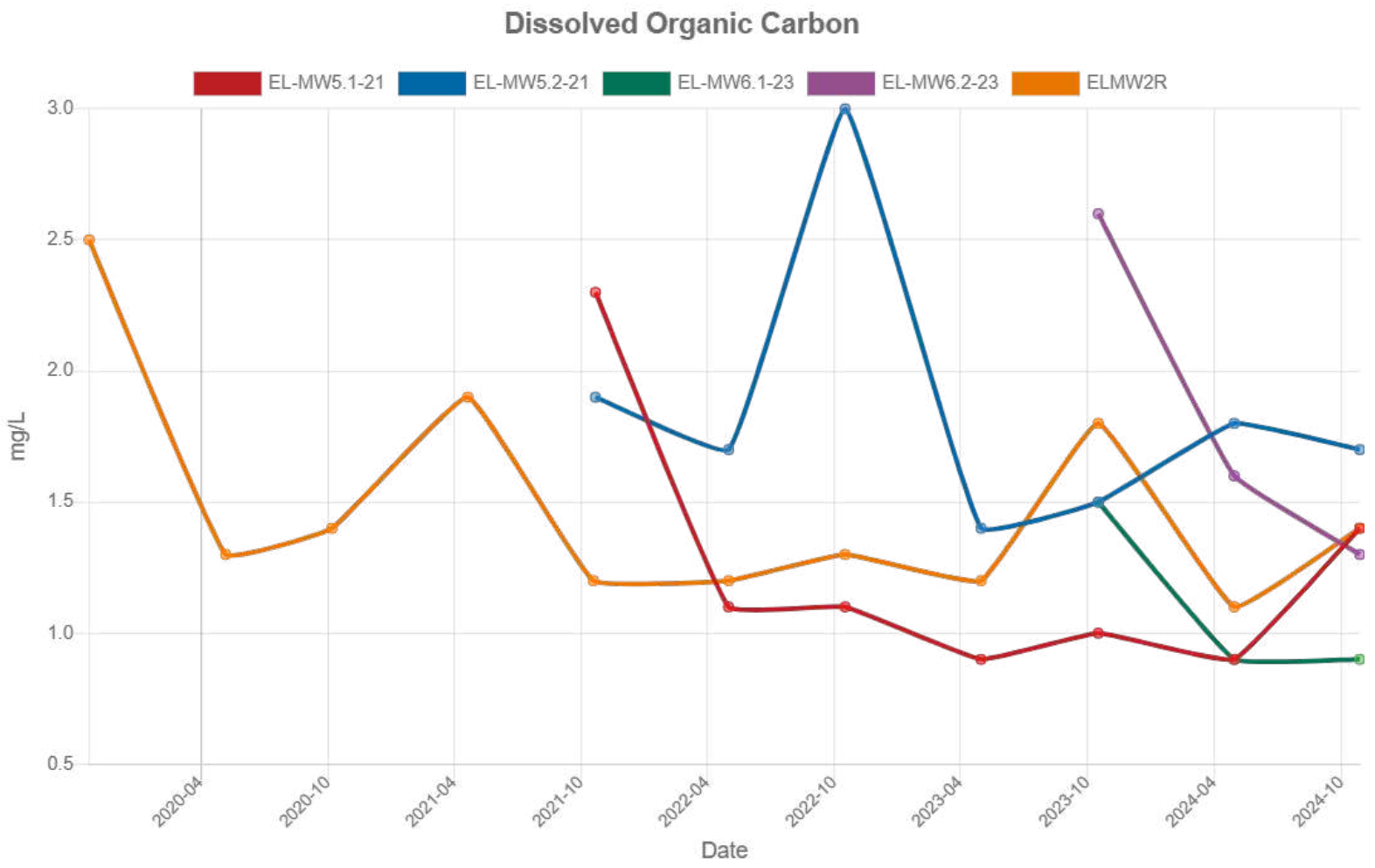


East Lake WDS
Municipality of Hasting's Highlands

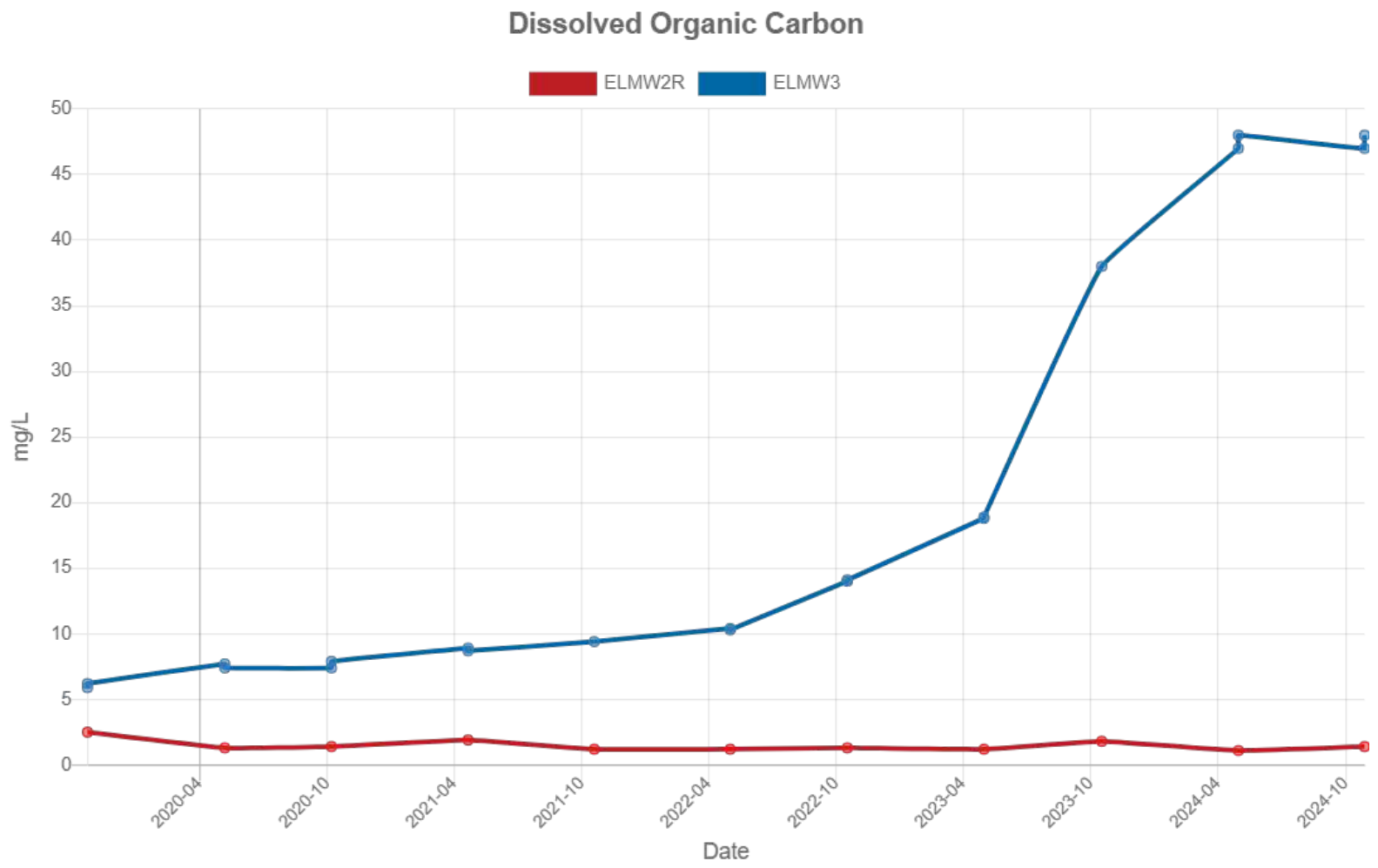
BluMetric Proj No: 240205
Date: February 12, 2025

Graph 6
Boron in Groundwater – Upgradient Wells

Created by: Megan Williamson



East Lake WDS **Municipality of Hasting's Highlands**	**Graph 7** **DOC in Groundwater – Downgradient Wells**
BluMetric Proj No: 240205 **Date: February 12, 2025**	**Created by: Megan Williamson**

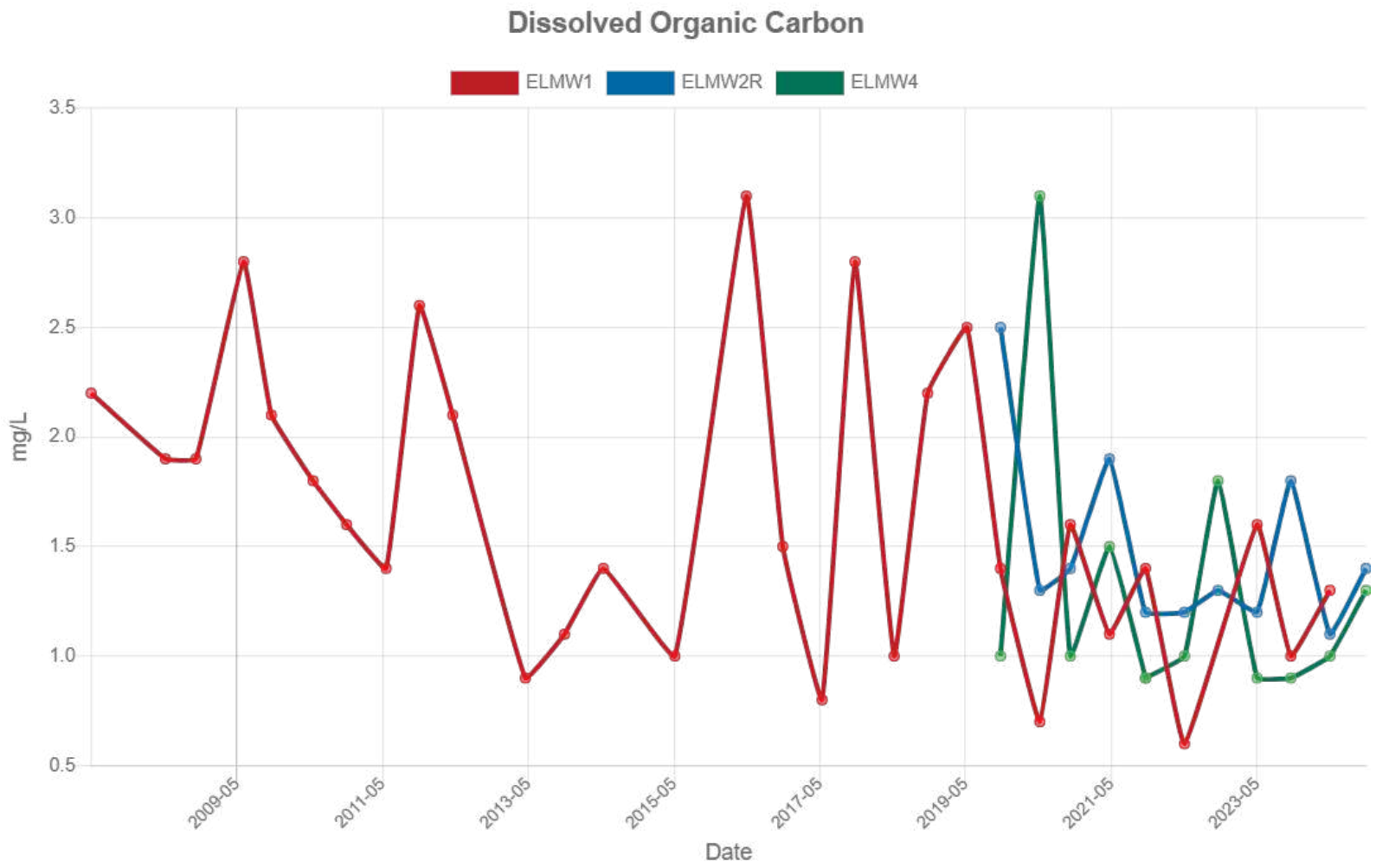


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 8
DOC in Groundwater – Leachate Well

Created by: Megan Williamson

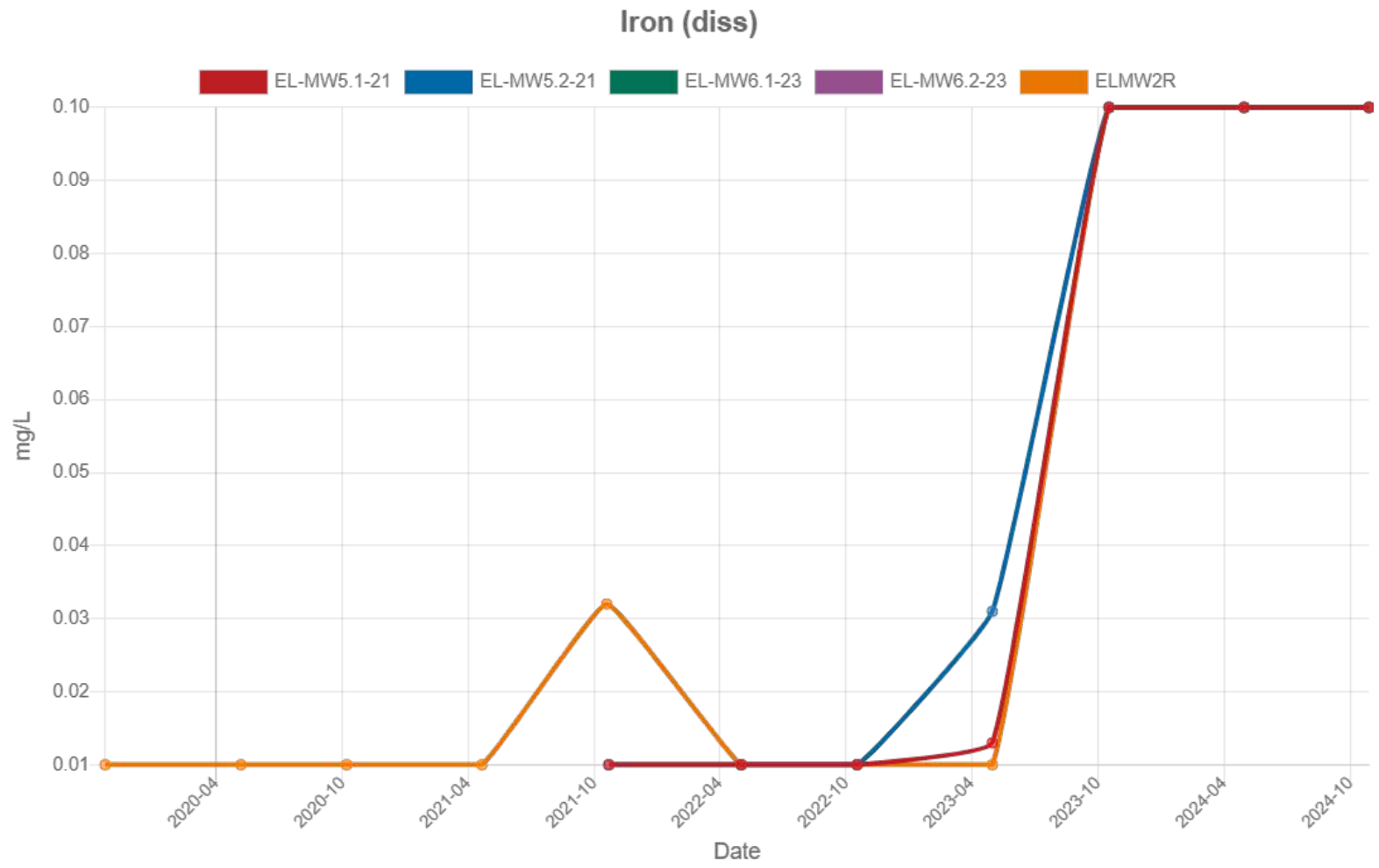


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 9
DOC in Groundwater – Upgradient Wells

Created by: Megan Williamson

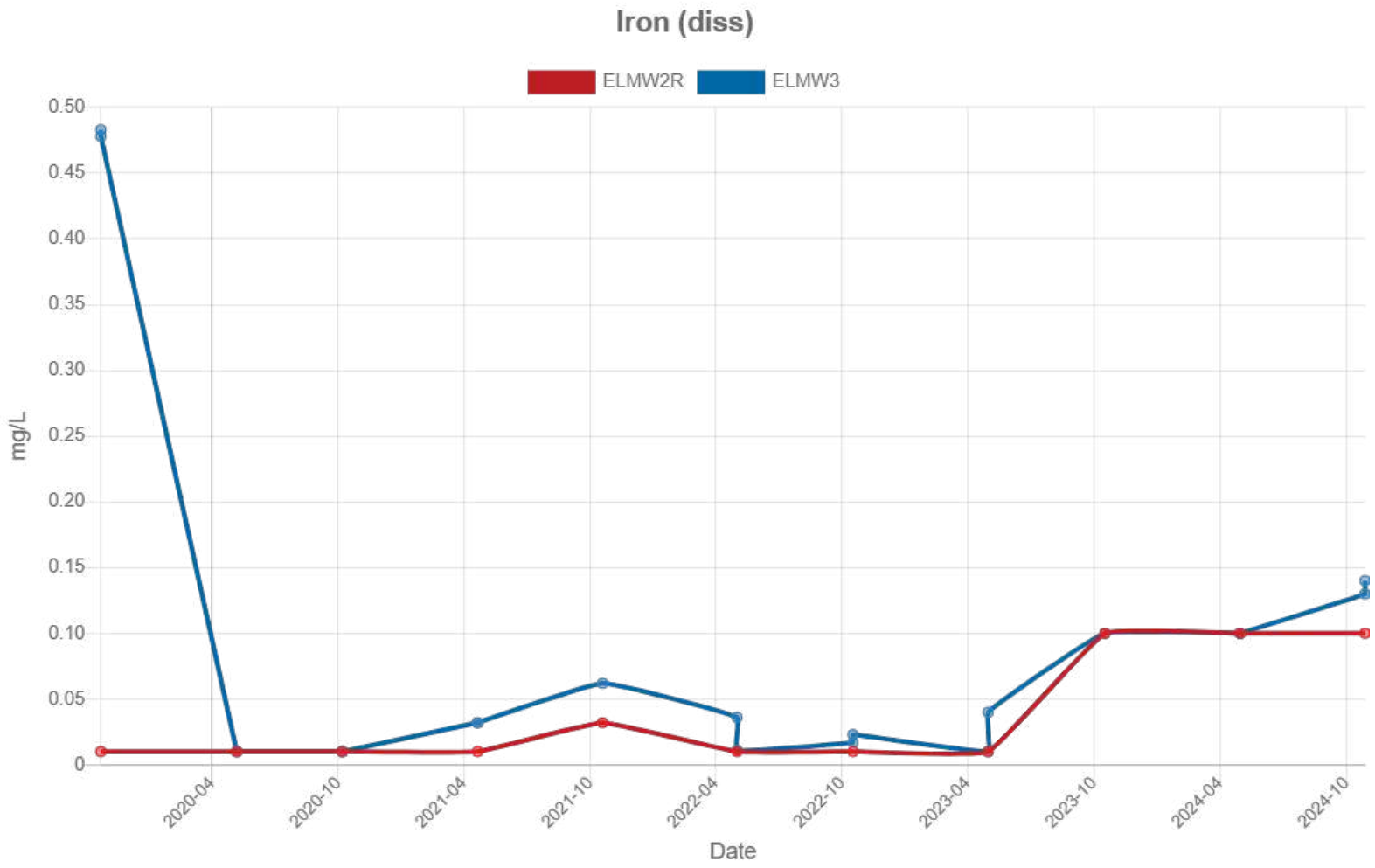


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 10
Iron in Groundwater – Downgradient Wells

Created by: Megan Williamson

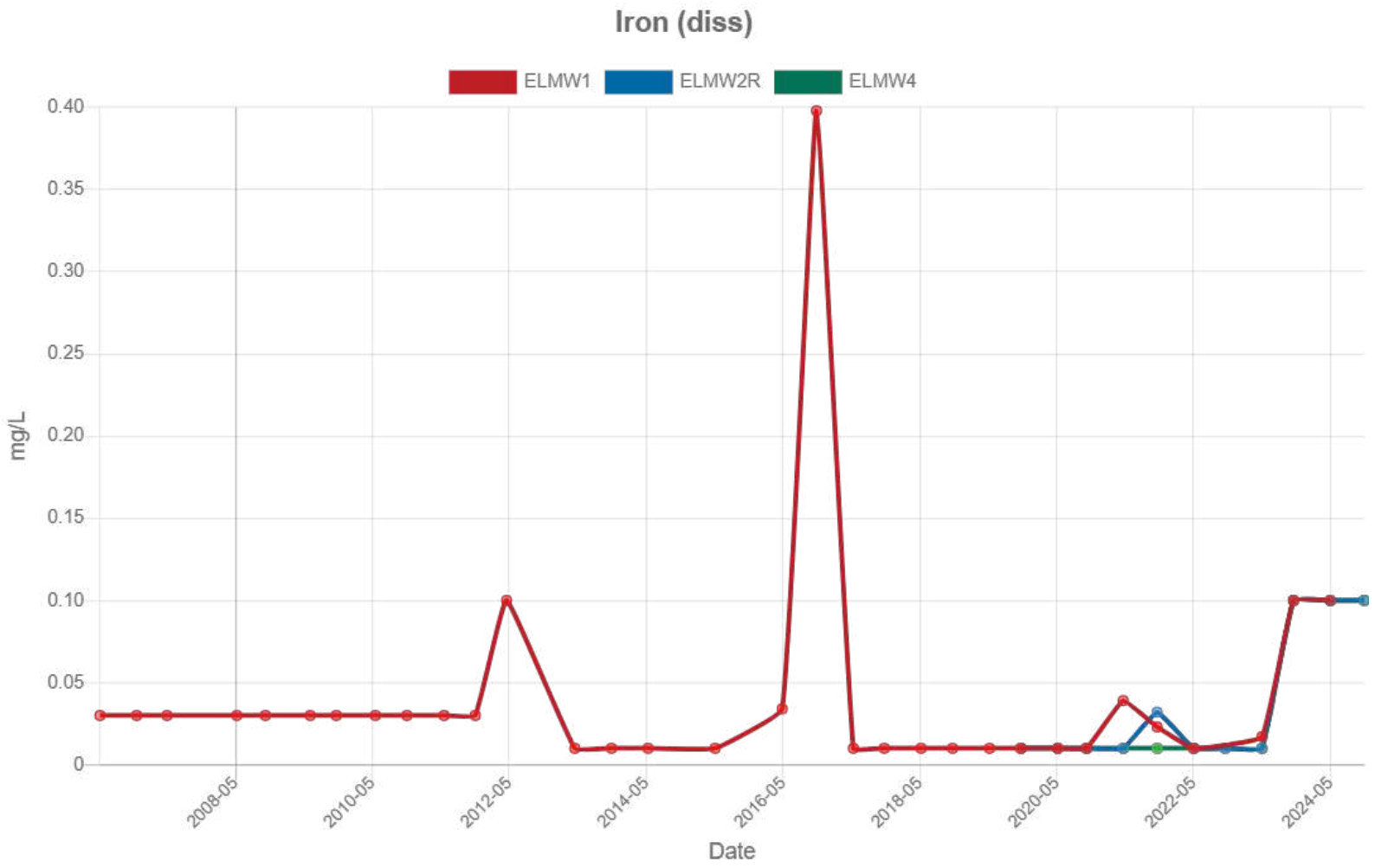


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 11
Iron in Groundwater – Leachate Well

Created by: Megan Williamson

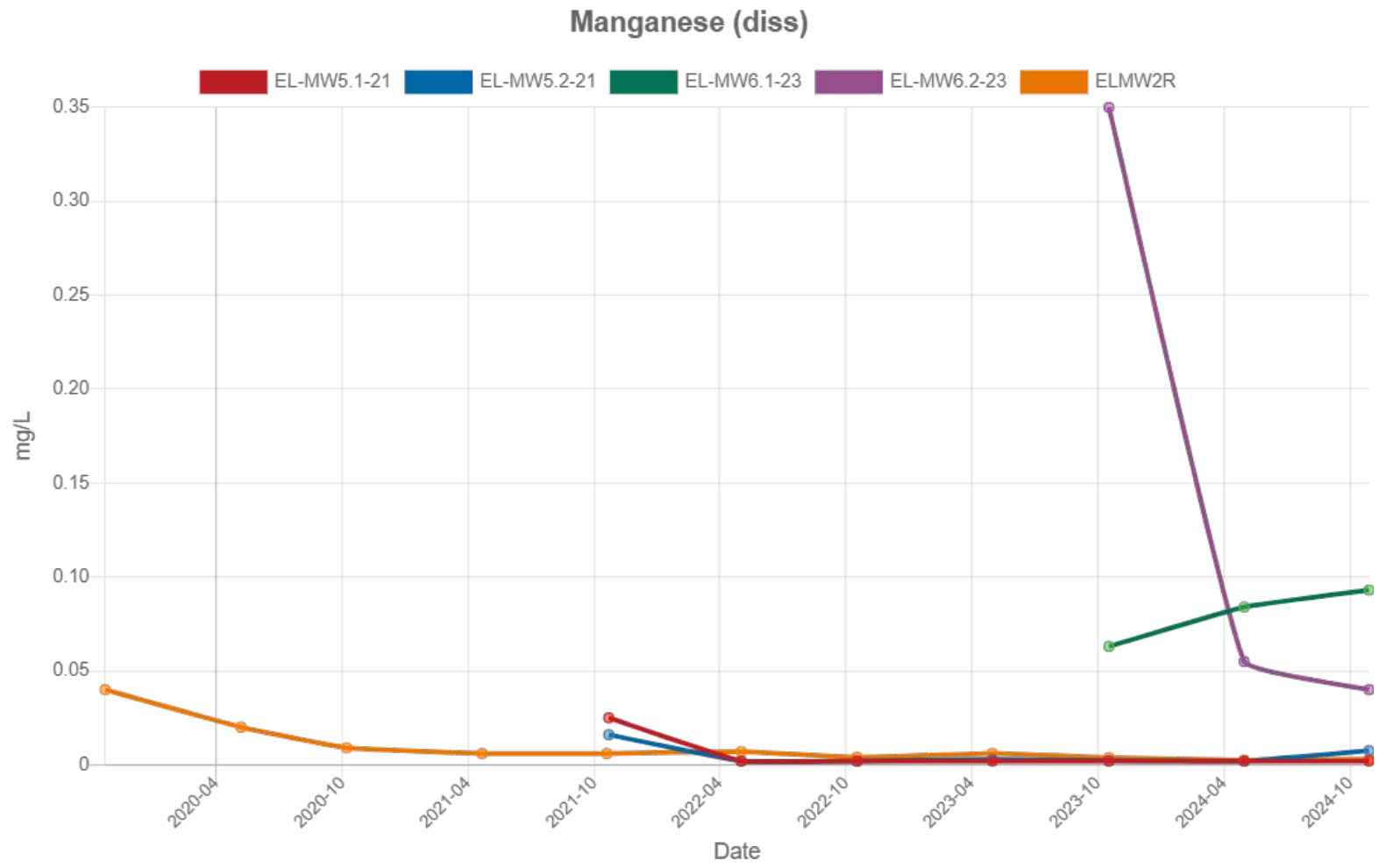


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 12
Iron in Groundwater – Upgradient Wells

Created by: Megan Williamson

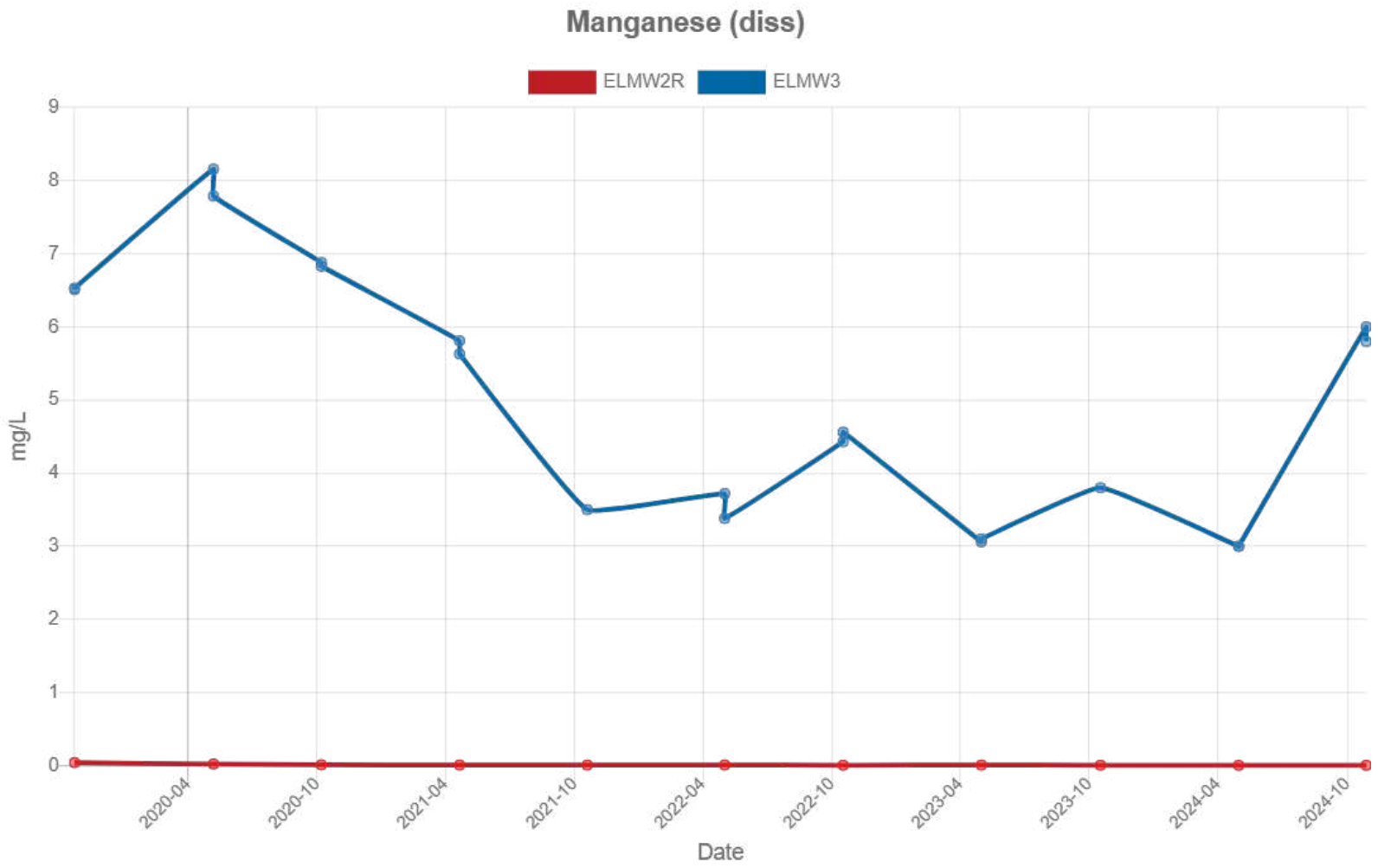


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 13
Manganese in Groundwater – Downgradient Wells

Created by: Megan Williamson

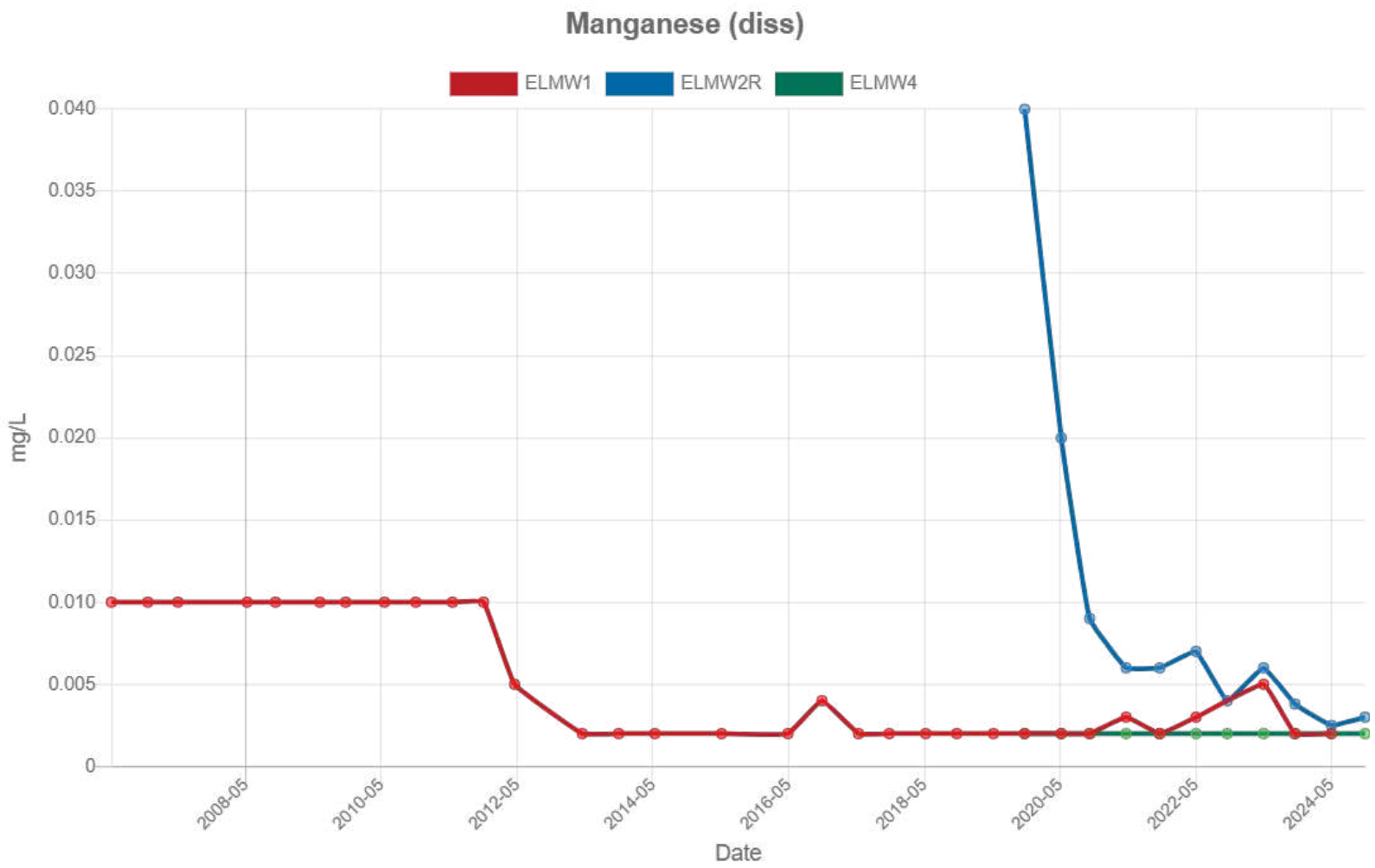


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 14
Manganese in Groundwater – Leachate Well

Created by: Megan Williamson

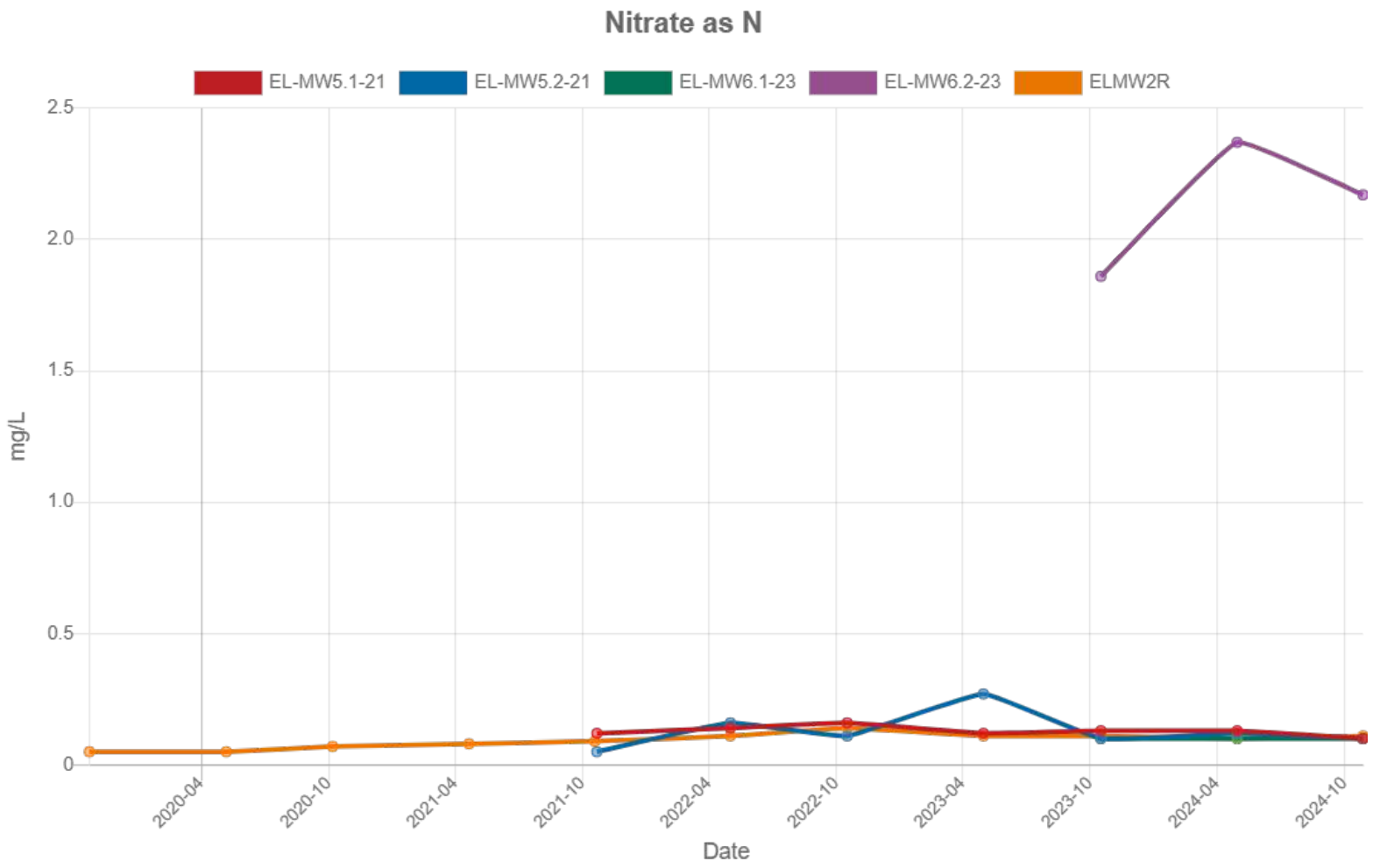


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 15
Manganese in Groundwater – Upgradient Wells

Created by: Megan Williamson



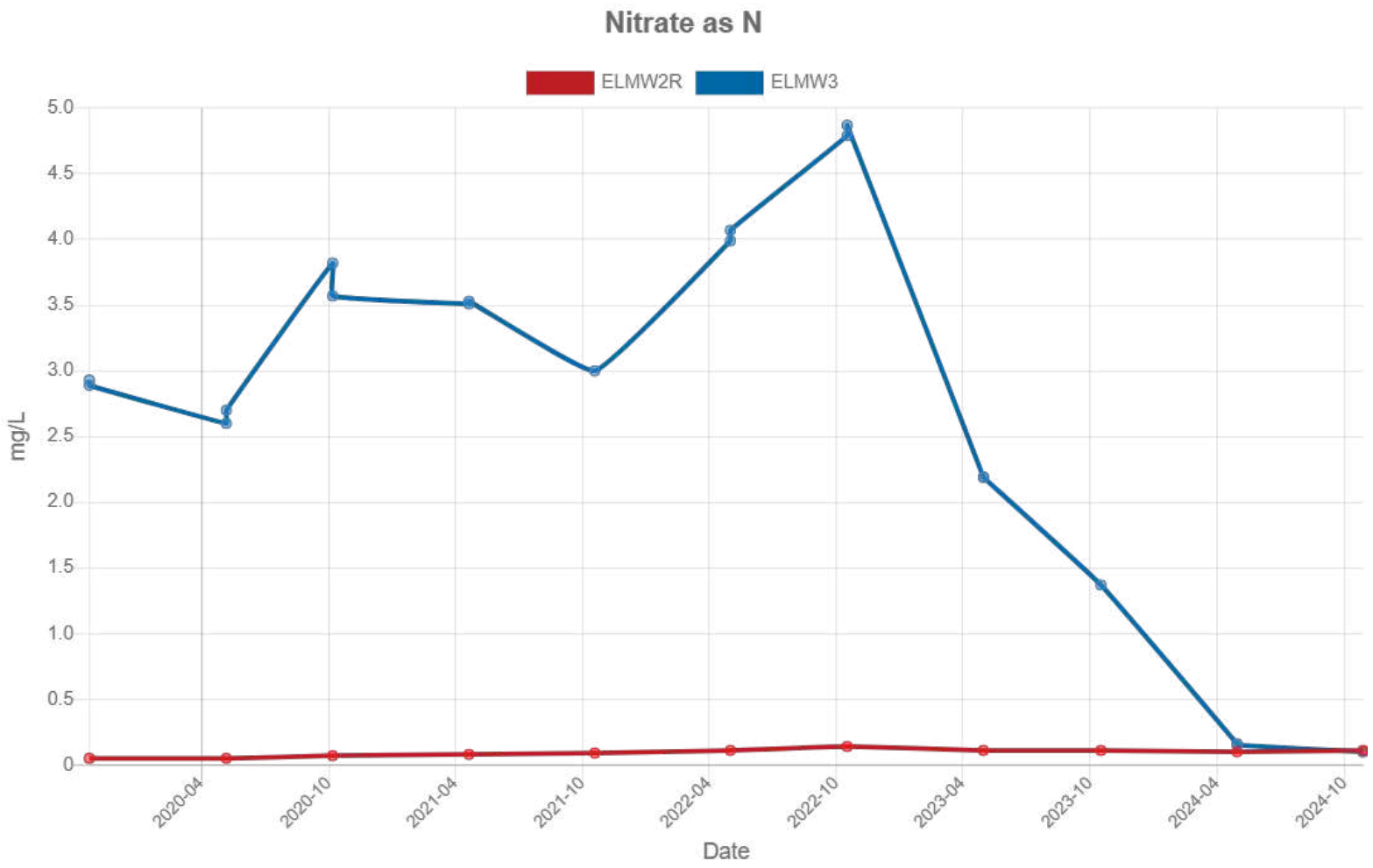
East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 16
Nitrate in Groundwater – Downgradient Wells

Created by: Megan Williamson

BluMetric Environmental

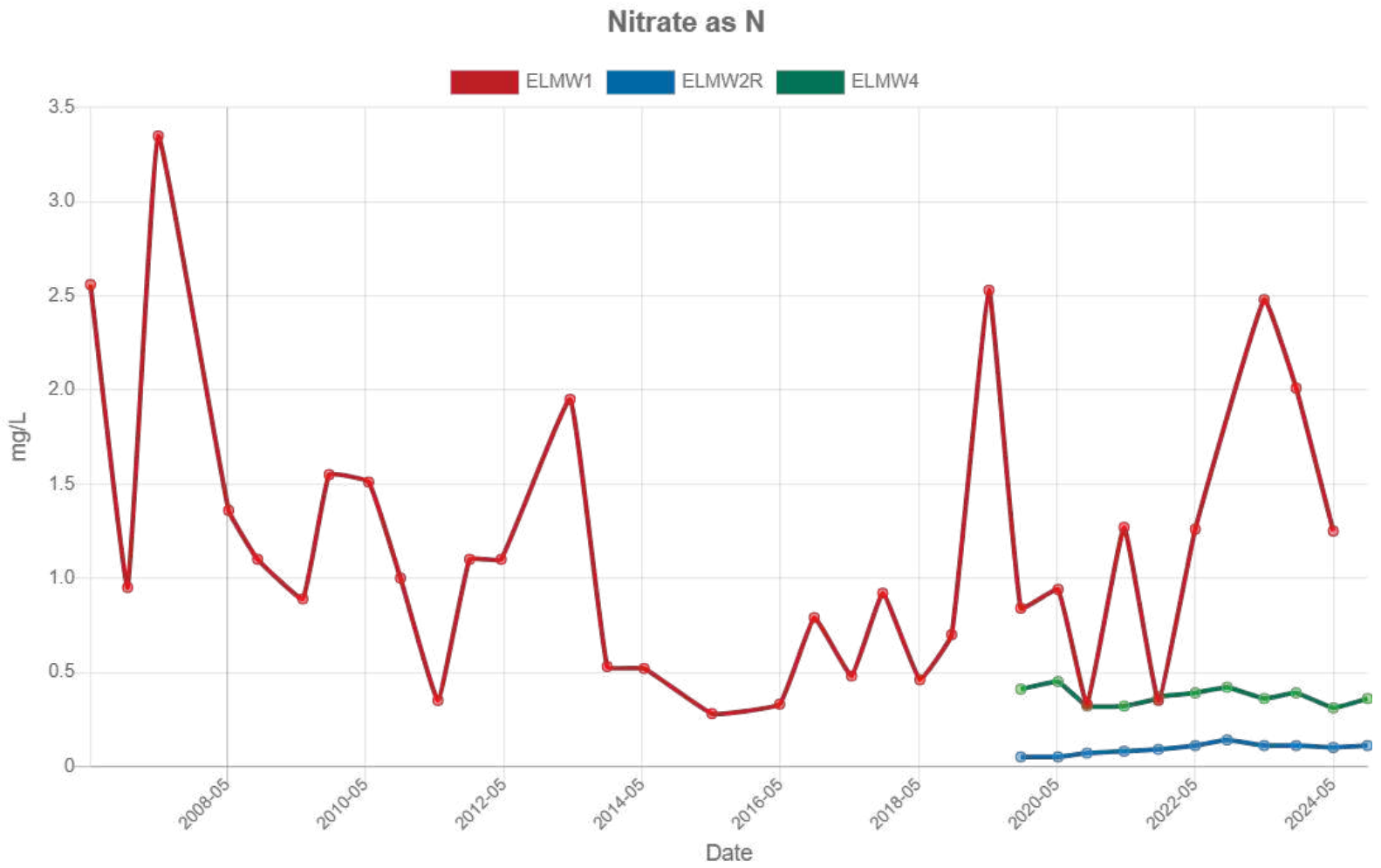


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 17
Nitrate in Groundwater – Leachate Well

Created by: Megan Williamson

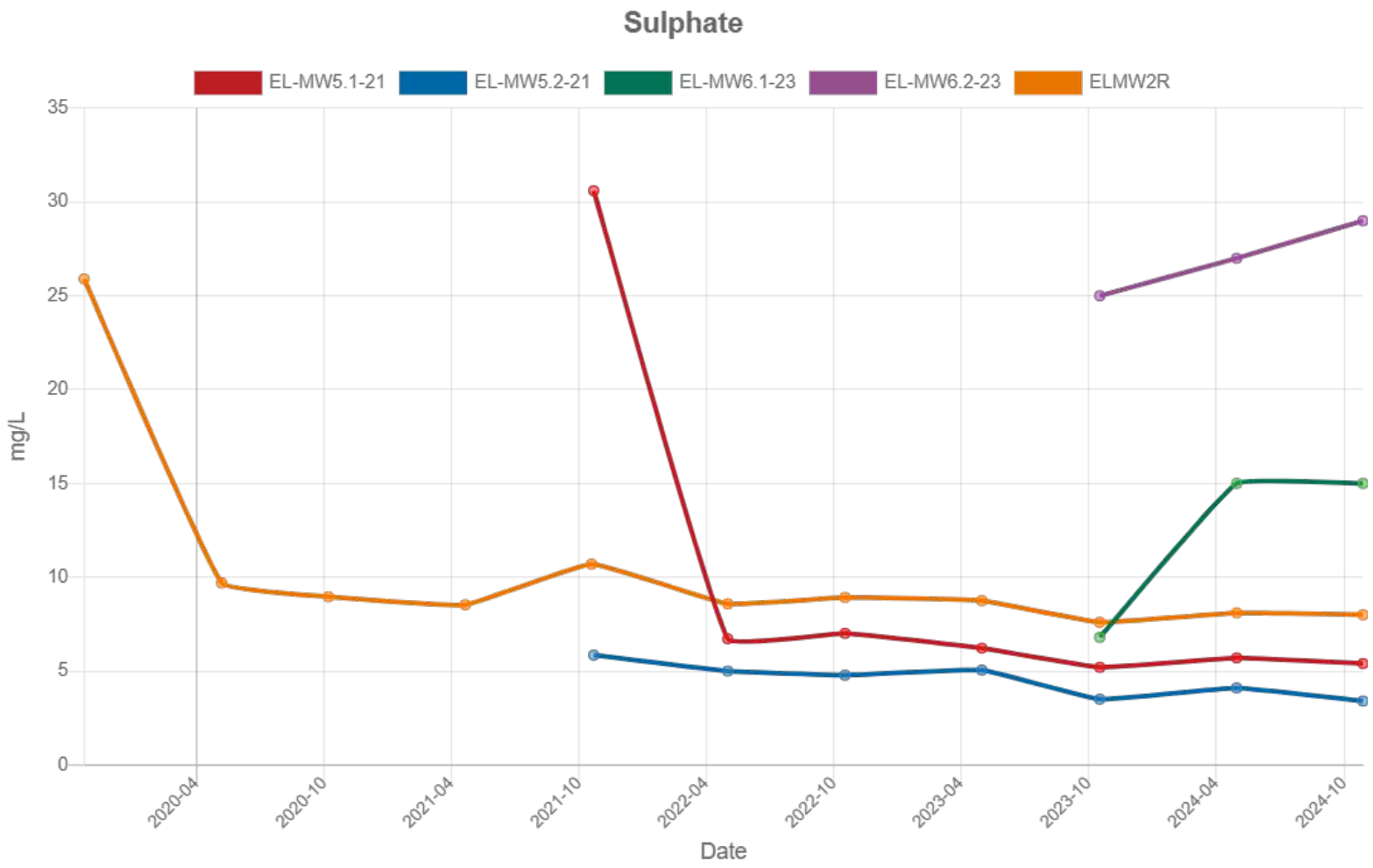


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 18
Nitrate in Groundwater – Upgradient Wells

Created by: Megan Williamson

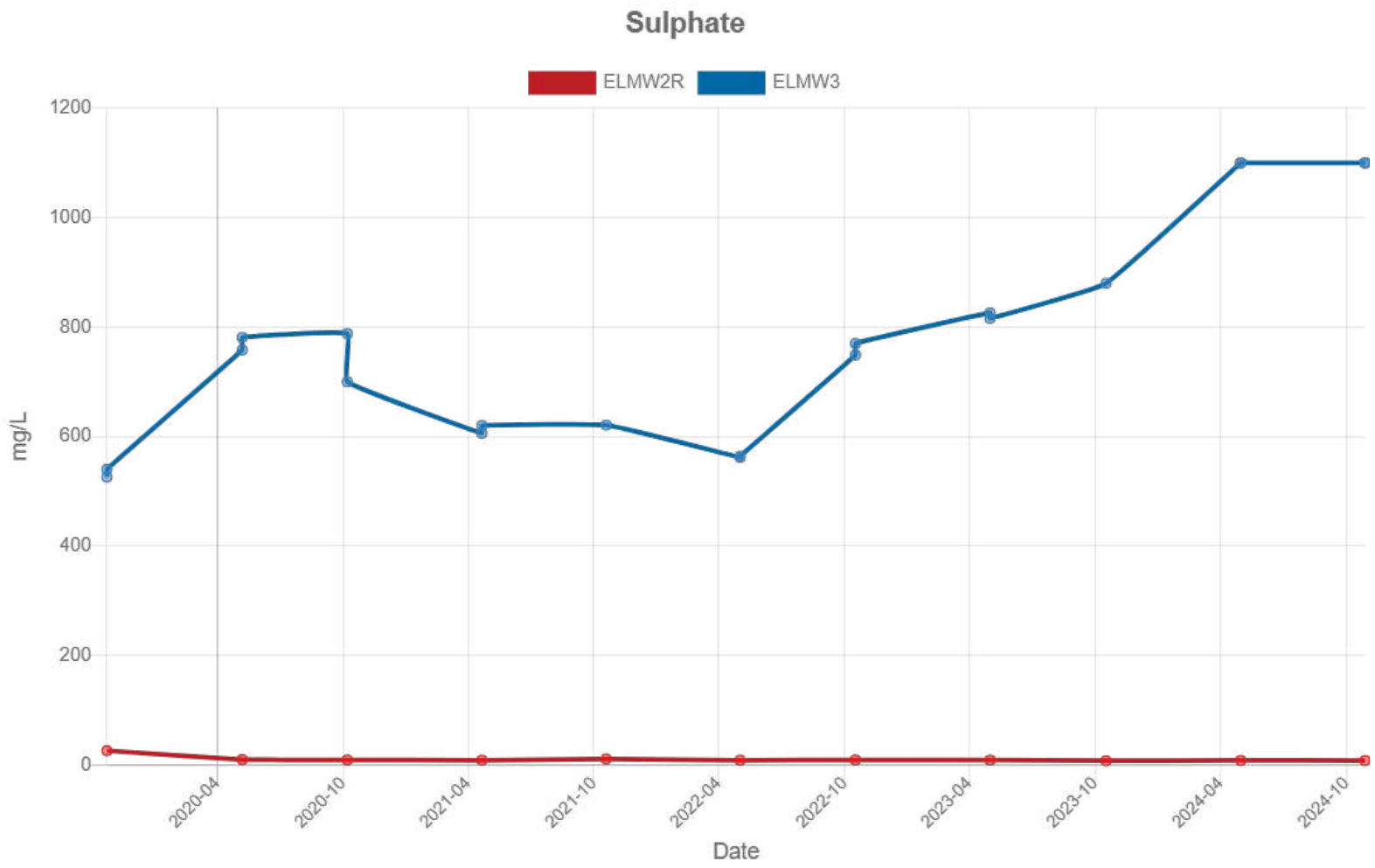


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 19
Sulphate in Groundwater – Downgradient Wells

Created by: Megan Williamson

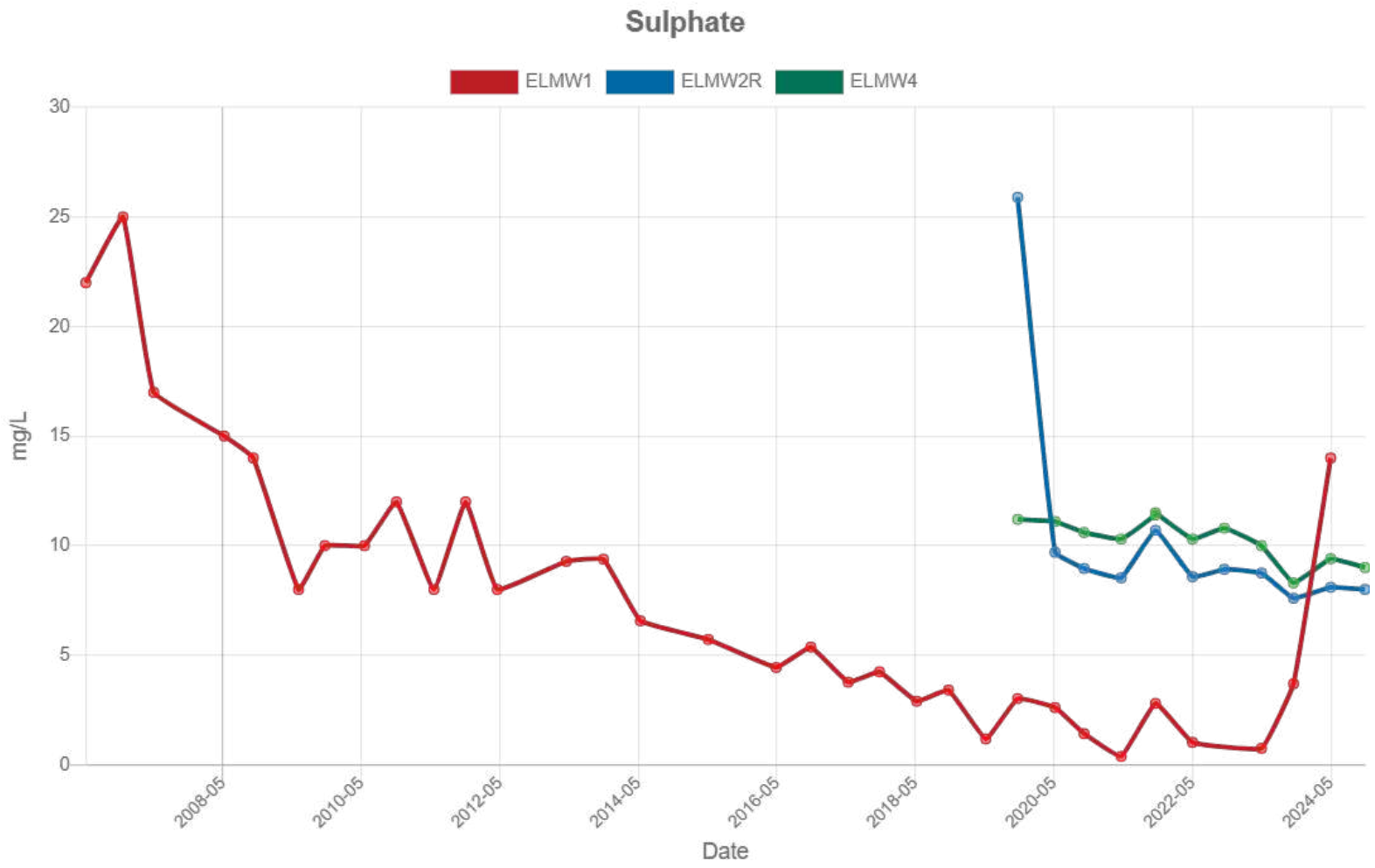


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 20
Sulphate in Groundwater – Leachate Well

Created by: Megan Williamson

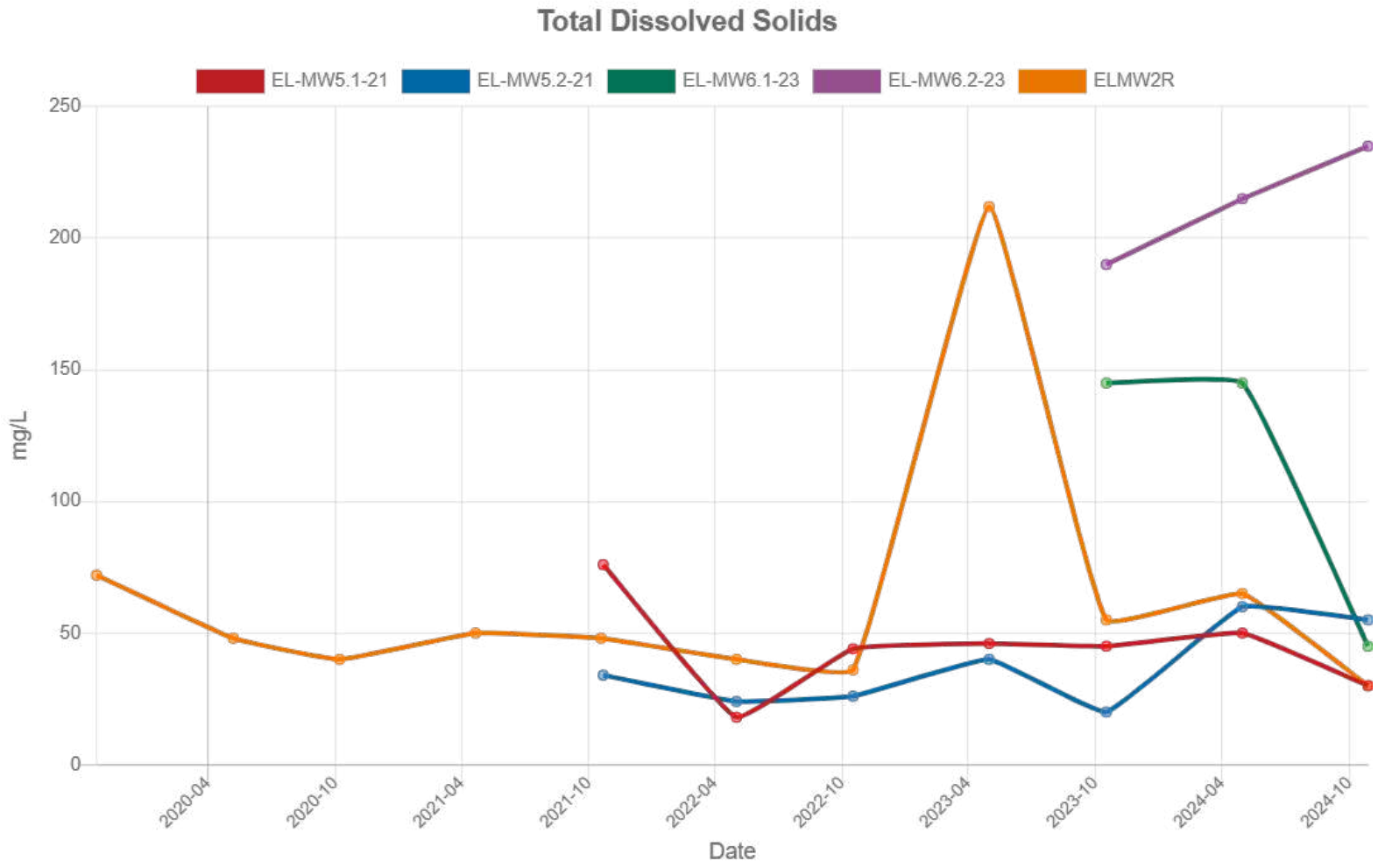


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 21
Sulphate in Groundwater – Upgradient Wells

Created by: Megan Williamson

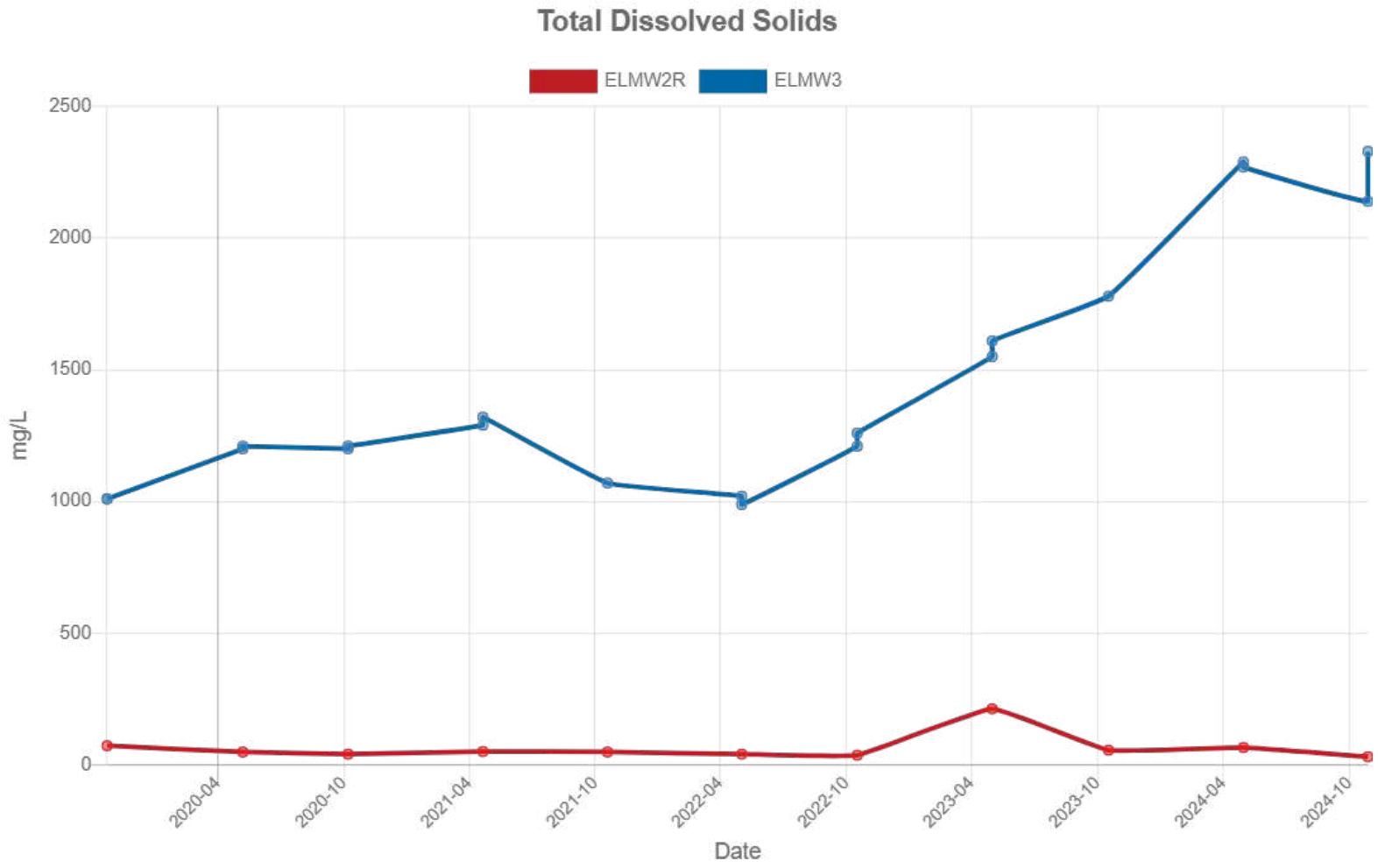


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 22
TDS in Groundwater – Downgradient Wells

Created by: Megan Williamson

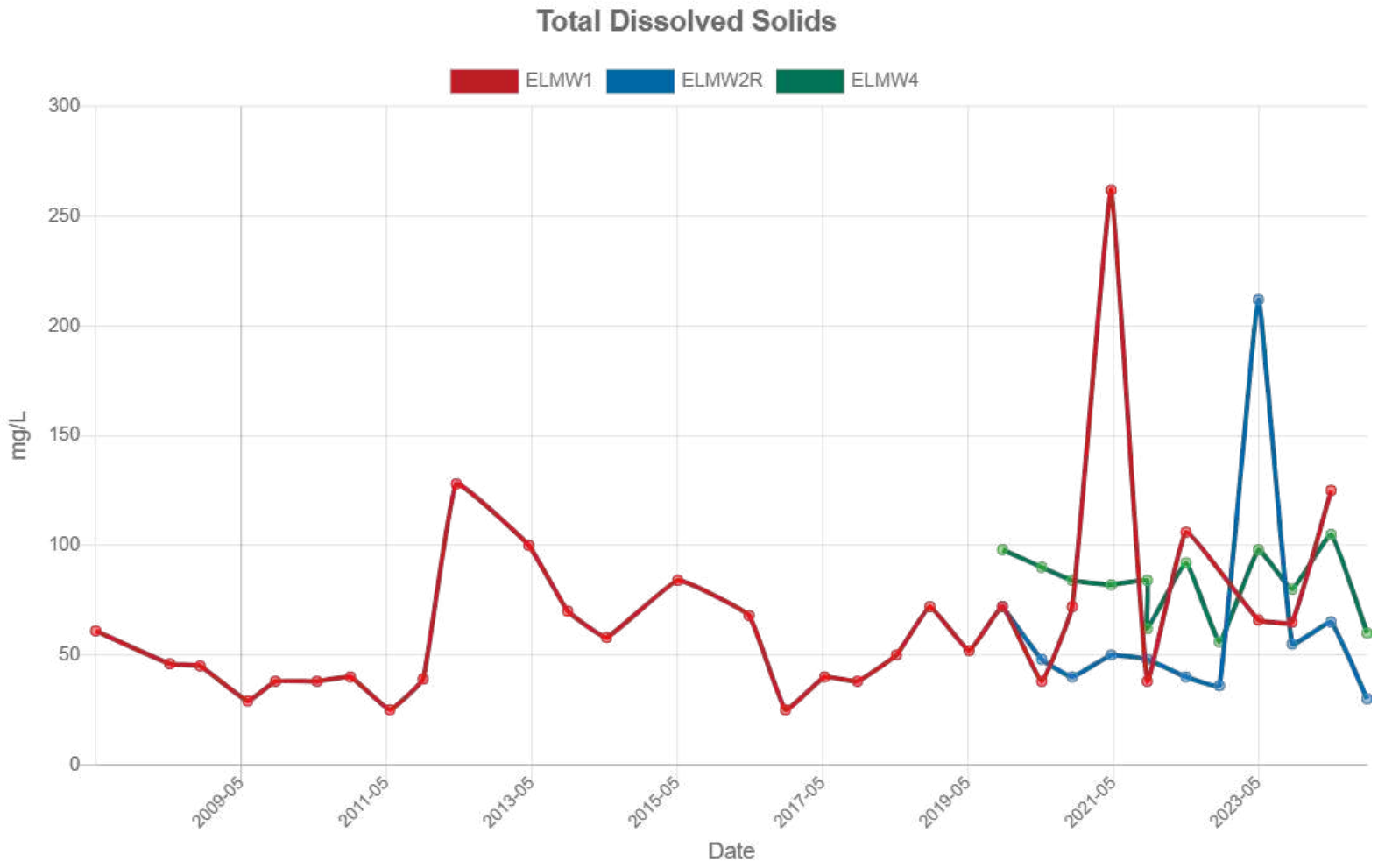


East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 23
TDS in Groundwater – Leachate Well

Created by: Megan Williamson



East Lake WDS
Municipality of Hasting's Highlands

BluMetric Proj No: 240205
Date: February 12, 2025

Graph 24
TDS in Groundwater – Upgradient Wells

Created by: Megan Williamson

Appendix A

A-1 Environmental Compliance Approval

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A361115
Issue Date: August 9, 2018

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

Site Location: East Lake (Cardwell) WDS
59 Cardwell Road
Lot Part of 29, Concession 3
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 a 2.3 hectare waste disposal site (landfilling) within a total site area of 4.05 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 Schedules "A" and "B";

"**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 for the geographic area in which the Site is located;

"**EPA**" means the Environmental Protection Act, R.S.O. 1990, as amended;

"**HHW**" means household hazardous waste;

"**Landfill**" means the 2.3 hectare portion of the Site designated for the permanent deposition of waste;

"**Ministry**" and "**MOECC**" means the ministry of the government of Ontario responsible for the EPA and includes all officials, employees or other persons acting on its behalf;

"**ODWS**" means the Ontario Drinking Water Standards, as amended from time to time;

"**Ontario Regulation 463/10**" means Ontario Regulation 463/10, Ozone Depleting Substances and Other Halocarbons, made under the EPA;

"**Ontario Regulation 903**" means Ontario Regulation 903 – R.R.O. 1990, Wells, amended to Ontario Regulation 128/03, made under the OWRA;

"**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;

"**Owner**" means any person that is responsible for the establishment or operation of the Site being approved by this Approval, and includes Highland Hastings Municipality, its successors and assigns;

"**OWRA**" means the Ontario Water Resources Act, R.S.O. 1990, c.0.40, as amended;

"**PA**" means the Pesticides Act, R.S.O. 1990, c. P-11, as amended from time to time;

"**Provincial Officer**" means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the OWRA or Section 5 of the EPA or Section 17 of PA;

"**PWQO**" means the 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;

"**Regulation 347**" means Regulation 347, R.R.O. 1990, General - Waste Management, made under the EPA, as amended from time to time;

"**RUG**" means the Reasonable Use Guidance (Guideline B-7) of the Ministry;

"**Site**" means the entire 4.05 hectare waste disposal site, including the buffer lands, and any contaminant attenuation zone located at Lot Part of 29, Concession 3, Hastings Highlands Municipality, County of Hastings;

"**trained person**" means a person that has been trained through instruction and/or practice, and receives refresher training, in accordance with Condition 2.11 of this Approval; and

"**WEEE**" and "**waste electrical and electronic equipment**" means a device that is a waste, that required an electric current to operate and includes household appliances, information technology equipment, telecommunications equipment, audio-visual equipment, toys, leisure equipment, sport equipment, electrical or electronic tool and instruments, as listed in Schedules 1 through 7 of the Ontario Regulation 393/04 Waste Electrical and Electronic Equipment made under the Waste Diversion Act 2002, and similar devices.

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

TERMS AND CONDITIONS

PART 1 - GENERAL

Revoke and Replace

1.1 This Approval revokes Provisional Certificate of Approval No. A361115 issued March 31, 1980 and Notices of Amendment issued June 9, 2000 and May 7, 2002. The approval given herein, including the terms and conditions set out, replaces all previously issued approvals and related terms and conditions under Part V of the *EPA* for this Site.

In Accordance With

1.2 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".

Compliance

1.3 The requirements specified in this *Approval* are requirements under the *EPA* . Issuance of this *Approval* in no way abrogates the *Owner's* legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.

1.4 The requirements of this *Approval* are severable. If any requirements of this *Approval* , or the application of any requirement of this *Approval* to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this *Approval* shall not be affected in any way.

1.5 The *Owner* must ensure compliance with all terms and conditions of this *Approval* . Any non-compliance constitutes a violation of the *EPA* and is grounds for enforcement.

1.6 a. The *Owner* shall, forthwith upon request of the *Director* , *District Manager* , or *Provincial Officer,* furnish any information requested by such persons with respect to compliance with this *Approval* , including but not limited to, any records required to be kept under this *Approval* ; and

b. In the event the *Owner* provides the Ministry with information, records, documentation or notification in accordance with this *Approval* (for the purposes of this condition referred to as "Information"),

i. the receipt of Information by the Ministry;

ii. the acceptance by the Ministry of the Information's completeness or accuracy; or

iii. the failure of the Ministry to prosecute the *Owner* , or to require the *Owner* to take any action, under this *Approval* or any statute or regulation in relation to the Information;

shall not be construed as an approval, excuse or justification by the Ministry of any act of omission of the *Owner* relating to the Information, amounting to non-compliance with this Approval or any statute or regulation.

Ministry Inspections

1.7 The *Owner* shall allow Ministry personnel, or a Ministry authorized representative(s), upon presentation of credentials, to:

a. Carry out any and all inspections authorized by Section 156, 157 or 158 of the *EPA* , Section 15, 16 or 17 of the *OWRA* or Section 19 or 20 of the *PA* , as amended from time to time, of any place to which this *Approval* relates; and

b. Without restricting the generality of the foregoing, to:

i. enter upon the premises where records required by the conditions of this *Approval* are kept;

ii. have access to and copy, at reasonable times, any records required by the conditions of this *Approval* ;

iii. inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this *Approval* ; and

iv. sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this *Approval* .

Interpretation

1.8 Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this *Approval* , the conditions in this *Approval* shall take precedence. Where there is a conflict between the documents listed in Schedule "A", the document bearing the most recent date shall prevail.

Transparency

1.9 Any information relating 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, R.S.O. 1990, C. F-31.

Record Retention

1.10 All records and monitoring data required by the conditions of this *Approval* must be kept on the Owner's premises for a minimum period of five (5) years from the date of their creation.

Certificate of Requirement/Registration on Title

1.11 Pursuant to Section 197 of the *EPA* , no person having an interest in the *Site* shall deal in any way with the *Site* without first giving a copy of this *Approval* to each person acquiring an interest in the *Site* as a result of the dealing.

1.12 The *Owner* shall notify the *Director,* in writing, and forward a copy of the notification to the *District Manager,* within 30 days of the occurrence of any changes in the following information:

(a) the ownership of the *Site;*
(b) the *Operator* of the *Site;*
(c) the address of the *Owner or Operator;* and
(d) the partners, where the *Owner or Operator* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act* , R. S. O. 1990, c. B.17, shall be included in the notification.

1.13 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.

1.14 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.*

1.15 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.

Notification

1.16 The *Owner* shall ensure that all communications/correspondence made pursuant to this *Approval* references Environmental Compliance Approval No. A361115.

PART 2 - GENERAL OPERATIONS

Service Area

2.1 Only wastes generated from within the geographic boundary of The Corporation of the Municipality of Hastings Highlands may be received and disposed of at the *Site* .

Signage and Security

2.2 A sign shall be posted at the entrance gate of the *Site* with the following information:

a. Name of the *Site* and *Owner* ;

b. Environmental Compliance No. for the *Site;*

c. Days and hours of operation of each area of the *Site;*

d. Allowable and prohibited waste types in the Landfill and Waste Diversion;

e. Contact telephone number(s); and

f. Warning against unauthorized access and against dumping outside the *Site* .

2.3 The *Owner* shall ensure that:

a. Access to the *Site* is restricted by fencing and/or natural features;

b. Fencing and lockable gate are kept in good repair; and

c. The *Site* is screened from public view on all sides.

Operating Hours

2.4 The *Owner* shall set operational hours, for each waste management activity conducted within the *Site* , which provides an adequate level of service. Hours of operation may be changed by the Owner at any time provided that the hours are correctly posted at the *Site* gate and that suitable public notice is given of any changes.

2.5 No waste shall be received at the *Site* except during the hours of operation and under the supervision of a trained person.

2.6 The *Owner* shall ensure that during non-operating hours, the Site entrance and exit gates, or areas of the Site which are not open to the public at those times, are locked or otherwise secured against access by unauthorized persons.

2.7 During non-operating hours when waste disposal is not permitted, the *Owner* may conduct equipment maintenance, administrative functions, and on-site activities including waste compaction and application of cover material; and allow licensed Contractors to transfer waste/recyclables off-site, as required.

Nuisance Control

2.8 If at any time problems such as odours, dust, litter, noise, vectors, vermin, rodents, bears or other nuisances are found at the *Site* , the *Owner* shall take appropriate, immediate remedial action to eliminate the problem.

2.9 The *Owner* shall implement a litter control plan which shall include:

a. Taking all practical steps to prevent the escape of litter from the *Site;*

b. Litter pick-up at the *Site* during each operating day;

c. Monthly litter pick-up along the access road in the vicinity of the *Site;*

d. Private property adjacent to the *Site* shall be inspected as required and litter shall be collected if necessary, with permission from the property owner; and

e. litter fencing shall be erected around the working area of the landfill as required.

2.10 No burning of waste is permitted at the *Site.*

a. Notwithstanding Condition 2.10, 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.

Staff Training

2.11 The *Owner* shall develop and maintain a training plan for current and new *Site* employees and shall ensure that all *Site* employees have been adequately trained and receive on-going training with respect to the following:

a. Terms, conditions, and operating requirements of this Approval;

b. An outline of the responsibilities of employees for each waste management activity undertaken at the *Site* ;

c. Operation and management of the *Site* , or area(s) within the *Site* , in accordance with the specific job requirements of each individual employee, including but not limited to procedures for receiving, screening and identifying waste, refusals, handling and temporarily storing wastes;

d. The operation, inspection, and maintenance of the *Site* , or area(s) within the *Site* , with respect to the approved design and operations documents listed in Schedule "A";

e. Record keeping requirements specific to each area / waste management activity;

f. Procedures for responding to public complaints;

g. Environmental concerns related to the type of waste handled in each area of the *Site;*

h. Occupational health and safety concerns related to waste management at the *Site;* and

i. Emergency procedures and contingency plans in cases of fire, spills, off-site impacts and any other emergency situations.

Complaints

2.12 If at any time, the *Owner* receives complaints regarding the operation of the *Site* , or an area within the *Site,* the *Owner* shall respond to these complaints according to the following procedure:

a. The *Owner* shall record each complaint on a formal complaint form entered in a log book. The information recorded shall included the nature of the complaint, the name, address and telephone number of the complainant and the time and date of the complaint;

b. The *Owner,* upon notification of the complaint, shall initiate appropriate steps to determine all 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 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 reoccurrence of similar incidents.

Emergency Response

2.13 The *Owner* shall take immediate measures to clean-up all spills, related discharges, and process upsets of wastes which result from the operation of any portion of the *Site* .

2.14 All spills and upsets shall be immediately reported to the Ministry's Spills Action Centre at 416-325-3000 or 1-800-268-6060 and shall be recorded in a written log or an electronic file format, as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.

PART 3 - LANDFILL OPERATIONS

Landfill Capacity

3.1 The maximum approved capacity of the landfill including waste, daily cover, and final cover is 147,546 m^3.

Waste Type

3.2 Only solid non-hazardous municipal waste, including wastes generated by residential, commercial and institutional sectors shall be received for disposal at this landfill. No household hazardous waste, hazardous waste, septic tank waste, sewage, biosolids, or liquid industrial wastes, as defined in *Regulation 347,* shall be disposed of at this landfill.

3.3 In the event that unacceptable waste is received at the *Landfill,* the *Owner* shall:

a. refuse receipt of the unacceptable waste and return the waste to the generator if safe to do so; or

b. if return of the waste is not feasible, the *Owner* shall isolate the unacceptable waste and remove it from the *Landfill* within seventy-two (72) hours, in accordance with *Regulation 347* ; and

c. the Owner shall review the incident and take appropriate steps to prevent future receipt of unacceptable waste.

Waste Placement

3.4 a. The Owner shall ensure that no waste is disposed of outside the limits of fill area and final contours as shown on Drawing No. 4, Item # 4, Schedule A, and final contours shall not exceed 4H:1V and shall not be less than 20H:1V;

b. The Landfill footprint shall be clearly marked at all times to prevent any fill beyond approved limits;

c. The waste placement at the Site shall progress as indicated on Drawing 07 to 09 of Item 4 in Schedule "A";

d. All waste shall be deposited at the active face of the Landfill except for waste handled in accordance with Part 4 and Part 5 of this Approval; and

e. Waste shall be deposited in a manner that minimizes the area of exposed waste at the active face of the Landfill

Cover Material

3.5 a. Cover material shall be applied as follows:

i. Cover material consisting of a minimum of 0.15 m thickness of soil or approved alternative daily cover (i.e. 40% soil/60% chipped wood mix) shall be applied once every week; and

ii. The Owner shall increase the frequency of cover material application if it is determined by the District Manager or by the Owner that the frequency outlined in Condition 3.5(a)(i) does not provide adequate control.

b. In areas where waste placement is below the final approved contours and landfilling is to be suspended for six months or more, an interim cover consisting of a minimum of 0.30 m thickness of soil shall be applied;

c. In landfilling areas which are no longer in use (i.e. historical) and where final contours have reached, a final cover of 0.60 m thickness of soil with an additional 0.15 m of topsoil shall be applied; and

d. Where existing cover material has eroded such that waste is exposed, the cover material shall be replaced promptly.

Inspections

3.6 The *Owner* shall ensure that the following *Landfill* inspection schedule is adhered to:

a. on a monthly basis, an inspection of the working face and storage areas, cover of waste, signage, fencing and gate;

b. on a monthly basis, an inspection of the areas under final cover, road condition, access road and adjacent property litter inspection; and

c. on an annual basis, an inspection of the monitoring wells and a field survey of the limit of fill area.

Design and Operations Report

3.7 The Owner shall submit an updated Design and Operations plan two (2) years prior to Phase 1 being filled to capacity (85,546 m^3 - includes waste, daily cover, and final cover).

Landfill Closure

3.8 Two (2) years prior to the *Landfill* reaching the final approved capacity, the *Owner* shall submit to the *Director,* for approval, a plan for the closure, end use, post closure monitoring and long term maintenance of the *Landfill.*

PART 4 - WASTE DIVERSION OPERATIONS

4.1 The *Owner* shall ensure that:

a. All white goods which contain refrigerants accepted at the *Site* , which have not been tagged by a licensed technician to verify that the equipment no longer contains refrigerants, are stored in such a manner that allows for the safe handling and removal from the Site for removal of refrigerants as required by *Ontario Regulation 463/10* ;

b. White goods may be shipped off site for recycling after the refrigerants have been removed and tagged by a licensed technician in accordance with Ontario Regulation 463/10; and

c. A detailed log of all white goods, which contain refrigerants received is maintained and includes the following information:

i. date of the record;

ii. types, quantities, and source of white goods which contain refrigerants received;

iii. destination of the white goods; or

iv. the details on removal of refrigerants, if conducted on Site, and the quantities and destination of the refrigerants transferred from the Site.

4.2 The diversion of other wastes including recyclables, tires, and scrap metals shall be removed from the *Site* at regular intervals to prevent potential nuisance and health and safety issues and includes the following information:

a. a detailed log of all waste diverted including:

i. date of the record;

ii. types, and quantities; and

iii. destination of the wastes.

4.3 Any waste stored in sealable and lockable bins or containers received at the *Site* shall be stored and handled as follows:

a. WEEE shall be packed in Gaylord boxes or stacked securely on skids;

b. Shall be clearly labelled as to the contents; and

c. All containers shall be maintained in good condition. If a container is found to be damaged or leaking, the contents of the container shall be immediately moved to an undamaged container;

PART 5 - MONITORING PROGRAM

Compliance

5.1 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 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,* or the *Canadian Water Quality Guidelines* published by the Canadian Council of Ministers of the Environment, 1999 for the protection of surface water both on and off the *Site.*

Monitoring Program

5.2 Within six (6) months from the date of this *Approval* being issued, the *Owner* shall submit to the *Director and District Manager,* a monitoring program for review that considers the site and the natural environment including groundwater for the purpose of assessing potential impacts associated with the *Landfill* .

a. The *Owner* shall construct and maintain to the satisfaction of the *Ministry,* a groundwater monitoring network which fully delineates the horizontal and vertical extent of leachate migration resulting from the landfilling activities at the Site. The groundwater monitoring network shall

adequately evaluate up-gradient or trans-gradient water quality for natural uncontaminated groundwater, at least one well to represent leachate impacted water, and at least one additional down-gradient well for a *Reasonable Use Guidance Assessment.* The location of groundwater monitoring wells shall be done in consultation with a *Ministry* Regional Technical Support hydrogeologist;

b. Upon completing Condition 5.2, the *Owner* shall provide the details of the new groundwater monitors, so that Schedule "B" of the *Approval* can be updated to reflect the additional monitoring locations;

c. The installation of additional groundwater monitoring wells shall occur within eighteen (18) months of this *Approval* being issued.

d. A 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

5.3 The *Owner* shall ensure that all groundwater monitoring wells which form part of the monitoring program are properly capped, locked and protected from damage.

5.4 Any groundwater monitoring well included in the on-going monitoring program that are damaged shall be assessed, repaired, replaced or decommissioned as prescribed by *O. Reg. 903* 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.

Changes to the Monitoring Plan

5.5 The *Owner* may request to make changes to the monitoring program(s) to the *District Manager* in accordance with the recommendations of the annual report. The *Owner* shall make clear reference to the proposed changes in separate letter that shall accompany the annual report.

5.6 Within thirty (30) 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, 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 monitoring program, to the *Director* requesting the *Approval* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.

5.7 In the event any other changes to the environmental monitoring program are proposed outside of the recommendation of the annual report, the *Owner* shall follow current ministry procedures for seeking approval for amending the *Approval.*

PART 6 - RECORD KEEPING AND REPORTING

Record Keeping

6.1 The *Owner* shall keep records pertaining to *Landfill* operations. The record shall include, but not be limited to:

a. Date of record;

b. Quantity of waste and cover material received at the Landfill;

c. A notation of the area of the Landfill in which waste disposal operations are taking place; and

d. A description of maintenance activities completed (e.g. compaction, placement of cover material, etc).

6.2 The *Owner* shall keep records documenting the inspections undertaken in accordance with this *Approval.* The records shall include:

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. Recommendations for remedial action; and

e. The date, time and description of remedial actions taken.

6.3 The *Owner* shall maintain a record of employee training. The record shall include, at a minimum:

a. Date of training;

b. Name and signature of person who has been trained; and

c. Description of the training provided.

Annual Report

6.4 No later than March 31 of each year, the *Owner* shall submit to the *District Manager* an Annual Report on the development, operation and monitoring of the *Site* for the preceding calendar year. The Annual Report shall, as a minimum, include the following elements:

a. Executive Summary

b. *Landfill Operations*

i. A site plan of the landfilling area showing: the current and final contours and cross-sections; and any changes to the *Site* layout (based on topographic surveys to be updated a minimum of every 5 years);

ii. A report on the landfill capacity used during the reporting period and the remaining capacity;

iii. A report on the types and volumes of waste diverted from the landfill by transfer from the *Site;* and

iv. A summary of complaints regarding *Site* operations and the *Owner's* response.

c. *Waste Diversion*

i. A detailed monthly summary of the type and quantity of waste diverted for recycling.

d. *Environmental Quality Monitoring*

i. An analysis and interpretation of gas, surface water and groundwater monitoring data;

ii. An assessment of surface water quality at the *Site* boundaries with respect to *PWQO* , and groundwater quality with respect to *RUG;*

iii. An assessment of the adequacy of the natural attenuation of leachate and gas generated by the *Site;*

iv. In the event that the results predict an off-site exceedance of the *RUG* or *PWQO* , the details of any such predicted off-site exceedance, including the assumptions upon which the prediction is based;

v. A discussion of the modifications, if any, to intended operations which would be necessary to prevent the predicted off-site exceedance;

vi. A discussion of the modifications, if any, which should be made to the monitoring program; and

vii. A discussion of other mitigation measures or contingency actions, if any, which may be necessary to prevent off-site impacts.

e. *Recommendations*

i. Recommendations on any proposed changes to gas, surface water or groundwater monitoring programs or any repairs required to the monitoring well network;

ii. Recommendations on any proposed changes to the operation of the *Landfill* or Waste Diversion Area; and

iii. Recommendations on the requirement for any remedial works or contingency actions based on the monitoring results or *Site* operations.

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

The reason for Condition 1.1 is to clarify that the previously issued Certificate of Approval No. A361115 issued on March 31, 1980 and Notices of Amendment issued June 9, 2000 and May 7, 2002, are no longer in effect and has been replaced and superseded by the Terms and Conditions stated in this Approval.

The reason for Conditions 1.2 and 3.8 is 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 reason for Conditions 1.3, 1.4, 1.5, 1.6 and 1.9 is to clarify the legal responsibilities and obligations imposed by this Approval.

The reason for Condition 1.7 is to ensure that appropriate Ministry staff have ready access to the Site in order to confirm that the Site is being operated according to this Approval. The condition is supplementary to the powers afforded a Provincial Officer pursuant to the EPA, the OWRA, and the PA, as amended.

The reason for Condition 1.8 is to clarify how to interpret this Approval in relation to the application and supporting documentation.

The reason for Condition 1.10, 6.1, 6.2, and 6.3 is to ensure that accurate records are maintained and available for review to demonstrate compliance with the conditions of this Approval, the EPA and its regulations.

The reason for Conditions 1.11, 1.12, 1.13, 1.14, 1.15, and 1.16 is to protect future occupants of the Site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Approval being registered on title.

The reason for Condition 2.1 is to specify the approved areas from which waste may be accepted at the Site.

The reason for Condition 2.2 is to ensure that users of the Site are informed of the hours and services available as well as given contact information in the event of a complaint or emergency.

The reason for Condition 2.3 is to minimize the risk of unauthorized entry.

The reason for Conditions 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, and 2.10 is to ensure that the Site is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.

Schedule "B"

This Schedule "B" forms part of Environmental Compliance Approval No. A361115.

Stations to be Sampled	*Monitoring Frequency*	*Parameter List*
Groundwater Representative Leachate Well: *To be determined.* Background well(s): **EL-MW2* Impact evaluation well(s): ***EL-MW1* * EL-MW2 will continue to be sampled until a replacement well is installed. ** At least one additional downgradient monitor is to be installed.	Twice per year. Sampling shall be done semi-annually in the spring (April-May), and fall (October-November).	Organic Parameters Dissolved Organic Carbon (DOC), Biochemical Oxygen Demand - 5 day test (BOD5), Volatile Organic Compounds (benzene, 1,4 dichlorobenzene, dichloromethane, toluene, and vinyl chloride) Inorganic Parameters ammonia, chloride, nitrate, major ions (sodium, potassium, calcium, magnesium, sulphate, alkalinity) Metals aluminum, boron, iron, lead, manganese, barium Physical/Chemical Parameters Chemical Oxygen Demand (COD), conductivity, pH, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), hardness Other Total, Kjeldahl Nitrogen (TKN)

Schedule "A"

This Schedule "A" forms part of Environmental Compliance Approval No. A361115.

1. General location map titled "Diagram 1, Wicklow Township" submitted November 15, 1977.

2. Site plan titled "Waste Disposal Site A361115, Township of Wicklow."

3. Letters outlining the operating programme from D.C. Bloom, Clerk-Treasurer to D.E. Graham, Ministry of the Environment, dated October 3, 1977 and January 26, 1978.

4. Application to amend Environmental Compliance Approval. Report entitled "Development and Operations Plan, East Lake Waste Disposal Site, Environmental Compliance Approval No. 361115" and all supporting documentation. Prepared by BluMetric Environmental Inc. February 2018.

f. Conclusions

i. Any environmental or operational problems that could negatively impact the environment, encountered during the operation of the *Site* and any mitigative actions taken; and

ii. An assessment as to whether or not the *Owner* is operating the *Site* in compliance with the Conditions of this *Approval* .

Condition 2.11 is included to ensure that the Owner properly trained the staff operating the site to ensure that the operations are undertaken in accordance with the requirements of this Approval.

The reason for Condition 2.12 is to ensure that complaints are properly and quickly resolved and that complaints and follow-up actions have been documented.

The reason for Condition 2.13 is to ensure the Owner immediately responds to a spill.

The reason for Condition 2.14 is to ensure that the Owner notifies the Ministry forthwith of any spills so that an appropriate response can be determined.

The reason for Conditions 3.1, 3.2, and 3.3 is to state the amounts and types of waste that may be accepted, based on the application and the supporting documentation and to ensure that only waste approved for receipt are accepted.

Condition 3.4 is included to ensure that waste disposal remains within the approved limits.

Condition 3.5 is included to ensure that the waste is covered with a suitable daily, interim and final cover material in a timely manner, to minimize the environmental impacts from the disposal of waste.

Condition 3.6 is included to ensure that efficient and environmentally sound procedures are employed during the operation of the landfill site.

The reason for Condition 3.8 is to ensure that the Site is closed in accordance with Ministry's standards and to protect the health and safety of the environment.

The reason for Condition 4.1 is to ensure that refrigerants are handled and disposed of in a manner which does not negatively impact the environment.

The reason for Condition 4.2 is to ensure proper record keeping of other wastes diverted from the Site.

The reason for Condition 4.3 is to ensure that waste stored in containers or bins are done in a safe and secure manner.

The reason for Condition 5.1 is to ensure that groundwater and surface water standards/objectives are used to evaluate potential water pollution impacts associated with the Site.

The reason for Condition 5.2 is to ensure an acceptable monitoring plan is proposed to assess potential impacts from the Site.

The reason for Conditions 5.3 and 5.4 is to ensure are to ensure that groundwater monitoring wells are properly maintained and decommissioned as required by Regulation 903.

The reason for Conditions 5.5, 5.6, and 5.7 is to outline the process for making changes to the

monitoring plan and amending the Approval.

Condition 6.4 is included to ensure that regular review of Site development, operations and monitoring is documented and any possible improvements to site design, operations or monitoring programs are identified.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A361115 issued on March 31, 1980

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 and Climate Change
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 9th day of August, 2018

Dale D. Gable

THIS APPROVAL WAS MAILED

ON AUG 1 5 2018

SD

(Signed)

Dale Gable, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

CF/

c: Area Manager, MOECC Belleville
c: District Manager, MOECC Kingston - District
Iris O'Connor P. Eng., BluMetric Environmental Inc.

Appendix A

A-2 2020 Annual Monitoring Report and Proposed Monitoring Plan Technical Review (2022)

Ministry of the Environment, Conservation and Parks
Eastern Region
1259 Gardiners Road, Unit 3
Kingston ON K7P 3J6
Phone: 613.549.4000
or 1.800.267.0974

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Région de l'Est
1259, rue Gardiners, unité 3
Kingston (Ontario) K7P 3J6
Tél: 613 549-4000
ou 1 800 267-0974

Ontario

M E M O R A N D U M

March 23, 2022

TO: Jon Morrish
Senior Environmental Officer
Belleville Area Office
Eastern Region

FROM: Obai Mohammed
Hydrogeologist
Technical Support Section
Eastern Region

RE: East Lake Waste Disposal Site
2020 Annual Monitoring Report; and Proposed Monitoring Plan
Part of Lot 29, Concessions 3, Township of Hastings Highlands,
Environmental Compliance Approval (ECA) Number A361115

Purpose

I have reviewed the hydrogeological aspects of the document entitled: "2020 Annual Monitoring Report, East Lake Waste Disposal Site, Environmental Compliance Approval No. A361115", dated March 2021 and prepared by BluMetric Environmental Inc. (BluMetric) on behalf of the Corporation of the Municipality of Hastings Highlands. In my review, I have also considered the proposed monitoring program detailed on the letter entitled "A361115 – East Lake (Cardwell) Waste Disposal Site (WDS), Proposed Monitoring Program", dated February 1, 2019, and prepared by BluMetric. I offer the following comments for your consideration.

Environmental Compliance Approval

The East Lake Waste Disposal Site (the site) operates under the amended Environmental Compliance Approval (ECA) Number A361115, issued on August 9, 2018, as an active waste disposal site. The site is operated by the Municipality of Hastings Highlands (the Municipality), owned by the Crown and administered by the Ministry of Natural Resources and Forestry (MNRF). It is understood from the Certificate of Approval (CofA) No. A361115 issued on March 31, 1980, that the site has been in operation since 1980. The site is approved to receive solid non-hazardous municipal waste, including residential, commercial, and institutional wastes, in an approved waste disposal area of 2.3 hectares (ha), included in a total area of 4.05 ha. It is further understood that the waste is currently transferred into the site from other waste disposal sites operated by the Municipality. The site receives most of the construction and demolition waste generated in the Municipality. The site has segregated collection areas for scrap metal, tires, large bulky items (e.g., couches and mattresses), electronic waste recycling and a recycling transfer station for household blue box recyclable containers (i.e., aluminum cans, metal cans, plastic bottles) and fibre (i.e., paper and cardboard).

Site Description

The site is located approximately 0.2 km from the Cardwell Lake Road North, in a Crown land, in Part of Lot 29, Concessions 3, in the former Wicklow Township, Township of Hastings Highlands. The site's civic address is 59 Cardwell Road, Maynooth, Ontario. Access to the site is via Highway 62, Highway 127, East Lake Road and Cardwell Lake Road North.

Figure 2, included in the report provided, shows that the site is surrounded mostly by vacant/forest lands, with a former sand and gravel pit within a forested area reportedly located adjacent to the site. There is no buffer, or other lands, designated as Contaminant Attenuation Zone (CAZ) within the total site area. There are no surface water features within the immediate vicinity of the WDS. Cardwell Lake is located approximately 250 m to the east of the site. The site does not comprise engineered control systems and therefore the site is considered a natural attenuating landfill site. The landfill reportedly has about 34 years of site life remaining, with a remaining volume estimated by the end of 2020 as 39,473.15 m3.

Geology

The regional geology of the area is described as glaciofluvial outwash deposits of sand and gravel and undifferentiated till of sand and sand-silt, possibly containing high clay content. The immediate area of the site is characterized generally by sandy overburden with a thickness ranging to depths over 5.5 meters (m).

The geology at the site is determined from the available site well records and is generally described as overburden, mainly comprised of dense fine silty sand, encountered between 5.5 and 14.5 m, on top of a sandy till layer that is overlying a granite bedrock expected to be at depths greater than 24.5 m.

Hydrogeology

Four (4) monitoring wells are available at the site to determine the static water levels and groundwater quality. Monitoring well EL-MW1 is located northeast and cross-gradient of the waste disposal area, monitoring well EL-MW2R-19 is located upgradient and southwest of waste disposal area near the southwest corner of the site, and therefore is considered to be the background monitor for the site, monitoring well EL-MW3-19 is located to the east and downgradient of the waste disposal area, and monitoring well EL-MW4-19 is located cross-gradient to the southeast of the historical waste area. It is understood that all of the four (4) monitoring wells at the site are screened in a water-bearing depths of the overburden unit.

In May 2020, groundwater elevations measured at the site were between 400.68 me ters above mean sea level (masl) to 409.79 masl and were between 399.61 masl to 409.60masl in October 2020 monitoring event. Based on the geology, surface water features, and current and historic data, the shallow groundwater flow direction was determined to be northeast towards Cardwell Lake, with a horizontal hydraulic gradient of 0.05 m/m and 0.03 m/m in the spring and fall of 2020, respectively.

Hydraulic conductivity testing was conducted back on October 24, 2019, at the two (2) installed monitors, EL-MW3-19 and EL-MW4-19, at the site. The resulting hydraulic conductivity values reported ranged between 5.25 x 10^{-5} m/s and 6.42 10^{-5} m/s in the dense sand overburden at EL-MW3-19, and between 5.25 x 10^{-5} m/s and 4.24 x 10^{-5} m/s in the sand till at ELMW4-19.

Background Groundwater Quality

Monitoring well EL-MW2R-19, located upgradient and southwest of waste area near the southwest corner of the site, is considered representative of background conditions. In 2020, the background groundwater quality met the Ontario Drinking Water Standards (ODWS) criteria during both monitoring events, with the exception of alkalinity and pH. The alkalinity and pH concentrations below the lower limits of the ODWS are considered naturally occurring and are not attributed to be related to landfill leachate. It is also understood that low alkalinity and pH is typical of groundwater in the region.

Downgradient Groundwater Quality

Groundwater quality in monitor EL-MW1 did not meet the lower limit of ODWS criteria for Alkalinity and pH in 2020 monitoring events, both of which are described to be naturally occurring and typical of groundwater in the region. In 2020, concentrations of manganese, sulfate and total dissolved solids (TDS) are reported to be exceeding the OWDS criteria at EL-MW3-19. In addition to pH lower limit, described as naturally occurring in the region. It is understood that monitoring well EL-MW3-19 is intended to be used as the leachate monitoring well for the site. The groundwater quality at EL-MW4-19 was below or within range ODWSOG standards for all of the parameters with no exceedances reported at EL-MW4-19 location.

Regulatory Evaluation

Guideline B-7 applies to all operating waste disposal sites and those closed after 1986. Since East Lake is an operating WDS, compliance with Guideline B-7 is required. BluMetric provides the Reasonable Use Concept (RUC) assessment for alkalinity, boron, chloride, DOC, iron, manganese, sodium, nitrate sulphate, and TDS. It is understood that RUC values (RUV) were not recalculated in 2020, and the calculations will be updated for the 2021 monitoring report to revise the mean background concentrations at the replacement background monitor (i.e., well EL-MW2R-19).

The 2019 background groundwater quality results at monitor EL-MW2R-19 were used to calculate RUC values. Parameters that exceed the compliance criteria in 2020 were DOC, Nitrate, TDS at monitoring well EL-MW3-19. Elevated concentrations of manganese, sulphate, and TDS area are also reported above their respective ODWS criteria at EL-MW3-19. It is understood that monitoring well EL-MW3-19 is intended to be used as the leachate monitor for the site. Results for monitoring well EL-MW4-19 were below or within range of compliance and ODWS.

BluMetric concluded that the site is in compliance with Guideline B-7 along the site's north, west, and south boundaries, and that the site is potentially out of compliance with Guideline B-7 along the eastern property boundary. I concur with this conclusion.

Groundwater – Surface water Interaction

Vertical hydraulic gradient values are not provided, and no groundwater-surface water interaction assessment provided. It is understood that there are no surface water features in the immediate vicinity of the site. Cardwell Lake is located approximately 250 m to the east of the site. Future reports should provide discussion on groundwater-surface water interaction and potential impacts on Cardwell Lake.

Volatile Organic Compounds (VOCs)

VOCs were sampled for in 2019 at the leachate monitor, EL-MW3-19, and were found to be below detectable limits and were therefore not sampled in 2020. The next VOCs sampling is scheduled to be conducted in 2025.

Landfill Gas

The consultant has assessed the risk related to landfill gas with the results for 2020, indicating that landfill gas is not currently a hazard concern, with levels noted to be significantly less than the concentrations of concern in the subsurface, buildings and structures onsite. Landfill gas should continue to be monitored and associated risk should continue to be evaluated by the consultant in future reports.

Trigger Mechanisms and Contingency Plan

No triggers mechanisms and contingency plan provided in the AMR for the site. I recommend establishing groundwater trigger mechanisms, and a contingency plan for the site, for MECP review and approval, in the next AMR.

Groundwater Monitoring Program

A phased approach monitoring program for the site is proposed by BluMetric in their letter dated February 1, 2019. Monitoring wells were installed in 2019 in Phase 1 of the proposed monitoring program. Phase 2 of the program includes an additional groundwater monitoring well installation at the eastern property boundary of the site, immediately east of EL-MW3-19, to assess and confirm natural attenuation, and to confirm compliance with Guideline B-7 along the eastern boundary. A future monitoring well, or monitoring well nest, is recommended to be located along the west side of Cardwell Lake Road North, approximately 150 m to 300 m east of EL-MW3 19.

It is understood that Phase 1 is complete and included the current available overburden monitors up to the bedrock surface/drilling refusal. I recommend installing Phase 2 and Phase 3 proposed three (3) monitoring wells, to the east and northeast, to determine lateral and vertical extents of the landfill impacts. As listed in Table 2 of BluMetric's letter, Phase 2 includes monitoring well EL-MW6 installation and Phase 3 includes monitoring wells EL-MW7 and EL-MW8 installations. The monitoring wells, available or proposed to be installed, at the site are to be utilized to measure groundwater levels and to collect groundwater samples for quality analyses. The exact locations and details of the three (3) monitoring well installations (i.e., EL-MW6, EL-MW7, and EL-MW8) should be provided to the Ministry for review and approval.

Groundwater samples collected from the monitoring to be analysed for:

- organic parameters: dissolved organic carbon (DOC) and biological oxygen demand (BOD_5);
- inorganic parameters: Nitrate, Ammonia, Chloride, Major Ions (Sodium, Calcium, Magnesium, Potassium, Sulphate, Alkalinity), and TKN;
- dissolved metals: Aluminum, Barium, Boron, Iron, Lead, and Manganese;
- physical and chemical parameters: pH, Conductivity, Total Dissolved Solids (TDS), Total Suspended Solids (TSS), Chemical Oxygen Demand (COD), and Hardness.

Volatile Organic Compounds (VOCs) are noted in the letter to be collected from monitoring wells EL-MW3 and EL-MW4-19 at every five years interval. Should the results from one or both wells indicate exceedances to ODWS criteria; the monitors will be sampled and analyzed for VOCs annually during the fall monitoring event. No VOCs were detected at the leachate monitor (i.e., EL-MW3-19) in 2019. The next VOCs sampling is scheduled to be conducted in 2025.

I generally concur with BluMetric's monitoring program. However, given the site is out of compliance with Guideline B-7 to the east, I recommend installing the remaining three (3) proposed monitoring wells as detailed in the proposed monitoring program. The exact locations and details of the monitoring well installations (i.e., EL-MW6, EL-MW7, and EL-MW8) should be provided to the Ministry for review and approval.

<u>Conclusions and Recommendations</u>

- The East Lake St. WDS is an active natural attenuation site, with approximately 34 years of site life remaining.
- Reasonable Use Guideline B-7 applies to all operating waste disposal sites and those closed after 1986. The site is not in compliance with Guideline B-7 along the eastern property boundary.
- The site has no buffer, or other lands, designated as Contaminant Attenuation Zone (CAZ) within the total site area.
- The shallow groundwater flow direction is to northeast towards Cardwell Lake.
- The background groundwater quality met the Ontario Drinking Water Standards in 2020, except for alkalinity and pH exceedances that were attributed to be naturally occurring, typical of groundwater in the region and not related to landfill leachate.
- It is understood that EL-MW3-19 is intended to be used as a leachate monitoring well. In 2020, concentrations of manganese, sulfate and total dissolved solids (TDS) are reported to be exceeding the OWDS criteria at EL-MW3-19. In addition to pH lower limit, described as naturally occurring in the region. RUV exceedances for DOC, Nitrate, TDS are also reported in 2020 at EL-MW3-19 location.

- Downgradient monitoring well EL-MW1 did not meet the lower limit of ODWS criteria for Alkalinity and pH in 2020, both of which described to be naturally occurring, and no exceedances were reported at the downgradient monitor EL-MW4-19.

- No groundwater-surface water interaction assessment is provided. Cardwell Lake is located 250 m to the east of the site. Future reports should include a discussion of groundwater-surface water interaction and potential impacts on Cardwell Lake.

- VOCs were not detected in the 2019 sampling conducted at the leachate monitor EL-MW3-19. The next VOCs sampling is scheduled to be conducted in 2025.

- Landfill gas currently appears to be of no hazard concerns. Landfill gas should continue to be monitored during the semi-annual sampling events.

- I concur with BluMetric's monitoring program for the site. Yet, I recommend installing the remaining proposed three (3) monitoring wells, to the east and northeast, to determine the lateral and vertical extents of the leachate impacts. The exact locations and details of the three (3) monitoring well installations (i.e., EL-MW6, EL-MW7, and EL-MW8) should be provided to the Ministry for review and approval.

Original to be signed by

Obai Mohammed, Ph.D., M.Sc., P.Eng., PMP
OYM/ob

ec: Cathy Chisholm
Victor Castro
James Mahoney

c: File GW HA HI 01 03 (East Lake WDS)
ECHO# 1-99894970

Appendix A

A-3 Land Use Permit

Ontario

Land Use Permit

Public Lands Act

File: (SEP)

Permit No.
LUP1634-1004216

Use shaded areas for corrections.

Name of Applicant/Permittee (insert Corporate Name if Applicant is "Limited" or "Incorporated")	Area Code	Telephone No.
Municipality of Hastings Highlands	613	338-2811

As Trustee for

Postal Address of Applicant/Permittee
33011 Hwy. 62 P.O. Box 130

City, Town or Village	Prov./State	Country	Postal Code
Maynooth	ON	Canada	K0L 2S0

Location of Land

Lot	Concession/Block No	Geographic Township	Municipality
29	3	WICKLOW	HASTINGS HIGHLANDS M

U.T.M. Grid	Geographic Location	Area in ha.
Zone 18 E 270123 N 5015960	North Cardwell Road	4.05

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	Sales Tax I.D. Number
WASTE DISPOSAL, GARBAGE	R124668666

Fee(s) and Period of Land Use

Amount Due	Annual Fee (subject to adjustment)	Permit Effective Date	Permit Termination Date
$542.97	$330.50 + $42.97 (HST)	Oct 1, 2016	Sep 30, 2026

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
Dump

Applicant's certification

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

Signature of Applicant (Incl. Corporation Official)	Date Signed
[signature]	Jan 24/18

Corporation Use Only

I have authority to bind the herein-named Corporation

Initials and Surname of Corporation Official (Please Print)	Signature of Corporation Official	Position
PE PINKNEY	[signature]	CAO/Clerk

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

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.

1620(95-03)

Return all parts of this form to the District/Area Office for authorization.

Appendix B

Monitoring and Screening Checklist (MECP/MOE)

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	East Lake Waste Disposal Site
Location (e.g. street address, lot, concession)	59 Cardwell Lake Road
GPS Location (taken within the property boundary at front gate/ front entry)	18T 270144 m E, 5015519 m N
Municipality	Municipality of Hasting Highlands (formerly Twp. of Wicklow)
Client and/or Site Owner	The Corporation of the Municipality of Hasting Highlands
Monitoring Period (Year)	2024
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval Number:	A 361115
Director's Order No.:	
Provincial Officer's Order No.:	
Other:	

Report Submission Frequency	◉ **Annual** ○ **Other**	Required to be submitted to MECP, on March 31st following reporting year.	
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	147,546	*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)	1,164.57	*Units*	Cubic Metres
Total Waste Received within Monitoring Period (Year) *Methodology*	Estimated		
Estimated Remaining Capacity	39,073	*Units*	Cubic Metres
Estimated Remaining Capacity *Methodology*	Estimated		
Estimated Remaining Capacity *Date Last Determined*	31-Dec-2024		
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 only)*	1977	**Current ECA Issue Date**	9-Aug-2018
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:	

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**	
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**
All	Lead was inadvertently omitted from the groundwater quality monitoring parameter suite from 2017 to spring 2023. Lead was analyzed at all groundwater monitoring locations in fall 2023 as required by the ECA.	2017 to 2023

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**	If no, specify (Type Here):

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	The Site is not compliant with Guideline B-7 along the eastern property boundary based on the results from EL-MW3. Two additional wells serving as the east-northeast property boundary wells were installed in 2023 as per Phase 3 of the proposed monitoring program. The required CAZ boundary will need be reassessed based on the results of these new boundary wells.	
6) The site meets compliance and assessment criteria.	○ Yes ◉ No	Guideline B-7 compliance along the northern, southern and western property boundary. Not compliant with Guideline B-7 along the eastern property boundary.	
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.*** **The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and** ***ii.*** **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	No MECP comments have been received on the proposed trigger plan at this time. While not required, groundwater quality at the proposed trigger location (EL-MW1) has been assessed for compliance with the proposed groundwater trigger plan. The groundwater chemical results in 2023 did not trigger the Tier 1 Contingency Plan response for groundwater.	

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:

21-Feb-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 site design and operation are recommended** ○ **The following change(s) to the site design and operation is/ are recommended:**	

Name:	Mark Somers, M.Eng., P.Eng., ing.		
Seal:			
Signature:		**Date:**	28-Mar-2025
CEP Contact Information:	Mark Somers, M.Eng., P.Eng., ing.		
Company:	BluMetric Environmental Inc.		
Address:	1682 Woodward Dr, Ottawa, ON, K2C 3R8		
Telephone No.:	(877) 487-8436 ext. 246	Fax No. :	
E-mail Address:	msomers@blumetric.ca		
Co-signers for additional expertise provided:			
Signature:		**Date:**	
Signature:		**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)	Cardwell Lake
Distance(s)	250 m to the East

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	No surface water monitoring is required at the site.
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**	No surface water monitoring is required at the site.

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
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**	No surface water monitoring is required at the site.

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**	No surface water monitoring is required at the site.
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	Increasing trend at monitoring well EL-MW3 for alkalinity, boron, and DOC while the other parameters at this location are observed to be generally stable or decreasing. An increasing trend in nitrate concentrations is apparent at EL-MW2R since monitoring began in 2019. Concentrations at EL-MW1 and EL-MW4 are stable, with fluctuations reported within their typical range. There is insufficient data to properly assess trends at the monitoring wells installed in 2019, 2021 and 2023. It is anticipated that at least five years of semi-annual data will be required prior to analysing trends at these newer wells. No exceedances associated with landfill impacts were reported at the nested wells located downgradient of the landfill. There appears to be sufficient natural attenuation occurring between the leachate well EL-MW3 where a PWQO exceedance was reported and the WL-MW5.1and EL-W52,, therefore surface water impacts to Cardwell Lake are unlikely.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ **Yes** ◉ **No** ○ **Not Applicable**	

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:

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:**	

CEP Signature	
Relevant Discipline	Environmental Engineer
Date:	28-Mar-2025
CEP Contact Information:	Mark Somers, M.Eng., P.Eng., ing.
Company:	BluMetric Environmental Inc.
Address:	1682 Woodward Dr, Ottawa, ON, K2C 3R8
Telephone No.:	(877) 487-8436 ext. 246
Fax No. :	
E-mail Address:	msomers@blumetric.ca

Save As		**Print Form**

Appendix C

C-1 Private Well Records

Ontario Ministry of the Environment

Well Tag Number (Place sticker and print number below)
A019207
A 019207

Well Record
Regulation 903 Ontario Water Resources Act

page 1 of 2

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only
MUN | CON | LOT

[redacted]

Address of Well Location (County/District/Municipality)	Township	Lot	Concession
Hasting County	Hasting Highland		

RR#/Street Number/Name	City/Town/Village	Site/Compartment/Block/Tract etc.
59 Candwell Lake RD	Maynooth	

GPS Reading	NAD	Zone	Easting	Northing	Unit Make/Model	Mode of Operation
	83	18	270065	5015915	Garmin	☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

	General Colour	Most common material	Other Materials	General Description	Depth Metres From	Depth Metres To
#1	Brown	Sand	Cobbles, Gravel	Dense	0	4.52
#2	Brown	Sand	Gravel		0	7.62

Hole Diameter

Depth Metres From	Depth Metres To	Diameter Centimetres
0	4.52	15.24
0	7.62	15.24

Water Record

(crossed out)

Water found at Metres / Kind of Water
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
☐ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was
☐ Clear and sediment free
☐ Other, specify
Chlorinated ☐ Yes ☐ No

Construction Record

	Inside diam centimetres	Material	Wall thickness centimetres	Depth Metres From	Depth Metres To
Casing #1	5.08	☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete ☐ Galvanized	Sch 40	0	1.52
Casing		☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Casing #2	5.50	☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete ☐ Galvanized	Sch 40	0	3.048
Screen Outside diam	5.50	☐ Steel ☐ Fibreglass ☒ Plastic ☐ Concrete ☐ Galvanized	Slot No. 0.10	#1 1.52	4.52
				#2 3.04	7.62
No Casing or Screen		☐ Open hole			

Test of Well Yield

(crossed out)

Pumping test method	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Pump intake set at - (metres)	Static Level			
Pumping rate - (litres/min)	1		1	
Duration of pumping ___hrs + ___ min	2		2	
Final water level end of pumping ___ metres	3		3	
Recommended pump type. ☐ Shallow ☐ Deep	4		4	
Recommended pump depth. ___ metres	5		5	
Recommended pump rate. (litres/min)	10		10	
If flowing give rate - (litres/min)	15		15	
If pumping discontinued, give reason.	20		20	
	25		25	
	30		30	
	40		40	
	50		50	
	60		60	

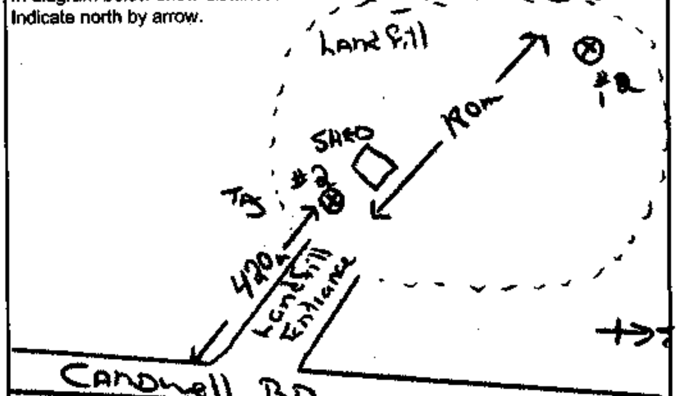
Plugging and Sealing Record

☒ Annular space ☐ Abandonment

	Depth set at - Metres From	To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
#1	0	1.21	Bentonite chips	
	1.21	4.52	Sand	
#2	0	0.91	Bentonite chips	
	0.91	2.74	~~back fill~~ Bentonite Chips	
	2.74	7.62	Sand	

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Method of Construction

☐ Cable Tool ☐ Rotary (conventional) ☐ Rotary (reverse) ☐ Rotary (air) ☐ Air percussion ☒ Boring ☐ Diamond ☐ Jetting ☐ Driving ☐ Digging ☐ Other

Water Use

☐ Domestic ☐ Stock ☐ Irrigation ☐ Industrial ☐ Commercial ☐ Municipal ☐ Public Supply ☐ Not used ☐ Cooling & air conditioning ☒ Other Mon. Test

Final Status of Well

☐ Water Supply ☐ Observation well ☒ Test Hole ☐ Recharge well ☐ Abandoned, insufficient supply ☐ Abandoned, poor quality ☐ Unfinished ☐ Dewatering ☐ Replacement well ☐ Abandoned, (Other)

Audit No. Z 26211

Date Well Completed (YYYY MM DD): 2005 04 26

Was the well owner's information package delivered? ☐ Yes ☒ No

Date Delivered (YYYY MM DD):

Well Contractor/Technician Information

Name of Well Contractor	Well Contractor's Licence No.
G.E.T. Drilling LTD	7085

Business Address (street name, number, city etc.): RR6 Napanee

Name of Well Technician (last name, first name)	Well Technician's Licence No.
Harrison, Tim	T-2251

Signature of Technician/Contractor	Date Submitted (YYYY MM DD)
X [signature]	2005 05 21

Ministry Use Only

Data Source	Contractor 7085
Date Received (YYYY MM DD) JUN 16 2005	Date of Inspection (YYYY MM DD)
Remarks	Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☒ Well Owner's Copy ☐

Cette formule est disponible en français

The Ontario Water Resources Commission Act

WATER WELL RECORD

Water management in Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 | 2905605 | MUNICIP. 29023 | CON. CON 03

COUNTY OR DISTRICT	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE	CON., BLOCK, TRACT, SURVEY, ETC.	LOT 25-27
Hastings	~~Bangor~~ Wicklow	II	028

[redacted] ynooth, Ont.

DATE COMPLETED: DAY 20 MO. 09 YR. 72

[redacted] 5016217 4 1285 6 25 MAR 21, 1975 249

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH – FEET FROM	DEPTH – FEET TO
	Top soil			0	1
Brown	med. sand	stones & dry gravel	loose	1	18
Brown	fine sand		packed	18	40
Brown	med. sand	gravel	packed	40	46
Brown	gravel	sand	porous	46	48

31 | 0001 | 0018 | 6091211 | 0040663 | 0046669411 | 0048611218

32

41 WATER RECORD

WATER FOUND AT – FEET	KIND OF WATER
0042	☒ FRESH
untested	

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH – FEET FROM	DEPTH – FEET TO
06	☒ STEEL	.188	0	0048

SCREEN

SIZE(S) OF OPENING (SLOT NO.) | DIAMETER | LENGTH | MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN

61 PLUGGING & SEALING RECORD

DEPTH SET AT – FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
☒ PUMP air	0060 GPM	01 HOURS 00 MINS.

WATER LEVELS DURING: ☒ RECOVERY

STATIC LEVEL	WATER LEVEL END OF PUMPING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
020 FEET	042 FEET	020 FEET	020 FEET	020 FEET	020 FEET

PUMP INTAKE SET AT: 42 FEET

WATER AT END OF TEST: ☒ CLEAR

RECOMMENDED PUMP TYPE: ☒ DEEP

RECOMMENDED PUMP SETTING: 042 FEET

RECOMMENDED PUMPING RATE: 0020 GPM

0027 GPM/FT. SPECIFIC CAPACITY

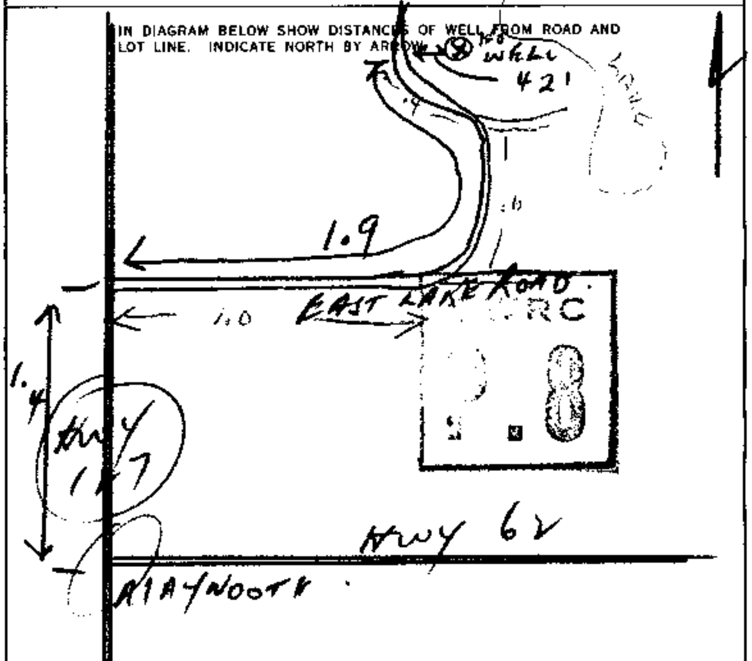
FINAL STATUS OF WELL: ☒ WATER SUPPLY

WATER USE: ☒ DOMESTIC (01)

METHOD OF DRILLING: ☒ ROTARY (AIR)

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS:

NAME OF WELL CONTRACTOR	LICENCE NUMBER
Faulkner Well Drilling Co.Ltd.	2104

ADDRESS: 587 Water St., Peterborough, Ont.

NAME OF DRILLER OR BORER: Herbert Latchford

SIGNATURE OF CONTRACTOR: Faulkner Ltd

SUBMISSION DATE: DAY 20 MO. 9 YR. 72

OFFICE USE ONLY: DATA SOURCE 1 | CONTRACTOR 2104 | DATE RECEIVED 271272

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OWRC COPY

MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act

31 F/5

WATER WELL RECORD

Ontario

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

(11) 2908932

MUNICIP. 29023 CON. CON 03

COUNTY OR DISTRICT: [redacted]

TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Huckins

CON. 3 BLOCK, TRACT, SURVEY, ETC.

LOT 028

DATE COMPLETED: DAY 09 MO 06 YR 78

[redacted]

UTM ZONE 015650 RC 5 ELEVATION 1300 RC 6 BASIN CODE 26

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
Stone &	Gravel			0	23
	Quicksand			23	60
	Gravel		Coarse	60	65

(31) 0023 | 12 | 11 | 0060 | 07 | 0065 | 31

(32)

(41) WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0065	1 ☒ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL
	1 ☐ FRESH 3 ☐ SULPHUR; 2 ☐ SALTY 4 ☐ MINERAL

(51) CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
06 1/4	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE	.188	0	0065
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE			

SCREEN

SIZE-SLOT OF OPENING (SLOT NO.)	DIAMETER (INCHES)	LENGTH (FEET)

MATERIAL AND TYPE | DEPTH TO TOP OF SCREEN (FEET)

(61) PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT, LEAD, PACKER, ETC.)
10-13	14-17	Drive Shoe
18-21	22-25	
26-29	30-33	

(71) PUMPING TEST

PUMPING TEST METHOD: 1 ☐ PUMP 2 ☒ BAILER

PUMPING RATE: 0020 GPM — DURATION OF PUMPING: 02 HOURS 00 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING: 1 ☒ PUMPING 2 ☐ RECOVERY	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
020 FEET	040 FEET		040 FEET	FEET	FEET	FEET

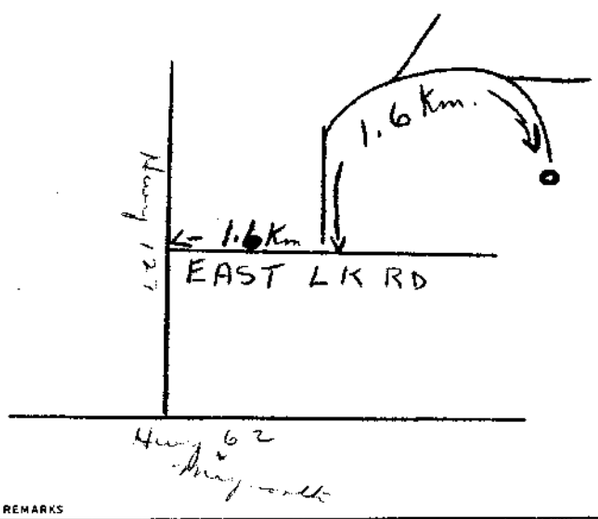
IF FLOWING, GIVE RATE: GPM — PUMP INTAKE SET AT: FEET — WATER AT END OF TEST: 1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE: ☐ SHALLOW ☒ DEEP — RECOMMENDED PUMP SETTING: 050 FEET — RECOMMENDED PUMPING RATE: 0015 GPM

GPM / FT. SPECIFIC CAPACITY

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW



DRILLERS REMARKS

FINAL STATUS OF WELL 1 — 1 ☒ WATER SUPPLY; 2 ☐ OBSERVATION WELL; 3 ☐ TEST HOLE; 4 ☐ RECHARGE WELL; 5 ☐ ABANDONED, INSUFFICIENT SUPPLY; 6 ☐ ABANDONED, POOR QUALITY; 7 ☐ UNFINISHED

WATER USE 01 — 1 ☒ DOMESTIC; 2 ☐ STOCK; 3 ☐ IRRIGATION; 4 ☐ INDUSTRIAL; ☐ OTHER; 5 ☐ COMMERCIAL; 6 ☐ MUNICIPAL; 7 ☐ PUBLIC SUPPLY; 8 ☐ COOLING OR AIR CONDITIONING; 9 ☐ NOT USED

METHOD OF DRILLING 1 — 1 ☒ CABLE TOOL; 2 ☐ ROTARY (CONVENTIONAL); 3 ☐ ROTARY (REVERSE); 4 ☐ ROTARY (AIR); 5 ☐ AIR PERCUSSION; 6 ☐ BORING; 7 ☐ DIAMOND; 8 ☐ JETTING; 9 ☐ DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Bernard Marquardt & Son — LICENCE NUMBER: 3610

ADDRESS: R.R. 2 Palmer Rapids

NAME OF DRILLER OR BORER: Bernard Marquardt — LICENCE NUMBER:

SIGNATURE OF CONTRACTOR: Bernard Marquardt — SUBMISSION DATE: DAY ____ MO. ____ YR. ____

OFFICE USE ONLY

DATA SOURCE 1 — CONTRACTOR 3610 — DATE RECEIVED 150279

DATE OF INSPECTION — INSPECTOR Km LC/JW

REMARKS

P

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MINISTRY OF THE ENVIRONMENT COPY

FORM 7 MOE 07-091

Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11 — 2915252 — MUNICIP 29023 — CON. CON — 93

COUNTY OR DISTRICT: HASTINGS
TOWNSHIP, BOROUGH CITY TOWN VILLAGE: [redacted] LOW
CON BLOCK TRACT, SURVEY ETC: Con 3
LOT: 28
DATE COMPLETED: DAY 17 MO 7 YR 92
[redacted] AYLMER-ONT
RC. ELEVATION BC BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET FROM	DEPTH - FEET TO
DK BR	TOPSOIL			8 FT	2.6'
LT BR	GRAVEL			2.6	0

31
32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
40	1 ☒ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS
	1 ☐ FRESH 2 ☐ SALTY 3 ☐ SULPHUR 4 ☐ MINERALS 6 ☐ GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET FROM	DEPTH - FEET TO
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☒ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	4"	LT BR	8 FT
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			
	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC			

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET FROM	TO	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER ETC.)

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 ☒ PUMP 2 ☐ BAILER	GPM	HOURS 12 MINS

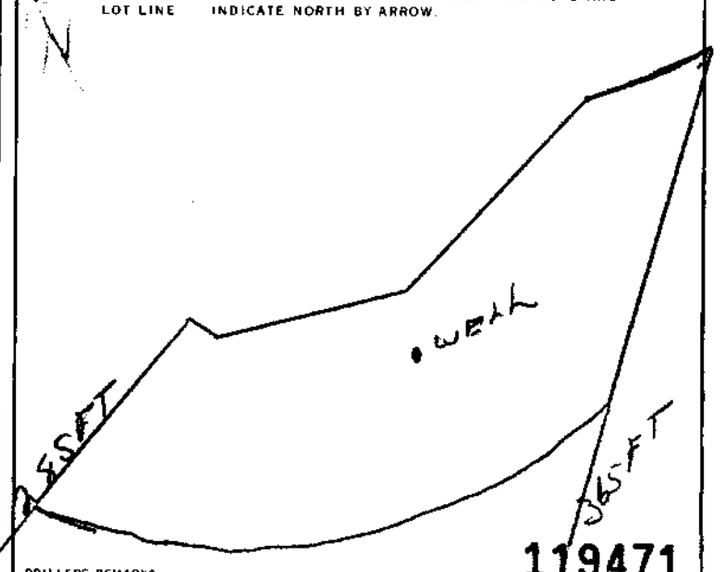
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
4 FEET	0 FEET	1 ☐ PUMPING 2 ☒ RECOVERY	2 FEET	3 FEET	FEET	4 FEET

IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
GPM	FEET	1 ☒ CLEAR 2 ☐ CLOUDY

RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
☒ SHALLOW ☐ DEEP	FEET	GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



DRILLERS REMARKS

119471

FINAL STATUS OF WELL

1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL 5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED ☐ DEWATERING

WATER USE

1 ☒ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL ☐ OTHER 5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☐ COOLING OR AIR CONDITIONING 9 ☐ NOT USED

METHOD OF CONSTRUCTION

1 ☐ CABLE TOOL 2 ☐ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION 6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING ☒ DIGGING ☐ OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: A W PETERS CONTRACTING — WELL CONTRACTOR'S LICENCE NUMBER: 6270
ADDRESS: BOX 25, MAYNOOTH, ONT
NAME OF WELL TECHNICIAN: ART PETERS — WELL TECHNICIAN'S LICENCE NUMBER: 11246
SIGNATURE OF TECHNICIAN/CONTRACTOR: [signature] — SUBMISSION DATE: DAY 19 MO. 7 YR. 92

OFFICE USE ONLY

DATA SOURCE: CONTRACTOR 6270 — DATE RECEIVED: JUL 22 1992
DATE OF INSPECTION — INSPECTOR
REMARKS

CSS.ES

MINISTRY OF THE ENVIRONMENT COPY

FORM NO. 0506 (11/86) FORM 9

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 — 2917418 — Municipality 29023 — Con CON 03

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
[redacted]	WICKLOW	3	28

Address 2150 BROMSGROVE RD APT 1007 MISSISSAUGA L5J 4G3 — Date completed 28 / 7 / 97 (day / month / year)

21 — Northing — RC — Elevation — RC — Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	GRAVEL	SAND	COARSE PIT RUN	0	32
GREY	SAND	SILT	FINE, LOOSE	32	49
"	"	"	" FIRM	49	71
"	"	" fractured rock	cobbles., Rough	71	73½
GREY	GRANITE		AVERAGE	73½	80
GREY, BLK	"	LARGE FRACTURE		80	81
GREY	"		AVERAGE	81	81½

31 — 32

41 WATER RECORD

Water found at – feet	Kind of water
80-81	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☒ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas
	1 ☐ Fresh 2 ☐ Salty 3 ☐ Sulphur 4 ☐ Minerals 5 ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6¼	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	.188	+1½	78½
5 7/8	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic		78½	81
	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet
Material and type	Depth at top of screen feet	

61 PLUGGING & SEALING RECORD

☒ Annular space ☐ Abandonment

Depth set at – feet From	Depth set at – feet To	Material and type (Cement grout, bentonite, etc.)
0	20	PORTLAND
20	60	Bentonite

71 PUMPING TEST

Pumping test method: 1 ☒ Pump 2 ☐ Bailer — Pumping rate: AIR 80 PUMP 15 GPM — Duration of pumping: ..... Hours ..... Mins

Static level	Water level end of pumping	Water levels during: 1 ☒ Pumping 2 ☐ Recovery			
4 feet	8 feet	15 minutes 6 feet	30 minutes 6½ feet	45 minutes 7 feet	60 minutes 7½ feet

If flowing give rate: ____ GPM — Pump intake set at: 15 feet — Water at end of test: ☒ Clear ☐ Cloudy

Recommended pump type: SUBM. ☐ Shallow ☒ Deep — Recommended pump setting: 30 feet — Recommended pump rate: 10 GPM

FINAL STATUS OF WELL

1 ☒ Water supply 2 ☐ Observation well 3 ☐ Test hole 4 ☐ Recharge well 5 ☐ Abandoned, insufficient supply 6 ☐ Abandoned, poor quality 7 ☐ Abandoned (Other) 8 ☐ Dewatering 9 ☐ Unfinished 10 ☐ Replacement well

WATER USE

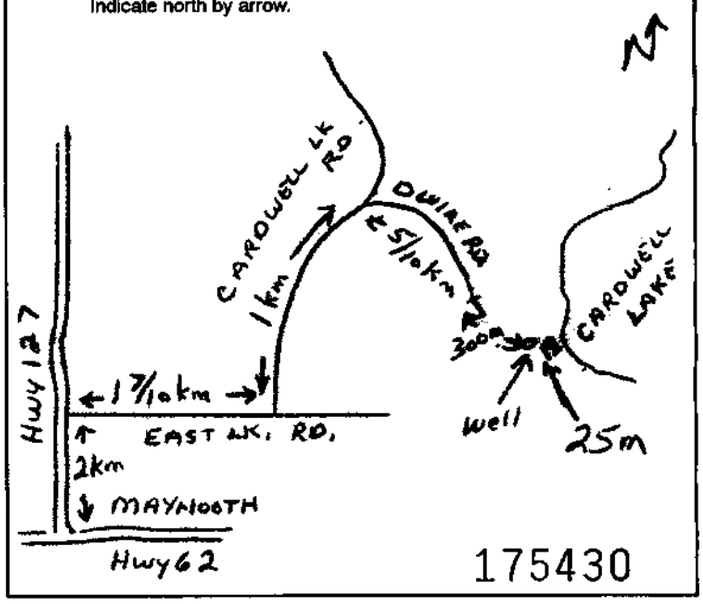
1 ☒ Domestic 2 ☐ Stock 3 ☐ Irrigation 4 ☐ Industrial 5 ☐ Commercial 6 ☐ Municipal 7 ☐ Public supply 8 ☐ Cooling & air conditioning 9 ☐ Not used 10 ☐ Other

METHOD OF CONSTRUCTION

1 ☐ Cable tool 2 ☒ Rotary (conventional) 3 ☐ Rotary (reverse) 4 ☐ Rotary (air) 5 ☒ Air percussion 6 ☐ Boring 7 ☐ Diamond 8 ☐ Jetting 9 ☐ Driving 10 ☐ Digging 11 ☐ Other

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



175430

Name of Well Contractor	Well Contractor's Licence No.
EARL V. MARQUARDT & SON INC	3611
Address: RR1 Box 86 PALMER RAPIDS ON. K0J-2E0	
Name of Well Technician: TERRY MARQUARDT	Well Technician's Licence No.: T0062
Signature of Technician/Contractor: Terry Marquardt	Submission date: 30 day 4 mo 97 yr

MINISTRY USE ONLY — Data source — Contractor 3611 — Date received MAY 07 1997 — Date of inspection — Inspector — Remarks — CSS.

2 - MINISTRY OF ENVIRONMENT & ENERGY COPY

Ministry of Environment and Energy
Ontario

The Ontario Water Resources Act
WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11 | 2917442 | Municipality 29023 | Con CON 04

County or District	Township/Borough/City/Town/Village	Con block tract survey, etc.	Lot
[redacted]	WICKLOW	— 4	28
	Address 446 - MONK ST COBOURG ON K9A - 258	Date completed 20 day 5 month 97 year	

21 | Northing | RC | Elevation | RC | Basin Code | ii | iii | iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth – feet From	Depth – feet To
BROWN	GRAVEL	SAND	COARSE	0	24
GREY	SAND		FINE	24	44
GREY	CLAY	SAND, BOULDERS	PACKED HARD	44	72
GREY, RED	BOULDER			72	76
GREY	CLAY	SAND COBBLES	HARD PACKED	76	172
GREY, RED	GRANITE		AVERAGE, to SOFT	172	206
RED	"		SOFT	206	218
RED, GREY	"		AVERAGE	218	240
" "	"		POROUS SEAMY	240	245

31

32

41 WATER RECORD

Water found at – feet	Kind of water
240	☐ Fresh ☐ Salty ☐ Sulphur ☑ Minerals — untested
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas
	☐ Fresh ☐ Salty ☐ Sulphur ☐ Minerals ☐ Gas

51 CASING & OPEN HOLE RECORD

Inside diam inches	Material	Wall thickness inches	Depth – feet From	Depth – feet To
6 1/4	☑ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic	.188	+2	179
5 13/16	☐ Steel ☐ Galvanized ☐ Concrete ☑ Open hole ☐ Plastic		179	245
	☐ Steel ☐ Galvanized ☐ Concrete ☐ Open hole ☐ Plastic			

SCREEN

Sizes of opening (Slot No.)	Diameter inches	Length feet

Material and type	Depth at top of screen feet

61 PLUGGING & SEALING RECORD

☑ Annular space ☐ Abandonment

Depth set at – feet From	To	Material and type (Cement grout, bentonite, etc.)
10	40	PORTLAND
40	175	Bentonite

71 PUMPING TEST

Pumping test method: AIR ☐ Pump ☐ Bailer | Pumping rate 7 GPM | Duration of pumping 1 Hours ...... Mins

Static level	Water level end of pumping	15 minutes	30 minutes	45 minutes	60 minutes
0 feet	245 feet	206 feet	139 feet	84 feet	37 feet

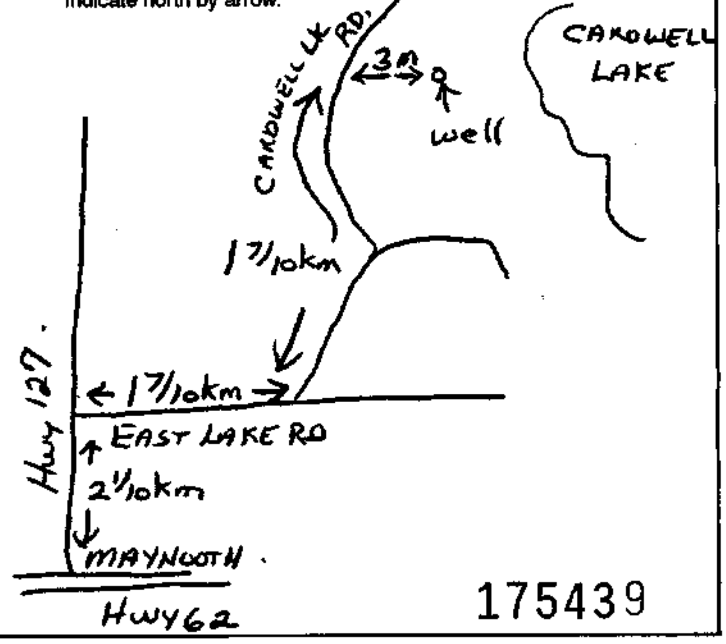
Water levels during: ☐ Pumping ■ Recovery

If flowing give rate 1/5 GPM | Pump intake set at 245 AIR feet | Water at end of test: ☐ Clear ■ Cloudy

Recommended pump type: ☐ Shallow ☑ Deep | Recommended pump setting 175 feet | Recommended pump rate 5 GPM

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.



175439

FINAL STATUS OF WELL

1 ☑ Water supply
2 ☐ Observation well
3 ☐ Test hole
4 ☐ Recharge well
5 ☐ Abandoned, insufficient supply
6 ☐ Abandoned, poor quality
7 ☐ Abandoned (Other)
8 ☐ Dewatering
9 ☐ Unfinished
10 ☐ Replacement well

WATER USE

1 ☑ Domestic
2 ☐ Stock
3 ☐ Irrigation
4 ☐ Industrial
5 ☐ Commercial
6 ☐ Municipal
7 ☐ Public supply
8 ☐ Cooling & air conditioning
9 ☐ Not used
10 ☐ Other ....

METHOD OF CONSTRUCTION

1 ☐ Cable tool
2 ☑ Rotary (conventional)
3 ☐ Rotary (reverse)
4 ☐ Rotary (air)
5 ☑ Air percussion
6 ☐ Boring
7 ☐ Diamond
8 ☐ Jetting
9 ☐ Driving
10 ☐ Digging
11 ☐ Other ....

Name of Well Contractor	Well Contractor's Licence No.
EARL V. MARQUARDT + SON INC	3611
Address: RR1 Box 86 PALMER RAPIDS ONT K0J-2E0	
Name of Well Technician: TERRY MARQUARDT	Well Technician's Licence No.: T 0062
Signature of Technician/Contractor: Terry Marquardt	Submission date: 28 day 5 mo 97

MINISTRY USE ONLY

Data source	Contractor 3611	Date received JUN 13 1997
Date of Inspection	Inspector	
Remarks		CSS. S

0506 (07/94) Front Form 9

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Ontario Ministry of the Environment

Well Tag Numb: A 038814

A 038814

Well Record

Regulation 903 Ontario Water Resources Act

page ___ of ___

Instructions for Completing Form

- For use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
- All Sections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
- Questions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
- **All metre measurements shall be reported to 1/10th of a metre.**
- Please print clearly in blue or black ink only.

Ministry Use Only

MUN | CON | LOT

Well Owner's Information and Location of Well Information

[redacted]

RR#/Street Number/Name	City/Town/Village	Site/Compartment/Block/Tract etc.
239 East Lake Rd	WICKLOW	31 2

GPS Reading: NAD 83 | Zone 18 | Easting 269757 | Northing 5101516

Unit Make/Model: Magellan Sportrac

Mode of Operation: ☐ Undifferentiated ☑ Averaged ☐ Differentiated, specify

Log of Overburden and Bedrock Materials (see instructions)

General Colour	Most common material	Other Materials	General Description		Depth From	Depth To
GREY	SAND, CLAY	TILL COBBLES	PACKED	0-54	0	16.5
BROWN	SAND		FIRM	54-58	16.5	17.7
GREEN, WHITE	GRANITE		MEDIUM	58-110	17.7	33.5
GREY	GRANITE		"	110-131	33.5	39.9
WHITE, GREY	"		"	131-164	39.9	50.0
RED	"		"	164-177	50.0	54.00
GREY	"		"	177-303	54.0	92.4
RED	"		"	303-340	92.4	103.7
		AIR TEST 5gpm				

Hole Diameter

Depth From	Depth To	Diameter Centimetres

Water Record

Water found at ___ Metres / Kind of Water

- 95 m ☑ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:
- ___ m ☐ Fresh ☐ Sulphur ☐ Gas ☐ Salty ☐ Minerals ☐ Other:

After test of well yield, water was ☑ Clear and sediment free ☐ Other, specify

Chlorinated ☑ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Depth To
Casing				
16	☑ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.48	+.6	18.3
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No.		
No Casing or Screen				
15.4	☑ Open hole		18.3	103.7

Test of Well Yield

Pumping test method: pump

Pump intake set at - (metres): 90

Pumping rate - (litres/min): 30

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping: 55 metres

Recommended pump type: ☐ Shallow ☑ Deep

Recommended pump depth: 100 metres

Recommended pump rate: 30 (litres/min)

If flowing give rate - (litres/min)

If pumping discontinued, give reason.

Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level	7.1		48.6
1	8.9	1	47.8
2	10.6	2	47.2
3	12.2	3	64.4
4	13.7	4	45.6
5	15.1	5	45.0
10	21.1	10	41.4
15	26.3	15	37.7
20	30.8	20	34.5
25	34.8	25	31.3
30	38.4	30	28.4
40	44.8	40	23.3
50	50.0	50	19.3
60	54.4	60	15.9

Plugging and Sealing Record

☑ Annular space ☐ Abandonment

Depth set at - Metres From	Depth set at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
0	8	Bentonite Slurry	1/2

Method of Construction

☐ Cable Tool ☐ Rotary (air) ☐ Diamond ☐ Digging
☐ Rotary (conventional) ☑ Air percussion ☐ Jetting ☐ Other X-DRILL
☐ Rotary (reverse) ☐ Boring ☐ Driving

Water Use

☑ Domestic ☐ Industrial ☐ Public Supply ☐ Other
☐ Stock ☐ Commercial ☐ Not used
☐ Irrigation ☐ Municipal ☐ Cooling & air conditioning

Final Status of Well

☑ Water Supply ☐ Recharge well ☐ Unfinished ☐ Abandoned, (Other)
☐ Observation well ☐ Abandoned, insufficient supply ☐ Dewatering
☐ Test Hole ☐ Abandoned, poor quality ☐ Replacement well

Well Contractor/Technician Information

Name of Well Contractor	Well Contractor's Licence No.
EARL V. MARQUARDT & SON INC.	3611

Business Address (street name, number, city etc.): RR1 Box 86 Palmer Rapids ON K0J-2E0

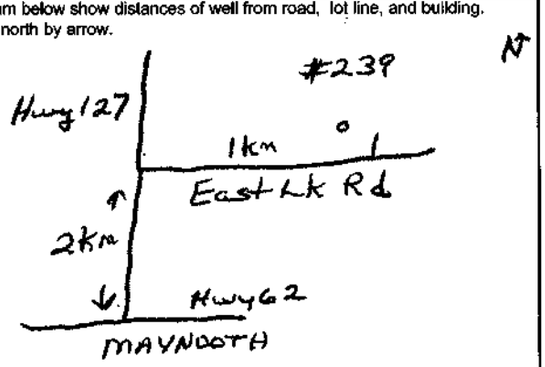
Name of Well Technician (last name, first name)	Well Technician's Licence No.
MARQUARDT TERRY	T62

Signature of Technician/Contractor: X Terry Marquardt

Date Submitted: YYYY 06 MM 06 DD 13

Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.



Audit No. Z 42016

Date Well Completed: YYYY 06 MM 06 DD 01

Was the well owner's information package delivered? ☑ Yes ☐ No

Date Delivered: YYYY 06 MM 06 DD 01

Ministry Use Only

Data Source | Contractor 3611

Date Received: JUL 13 2006 | Date of Inspection

Remarks | Well Record Number

0506E (09/03) Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐

Cette formule est disponible en français

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*

Tag#: A251488

Well Record

Regulation 903 Ontario Water Resources Act

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
368 Cardwell Lake Road	Hastings Highlands	28	4

County/District/Municipality	City/Town/Village	Province	Postal Code
Hastings		Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	270394	5016775		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
brown	coarse gravel - sand			0'	42'
brown	boulders - clay - quicksand			42'	194'
red / grey	granite		soft	194'	280'

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0'	20'	bentonite slurry	2 bags
0'	20'	H plug	2 bags

Method of Construction

☐ Cable Tool ☒ Rotary (Conventional) ☐ Rotary (Reverse) ☐ Boring ☐ Air percussion ☐ Other, *specify* _____

☐ Diamond ☐ Jetting ☐ Driving ☐ Digging

Well Use

☐ Public ☒ Domestic ☐ Livestock ☐ Irrigation ☐ Industrial ☐ Other, *specify* _____

☐ Commercial ☐ Municipal ☐ Test Hole ☐ Cooling & Air Conditioning

☐ Not used ☐ Dewatering ☐ Monitoring

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	steel	.188"	+ 2'	196'

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☒ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Water Details

Water found at Depth	Kind of Water	
243' (m/ft) ☐ Gas	☐ Fresh ☒ Untested	☐ Other, *specify*
261' (m/ft) ☐ Gas	☐ Fresh ☒ Untested	☐ Other, *specify*
(m/ft) ☐ Gas	☐ Fresh ☐ Untested	☐ Other, *specify*

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0'	196'	10"
196'	280'	5 7/8"

Results of Well Yield Testing

After test of well yield, water was:
☒ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at (m/ft): 250'

Pumping rate (l/min / GPM): 3 1/2 gpm

Duration of pumping: 1 hrs + _____ min

Final water level end of pumping (m/ft): 119' 6"

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 250'

Recommended pump rate (l/min / GPM): 3 1/2 gpm

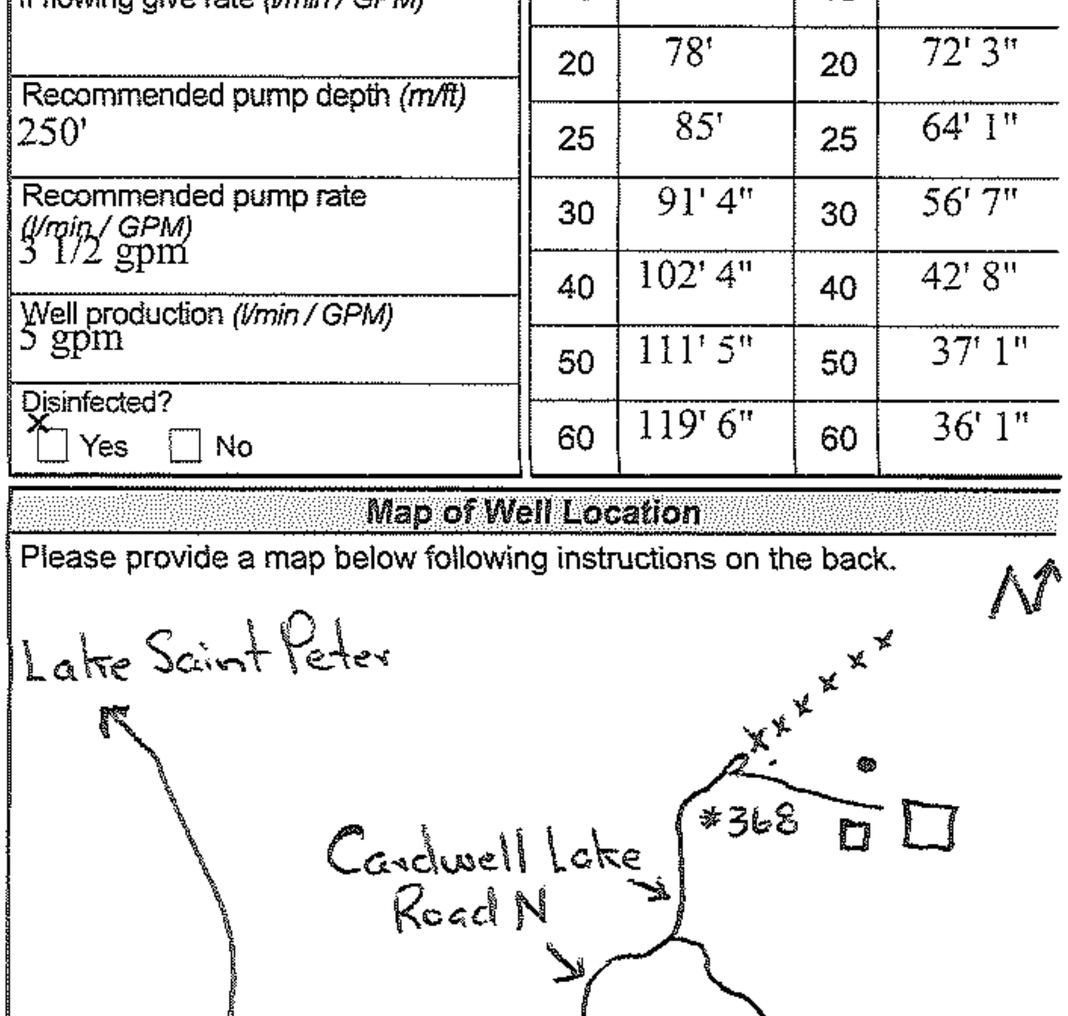
Well production (l/min / GPM): 5 gpm

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	36' 1"		
1	40' 2"	1	115' 9"
2	43' 5"	2	112' 8"
3	46'	3	109' 9"
4	48' 4"	4	107' 1"
5	50' 8"	5	104' 8"
10	61' 2"	10	92' 7"
15	70' 1"	15	80' 9"
20	78'	20	72' 3"
25	85'	25	64' 1"
30	91' 4"	30	56' 7"
40	102' 4"	40	42' 8"
50	111' 5"	50	37' 1"
60	119' 6"	60	36' 1"

Map of Well Location

Please provide a map below following instructions on the back.



Comments:
Distance from property line 42'
Distance from house 76' Distance from road 66'

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
Bernard Marquardt & Son Ltd.	3651

Business Address (Street Number/Name)	Municipality
8 Crescent Drive, RR# 1	Palmer Rapids

Province	Postal Code	Business E-mail Address
ON	K0J 2E0	info@cleandrinkingwater.ca

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6137582238	Marquardt, Brad

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
2781	[signature]	2018 09 14

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☐ No	Y Y Y Y M M D D	2018 08 13

Ministry Use Only

Audit No. Z292840

SEP 10 2018

Received

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. *(Place Sticker and/or Print Below)*

Tag#:A261679

Well Record

Regulation 903 Ontario Water Resources Act

Page _____ of _____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
392 EAST LAKE RD	WICKLOW	29	2

County/District/Municipality	City/Town/Village	Province	Postal Code
HASTINGS	MAYNOOTH	Ontario	

UTM Coordinates	Zone	Easting	Northing	Municipal Plan and Sublot Number	Other
NAD 83	18	270525	5015230		

Overburden and Bedrock Materials/Abandonment Sealing Record *(see instructions on the back of this form)*

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BROWN	SAND, GRAVEL	SILT	FINE	0	40
GREY	CLAY	STONES	HARDPAN	40	134
GREY	GRANITE		BEDROCK	134	260

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	136	BENTONITE SLURRY	34 FT³

Method of Construction

☐ Cable Tool ☐ Diamond
☒ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☒ Air percussion
☐ Other, *specify* _____

Well Use

☐ Public ☐ Commercial ☐ Not used
☒ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, *specify* _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	STEEL	.188	+2	136
6"	OPEN HOLE		136	260

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☒ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, *specify* _____
☐ Other, *specify* _____

Water Details

Water found at Depth	Kind of Water	
257 (m/ft) ☐ Gas	☐ Fresh ☒ Untested ☐ Other, *specify*	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	
(m/ft) ☐ Gas	☐ Fresh ☐ Untested ☐ Other, *specify*	

Hole Diameter

Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
0	134	9"
134	260	6"

Results of Well Yield Testing

After test of well yield, water was:
☒ Clear and sand free
☐ Other, *specify* _____

If pumping discontinued, give reason:

Pump intake set at (m/ft): 178.2

Pumping rate (l/min / GPM): 15

Duration of pumping: 1 hrs + 0 min

Final water level end of pumping (m/ft): 178.2

If flowing give rate (l/min / GPM):

Recommended pump depth (m/ft): 240

Recommended pump rate (l/min / GPM): 10

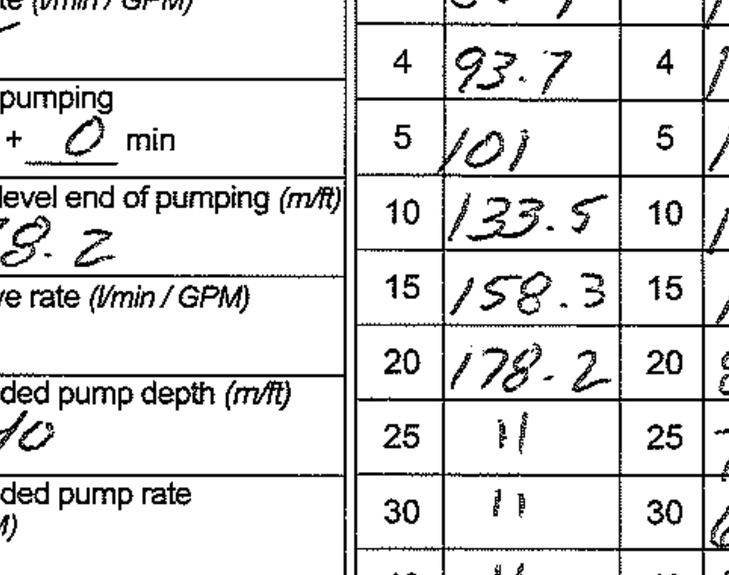
Well production (l/min / GPM): 7

Disinfected? ☒ Yes ☐ No

Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level	63.4		178.2
1	68.9	1	167.8
2	77.5	2	162.0
3	85.9	3	156.7
4	93.7	4	151.3
5	101	5	146.1
10	133.5	10	120.2
15	158.3	15	100.1
20	178.2	20	84.7
25	"	25	72.5
30	"	30	66.5
40	"	40	63.4
50	"	50	"
60	178.2	60	63.4

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
JOE LEGGE & SONS	7052

Business Address (Street Number/Name)	Municipality
RR#3	BANCROFT

Province	Postal Code	Business E-mail Address
ONT	K0L1C0	

Bus. Telephone No. (inc. area code)	Name of Well Technician (Last Name, First Name)
6133392025	LEGGE JOE

Well Technician's Licence No.	Signature of Technician and/or Contractor	Date Submitted
1879	J Legge	

Well owner's information package delivered	Date Package Delivered	Date Work Completed
☐ Yes ☒ No		2019 08 01

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Audit No. Z303307

AUG 28 2019

Received

0506E (2014/11) — Ministry's Copy

Ontario — Ministry of the Environment and Climate Change

Measurements recorded in: ☐ Metric ☒ Imperial

Well Tag No. (Below) Tag#:A261622

Well Record

Regulation 903 Ontario Water Resources Act

Page ____ of ____

[redacted]

Address of Well Location (Street Number/Name)	Township	Lot	Concession
511 EAST LK RD	HASTINGS HIGHLANDS		
County/District/Municipality	**City/Town/Village**	**Province**	**Postal Code**
HASTINGS	MAYNOOTH	Ontario	
UTM Coordinates Zone / Easting / Northing	**Municipal Plan and Sublot Number**	**Other**	
NAD 83 18 270889 5015769			

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BROWN	SAND	GRAVEL	PACKED	0	14
GREY	SILTY, SAND	CLAY	SOFT	14	80
GREY	GRAVEL SAND	CLAY	PACKED	80	88
GREY	GRANITE		BEDROCK	88	100

Annular Space

Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m^3/ft^3)
0	88	BENTONITE SLURRY	21 Ft^3

Method of Construction

☐ Cable Tool ☐ Diamond
☒ Rotary (Conventional) ☐ Jetting
☐ Rotary (Reverse) ☐ Driving
☐ Boring ☐ Digging
☒ Air percussion
☐ Other, specify ____

Well Use

☐ Public ☐ Commercial ☐ Not used
☒ Domestic ☐ Municipal ☐ Dewatering
☐ Livestock ☐ Test Hole ☐ Monitoring
☐ Irrigation ☐ Cooling & Air Conditioning
☐ Industrial
☐ Other, specify ____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To
6 1/4"	STEEL	.188	+2	88
6"	OPEN HOLE		88	100

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To

Status of Well

☒ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☐ Abandoned, other, specify
☐ Other, specify

Water Details

Water found at Depth	Kind of Water	If Other, specify
88-100 (m/ft) ☐ Gas	☐ Fresh ☒ Untested	☐ Other
(m/ft) ☐ Gas	☐ Fresh ☐ Untested	☐ Other
(m/ft) ☐ Gas	☐ Fresh ☐ Untested	☐ Other

Hole Diameter

Depth (m/ft) From	To	Diameter (cm/in)
0	88	10"
88	100	6"

Pumping Test / Well Yield Testing

After test of well yield, water was:
☒ Clear and sand free
☐ Other, specify ____

If pumping discontinued, give reason:

Pump intake set at (m/ft): 40

Pumping rate (l/min / GPM): 12

Duration of pumping: 36 hrs + ____ min

Final water level end of pumping (m/ft): 9.1

If flowing give rate (l/min / GPM)

Recommended pump depth (m/ft): 30

Recommended pump rate (l/min / GPM): 10

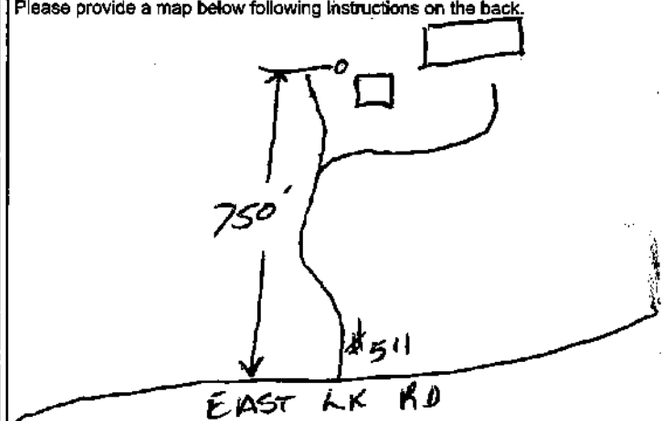
Well production (l/min / GPM): 12 +

Disinfected? ☒ Yes ☐ No

	Draw Down Time (min)	Draw Down Water Level (m/ft)	Recovery Time (min)	Recovery Water Level (m/ft)
Static Level		8.8		9.1
1	1	9.0	1	9.0
2	2	9.0	2	"
3	3	9.1	3	"
4	4	"	4	"
5	5	"	5	"
10	10	"	10	"
15	15	"	15	"
20	20	"	20	8.8
25	25	"	25	"
30	30	"	30	"
40	40	"	40	"
50	50	"	50	"
60	60	9.1	60	8.8

Map of Well Location

Please provide a map below following instructions on the back.



Comments:

Well Contractor and Well Technician Information

Business Name of Well Contractor	Well Contractor's Licence No.
JOE LEGGE & SONS	7052
Business Address (Street Number/Name)	**Municipality**
RR#3	BANCROFT
Province	**Postal Code** / **Business E-mail Address**
ONT	K0L1C0
Bus. Telephone No. (inc. area code)	**Name of Well Technician (Last Name, First Name)**
7133392025	LEGGE JT.
Well Technician's Licence No.	**Signature of Technician and/or Contractor** / **Date Submitted**
4115	J Legge

Well owner's information package delivered: ☐ Yes ☒ No

Date Package Delivered: ____

Date Work Completed: 2020/06/03

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Appendix C

C-2 Monitoring Well Logs

Project No: 06-1066

Project: East Lake Landfill Site

Client: Municipality of Hastings Highlands

Location:

Monitoring Well: EL 1

Depth	Symbol	Description	Elev.	Sample ID	Type	Recovery	Well Data		Remarks
ft / m			0.762						
0		Ground Surface							
1 / 1		***Sand*** Fine grain, medium brown, dry							
7 / 2			-2.29						
10 / 3		***Cobble*** Mixed with medium brown sand, dry							
17 / 5			-5.33						

Drill Method: Machine Auger

Drill Date: April 26, 2005

Hole Size:

Quinte-Eco Consultants
RR #7, Box 400
Belleville, Ontario
K8N 4Z7

Datum:

Checked by:

Sheet: 1 of 1

Well ID: ELMW2R

Project No.: 190495-04
Client: Municipality of Hastings Highlands
Report: 2019 Monitoring Well Installations
Site Address: East Lake W.D.S.
59 Cardwell Lake Rd., Maynooth, Ontario

Elevation Ground: *417.46 m*
TOP: *418.22 m*

UTM NAD83 (Zone 18T): 5015893 N
270068 E

Depth (m)	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)	Notes
	Ground Surface	0.00 / 417.46							4 in. sq. steel monument with lock; PVC Stickup = 0.76m
0	**Boulders and Cobbles** Granitic, some rusty brown, damp sand.		AU1						
1	**Sand** Light brown, damp, fine to medium grained, some gravel and cobbles.	0.91 / 416.55	AU2						
2									
3	- very dense, greyish brown, fine to medium grained, some gravel, cobbles.		SS1		13 29 31 36	79			
4									bentonite gravel seal
5									
6	- grey, wet,		SS2		32 for 5"	20			
7	- grey, wet, fine, trace gravel.		SS3		8 42 40 32	25			
8			SS4		19 90	25			
9									1.52m x 50mm slot 10 PVC screen within No. 2 silica sand pack
10	- fine to coarse, trace clay.	10.40 / 407.06	SS5		18 40 69	50			native soil collaspe
	End of well at 10.40 m								
11	Well Completion Details: Screened interval from 8.43 m to 9.95 m below surface Elevation at top of pipe (TOP) = 418.22 m								

Drill Date: 2019 September 25
Drilled By: Orbit Garant
Drilling Method: Mud Rotary
Hole Diameter: 0.11 m (OD)
Logged By: B.A.
Checked By: B.M.

Notes: AUGER SAMPLE; SPLIT SPOON

Sheet 1 of 1

BH MW OB LOGV1.0 190495-04 EAST LAKE.GPJ WESA TEMPLATE V1.2.GDT 20-3-5

Well ID: ELMW3

Project No.: 190495-04
Client: Municipality of Hastings Highlands
Report: 2019 Monitoring Well Installations
Site Address: East Lake W.D.S.
59 Cardwell Lake Rd., Maynooth, Ontario

Elevation Ground: *403.86 m*
TOP: *404.41 m*

UTM NAD83 (Zone 18T): 5016002 N
270232 E

Depth (m)	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)	Construction	Notes
	Ground Surface	0.00 / 403.86								4 in. sq. steel monument with lock PVC Stickup = 0.55m
0–2.43	**Boulders and Cobbles** Light brown, some fine to medium grained sand.		AU1							
2.43–3.05	**Sand** Light grey, fine grained, trace shells.	2.43 / 401.43								
3.05–3.96	**Boulders** - granitic.	3.05 / 400.81								
3.96–11.58	**Sand** Dense, grey, wet, fine grained, some silt.	3.96 / 399.90	SS1		12 20 50 for 1"	54				bentonite gravel seal
	- fine to medium grained, some gravel.		SS2		16 17 23 20	54				
	- fine grained, some gravel.		SS3		30 22 25 19	58				
	- cobbles and boulders.		SS4		16 50 for 1"					3.05m x 50mm slot 10 PVC screen within No. 2 silica sand pack
	- fine to medium grained, some gravel, some cobbles.									
	- cobbles and boulders.									
11.58–11.76	**Sand Till** Very dense, grey, moist, fine grained.	11.58 / 392.28	SS5		50 50 for 1"					
	End of well at 11.76 m									

Well Completion Details:
Screened interval from 8.53 m to 11.58 m below surface
Elevation at top of pipe (TOP) = 404.41 m

Drill Date: 2019 September 27
Drilled By: Orbit Garant
Drilling Method: Mud Rotary
Hole Diameter: 0.11 m (OD)
Logged By: B.A.
Checked By: B.M.

Notes: AUGER SAMPLE SPLIT SPOON

Sheet 1 of 1

BH MW OB LOGV1.0 190495-04 EAST LAKE.GPJ WESA TEMPLATE V1.2.GDT 20-3-5

Well ID: ELMW4

Project No.: 190495-04
Client: Municipality of Hastings Highlands
Report: 2019 Monitoring Well Installations
Site Address: East Lake W.D.S.
59 Cardwell Lake Rd., Maynooth, Ontario

Elevation Ground: *403.63 m*
TOP: *404.44 m*

UTM NAD83 (Zone 18T): 5015954 N
270222 E

Depth (m)	Description	Depth (m) / Elev. (m.a.s.l.)	Sample ID	Type	Blow Counts	Recovery (%)	Lab Analysis	Headspace Vapour Level (ppm)	Construction	Notes
	Ground Surface	0.00 / 403.63								4 in. sq. steel monument with lock PVC Stickup = 0.81m
0	**Sand** Dense, brown, some cobbles.		AU1							
2.44 / 401.19	**Sandy Silt** Very dense, grey, some cobbles		SS1		21 27 16 18					
5.49 / 398.14	**Silty Sand** Very dense, fine grained, some cobbles.		SS2		35 50 for 5"					
	- grey.		SS3		26 50 for 5"					bentonite gravel seal
	- grey, trace clay.		SS4		50 for 6"					
14.60 / 389.03	**Sand Till** Very dense, grey, coarse, some silt.		SS5		50 for 6"					
			SS6		50 for 6"					6.1m x 50mm slot 10 PVC screen within No. 2 silica sand pack
24.38 / 379.25	End of well at 24.38 m Well Completion Details: Screened interval from 15.24 m to 21.34 m below surface Elevation at top of pipe (TOP) = 404.44 m									bentonite gravel seal

Drill Date: 2019 October 1
Drilled By: Orbit Garant
Drilling Method: Mud Rotary
Hole Diameter: 0.11 m (OD)
Logged By: A.B.
Checked By: B.M.

Notes: AUGER SAMPLE SPLIT SPOON

Monitoring Well ID: EL-MW5.1-21

Project No.: 210217-03
Client: Municipality of Hastings Highlands
Report: East Lake WDS
Site Address: 59 Cardwell Lake Road, Maynooth, ON

Elevation Ground: *395.11 m*
TOP: *395.98 m*

UTM NAD-83 (Zone 18): 5016010.000 N, 270380.000 E

Depth (m)	Elevation (m)	Description	Depth (m) / Elev. (m.a.s.l.)
0	396	Ground Surface	0.0
	395	**GRAVELLY SAND** Brown sand and gravel	395.1
4.6	391		[4.6]
		SAND & GRAVEL Brown/grey sand, gravel, cobbles, trace amount of boulders	4.6 / 390.5
7.9	387		[7.9]
12.5	383	Observations made from augars, descending cyclone and mudwash tub. EOH at 12.5 mbgs.	12.5 / 382.6

SAMPLE: Type | Recovery (%) | Blow Counts | Sample ID | Lab Analysis | Headspace Vapour Level PID IBL ▲ ppm (0 0 0 0)

WELL COMPLETION: Construction

Notes:
- J-Plug
- Monument Well Casing
- 2.40 m bgs (392.71 m)
- Granular Drainage Layer
- Bentonite Seal
- Silica Sand Filter
- 50 mm 010 Slot PVC Screen

Drill Date: 2021 September 21
Drilled By: Orbit Garant Drilling
Drilling Method: Tri-Cone
Hole Diameter (OD): 0.05 m
Logged By: BM
Checked By: IO

▽ Perched Groundwater Strike / Unstabilized Groundwater Level
▼ True Groundwater Strike / Stabilized Groundwater Level

Sheet 1 of 1

BH MW OB LOG 210217-03 MW5.1-21 & MW5.2-21.GPJ BLUMETRIC STANDARD.GDT 22-2-1

Monitoring Well ID: EL-MW5.2-21

Project No.: 210217-03
Client: Municipality of Hastings Highlands
Report: East Lake WDS
Site Address: 59 Cardwell Lake Road, Maynooth, ON

Elevation Ground: *395.15 m*
TOP: *396.07 m*

UTM NAD-83 (Zone 18): 5016010.000 N, 270378.000 E

Depth (m)	Elevation (m)	Description	Depth (m) / Elev. (m.a.s.l.)
		Ground Surface	0.0 / 395.2
0 to 4.6	395 to 391	**GRAVELLY SAND** Brown sand and gravel	[4.6]
4.6 to 6.1	391 to 389	**SAND & GRAVEL** Brown/grey sand, gravel, cobbles, trace amount of boulders	4.6 / 390.6; [1.5]; 6.1 / 389.1
6.1	389	Observations made by augar, descending cyclone and mud wash tub. EOH at 6.1 mbgs	

SAMPLE: Type | Recovery (%) | Blow Counts | Sample ID | Lab Analysis | Headspace Vapour Level PID IBL ▲ ppm (0 0 0 0)

WELL COMPLETION: Construction

Notes:
- J-Plug
- Stickup Monument Well Casing
- Granular Drainage Layer
- Bentonite Seal
- 2.40 m bgs (392.75 m)
- Silica Sand Filter
- 50 mm 010 Slot PVC Screen

Drill Date: 2021 September 22
Drilled By: Orbit Garant Drilling
Drilling Method: Tri-Cone
Hole Diameter (OD): 0.05 m
Logged By: BM
Checked By: IO

▽ Perched Groundwater Strike / Unstabilized Groundwater Level
▼ True Groundwater Strike / Stabilized Groundwater Level

Sheet 1 of 1

BH MW OB LOG 210217-03 MW5.1-21 & MW5.2-21.GPJ BLUMETRIC STANDARD.GDT 22-2-1

Monitoring Well ID: EL-MW6.1-23

Project No.: 230226
Client: MHH
Report: East Lake WDS
Site Address: East Lake Ontario

Elevation Ground: *395.48 m*
TOP: *396.28 m*

UTM NAD 83 (Zone 17): 5016150.903 N
270307.126 E

Depth (m)	Elevation (m)	Description	Depth (m) / Elev. (m.a.s.l.)
0	396	Ground Surface	0.0
	395	**SILTY SAND** Dry, brown/grey silty sand with cobbles	395.5
1	394		[3.0]
2	393		
3	392		3.0 392.4
		SILT & GRAVEL Moist, brown/grey silty sand with gravel	
4	391		[2.4]
5			
	390		5.5 390.0
		SAND & GRAVEL Moist, brown/grey sand with cobbles	[0.6]
6			6.1 389.4
	389	**SAND & GRAVEL** Wet, brown/grey sand and gravel	
7			[1.5]
	388		7.6 387.9
8		**SAND & GRAVEL** Wet to saturated, brown/grey sand and gravel with cobbles ▼ 7.6 m: Flowing sands	
	387		
9			
	386		
10			
	385		
11			[7.6]
	384		
12			
	383		
13			
	382		
14			
	381		
15			15.2 380.2
	380	EOH @ 15.24 mbgs. Drilling in flowing sands required sacrificial plastic plug to be implimented to install monitoring well. MOE Tag # 361479	

SAMPLE: Type | Recovery (%) | Blow Counts | Sample ID | Lab Analysis | 1000 ▲ 200 400 600 800

WELL COMPLETION: Construction | Notes

- J-Plug
- Monument Well Casing
- Bentonite Seal
- Native backfill
- Riser
- Bentonite Seal
- Silica Sand Filter Pack
- 50 mm 010 Slot PVC Screen

Drill Date: September 19, 2023
Drilled By: Canadian Environmental
Drilling Method: Hollow Stem Auger
Hole Diameter (OD): 0.20 m
Logged By: BM
Checked By: CM

AUGER SAMPLE
Perched Groundwater Strike / Unstabilized Groundwater Level
True Groundwater Strike / Stabilized Groundwater Level

Sheet 1 of 1

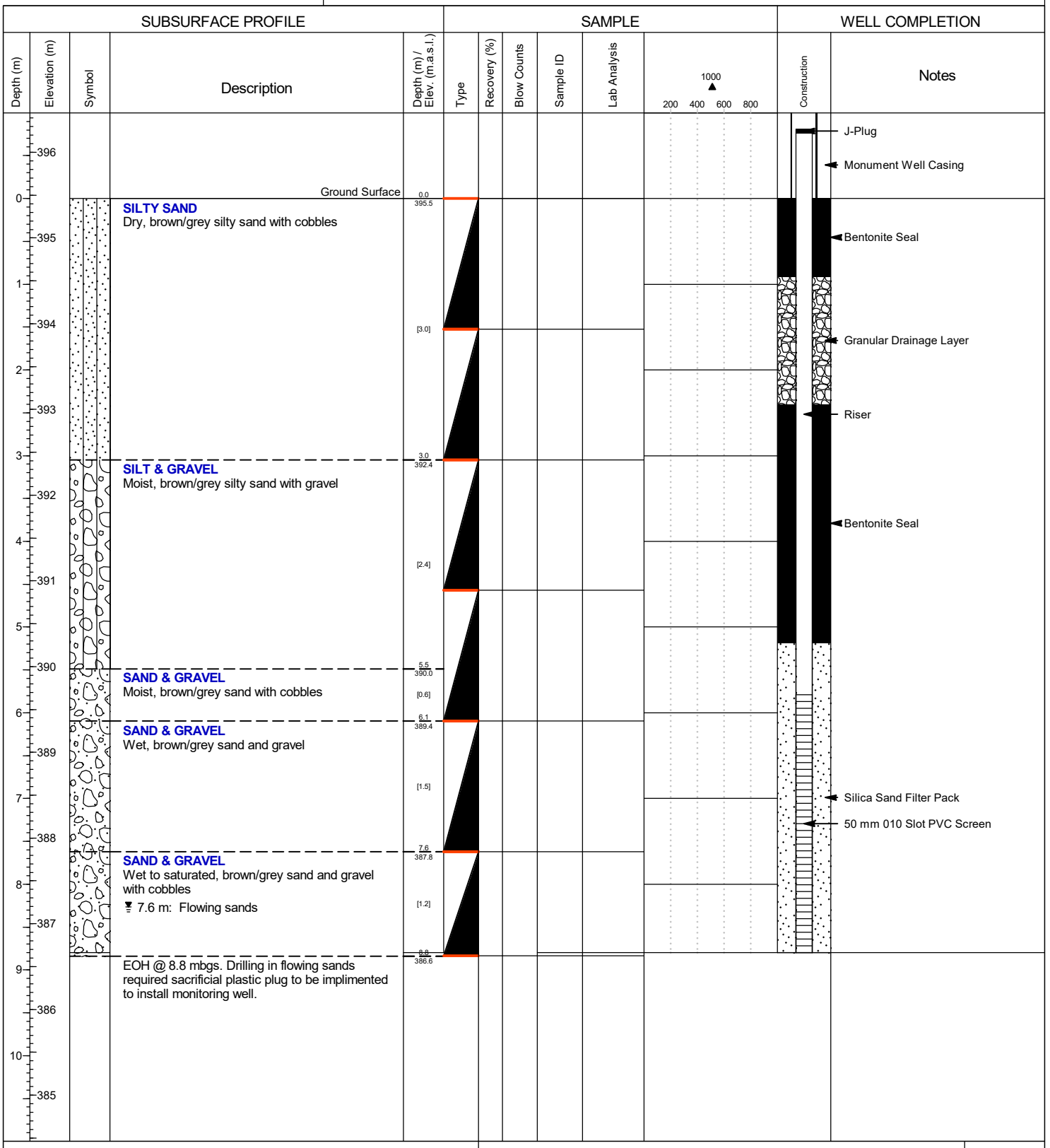
BH MW OB LOG 230226 - EL UPDATED.GPJ BLUMETRIC STANDARD.GDT 2/2/24

Monitoring Well ID: EL-MW6.2-23

Project No.: 230226
Client: MHH
Report: East Lake WDS
Site Address: East Lake
Ontario

Elevation Ground: *395.46 m*
TOP: *396.31 m*

UTM NAD 83 (Zone 17): 5016152.961 N
270303.473 E



Drill Date: September 20, 2023
Drilled By: Canadian Environmental
Drilling Method: Hollow Stem Auger

Hole Diameter (OD): 0.20 m
Logged By: BM
Checked By: CM

AUGER SAMPLE
Perched Groundwater Strike / Unstabilized Groundwater Level
True Groundwater Strike / Stabilized Groundwater Level

Sheet
1 of 1

BH MW OB LOG 230226 - EL UPDATED.GPJ BLUMETRIC STANDARD.GDT 2/2/24

Appendix D

Field Forms, Laboratory Reports, and Chain of Custody Records

Appendix D

D-1 Field Inspection Forms

SMALL LANDFILL
OPERATION AND INSPECTION FORM

BluMetric Environmental

Site Name: East Lake WDS, MHHs	Date: April 30, 2024	Weather:
Project #: 240205-06	BluMetric Staff: BM/MD	Overcast, Misty 10°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 ✓	Boulders added at entrance to prevent illegal access
❑ Perimeter fencing and gate in good condition	Yes ✓	No _	
❑ Gate locked if closed	Yes ✓	No _	

DESIGNATED WASTE AREA

❑ Working active/trench area (moderate size, daily cover, compacted)	Yes _	No ✓	Not covered/ packed
❑ Designated waste areas are properly signed and easily accessed by public	Yes ✓	No _	

More interim cover in other areas required

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 _	Skids should be removed (clean brush only)
❑ Construction Debris neat and appropriate size	Yes ✓	No _	

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 _	

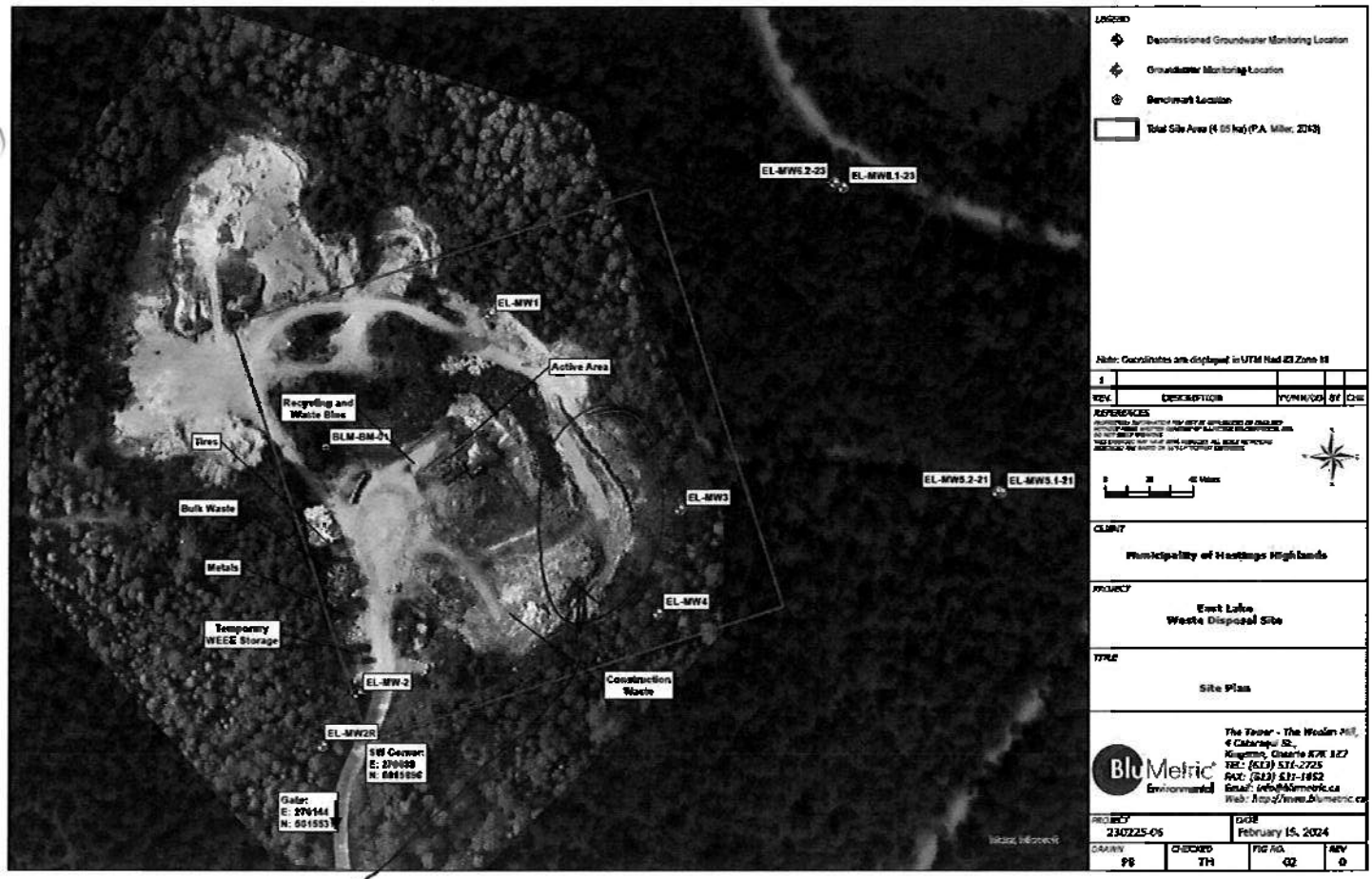
LANDFILL GAS MONITORING

❑ Conducted at structures	Yes ✓	No _	Attendant Building = 0ppm
❑ Conducted at monitoring wells	Yes ✓	No _	

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

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

This form is intended as a general reminder of information that should 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:

Area needs to be reshaped and properly covered using interm cover

Excessive blown plastics into the forest by EL-MW3 and EL-MW4

SEE PHOTOS

This form is intended as a general reminder of information that should 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

BluMetric Environmental

Site Name: East Lake WDS, MHHs	Date: 2024/10/28	Weather: Sun/Cloud 4°C
Project #: 240205-06	BluMetric Staff: BM/NW	

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

OVERALL INSPECTION AND OPERATION REVIEW

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

DESIGNATED WASTE AREA

❑	Working active/trench area (moderate size, daily cover, compacted)	Yes ✓	No _
❑	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 _	Sign missing from Metals pile
❑	Tires neat and appropriate size	Yes ✓	No _	
❑	Bulky Items neat and appropriate size	Yes _	No _	Bulky Large pile
❑	Brush pile neat and appropriate size	Yes ✓	No _	
❑	Construction Debris neat and appropriate size	Yes ✓	No _	

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 _

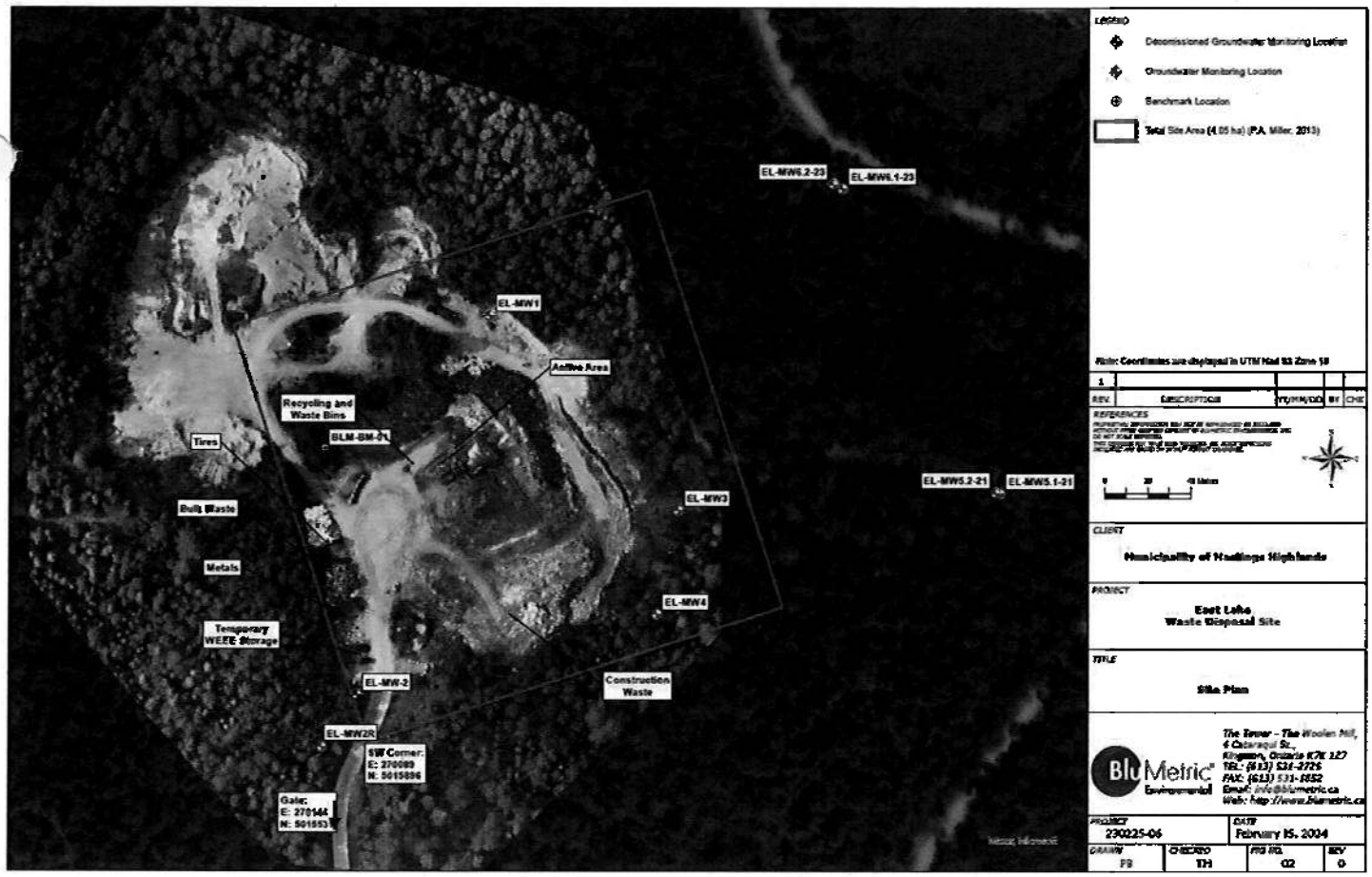
LANDFILL GAS MONITORING

❑	Conducted at structures	Yes ✓	No _	Attendant Building = Oppm
❑	Conducted at monitoring wells	Yes ✓	No _	

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

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

This form is intended as a general reminder of information that should 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:

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

Appendix D

D-2 Groundwater Laboratory Reports

Your Project #: 240205-06
Site Location: East Lake
Your C.O.C. #: 880143

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 #: R8143160
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4D1233
Received: 2024/05/02, 09:11

Sample Matrix: Ground Water
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	9	N/A	2024/05/06	CAM SOP-00447	EPA 6020B m
Alkalinity	9	N/A	2024/05/08	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	9	2024/05/03	2024/05/08	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	9	N/A	2024/05/07	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	9	N/A	2024/05/08	CAM SOP-00416	SM 24 5220 D m
Conductivity	9	N/A	2024/05/08	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	9	N/A	2024/05/06	CAM SOP-00446	SM 24 5310 B m
Hardness (calculated as CaCO3)	9	N/A	2024/05/06	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	3	N/A	2024/05/03	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	6	N/A	2024/05/06	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	9	N/A	2024/05/08	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	8	N/A	2024/05/03	CAM SOP-00440	SM 24 4500-NO3I/NO2B
Nitrate & Nitrite as Nitrogen in Water (2)	1	N/A	2024/05/06	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	9	2024/05/03	2024/05/08	CAM SOP-00413	SM 24th - 4500H+ B
Sulphate by Automated Turbidimetry	9	N/A	2024/05/07	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	8	2024/05/06	2024/05/07	CAM SOP-00428	SM 24 2540C m
Total Dissolved Solids	1	2024/05/07	2024/05/08	CAM SOP-00428	SM 24 2540C m
Total Kjeldahl Nitrogen in Water	9	2024/05/06	2024/05/07	CAM SOP-00938	OMOE E3516 m
Total Suspended Solids	8	2024/05/03	2024/05/04	CAM SOP-00428	SM 24 2540D m
Total Suspended Solids	1	2024/05/07	2024/05/08	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 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.

Your Project #: 240205-06
Site Location: East Lake
Your C.O.C. #: 880143

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 #: R8143160
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4D1233
Received: 2024/05/02, 09:11

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.

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

==========

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

Bureau Veritas Job #: C4D1233
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		ZBG711			ZBG711			ZBG712		
Sampling Date		2024/04/30 20:05			2024/04/30 20:05			2024/04/30 19:59		
COC Number		880143			880143			880143		
	UNITS	EL-MW1	RDL	QC Batch	EL-MW1 Lab-Dup	RDL	QC Batch	EL-MW2R	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO3)	mg/L	20	1.0	9369500				18	1.0	9369500
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9372073				ND	0.050	9372073
Total BOD	mg/L	ND	2	9371248				ND	2	9371248
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	9375927				7.1	4.0	9375927
Conductivity	umho/cm	80	1.0	9371843				56	1.0	9371905
Total Dissolved Solids	mg/L	125	10	9375189				65	10	9375189
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	0.10	9376000	ND	0.10	9376000	ND	0.10	9376000
Dissolved Organic Carbon	mg/L	1.3	0.4	9375697				1.1	0.4	9375697
pH	pH	6.93		9371830				7.49		9371904
Total Suspended Solids	mg/L	5100	20	9372225				1100	10	9372225
Dissolved Sulphate (SO4)	mg/L	14	1.0	9373398				8.1	1.0	9373398
Alkalinity (Total as CaCO3)	mg/L	8.1	1.0	9371827				22	1.0	9371880
Dissolved Chloride (Cl-)	mg/L	4.9	1.0	9373396				ND	1.0	9373396
Nitrate (N)	mg/L	1.25	0.10	9371852				0.10	0.10	9372893

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 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4D1233
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		ZBG712			ZBG713			ZBG714		
Sampling Date		2024/04/30 19:59			2024/04/30 19:40			2024/04/30 19:48		
COC Number		880143			880143			880143		
	UNITS	EL-MW2R Lab-Dup	RDL	QC Batch	EL-MW3	RDL	QC Batch	EL-MW4	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO3)	mg/L				1200	1.0	9369500	42	1.0	9369500
Inorganics										
Total Ammonia-N	mg/L				0.23	0.050	9372073	ND	0.050	9372073
Total BOD	mg/L				ND	2	9371248	ND	2	9371248
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	9375927	130	8.0	9375927	ND	4.0	9375927
Conductivity	umho/cm				2500	1.0	9371843	120	1.0	9371843
Total Dissolved Solids	mg/L				2290	10	9375189	105	10	9375189
Total Kjeldahl Nitrogen (TKN)	mg/L				1.8	0.10	9376000	ND	0.10	9376000
Dissolved Organic Carbon	mg/L				47	0.4	9375697	1.0	0.4	9375697
pH	pH				7.07		9371830	7.83		9371830
Total Suspended Solids	mg/L				480	10	9372225	1100	10	9372225
Dissolved Sulphate (SO4)	mg/L				1100	10	9373406	9.4	1.0	9373398
Alkalinity (Total as CaCO3)	mg/L				260	1.0	9371827	46	1.0	9371827
Dissolved Chloride (Cl-)	mg/L				110	1.0	9373402	5.5	1.0	9373396
Nitrate (N)	mg/L				0.16	0.10	9371847	0.31	0.10	9371852

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 #: C4D1233
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		ZBG715	ZBG716			ZBG717		
Sampling Date		2024/04/30 19:20	2024/04/30 19:25			2024/04/30 18:40		
COC Number		880143	880143			880143		
	UNITS	EL-MW5.1-21	EL-MW5.2-21	RDL	QC Batch	EL-MW6.1-23	RDL	QC Batch
Calculated Parameters								
Hardness (CaCO3)	mg/L	17	9.1	1.0	9369500	41	1.0	9369500
Inorganics								
Total Ammonia-N	mg/L	ND	0.054	0.050	9372073	0.095	0.050	9372073
Total BOD	mg/L	ND	ND	2	9371248	ND	2	9371248
Total Chemical Oxygen Demand (COD)	mg/L	ND	ND	4.0	9375927	ND	4.0	9375927
Conductivity	umho/cm	54	30	1.0	9371843	110	1.0	9371905
Total Dissolved Solids	mg/L	50	60	10	9375189	145	10	9374000
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	ND	0.10	9376000	ND	0.10	9376000
Dissolved Organic Carbon	mg/L	0.9	1.8	0.4	9375697	0.9	0.4	9375697
pH	pH	7.49	6.98		9371830	7.99		9371904
Total Suspended Solids	mg/L	800	90	10	9372225	39000	200	9377039
Dissolved Sulphate (SO4)	mg/L	5.7	4.1	1.0	9373398	15	1.0	9373398
Alkalinity (Total as CaCO3)	mg/L	23	9.9	1.0	9371827	43	1.0	9371880
Dissolved Chloride (Cl-)	mg/L	1.4	1.8	1.0	9373396	ND	1.0	9373396
Nitrate (N)	mg/L	0.13	0.12	0.10	9371852	ND	0.10	9371852

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

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Bureau Veritas Job #: C4D1233
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		ZBG718		ZBG719		
Sampling Date		2024/04/30 18:45		2024/04/30 19:40		
COC Number		880143		880143		
	UNITS	EL-MW6.2-23	RDL	EL-QAQC-GW1	RDL	QC Batch
Calculated Parameters						
Hardness (CaCO3)	mg/L	100	1.0	1200	1.0	9369500
Inorganics						
Total Ammonia-N	mg/L	ND	0.050	0.19	0.050	9372073
Total BOD	mg/L	ND	2	ND	2	9371248
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	130	8.0	9375927
Conductivity	umho/cm	280	1.0	2500	1.0	9371843
Total Dissolved Solids	mg/L	215	10	2270	10	9375189
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	0.10	1.8	0.10	9376000
Dissolved Organic Carbon	mg/L	1.6	0.4	48	0.4	9375697
pH	pH	7.67		7.34		9371830
Total Suspended Solids	mg/L	610	10	400	10	9372225
Dissolved Sulphate (SO4)	mg/L	27	1.0	1100	10	9373398
Alkalinity (Total as CaCO3)	mg/L	91	1.0	250	1.0	9371827
Dissolved Chloride (Cl-)	mg/L	6.2	1.0	110	1.0	9373396
Nitrate (N)	mg/L	2.37	0.10	0.15	0.10	9371852

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

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Bureau Veritas Job #: C4D1233
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

Bureau Veritas ID		ZBG711		ZBG712		ZBG713		ZBG714	ZBG715		
Sampling Date		2024/04/30 20:05		2024/04/30 19:59		2024/04/30 19:40		2024/04/30 19:48	2024/04/30 19:20		
COC Number		880143		880143		880143		880143	880143		
	UNITS	EL-MW1	QC Batch	EL-MW2R	RDL	EL-MW3	RDL	EL-MW4	EL-MW5.1-21	RDL	QC Batch
Metals											
Dissolved (0.2u) Aluminum (Al)	ug/L	ND	9373097	ND	5	ND	5	ND	ND	5	9373074
Dissolved Aluminum (Al)	ug/L	9.3	9371476	ND	4.9	ND	4.9	ND	ND	4.9	9371476
Dissolved Barium (Ba)	ug/L	ND	9371476	4.3	2.0	40	2.0	5.0	5.3	2.0	9371476
Dissolved Boron (B)	ug/L	ND	9371476	ND	10	9100	50	ND	ND	10	9371476
Dissolved Calcium (Ca)	ug/L	5600	9371476	5500	200	420000	200	10000	4800	200	9371476
Dissolved Iron (Fe)	ug/L	ND	9371476	ND	100	ND	100	ND	ND	100	9371476
Dissolved Lead (Pb)	ug/L	ND	9371476	ND	0.50	ND	0.50	ND	ND	0.50	9371476
Dissolved Magnesium (Mg)	ug/L	1300	9371476	1100	50	33000	50	4200	1300	50	9371476
Dissolved Manganese (Mn)	ug/L	ND	9371476	2.5	2.0	3000	2.0	ND	ND	2.0	9371476
Dissolved Potassium (K)	ug/L	900	9371476	750	200	8400	200	1200	880	200	9371476
Dissolved Sodium (Na)	ug/L	3800	9371476	2600	100	170000	100	4600	2600	100	9371476

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 ID		ZBG716		ZBG717		ZBG718		ZBG719		
Sampling Date		2024/04/30 19:25		2024/04/30 18:40		2024/04/30 18:45		2024/04/30 19:40		
COC Number		880143		880143		880143		880143		
	UNITS	EL-MW5.2-21	QC Batch	EL-MW6.1-23	QC Batch	EL-MW6.2-23	RDL	EL-QAQC-GW1	RDL	QC Batch
Metals										
Dissolved (0.2u) Aluminum (Al)	ug/L	23	9373097	10	9373074	ND	5	ND	5	9373097
Dissolved Aluminum (Al)	ug/L	31	9371476	28	9371476	ND	4.9	ND	4.9	9371476
Dissolved Barium (Ba)	ug/L	10	9371476	7.7	9371476	20	2.0	37	2.0	9371476
Dissolved Boron (B)	ug/L	ND	9371476	ND	9371476	82	10	8900	50	9371476
Dissolved Calcium (Ca)	ug/L	2700	9371476	11000	9371476	27000	200	410000	200	9371476
Dissolved Iron (Fe)	ug/L	ND	9371476	ND	9371476	ND	100	ND	100	9371476
Dissolved Lead (Pb)	ug/L	ND	9371476	ND	9371476	ND	0.50	ND	0.50	9371476
Dissolved Magnesium (Mg)	ug/L	600	9371476	3300	9371476	7800	50	34000	50	9371476
Dissolved Manganese (Mn)	ug/L	ND	9371476	84	9371476	55	2.0	3000	2.0	9371476
Dissolved Potassium (K)	ug/L	390	9371476	2000	9371476	2900	200	8300	200	9371476
Dissolved Sodium (Na)	ug/L	1300	9371476	3500	9371476	14000	100	180000	100	9371476

RDL = Reportable Detection Limit
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Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvna.com

Bureau Veritas Job #: C4D1233
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZBG711
Sample ID: EL-MW1
Matrix: Ground Water

Collected: 2024/04/30
Shipped:
Received: 2024/05/02

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	9371827	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373396	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371843	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/03	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9371852	N/A	2024/05/03	Jinal Chavda
pH	AT	9371830	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373398	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9375189	2024/05/06	2024/05/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi
Total Suspended Solids	BAL	9372225	2024/05/03	2024/05/04	Darshan Patel

Bureau Veritas ID: ZBG711 Dup
Sample ID: EL-MW1
Matrix: Ground Water

Collected: 2024/04/30
Shipped:
Received: 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi

Bureau Veritas ID: ZBG712
Sample ID: EL-MW2R
Matrix: Ground Water

Collected: 2024/04/30
Shipped:
Received: 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373074	N/A	2024/05/06	Azita Fazaeli
Alkalinity	AT	9371880	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373396	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371905	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/03	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9372893	N/A	2024/05/06	Samuel Law
pH	AT	9371904	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373398	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9375189	2024/05/06	2024/05/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi

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Bureau Veritas Job #: C4D1233
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: ZBG712 **Collected:** 2024/04/30
Sample ID: EL-MW2R **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Suspended Solids	BAL	9372225	2024/05/03	2024/05/04	Darshan Patel

Bureau Veritas ID: ZBG712 Dup **Collected:** 2024/04/30
Sample ID: EL-MW2R **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake

Bureau Veritas ID: ZBG713 **Collected:** 2024/04/30
Sample ID: EL-MW3 **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373074	N/A	2024/05/06	Azita Fazaeli
Alkalinity	AT	9371827	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373402	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371843	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/06	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9371847	N/A	2024/05/03	Jinal Chavda
pH	AT	9371830	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373406	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9375189	2024/05/06	2024/05/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi
Total Suspended Solids	BAL	9372225	2024/05/03	2024/05/04	Darshan Patel

Bureau Veritas ID: ZBG714 **Collected:** 2024/04/30
Sample ID: EL-MW4 **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373074	N/A	2024/05/06	Azita Fazaeli
Alkalinity	AT	9371827	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373396	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371843	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk

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TEST SUMMARY

Bureau Veritas ID: ZBG714 **Collected:** 2024/04/30
Sample ID: EL-MW4 **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/06	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9371852	N/A	2024/05/03	Jinal Chavda
pH	AT	9371830	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373398	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9375189	2024/05/06	2024/05/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi
Total Suspended Solids	BAL	9372225	2024/05/03	2024/05/04	Darshan Patel

Bureau Veritas ID: ZBG715 **Collected:** 2024/04/30
Sample ID: EL-MW5.1-21 **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373074	N/A	2024/05/06	Azita Fazaeli
Alkalinity	AT	9371827	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373396	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371843	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/06	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9371852	N/A	2024/05/03	Jinal Chavda
pH	AT	9371830	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373398	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9375189	2024/05/06	2024/05/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi
Total Suspended Solids	BAL	9372225	2024/05/03	2024/05/04	Darshan Patel

Bureau Veritas ID: ZBG716 **Collected:** 2024/04/30
Sample ID: EL-MW5.2-21 **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

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	9371827	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373396	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371843	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk

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TEST SUMMARY

Bureau Veritas ID: ZBG716 **Collected:** 2024/04/30
Sample ID: EL-MW5.2-21 **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/06	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9371852	N/A	2024/05/03	Jinal Chavda
pH	AT	9371830	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373398	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9375189	2024/05/06	2024/05/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi
Total Suspended Solids	BAL	9372225	2024/05/03	2024/05/04	Darshan Patel

Bureau Veritas ID: ZBG717 **Collected:** 2024/04/30
Sample ID: EL-MW6.1-23 **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9373074	N/A	2024/05/06	Azita Fazaeli
Alkalinity	AT	9371880	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373396	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371905	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/06	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9371852	N/A	2024/05/03	Jinal Chavda
pH	AT	9371904	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373398	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9374000	2024/05/07	2024/05/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi
Total Suspended Solids	BAL	9377039	2024/05/07	2024/05/08	Razieh Tabesh

Bureau Veritas ID: ZBG718 **Collected:** 2024/04/30
Sample ID: EL-MW6.2-23 **Shipped:**
Matrix: Ground Water **Received:** 2024/05/02

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	9371827	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373396	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371843	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk

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TEST SUMMARY

Bureau Veritas ID: ZBG718
Sample ID: EL-MW6.2-23
Matrix: Ground Water

Collected: 2024/04/30
Shipped:
Received: 2024/05/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/03	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9371852	N/A	2024/05/03	Jinal Chavda
pH	AT	9371830	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373398	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9375189	2024/05/06	2024/05/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi
Total Suspended Solids	BAL	9372225	2024/05/03	2024/05/04	Darshan Patel

Bureau Veritas ID: ZBG719
Sample ID: EL-QAQC-GW1
Matrix: Ground Water

Collected: 2024/04/30
Shipped:
Received: 2024/05/02

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	9371827	N/A	2024/05/08	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9371248	2024/05/03	2024/05/08	Amrutha Anilkumar
Chloride by Automated Colourimetry	SKAL	9373396	N/A	2024/05/07	Massarat Jan
Chemical Oxygen Demand	SPEC	9375927	N/A	2024/05/08	Neil Dassanayake
Conductivity	AT	9371843	N/A	2024/05/08	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9375697	N/A	2024/05/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9369500	N/A	2024/05/06	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9371476	N/A	2024/05/06	Indira HarryPaul
Total Ammonia-N	LACH/NH4	9372073	N/A	2024/05/08	Latha Narayanan
Nitrate & Nitrite as Nitrogen in Water	LACH	9371852	N/A	2024/05/03	Jinal Chavda
pH	AT	9371830	2024/05/03	2024/05/08	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9373398	N/A	2024/05/07	Massarat Jan
Total Dissolved Solids	BAL	9375189	2024/05/06	2024/05/07	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9376000	2024/05/06	2024/05/07	Rajni Tyagi
Total Suspended Solids	BAL	9372225	2024/05/03	2024/05/04	Darshan Patel

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GENERAL COMMENTS

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

Package 1	0.7°C
Package 2	2.7°C

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9371248	Total BOD	2024/05/08					ND,RDL=2	mg/L	NC	30	95	80 - 120
9371476	Dissolved Aluminum (Al)	2024/05/03	96	80 - 120	92	80 - 120	ND, RDL=4.9	ug/L				
9371476	Dissolved Barium (Ba)	2024/05/03	106	80 - 120	101	80 - 120	ND, RDL=2.0	ug/L				
9371476	Dissolved Boron (B)	2024/05/03	91	80 - 120	84	80 - 120	ND, RDL=10	ug/L	0.34	20		
9371476	Dissolved Calcium (Ca)	2024/05/03	NC	80 - 120	99	80 - 120	ND, RDL=200	ug/L	1.6	20		
9371476	Dissolved Iron (Fe)	2024/05/03	102	80 - 120	98	80 - 120	ND, RDL=100	ug/L	0.32	20		
9371476	Dissolved Lead (Pb)	2024/05/03	103	80 - 120	96	80 - 120	ND, RDL=0.50	ug/L				
9371476	Dissolved Magnesium (Mg)	2024/05/03	99	80 - 120	96	80 - 120	ND, RDL=50	ug/L	0.35	20		
9371476	Dissolved Manganese (Mn)	2024/05/03	NC	80 - 120	91	80 - 120	ND, RDL=2.0	ug/L	1.1	20		
9371476	Dissolved Potassium (K)	2024/05/03	101	80 - 120	103	80 - 120	ND, RDL=200	ug/L				
9371476	Dissolved Sodium (Na)	2024/05/03	99	80 - 120	97	80 - 120	ND, RDL=100	ug/L	3.0	20		
9371827	Alkalinity (Total as CaCO3)	2024/05/08			102	85 - 115	ND, RDL=1.0	mg/L	4.0	20		
9371830	pH	2024/05/08			102	98 - 103			0.26	N/A		
9371843	Conductivity	2024/05/08			101	85 - 115	ND, RDL=1.0	umho/cm	1.2	10		
9371847	Nitrate (N)	2024/05/03	90	80 - 120	91	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9371852	Nitrate (N)	2024/05/03	87	80 - 120	91	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9371880	Alkalinity (Total as CaCO3)	2024/05/08			101	85 - 115	ND, RDL=1.0	mg/L	1.3	20		
9371904	pH	2024/05/08			102	98 - 103			0.96	N/A		
9371905	Conductivity	2024/05/08			100	85 - 115	ND, RDL=1.0	umho/cm	0.15	10		
9372073	Total Ammonia-N	2024/05/08	101	75 - 125	99	80 - 120	ND, RDL=0.050	mg/L	NC	20		
9372225	Total Suspended Solids	2024/05/04			101	80 - 120	ND, RDL=10	mg/L	6.5	20		
9372893	Nitrate (N)	2024/05/06	85	80 - 120	89	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9373074	Dissolved (0.2u) Aluminum (Al)	2024/05/06	104	80 - 120	98	80 - 120	ND,RDL=5	ug/L	NC	20		
9373097	Dissolved (0.2u) Aluminum (Al)	2024/05/06	101	80 - 120	98	80 - 120	ND,RDL=5	ug/L	NC	20		
9373396	Dissolved Chloride (Cl-)	2024/05/07	104	80 - 120	101	80 - 120	ND, RDL=1.0	mg/L	NC	20		
9373398	Dissolved Sulphate (SO4)	2024/05/07	103	75 - 125	98	80 - 120	ND, RDL=1.0	mg/L	0.090	20		
9373402	Dissolved Chloride (Cl-)	2024/05/07	NC	80 - 120	99	80 - 120	ND, RDL=1.0	mg/L	1.8	20		
9373406	Dissolved Sulphate (SO4)	2024/05/07	NC	75 - 125	99	80 - 120	ND, RDL=1.0	mg/L	0.63	20		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9374000	Total Dissolved Solids	2024/05/08			100	80 - 120	ND, RDL=10	mg/L	0	20		
9375189	Total Dissolved Solids	2024/05/07			95	80 - 120	ND, RDL=10	mg/L	0	20		
9375697	Dissolved Organic Carbon	2024/05/06	NC	80 - 120	99	80 - 120	ND, RDL=0.4	mg/L	0.047	20		
9375927	Total Chemical Oxygen Demand (COD)	2024/05/08	98	80 - 120	101	80 - 120	ND, RDL=4.0	mg/L	NC	20		
9376000	Total Kjeldahl Nitrogen (TKN)	2024/05/07	99	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L	NC	20	98	80 - 120
9377039	Total Suspended Solids	2024/05/08			98	80 - 120	ND, RDL=10	mg/L	NC	20		

N/A = Not Applicable

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

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

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

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

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

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

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

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Bureau Veritas Job #: C4D1233
Report Date: 2024/05/10

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Senior Scientific Specialist

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Custody Tracking Form

T880143

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: EL-MW1
Last Sample: EL-QAQC-GW1
Sample Count: 9

Relinquished By				Received By			
Print	Sign	Date	2024/05/01	Print	Sign	Date	2024/05/02
Brad M'Callum	Brad M'Call	Time (24 HR)	08:00	VIJAYSHTI PATEL	V14	Time (24 HR)	9:11
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 M'Callum / Matthew Degear

# of Coolers/Pkgs: 2

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab Comments:

02-May-24 09:11
Christine Gripton
C4D1233

URE ENV-1101

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
Y	Y	Y	0	1	1
Y	Y	Y	2	3	3
Drinking Water Metals Preservation Check Done (Circle)				YES	NO

COR FCD-00383/4

Page 1 of 1

Your Project #: 240205-06
Site Location: East Lake
Your C.O.C. #: 971301

Attention: MHH Distribution

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

Report Date: 2024/11/20
Report #: R8412497
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C4Y1997
Received: 2024/10/30, 09:37

Sample Matrix: Ground Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	6	N/A	2024/11/04	CAM SOP-00447	EPA 6020B m
Dissolved Aluminum (0.2 u, clay free)	2	N/A	2024/11/05	CAM SOP-00447	EPA 6020B m
Alkalinity	2	N/A	2024/11/03	CAM SOP-00448	SM 24 2320 B m
Alkalinity	3	N/A	2024/11/04	CAM SOP-00448	SM 24 2320 B m
Alkalinity	3	N/A	2024/11/05	CAM SOP-00448	SM 24 2320 B m
Biochemical Oxygen Demand (BOD)	8	2024/10/31	2024/11/05	CAM SOP-00427	SM 24 5210B m
Chloride by Automated Colourimetry	8	N/A	2024/11/05	CAM SOP-00463	SM 24 4500-Cl E m
Chemical Oxygen Demand	4	N/A	2024/11/04	CAM SOP-00416	SM 24 5220 D m
Chemical Oxygen Demand	4	N/A	2024/11/05	CAM SOP-00416	SM 24 5220 D m
Conductivity	2	N/A	2024/11/03	CAM SOP-00414	SM 24 2510 m
Conductivity	3	N/A	2024/11/04	CAM SOP-00414	SM 24 2510 m
Conductivity	3	N/A	2024/11/05	CAM SOP-00414	SM 24 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2024/11/05	CAM SOP-00446	SM 24 5310 B m
Dissolved Organic Carbon (DOC) (1)	5	N/A	2024/11/06	CAM SOP-00446	SM 24 5310 B m
Hardness (calculated as CaCO3)	8	N/A	2024/11/05	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Metals by ICPMS	4	N/A	2024/11/01	CAM SOP-00447	EPA 6020B m
Dissolved Metals by ICPMS	4	N/A	2024/11/04	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	8	N/A	2024/11/04	CAM SOP-00441	USGS I-2522-90 m
Nitrate & Nitrite as Nitrogen in Water (2)	8	N/A	2024/11/04	CAM SOP-00440	SM 24 4500-NO3I/NO2B
pH (3)	2	2024/10/31	2024/11/03	CAM SOP-00413	SM 24th - 4500H+ B
pH (3)	3	2024/10/31	2024/11/04	CAM SOP-00413	SM 24th - 4500H+ B
pH (3)	3	2024/10/31	2024/11/05	CAM SOP-00413	SM 24th - 4500H+ B
Sulphate by Automated Turbidimetry	8	N/A	2024/11/05	CAM SOP-00464	SM 24 4500-SO42- E m
Total Dissolved Solids	5	2024/11/02	2024/11/05	CAM SOP-00428	SM 24 2540C m
Total Dissolved Solids	3	2024/11/07	2024/11/08	CAM SOP-00428	SM 24 2540C m
Total Kjeldahl Nitrogen in Water	8	2024/11/04	2024/11/04	CAM SOP-00938	OMOE E3516 m
Total Suspended Solids	8	2024/10/31	2024/11/04	CAM SOP-00428	SM 24 2540D m

Remarks:

Your Project #: 240205-06
Site Location: East Lake
Your C.O.C. #: 971301

Attention: MHH Distribution

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

Report Date: 2024/11/20
Report #: R8412497
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C4Y1997
Received: 2024/10/30, 09:37

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.

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

==========

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Bureau Veritas Job #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHLD63			AHLD63			AHLD64		
Sampling Date		2024/10/28 12:58			2024/10/28 12:58			2024/10/28 13:58		
COC Number		971301			971301			971301		
	UNITS	EL-MW2R	RDL	QC Batch	EL-MW2R Lab-Dup	RDL	QC Batch	EL-MW3	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO3)	mg/L	17	1.0	9735592				1300	1.0	9735592
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9737752				0.21	0.050	9737752
Total BOD	mg/L	ND	2	9736124				ND	2	9736124
Total Chemical Oxygen Demand (COD)	mg/L	ND	4.0	9743088				160	8.0	9741832
Conductivity	umho/cm	58	1.0	9737470				2400	1.0	9738663
Total Dissolved Solids	mg/L	30	10	9741635				2140	10	9751322
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	0.10	9743560				2.0	0.10	9743560
Dissolved Organic Carbon	mg/L	1.4	0.4	9745945	1.3	0.4	9745945	47	0.4	9745945
pH	pH	7.14		9737477				7.61		9738665
Total Suspended Solids	mg/L	650	10	9736706				430	10	9736706
Dissolved Sulphate (SO4)	mg/L	8.0	1.0	9738695				1100	10	9739829
Alkalinity (Total as CaCO3)	mg/L	14	1.0	9737479				260	1.0	9738662
Dissolved Chloride (Cl-)	mg/L	ND	1.0	9738693				92	1.0	9739825
Nitrate (N)	mg/L	0.11	0.10	9738671				ND	0.10	9738676

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 #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHLD64			AHLD65			AHLD65		
Sampling Date		2024/10/28 13:58			2024/10/28 13:49			2024/10/28 13:49		
COC Number		971301			971301			971301		
	UNITS	EL-MW3 Lab-Dup	RDL	QC Batch	EL-MW4	RDL	QC Batch	EL-MW4 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO3)	mg/L				46	1.0	9735592			
Inorganics										
Total Ammonia-N	mg/L				ND	0.050	9737752			
Total BOD	mg/L				ND	2	9736124			
Total Chemical Oxygen Demand (COD)	mg/L				ND	4.0	9743088			
Conductivity	umho/cm				130	1.0	9737470			
Total Dissolved Solids	mg/L	2150	10	9751322	60	10	9751322	55	10	9751322
Total Kjeldahl Nitrogen (TKN)	mg/L				ND	0.10	9743560			
Dissolved Organic Carbon	mg/L				1.3	0.4	9745945			
pH	pH				7.61		9737477			
Total Suspended Solids	mg/L				1400	10	9736706			
Dissolved Sulphate (SO4)	mg/L	1200	10	9739829	9.0	1.0	9738695			
Alkalinity (Total as CaCO3)	mg/L				39	1.0	9737479			
Dissolved Chloride (Cl-)	mg/L	100	1.0	9739825	6.3	1.0	9738693			
Nitrate (N)	mg/L				0.36	0.10	9738671			

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 #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHLD66			AHLD66			AHLD67		
Sampling Date		2024/10/28 13:28			2024/10/28 13:28			2024/10/28 13:32		
COC Number		971301			971301			971301		
	UNITS	EL-MW5.1-21	RDL	QC Batch	EL-MW5.1-21 Lab-Dup	RDL	QC Batch	EL-MW5.2-21	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO3)	mg/L	17	1.0	9735592				9.9	1.0	9735592
Inorganics										
Total Ammonia-N	mg/L	ND	0.050	9737752				ND	0.050	9737752
Total BOD	mg/L	ND	2	9736124				ND	2	9736124
Total Chemical Oxygen Demand (COD)	mg/L	4.1	4.0	9741832				ND	4.0	9743088
Conductivity	umho/cm	53	1.0	9738663	53	1.0	9738663	35	1.0	9737470
Total Dissolved Solids	mg/L	30	10	9741635				55	10	9741635
Total Kjeldahl Nitrogen (TKN)	mg/L	ND	0.10	9743560				ND	0.10	9743560
Dissolved Organic Carbon	mg/L	1.4	0.4	9745945				1.7	0.4	9745945
pH	pH	7.14		9738665	7.19		9738665	6.46		9737477
Total Suspended Solids	mg/L	340	10	9736706				210	10	9736706
Dissolved Sulphate (SO4)	mg/L	5.4	1.0	9739829				3.4	1.0	9738695
Alkalinity (Total as CaCO3)	mg/L	14	1.0	9738662	15	1.0	9738662	4.4	1.0	9737479
Dissolved Chloride (Cl-)	mg/L	1.9	1.0	9739825				2.4	1.0	9738693
Nitrate (N)	mg/L	ND	0.10	9738676				ND	0.10	9738671

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 #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHLD67			AHLD68			AHLD68		
Sampling Date		2024/10/28 13:32			2024/10/28 12:28			2024/10/28 12:28		
COC Number		971301			971301			971301		
	UNITS	EL-MW5.2-21 Lab-Dup	RDL	QC Batch	EL-MW6.1-23	RDL	QC Batch	EL-MW6.1-23 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO3)	mg/L				40	1.0	9735592			
Inorganics										
Total Ammonia-N	mg/L				0.059	0.050	9737752			
Total BOD	mg/L				ND	2	9736124			
Total Chemical Oxygen Demand (COD)	mg/L				ND	4.0	9743088			
Conductivity	umho/cm				110	1.0	9738663			
Total Dissolved Solids	mg/L				45	10	9751322	50	10	9751322
Total Kjeldahl Nitrogen (TKN)	mg/L				ND	0.10	9743560			
Dissolved Organic Carbon	mg/L				0.9	0.4	9745945			
pH	pH				7.61		9738665			
Total Suspended Solids	mg/L				7400	50	9736706			
Dissolved Sulphate (SO4)	mg/L	3.4	1.0	9738695	15	1.0	9738695			
Alkalinity (Total as CaCO3)	mg/L				36	1.0	9738662			
Dissolved Chloride (Cl-)	mg/L	2.4	1.0	9738693	ND	1.0	9738693			
Nitrate (N)	mg/L				ND	0.10	9738671			

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 #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

RESULTS OF ANALYSES OF GROUND WATER

Bureau Veritas ID		AHLD69		AHLD70		
Sampling Date		2024/10/28 12:33		2024/10/28 13:58		
COC Number		971301		971301		
	UNITS	EL-MW6.2-23	RDL	EL-QAQC-GW1	RDL	QC Batch
Calculated Parameters						
Hardness (CaCO3)	mg/L	100	1.0	1300	1.0	9735592
Inorganics						
Total Ammonia-N	mg/L	ND	0.050	0.20	0.050	9737752
Total BOD	mg/L	ND	2	ND	2	9736124
Total Chemical Oxygen Demand (COD)	mg/L	14	4.0	160	8.0	9741832
Conductivity	umho/cm	300	1.0	2600	1.0	9737470
Total Dissolved Solids	mg/L	235	10	2330	10	9741635
Total Kjeldahl Nitrogen (TKN)	mg/L	0.18	0.10	2.0	0.10	9743560
Dissolved Organic Carbon	mg/L	1.3	0.4	48	0.4	9745945
pH	pH	7.30		6.99		9737477
Total Suspended Solids	mg/L	2400	50	430	10	9736706
Dissolved Sulphate (SO4)	mg/L	29	1.0	1100	5.0	9738695
Alkalinity (Total as CaCO3)	mg/L	89	1.0	260	1.0	9737479
Dissolved Chloride (Cl-)	mg/L	12	1.0	97	1.0	9738693
Nitrate (N)	mg/L	2.17	0.10	ND	0.10	9738671

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

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Bureau Veritas Job #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

Bureau Veritas ID		AHLD63		AHLD64		AHLD65	AHLD66	AHLD67		
Sampling Date		2024/10/28 12:58		2024/10/28 13:58		2024/10/28 13:49	2024/10/28 13:28	2024/10/28 13:32		
COC Number		971301		971301		971301	971301	971301		
	UNITS	EL-MW2R	RDL	EL-MW3	RDL	EL-MW4	EL-MW5.1-21	EL-MW5.2-21	RDL	QC Batch
Metals										
Dissolved (0.2u) Aluminum (Al)	ug/L	ND	5	ND	30	ND	ND	28	5	9740479
Dissolved Aluminum (Al)	ug/L	ND	4.9	4.9	4.9	ND	ND	39	4.9	9739088
Dissolved Barium (Ba)	ug/L	3.8	2.0	33	2.0	5.5	5.6	14	2.0	9739088
Dissolved Boron (B)	ug/L	ND	10	12000	50	ND	ND	21	10	9739088
Dissolved Calcium (Ca)	ug/L	5200	200	450000	200	11000	4800	2900	200	9739088
Dissolved Iron (Fe)	ug/L	ND	100	130	100	ND	ND	ND	100	9739088
Dissolved Lead (Pb)	ug/L	ND	0.50	ND	0.50	ND	ND	ND	0.50	9739088
Dissolved Magnesium (Mg)	ug/L	1000	50	40000	50	4500	1200	620	50	9739088
Dissolved Manganese (Mn)	ug/L	3.0	2.0	6000	2.0	ND	ND	7.5	2.0	9739088
Dissolved Potassium (K)	ug/L	720	200	8700	200	1200	830	520	200	9739088
Dissolved Sodium (Na)	ug/L	2700	100	180000	100	4400	2400	1400	100	9739088

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 ID		AHLD68	AHLD69		AHLD70		
Sampling Date		2024/10/28 12:28	2024/10/28 12:33		2024/10/28 13:58		
COC Number		971301	971301		971301		
	UNITS	EL-MW6.1-23	EL-MW6.2-23	RDL	EL-QAQC-GW1	RDL	QC Batch
Metals							
Dissolved (0.2u) Aluminum (Al)	ug/L	12	ND	5	ND	30	9740479
Dissolved Aluminum (Al)	ug/L	15	ND	4.9	ND	4.9	9739088
Dissolved Barium (Ba)	ug/L	7.8	20	2.0	33	2.0	9739088
Dissolved Boron (B)	ug/L	16	95	10	11000	50	9739088
Dissolved Calcium (Ca)	ug/L	11000	28000	200	450000	200	9739088
Dissolved Iron (Fe)	ug/L	ND	ND	100	140	100	9739088
Dissolved Lead (Pb)	ug/L	ND	ND	0.50	ND	0.50	9739088
Dissolved Magnesium (Mg)	ug/L	3300	7800	50	39000	50	9739088
Dissolved Manganese (Mn)	ug/L	93	40	2.0	5800	2.0	9739088
Dissolved Potassium (K)	ug/L	1900	2700	200	8400	200	9739088
Dissolved Sodium (Na)	ug/L	3300	14000	100	180000	100	9739088

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not Detected at a concentration equal or greater than the indicated Detection Limit.

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Bureau Veritas Job #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHLD63
Sample ID: EL-MW2R
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9740479	N/A	2024/11/04	Prempal Bhatti
Alkalinity	AT	9737479	N/A	2024/11/03	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9736124	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9738693	N/A	2024/11/05	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9743088	N/A	2024/11/05	Shivani Shivani
Conductivity	AT	9737470	N/A	2024/11/03	Gurparteek KAUR
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/05	Gyulshen Idriz
Hardness (calculated as CaCO3)		9735592	N/A	2024/11/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9739088	N/A	2024/11/01	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9737752	N/A	2024/11/04	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9738671	N/A	2024/11/04	Chandra Nandlal
pH	AT	9737477	2024/10/31	2024/11/03	Gurparteek KAUR
Sulphate by Automated Turbidimetry	SKAL	9738695	N/A	2024/11/05	Alina Dobreanu
Total Dissolved Solids	BAL	9741635	2024/11/02	2024/11/05	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9743560	2024/11/04	2024/11/04	Rajni Tyagi
Total Suspended Solids	BAL	9736706	2024/10/31	2024/11/04	Razieh Tabesh

Bureau Veritas ID: AHLD63 Dup
Sample ID: EL-MW2R
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/05	Gyulshen Idriz

Bureau Veritas ID: AHLD64
Sample ID: EL-MW3
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9740479	N/A	2024/11/05	Prempal Bhatti
Alkalinity	AT	9738662	N/A	2024/11/05	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9736124	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9739825	N/A	2024/11/05	Massarat Jan
Chemical Oxygen Demand	SPEC	9741832	N/A	2024/11/04	Shivani Shivani
Conductivity	AT	9738663	N/A	2024/11/05	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/05	Gyulshen Idriz
Hardness (calculated as CaCO3)		9735592	N/A	2024/11/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9739088	N/A	2024/11/04	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9737752	N/A	2024/11/04	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9738676	N/A	2024/11/04	Chandra Nandlal
pH	AT	9738665	2024/10/31	2024/11/05	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9739829	N/A	2024/11/05	Massarat Jan
Total Dissolved Solids	BAL	9751322	2024/11/07	2024/11/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9743560	2024/11/04	2024/11/04	Rajni Tyagi

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Bureau Veritas Job #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHLD64
Sample ID: EL-MW3
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Suspended Solids	BAL	9736706	2024/10/31	2024/11/04	Razieh Tabesh

Bureau Veritas ID: AHLD64 Dup
Sample ID: EL-MW3
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	SKAL	9739825	N/A	2024/11/05	Massarat Jan
Sulphate by Automated Turbidimetry	SKAL	9739829	N/A	2024/11/05	Massarat Jan
Total Dissolved Solids	BAL	9751322	2024/11/07	2024/11/08	Razieh Tabesh

Bureau Veritas ID: AHLD65
Sample ID: EL-MW4
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9740479	N/A	2024/11/04	Prempal Bhatti
Alkalinity	AT	9737479	N/A	2024/11/03	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9736124	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9738693	N/A	2024/11/05	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9743088	N/A	2024/11/05	Shivani Shivani
Conductivity	AT	9737470	N/A	2024/11/03	Gurparteek KAUR
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/05	Gyulshen Idriz
Hardness (calculated as CaCO3)		9735592	N/A	2024/11/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9739088	N/A	2024/11/04	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9737752	N/A	2024/11/04	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9738671	N/A	2024/11/04	Chandra Nandlal
pH	AT	9737477	2024/10/31	2024/11/03	Gurparteek KAUR
Sulphate by Automated Turbidimetry	SKAL	9738695	N/A	2024/11/05	Alina Dobreanu
Total Dissolved Solids	BAL	9751322	2024/11/07	2024/11/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9743560	2024/11/04	2024/11/04	Rajni Tyagi
Total Suspended Solids	BAL	9736706	2024/10/31	2024/11/04	Razieh Tabesh

Bureau Veritas ID: AHLD65 Dup
Sample ID: EL-MW4
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	9751322	2024/11/07	2024/11/08	Razieh Tabesh

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Bureau Veritas Job #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHLD66
Sample ID: EL-MW5.1-21
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9740479	N/A	2024/11/04	Prempal Bhatti
Alkalinity	AT	9738662	N/A	2024/11/05	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9736124	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9739825	N/A	2024/11/05	Massarat Jan
Chemical Oxygen Demand	SPEC	9741832	N/A	2024/11/04	Shivani Shivani
Conductivity	AT	9738663	N/A	2024/11/05	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9735592	N/A	2024/11/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9739088	N/A	2024/11/04	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9737752	N/A	2024/11/04	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9738676	N/A	2024/11/04	Chandra Nandlal
pH	AT	9738665	2024/10/31	2024/11/05	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9739829	N/A	2024/11/05	Massarat Jan
Total Dissolved Solids	BAL	9741635	2024/11/02	2024/11/05	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9743560	2024/11/04	2024/11/04	Rajni Tyagi
Total Suspended Solids	BAL	9736706	2024/10/31	2024/11/04	Razieh Tabesh

Bureau Veritas ID: AHLD66 Dup
Sample ID: EL-MW5.1-21
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	9738662	N/A	2024/11/05	Nachiketa Gohil
Conductivity	AT	9738663	N/A	2024/11/05	Nachiketa Gohil
pH	AT	9738665	2024/10/31	2024/11/05	Nachiketa Gohil

Bureau Veritas ID: AHLD67
Sample ID: EL-MW5.2-21
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9740479	N/A	2024/11/04	Prempal Bhatti
Alkalinity	AT	9737479	N/A	2024/11/04	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9736124	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9738693	N/A	2024/11/05	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9743088	N/A	2024/11/05	Shivani Shivani
Conductivity	AT	9737470	N/A	2024/11/04	Gurparteek KAUR
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9735592	N/A	2024/11/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9739088	N/A	2024/11/01	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9737752	N/A	2024/11/04	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9738671	N/A	2024/11/04	Chandra Nandlal
pH	AT	9737477	2024/10/31	2024/11/04	Gurparteek KAUR
Sulphate by Automated Turbidimetry	SKAL	9738695	N/A	2024/11/05	Alina Dobreanu

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Bureau Veritas Job #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHLD67
Sample ID: EL-MW5.2-21
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	9741635	2024/11/02	2024/11/05	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9743560	2024/11/04	2024/11/04	Rajni Tyagi
Total Suspended Solids	BAL	9736706	2024/10/31	2024/11/04	Razieh Tabesh

Bureau Veritas ID: AHLD67 Dup
Sample ID: EL-MW5.2-21
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	SKAL	9738693	N/A	2024/11/05	Alina Dobreanu
Sulphate by Automated Turbidimetry	SKAL	9738695	N/A	2024/11/05	Alina Dobreanu

Bureau Veritas ID: AHLD68
Sample ID: EL-MW6.1-23
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9740479	N/A	2024/11/04	Prempal Bhatti
Alkalinity	AT	9738662	N/A	2024/11/05	Nachiketa Gohil
Biochemical Oxygen Demand (BOD)	DO	9736124	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9738693	N/A	2024/11/05	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9743088	N/A	2024/11/05	Shivani Shivani
Conductivity	AT	9738663	N/A	2024/11/05	Nachiketa Gohil
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9735592	N/A	2024/11/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9739088	N/A	2024/11/01	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9737752	N/A	2024/11/04	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9738671	N/A	2024/11/04	Chandra Nandlal
pH	AT	9738665	2024/10/31	2024/11/05	Nachiketa Gohil
Sulphate by Automated Turbidimetry	SKAL	9738695	N/A	2024/11/05	Alina Dobreanu
Total Dissolved Solids	BAL	9751322	2024/11/07	2024/11/08	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9743560	2024/11/04	2024/11/04	Rajni Tyagi
Total Suspended Solids	BAL	9736706	2024/10/31	2024/11/04	Razieh Tabesh

Bureau Veritas ID: AHLD68 Dup
Sample ID: EL-MW6.1-23
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids	BAL	9751322	2024/11/07	2024/11/08	Razieh Tabesh

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Bureau Veritas Job #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

TEST SUMMARY

Bureau Veritas ID: AHLD69
Sample ID: EL-MW6.2-23
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9740479	N/A	2024/11/04	Prempal Bhatti
Alkalinity	AT	9737479	N/A	2024/11/04	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9736124	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9738693	N/A	2024/11/05	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9741832	N/A	2024/11/04	Shivani Shivani
Conductivity	AT	9737470	N/A	2024/11/04	Gurparteek KAUR
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9735592	N/A	2024/11/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9739088	N/A	2024/11/01	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9737752	N/A	2024/11/04	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9738671	N/A	2024/11/04	Chandra Nandlal
pH	AT	9737477	2024/10/31	2024/11/04	Gurparteek KAUR
Sulphate by Automated Turbidimetry	SKAL	9738695	N/A	2024/11/05	Alina Dobreanu
Total Dissolved Solids	BAL	9741635	2024/11/02	2024/11/05	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9743560	2024/11/04	2024/11/04	Rajni Tyagi
Total Suspended Solids	BAL	9736706	2024/10/31	2024/11/04	Razieh Tabesh

Bureau Veritas ID: AHLD70
Sample ID: EL-QAQC-GW1
Matrix: Ground Water

Collected: 2024/10/28
Shipped:
Received: 2024/10/30

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	9740479	N/A	2024/11/05	Prempal Bhatti
Alkalinity	AT	9737479	N/A	2024/11/04	Gurparteek KAUR
Biochemical Oxygen Demand (BOD)	DO	9736124	2024/10/31	2024/11/05	Nusrat Naz
Chloride by Automated Colourimetry	SKAL	9738693	N/A	2024/11/05	Alina Dobreanu
Chemical Oxygen Demand	SPEC	9741832	N/A	2024/11/04	Shivani Shivani
Conductivity	AT	9737470	N/A	2024/11/04	Gurparteek KAUR
Dissolved Organic Carbon (DOC)	TOCV/NDIR	9745945	N/A	2024/11/06	Gyulshen Idriz
Hardness (calculated as CaCO3)		9735592	N/A	2024/11/05	Automated Statchk
Dissolved Metals by ICPMS	ICP/MS	9739088	N/A	2024/11/04	Thuy Linh Nguyen
Total Ammonia-N	SKAL/NH4	9737752	N/A	2024/11/04	Jinal Chavda
Nitrate & Nitrite as Nitrogen in Water	LACH	9738671	N/A	2024/11/04	Chandra Nandlal
pH	AT	9737477	2024/10/31	2024/11/04	Gurparteek KAUR
Sulphate by Automated Turbidimetry	SKAL	9738695	N/A	2024/11/05	Alina Dobreanu
Total Dissolved Solids	BAL	9741635	2024/11/02	2024/11/05	Razieh Tabesh
Total Kjeldahl Nitrogen in Water	SKAL	9743560	2024/11/04	2024/11/04	Rajni Tyagi
Total Suspended Solids	BAL	9736706	2024/10/31	2024/11/04	Razieh Tabesh

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GENERAL COMMENTS

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

Package 1	4.7°C

Revised Report [2024/11/20]: Nitrate and DOC added to the report.

Sample AHLD64 [EL-MW3] : Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

Sample AHLD70 [EL-QAQC-GW1] : Metals 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 #: C4Y1997
Report Date: 2024/11/20

QUALITY ASSURANCE REPORT

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9736124	Total BOD	2024/11/05					ND,RDL=2	mg/L	NC	30	98	80 - 120
9736706	Total Suspended Solids	2024/11/04			97	80 - 120	ND, RDL=10	mg/L	NC	20		
9737470	Conductivity	2024/11/03			102	85 - 115	ND, RDL=1.0	umho/cm	0.51	10		
9737477	pH	2024/11/03			102	98 - 103			0.29	N/A		
9737479	Alkalinity (Total as CaCO3)	2024/11/03			96	85 - 115	ND, RDL=1.0	mg/L	1.0	20		
9737752	Total Ammonia-N	2024/11/04	91	75 - 125	96	80 - 120	ND, RDL=0.050	mg/L	1.9	20		
9738662	Alkalinity (Total as CaCO3)	2024/11/05			97	85 - 115	ND, RDL=1.0	mg/L	3.4	20		
9738663	Conductivity	2024/11/05			102	85 - 115	ND, RDL=1.0	umho/cm	0.19	10		
9738665	pH	2024/11/05			102	98 - 103			0.74	N/A		
9738671	Nitrate (N)	2024/11/04	91	80 - 120	98	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9738676	Nitrate (N)	2024/11/04	91	80 - 120	97	80 - 120	ND, RDL=0.10	mg/L	NC	20		
9738693	Dissolved Chloride (Cl-)	2024/11/05	101	80 - 120	98	80 - 120	ND, RDL=1.0	mg/L	0.89	20		
9738695	Dissolved Sulphate (SO4)	2024/11/05	99	75 - 125	99	80 - 120	ND, RDL=1.0	mg/L	0.48	20		
9739088	Dissolved Aluminum (Al)	2024/11/01	89	80 - 120	97	80 - 120	ND, RDL=4.9	ug/L	0.39	20		
9739088	Dissolved Barium (Ba)	2024/11/01	89	80 - 120	99	80 - 120	ND, RDL=2.0	ug/L	1.8	20		
9739088	Dissolved Boron (B)	2024/11/01	88	80 - 120	94	80 - 120	ND, RDL=10	ug/L	3.0	20		
9739088	Dissolved Calcium (Ca)	2024/11/01	NC	80 - 120	97	80 - 120	ND, RDL=200	ug/L	0.56	20		
9739088	Dissolved Iron (Fe)	2024/11/01	NC	80 - 120	99	80 - 120	ND, RDL=100	ug/L	1.3	20		
9739088	Dissolved Lead (Pb)	2024/11/01	90	80 - 120	98	80 - 120	ND, RDL=0.50	ug/L	NC	20		
9739088	Dissolved Magnesium (Mg)	2024/11/01	92	80 - 120	100	80 - 120	ND, RDL=50	ug/L	1.6	20		
9739088	Dissolved Manganese (Mn)	2024/11/01	NC	80 - 120	98	80 - 120	ND, RDL=2.0	ug/L	0.79	20		
9739088	Dissolved Potassium (K)	2024/11/01	97	80 - 120	95	80 - 120	ND, RDL=200	ug/L	0.16	20		
9739088	Dissolved Sodium (Na)	2024/11/01	NC	80 - 120	99	80 - 120	ND, RDL=100	ug/L	0.23	20		
9739825	Dissolved Chloride (Cl-)	2024/11/05	NC	80 - 120	97	80 - 120	ND, RDL=1.0	mg/L	8.3	20		
9739829	Dissolved Sulphate (SO4)	2024/11/05	NC	75 - 125	97	80 - 120	ND, RDL=1.0	mg/L	2.2	20		
9740479	Dissolved (0.2u) Aluminum (Al)	2024/11/04	101	80 - 120	100	80 - 120	ND,RDL=5	ug/L	NC	20		
9741635	Total Dissolved Solids	2024/11/05			100	80 - 120	ND, RDL=10	mg/L	0.49	20		
9741832	Total Chemical Oxygen Demand (COD)	2024/11/04	101	80 - 120	103	80 - 120	ND, RDL=4.0	mg/L	NC	20		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9743088	Total Chemical Oxygen Demand (COD)	2024/11/05	103	80 - 120	102	80 - 120	ND, RDL=4.0	mg/L	7.0	20		
9743560	Total Kjeldahl Nitrogen (TKN)	2024/11/04	NC	80 - 120	103	80 - 120	ND, RDL=0.10	mg/L	7.1	20	107	80 - 120
9745945	Dissolved Organic Carbon	2024/11/05	92	80 - 120	95	80 - 120	ND, RDL=0.4	mg/L	4.3	20		
9751322	Total Dissolved Solids	2024/11/08			102	80 - 120	ND, RDL=10	mg/L	1.7	20		

N/A = Not Applicable

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

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

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

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

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

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

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

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Bureau Veritas Job #: C4Y1997
Report Date: 2024/11/20

BluMetric Environmental Inc
Client Project #: 240205-06
Site Location: East Lake
Sampler Initials: BM

VALIDATION SIGNATURE PAGE

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

Cristina Carriere, Senior Scientific Specialist

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.

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Custody Tracking Form

T971301

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: EL-MW1
Last Sample: EL-QAQC-GW1
Sample Count: 9

Relinquished By				Received By			
Brad McCallum	Brad McCallum	Date	2024/10/29	Keith Sullivan	Keith Sullivan	Date	2024/10/30
		Time (24 HR)	08:00			Time (24 HR)	09:37
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): BM / NW

# of Coolers/Pkgs: 1

Rush ☐ Immediate Test ☐ Food Residue ☐

Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At

Labeled By

Verified By

Lab Comments:

30-Oct-24 09:37
Elora Di Bratto
C4Y1997
A6K ENV-590

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

COR FCD-00383/4

Page 1 of 1

Appendix D

D-3 QA/QC Calculations

2024 Groundwater Sampling Quality Assurance and Quality Control (Spring)

Sample Description		RDL	EL-MW3	EL-QAQC-GW1 (ELMW3)	Relative Percent Difference
Date Sampled			30-Apr-24	30-Apr-24	
Parameter	**Unit**				
pH	pH Units	NA	7.07	7.34	
Alkalinity (as CaCO3)	mg/L	5	260	250	4%
Electrical Conductivity	uS/cm	2	2500	2500	0%
Total Dissolved Solids	mg/L	10	2290	2270	1%
Total Suspended Solids	mg/L	10	480	400	18%
Chloride	mg/L	0.10	110	110	0%
Nitrate as N	mg/L	0.05	0.16	0.15	NA
Sulphate	mg/L	0.10	1100	1100	0%
Ammonia as N	mg/L	0.02	0.23	0.19	19%
Total Kjeldahl Nitrogen	mg/L	0.10	1.8	1.8	0%
Chemical Oxygen Demand	mg/L	5	130	130	0%
Dissolved Organic Carbon	mg/L	0.5	47	48	2%
Dissolved Calcium	mg/L	0.05	420	410	2%
Dissolved Magnesium	mg/L	0.05	33	34	3%
Dissolved Potassium	mg/L	0.50	8.4	8.3	1%
Dissolved Sodium	mg/L	0.05	170	180	6%
Aluminum-dissolved	mg/L	0.004	<0.005	<0.005	NA
Dissolved Aluminum	mg/L	0.004	<0.0049	<0.0049	NA
Dissolved Barium	mg/L	0.002	0.04	0.037	8%
Dissolved Boron	mg/L	0.010	9.1	8.9	2%
Dissolved Iron	mg/L	0.010	<0.1	<0.1	NA
Dissolved Manganese	mg/L	0.002	3	3	0%
Biochemical Oxygen Demand, Total	mg/L	2	<2	<2	NA

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

10% for electrical conductivity

20% for metals and inorganics

30% for BTEX and PHC.

2024 Groundwater Sampling Quality Assurance and Quality Control (Fall)

Sample Description		RDL	EL-MW3	EL-QAQC-GW1 (ELMW3)	Relative Percent Difference
Date Sampled			28-Oct-24	28-Oct-24	
Parameter	Unit				
pH	pH Units	NA	7.61	6.99	
Alkalinity (as CaCO3)	mg/L	5	260	260	0%
Electrical Conductivity	uS/cm	2	2400	2600	8%
Total Dissolved Solids	mg/L	10	2140	2330	9%
Total Suspended Solids	mg/L	10	430	430	0%
Chloride	mg/L	0.10	92	97	5%
Nitrate as N	mg/L	0.05	<0.1	<0.1	NA
Sulphate	mg/L	0.10	1100	1100	0%
Ammonia as N	mg/L	0.02	0.21	0.2	5%
Total Kjeldahl Nitrogen	mg/L	0.10	2	2	0%
Chemical Oxygen Demand	mg/L	5	160	160	0%
Dissolved Organic Carbon	mg/L	0.5	47	48	2%
Dissolved Calcium	mg/L	0.05	450	450	0%
Dissolved Magnesium	mg/L	0.05	40	39	3%
Dissolved Potassium	mg/L	0.50	8.7	8.4	4%
Dissolved Sodium	mg/L	0.05	180	180	0%
Aluminum-dissolved	mg/L	0.004	<0.03	<0.03	NA
Dissolved Aluminum	mg/L	0.004	0.0049	<0.0049	NA
Dissolved Barium	mg/L	0.002	0.033	0.033	0%
Dissolved Boron	mg/L	0.010	12	11	9%
Dissolved Iron	mg/L	0.010	0.13	0.14	7%
Dissolved Lead	mg/L	0.0005	<0.0005	<0.0005	NA
Dissolved Manganese	mg/L	0.002	6	5.8	3%
Biochemical Oxygen Demand, Total	mg/L	2	<2	<2	NA

Yellow shading indicates RPD value is above the percentage for a high level of reproducibility:

10% for electrical conductivity

20% for metals and inorganics

30% for BTEX and PHC.

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Appendix E

Historic Groundwater Chemistry

Appendix E

E-1 Historical Groundwater Chemistry Results

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	EL-MW2	EL-MW2	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.2-21	EL-MW5.2-21	EL-MW5.2-21	EL-MW5.2-21
						Sample ID	EL-MW2	EL-MW2	EL-MW5.1	EL-MW5.1	EL-MW5.1	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.1-21	EL-MW5.2	EL-MW5.2	EL-MW5.2	EL-MW5.2-21
						Sample Date	2008-May-08	2008-Oct-08	2021-Oct-22	2022-May-02	2022-Oct-17	2023-May-01	2023-Oct-17	2024-Apr-30	2024-Oct-28	2021-Oct-22	2022-May-02	2022-Oct-17	2023-May-01
						Lab Job Number			21T819622	22T891229	22T958971	23T020437	C3W5728	C4D1233	C4Y1997	21T819622	22T891229	22T958971	23T020437
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Sample ID			3118508	3812150	4429858	4957894	XIM074	ZBG715	AHLD66	3118515	3812151	4429859	4957895
Anions						**Detection Limit**													
Chloride	mg/L	125.3	250	-	-	0.1, 0.12, 0.2, 0.24, 0.5, 1	8	5	13.1	1.32	1.73	2.07	<1	1.4	1.9	1.63	1.93	2.89	1.59
Nitrate as N	mg/L	2.6	10	-	-	0.05, 0.07, 0.1, 0.25	6.62	5.13	0.12	0.14	0.16	0.12	0.13	0.13	<0.1	<0.05	0.16	0.11	0.27
Nitrite as N	mg/L	-	1	-	-	0.02	<0.02	<0.02	-	-	-	-	-	-	-	-	-	-	-
Sulphate	mg/L	254.4	500	-	-	0.1, 0.19, 1, 3, 5, 10	58	130	30.6	6.72	7.01	6.22	5.2	5.7	5.4	5.85	5	4.78	5.05
Cations																			
Calcium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.25, 0.5	47	61	5.82	4.63	5.54	5.88	5.1	4.8	4.8	2.75	2.75	2.77	3.46
Magnesium (diss)	mg/L	-	-	-	-	0.05, 0.25, 0.5	10	15	1.49	1.31	1.25	1.43	1.4	1.3	1.2	0.65	0.66	0.63	0.62
Potassium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.5, 2.5	12	12	1.25	0.87	0.96	0.55	0.89	0.88	0.83	0.71	<0.5	0.67	<0.5
Sodium (diss)	mg/L	101.3	200	-	-	0.05, 0.1, 0.25, 0.5	6	7	8.31	2.4	2.6	3.15	2.5	2.6	2.4	2.24	1.28	1.43	1.59
General Chemistry																			
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1, 5	90	120	31	16	18	14	15	23	14	9	7	6	<5
Ammonia as N	mg/L	-	-	-	-	0.02, 0.05	-	-	0.3	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	0.11	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2, 5	-	-	3	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 5, 8	5	10	<5	<5	12	<5	<4	<4	4.1	<5	<5	15	<5
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4, 0.5	4.4	4.3	2.3	1.1	1.1	0.9	1	0.9	1.4	1.9	1.7	3	1.4
Electrical Conductivity	uS/cm	-	-	-	-	1, 2	384	560	97	57	61	58	57	54	53	34	37	34	32
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	158.5	214.1	20.7	17	19	-	18	17	17	9.5	9.6	9.5	-
Lab Filtration Aluminum (diss)		-	-	-	-		-	-	-	-	-		-	-	-	-	-	-	
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.05	7.48	7.03	6.64	7.11	6.93	7.23	7.49	7.14	**6.37**	**6.34**	**6.27**	**6.27**
Total Dissolved Solids	mg/L	274	500	-	-	5, 10, 20	250	364	76	18	44	46	45	50	30	34	24	26	40
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.2	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	0.1
Total Suspended Solids	mg/L	-	-	-	-	10, 17, 20, 50, 200	-	-	687	306	2330	524	980	800	340	828	420	458	146
Metals																			
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004, 0.005, 0.03	-	-	-	0.009	0.008	<0.004	<0.005	<0.005	<0.005	-	0.008	0.032	0.028
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.004, 0.0049	<0.01	<0.01	0.011	0.008	0.01	0.014	<0.0049	<0.0049	<0.0049	0.028	0.072	0.047	0.037
Barium (diss)	mg/L	-	1	-	-	0.002	0.05	0.07	0.013	0.005	0.005	0.006	0.0055	0.0053	0.0056	0.012	0.01	0.012	0.013
Beryllium (diss)	mg/L	-	-	Calculated	-	0.001	<0.001	<0.001	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.02, 0.05, 0.2	0.2	0.28	0.01	<0.01	0.014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.012	<0.01
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-
Chromium (diss)	mg/L	-	0.05	-	-	0.001	<0.001	<0.001	-	-	-	-	-	-	-	-	-	-	-
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0002	<0.0002	<0.0002	-	-	-	-	-	-	-	-	-	-	-
Copper (diss)	mg/L	-	1	-	Calculated	0.001	0.003	0.003	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.01, 0.1	<0.03	<0.03	<0.01	<0.01	<0.01	0.013	<0.1	<0.1	<0.1	<0.01	<0.01	<0.01	0.031
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005, 0.001	<0.001	<0.001	-	-	-	-	<0.0005	<0.0005	<0.0005	-	-	-	-
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	<0.01	<0.01	0.025	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.016	0.002	0.002	0.003
Molybdenum (diss)	mg/L	-	-	-	0.04	0.005	<0.005	<0.005	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	-	-	0.025	-	0.005	<0.005	<0.005	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.1	5.8	4.9	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	-	-	0.0001	-	0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-
Strontium (diss)	mg/L	-	-	-	-	0.001	0.427	0.149	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	-	-	-	0.0003	0.0001	<0.0001	<0.0001	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	0.006	0.001	0.002	<0.001	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	-	5	-	0.02	0.01	<0.01	<0.01	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet	for all Calculated criteria/guidelines.
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manually.

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	EL-MW5.2-21	EL-MW5.2-21	EL-MW5.2-21	EL-MW6.1-23	EL-MW6.1-23	EL-MW6.1-23	EL-MW6.2-23	EL-MW6.2-23	EL-MW6.2-23	ELMW1	ELMW1	ELMW1	ELMW1
						Sample ID	EL-MW5.2-21	EL-MW5.2-21	EL-MW5.2-21	EL-MW6.1-23	EL-MW6.1-23	EL-MW6.1-23	EL-MW6.2-23	EL-MW6.2-23	EL-MW6.2-23	EL-MW1	EL-MW1	EL-MW1	EL-MW1
						Sample Date	2023-Oct-17	2024-Apr-30	2024-Oct-28	2023-Oct-17	2024-Apr-30	2024-Oct-28	2023-Oct-17	2024-Apr-30	2024-Oct-28	2006-May-09	2006-Nov-21	2007-May-02	2008-May-08
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number	C3W5728	C4D1233	C4Y1997	C3W5728	C4D1233	C4Y1997	C3W5728	C4D1233	C4Y1997				
						Lab Sample ID	XIM075	ZBG716	AHLD67	XIM076	ZBG717	AHLD68	XIM077	ZBG718	AHLD69				
Anions						**Detection Limit**													
Chloride	mg/L	125.3	250	-	-	0.1, 0.12, 0.2, 0.24, 0.5, 1	3.2	1.8	2.4	<1	<1	<1	2.1	6.2	12	-	-	2	1
Nitrate as N	mg/L	2.6	10	-	-	0.05, 0.07, 0.1, 0.25	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	1.86	2.37	2.17	2.56	0.95	3.35	1.36
Nitrite as N	mg/L	-	1	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	0.08	<0.02
Sulphate	mg/L	254.4	500	-	-	0.1, 0.19, 1, 3, 5, 10	3.5	4.1	3.4	6.8	15	15	25	27	29	22	25	17	15
Cations																			
Calcium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.25, 0.5	2.9	2.7	2.9	12	11	11	29	27	28	11	8	8	6
Magnesium (diss)	mg/L	-	-	-	-	0.05, 0.25, 0.5	0.66	0.6	0.62	3.4	3.3	3.3	5.9	7.8	7.8	3	2	2	1
Potassium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.5, 2.5	0.59	0.39	0.52	2.2	2	1.9	2.8	2.9	2.7	2	2	1	1
Sodium (diss)	mg/L	101.3	200	-	-	0.05, 0.1, 0.25, 0.5	1.5	1.3	1.4	3.9	3.5	3.3	15	14	14	6	6	5	5
General Chemistry																			
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1, 5	3.9	9.9	4.4	40	43	36	100	91	89	14	14	15	11
Ammonia as N	mg/L	-	-	-	-	0.02, 0.05	<0.05	0.054	<0.05	0.16	0.095	0.059	0.12	<0.05	<0.05	-	-	-	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	2, 5	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 5, 8	9.2	<4	<4	11	<4	<4	7.6	<4	14	-	-	<5	15
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4, 0.5	1.5	1.8	1.7	1.5	0.9	0.9	2.6	1.6	1.3	-	-	2.2	1.9
Electrical Conductivity	uS/cm	-	-	-	-	1, 2	33	30	35	120	110	110	270	280	300	119	98	93	71
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	10	9.1	9.9	43	41	40	98	100	100	39.8	28.2	28.2	19.1
Lab Filtration Aluminum (diss)		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.54	6.98	**6.46**	7.8	7.99	7.61	7.54	7.67	7.3	6.61	6.62	**6.24**	6.78
Total Dissolved Solids	mg/L	274	500	-	-	5, 10, 20	20	60	55	145	145	45	190	215	235	-	-	61	46
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.2	0.15	<0.1	<0.1	0.16	<0.1	<0.1	<0.1	<0.1	0.18	-	-	-	-
Total Suspended Solids	mg/L	-	-	-	-	10, 17, 20, 50, 200	240	90	210	25000	39000	7400	1400	610	2400	-	-	-	-
Metals																			
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004, 0.005, 0.03	0.028	0.023	0.028	0.011	0.01	0.012	<0.005	<0.005	<0.005	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.004, 0.0049	0.037	0.031	0.039	0.011	0.028	0.015	<0.0049	<0.0049	<0.0049	0.03	0.02	0.02	<0.01
Barium (diss)	mg/L	-	1	-	-	0.002	0.014	0.01	0.014	0.01	0.0077	0.0078	0.019	0.02	0.02	<0.01	<0.01	<0.01	<0.01
Beryllium (diss)	mg/L	-	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.02, 0.05, 0.2	<0.01	<0.01	0.021	<0.01	<0.01	0.016	0.093	0.082	0.095	0.03	0.02	0.02	0.02
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.0001	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Chromium (diss)	mg/L	-	0.05	-	-	0.001	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	0.001
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0002	-	-	-	-	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002
Copper (diss)	mg/L	-	1	-	Calculated	0.001	-	-	-	-	-	-	-	-	-	0.002	0.001	0.001	<0.001
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.01, 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005, 0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	0.0023	<0.002	0.0075	0.063	0.084	0.093	0.35	0.055	0.04	<0.01	<0.01	<0.01	<0.01
Molybdenum (diss)	mg/L	-	-	-	0.04	0.005	-	-	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005
Nickel (diss)	mg/L	-	-	0.025	-	0.005	-	-	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005
Silicon (diss)	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	7.6	-	6.1	6.4
Silver (diss)	mg/L	-	-	0.0001	-	0.0001	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Strontium (diss)	mg/L	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	0.105	0.067	0.063	0.043
Thallium (diss)	mg/L	-	-	-	0.0003	0.0001	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001
Titanium (diss)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01
Vanadium (diss)	mg/L	-	-	-	0.006	0.001	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001
Zinc (diss)	mg/L	-	5	-	0.02	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 RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet	for all Calculated criteria/guidelines.
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manual

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1
						Sample ID	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1
						Sample Date	2008-Oct-08	2009-Jun-04	2009-Oct-21	2010-May-18	2010-Nov-02	2011-May-19	2011-Nov-02	2012-Apr-17	2013-Apr-16	2013-Oct-29	2014-May-12	2015-May-05	2016-Apr-27
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number													
						Lab Sample ID													
Anions						**Detection Limit**													
Chloride	mg/L	125.3	250	-	-	0.1, 0.12, 0.2, 0.24, 0.5, 1	<1	1	1	2	5	2	<1	<1	0.43	0.43	0.35	0.42	0.29
Nitrate as N	mg/L	2.6	10	-	-	0.05, 0.07, 0.1, 0.25	1.1	0.89	1.55	1.51	1	0.35	1.1	1.1	1.95	0.53	0.52	0.28	0.33
Nitrite as N	mg/L	-	1	-	-	0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.1	0.02	0.13	<0.02	0.03	<0.02	0.05
Sulphate	mg/L	254.4	500	-	-	0.1, 0.19, 1, 3, 5, 10	14	8	10	10	12	8	12	8	9.28	9.38	6.57	5.72	4.44
Cations																			
Calcium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.25, 0.5	5	3	4	4	5	2	2	3.29	5.34	3.58	2.03	1.94	1.38
Magnesium (diss)	mg/L	-	-	-	-	0.05, 0.25, 0.5	1	<1	<1	<1	1	<1	<1	0.682	1.2	0.81	0.48	0.47	0.35
Potassium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.5, 2.5	1	<1	1	<1	<1	<1	<1	0.739	1.17	0.99	0.71	0.66	0.64
Sodium (diss)	mg/L	101.3	200	-	-	0.05, 0.1, 0.25, 0.5	4	4	4	4	4	2	2	3.77	6.69	4.1	3.34	3.19	3.02
General Chemistry																			
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1, 5	12	7	10	9	6	10	10	7	18	9	6	8	8
Ammonia as N	mg/L	-	-	-	-	0.02, 0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
Biochemical Oxygen Demand	mg/L	-	-	-	-	2, 5	-	-	-	-	-	-	-	-	-	-	-	-	-
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 5, 8	<5	8	8	<5	<5	8	40	52	<5	<5	<5	<5	<5
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4, 0.5	1.9	2.8	2.1	1.8	1.6	1.4	2.6	2.1	0.9	1.1	1.4	1	3.1
Electrical Conductivity	uS/cm	-	-	-	-	1, 2	69	45	58	59	61	38	58	52	79	48	36	35	30
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	16.6	9.6	12	12	16.6	7.1	7.1	11	18.3	12.3	7	6.8	4.9
Lab Filtration Aluminum (diss)		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.83	6.64	6.73	6.74	6.64	6.75	6.17	6.4	7.32	7.18	6.85	7.27	6.83
Total Dissolved Solids	mg/L	274	500	-	-	5, 10, 20	45	29	38	38	40	25	39	128	100	70	58	84	68
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	-	-	-	-	10, 17, 20, 50, 200	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																			
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004, 0.005, 0.03	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.004, 0.0049	<0.01	0.02	0.03	<0.01	<0.01	0.03	0.02	0.018	0.032	0.045	0.009	0.033	0.061
Barium (diss)	mg/L	-	1	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001	0.002	<0.002	<0.002	<0.002	<0.002
Beryllium (diss)	mg/L	-	-	Calculated	-	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.02, 0.05, 0.2	0.03	0.01	0.02	0.03	0.03	<0.01	0.02	0.025	0.015	0.015	0.011	0.01	0.01
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.001
Chromium (diss)	mg/L	-	0.05	-	-	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
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.001
Copper (diss)	mg/L	-	1	-	Calculated	0.001	0.003	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.0005	<0.003	<0.003	<0.003	<0.003	<0.003
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.01, 0.1	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1	<0.01	<0.01	<0.01	<0.01	0.034
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005, 0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002
Molybdenum (diss)	mg/L	-	-	-	0.04	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002
Nickel (diss)	mg/L	-	-	0.025	-	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001	<0.003	<0.003	<0.003	<0.003	<0.003
Silicon (diss)	mg/L	-	-	-	-	0.1	8.6	4.9	8.2	5.8	7.8	5.5	5.2	4.58	7.52	7.18	5.84	6.15	6.45
Silver (diss)	mg/L	-	-	0.0001	-	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.002	<0.002	<0.002	<0.002	<0.002
Strontium (diss)	mg/L	-	-	-	-	0.001	0.045	0.021	0.04	0.033	0.044	0.021	<0.0001	0.026	0.042	0.03	0.019	0.019	0.016
Thallium (diss)	mg/L	-	-	-	0.0003	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.006	<0.006	<0.006	<0.006	<0.006
Titanium (diss)	mg/L	-	-	-	-	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.002	<0.002	<0.002	<0.002	0.002
Vanadium (diss)	mg/L	-	-	-	0.006	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.002	<0.002	<0.002	<0.002	<0.002
Zinc (diss)	mg/L	-	5	-	0.02	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	0.006	0.029	<0.005	<0.005	<0.005

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet	for all Calculated criteria/guidelines.
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manual

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1	ELMW1
						Sample ID	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1	EL-MW1
						Sample Date	2016-Oct-27	2017-May-12	2017-Oct-24	2018-May-08	2018-Oct-23	2019-May-08	2019-Oct-23	2020-May-07	2020-Oct-07	2021-Apr-21	2021-Oct-19	2022-May-02	2023-May-01
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number										21T737451	21T819627	22T891229	23T020437
						Lab Sample ID										2378275	3118622	3812146	4957890
Anions						**Detection Limit**													
Chloride	mg/L	125.3	250	-	-	0.1, 0.12, 0.2, 0.24, 0.5, 1	0.55	0.33	0.27	0.28	1.52	0.35	0.15	0.21	20.8	96.7	2.3	35.3	46.9
Nitrate as N	mg/L	2.6	10	-	-	0.05, 0.07, 0.1, 0.25	0.79	0.48	0.92	0.46	0.7	2.53	0.84	0.94	0.33	1.27	0.35	1.26	2.48
Nitrite as N	mg/L	-	1	-	-	0.02	<0.02	<0.02	0.17	0.22	<0.02	-	-	-	-	-	-	-	-
Sulphate	mg/L	254.4	500	-	-	0.1, 0.19, 1, 3, 5, 10	5.37	3.77	4.24	2.9	3.41	1.18	3.02	2.61	1.42	0.38	2.8	1.02	0.75
Cations																			
Calcium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.25, 0.5	2.22	1.56	1.55	1.09	0.06	2.08	1.17	1.15	8.36	41	1.93	24.2	44.7
Magnesium (diss)	mg/L	-	-	-	-	0.05, 0.25, 0.5	0.48	0.3	0.46	0.26	<0.05	0.63	0.27	0.26	1.97	9.8	0.45	5.9	11
Potassium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.5, 2.5	0.72	-	-	0.49	<0.05	0.88	0.57	0.46	1.73	2.95	0.71	2.26	1.8
Sodium (diss)	mg/L	101.3	200	-	-	0.05, 0.1, 0.25, 0.5	3.62	2.69	3.42	2.22	<0.05	2.35	3.31	1.9	8.59	19.3	3.37	13.1	12.2
General Chemistry																			
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1, 5	10	8	7	7	7	6	6	5	6	<5	6	<5	<5
Ammonia as N	mg/L	-	-	-	-	0.02, 0.05	-	-	-	-	-	<0.02	0.07	<0.02	<0.02	<0.02	0.09	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2, 5	-	<5	<5	<5	<5	<5	<5	<5	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 5, 8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4, 0.5	1.5	0.8	2.8	1	2.2	2.5	1.4	0.7	1.6	1.1	1.4	0.6	1.6
Electrical Conductivity	uS/cm	-	-	-	-	1, 2	41	30	29	22	31	34	119	27	82	340	28	142	189
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	7.5	5.1	5.8	3.8	0.3	7.8	4	3.9	29	142.7	6.7	84.7	-
Lab Filtration Aluminum (diss)		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.69	6.91	7.66	**6.38**	6.73	**6.11**	6.93	6.52	**6.08**	**5.93**	**6.37**	**6.18**	**6.44**
Total Dissolved Solids	mg/L	274	500	-	-	5, 10, 20	25	40	38	50	72	52	72	38	72	262	38	106	66
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.2	-	-	-	0.44	<0.1	<0.1	<0.1	0.18	0.12	-	<0.1	<0.1	<0.1
Total Suspended Solids	mg/L	-	-	-	-	10, 17, 20, 50, 200	-	3220	4360	2240	4650	1750	4040	2850	3080	2120	1440	1780	3230
Metals																			
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004, 0.005, 0.03	-	-	-	-	-	-	-	-	-	-	-	<0.004	<0.004
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.004, 0.0049	0.564	-	-	-	-	-	-	-	0.014	0.048	0.021	0.016	0.008
Barium (diss)	mg/L	-	1	-	-	0.002	0.01	0.003	<0.002	<0.002	<0.002	<0.002	0.003	0.002	0.002	0.01	<0.002	0.006	0.008
Beryllium (diss)	mg/L	-	-	Calculated	-	0.001	<0.001	-	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.02, 0.05, 0.2	0.011	<0.01	0.018	0.016	<0.01	<0.01	<0.01	<0.01	0.067	0.012	<0.01	<0.01	<0.01
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.0001	<0.001	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (diss)	mg/L	-	0.05	-	-	0.001	<0.003	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0002	<0.001	-	-	-	-	-	-	-	-	-	-	-	-
Copper (diss)	mg/L	-	1	-	Calculated	0.001	<0.003	-	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.01, 0.1	0.398	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.039	0.023	<0.01	0.017
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005, 0.001	<0.002	-	-	-	-	-	-	-	-	-	-	-	-
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.003	0.005
Molybdenum (diss)	mg/L	-	-	-	0.04	0.005	<0.002	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	-	-	0.025	-	0.005	<0.003	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.1	7.78	-	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	-	-	0.0001	-	0.0001	<0.002	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (diss)	mg/L	-	-	-	-	0.001	0.025	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	-	-	-	0.0003	0.0001	<0.006	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	-	-	-	-	0.002	0.025	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	0.006	0.001	<0.002	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	-	5	-	0.02	0.01	<0.005	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet	for all Calculated criteria/guidelines.
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manual

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	ELMW1	ELMW1	ELMW2R	ELMW2R	ELMW2R	ELMW2R	ELMW2R	ELMW2R	ELMW2R	ELMW2R	ELMW2R	ELMW2R
						Sample ID	EL-MW1	EL-MW1	EL-MW2R-19	EL-MW2R	EL-MW2R	EL-MW2R	EL-MW2R	EL-MW2R	EL-MW2R	EL-MW2R	EL-MW2R	EL-MW2R
						Sample Date	2023-Oct-17	2024-Apr-30	2019-Oct-23	2020-May-07	2020-Oct-07	2021-Apr-21	2021-Oct-19	2022-May-02	2022-Oct-17	2023-May-01	2023-Oct-17	2024-Apr-30	2024-Oct-28
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number	C3W5728	C4D1233				21T737451	21T819627	22T891229	22T958971	23T020437	C3W5728	C4D1233	C4Y1997
						Lab Sample ID	XIM070	ZBG711				2378292	3118656	3812147	4429848	4957891	XIM071	ZBG712	AHLD63
Anions						**Detection Limit**													
Chloride	mg/L	125.3	250	-	-	0.1, 0.12, 0.2, 0.24, 0.5, 1	4.9	4.9	1.43	0.33	0.69	0.32	0.5	0.48	0.54	0.64	<1	<1	<1
Nitrate as N	mg/L	2.6	10	-	-	0.05, 0.07, 0.1, 0.25	2.01	1.25	<0.05	0.05	0.07	0.08	0.09	0.11	0.14	0.11	0.11	0.1	0.11
Nitrite as N	mg/L	-	1	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate	mg/L	254.4	500	-	-	0.1, 0.19, 1, 3, 5, 10	3.7	14	25.9	9.7	8.96	8.53	10.7	8.58	8.92	8.75	7.6	8.1	8
Cations																			
Calcium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.25, 0.5	3.9	5.6	7.7	4.9	5.01	4.94	4.8	4.79	6.15	5.47	5.6	5.5	5.2
Magnesium (diss)	mg/L	-	-	-	-	0.05, 0.25, 0.5	0.87	1.3	1.26	1.02	1.02	1.05	0.98	1.01	1.09	1.23	1.1	1.1	1
Potassium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.5, 2.5	0.84	0.9	1.06	0.77	0.82	-	0.79	0.75	0.94	0.6	0.77	0.75	0.72
Sodium (diss)	mg/L	101.3	200	-	-	0.05, 0.1, 0.25, 0.5	3.1	3.8	10.4	2.44	2.63	2.4	2.5	2.47	2.59	2.73	2.8	2.6	2.7
General Chemistry																			
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1, 5	7.5	8.1	26	12	15	13	12	12	21	18	16	22	14
Ammonia as N	mg/L	-	-	-	-	0.02, 0.05	<0.05	<0.05	0.1	<0.02	<0.02	<0.02	0.08	<0.02	0.03	<0.02	<0.05	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2, 5	<2	<2	<5	<5	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 5, 8	4.3	<4	<5	<5	<5	<5	<5	<5	14	<5	<4	7.1	<4
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4, 0.5	1	1.3	2.5	1.3	1.4	1.9	1.2	1.2	1.3	1.2	1.8	1.1	1.4
Electrical Conductivity	uS/cm	-	-	-	-	1, 2	60	80	191	67	51	51	55	55	60	63	57	56	58
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	13	20	24.4	16.4	16.7	16.7	16	16.1	19.8	-	18	18	17
Lab Filtration Aluminum (diss)		-	-	-	-		-	-	-	-	-	-	-	-	-		-	-	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.9	6.93	7.51	6.6	6.46	6.82	6.55	6.46	7.17	6.92	7.04	7.49	7.14
Total Dissolved Solids	mg/L	274	500	-	-	5, 10, 20	65	125	72	48	40	50	48	40	36	212	55	65	30
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.2	<0.1	<0.1	<0.1	0.13	0.11	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Suspended Solids	mg/L	-	-	-	-	10, 17, 20, 50, 200	960	5100	1220	360	1080	272	735	524	509	682	940	1100	650
Metals																			
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004, 0.005, 0.03	<0.005	<0.005	-	-	-	-	-	0.005	<0.004	<0.004	<0.005	<0.005	<0.005
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.004, 0.0049	<0.0049	0.0093	-	-	0.019	0.006	<0.004	0.008	0.015	0.026	<0.0049	<0.0049	<0.0049
Barium (diss)	mg/L	-	1	-	-	0.002	<0.002	<0.002	0.01	0.007	0.005	0.004	0.004	0.004	0.004	0.005	0.0042	0.0043	0.0038
Beryllium (diss)	mg/L	-	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.02, 0.05, 0.2	<0.01	<0.01	<0.01	<0.01	0.042	<0.01	<0.01	<0.01	0.014	<0.01	<0.01	<0.01	<0.01
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (diss)	mg/L	-	0.05	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (diss)	mg/L	-	1	-	Calculated	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.01, 0.1	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	0.032	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005, 0.001	<0.0005	<0.0005	-	-	-	-	-	-	-	-	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	<0.002	<0.002	0.04	0.02	0.009	0.006	0.006	0.007	0.004	0.006	0.0038	0.0025	0.003
Molybdenum (diss)	mg/L	-	-	-	0.04	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	-	-	0.025	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	-	-	0.0001	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (diss)	mg/L	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	-	-	-	0.0003	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	0.006	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	-	5	-	0.02	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet	for all Calculated criteria/guidelines.
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manual

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3
						Sample ID	EL-MW3	EL-QAQC GW-F19 (ELMW3)	EL-MW3	EL-MW3-QAQC GW-S20 (ELMW3)	EL-MW3	EL-QAQC GW-F20 (ELMW3)	EL-MW3	EL-QAQC GW-S21 (ELMW3)	EL-MW3	EL-MW3	EL-QAQC GW-S22 (ELMW3)	EL-MW3	EL-QAQC GW1-F22 (ELMW3)
						Sample Date	2019-Oct-23	2019-Oct-23	2020-May-07	2020-May-07	2020-Oct-07	2020-Oct-07	2021-Apr-21	2021-Apr-21	2021-Oct-19	2022-May-02	2022-May-02	2022-Oct-17	2022-Oct-17
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number							21T737451	21T737451	21T819627	22T891229	22T891229	22T958971	22T958971
						Lab Sample ID							2378304	2378309	3118657	3812148	3812152	4429856	4429860
Anions						Detection Limit													
Chloride	mg/L	125.3	250	-	-	0.1, 0.12, 0.2, 0.24, 0.5, 1	54.2	54.8	98.1	95.6	70.1	64.5	101	102	55.1	67.1	67.6	89.3	91.2
Nitrate as N	mg/L	2.6	10	-	-	0.05, 0.07, 0.1, 0.25	2.93	2.89	2.7	2.6	3.82	3.57	3.51	3.53	3	3.99	4.07	4.79	4.87
Nitrite as N	mg/L	-	1	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate	mg/L	254.4	500	-	-	0.1, 0.19, 1, 3, 5, 10	526	540	781	758	788	700	606	620	621	562	564	749	770
Cations																			
Calcium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.25, 0.5	155	144	229	225	222	220	208	215	194	194	196	279	278
Magnesium (diss)	mg/L	-	-	-	-	0.05, 0.25, 0.5	29.8	28.3	43.4	43.4	39.5	39	36.2	36.9	23.1	25.5	25.9	30.8	32.3
Potassium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.5, 2.5	5.25	4.96	6.65	6.58	7.21	6.91	-	-	6.24	5.66	5.84	7.11	7.18
Sodium (diss)	mg/L	101.3	200	-	-	0.05, 0.1, 0.25, 0.5	69	63.8	68.1	66.8	73.9	73.3	63.2	65.1	69.8	65.6	66.9	75.2	76.5
General Chemistry																			
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1, 5	86	87	71	75	59	59	63	63	84	88	73	121	118
Ammonia as N	mg/L	-	-	-	-	0.02, 0.05	0.48	0.5	0.44	0.45	0.65	0.71	0.54	0.53	0.18	0.03	0.03	0.08	0.08
Biochemical Oxygen Demand	mg/L	-	-	-	-	2, 5	<5	<5	<5	<5	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 5, 8	<5	<5	6	11	19	25	<5	<5	20	25	24	31	38
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4, 0.5	5.9	6.2	7.4	7.7	7.4	7.9	8.9	8.7	9.4	10.4	10.3	14	14.1
Electrical Conductivity	uS/cm	-	-	-	-	1, 2	1460	1440	1930	1940	1470	1460	1510	1500	1380	1310	1340	1710	1730
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	509.8	476.1	750.5	740.5	717	709.9	668.4	688.8	579.5	589.4	596.1	823.5	827.2
Lab Filtration Aluminum (diss)		-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.29	7.31	6.38	6.34	6.72	6.71	6.61	6.61	6.71	7.03	6.68	6.91	6.89
Total Dissolved Solids	mg/L	274	500	-	-	5, 10, 20	1010	1010	1210	1200	1200	1210	1290	1320	1070	1020	988	1210	1260
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.2	0.79	0.75	1.02	1.01	1.26	1.32	-	-	0.71	0.7	0.72	1.07	1.09
Total Suspended Solids	mg/L	-	-	-	-	10, 17, 20, 50, 200	488	498	268	288	366	360	281	267	313	440	792	589	681
Metals																			
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004, 0.005, 0.03	-	-	-	-	-	-	-	-	-	<0.004	0.007	0.007	0.004
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.004, 0.0049	-	-	-	-	0.02	0.028	0.005	0.008	<0.004	0.034	0.029	0.012	0.012
Barium (diss)	mg/L	-	1	-	-	0.002	0.076	0.076	0.058	0.06	0.042	0.041	0.037	0.038	0.033	0.035	0.032	0.036	0.036
Beryllium (diss)	mg/L	-	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.02, 0.05, 0.2	1.4	1.41	1.58	1.58	1.64	1.65	1.74	1.64	1.66	2.09	1.91	2.16	2.18
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (diss)	mg/L	-	0.05	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (diss)	mg/L	-	1	-	Calculated	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.01, 0.1	0.483	0.478	<0.01	<0.01	<0.01	<0.01	0.032	0.032	0.062	0.036	0.011	0.017	0.023
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005, 0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	6.51	6.53	7.79	8.16	6.88	6.83	5.81	5.63	3.5	3.72	3.38	4.43	4.56
Molybdenum (diss)	mg/L	-	-	-	0.04	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	-	-	0.025	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	-	-	0.0001	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (diss)	mg/L	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	-	-	-	0.0003	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	0.006	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	-	5	-	0.02	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet for all Calculated criteria/guidelines.	
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manual

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW3	ELMW4	ELMW4	ELMW4	ELMW4	ELMW4
						Sample ID	EL-MW3	EL-QAQC-GW1 (ELMW3)	EL-MW3	EL-MW3	EL-QAQC-GW1 (ELMW3)	EL-MW3	EL-QAQC-GW1 (ELMW3)	EL-MW4-19	EL-MW4	EL-MW4	EL-MW4	EL-MW4	EL-QAQC GW-F21 (ELMW4)
						Sample Date	2023-May-01	2023-May-01	2023-Oct-17	2024-Apr-30	2024-Apr-30	2024-Oct-28	2024-Oct-28	2019-Oct-23	2020-May-07	2020-Oct-07	2021-Apr-21	2021-Oct-19	2021-Oct-19
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number	23T020437	23T020437	C3W5728	C4D1233	C4D1233	C4Y1997	C4Y1997				21T737451	21T819627	21T819627
						Lab Sample ID	4957892	4957896	XIM072	ZBG713	ZBG719	AHLD64	AHLD70				2378308	3118659	3118660
Anions						Detection Limit													
Chloride	mg/L	125.3	250	-	-	0.1, 0.12, 0.2, 0.24, 0.5, 1	97.7	96.5	95	110	110	92	97	3.37	5	3.16	3.17	3.88	3.91
Nitrate as N	mg/L	2.6	10	-	-	0.05, 0.07, 0.1, 0.25	2.19	2.19	1.37	0.16	0.15	<0.1	<0.1	0.41	0.45	0.32	0.32	0.36	0.37
Nitrite as N	mg/L	-	1	-	-	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulphate	mg/L	254.4	500	-	-	0.1, 0.19, 1, 3, 5, 10	826	816	880	1100	1100	1100	1100	11.2	11.1	10.6	10.3	11.4	11.5
Cations																			
Calcium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.25, 0.5	356	266	400	420	410	450	450	9.92	10.4	9.89	10.2	10.2	9.78
Magnesium (diss)	mg/L	-	-	-	-	0.05, 0.25, 0.5	33.9	30.2	38	33	34	40	39	4.38	4.62	4.2	4.53	4.3	4.16
Potassium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.5, 2.5	8.37	9.31	7.6	8.4	8.3	8.7	8.4	1.37	1.29	1.21	-	1.31	1.25
Sodium (diss)	mg/L	101.3	200	-	-	0.05, 0.1, 0.25, 0.5	93.6	98.5	100	170	180	180	180	4.27	4.49	4.22	4.32	4.34	4.18
General Chemistry																			
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1, 5	180	173	210	260	250	260	260	41	42	42	39	42	42
Ammonia as N	mg/L	-	-	-	-	0.02, 0.05	0.09	0.08	0.15	0.23	0.19	0.21	0.2	0.08	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen Demand	mg/L	-	-	-	-	2, 5	<2	<2	2	<2	<2	<2	<2	<5	<5	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 5, 8	38	41	110	130	130	160	160	<5	<5	<5	<5	<5	<5
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4, 0.5	18.8	18.9	38	47	48	47	48	1	3.1	1	1.5	0.9	0.9
Electrical Conductivity	uS/cm	-	-	-	-	1, 2	1930	1900	2200	2500	2500	2400	2600	247	158	111	113	128	128
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	-	-	1200	1200	1200	1300	1300	42.8	45	42	44.1	43.2	41.6
Lab Filtration Aluminum (diss)		-	-	-	-				-	-	-	-	-	-	-	-	-	-	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		6.75	6.79	7.52	7.07	7.34	7.61	6.99	7.48	7.15	6.87	7.41	7.18	7.19
Total Dissolved Solids	mg/L	274	500	-	-	5, 10, 20	1550	1610	1780	2290	2270	2140	2330	98	90	84	82	84	62
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.2	1.07	1.09	1.5	1.8	1.8	2	2	<0.1	0.14	<0.1	-	<0.1	<0.1
Total Suspended Solids	mg/L	-	-	-	-	10, 17, 20, 50, 200	328	352	990	480	400	430	430	884	489	961	294	313	252
Metals																			
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004, 0.005, 0.03	<0.004	<0.004	<0.005	<0.005	<0.005	<0.03	<0.03	-	-	-	-	-	-
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.004, 0.0049	0.013	0.013	0.0049	<0.0049	<0.0049	0.0049	<0.0049	-	-	0.016	0.008	<0.004	<0.004
Barium (diss)	mg/L	-	1	-	-	0.002	0.041	0.04	0.042	0.04	0.037	0.033	0.033	0.007	0.006	0.005	0.005	0.005	0.005
Beryllium (diss)	mg/L	-	-	Calculated	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.02, 0.05, 0.2	2.72	2.55	3.5	9.1	8.9	12	11	0.043	0.022	0.064	0.012	<0.01	<0.01
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium (diss)	mg/L	-	0.05	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper (diss)	mg/L	-	1	-	Calculated	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.01, 0.1	<0.01	0.04	<0.1	<0.1	<0.1	0.13	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005, 0.001	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	3.06	3.1	3.8	3	3	6	5.8	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Molybdenum (diss)	mg/L	-	-	-	0.04	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel (diss)	mg/L	-	-	0.025	-	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (diss)	mg/L	-	-	0.0001	-	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Strontium (diss)	mg/L	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (diss)	mg/L	-	-	-	0.0003	0.0001	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium (diss)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	0.006	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc (diss)	mg/L	-	5	-	0.02	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet	for all Calculated criteria/guidelines.
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manual

Hastings Highlands Analytical Chemistry Results: Anions, Cations, GenChem, Met in Well Screen						Site Name	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS	East Lake WDS
						Location	ELMW4	ELMW4	ELMW4	ELMW4	ELMW4	ELMW4
						Sample ID	EL-MW4	EL-MW4	EL-MW4	EL-MW4	EL-MW4	EL-MW4
						Sample Date	2022-May-02	2022-Oct-17	2023-May-01	2023-Oct-17	2024-Apr-30	2024-Oct-28
Parameter	Units	RUV-EL	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number	22T891229	22T958971	23T020437	C3W5728	C4D1233	C4Y1997
						Lab Sample ID	3812149	4429857	4957893	XIM073	ZBG714	AHLD65
Anions						**Detection Limit**						
Chloride	mg/L	125.3	250	-	-	0.1, 0.12, 0.2, 0.24, 0.5, 1	4.56	4.66	5.06	4.3	5.5	6.3
Nitrate as N	mg/L	2.6	10	-	-	0.05, 0.07, 0.1, 0.25	0.39	0.42	0.36	0.39	0.31	0.36
Nitrite as N	mg/L	-	1	-	-	0.02	-	-	-	-	-	-
Sulphate	mg/L	254.4	500	-	-	0.1, 0.19, 1, 3, 5, 10	10.3	10.8	10	8.3	9.4	9
Cations												
Calcium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.25, 0.5	9.22	10.8	10.7	12	10	11
Magnesium (diss)	mg/L	-	-	-	-	0.05, 0.25, 0.5	4.01	4.74	4.57	4.8	4.2	4.5
Potassium (diss)	mg/L	-	-	-	-	0.05, 0.2, 0.5, 2.5	1.17	1.44	1	1.3	1.2	1.2
Sodium (diss)	mg/L	101.3	200	-	-	0.05, 0.1, 0.25, 0.5	3.98	4.16	4.3	4.9	4.6	4.4
General Chemistry												
Alkalinity (as CaCO3)	mg/L	257.5	30 - 500	See Factsheet	-	1, 5	39	40	40	40	46	39
Ammonia as N	mg/L	-	-	-	-	0.02, 0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
Biochemical Oxygen Demand	mg/L	-	-	-	-	2, 5	<2	<2	<2	<2	<2	<2
Chemical Oxygen Demand	mg/L	-	-	-	-	4, 5, 8	<5	<5	<5	<4	<4	<4
Dissolved Organic Carbon	mg/L	3.2	5	-	-	0.4, 0.5	1	1.8	0.9	0.9	1	1.3
Electrical Conductivity	uS/cm	-	-	-	-	1, 2	121	124	122	120	120	130
Hardness (as CaCO3)	mg/L	-	80 - 100	-	-	1	39.5	46.5	-	49	42	46
Lab Filtration Aluminum (diss)		-	-	-	-		-	-		-	-	-
pH	pH units	-	6.5 - 8.5	6.5 - 8.5	-		7.03	7.56	7.47	7.54	7.83	7.61
Total Dissolved Solids	mg/L	274	500	-	-	5, 10, 20	92	56	98	80	105	60
Total Kjeldahl Nitrogen	mg/L	-	-	-	-	0.1, 0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Suspended Solids	mg/L	-	-	-	-	10, 17, 20, 50, 200	180	715	1130	2200	1100	1400
Metals												
Aluminum (diss, 0.2 µm)	mg/L	-	-	-	Calculated	0.004, 0.005, 0.03	<0.004	0.007	<0.004	<0.005	<0.005	<0.005
Aluminum (diss, 0.45 µm)	mg/L	-	0.1	-	Calculated	0.004, 0.0049	0.015	0.011	0.023	<0.0049	<0.0049	<0.0049
Barium (diss)	mg/L	-	1	-	-	0.002	0.005	0.005	0.006	0.0057	0.005	0.0055
Beryllium (diss)	mg/L	-	-	Calculated	-	0.001	-	-	-	-	-	-
Boron (diss)	mg/L	1.3	5	-	0.2	0.01, 0.02, 0.05, 0.2	0.014	0.014	0.011	<0.01	<0.01	<0.01
Cadmium (diss)	mg/L	-	0.005	-	Calculated	0.0001	-	-	-	-	-	-
Chromium (diss)	mg/L	-	0.05	-	-	0.001	-	-	-	-	-	-
Cobalt (diss)	mg/L	-	-	-	0.0009	0.0002	-	-	-	-	-	-
Copper (diss)	mg/L	-	1	-	Calculated	0.001	-	-	-	-	-	-
Iron (diss)	mg/L	0.15	0.3	0.3	-	0.01, 0.1	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1
Lead (diss)	mg/L	-	0.01	-	Calculated	0.0005, 0.001	-	-	-	<0.0005	<0.0005	<0.0005
Manganese (diss)	mg/L	0.028	0.05	-	-	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Molybdenum (diss)	mg/L	-	-	-	0.04	0.005	-	-	-	-	-	-
Nickel (diss)	mg/L	-	-	0.025	-	0.005	-	-	-	-	-	-
Silicon (diss)	mg/L	-	-	-	-	0.1	-	-	-	-	-	-
Silver (diss)	mg/L	-	-	0.0001	-	0.0001	-	-	-	-	-	-
Strontium (diss)	mg/L	-	-	-	-	0.001	-	-	-	-	-	-
Thallium (diss)	mg/L	-	-	-	0.0003	0.0001	-	-	-	-	-	-
Titanium (diss)	mg/L	-	-	-	-	0.002	-	-	-	-	-	-
Vanadium (diss)	mg/L	-	-	-	0.006	0.001	-	-	-	-	-	-
Zinc (diss)	mg/L	-	5	-	0.02	0.01	-	-	-	-	-	-

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
Concentration exceeds RUV-EL	Reasonable Use Values East Lake
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

- FOR REVIEWER -

*Please double check with Factsheet for all Calculated criteria/guidelines.	
Result	Calculated Criteria result could not be determined. Please see Factsheet and calculate manual

Appendix E

E-2 Historical Groundwater VOCs Results

Hastings Highlands Analytical Chemistry Results: VOCs in Well Screen					Site Name	East Lake WDS	East Lake WDS	East Lake WDS
					Location	ELMW3	ELMW3	ELMW4
					Sample ID	EL-MW3	EL-QAQC GW-F19 (ELMW3)	EL-MW4-19
					Sample Date	2019-Oct-23	2019-Oct-23	2019-Oct-23
Parameter	Units	ODWQS-ALL-MERGED	PWQO-GENERAL	PWQO-INTERIM	Lab Job Number			
					Lab Sample ID			
VOCs					Detection Limit			
1,4-Dichlorobenzene	mg/L	0.001	0.004	-	0.0001	<0.0001	<0.0001	<0.0001
Benzene	mg/L	0.001	-	0.1	0.0002	<0.0002	<0.0002	<0.0002
Methylene Chloride	mg/L	-	-	0.1	0.0003	<0.0003	<0.0003	<0.0003
Toluene	mg/L	0.024	-	0.0008	0.0002	<0.0002	<0.0002	<0.0002
Vinyl Chloride	mg/L	0.001	-	0.6	0.00017	<0.00017	<0.00017	<0.00017

-LEGEND-

Detection Limit	DL: May vary between sample locations and events
DL exceeds criteria	
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

Appendix F

Trigger Mechanisms and Contingency Plan

EAST LAKE WASTE DISPOSAL SITE
TRIGGER MECHANISMS - (DRAFT-PROPOSED)

OBJECTIVE AND BACKGROUND

The objective of the trigger mechanisms and contingency plan for the East Lake Waste Disposal Site (WDS) is to identify the potential off-site migration of leachate impacted groundwater, and ensure timely action to prevent and mitigate any adverse impacts to the environment.

North Property Boundary-Groundwater

Assessment Point- EL-MW-1
Trigger Mechanisms- Aluminum, Boron, Chloride, DOC, Iron, Manganese, and TDS
Frequency-Sampling twice per year (Spring and Fall)
Contingency Plan is activated if the following occurs: —

- Four or more of the following chemical parameters exceed at EL-MW-1 assessment point for one sampling event; Aluminum, Boron, Chloride, DOC, Iron, Manganese, and TDS exceeds the RUVs presented in Table 1

Table 1: Trigger Values –RUVs (2-Data Points only in 2008 from EL-MW2)

Parameter	RUV mg/L
Aluminum	0.055
Boron	1.43
Chloride	128
DOC	4.7
Iron	0.165
Manganese	0.03
TDS	253

Note: RUVs to be recalculated in the future

East and South Property Boundary-Groundwater

Assessment Point- Future Buffer Monitoring Wells
Trigger Mechanisms- Aluminum, Boron, Chloride, DOC, Iron, Manganese, and TDS
Frequency-Sampling twice per year (Spring and Fall)
Contingency Plan is activated if the following occurs: —

- Four or more RUV chemical parameters are exceed at the future east assessment point(s) for one sampling event for Aluminum, Boron, Chloride, DOC, Iron, Manganese and TDS. The RUVs are currently set at the values presented in Table 1 but are to be updated

once a new background well is drilled and a minimum of 10 sample results have been obtained.

CONTINGENCY PLAN – GROUNDWATER

Tier 1: If four or more triggers are exceeded at EL-MW-1 or future buffer monitoring wells, during one sampling event, a repeat sampling will be conducted within one (1) month to confirm or refute the results at that location.

Tier 2: If the triggers are exceeded at one assessment point and are confirmed through Tier 1 additional sampling then the following measures will be implemented depending on the nature of the trigger activation:

a. Increase monitoring frequency to twice monthly, for four months, if exceedances continue. Revert back to typical annual monitoring sampling frequency if there are two consecutive sampling results that do not show exceedances; and/or
b. Identification of other potential causes for elevated concentrations through additional studies.

Tier 3: If the increased sampling indicates 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 groundwater before it reaches a receptor. The specifics of the plan will be dependent on the nature of the impact.

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