2024 Environmental Monitoring Report

Meadowview Landfill, North Kentville, Nova Scotia

Municipality of the County of Kings
Final Report

December 30, 2024
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ENGLOBE

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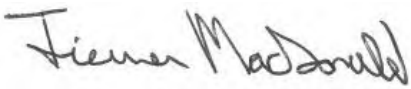

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Executive Summary

Englobe Corp. (Englobe) was retained by Municipality of the County of Kings (Municipality), to undertake an Environmental Monitoring Program (EMP) for the Meadowview Landfill located in North Kentville, NS. The Industrial Approval Number for the Meadowview Landfill, as issued by the Nova Scotia Department of Environment and Labour in 2001 (now Department of Environment and Climate Change [NSECC]) was #2001-021092. The 2024 EMP was carried out in accordance with NRFP #24-33 (issued on July 25, 2024) and Addenda #1 (dated August 6, 2024) and #2 (dated August 12, 2024), provided by the Municipality. The current scope of work is for three (3) years (starting in Summer 2024) with the option to renew for an additional two (2) years. The EMP includes three main components: Groundwater Monitoring, Surface Water Monitoring, and Landfill Gas Monitoring.

Based on the results of the 2024 Meadowview Landfill EMP, Englobe makes the following conclusions:

Groundwater

Based on the groundwater elevation data measured from the site during September 2024, the groundwater flow direction was estimated to be to the south-southwest toward the Cornwallis River, with an average hydraulic gradient of 0.0158 at the time of sampling.

It should be noted that monitoring well MW31-A was not accessible during the monitoring program, due to Department of National Defence access restrictions.

The groundwater analytical results were compared to two different sets of standards including the NSECC Tier 1 Environmental Quality Standards (EQS) for Groundwater - All Land Uses (Non-potable and Coarse-Grained Soil Type), and the NSECC Tier 1 EQS for Groundwater Discharging to Surface Water (>10m).

Elevated concentrations of arsenic, cobalt, iron, manganese, and low pH in groundwater have been documented at concentrations exceeding or out of range of the NSECC Tier 1 EQS for Groundwater Discharging to Surface Water (>10m) at various monitoring wells located downgradient of the site. These elevated parameters satisfied the same standards at upgradient, background monitoring well locations (MW27-B, MW28-B, MW29-B and MW29-C). The elevated concentrations of arsenic, cobalt, iron, manganese and low pH affecting water quality in down-gradient wells may indicate site impacts related to the landfill.

It should be noted that the NSECC Tier 1 EQS for Groundwater Discharging to Surface Water (>10m) for arsenic, cobalt, iron, manganese and low pH are established for the protection of freshwater aquatic life; therefore, observed exceedances in the groundwater samples do not necessarily indicate a human health hazard.

Surface Water

The surface water analytical results are compared to the NSECC Tier 1 EQS for Surface Water.

Surface water sampling location SW20A was found dry and therefore, no sample could be collected during the 2024 EMP.

Surface water sample location SW24-1, collected from the Cornwallis River, is considered to be upstream of the Meadowview Landfill waste cells and is assumed to reflect the natural background conditions. Concentrations of most surface water metals at SW24-1 satisfied the applicable Provincial standard, with the exception of total aluminum and iron, which are common in these freshwater environments. All remaining metals and general chemistry parameters in the surface water sample SW24-1 were reported at levels that satisfied the applicable standard.

Downgradient surface water sampling locations SW24-2 and SW24-3, also collected along the Cornwallis River, are considered downstream of the landfill and would contain surface water potentially influenced by flow from the site. Surface water sample locations at SW7, SW7A and SW19B are located along the Palmer Brook southwest of the Meadowview Landfill. Abundant iron

precipitate was observed in surface water locations SW7A and SW19B. The field and laboratory data reported elevated levels or concentrations of field pH, aluminum, arsenic, cobalt, iron, and dissolved manganese which may suggest potential leachate impacts. Since aluminum impacts were noted at SW7, SW7A and SW19B, but at lower concentrations than from the upstream "background" location SW24-1, elevated aluminum concentrations are not considered to be a contaminant issue related to surface water runoff from the landfill site. All remaining metals and general chemistry parameters in these surface water samples satisfied the applicable standard.

Again, it should be noted that the NSECC Tier 1 EQS for Surface Water for pH, aluminum, arsenic, cobalt, iron, and dissolved manganese are for the protection of freshwater aquatic life; therefore, observed exceedances in the surface water samples do not necessarily indicate a human health hazard.

Landfill Gas

Using a Landtec GEM 5000 gas monitor, all methane readings were recorded as <0.1 parts per million (ppm) except for a reading of 0.1 ppm observed at MW29-B located on the northern boundary of the former landfill site. No measurements in the % Lower Explosive Limit (LEL) range for methane gas were detected using the equipment operated by Englobe. In general terms, all gas monitoring results satisfied the British Columbia Government Landfill Gas Management Regulations of <5% LEL for methane gas.

Based on the age of the Meadowview Landfill (closed in 1999), the gas monitoring screening data and the relative stability of the pH across the site, the potential risk of methane gas exposure to the residential community located east of the Meadowview landfill is interpreted to low; however, there is the potential for dilution of landfill gases using a handheld gas meter and these 'one-time' sampling results should be treated with caution. Further evaluation of these sampling points should be conducted to ensure the gas monitoring data accurately represent the landfill gas conditions present in the subsurface at each of the existing test locations.

Summary

Based on the results of the 2024 Meadowview Landfill EMP, Englobe make the following recommendations:

- Sampling and monitoring of the existing groundwater wells at the site should continue on an annual basis.
- Select surface water locations should continue to be sampled and monitored at the same locations and frequency.
- Further evaluation of the Gas Survey sampling points should be conducted to ensure the gas monitoring data accurately represent the landfill gas conditions present in the subsurface at each of the existing test locations.
- Re-assess for possible repairs to the protective covers for monitoring wells MW26-B and MW32-A.
- Monitoring well MW31-A (located on DND property) should be removed from future EMPs due to difficulty in obtaining permission from DND to access the well, and the dedicated sampling proposed at MW31-A be replaced by sampling monitoring well MW20-A or MW20-B (located at the far east of the site). Sampling at MW20-A or MW-20B should be added to the EMP for future years, including collection of groundwater elevations and landfill gas measurements. In addition, sampling of monitoring well MW-21C should be added to the EMP to confirm site conditions in this area (downgradient of MW-4A).
- The Municipality, in consultation with Englobe, should continue its communications with NSECC in order to identify whether a current Approval exists and if annual monitoring of the Meadowview Landfill is a Provincial requirement under such an Approval.
- Due to damage noted by the Municipality to monitoring wells MW19-B and MW7-A in spring 2024, both monitoring wells should be decommissioned in 2025 under the supervision and guidance of a Site Professional (such as Englobe) recognized by the Province of Nova Scotia.

This Executive Summary is a summary of the findings of the Environmental Monitoring Program Report and must be read in conjunction with the entire report. The statements made in the Executive Summary are subject to the same limitations as described in the report.

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Englobe Corp.’s subcontractors who have carried out on-site or laboratory work are duly assessed according to the purchase procedure of our quality system. For further information, please contact your project manager.”

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1 Introduction

In accordance with NRFP #24-33 (issued on July 25, 2024) and Addenda #1 (dated August 6, 2024) and #2 (dated August 12, 2024), issued by the Municipality of the County of Kings (Municipality), Englobe completed the2024 Environmental Monitoring Program (EMP) and field work for the Meadowview Landfill located in North Kentville, NS. It is our understanding that the work term for the current scope of work is for three (3) years (starting in Summer 2024) with the option to renew for an additional two (2) years. The EMP includes three main components: Groundwater Monitoring, Surface Water Monitoring, and Landfill Gas Monitoring.

This 2024 EMP report provides a brief background of the project, and then details the sampling methodology and results achieved from the environmental monitoring event completed on September 16 and 17, 2024. Assessment of analytical results in conjunction with project-specific Federal and Provincial standards and/or guidelines, in addition to evaluation of data trends based on previous sampling data (including graphs) is provided.

1.1 Site Information

The closed Meadowview Landfill is associated with property parcels identified by Property Identification (PID) number 55553085, 55553093, 55553101, 55553119, 55413207, 55047328, 55047369, 55047351 and 55049035. Additional monitoring wells used to assess groundwater quality adjacent to the site are located on PID Nos. 55058325, 55058010, 55412522 and 55047336. The site is located between Lanzy Road and Brooklyn Street, south of Aldershot and approximately 2 km northwest of Kentville, NS. The UTM coordinates for the site gates to the Landfill are Zone 20T, 4993696N, 380116E.

Analytical results were compared to the most up-to-date online versions of the following:

— Groundwater analytical data are compared to Table 4B - Nova Scotia Environment and Climate Change (NSECC) *Tier 1 Environmental Quality Standards* (EQS) for Groundwater and all land uses, non-potable, and coarse-grained soil type.

— Surface water analytical data are compared to Table 3 - NSECC *Tier 1 EQS* for Surface Water and Groundwater Discharging to Surface Water.

— Landfill gas monitoring data have been compared to the British Columbia Government Landfill Gas Management Regulations and the proposed Federal Surface Methane Concentration Limits.

1.2 Background and Recent Communications

The Meadowview Landfill (NSECC Approval No. 2001-021092) was initially opened and operated by the Town of Kentville in the late 1960s. The Municipality then took over operations of the landfill until its closure on June 30, 1999. Once closed, the Municipality had reportedly implemented a Closure Plan which included recommendations and specifications outlined in the 1995 Site Closure Report, completed previously by Porter Dillon.

Historically, annual groundwater, surface water monitoring, and fish habitat surveys have previously been conducted at the Meadowview Landfill by ABL Environmental (2011 – 2012), WSP (2013 – 2015) and Stantec (2017). Stantec continued to monitor groundwater and surface water conditions between

2018 – 2020 but recommended that fish habitat surveys not be carried forward since no negative impacts on fish habitat or benthic invertebrates were correlated to the site (Stantec 2017 Monitoring Report). No groundwater or surface water monitoring occurred at the site from 2021 – 2023.

Recent communications between the Municipality and Englobe indicate that:

— The relocation of three surface water sampling locations, including SW24-1, SW24-2 and SW24-3, was found acceptable by the Municipality.

— Access was not granted to groundwater monitoring well at MW31-A by the Department of National Defence (DND). An agreement between the Municipality and DND is required for future access to monitoring well MW31-A.

— Based on communications between the Municipality (in consultation with Englobe) and the NSECC, the Industrial Approval (Approval No. 2001-021092) and Terms and Conditions of the Approval was granted by the Nova Scotia Department of Environment and Labour in 2001. The duration of the Approval was for ten years from the date of issue. At the time of this report, it is unresolved whether a new Approval was granted for the site once the original Approval had expired or whether any further documentation was provided by NSECC to confirm monitoring of the Landfill could be discontinued. It is our understanding that the Municipality will continue to update Englobe on the response from NSECC.

1.3 Purpose and Scope

Based on the NRFP, groundwater elevations were measured at twenty-five (25) groundwater monitoring well locations, fifteen (15) groundwater samples (including one (1) field duplicate) and eight (8) surface water samples (including one (1) field duplicate) were collected for laboratory analysis in 2024. Additionally, a total of twenty-eight (28) groundwater monitoring wells were included in the landfill gas monitoring program in 2024. A site and sampling location plan for the Meadowview Landfill Facility site is provided following the text of this report in Figure 2. Table 1-1 below, summarizes the current analytical program conducted at the Meadowview Landfill Facility:

Table 1-1 – Meadowview Landfill Facility Sampling Locations

Monitoring Media	Location IDs	Chemical Parameters Monitored
Groundwater	MW27-B, MW28-B, MW29-B, MW29-C, MW31-A (no access), MW4-A, MW22-A, MW22-B, MW22-C, MW23-A, MW23-B, MW23-C, MW25-B, TH1 and Field Duplicate.	Standard water general chemistry analysis and metals.
Surface Water	SW19B, SW7, SW7A, SW20A (dry), SW24-1, SW24-2, SW24-3 and Field Duplicate.	Standard water general chemistry analysis and metals.
Gas	MW4-A, MW4-C, MW12-A, MW19-A, MW21-C, MW22-A, MW22-B, MW22-C, MW23-A,MW23-B, MW23-C, MW24-A, MW24-B, MW25-B, MW26-B, MW27-B, MW27-C, MW28-B, MW29-B, MW29-C, MW31-A (no access), MW32-A, MW35-A, MW36-A, TH1 and TH2.	Methane, Oxygen and Carbon Dioxide

Based on the correspondence between the Municipality and NSECC to date, the annual environmental monitoring program at the Meadowview Landfill Facility appears to be completed for due diligence purposes only.

2 Site Description

2.1 Topography and Drainage

Topographical contours retrieved from the Access Nova Scotia website (Nova Scotia Topographic Database, 2006) show that the greatest elevation is 40 metres above sea level (masl) at the northern most location on-site near Brook Street. The lowest elevation is 4 metres above sea level (masl) near the Cornwallis River (south of the closed landfill). Topography at the site generally slopes downwards to the south to southeast (Figure 1: Regional Location Plan following the text of this report).

Based on the topography, surface water run-off and shallow groundwater originating at the Meadowview site are expected to discharge into Palmer Brook which drains into the Cornwallis River to the south) and local drainage ditches along Brooklyn Street (Figure 2). For the purposes of this report, both Palmer Brook and the Cornwallis River (although the Cornwallis River discharges into the saltwater of the tidally influenced Minas Basin approximately 25 km to the east) are both considered to be freshwater receptors.

2.2 Geological and Hydrogeological Conditions

Based on the available surficial geology mapping (NSDNR Map 92-3, 1992), overburden deposits in the sampling area consist of gravel, sand and silt, diamicton layers which are poorly to well bedded with horizontal to angular beds from the Quaternary Period (Wisconsinan Stage). The topography generally includes steep sided mounds or hummocks, pitted terraces on valley sides (kame terraces) and sinuous steep sided ridges (eskers) originating from streams of glacial meltwater.

Based on the available bedrock geology mapping for the area (NSDNR Map 2000-003, 2000), the geological maps indicate that the site is underlain by the Fundy Group, specifically, the Wolfville Formation, which consists of fluvial sandstones and conglomerates, aeolian sandstone and minor deltaic-lacustrine deposits.

3 Environmental Monitoring Program Methodology

The 2024 EMP was completed by Englobe staff at the site between September 16 and 17, 2024.

3.1 Groundwater Monitoring

Field parameters including pH, conductivity, dissolved oxygen, and temperature were measured and recorded at each groundwater monitoring location prior to sampling. Sample observations for colour, clarity, odour, and sheen were collected at all locations where all samples were obtained. Measurements including static water level, well depth, stick up height, and well diameter were taken at all groundwater monitoring wells. Field Sampling Records are presented in Appendix C.

At each groundwater monitoring well location, the static groundwater level was measured using a *Solinst* water level indicator, prior to purging a total of three well volumes. Monitoring wells were sampled using HDPE (high-density polyethylene) tubing and foot valves. Metals samples collected from groundwater monitoring wells were field filtered using disposable 0.45-micron field filters and analyzed for dissolved metals.

A new pair of nitrile gloves was worn at each sampling location. Collected samples were taken in laboratory-supplied containers and preserved on-site, where necessary. All samples were stored in coolers on ice prior to their submission at the ALS Canada Ltd (ALS) in Dartmouth, NS.

Access was not granted to the (DND) property where groundwater monitoring well MW31-A is located. Subsequently, MW31-A was not sampled during the 2024 sampling event.

All groundwater wells were found to be in good condition with the exception of MW32-A and MW26-B. The caps for these wells were broken and could not be properly closed.

3.2 Surface Water Monitoring

Field parameters including pH, conductivity, dissolved oxygen, and temperature were measured and recorded at each surface water monitoring station prior to water sampling. Sample observations for colour, clarity, odour, and sheen were collected at all surface water locations where all samples were obtained. Physical stream data for depth, width and flow velocity were recorded, where safe.

At each surface water station, samples were collected by immersing the container at least 15 centimetres below the water surface and pointing the container upstream. Unfiltered surface water samples were collected for total metals analysis, except for zinc and manganese which require dissolved analysis as per the NSE Tier I standards (referencing CCME guidelines). Stream flow was measured using a portable stream flow water meter. Where safe and sufficient stream depth allowed, water clarity was measured by lowering a secchi disk into the stream, until the disk was no longer visible. Field Sampling Records are presented in Appendix C.

A new pair of nitrile gloves was worn at each sampling location. Collected samples were taken in laboratory-supplied containers and preserved on-site, where necessary. All samples were stored in coolers on ice prior to their submission at the ALS Canada Ltd (ALS) in Dartmouth, NS.

Due to unsafe, swampy conditions, surface water stations at SWA and SW3 were relocated further upstream and further downstream of the site. New surface water locations for the 2024 EMP are identified as SW24-1, SW24-2 and SW24-3; however, physical stream data could not be recorded at SW24-1 or SW24-2 due to safety concerns regarding the depth and flow rate of the Cornwallis River.

Surface water sampling locations SW19B and SW7A had an abundance of iron precipitate noted while sampling the water of Palmer Brook. The precipitate was avoided during sampling of these locations.

Finally, SW20A was dry during the 2024 sampling event.

3.3 Landfill Gas Monitoring

Landfill gas monitoring was completed using a handheld Landfill Gas Monitor (Landtec GEM 5000) to measure gas readings from all monitoring wells onsite. When arriving to a monitoring well, a new pair of nitrile gloves were worn at each sampling location. The cap and/or j-plug were removed with care taken not to dilute gas concentrations present at each well (i.e. no ventilation of the well). The gas probe was then inserted into the PVC pipe and extended downward above the level of groundwater. The probe purged air from well for one minute before readings were taken and recorded on the field observation sheet in Appendix C.

It is understood that although this sampling methodology is followed within the industry for initial screening of a site, the potential for dilution of landfill gases is high.

Note that since the Meadowview Landfill is closed with no permanent structures or workers located at the site, there are currently no provincial or federal criteria in place for landfill gases, including methane; however new regulations have recently been proposed by the Government of Canada (*Regulations Respecting the Reduction in the Release of Methane (Waste Sector)),* which will require certain landfills to control and reduce methane emissions. It is anticipated that monitoring and compliance requirements would not come into effect until 2027 and 2033. Since there are no provincial or federal criteria established in NS, the BC regulations have been applied. In addition, the 1995 Site Closure Report and the Industrial Approval (Approval No. 2001-021092) do not include any limits on gas emissions from the landfill.

Landfill gas monitoring data have been compared to the British Columbia Government Landfill Gas Management Regulations and the proposed Federal Surface Methane Concentration Limits.

3.4 Analytical Laboratory Accreditation

Groundwater and surface water samples collected during the 2024 EMP were submitted to ALS for chemical analysis of those parameters outlined in Table 1-1 (see Page 8).

ALS Canada laboratories are accredited by the Canadian Association for Laboratory Accreditation (CALA) to the ISO 17025 standard. External audits are completed at a frequency determined by CALA while internal audits are also conducted of each laboratory on an internal schedule. The ALS Halifax laboratory is approved as a water testing laboratory by Nova Scotia Environment and Climate Change (NSECC) and no further permits are required for their operations.

4 Environmental Monitoring Results

4.1 Groundwater Quality Results

4.1.1 Assessment of Groundwater Configuration and Flow Direction

In general, the static groundwater table elevations range between 23.10 masl (MW28-B) and 6.62 masl (TH1). Analysis of the groundwater elevation data during this monitoring event indicates a groundwater flow direction towards the south-southwest, with an average hydraulic gradient of 0.0158. Equipotential lines indicating groundwater elevations and the flow direction at the site is presented on Figure 3, a copy of which is appended to this report.

Groundwater elevations measured at nested wells sets (MW4-A and MW4-C, MW22-A, MW22-B and MW22-C, MW23-A, MW23-B and MW23-C, MW27-B and MW27-C and MW29-B and MW29-C) indicate that the vertical gradient is negative, and flow is downward.

Quantitative values of the vertical hydraulic gradient are as follows:

— The hydraulic gradient at set MW4-A and MW4-C is - 0.015;

— The hydraulic gradient at set MW22-A, MW22-B and MW22-C is – 0.092;

— The hydraulic gradient at set MW23-A, MW23-B and MW23-C is – 0.005;

— The hydraulic gradient at set MW24-A and MW24-B is 0.000;

— The hydraulic gradient at set MW27-B and MW27-C is -0.051;

— The hydraulic gradient at set MW29-B and MW29-C is -0.034.

4.1.2 Groundwater Quality Assessment

Field measurements (pH, conductivity, dissolved oxygen and temperature) obtained for the groundwater monitoring wells are presented in conjunction with the laboratory general chemistry results presented in Tables 4A through 4D (following the text of this report). Exceedances of NSE Tier 1 EQS for Groundwater - All Land Uses (Non-potable, and Coarse-Grained Soil Type), and NSE Tier 1 EQS for Groundwater Discharging to Surface Water (>10m), are highlighted for easy interpretation. Laboratory certificates of analysis are appended in Appendix D.

The field pH measured for groundwater sampled at monitoring wells MW22-A, MW23-A, and MW23-B was lower than the recommended range given by the NSE Tier 1 EQS for Groundwater Discharging to Surface Water (>10m). Note that the field pH measurements outside the recommended standard may be different from the laboratory reported pH, as the two measurements were not performed at the same time or with the same instruments.

All groundwater quality results analyzed at all sampling locations satisfy the NSE Tier I EQS - All Land Uses (Non-potable, and Coarse-Grained Soil Type).

Groundwater inorganic chemistry and metals exceeding the NSE Tier 1 EQS for Groundwater Discharging to Surface Water (>10m) from monitoring locations sampled and tested during this program are listed below:

— Dissolved arsenic exceeded at MW4-A and MW22-A.

— Dissolved cobalt exceeded at MW22-A and MW22-B.

— Dissolved iron exceeded at MW4-A, MW22-A, MW22-B, MW23-B, and TH1.

— Dissolved manganese exceeded at MW22-A, MW22-B and MW23-B.

Other than the exceedances noted above, all other groundwater quality results for the remaining parameters analysed at all monitoring well locations satisfy NSE Tier 1 EQS for Groundwater Discharging to Surface Water (>10m).

Based on a review of the historical data, concentrations of arsenic and iron are above Tier II Pathway Specific Standards for Groundwater from Nova Scotia's *Contaminated Site Regulations* and have historically been reported at levels in excess of these standards in many of the groundwater monitoring wells throughout the site.

Data trend analysis was completed by Stantec (2020) and included plotting groundwater results of certain downgradient sampling locations. The parameters included in the trend analysis are ammonia, chloride and conductivity which are leachate indicators identified in the Site Closure Report (Porter Dillon 1995) and Monitor Plan Evaluation (Stantec 2017). The trend analysis has been continued and includes results accumulated by WSP (2012-2013), Stantec (2016-2020) and Englobe (2024).

The groundwater locations have been divided into the following two separate downgradient areas (outlined by Stantec in 2020):

— Area 1 includes MW25-B, MW4-A, and TH1 (downgradient toward the Cornwallis River).

— Area 2 includes MW22-A, MW22-B, and MW22-C (downgradient toward Palmer Brook).

Groundwater Trend Analysis

Trend analysis for groundwater is summarized below:

- Trends in Area 1 for all parameters have remained stable for all parameters evaluated, with slight increases or decreases in values from year-to-year. Overall parameter values have decreased since 2012.
- Trends in Area 2 for all parameters have remained stable for all parameters evaluated, with slight increases or decreases in values from year-to-year. Overall parameter values have remained stable since 2012.
- Ammonia values are generally higher in Area 1 than in Area 2. MW4-A has had the highest ammonia values since 2012.
- Chloride values are relatively the same between Areas 1 and 2. MW22-B has had the highest chloride values since 2012.
- Conductivity values are relatively the same between Areas 1 and 2. MW22-B has had the highest conductivity values since 2012.

The results of the trend analysis are provided following the text of this report.

4.1.3 Action Level Assessment

Action levels were developed for indicator parameters in the Monitor Evaluation Plan (Stantec 2017). The leachate indicator parameters include ammonia, chloride and. Action levels are concentrations for indicator parameters that are three times the standard deviation of historical data, and indicator parameters above action levels would initiate further investigation. Historical data includes values from 2007-2017 collected by various consulting firms. Action levels calculated by Stantec in 2017 will be used in this report for indicator parameters. Action levels were calculated for monitor wells MW4-A, MW22-A, MW22-B, MW22-C, MW25-B, and TH1. Action levels for indicator parameters are compared to 2024 data in the table below.

Table 4-1 – 2024 Data Compared to Action Levels for Indicator Parameters

Well ID	Indicator Parameters - 2024 Data			Action Levels		
	Ammonia (mg/L)	Conductivity (µs/cm)	Dissolved Chloride (mg/L)	Ammonia (mg/L)	Conductivity (µs/cm)	Dissolved Chloride (mg/L)
MW4-A	54.7	1,260	32.9	109	2,463	139
MW22-A	20.7	844	38	48	1,506	204
MW22-B	2.74	1,470	111	3.3	2,251	291
MW22-C	0.122	154	11.2	14	755	51
MW25-B	0.0089	752	78.7	0.5	1,654	178
TH1	30.2	905	17.8	79	1,565	60

Based on the 2024 monitoring results, no indicator parameters were identified exceeded the established action levels for the subject site of any of the three designated parameters.

4.2 Surface Water Quality Results

Field measurements (pH, conductivity, dissolved oxygen, and temperature) obtained for the surface water sampling locations are presented in conjunction with the laboratory metals and general chemistry results at all locations, found in Tables 5A through 5D (found following the text of this report). Exceedances of NSE Tier 1 EQS for Surface Water are highlighted for easy interpretation. Laboratory certificates of analysis are appended in Appendix C.

Field pH readings were lower than the NSE Tier 1 EQS for Surface Water recommended range during the sampling event at SW7, SW7A and SW19B. Note that the field pH measurements that are outside of the recommended guideline may be different to the laboratory reported pH readings in some wells.

Surface water general inorganic chemistry and metals exceeding the NSE Tier 1 EQS for Surface Water from all test locations are summarized below:

— Total aluminum and iron exceeded at all sampled locations (i.e., SW7, SW7A, SW19B, SW24-1, SW24-2 and SW24-3).

— Total arsenic exceeded at sampling location SW7A.

— Total cobalt exceeded at sampling locations SW7A and SW19B.

— Dissolved manganese exceeded at sampling locations SW7, SW7A and SW19B.

Surface water quality for the remaining parameters analysed satisfied NSE Tier 1 EQS for Surface Water.

Based on review of the historical data, concentrations of inorganic parameters (including ammonia and nitrate) and metals (including aluminum, arsenic, barium, calcium, strontium and manganese) above CCME FWAL guidelines have been historically reported in the surface water collected at the Meadowview Landfill Site

Upgradient of the site:

Routine exceedances of nitrite, aluminum, and iron have been observed at the former upgradient site (SWA) and may reflect naturally occurring background conditions.

Downgradient of the site:

Routine exceedances of ammonia, aluminum, arsenic, barium, calcium and strontium have been reported at surface water locations in the Palmer Brook (SW7, SW7A, SW19B). Most recently iron (2020 Stantec Annual Monitoring Program) has exceeded in the Palmer Brook locations at a higher concentration than the upgradient locations. The former downstream location in the Cornwallis River, (SW3), has routinely exceeded aluminum and iron, similar to the upstream location (SWA) in the Cornwallis River. Prior to 2020, SW3 had exceedances in copper, cadmium, lead, vanadium, and zinc but these concentrations have since been reported under their respective guideline exceedances limit. This suggests that the impacts seen in the Palmer Brook are localized (i.e. not impacting the Cornwallis River). The source or cause of the concentrations in the Palmer Brook surface water samples is unknown but may suggest potential impacts from site.

Data trend analysis was completed by Stantec (2020) and included plotting groundwater and surface water results of certain downgradient sampling locations. The parameters included in the trend analysis are ammonia, chloride and conductivity which are leachate indicators identified in the Site Closure Report (Porter Dillon 1995) and Monitor Plan Evaluation (Stantec 2017). The trend analysis has been continued and includes results accumulated by WSP (2012-2013), Stantec (2016-2020), and Englobe (2024).

Surface water locations include the Palmer Brook sampling locations, the former upstream location SWA, the former downstream location SW3, and three new Cornwallis River sampling locations SW24-1, SW24-2, and SW24-3.

Surface Water Trend Analysis

- Ammonia at SW7A peaked at 17 mg/L in 2017 but has since stabilized around 2 mg/L. Remaining ammonia values have remained stable from year to year. Overall ammonia values have been the highest at SW7A among all surface water locations since.
- Conductivity at SW7A peaked in 2017 at 650 µs/cm but has since stabilized around 300 µs/cm. Remaining conductivity values have remained stable from year to year. Conductivity values at the new Cornwallis River surface water locations (SW24-1, SW24-2, and SW24-3) were higher than the conductivity values at the Palmer Brook sampling locations (SW7, SW7A, and SW19B) for 2024. Historically conductivity values have been the highest at SW7A among all surface water locations since 2017.
- Chloride values for all sampling locations have remained stable from year-to-year. Overall values have decreased since 2012. In the 2024 event, lab values show chloride values at the new Cornwallis River surface water locations (SW24-1, SW24-2, and SW24-3) were higher than the chloride values at the Palmer Brook sampling locations (SW7, SW7A and SW19B). Historically chloride values have remained consistent since 2019 and remain between 20 and 35 mg/L with the highest historic value reported at SW19B.

The results of the trend analysis are provided following the text of this report.

4.3 Landfill Gas Monitoring Results

Field parameters including methane (ppm), methane (LEL), Oxygen and Carbon dioxide for were taken from monitor wells to assess ambient landfill gases.

Ambient landfill gas readings are summarized below:

- Oxygen readings ranged from 18.2% (MW32-A) to 21.4% (MW23-C).
- Carbon Dioxide readings ranged from 0% (MW21-C) to 0.8% (TH1).
- Methane readings at all locations were <0.1 ppm except for a reading of 0.1 ppm at MW29-B.
- The methane LEL reading at all locations was 0% LEL.

All gas monitoring results satisfied British Columbia Government Landfill Gas Management Regulations of 5% LEL.

These ‘one-time’ sampling results should be treated with caution, and for this reason, further evaluation of these sampling points should be conducted to ensure the gas monitoring data accurately represent the landfill gas conditions present in the subsurface.

4.4 QA & QC Results

As part of our QA/QC program, validation criteria were established that required the field collected data to have an acceptable level of precision, accuracy, representativeness, comparability and completeness (the “PARCC” criteria). Precision was evaluated by calculating the RPD (relative percent difference) and comparing the RPD to the acceptable amount of variation. RPD is defined as:

$$RPD = \frac{(\text{sample result} - \text{duplicate result})}{(\text{sample result} + \text{duplicate result})/2} x100$$

It should be noted that RPDs cannot be calculated in instances where the original sample, the duplicate sample, or both were found to contain no detectable concentrations or if results are within 5x

the reportable detection limits. Parameters that have been ‘calculated’ by the laboratory (e.g. anion sum) are also not included in the comparison.

A summary of RPD results is listed below:

— All RPD values for sample surface water sample SW24-1 and its blind field duplicate were found to be acceptable and below 40% except for Langelier Index (at 20°C) which had an RPD value of 51.8%.

— All RPD values for groundwater sample TH1 and its blind field duplicate were found to be acceptable and below 40% except for Langelier Index (at 4°C) (48.9%) and Total Organic Carbon (60.9%).

Based on field procedures, laboratory methods, sampling program design and field observations, the analytical results are concluded to be representative of the site conditions in general.

A summary of the RPD results is provided in Tables 4C, 4D, 5C and 5D (following the text of this report. Laboratory RPD results can be found in the Laboratory Certificates of Analysis in Appendix D.

5 Conclusions

Based on the recorded field data and analytical results, and their comparison with applicable standards, the following conclusions are made for the 2024 EMP at the Meadowview Landfill.

5.1 Groundwater

Based on the groundwater elevation data measured from the site during September 2024, the groundwater flow direction was estimated to be to the south-southwest toward the Cornwallis River, with a hydraulic gradient of 0.0158 at the time of sampling.

It should be noted that monitoring well MW31-A was not accessible during the monitoring program due to DND-related access restrictions.

The groundwater analytical results were compared to two different sets of standards including the Nova Scotia Environment and Climate Change (NSECC) Tier 1 Environmental Quality Standards (EQS) for Groundwater - All Land Uses (Non-potable and Coarse-Grained Soil Type), and the NSECC Tier 1 EQS for Groundwater Discharging to Surface Water (>10m).

Elevated arsenic, cobalt, iron, manganese and low pH in groundwater have been documented at concentrations exceeding or out of range of the NSE Tier 1 EQS for Groundwater Discharging to Surface Water (>10m) at various monitoring wells located downgradient of the site (including MW4-A, MW22-A, MW22-B, MW23-B and TH1). These elevated parameters satisfied the same standards at upgradient, background monitoring well locations (MW27-B, MW28-B, MW29-B and MW29-C). The elevated arsenic, cobalt, iron, manganese and low pH affecting water quality in down-gradient wells may indicate site impacts related to the landfill.

It should be noted that the NSE Tier 1 EQS for Groundwater Discharging to Surface Water (>10m) for arsenic, cobalt, iron, manganese and low pH are established for the protection of freshwater aquatic life; therefore, observed exceedances in the groundwater samples do not necessarily indicate a human health hazard.

Based on the results of the 2024 EMP, groundwater samples collected from downgradient wells at MW4-A, MW22-A, MW22-B, MW23-B and TH1 may be impacted from the Meadowview Landfill.

Exceedances of applied guideline/standard and triggers are summarized in Table 5-1.

Table 5-1 – Groundwater Tier I EQS Exceedances - 2024

Groundwater Exceedances
- MW4-A: Arsenic and iron exceedances. - MW22-A: Depressed field pH. Arsenic, Cobalt, Iron and Manganese exceedances. - MW22-B: Cobalt, iron and manganese exceedances. - MW23-A: Depressed field pH. - MW23-B: Depressed field pH. Iron and Manganese exceedances. - TH1: Iron exceedance.
NSE Tier 1 EQS for Groundwater Discharging to Surface Water (>10m) - Field pH 6.5-9.0 - Arsenic 50 µg/L - Cobalt 7.8-18 µg/L (calculated based on hardness) - Iron 3,000 µg/L - Manganese 4,300 µg/L (calculated based hardness and field pH)
Notes: 1. Background Wells: MW27-B, MW28-B, MW29-B, MW29-C, and MW31-A. 2. Downgradient wells: MW4-A, MW22-A, MW22-B, MW22-C, MW23-A, MW23-B, MW23-C, MW25-B, TH1. 3. NSE Tier 1 EQS for Groundwater Discharging to Surface Water (>10m) for arsenic, cobalt, iron, manganese and low pH are for protection of freshwater aquatic life

5.2 Surface Water

The surface water analytical results are compared to the NSE Tier 1 EQS for Surface Water. For the purpose of this report, the waters of Palmer Brook and of the Cornwallis River are considered to be freshwater.

Palmer Brook

Surface water sample locations at SW20A, SW7, SW7A and SW19B are located along the Palmer Brook southwest of the Facility. Background (Palmer Brook) surface water sampling location SW20A was found dry and therefore, no sample could be collected during the 2024 EMP. Surface water samples were collected from SW19B, SW7 and SW7A and are considered to be downgradient of Meadowview Landfill. Abundant iron precipitate was observed in surface water locations SW7A and SW19B.

The field and laboratory data reported elevated levels or concentrations of field pH, aluminum, arsenic, cobalt, iron, and dissolved manganese which may suggest potential leachate impacts. All remaining metals and general chemistry parameters in the surface water samples collected from the Palmer Brook satisfied the applicable standard.

Cornwallis River

Surface water sample location SW24-1, collected from the Cornwallis River, is considered to be upstream of the Meadowview landfill waste cells and is assumed to reflect the natural background conditions. Concentrations of most surface water metals at SW24-1 satisfied the applicable Provincial standard, with the exception of total aluminum and iron, which are common in these freshwater environments. All remaining metals and general chemistry parameters in the surface water sample SW24-1 were reported at levels that satisfied the applicable standard.

Downgradient surface water sampling locations SW24-2 and SW24-3, also collected along the Cornwallis River, are considered downstream of the landfill, and would contain surface water

potentially influenced by flow from the site. The laboratory data reported elevated concentrations of aluminium and iron for the sample collected at SW24-2 and SW24-3. All remaining metals and general chemistry parameters in surface water samples SW24-2 and SW24-3 were reported at levels that satisfied the applicable standard.

Since aluminum impacts were noted at downstream surface water sample locations SW7, SW7A and SW19B, and at lower concentrations than the upstream “background” location SW24-1, elevated aluminum concentrations are not considered to be a contaminant issue related to surface water runoff from the landfill site.

Based on the results of the 2024 EMP, downstream surface water samples along the Palmer Brook (including SW19A, SW7 and SW7A) maybe influenced by leachate impacts from the Meadowview Landfill. Conversely, downstream surface water samples along the Cornwallis River (including SW24-2 and SW24-3 are not interpreted to be influenced by leachate impacts from the Meadowview Landfill.

Again, it should be noted that the NSE Tier 1 EQS for Surface Water for pH, aluminum, arsenic, cobalt, iron, and dissolved manganese are for the protection of freshwater aquatic life; therefore, observed exceedances in the surface water samples do not necessarily indicate a human health hazard.

The surface water exceedances are summarized in Table 5-2.

Table 5-2 – Surface Water – Tier I EQS exceedances - 2024

Surface Water Exceedances
- SW7: total aluminum, iron, dissolved manganese exceedances and depressed field pH. - SW7A: total aluminum, arsenic, cobalt, iron, dissolved manganese exceedances and depressed field pH. - SW19B: total aluminum cobalt, iron, dissolved manganese exceedances and depressed field pH. - SW24-1: total aluminum and iron. - SW24-2: total aluminum and iron. - SW24-4: total aluminum and iron.
NSE Tier 1 EQS for Surface Water - pH 6.5 – 9.0 units. - Aluminium 5 – 100 µg/L (calculated based on pH). - Arsenic 5 µg/L. - Cobalt 0.78 – 1.8 µg/L (calculated based on hardness). - Iron 300 µg/L - Dissolved manganese 90 – 1500 µg/L (calculated based on hardness and field pH).
Notes: 1. Upgradient/background locations include SW24-1. 2. SW7, SW7A, and SW19B are located in the Palmer Brook downgradient of the site. 3. SW24-2 and SW24-3 are located downstream of the site in the Cornwallis River.

5.3 Landfill Gas

All methane reading were recorded as <0.1 ppm except for a reading of 0.1 ppm observed at MW29-B located on the northern boundary of the former landfill site. No measurements in the % LEL range for methane gas were detected using the equipment operated by Englobe. In general terms, all gas monitoring results satisfied the British Columbia Government Landfill Gas Management Regulations of <5% LEL for methane gas.

Based on the age of the Meadowview landfill (closed in 1999), the gas monitoring screening data and the relative stability of the pH across the site, the potential risk of methane gas exposure to the residential community located east of the Meadowview landfill is interpreted to be low; however, there is the potential for dilution of landfill gases using a handheld gas meter and these 'one-time' sampling results should be treated with caution. Further evaluation of these sampling points should be conducted to ensure the gas monitoring data accurately represent the landfill gas conditions present in the subsurface at each of the existing test locations.

6 Recommendations

Based on the results of the 2024 EMP for the Meadowview Landfill, Englobe has made the following recommendations:

- Sampling and monitoring of the existing groundwater wells at the site should continue on an annual basis.
- Select surface water locations should continue to be sampled and monitored at the same locations and frequency.
- Further evaluation of the Gas Survey sampling points should be conducted to ensure the gas monitoring data accurately represent the landfill gas conditions present in the subsurface at each of the existing test locations.
- Re-assess for possible repairs to the protective covers for monitoring wells MW26-B and MW32-A.
- Monitoring well MW31-A (located on DND property) should be removed from future EMPs due to difficulty in obtaining permission from DND to access the well, and the dedicated sampling proposed at MW31-A be replaced by sampling monitoring well MW20-A or MW20-B (located at the far east of the site). Sampling at MW20-A or MW-20B should be added to the EMP for future years, including collection of groundwater elevations and landfill gas measurements. In addition, sampling of monitoring well MW-21C should be added to the EMP to confirm site conditions in this area (downgradient of MW-4A).
- The Municipality, in consultation with Englobe, should continue its communications with NSECC in order to identify whether a current Approval exists and if annual monitoring of the Meadowview Landfill is a Provincial requirement under such an Approval.
- Due to damage noted by the Municipality to monitoring wells MW19-B and MW7-A in spring 2024, both monitoring wells should be decommissioned in 2025 under the supervision and guidance of a Site Professional (such as Englobe) recognized by the Province of Nova Scotia.

7 Closing

This report was prepared for the exclusive use of the Municipality of the County of Kings. It is based on data and information obtained during site visits by Englobe Corp. and is based solely upon the condition of the site on the date of such visits, supplemented by information obtained and described herein.

The evaluation and conclusions contained in this report have been prepared in light of the expertise and experience of Englobe. In evaluating the site, Englobe has relied in good faith upon representation

and information furnished by individuals noted in the report with respect to operations and existing site conditions and the historic use of the site to the extent that they have not been contradicted by data obtained by other sources. Accordingly, Englobe accepts no responsibility for any deficiency or inaccuracy in this report as a result of omissions, misstatements or misrepresentations of the persons interviewed. In addition, Englobe will not accept liability for loss, injury, claim or damage arising from any use or reliance on this report as a result of misrepresentation or fraudulent information.

Environmental conditions are dynamic in nature and changing circumstances in the environment and in the use of the site can alter radically the conclusions and information contained herein.

8 References

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9 Tables

Table 1 – Environmental Monitoring Program

Table 1: Environmental Monitoring Program
Meadowview Well Observations and Field Data - 2024
Client: Municipality of County of Kings
Site: Meadowview Landfill
Englobe - Ref No.: 2408035.000

Test Location ID			Frequency	Parameters			
Groundwater Elevations							
MW4-A	MW4-C	MW12-A	Annually	**Field Measurements**			
MW19-A	MW21-C	MW22-A		Static Water Levels (mbgs and masl)	Borehole Depths (m)	Stick Up Height (mags)	Borehole Diameter (m)
MW22-B	MW22C	MW23-A					
MW23-B	MW23-C	MW24-A	Summer				
MW24-B	MW25-B	MW26-B					
MW27-B	MW27-C	MW28-B					
MW29-B	MW29-C	MW31-A	Sept 16 and 17, 2024				
MW32-A	MW35-A	MW36-A					
TH1	TH2						
Groundwater Sampling							
MW27-B (background)	MW28-B (background)	MW29-B (background)	Annually	**General Chemistry**			
MW29-C (background)	MW31-A (background)	MW4-A		Alkalinity (Bicarbonate)	Alkalinity (Carbonate)	Alkalinity (Total)	Anion Sum
MW22-A	MW22-B	MW22-C		Cation Sum	Chloride (Dissolved Cl)	Colour	Conductivity
MW23-A	MW23-B	MW23-C		Hardness (CaCO3)	Ion Balance (% Difference)	Langelier Index (@ 20oC)	Langelier Index (@ 4oC)
MW25-B	TH1			Nitrate (N)	Nitrate + Nitrite (N)	Nitrite (N)	Nitrogen (Ammonia Nitrogen)
				Orthophosphate	pH	Reactive Silica (SiO2)	Saturation pH (@ 20oC)
				Saturation pH (@ 4oC)	Sulphate (Dissolved SO4)	TDS (calc.)	Total Organic Carbon (TOC)
			Summer	Turbidity			
				Metals			
				Aluminum (total)	Antimony (total)	Arsenic (total)	Barium (total)
				Beryllium (total)	Bismuth (total)	Boron (total)	Cadmium (total)
				Calcium (total)	Chromium (total)	Cobalt (total)	Copper (total)
				Iron (total)	Lead (total)	Magnesium (total)	Manganese (total)
				Mercury (total)	Molybdenum (total)	Nickel (total)	Phosphorus (total)
				Potassium (total)	Selenium (total)	Silver (total)	Sodium (total)
				Strontium (total)	Thallium (total)	Tin (total)	Titanium (total)
				Uranium (total)	Vanadium (total)	Zinc (total)	
			Sept 16 and 17, 2024	Field Measurements			
				Static Water Level (m)	Borehole Depth (m)	Stick-Up (m)	Borehole Diameter (mm)
				Purge Volume Required (L)	Purge Volume Obtained (L)	Temperature (oC)	pH (units)
				Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Colour	Clarity
				Odour	Sheen		
Surface Water Sampling							
SW24-1 (background Cornwallis River)	SW24-2 (midstream Cornwallis River)	SW24-3 (downstream Cornwallis River)	Annually	**General Chemistry**			
SW20A (background Palmer Brook)	SW19B (mid-stream Palmer Brook)	SW7 (mid-stream Palmer Brook)		Alkalinity (Bicarbonate)	Alkalinity (Carbonate)	Alkalinity (Total)	Anion Sum
SW7A (mid-stream Palmer Brook)				Cation Sum	Chloride (Dissolved Cl)	Colour	Conductivity
				Hardness (CaCO3)	Ion Balance (% Difference)	Langelier Index (@ 20oC)	Langelier Index (@ 4oC)
				Nitrate (N)	Nitrate + Nitrite (N)	Nitrite (N)	Nitrogen (Ammonia Nitrogen)
			Summer	Orthophosphate	pH	Reactive Silica (SiO2)	Saturation pH (@ 20oC)
				Saturation pH (@ 4oC)	Sulphate (Dissolved SO4)	TDS (calc.)	Total Organic Carbon (TOC)
				Turbidity			
				Metals			
				Aluminum (dissolved and total)	Antimony (dissolved and total)	Arsenic (dissolved and total)	Barium (dissolved and total)
				Beryllium (dissolved and total)	Bismuth (dissolved and total)	Boron (dissolved and total)	Cadmium (dissolved and total)
				Calcium (dissolved and total)	Chromium (dissolved and total)	Cobalt (dissolved and total)	Copper (dissolved and total)
			Sept 16 and 17, 2024	Iron (dissolved and total)	Lead (dissolved and total)	Magnesium (dissolved and total)	Manganese (dissolved and total)
				Molybdenum (dissolved and total)	Nickel (dissolved and total)	Phosphorus (dissolved and total)	Potassium (dissolved and total)
				Selenium (dissolved and total)	Silver (dissolved and total)	Sodium (dissolved and total)	Strontium (dissolved and total)
				Thallium (dissolved and total)	Tin (dissolved and total)	Titanium (dissolved and total)	Uranium (dissolved and total)
				Vanadium (dissolved and total)	Zinc (dissolved and total)		
				Field Measurements			
				Depth (m)	Width (m)	Flow Velocity (m/second)	Discharge (m3/second)
				Temperature (oC)	pH (units)	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)
				Colour	Clarity	Odour	Sheen
Landfill Gas Monitoring							
MW4-A	MW4-C	MW12-A	Annually	Methane (parts per million (ppm))	Methane (Lower Explosive Limit; LEL)	Oxygen	Carbon Dioxide
MW19-A	MW21-C	MW22-A					
MW22-B	MW22C	MW23-A					
MW23-B	MW23-C	MW24-A	Summer				
MW24-B	MW25-B	MW26-B					
MW27-B	MW27-C	MW28-B					
MW29-B	MW29-C	MW31-A	Sept 16 and 17, 2024				
MW32-A	MW35-A	MW36-A					
TH1	TH2						

Table 2 - Groundwater Monitoring Well & Surface Water Sampling Station Locations

Table 2: Groundwater Monitoring Well & Surface Water Sampling Station Locations
Meadowview Well Observations and Field Data - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe - Ref No. 2408035.000

Test Location ID	Zone	Northing (m N)	Easting (m E)
MW4-A	20T	4993549.63	380794.79
MW4-C	20T	4993546.57	380793.98
MW7-A	20T	4993672.87	380977.54
MW12-A	20T	4993815.01	379989.01
MW19-A	20T	4993798.50	380895.43
MW19-B	20T	4993807.28	380892.40
MW20-A	20T	4993769.36	380961.75
MW20-B	20T	4993776.29	380965.70
MW21-C	20T	4993439.69	380859.98
MW22-A	20T	4993547.31	380035.98
MW22-B	20T	4993545.78	380036.53
MW22-C	20T	4993546.47	380033.93
MW23-A	20T	4993726.13	379826.71
MW23-B	20T	4993728.92	379827.68
MW23-C	20T	4993727.93	379824.20
MW24-A	20T	4993645.70	380105.66
MW24-B	20T	4993644.40	380,106.41
MW25-B	20T	4993536.59	380241.75
MW26-B	20T	4994047.34	380743.97
MW27-B	20T	4994150.99	380818.90
MW27-C	20T	4994151.37	380820.87
MW28-B	20T	4994165.44	380675.38
MW29-B	20T	4994102.56	380289.06
MW29-C	20T	4994101.32	380291.16
MW32-A	20T	4993826.54	379858.51
MW35-A	20T	4993457.50	380225.23
MW36-A	20T	4993466.54	380330.53
TH1	20T	4993545.73	380611.98
TH2	20T	4993535.84	380579.72
SW20A	20T	4993805.23	379399.91
SW19B	20T	4993666.37	379863.96
SW7	20T	4993518.73	380015.11
SW7A	20T	4993442.96	380032.35
SW24-1	20T	4993295.17	379832.31
SW24-2	20T	4993420.81	380344.21
SW24-3	20T	4992897.06	381646.05

Table 3 - Groundwater Elevations

Table 3: Groundwater Elevations
Meadowview Well Observations and Field Data - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe - Ref No. 2408035.000

Test Location ID	Ground Surface Elevation (masl)	Groundwater Elevation (masl)	Top of Pipe Elevation (masl)	Stick Up Height (m)	Total Well Depth (m)	Borehole Diametre (mm)
MW4-A	11.73	7.67	11.70	-0.03	10.42	25
MW4-C	11.68	7.58	11.67	-0.01	16.72	25
MW12-A	13.3	10.51	13.54	0.24	4.45	60
MW19-A	28.93	9.83	29.02	0.09	27.20	60
MW21-C	8.98	7.12	9.16	0.18	23.37	60
MW22-A	10.69	8.75	10.91	0.22	8.64	60
MW22-B	10.72	8.10	10.90	0.18	13.23	60
MW22-C	10.73	7.23	10.95	0.22	25.13	60
MW23-A	12.57	10.16	12.74	0.17	4.75	60
MW23-B	12.49	10.09	12.77	0.28	11.44	60
MW23-C	12.5	10.07	12.60	0.10	23.11	60
MW24-A	12.87	9.95	13.25	0.38	3.66	60
MW24-B	12.8	9.95	13.11	0.31	12.00	60
MW25-B	11.05	6.64	11.35	0.30	13.81	60
MW26-B	24.48	20.31	24.88	0.40	13.88	60
MW27-B	23.82	20.46	24.06	0.24	13.60	60
MW27-C	23.7	19.97	23.91	0.21	23.30	60
MW28-B	29.64	23.10	29.91	0.27	15.07	60
MW29-B	22.67	19.20	22.91	0.24	9.61	60
MW29-C	22.75	18.76	23.17	0.42	22.31	60
MW32-A	12.08	10.57	12.57	0.49	3.16	60
MW35-A	9.54	6.88	10.06	0.52	4.00	60
MW36-A	10.46	6.82	10.94	0.48	4.51	60
TH1	13.16	7.58	13.21	0.05	9.12	60
TH2	11.26	6.62	11.83	0.57	16.93	60

Tables 4A-4D - Groundwater Results – Metals and Elements – 2024

Table 4A: Groundwater Results - Metals and Elements - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe Ref. No. 2408035.000

Parameter	Units	NSECC Tier I EQS for Non-potable GW (all Land Uses)[1]	NSECC Tier I EQS for GW discharging to SW (>10m)[2]	Sample ID												
				MW4-A	MW22-A	MW22-B	MW22-C	MW23-A	MW23-B	MW23-C	MW25-B	MW27-B	MW28-B	MW29-B	MW29-C	TH1
				17/Sep/24	16/Sep/24	17/Sep/24	17/Sep/24	17/Sep/24	17/Sep/24	17/Sep/24	17/Sep/24	18/Sep/24	18/Sep/24	18/Sep/24	18/Sep/24	17/Sep/24
Dissolved Aluminum (Al)	µg/L	-	50 [3]	62.5	<10.0	<10.0	10.3	4.9	<1.0	17.6	1.5	9.1	5.5	2.2	9.4	1.2
Dissolved Antimony (Sb)	µg/L	-	90	<1.00	<1.00	<1.00	0.12	<0.10	<0.10	<0.10	<0.10	0.80	<0.10	<0.10	<0.10	<0.10
Dissolved Arsenic (As)	µg/L	-	50	**67.6**	**76.9**	17.2	1.40	0.16	11.4	7.31	2.95	12.3	1.12	1.75	4.76	30.5
Dissolved Barium (Ba)	µg/L	-	10,000	2,470	1,150	637	7.59	50.9	242	37.2	10.2	1.83	5.61	10.8	2.75	904
Dissolved Beryllium (Be)	µg/L	-	1.5	<0.200	<0.200	<0.200	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dissolved Bismuth (Bi)	µg/L	-	-	<0.500	<0.500	<0.500	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dissolved Boron (B)	µg/L	-	15,000	333	260	380	<10	<10	16	13	75	100	<10	<10	15	144
Dissolved Cadmium (Cd)	µg/L	-	0.9 [4]	<0.0500	<0.0500	<0.0500	0.0477	0.0654	0.0769	<0.0050	0.0087	0.0052	<0.0050	<0.0050	<0.0050	<0.0050
Dissolved Calcium (Ca)	µg/L	-	-	84,900	74,000	209,000	14,200	16,400	28,700	8,960	92,900	4,840	26,600	28,000	8,220	84,600
Dissoved Cesium (Cs)	µg/L	-	-	<0.100	<0.100	0.236	0.053	<0.010	<0.010	0.034	0.121	0.090	0.031	0.062	0.063	0.072
Dissolved Chromium (Cr)	µg/L	-	89	<5.00	<5.00	<5.00	0.65	<0.50	<0.50	2.18	<0.50	1.15	<0.50	<0.50	<0.50	<0.50
Dissolved Cobalt (Co)	µg/L	-	10 [5]	10.7	**17.1**	**10.9**	<0.10	<0.10	3.50	<0.10	0.25	<0.10	<0.10	<0.10	<0.10	4.37
Dissolved Copper (Cu)	µg/L	-	20 [6]	<2.00	<2.00	<2.00	0.65	<0.20	<0.20	<0.20	0.29	0.71	0.35	0.36	0.34	<0.20
Dissolved Iron (Fe)	µg/L	-	3,000	**19,900**	**55,400**	**8,910**	22	<10	**5,780**	25	<10	<10	<10	<10	18	**11,600**
Dissolved Lead (Pb)	µg/L	-	10 [7]	<0.500	<0.500	<0.500	0.382	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dissolved Lithium (Li)	µg/L	-	-	12.6	<10.0	33.3	12.1	<1.0	1.1	14	13.8	30.8	<1.0	1.8	11	23.9
Dissolved Magnesium (Mg)	µg/L	-	-	18,300	14,100	27,500	2,500	2,100	4,700	964	14,300	690	2,650	3,900	1,150	15,400
Dissolved Manganese (Mn)	µg/L	-	4,300 [8]	972	**3,500**	**4,340**	5.79	693	**4,250**	5.90	26.6	0.37	2.15	0.60	1.19	1,280
Dissolved Mercury (Hg)	µg/L	-	-	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Total Mercury (Hg)	µg/L	-	0.26	0.0101	<0.0050	<0.0050	0.0071	0.0171	0.0330	<0.0050	<0.0050	0.0052	<0.0050	0.0062	<0.0050	<0.0050
Dissolved Molybdenum (Mo)	µg/L	-	730	1.12	0.844	<0.500	0.242	<0.050	0.142	0.11	0.087	0.993	<0.050	0.314	<0.050	0.555
Dissolved Nickel (Ni)	µg/L	-	250 [9]	15.6	13.8	21.3	<0.50	1.29	2.93	<0.50	6.13	<0.50	<0.50	<0.50	<0.50	3.76
Dissolved Phosphorous (P)	µg/L	-	-	<500	<500	<500	<50	<50	<50	<50	<50	<50	54	<50	<50	63
Dissolved Potassium (K)	µg/L	-	-	52,000	19,400	8,060	4,030	1,080	2,530	2,790	7,480	4,280	1,400	3,720	3,760	26,600
Dissolved Rubidium (Rb)	µg/L	-	-	<2.00	8.83	8.41	3.04	1.12	0.84	1.81	6.17	2.68	1.64	3.18	2.88	5.07
Dissolved Selenium (Se)	µg/L	-	10	<0.500	<0.500	<0.500	0.052	<0.050	<0.050	0.085	0.059	0.059	<0.050	<0.050	<0.050	0.913
Dissolved Silicon (as SiO2)	mg/L	-	-	36.6	21	22.2	8.68	11.8	12.4	9.24	13.3	10.3	8.7	10.2	7.21	35.1
Dissolved Silicon (Si)	µg/L	-	-	17,100	9,830	10,400	4,060	5,500	5,790	4,320	6,210	4,800	4,070	4,790	3,370	16,400
Dissolved Silver (Ag)	µg/L	-	2.5	<0.100	<0.100	<0.100	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dissolved Sodium (Na)	µg/L	-	-	41,600	40,000	73,600	9,770	21,900	24,500	15,000	17,700	29,500	4,380	7,280	18,100	33,200
Dissolved Strontium (Sr)	µg/L	-	210,000	562	387	1810	202	23.3	59.3	75.6	1200	65.7	232	326	111	386
Dissolved Sulfur (S)	µg/L	-	-	<5000	<5000	<5000	<500	3030	5080	<500	<500	<500	1210	750	1240	<500
Dissolved Tellurium (Te)	µg/L	-	-	<2.00	<2.00	<2.00	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Thallium (Tl)	µg/L	-	8	<0.100	<0.100	<0.100	0.021	<0.010	0.013	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dissolved Thorium (Th)	µg/L	-	-	<1.00	<1.00	<1.00	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Tin (Sn)	µg/L	-	-	<1.00	<1.00	<1.00	0.4	<0.10	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	<0.10	0.18
Dissolved Titanium (Ti)	µg/L	-	-	<3.00	<3.00	<3.00	1.23	<0.30	<0.30	<2.00	<0.30	<0.30	<0.30	<0.30	0.77	<0.30
Dissolved Tungsten (W)	µg/L	-	-	<1.00	<1.00	<1.00	<0.10	<0.10	<0.10	0.79	0.28	14.8	<0.10	1.37	0.39	<0.10
Dissolved Uranium (U)	µg/L	-	150	<0.100	<0.100	6.21	5.93	0.039	0.026	4.78	17.3	3.03	0.273	2.2	1.01	0.042
Dissolved Vanadium (V)	µg/L	-	1,200	<5.00	<5.00	<5.00	1.62	<0.50	<0.50	4.91	1.02	4.52	0.92	0.76	4.95	0.6
Dissolved Zinc (Zn)	µg/L	-	70 [10]	<10.0	<10.0	<10.0	43.5	1.7	1.5	<1.0	1.6	1.6	1.4	<1.0	<1.0	3.3
Dissolved Zirconium (Zr)	µg/L	-	-	<2.00	<2.00	<2.00	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Notes:

value	- exceeds NSECC Tier I EQS Non-potable GW
value	- exceeds NSECC Tier I EQS GW discharging to SW
-	- no guideline

[1] 2021 Nova Scotia Environment and Climate Change (NSECC) Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses ; Non-potable Ground Water Condition

[2] 2021 Nova Scotia Tier 1 Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water

[3] Aluminium Guideline for pH < 6.5 = 50 ug/L
Aluminium Guideline for pH ≥ 6.5 = 1000 ug/L

[4] At [CaCO3] = > 0 to < 17 mg/L, cadmium guideline = 0.4 µg/L
At [CaCO3] = ≥ 17 to ≤ 280 mg/L, cadmium guideline (µg/L) = $10^{\{0.83(\log[\text{hardness}]) - 2.46\}}$
At [CaCO3] = > 280 mg/L, cadmium guideline = 3.7 µg/L

[5] At [$CaCO_3$] = 0 to ≤52 mg/L, cobalt guideline = 7.8 ug/L
At [$CaCO_3$] = >52 to ≤396 mg/L, cobalt guideline = $e^{\{0.414[\ln(\text{hardness})]-1.887\}}$
At [$CaCO_3$] = >396 mg/L, cobalt guideline = 18 ug/L

[6] At [$CaCO_3$] = 0 to 120 mg/L, copper guideline = 20 ug/L.
At [CaCO3] = ≥82 to ≤180 mg/L, copper guideline = 0.2 * e{0.8545[ln(hardness)]-1.465}
At [CaCO3] = > 180 mg/L, copper guideline = 40 ug/L.

[7] At [$CaCO_3$] = 0 to ≤60 mg/L, lead guideline = 10 ug/L
At [$CaCO_3$] = >60 to ≤180 mg/L, lead guideline = $e^{\{1.273[\ln(\text{hardness})]-4.705\}}$
At [$CaCO_3$] = >180 mg/L, lead guideline = 70 ug/L

[8] 2019 CCME Scientific Criteria Document for the Development of
the Canadian Water Quality Guidelines for the Protection of Aquatic Life
Appendix B - Manganese - Canadian Water Quality Guideline and Benchmark Calculator

[9] At [$CaCO_3$] = 0 to 60 mg/L, nickel guideline = 250 ug/L.
At [CaCO3] = > 60 to ≤ 180 mg/L, nickel guideline (µg/L) = $e^{\{0.76[\ln(\text{hardness})]+1.06\}}$
At [CaCO3] = > 180 mg/L, nickel guideline = 1500 µg/L

[10] $\exp^{0.947[\ln(\text{hardness mg·L-1})] - 0.815[\text{pH}] + 0.398[\ln(\text{DOC mg·L-1})] + 4.625}$
When CaCO3 23.4 to 399 mg/L and pH 6.5 to 8.13
Otherwise, zinc guideline = 70 ug/L

TABLE 4B: Groundwater Results - General Chemistry - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe Ref. No. 2408035.000

Parameter	Units	NSECC Tier I EQS for Non-potable GW (all Land Uses)[1]	NSECC Tier I EQS for GW discharging to SW (>10m)[2]	Sample ID												
				MW4-A	MW22-A	MW22-B	MW22-C	MW23-A	MW23-B	MW23-C	MW25-B	MW27-B	MW28-B	MW29-B	MW29-C	TH1
				17/Sep/24	16/Sep/24	17/Sep/24	17/Sep/24	17/Sep/24	17/Sep/24	17/Sep/24	17/Sep/24	18/Sep/24	18/Sep/24	18/Sep/24	18/Sep/24	17/Sep/24
Field Readings																
Field pH	pH units	-	6.5-9.0	6.98	**6.34**	6.52	7.31	**6.48**	**6.38**	8.48	7.89	8.15	7.95	7.89	8.84	7.35
Field Conductivity	µS/cm	-	-	1,087	855	1,276	139	192.4	292.9	111.9	555	138.3	26	190.2	132.9	850
Field Temperature	°C	-	-	10.5	5.2	5.2	7.9	11.3	4.2	11.3	6.0	9.1	8.1	5.2	5.2	6.0
Physical Tests																
Conductivity	µS/cm	-	-	1,260	844	1,470	154	217	309	128	752	163	187	211	156	905
Alkalinity, bicarbonate (as HCO3)	mg/L	-	-	712	467	791	71.6	74.3	89.9	69.1	330	94	86	111	78.2	546
Alkalinity, carbonate (as CO3)	mg/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	1.1	<1.0	<1.0	3	<1.0
Alkalinity, hydroxide (as OH)	mg/L	-	-	<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
Alkalinity, total (as CaCO3)	mg/L	-	-	584	382	649	58.7	60.9	73.7	58.7	270	78.8	70.5	90.7	69	448
Colour, apparent	CU	-	-	4,270	1,220	720	72.2	2,780	2,270	23,000	607	1,200	594	5,880	6,280	1,870
Hardness (as CaCO3), dissolved	mg/L	-	-	287	243	635	45.8	49.6	91	26.3	291	14.9	77.3	86	25.3	275
Langelier index (@ 4°C)	-	-	-	-0.088	-0.577	0.323	-1.02	-1.56	-1.46	-0.48	0.312	-0.611	-0.18	-0.081	-0.049	0.136
Solids, total dissolved [TDS]	mg/L	-	-	589	457	875	91	145	173	78	444	122	110	115	99	426
Turbidity	NTU	-	-	1930	232	180	30	696	763	640	250	378	219	2300	3940	864
pH	pH units	-	6.5 - 9.0	6.95	6.68	6.97	7.65	7.05	6.84	8.39	7.62	8.42	8.15	8.12	8.81	7.26
Langelier index (@ 20°C)	-	-	-	0.156	-0.328	0.57	-0.768	-1.31	-1.21	-0.231	0.56	-0.365	0.069	0.168	0.192	0.385
pH, saturation (@ 4°C)	pH units	-	-	7.04	7.26	6.65	8.67	8.62	8.3	8.87	7.31	9.03	8.33	8.2	8.86	7.12
pH, saturation (@ 20°C)	pH units	-	-	6.79	7.01	6.4	8.42	8.36	8.05	8.62	7.06	8.78	8.08	7.95	8.62	6.88
Anions and Nutrients																
Ammonia, total (as N)	mg/L	-	varies [3]	54.7	20.7	2.74	0.0122	0.0101	0.412	<0.0050	0.0089	0.0088	0.0095	0.0068	<0.0050	30.2
Chloride	mg/L	-	1,200	32.9	38	111	11.2	24.4	42	3.88	78.7	3.36	13.6	9.63	16.6	17.8
Fluoride	mg/L	-	1.2	<0.100	0.048	<0.100	0.029	0.052	0.020	0.047	<0.020	0.202	0.024	0.023	0.040	0.028
Nitrate (as N)	mg/L	-	30 [4]	<0.100	<0.020	<0.100	0.040	<0.020	0.101	0.170	<0.020	0.167	<0.020	0.043	0.160	0.050
Nitrate + Nitrite (as N)	mg/L	-	-	<0.112	<0.0224	<0.112	0.040	<0.0224	0.259	0.170	<0.0224	0.167	<0.0224	0.043	0.160	0.122
Nitrite (as N)	mg/L	-	0.6	<0.050	<0.010	<0.050	<0.010	<0.010	0.158	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.072
Phosphate, ortho-, dissolved (as P)	mg/L	-	-	<0.0010	<0.0010	<0.0010	0.0075	0.0428	0.0013	0.0163	0.0062	0.0067	0.0548	0.0233	0.0079	<0.0010
Silicate (as SiO2)	mg/L	-	-	30.3	21.1	19.4	9.33	11.1	10.8	8.58	13.5	9.31	9.36	8.44	6.97	28.3
Sulfate (as SO4)	mg/L	-	1280 [5]	<1.50	<0.30	<1.50	1.29	8.10	13.9	1.16	0.52	1.30	3.57	2.27	3.69	2.17
Organic / Inorganic Carbon																
Carbon, total organic [TOC]	mg/L	-	-	16.8	10.2	17.3	4.86	28.5	6.31	<5.00	7.39	4.02	<2.50	<10.0	<10.0	6.61
Ion Balance																
Anion sum	meq/L	-	-	12.6	8.71	16.1	1.52	2.08	2.97	1.32	7.63	1.72	1.87	2.14	1.94	9.51
Cation sum	meq/L	-	-	13.5	10.7	16.8	1.45	2	3.34	1.25	6.77	1.69	1.77	2.13	1.39	10.2
Ion balance (cations/anions)	%	-	-	107	123	104	95.4	96.2	112	94.7	88.7	98.2	94.6	99.5	71.6	107

Notes:

value	- exceeds NSECC Tier I EQS Non-potable GW
value	- exceeds NSECC Tier I GW discharging to SW
-	- no guideline

[1] 2021 Nova Scotia Environment and Climate Change (NSECC) Tier I Environmental Quality Standards (EQS) for Groundwater - All Land Uses ; Non-potable Groundwater Condition
[2] 2021 Nova Scotia Tier 1 Environmental Quality Standards (EQS) for Surface Water and Groundwater Discharging to Surface Water
[3] Ammonia - calculations as per http://st-ts.ccme.ca/en/index.html?lang=en&factsheet=5#aql_fresh_concentration.
[4] Nitrate guideline has been converted from Nitrate (as NH4) to Nitrate (as N)
[5] At [CaCO3] = 0 to ≤30 mg/L, sulphate guideline = 1280 mg/L
At [CaCO3] = >30 to ≤75 mg/L, sulphate guideline = 2180 mg/L
At [CaCO3] = >75 to ≤180 mg/L, sulphate guideline = 3090 mg/L
At [CaCO3] = >180 mg/L, sulphate guideline = 4290 mg/L

TABLE 4C: Field QA/QC of Groundwater Results - Metals and Elements - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe Ref. No. 2408035.000

Parameter	Units	RDL	RDL x5	TH1		RPD (%)
				17/Sep/24	GW DUP	
Dissolved Aluminum (Al)	µg/L	1.0	5.0	1.2	<1.0	NC
Dissolved Antimony (Sb)	µg/L	0.10	0.50	<0.10	<0.10	NC
Dissolved Arsenic (As)	µg/L	0.10	0.50	30.5	31.1	1.9
Dissolved Barium (Ba)	µg/L	0.10	0.50	904	899	0.6
Dissolved Beryllium (Be)	µg/L	0.020	0.10	<0.020	<0.020	NC
Dissolved Bismuth (Bi)	µg/L	0.050	0.250	<0.050	<0.050	NC
Dissolved Boron (B)	µg/L	10	50	144	144	0.0
Dissolved Cadmium (Cd)	µg/L	0.0050	0.0250	<0.0050	<0.0050	NC
Dissolved Calcium (Ca)	µg/L	50	250	84,600	85,300	0.8
Dissoved Cesium (Cs)	µg/L	0.010	0.050	0.072	0.07	2.8
Dissolved Chromium (Cr)	µg/L	0.50	2.5	<0.50	<0.50	NC
Dissolved Cobalt (Co)	µg/L	0.10	0.50	4.37	4.34	0.7
Dissolved Copper (Cu)	µg/L	0.20	1.0	<0.20	0.21	NC
Dissolved Iron (Fe)	µg/L	10	50	11,600	11,900	2.6
Dissolved Lead (Pb)	µg/L	0.050	0.250	<0.050	<0.050	NC
Dissolved Lithium (Li)	µg/L	1.0	5.0	23.9	24.1	0.8
Dissolved Magnesium (Mg)	µg/L	5.0	25	15,400	15,700	1.9
Dissolved Manganese (Mn)	µg/L	0.10	0.50	1,280	1,260	1.6
Dissolved Mercury (Hg)	µg/L	0.0050	0.0250	<0.0050	<0.0050	NC
Total Mercury (Hg)	µg/L	0.0050	0.0250	<0.0050	<0.0050	NC
Dissolved Molybdenum (Mo)	µg/L	0.050	0.250	0.555	0.562	1.3
Dissolved Nickel (Ni)	µg/L	0.50	2.5	3.76	3.73	0.8
Dissolved Phosphorous (P)	µg/L	50	250	63	69	9.1
Dissolved Potassium (K)	µg/L	50	250	26,600	26,800	0.7
Dissolved Rubidium (Rb)	µg/L	0.20	1.0	5.07	5.08	0.2
Dissolved Selenium (Se)	µg/L	0.050	0.250	0.913	1.02	11.1
Dissolved Silicon (as SiO2)	mg/L	0.150	0.750	35.1	35.3	0.6
Dissolved Silicon (Si)	µg/L	50	250	16,400	16,500	0.6
Dissolved Silver (Ag)	µg/L	0.010	0.050	<0.010	<0.010	NC
Dissolved Sodium (Na)	µg/L	50	250	33,200	32,900	0.9
Dissolved Strontium (Sr)	µg/L	0.20	1.0	386	381	1.3
Dissolved Sulfur (S)	µg/L	500	2500	<500	<500	NC
Dissolved Tellurium (Te)	µg/L	0.20	1.0	<0.20	<0.20	NC
Dissolved Thallium (Tl)	µg/L	0.010	0.050	<0.010	<0.010	NC
Dissolved Thorium (Th)	µg/L	0.100	0.50	<0.10	<0.10	NC
Dissolved Tin (Sn)	µg/L	0.100	0.50	0.18	0.18	NC
Dissolved Titanium (Ti)	µg/L	0.30	1.5	<0.30	<0.30	NC
Dissolved Tungsten (W)	µg/L	0.10	0.50	<0.10	<0.10	NC
Dissolved Uranium (U)	µg/L	0.010	0.050	0.042	0.038	NC
Dissolved Vanadium (V)	µg/L	0.50	2.5	0.6	0.59	NC
Dissolved Zinc (Zn)	µg/L	1.0	5.0	3.3	3.4	NC
Dissolved Zirconium (Zr)	µg/L	0.20	1.0	<0.20	<0.20	NC

Notes:

value	- RDP outside of acceptable range
RDL	- Reportable Detection Limit
RPD	- Relative Percent Difference
NC	- Non-calculable

RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 40% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 4D: Field QA/QC of Groundwater Results - General Chemistry - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe Ref. No. 2408035.000

Parameter	Units	RDL	RDL x5	TH1		RPD (%)
				17/Sep/24	GW DUP	
Physical Tests						
Conductivity	µS/cm	1.0	5.0	905	924	2.1
Alkalinity, bicarbonate (as HCO3)	mg/L	1.0	5.0	546	567	3.8
Alkalinity, carbonate (as CO3)	mg/L	1.0	5.0	<1.0	<1.0	NC
Alkalinity, hydroxide (as OH)	mg/L	1.0	5.0	<1.0	<1.0	NC
Alkalinity, total (as CaCO3)	mg/L	1.0	5.0	448	465	3.7
Colour, apparent	CU	2.0	10	1,870	1600	15.6
Hardness (as CaCO3), dissolved	mg/L	0.50	2.5	275	278	1.1
Langelier index (@ 4°C)	-	0.010	0.050	0.136	0.224	48.9
Solids, total dissolved [TDS]	mg/L	10	50	426	434	1.9
Turbidity	NTU	0.10	0.50	864	711	19.4
pH	pH units	0.10	0.50	7.26	7.33	1.0
Langelier index (@ 20°C)	-	0.010	0.050	0.385	0.473	20.5
pH, saturation (@ 4°C)	pH units	0.010	0.050	7.12	7.10	0.3
pH, saturation (@ 20°C)	pH units	0.010	0.050	6.88	6.86	0.3
Anions and Nutrients						
Ammonia, total (as N)	mg/L	0.0050	0.0250	30.2	28.8	4.7
Chloride	mg/L	0.50	2.5	17.8	17.6	1.1
Fluoride	mg/L	0.020	0.10	0.028	0.029	NC
Nitrate (as N)	mg/L	0.020	0.10	0.050	0.052	NC
Nitrate + Nitrite (as N)	mg/L	0.0032	0.0160	0.122	0.098	21.8
Nitrite (as N)	mg/L	0.010	0.050	0.072	0.046	NC
Phosphate, ortho-, dissolved (as P)	mg/L	0.0010	0.0050	<0.0010	<0.0010	NC
Silicate (as SiO2)	mg/L	0.50	2.5	28.3	28.7	1.4
Sulfate (as SO4)	mg/L	0.30	1.5	2.17	1.03	NC
Organic / Inorganic Carbon						
Carbon, total organic [TOC]	mg/L	0.50	2.5	6.61	12.4	60.9
Ion Balance						
Anion sum	meq/L	0.10	0.50	9.51	9.82	3.2
Cation sum	meq/L	0.10	0.50	10.2	10.2	0.0
Ion balance (cations/anions)	%	0.010	0.050	107	104	2.8

Notes:

value	- RDP outside of acceptable range
RDL	- Reportable Detection Limit
RPD	- Relative Percent Difference
NC	- Non-calculable

RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 40% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

Tables 5A-5D - Surface Water Results – Metals and Elements – 2024

TABLE 5A: Surface Water Results - Metals and Elements - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe - Ref No. 2408035.000

Parameter	Units	NSECC Tier I EQS [1]	Sample ID						
			SW7	SW7A	SW19B	SW20A	SW24-1	SW24-2	SW24-3
			16/Sep/24	16/Sep/24	16/Sep/24	16/Sep/24	16/Sep/24	16/Sep/24	16/Sep/24
Total Aluminum (Al)	µg/L	5 [2]	***14.1***	***10.3***	***88.3***	-	***239***	***161***	***122***
Total Antimony (Sb)	µg/L	9	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10
Total Arsenic (As)	µg/L	5	1.95	***7.61***	1.25	-	1.26	1.45	1.39
Total Barium (Ba)	µg/L	1,000	159	286	139	-	35.6	39.2	38.8
Total Beryllium (Be)	µg/L	0.15	<0.020	<0.020	<0.020	-	<0.020	<0.020	<0.020
Total Bismuth (Bi)	µg/L	-	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050
Total Boron (B)	µg/L	1,500	<10	29	<10	-	16	18	17
Total Cadmium (Cd)	µg/L	0.04 - 0.37 [3]	<0.0050	<0.0050	0.0071	-	0.0075	0.0111	<0.0050
Total Calcium (Ca)	µg/L	-	20,200	26,600	7,320	-	31,700	31,700	32,100
Total Cesium (Cs)	µg/L	-	<0.010	<0.010	0.018	-	0.074	0.046	0.038
Total Chromium (Cr)	µg/L	8.9	0.54	<0.50	<0.50	-	0.68	0.58	<0.50
Total Cobalt (Co)	µg/L	0.78 - 1.8 [4]	0.36	***1.98***	***1.26***	-	0.25	0.25	0.19
Total Copper (Cu)	µg/L	2 - 4 [5]	<0.50	<0.50	<0.50	-	0.55	0.87	<0.50
Total Iron (Fe)	µg/L	300	***1,890***	***7,380***	***8,710***	-	***530***	***571***	***525***
Total Lead (Pb)	µg/L	1 to 7 [6]	0.064	0.099	0.388	-	0.233	0.621	0.139
Total Lithium (Li)	µg/L	-	<1.0	2.0	<1.0	-	2.8	2.3	2.5
Total Magnesium (Mg)	µg/L	-	2,370	3,720	1,610	-	3,820	3,740	3,890
Total Manganese (Mn)	µg/L	-	1,440	1,980	4,960	-	121	145	158
Dissolved Manganese (Mn)	µg/L	90 to 1500 [7]	***1,350***	***1,860***	***4,760***	-	98	133	145
Total Mercury (Hg)	µg/L	0.026	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	<0.0050
Total Molybdenum (Mo)	µg/L	73	<0.050	0.091	0.079	-	0.449	0.438	0.418
Total Nickel (Ni)	µg/L	25 - 150 [8]	<0.50	1.0	<0.50	-	0.51	0.63	<0.50
Total Potassium (K)	µg/L	-	1,850	3,540	1,350	-	2,570	2,670	2,680
Total Rubidium (Rb)	µg/L	-	0.99	1.62	2.96	-	1.84	1.71	1.87
Total Selenium (Se)	µg/L	1	<0.050	<0.050	0.051	-	0.072	0.082	0.080
Total Silicon (as SiO2)	mg/L	-	13.1	14.9	10.3	-	9.54	9.00	8.92
Total Silicon (Si)	µg/L	-	6,140	6,970	4,810	-	4,460	4,210	4,170
Total Silver (Ag)	µg/L	0.25	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010
Total Sodium (Na)	µg/L	-	11,700	14,400	21,900	-	17,000	17,200	18,400
Total Strontium (Sr)	µg/L	21,000	44.1	82.3	25.0	-	119	122	123
Total Sulfur (S)	µg/L	-	1,210	1,080	980	-	7,980	7,930	7,670
Total Tellurium (Te)	µg/L	-	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20
Total Thallium (Tl)	µg/L	0.8	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010
Total Thorium (Th)	µg/L	-	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10
Total Tin (Sn)	µg/L	-	<0.10	<0.10	<0.10	-	<0.10	0.13	<0.10
Total Titanium (Ti)	µg/L	-	<0.30	<0.30	0.97	-	5.41	3.78	2.96
Total Tungsten (W)	µg/L	-	<0.10	<0.10	<0.10	-	<0.10	<0.10	<0.10
Total Uranium (U)	µg/L	15	0.036	0.028	<0.010	-	0.989	0.961	0.918
Total Vanadium (V)	µg/L	120	<0.50	<0.50	0.54	-	1.34	1.18	1.07
Total Zinc (Zn)	µg/L	-	<3.0	<3.0	<3.0	-	<3.0	3.1	<3.0
Dissolved Zinc (Zn)	µg/L	7 [9]	<1.0	<1.0	1.0	-	<1.0	1.7	1.6
Dissolved Zinrconium (Zr)	µg/L	-	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20

Notes:

value	- exceeds NSECC Tier I EQS
-	- no guideline

[1] 2021 Nova Scotia Environment & Climate Change (NSECC) Tier I Environmental Quality Standards (EQS) for surface water

[2] Aluminium Guideline for pH < 6.5 = 5 ug/L
Aluminium Guideline for pH ≥ 6.5 = 100 ug/L

[3] At [CaCO3] = > 0 to < 17 mg/L, cadmium guideline = 0.04 µg/L
At [CaCO3] = ≥ 17 to ≤ 280 mg/L, cadmium guideline (µg/L) = $10^{\{0.83[\log(\text{hardness})] - 2.46\}}$
At [CaCO3] = > 280 mg/L, cadmium guideline = 0.37 µg/L

[4] At [$CaCO_3$] = 0 to ≤52 mg/L, cobalt guideline = 0.78 ug/L
At [$CaCO_3$] = >52 to ≤396 mg/L, cobalt guideline = $e^{\{0.414[\ln(\text{hardness})]-1.887\}}$
At [$CaCO_3$] = >396 mg/L, cobalt guideline = 1.8 ug/L

[5] At [CaCO3] = > 180 mg/L, copper guideline = 40 ug/L.

[5] At [$CaCO_3$] = 0 to 120 mg/L, copper guideline = 2 ug/L.
At [CaCO3] = ≥82 to ≤180 mg/L, copper guideline = 0.2 * e{0.8545[ln(hardness)]-1.465}
At [CaCO3] = > 180 mg/L, copper guideline = 4 ug/L.

[6] At [$CaCO_3$] = 0 to ≤60 mg/L, lead guideline = 1 ug/L
At [$CaCO_3$] = >60 to ≤180 mg/L, lead guideline = $e^{\{1.273[\ln(\text{hardness})]-4.705\}}$
At [$CaCO_3$] = >180 mg/L, lead guideline = 7 ug/L

[7] Manganese 2019 CCME Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life Appendix B - Manganese - Canadian Water Quality Guideline and Benchmark Calculator

[8] Nickle Guideline - At [CaCO3] = 0 to 60 mg/L, nickel guideline = 25 ug/L.
At [CaCO3] = > 60 to ≤ 180 mg/L, nickel guideline (µg/L) = e{0.76[ln(hardness)]+1.06}
At [CaCO3] = > 180 mg/L, nickel guideline = 150 µg/L

[9] Zinc Guideline - 10 exp0.947[ln(hardness mg·L-1)] - 0.815[pH] + 0.398[ln(DOC mg·L-1)] + 4.625
When CaCO3 23.4 to 399 mg/L and pH 6.5 to 8.13
Otherwise, zinc guideline = 7 ug/L

TABLE 5B: Surface Water Results - Metals and Elements - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe - Ref No. 2408035.000

Parameter	Units	NSECC Tier I EQS [1]	Sample ID						
			SW7	SW7A	SW19B	SW20A	SW24-1	SW24-2	SW24-3
			16/Sep/24	16/Sep/24	16/Sep/24	16/Sep/24	16/Sep/24	16/Sep/24	16/Sep/24
Field Readings									
Field pH	pH units	6.5-9.0	***6.43***	***6.24***	***6.47***	Dry	7.26	6.91	6.88
Field Conductivity	uS/cm	-	168.5	225.0	157.5	-	254.8	257.9	262.3
Field Temperature	°C	-	7.7	8.1	9.5	-	9.6	9.2	9.2
Physical Tests									
Conductivity	µS/cm	-	190	255	177	-	293	299	302
Alkalinity, bicarbonate (as HCO3)	mg/L	-	77.2	117	43.0	-	73.3	71.7	74.7
Alkalinity, carbonate (as CO3)	mg/L	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	mg/L	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	mg/L	-	63.3	95.9	35.3	-	60.1	58.8	61.2
Colour, apparent	CU	-	68.0	212	505	-	32.3	36.3	36.2
Hardness (as CaCO3), dissolved	mg/L	-	60.2	81.7	24.9	-	94.9	94.6	96.2
Langelier index (@ 4°C)	-	-	-0.944	-0.951	-2.01	-	-0.52	-0.742	-0.642
Solids, total dissolved [TDS]	mg/L	-	109	144	117	-	178	180	188
Turbidity	NTU	-	5.74	25.9	45.1	-	4.51	5.06	4.23
pH	pH units	6.5 - 9.0	7.55	7.26	7.18	-	7.83	7.62	7.70
Langelier index (@ 20°C)	-	-	-0.693	-0.699	-1.76	-	-0.273	-0.491	-0.391
pH, saturation (@ 4°C)	pH units	-	8.49	8.21	9.19	-	8.35	8.36	8.34
pH, saturation (@ 20°C)	pH units	-	8.24	7.96	8.94	-	8.10	8.11	8.09
Anions and Nutrients									
Ammonia, total (as N)	mg/L	varies [3]	0.256	1.4	0.264	-	0.0371	0.0829	0.0724
Chloride	mg/L	120	17.0	18.6	31.4	-	32.4	33.5	35.0
Fluoride	mg/L	0.12	0.022	0.021	<0.020	-	0.036	0.043	0.037
Nitrate (as N)	mg/L	3 [4]	0.086	0.068	0.051	-	2.27	2.51	2.17
Nitrate + Nitrite (as N)	mg/L	-	0.122	0.068	0.077	-	2.28	2.53	2.2
Nitrite (as N)	mg/L	0.06	0.036	<0.010	0.026	-	0.012	0.017	0.034
Phosphate, ortho-, dissolved (as P)	mg/L	-	0.005	<0.0010	0.0067	-	0.0469	0.0408	0.0318
Total Phosphorous (P)	µg/L	-	10.4	32.2	73.8	-	109	96.4	86.2
Silicate (as SiO2)	mg/L	-	11.0	12.0	8.33	-	7.34	6.90	7.28
Sulfate (as SO4)	mg/L	128 [5]	2.97	2.44	2.04	-	22.1	22.7	21.4
Organic / Inorganic Carbon									
Carbon, total organic [TOC]	mg/L	-	3.11	3.52	12.2	-	3.09	3.00	2.99
Ion Balance									
Anion sum	meq/L	-	1.82	2.50	1.64	-	2.74	2.78	2.82
Cation sum	meq/L	-	1.90	2.79	2.01	-	2.75	2.76	2.83
Ion balance (cations/anions)	%	-	104	112	122	-	100	99.3	100

Notes:

value	- exceeds NSECC Tier I EQS
-	- no guideline

[1] 2021 Nova Scotia Environment & Climate Change (NSECC) Tier I Environmental Quality Standards (EQS) for surface water
[2] 1999 (Update 2021) Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life.
[3] Ammonia - calculations as per http://st-ts.ccme.ca/en/index.html?lang=en&factsheet=5#aql_fresh_concentration.
[4] Nitrate guideline has been converted from Nitrate (as NH4) to Nitrate (as N)
[5] At [$CaCO_3$] = 0 to ≤30 mg/L, sulphate guideline = 128 mg/L
At [$CaCO_3$] = >30 to ≤75 mg/L, sulphate guideline = 218 mg/L
At [$CaCO_3$] = >75 to ≤180 mg/L, sulphate guideline = 309 mg/L
At [$CaCO_3$] = >180 mg/L, sulphate guideline = 429 mg/L

TABLE 5C: Surface Water Results - Metals and Elements - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe - Ref No. 2408035.000

Parameter	Units	RDL	RDL x5	SW24-1		RPD (%)
				17/Sep/24	GW DUP	
Total Aluminum (Al)	µg/L	3.0	15.0	239	176	30.4
Total Antimony (Sb)	µg/L	0.10	0.50	<0.10	<0.10	NC
Total Arsenic (As)	µg/L	0.10	0.50	1.26	1.23	2.4
Total Barium (Ba)	µg/L	0.10	0.50	35.6	34.5	3.1
Total Beryllium (Be)	µg/L	0.020	0.10	<0.020	<0.020	NC
Total Bismuth (Bi)	µg/L	0.050	0.3	<0.050	<0.050	NC
Total Boron (B)	µg/L	10	50.0	16	16	NC
Total Cadmium (Cd)	µg/L	0.0050	0.03	0.0075	<0.0050	NC
Total Calcium (Ca)	µg/L	100	500	31,700	31,800	0.3
Total Cesium (Cs)	µg/L	0.010	0.05	0.074	0.06	20.9
Total Chromium (Cr)	µg/L	0.50	2.50	0.68	0.54	23.0
Total Cobalt (Co)	µg/L	0.10	0.50	0.25	0.21	NC
Total Copper (Cu)	µg/L	0.50	2.50	0.55	<0.50	NC
Total Iron (Fe)	µg/L	10	50.0	530	445	17.4
Total Lead (Pb)	µg/L	0.050	0.25	0.233	0.183	NC
Total Lithium (Li)	µg/L	1.0	5.00	2.8	2.5	NC
Total Magnesium (Mg)	µg/L	5.0	25.0	3,820	3,740	2.1
Dissolved Manganese (Mn)	µg/L	0.1	0.50	121	102	17.0
Total Manganese (Mg)	µg/L	0.10	0.50	121	118	2.5
Total Mercury (Hg)	µg/L	0.005	0.03	<0.0050	<0.0050	NC
Total Molybdenum (Mo)	µg/L	0.05	0.25	0.449	0.442	1.6
Total Nickel (Ni)	µg/L	0.50	2.50	0.51	<0.50	NC
Total Phosphorous (P)	µg/L	2	10	109	99.5	9.1
Total Potassium (K)	µg/L	50	250	2,570	2,590	0.8
Total Rubidium (Rb)	µg/L	0.20	1.00	1.84	1.86	1.1
Total Selenium (Se)	µg/L	0.05	0.25	0.072	0.076	NC
Total Silicon (as SiO2)	mg/L	0.25	1.25	9.54	9	5.8
Total Silicon (Si)	µg/L	100	500	4,460	4,210	5.8
Total Silver (Ag)	µg/L	0.01	0.05	<0.010	<0.010	NC
Total Sodium (Na)	µg/L	50	250	17,000	16,900	0.6
Total Strontium (Sr)	µg/L	0.20	1.00	119	117	1.7
Total Sulfur (S)	µg/L	500	2500	7980	7980	0.0
Total Tellurium (Te)	µg/L	0.20	1.00	<0.20	<0.20	NC
Total Thallium (Tl)	µg/L	0.01	0.05	<0.010	<0.010	NC
Total Thorium (Th)	µg/L	0.10	0.50	<0.10	<0.10	NC
Total Tin (Sn)	µg/L	0.10	0.50	<0.10	<0.10	NC
Total Titanium (Ti)	µg/L	0.30	1.50	5.41	4.19	25.4
Total Tungsten (W)	µg/L	0.10	0.50	<0.10	<0.10	NC
Total Uranium (U)	µg/L	0.01	0.05	0.989	0.984	0.5
Total Vanadium (V)	µg/L	0.50	2.50	1.34	1.22	NC
Dissolved Zinc (Zn)	µg/L	1.00	5.00	<1.0	<1.0	NC
Total Zinc (Zn)	µg/L	3.0	15.0	3.3	<3.0	NC
Total Zirconium (Zr)	µg/L	0.20	1.00	<0.20	<0.20	NC

Notes:

value	- RDP outside of acceptable range
RDL	- Reportable Detection Limit
RPD	- Relative Percent Difference
NC	- Non-calculable

RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 40% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

TABLE 5D: Surface Water Results - Metals and Elements - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe - Ref No. 2408035.000

Parameter	Units	RDL	RDL x5	SW24-1		RPD (%)
				17/Sep/24	GW DUP	
Physical Tests						
Conductivity	µS/cm	1.0	5.0	293	291	0.7
Alkalinity, bicarbonate (as HCO3)	mg/L	1.0	5.0	73.3	71	3.2
Alkalinity, carbonate (as CO3)	mg/L	1.0	5.0	<1.0	<1.0	NC
Alkalinity, hydroxide (as OH)	mg/L	1.0	5.0	<1.0	<1.0	NC
Alkalinity, total (as CaCO3)	mg/L	1.0	5.0	60.1	58.2	3.2
Colour, apparent	CU	2.0	10	32	30.7	5.1
Hardness (as CaCO3), dissolved	mg/L	0.50	2.5	94.9	94.8	0.1
Langelier index (@ 4°C)	-	0.010	0.050	-0.52	-0.715	31.6
Solids, total dissolved [TDS]	mg/L	10	50	178	182	2.2
Turbidity	NTU	0.10	0.50	4.51	4.76	5.4
pH	pH units	0.10	0.50	7.83	7.65	2.3
Langelier index (@ 20°C)	-	0.010	0.050	-0.273	-0.464	51.8
pH, saturation (@ 4°C)	pH units	0.010	0.050	8.35	8.36	0.1
pH, saturation (@ 20°C)	pH units	0.010	0.050	8.1	8.11	0.1
Anions and Nutrients						
Ammonia, total (as N)	mg/L	0.0050	0.0250	0.0371	0.0277	29.0
Chloride	mg/L	0.50	2.5	32.4	33.3	2.7
Fluoride	mg/L	0.020	0.10	0.036	0.045	NC
Nitrate (as N)	mg/L	0.020	0.10	2.270	2.32	2.2
Nitrate + Nitrite (as N)	mg/L	0.0032	0.0160	2.28	2.33	2.2
Nitrite (as N)	mg/L	0.010	0.050	0.012	0.014	NC
Phosphate, ortho-, dissolved (as P)	mg/L	0.0010	0.0050	0.0469	0.0518	NC
Silicate (as SiO2)	mg/L	0.50	2.5	7.34	6.91	6.0
Sulfate (as SO4)	mg/L	0.30	1.5	22.1	22.8	3.1
Organic / Inorganic Carbon						
Carbon, total organic [TOC]	mg/L	0.50	2.5	3.09	2.86	7.7
Ion Balance						
Anion sum	meq/L	0.10	0.50	2.74	2.75	0.4
Cation sum	meq/L	0.10	0.50	2.75	2.74	0.4
Ion balance (cations/anions)	%	0.010	0.050	100	99.6	0.4

Notes:

value	- RDP outside of acceptable range
RDL	- Reportable Detection Limit
RPD	- Relative Percent Difference
NC	- Non-calculable

RPD is considered non-calculable where concentrations are less than five times the laboratory detection limit.
RPD results of within 40% are considered to be acceptable.
Where RPD is non-calculable, results are considered acceptable where the difference between concentrations is less than the laboratory detection limit.

Table 6 - Landfill Gas Results

Table 6: Landfill Gas Results
Meadowview Well Observations and Field Data - 2024
Client: Municipality of the County of Kings
Site: Meadowview Landfill
Englobe - Ref No. 2408035.000

MW ID	Gas Monitoring			
	Methane (ppm)	Methane LEL	Oxygen (%)	Carbon Dioxide (%)
MW4-A	0	0	21.1	0.3
MW4-C	0	0	20.9	0.5
MW12-A	0	0	20.4	0.1
MW19-A	0	0	20.7	0.1
MW21-C	0	0	20.5	0
MW22-A	0	0	21.4	0.1
MW22-B	0	0	21.3	0.2
MW22-C	0	0	21.4	0.1
MW23-A	0	0	21.2	0.1
MW23-B	0	0	21.2	0.1
MW23-C	0	0	21.2	0.1
MW24-A	0	0	21.1	0.2
MW24-B	0	0	12.2	0.3
MW25-B	0	0	18.6	0.1
MW26-B	0	0	20.8	0.1
MW27-B	0	0	20.6	0.2
MW27-C	0	0	20.6	0.1
MW28-B	0	0	21.1	0.1
MW29-B	0.1	0	21.2	0.1
MW29-C	0	0	21.1	0.1
MW32-A	0	0	18.2	0.3
MW35-A	0	0	20.6	0.2
MW36-A	0	0	20.4	0.3
TH1	0	0	20.9	0.8
TH2	0	0	21	0.1

Graphs

Figure D-1: Groundwater Area 1 - Ammonia

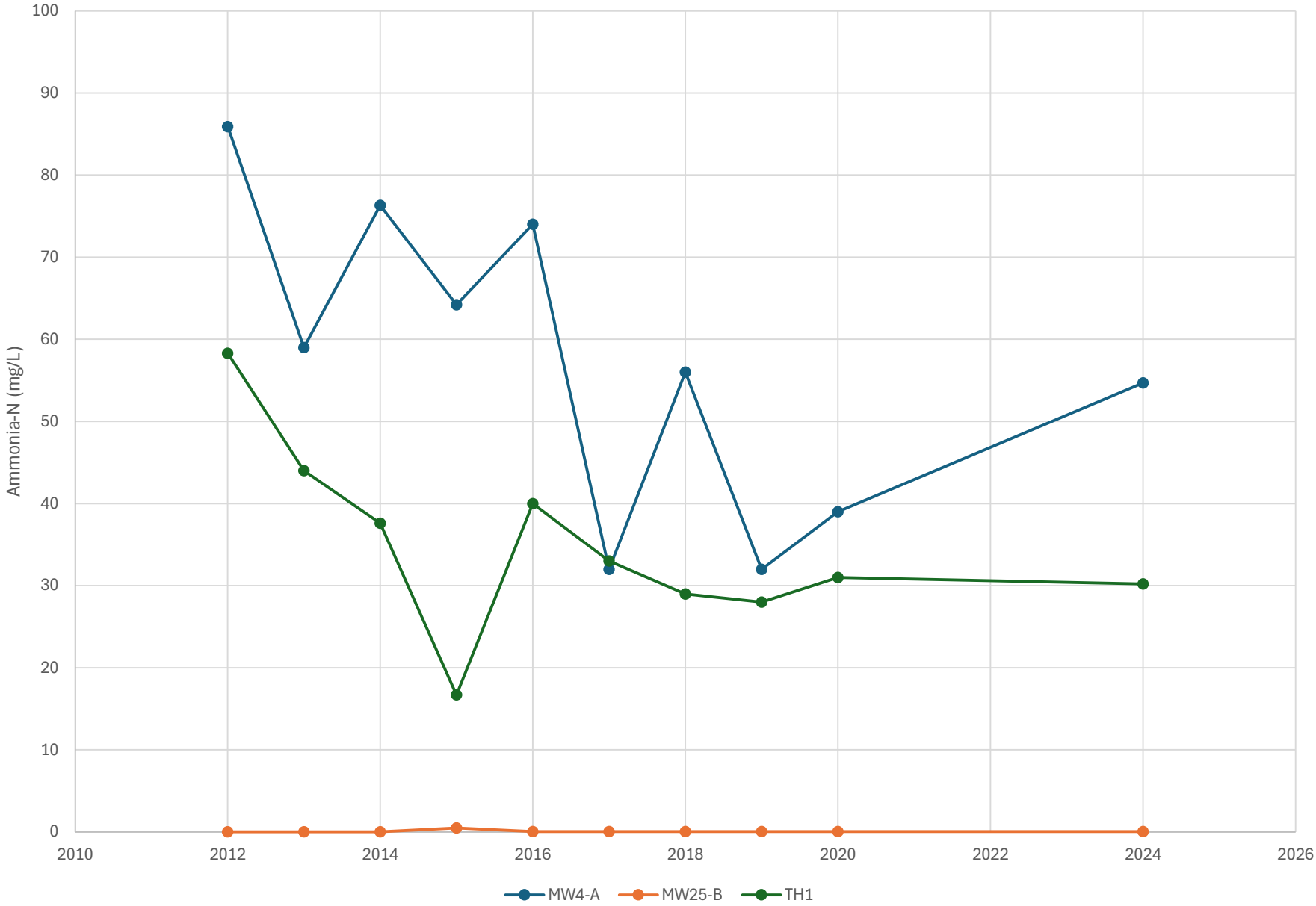


Figure D-2: Groundwater Area 2 - Ammonia

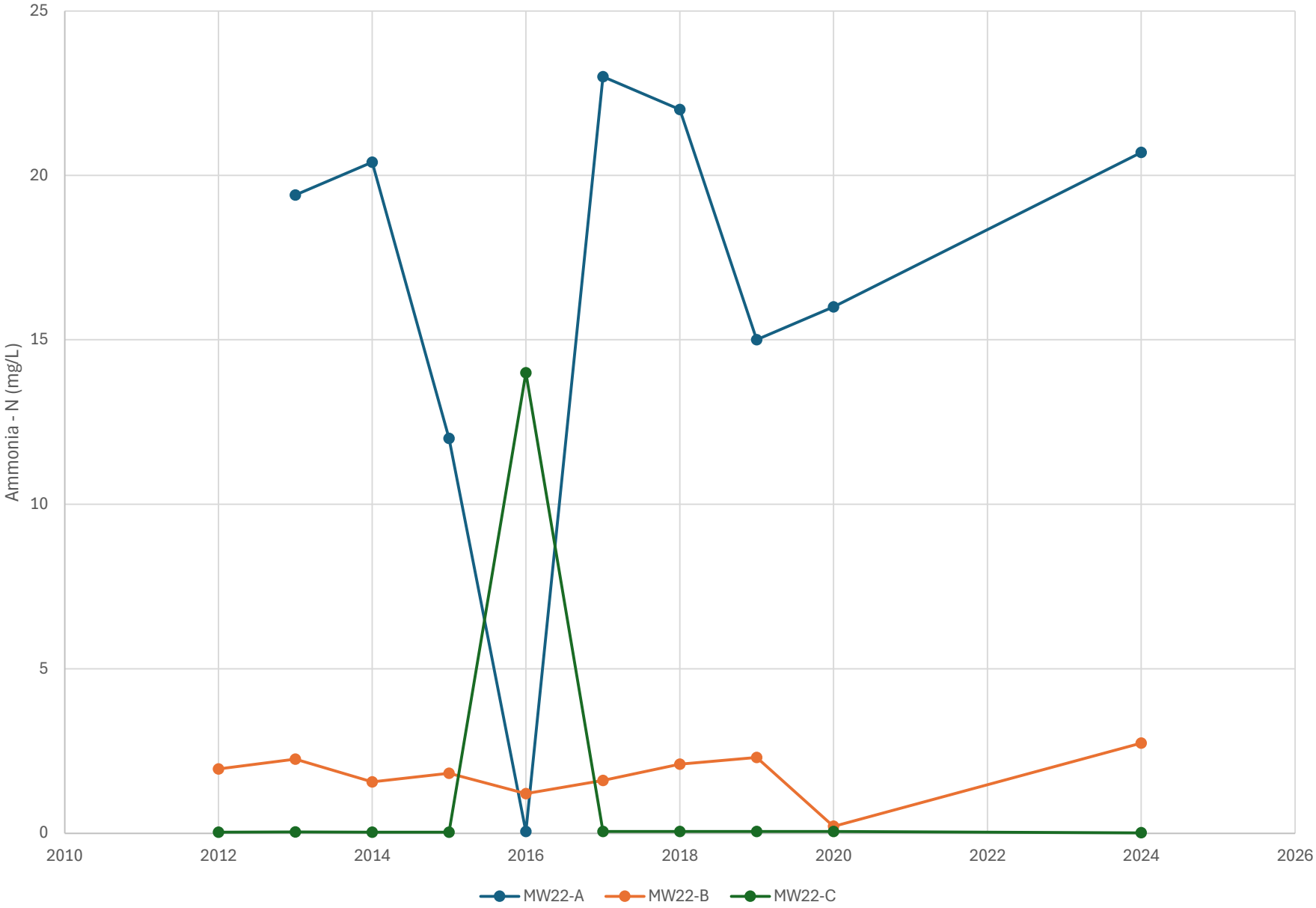


Figure D-3: Groundwater Area 1 - Chloride

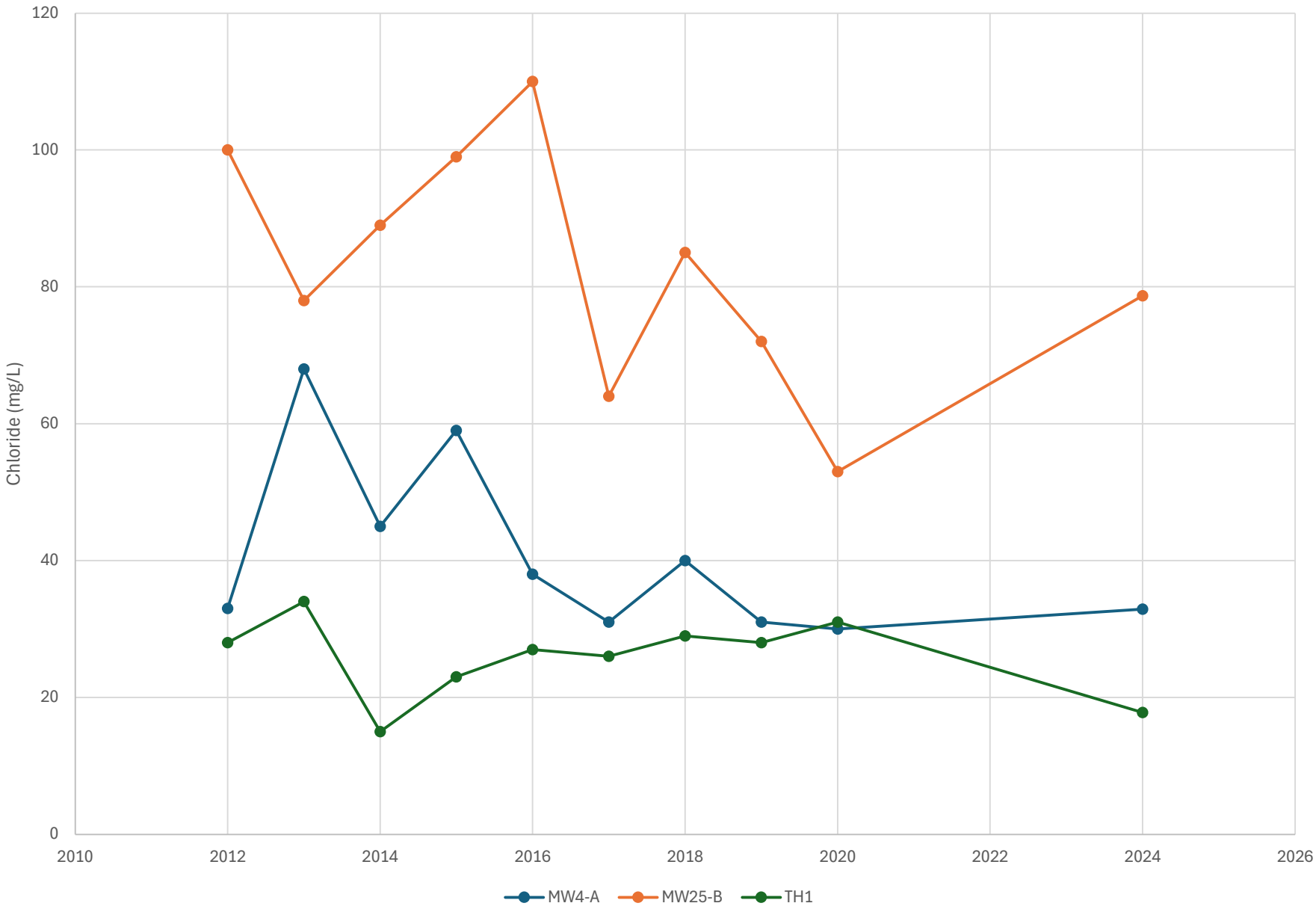


Figure D-4: Groundwater Area 2 - Chloride

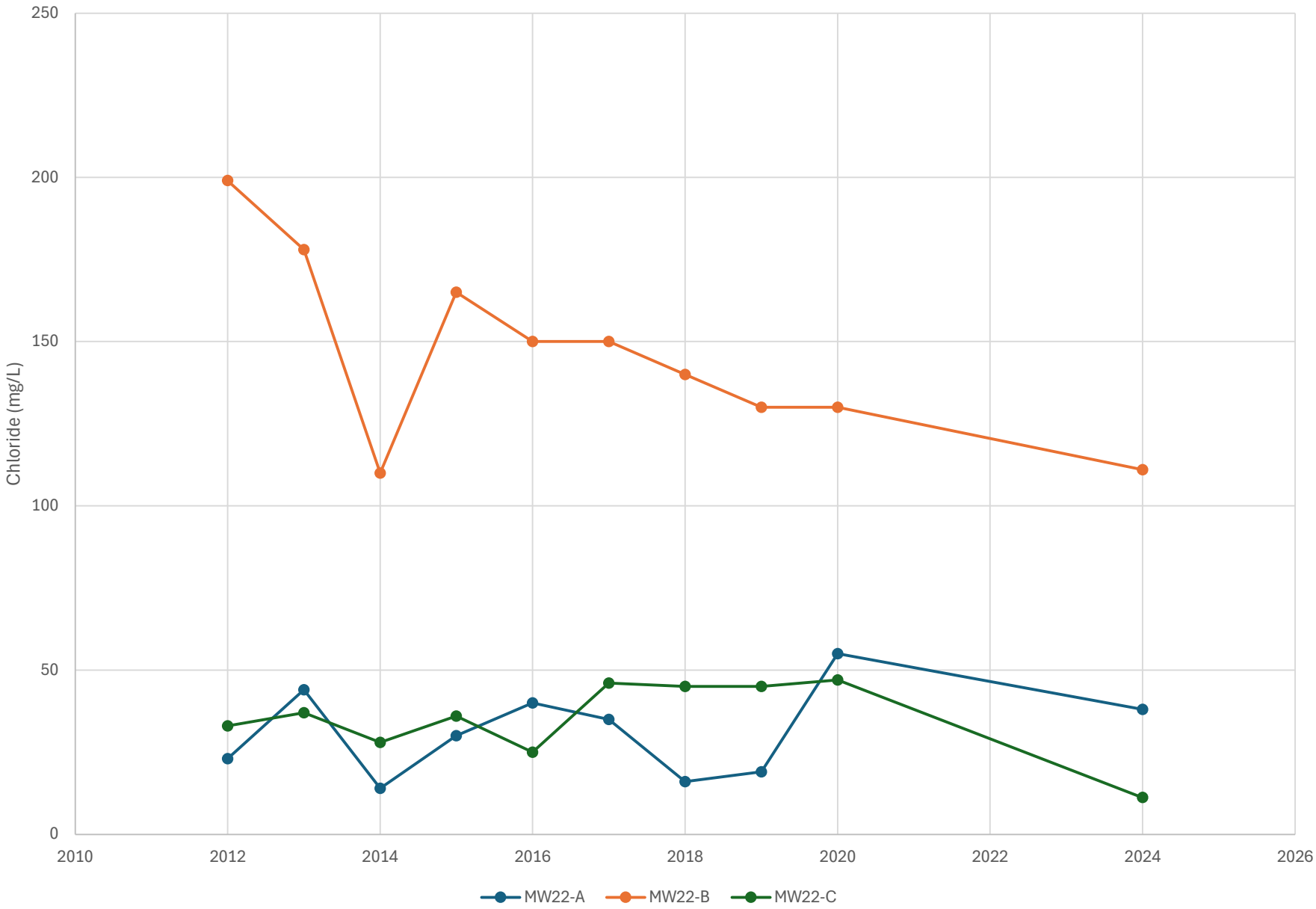


Figure D-5: Groundwater Area 1 - Conductivity

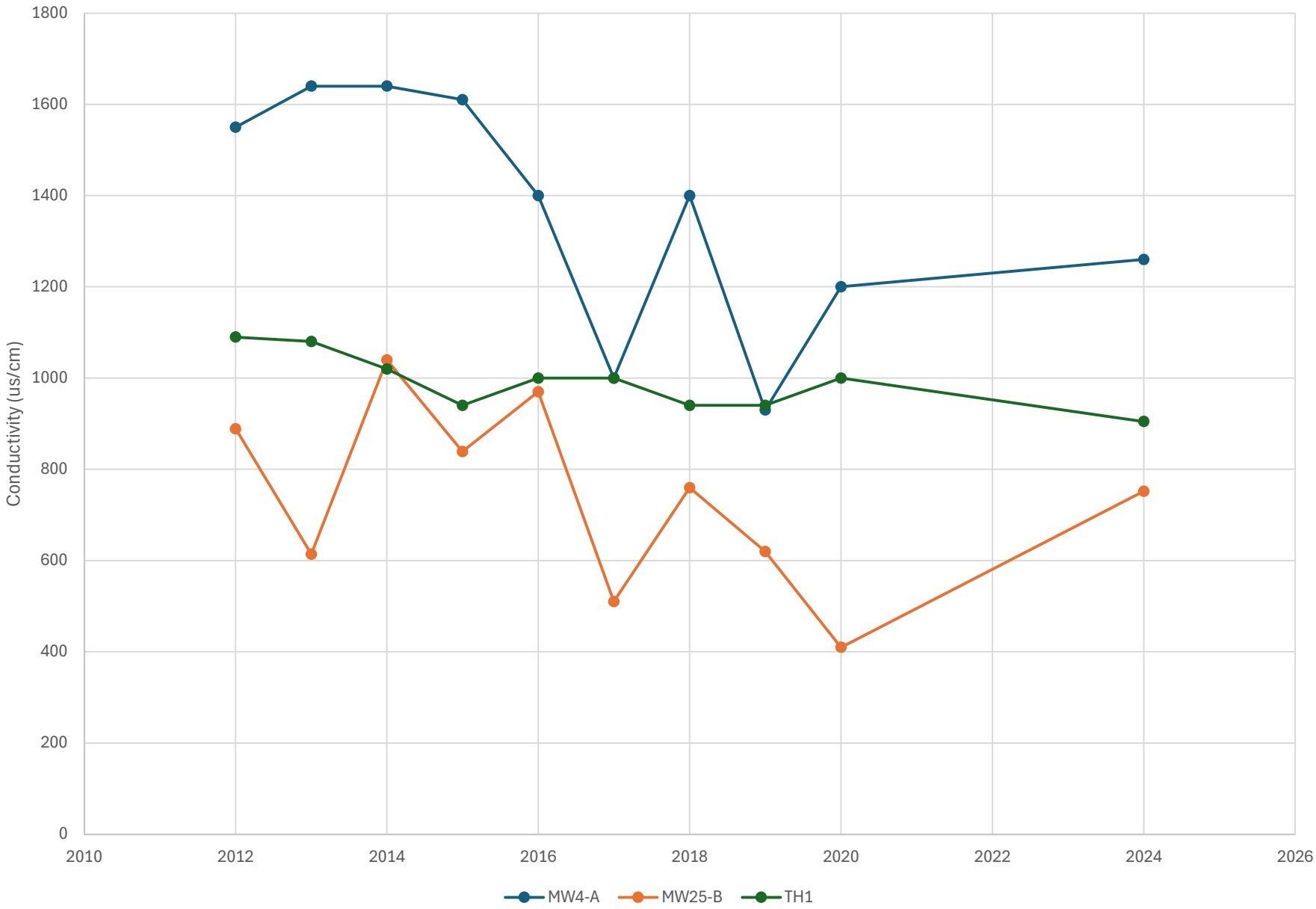


Figure D-6: Groundwater Area 2 - Conductivity

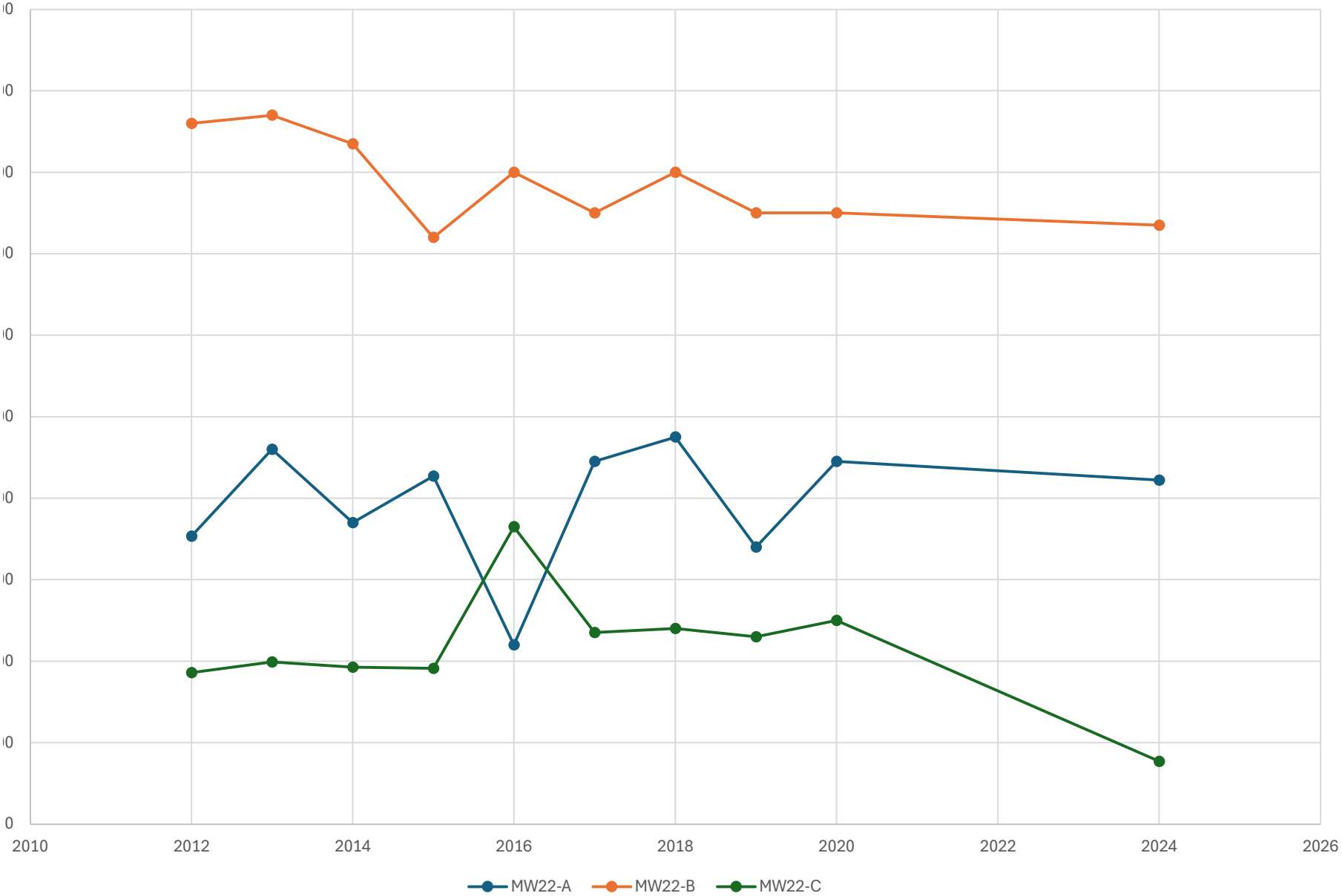


Figure D-7: Surface Water Ammonia

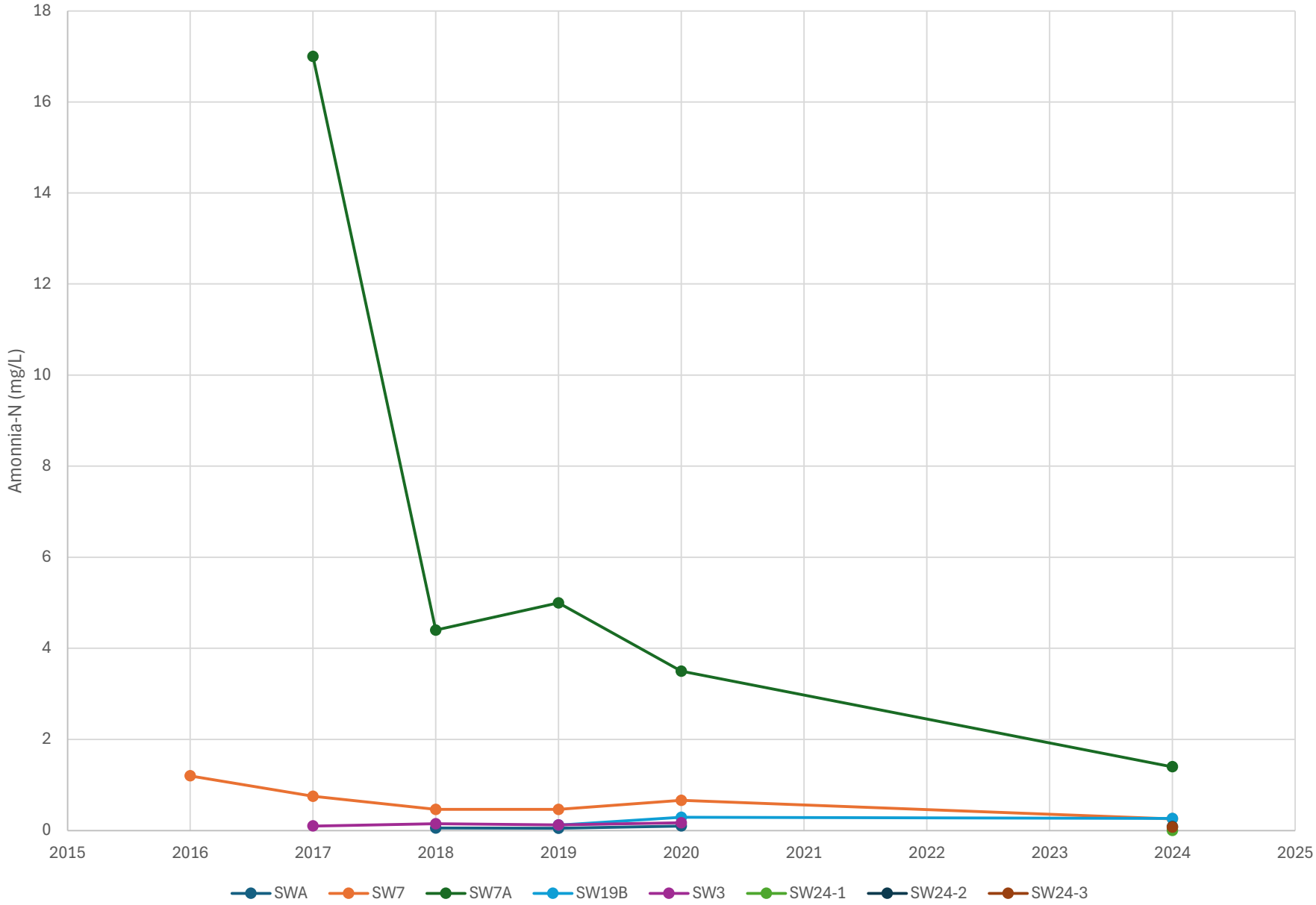


Figure D-8: Surface Water Chloride

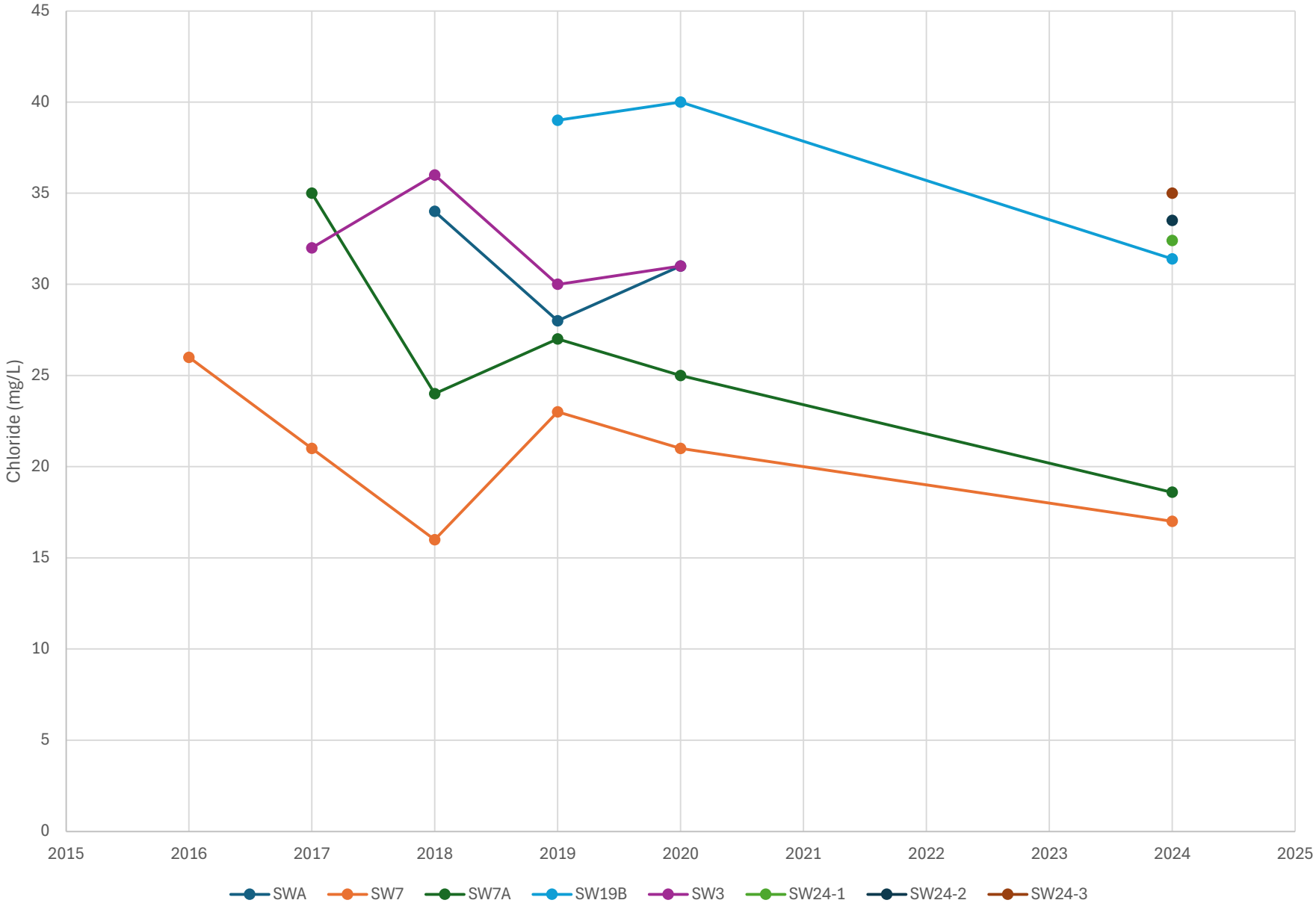
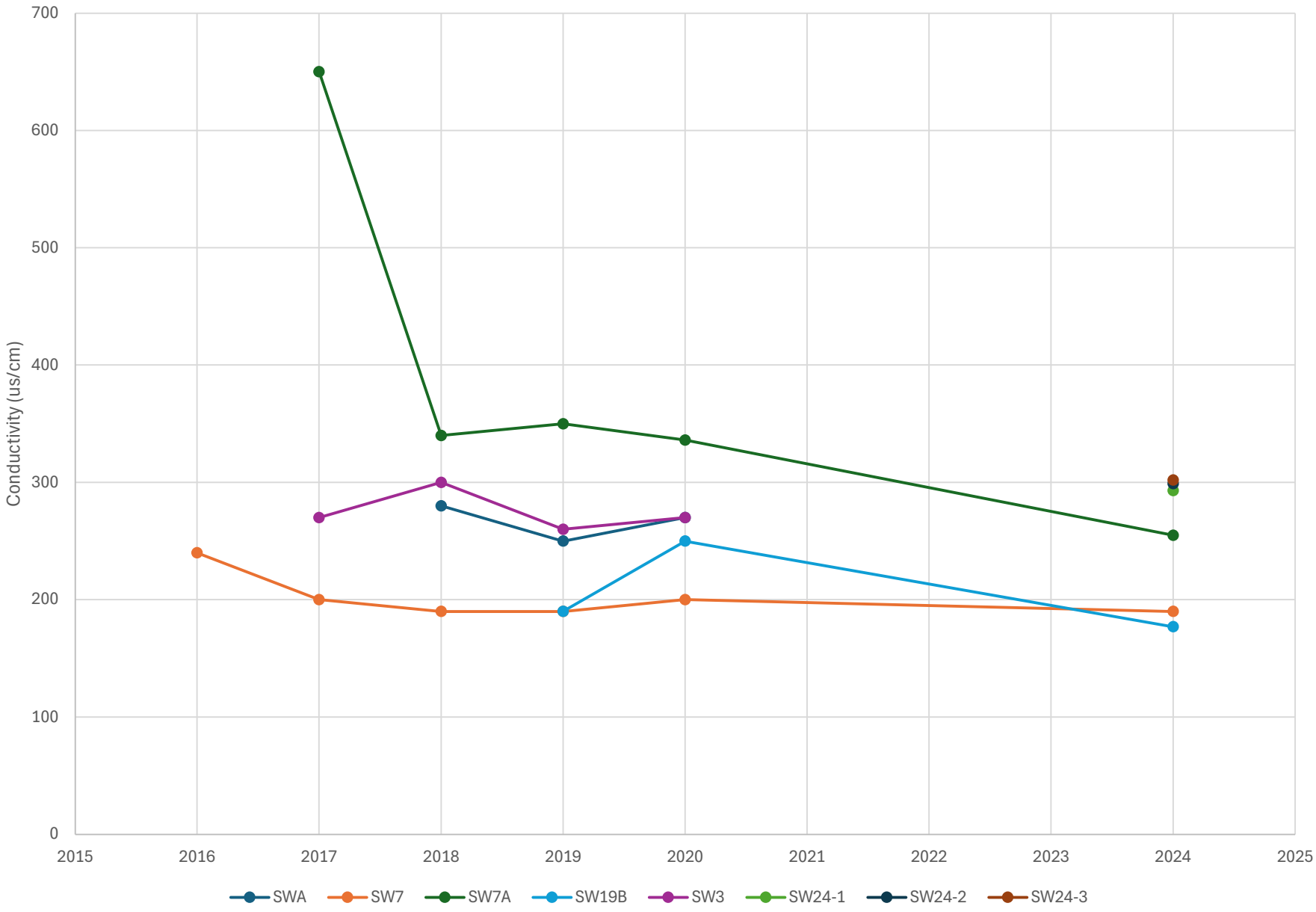
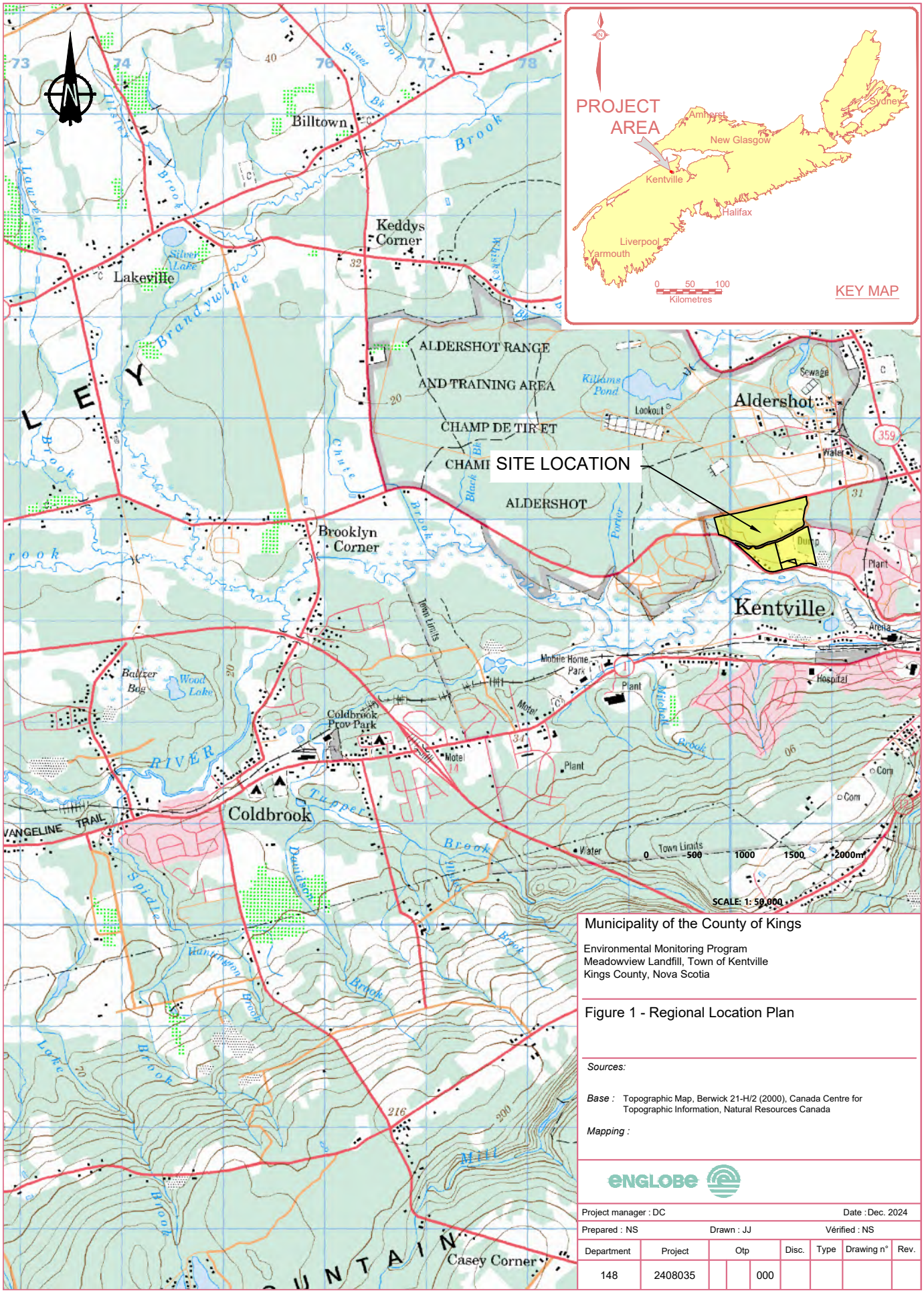


Figure D-9: Surface Water Conductivity



Figures



Municipality of the County of Kings

Environmental Monitoring Program
Meadowview Landfill, Town of Kentville
Kings County, Nova Scotia

Figure 1 - Regional Location Plan

Sources:

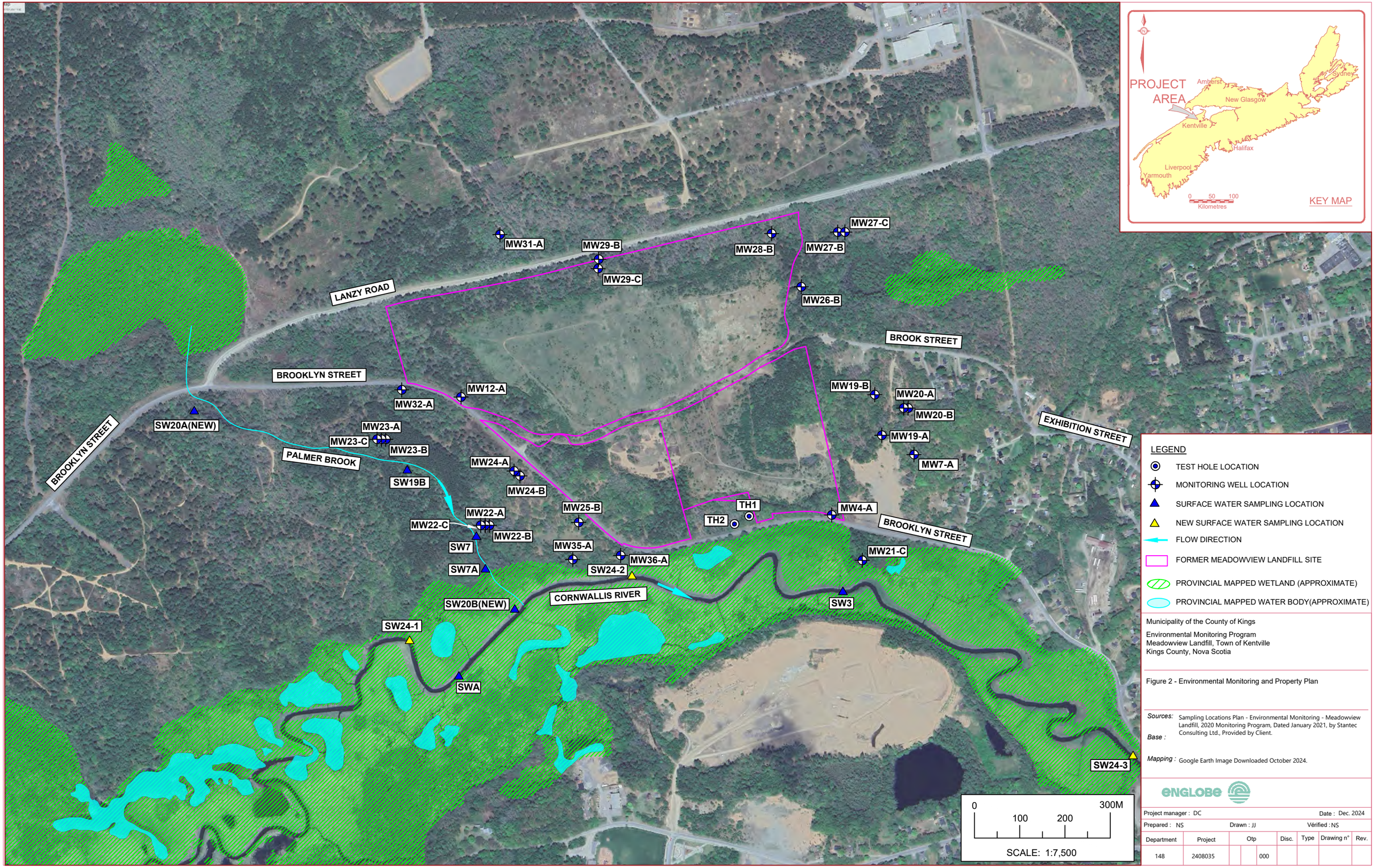
Base : Topographic Map, Berwick 21-H/2 (2000), Canada Centre for Topographic Information, Natural Resources Canada

Mapping :

ENGLOBE

Project manager : DC					Date : Dec. 2024			
Prepared : NS		Drawn : JJ			Vérified : NS			
Department	Project	Otp			Disc.	Type	Drawing n°	Rev.
148	2408035			000				

Figure 2 - Environmental Monitoring and Property Plan



Municipality of the County of Kings

Environmental Monitoring Program
Meadowview Landfill, Town of Kentville
Kings County, Nova Scotia

Figure 2 - Environmental Monitoring and Property Plan

Sources: Sampling Locations Plan - Environmental Monitoring - Meadowview Landfill, 2020 Monitoring Program, Dated January 2021, by Stantec Consulting Ltd., Provided by Client.

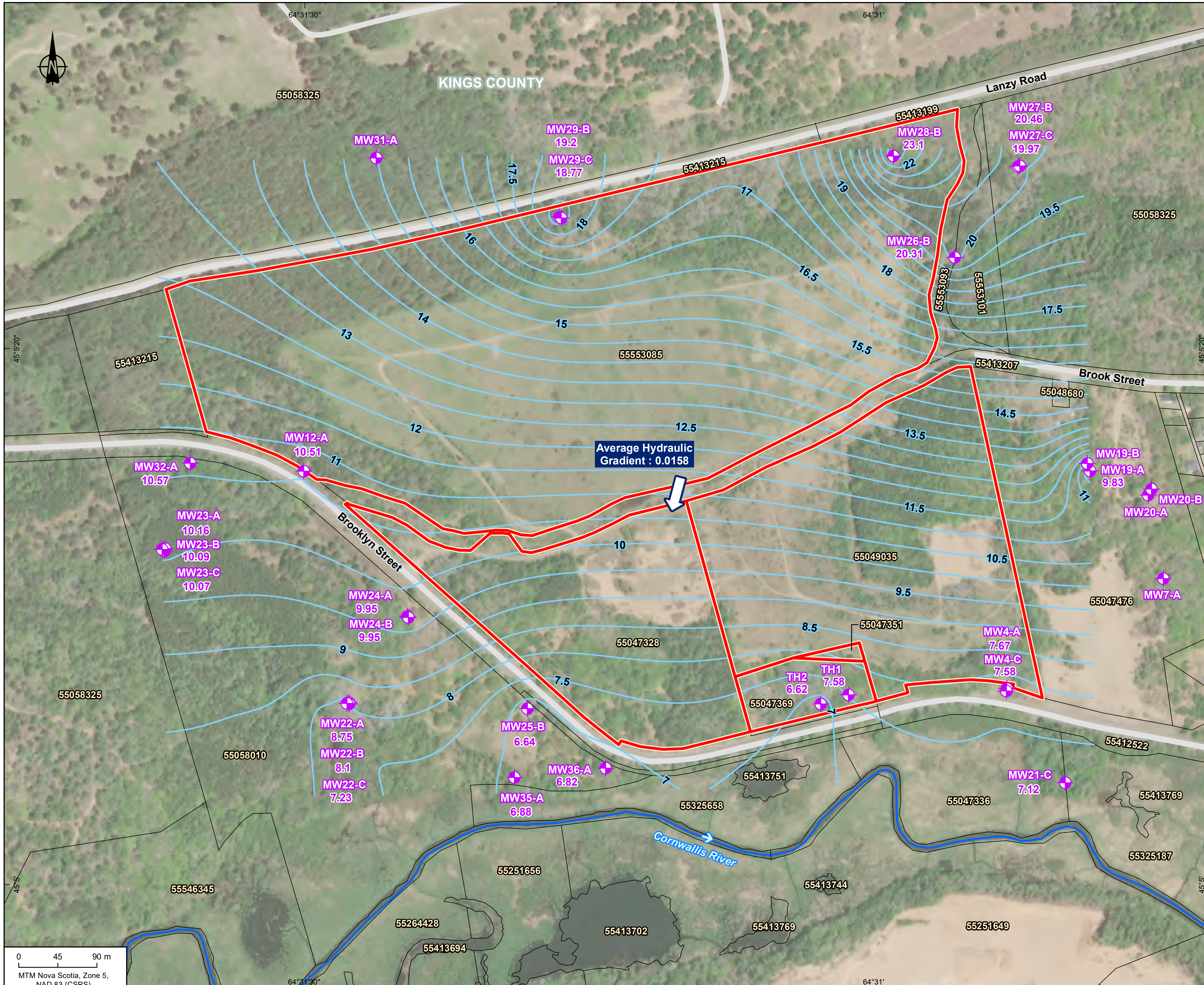
Base :

Mapping : Google Earth Image Downloaded October 2024.

ENGLOBE

Project manager : DC					Date : Dec. 2024		
Prepared : NS		Drawn : JJ			Vérified : NS		
Department	Project	Otp			Disc.	Type	Drawing n°	Rev.
148	2408035			000				

Figure 3 - Groundwater Table and Flow Direction Plan



Project Components

- Former Meadowview Landfill Site
- Property Line
- 55098325 Property Line Identifier (PID)
- MW19-A — Property Line Identifier (PID); 20.31 — Groundwater Elevation; Monitoring Well
- Groundwater Flow Direction
- 12.5 Groundwater Elevation, Contour 0.5 m

Hydrography

- Watercourse
- Flow Direction

Infrastructure

- Road

Municipality of the County of Kings

Environmental Monitoring Program for Meadowview Landfill

Figure 3

Groundwater Contours and Flow Direction Plan

Sources :

Base : Orthophoto, © 2014 DigitalGlobe Image courtesy of USGS
Canvec 50K. Gov. of Canada. 2023
Canvec 1M. Gov. of Canada. 2023
Property, NSPRD, Gov. of Nova Scotia, 2023

Mapping : Englobe, 2024

December 2024

ENGLOBE

DRAFT

Project manager : N. Sahakyan — Date : 2024-12-16

Prepared : N. Sahakyan — Drawn : F. Thériault — Verified : N. Sahakyan

Department	Projet	Sub-phase	Disc.	Type	Drawing n°	Rev.
148	2408035.000	0101	EN	F	01	0A

File : X:\2024_Deltek\2408035.000 Meadowview Landfill Environmental Monitoring Program\Project\2024_Program\24_CAD\GIS\2_carto\5_produit\0100\0101\version_0A\148-02408035-0100-0101-EN-F-03-0A_Groundwater_241217.mxd

Appendix A
Correspondence

ENGLOBE

Dan Hagan

From: Haverstock, Michael <Michael.Haverstock@novascotia.ca>
Sent: November 22, 2024 4:25 PM
To: Dan Hagan
Subject: RE: NSECC Approval for Meadowview Landfill - Municipality of the County of Kings
Attachments: Kentville Meadowview closure plan tables.pdf; Kentville Meadowview closure plan.pdf

We were able to find a copy of a closure plan.

I don't know if it is the most current though.

Note that this document might not show up in a past FOIPOP because it was just identified in other Department folders.

I don't know if there was any official documented classification of the landfill but will let you know if we find anything. More likely the classification is based on the vintage of the landfill.

Have a good weekend,

Mike Haverstock
District Engineer
Nova Scotia Department of Environment and Climate Change

From: Dan Hagan <dhagan@countyofkings.ca>
Sent: November 18, 2024 12:16 PM
To: Haverstock, Michael <Michael.Haverstock@novascotia.ca>
Subject: RE: NSECC Approval for Meadowview Landfill - Municipality of the County of Kings

Hi Michael –

Just following up from my email this morning – our environmental consultant (Englobe) has reviewed the documents you provided and were wondering if you could also look into this for us as well?

- Do you know if there was ever a "file closure document" (or equivalent) issued for the site? Perhaps circa 2011/2012 when the Approval was set to expire, per Condition 9 of the Approval?

We acknowledge that it may be hard to find information given the landfill was closed in the mid-late 1990s, but anything that you may be able to share would be very much appreciated as we try and understand some of the historical aspects to the site.

I note that as part of the *2018 Environmental Monitoring Program* for the Meadowview Landfill, our environmental consultants at the time (Stantec) noted the following in the *2018 Annual Monitoring Report*:

1.2.1 2018 Monitoring Plan Update
The environmental monitoring program for the Site was updated twice during 2017 based on a review of available data and to better align with regulatory requirements. The first update was provided to the Municipality and NSE and focused on reducing the number of sampling locations and adjusting the sampling frequency at some monitoring locations (Stantec Consulting Ltd. (b), 2017). Discussions with NSE further revealed that environmental compliance monitoring for the Site was not required as the Site is considered a Class 1 Landfill. As environmental compliance monitoring is no longer required from a regulatory perspective for Class 1 Landfills (as informed by NSE), the need for an ongoing monitoring program was re-examined from a due diligence perspective and Stantec recommended that the Municipality adjust the ongoing monitoring to focus on areas where potential impacts from the Site have been observed.

The Municipality has proceeded with the understanding that any continued monitoring at the site was a "due diligence effort", based on Stantec noting that discussions with NSECC had confirmed that monitoring was not required as the site is "considered a Class 1 Landfill". It would be great if there was some documentation to that effect from ~ 2017/2018…

Thanks in advance for your time –

Dan Hagan, P.Geo.
Municipality of the County of Kings
Strategic Project Specialist
t: (902) 690-6170
www.countyofkings.ca

From: Dan Hagan
Sent: November 18, 2024 9:20 AM
To: Haverstock, Michael <Michael.Haverstock@novascotia.ca>
Cc: Levy, Melissa <Melissa.Levy@novascotia.ca>
Subject: RE: NSECC Approval for Meadowview Landfill - Municipality of the County of Kings

Good morning, Michael (& Melissa):

Thank you so much for finding the electronic copies of our Industrial Approval and Terms & Conditions of Approval for our Meadowview Landfill. I will provide these to our environmental consultants for their review and consideration as part of our environmental monitoring program reporting for 2024.

I'll be in touch if we have anything additional questions – hope you both have a great week –

Dan.

Dan Hagan, P.Geo.
Municipality of the County of Kings
Strategic Project Specialist
t: (902) 690-6170
www.countyofkings.ca

From: Haverstock, Michael <Michael.Haverstock@novascotia.ca>
Sent: November 14, 2024 4:52 PM
To: Dan Hagan <dhagan@countyofkings.ca>
Cc: Levy, Melissa <Melissa.Levy@novascotia.ca>
Subject: RE: NSECC Approval for Meadowview Landfill - Municipality of the County of Kings

*** Your attachment(s) were cleaned by Check Point. Click here to restore the original(s) or contact your system administrator. ***

Hi Dan,

As Melissa may have mentioned, typically an Environmental Registry or Freedom of Information and Protection of Privacy Act information access request would be the best methods to request files from the ECC, but I think I can send you the Approval as the Approval Holder.

I understand that the Meadowview file was destroyed in accordance with ECC's record retention policy.

We were able to find an electronic copy of an approval though. See attached.

I've reached out to ECC's Solid Waste Program Lead to confirm the status of ECC's regulatory requirements for closed 1st generation landfills because a province-wide program has yet to be developed. I'll reach out to you after I hear back from him.

Thanks,

NOVA SCOTIA
Department of Environment and Climate Change

Michael Haverstock, M.Sc., P.Eng.
District Engineer
Inspection Compliance & Enforcement Division

136 Exhibition Street
Provincial Building Floor 2
Kentville, NS B4N 4E5

(902) 679-6086 (office) or (902) 478-1639 (mobile)
mike.haverstock@novascotia.ca

From: Dan Hagan <dhagan@countyofkings.ca>
Sent: November 12, 2024 9:10 AM
To: Haverstock, Michael <Michael.Haverstock@novascotia.ca>
Subject: NSECC Approval for Meadowview Landfill - Municipality of the County of Kings

Good morning, Mr. Haverstock:

I was chatting with one of your colleagues this morning (Melissa) regarding NSECC Western Regional Office sharing with us a copy of our NSECC Approval for the closed Meadowview Landfill (closed in 1996) in North Kentville.

It seems that a copy of this Approval may not be available for sharing through normal means, and I was wondering if you would be able to chat with me about if there are any other potential sources that we may be able to check to find a copy of the Approval for the closed landfill?

We ask because we have tasked our new environmental consultants, responsible for conducting our Environmental Monitoring Program for the site (groundwater, surface water, landfill gas), to advise us as to whether our continued environmental monitoring efforts for the site are a requirement of any existing Approvals from the Province or whether our efforts are related to due diligence efforts only.

Would you have any time this week to chat with me on this matter?

Many thanks in advance for your time -

Dan Hagan, P.Geo.
Municipality of the County of Kings
Strategic Project Specialist
t: (902) 690-6170
www.countyofkings.ca

Appendix B Photograph Log

ENGLOBE

Photo 1: Surface water sampling location SW24-1.

Photo 2: Surface water sampling location SW24-2.

Photo 3: Surface water sampling location SW24-3.

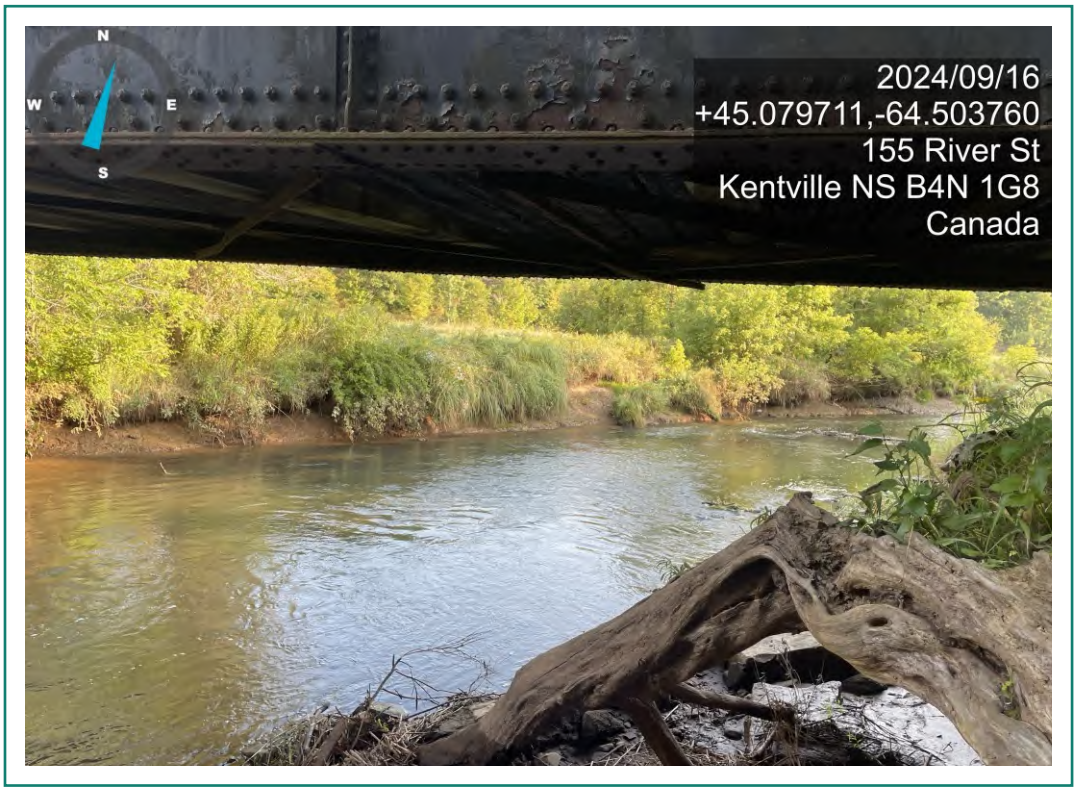


Photo 4: Surface water sampling location SW24-3.

Photo 5: Biological metallic sheen close to surface water location SW7A.

Photo 6: Surface water sampling location SW7.

Photo 7: Surface water location SW19B.

Photo 8: Surface water location SW19B.

Photo 9: Surface water location SW20A Note: the location was dry and unable to be sampled.

Photo 10: Monitoring Well MW22-B.

Photo 11: Monitoring Well MW22-C.

Photo 12: Monitoring Wells MW22-A (front, left) and MW22-B.

Photo 13: Monitoring Well MW12-A.

Photo 14: Monitoring Well MW36-A.

Photo 15: Monitoring Well MWTH-1.

Photo 16: Monitoring Well MW4-C.

Photo 17: Monitoring Well MW4-A.

Photo 18: Monitoring Well MW29-C.

Photo 19: Monitoring Well MW29-B.

Photo 20: Monitoring Well MW28-B.

Photo 21: Monitoring Well MW26-B.

Photo 22: Monitoring Well MW27-B.

Photo 23: Monitoring Well MW27-C.

Photo 24: Monitoring Well MW32-A.

Photo 25: Monitoring Well MW25-B.

Photo 26: Field staff measuring surface water flow rates.

Photo 27: Monitoring Well sampling set up after replacing Waterra tubing.

Appendix C
Field Sampling Records

ENGLOBE

Groundwater Monitoring and Low-Flow Sample Collection Form

Location:	Meadowview Landfill	**Date:**	September 16 and 17, 2024
Project #:	2408035.000	**Personnel:**	TM and VJ
Weather:	Sunny 25°C	**Monitoring Equipment:**	Water Level Meter, YSI, GEM5000
Decontamination Method:		**Water Quality Meter (YSI) Serial No.:**	
Pump (circle one):	Waterra / Peristaltic / Geo-submersible / Bladder	**Pump Description:**	

Well ID	Sample Collection Time	Groundwater Monitoring Data and Field Parameters																		
		Static Water Level Depth (mbtoc and mbgs)	Borehole Depth (mbgs)	Stick-Up Height (m)	Borehole Diameter (mm)	Purge Volume Required (L)	Purge Volume Obtained (L)	Temp (°C)	pH	EC (µs/m or mS/cm)	DO (mg/L)	Colour and Clarity	Odour and Sheen	Gas Monitoring				Photos	Lock (Y or N)	Comments
														Methane (ppm)	Methane (LEL)	Oxygen	Carbon Dioxoide			
MW22-A	16:00	2.166 and 1.942	8.635	0.224	60	39	39	5.2	6.34	855	3.09	Clear	Slight sulfur odour, slight metallic sheen	0	0	21.4	0.1	Y	Y	-
MW22-B	10:00	2.798 and 2.623	13.225	0.175	60	63	28 and went dry	5.2	6.52	1,276	4.34	Light Brown	No odour, no sheen	0	0	21.3	0.2	Y	Y	-
MW22-C	10:15	3.729 and 3.505	25.129	0.224	60	128	128	7.9	7.31	139	8.10	Clear	No odour, no sheen	0	0	21.4	0.1	Y	Y	-
MW24-A	8:30	3.295 and 2.917	3.662	0.378	60	No Sample								0	0	21.1	0.2	Y	Y	-
MW24-B	8:35	3.162 and 2.850	12.003	0.312	60	No Sample								0	0	21.2	0.3	Y	Y	-
MW23-A	11:00	2.584 and 2.414	4.751	0.170	60	13	13	11.3	6.48	192.4	5.74	Red Brown - Silty	No odour, no sheen	0	0	21.2	0.1	Y	Y	-
MW23-B	11:30	2.678 and 2.403	11.444	0.275	60	68	68	4.2	6.38	292.9	4.11	Red Brown - Silty	No odour, no sheen	0	0	21.2	0.1	Y	Y	-

Note: Recommended stabilization criteria: temp ±0.5°C; pH ± 0.1 units; EC ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes.

Groundwater Monitoring and Low-Flow Sample Collection Form

Location:	Meadowview Landfill	**Date:**	September 16 and 17, 2024
Project #:	2408035.000	**Personnel:**	TM and VJ
Weather:	Sunny 25°C	**Monitoring Equipment:**	Water Level Meter, YSI, GEM5000
Decontamination Method:		**Water Quality Meter (YSI) Serial No.:**	
Pump (circle one):	Waterra / Peristaltic / Geo-submersible / Bladder	**Pump Description:**	

Well ID	Sample Collection Time	Groundwater Monitoring Data and Field Parameters																		
		Static Water Level Depth (mbtoc and mbgs)	Borehole Depth (mbgs)	Stick-Up Height (m)	Borehole Diameter (mm)	Purge Volume Required (L)	Purge Volume Obtained (L)	Temp (°C)	pH	EC (µs/m or mS/cm)	DO (mg/L)	Colour and Clarity	Odour and Sheen	Gas Monitoring				Photos	Lock (Y or N)	Comments
														Methane (ppm)	Methane (LEL)	Oxygen	Carbon Dioxoide			
MW23-C	12:15	2.428	23.109	0.10	60	124	124	4.3	8.48	111.9	11.8	Red Brown - Silty	No odour, no sheen	0	0	21.1	0.1	Y	Y	-
MW32-A	12:35	2.073 and 1.5083	3.159	0.490	60	No Sample								0	0	18.2	0.3	Y	Y	Casing cannot close properly
MW12-A	12:50	3.029 and 2.789	4.446	0.240	60	No Sample								0	0	20.4	0.1	Y	Y	-
MW36-A	13:30	4.114 and 3.639	4.513	0.475	60	No Sample								0	0	20.4	0.3	Y	Y	-
MW35-A	13:50	3.177 and 2.657	4.000	0.520	60	No Sample								0	0	20.6	0.2	Y	Y	-
MW25-B	14:40	4.704 and 4.409	13.809	0.295	60	54	54	6.0	7.89	555	5.30	Red-Brown, Silty	No odour, no sheen	0	0	18.6	0.1	Y	Y	-
MW21-C	15:05	1.943 and 1.863	23.370	0.180	60	No Sample								0	0	20.5	0	Y	Y	Tubing Left

Note: Recommended stabilization criteria: temp ±0.5°C; pH ± 0.1 units; EC ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes.

Groundwater Monitoring and Low-Flow Sample Collection Form

Location:	Meadowview Landfill	**Date:**	September 16 and 17, 2024
Project #:	2408035.000	**Personnel:**	TM and VJ
Weather:	Sunny 25°C	**Monitoring Equipment:**	Water Level Meter, YSI, GEM5000
Decontamination Method:		**Water Quality Meter (YSI) Serial No.:**	
Pump (circle one):	Waterra / Peristaltic / Geo-submersible / Bladder	**Pump Description:**	

Well ID	Sample Collection Time	Groundwater Monitoring Data and Field Parameters																	
		Static Water Level Depth (mbtoc and mbgs)	Borehole Depth (mbgs)	Stick-Up Height (m)	Borehole Diameter (mm)	Purge Volume Required (L)	Purge Volume Obtained (L)	Temp (°C)	pH	EC (µs/m or mS/cm)	DO (mg/L)	Colour and Clarity	Odour and Sheen	Gas Monitoring				Photos	Lock (Y or N)	Comments
														Methane (ppm)	Methane (LEL)	Oxygen	Carbon Dioxoide			
TH2	15:30	5.217 and 4.644	16.932	0.573	60	No Sample								0	0	21.0	0.1	Y	Y	-
TH1	16:00	5.584 and 5.579	9.118	0.05	60	21	21	6.0	7.35	850	4.11	Light Brown	Sewage Odour, slight metallic sheen	0	0	20.9	0.8	Y	Y	Possible septic field near old house
MW4-C	16:30	4.103 and 4.103	16.715	0	25	No Sample								0	0	20.9	0.5	-	Y	-
MW4-A	17:05	4.059 and 4.059	10.422	0	25	19	6 and went dry	10.5	6.98	1,087	5.73	Red-Brown	Sewage Odour, no sheen	0	0	21.1	0.3	-	Y	-
MW29-B	9:30	3.713 and 3.473	9.605	0.240	60	35	20 and went dry	5.2	7.89	190.2	8.59	Brown	No odour, no sheen	0.1	0	21.2	0.1	Y	Y	Slow recharge
MW29-C	10:15	4.409 and 3.989	22.307	0.420	60	108	50 and went dry	5.2	8.84	132.9	8.73	Brown	No odour, no sheen	0	0	21.1	0.1	Y	Y	Slow recharge
MW28B	10:45	6.801 and 6.536	15.066	0.265	60	49	44 and went dry	8.1	7.95	26	11.92	Orange-Brown	No odour, no sheen	0	0	21.1	0.1	Y	Y	-

Note: Recommended stabilization criteria: temp ±0.5°C; pH ± 0.1 units; EC ± 3%; DO ± 1 mg/L; ORP ± 10 mV; for at least three successive measurements that are made every 3-5 minutes.

Groundwater Monitoring and Low-Flow Sample Collection Form

Location:	Meadowview Landfill	**Date:**	September 16 and 17, 2024
Project #:	2408035.000	**Personnel:**	TM and VJ
Weather:	Sunny 25°C	**Monitoring Equipment:**	Water Level Meter, YSI, GEM5000
Decontamination Method:		**Water Quality Meter (YSI) Serial No.:**	
Pump (circle one):	Waterra / Peristaltic / Geo-submersible / Bladder	**Pump Description:**	

Well ID	Sample Collection Time	Groundwater Monitoring Data and Field Parameters																		
		Static Water Level Depth (mbtoc and mbgs)	Borehole Depth (mbgs)	Stick-Up Height (m)	Borehole Diameter (mm)	Purge Volume Required (L)	Purge Volume Obtained (L)	Temp (°C)	pH	EC (µs/m or mS/cm)	DO (mg/L)	Colour and Clarity	Odour and Sheen	Gas Monitoring				Photos	Lock (Y or N)	Comments
														Methane (ppm)	Methane (LEL)	Oxygen	Carbon Dioxoide			
MW26-B	11:15	4.566 and 4.171	13.883	0.395	60	No Sample								0	0	20.8	0.1	Y	Y	Cap broken. casing closed over well
MW27-B	11:45	3.598 and 3.362	13.604	0.236	60	60	20 and went dry	9.1	8.15	138.3	10.44	Orange	No odour, No Sheen	0	0	20.6	0.2	Y	Y	Slow recharge
MW27-C	11:30	3.949 and 3.735	23.300	0.214	60	No Sample								0	0	20.6	0.1	Y	Y	-
MW19-A	12:20	19.187 and 19.102	27.195	0.085	60	No Sample								0	0	20.7	0.1	Y	Y	-

Appendix D
Laboratory Certificates

ENGLOBE

CERTIFICATE OF ANALYSIS

Work Order	: **HA2402049**		
Amendment	: **2**		
Client	: **Englobe Corp.**	Laboratory	: ALS Environmental - Winnipeg
Contact	: Nathalie Sahakyan	Account Manager	: Emily Smith
Address	: 97 Troop Avenue Dartmouth Nova Scotia Canada B3B 2A7	Address	: 1329 Niakwa Road East, Unit 12 Winnipeg MB Canada R2J 3T4
Telephone	: ----	Telephone	: +1 204 255 9720
Project	: 2408035.000	Date Samples Received	: 19-Sep-2024 12:05
PO	: ----	Date Analysis Commenced	: 20-Sep-2024
C-O-C number	: ----	Issue Date	: 09-Oct-2024 12:35
Sampler	: ----		
Site	: ----		
Quote number	: Meadowview Landfill		
No. of samples received	: 14		
No. of samples analysed	: 14		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Manager - Inorganics	Inorganics, Dartmouth, Nova Scotia
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Metals, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Inorganics, Dartmouth, Nova Scotia
Kelly Fischer	Technical Specialist	Inorganics, Waterloo, Ontario
Kelly Fischer	Technical Specialist	Metals, Waterloo, Ontario
Nik Perkio	Senior Analyst	Inorganics, Waterloo, Ontario
Nik Perkio	Senior Analyst	Metals, Waterloo, Ontario
Oleksandr Busel		Inorganics, Winnipeg, Manitoba
Walt Kippenhuck	Supervisor - Inorganic	Metals, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre
NTU	nephelometric turbidity units
CU	colour units (1 cu = 1 mg/l pt)
-	no units
pH units	pH units
µS/cm	microsiemens per centimetre
meq/L	milliequivalents per litre
%	percent

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Amendment (30-SEP-24): This report has been amended to include requested guideline(s). All analysis results are as per the previous report.

Amendment (08/10/2024): This report has been amended following minor LIMS report formatting corrections. All analysis results are as per the previous report. Revised to update metals reporting units.

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DLUI	Detection Limit Raised: Unknown interference generated an apparent false positive test result.

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW27-B	MW28-B	MW29-B	MW29-C	MW4-A
					Client sampling date / time	18-Sep-2024 11:45	18-Sep-2024 10:45	18-Sep-2024 09:30	18-Sep-2024 10:15	17-Sep-2024 17:05
						HA2402049-001	HA2402049-002	HA2402049-003	HA2402049-004	HA2402049-006
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	1.0	mg/L		94.0	86.0	111	78.2	712
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1.0	mg/L		1.1	<1.0	<1.0	3.0	<1.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L		78.8	70.5	90.7	69.0	584
Colour, apparent	----	E330/WT	2.0	CU		1200	594	5880	6280	4270
Conductivity	----	E100/WT	1.0	µS/cm		163	187	211	156	1260
Hardness (as CaCO3), dissolved	----	EC100/WT	0.50	mg/L		14.9	77.3	86.0	25.3	287
Langelier index (@ 20°C)	----	EC105/WT	0.010	-		-0.365	0.069	0.168	0.192	0.156
Langelier index (@ 4°C)	----	EC105/WT	0.010	-		-0.611	-0.180	-0.081	-0.049	-0.088
pH	----	E108/WT	0.10	pH units		8.42	8.15	8.12	8.81	6.95
pH, saturation (@ 20°C)	----	EC105/WT	0.010	pH units		8.78	8.08	7.95	8.62	6.79
pH, saturation (@ 4°C)	----	EC105/WT	0.010	pH units		9.03	8.33	8.20	8.86	7.04
Solids, total dissolved [TDS]	----	E162/HA	10	mg/L		122 DLDS	110 DLDS	115 DLDS	99 DLDS	589 DLDS
Turbidity	----	E121/WT	0.10	NTU		378	219	2300	3940	1930
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L		0.0088	0.0095	0.0068	<0.0050	54.7
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L		3.36	13.6	9.63	16.6	32.9 DLDS
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L		0.202	0.024	0.023	0.040	<0.100 DLDS
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L		0.167	<0.020	0.043	0.160	<0.100 DLDS
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L		0.167	<0.0224	0.0430	0.160	<0.112
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.050 DLDS

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	MW27-B	MW28-B	MW29-B	MW29-C	MW4-A
Client sample ID									
Client sampling date / time					18-Sep-2024 11:45	18-Sep-2024 10:45	18-Sep-2024 09:30	18-Sep-2024 10:15	17-Sep-2024 17:05
					HA2402049-001	HA2402049-002	HA2402049-003	HA2402049-004	HA2402049-006
					Result	Result	Result	Result	Result
Anions and Nutrients									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	0.0067	0.0548	0.0233	0.0079	<0.0010
Silicate (as SiO2)	7631-86-9	E392/WP	0.50	mg/L	9.31	9.36	8.44	6.97	30.3
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	1.30	3.57	2.27	3.69	<1.50 DLDS
Organic / Inorganic Carbon									
Carbon, total organic [TOC]	----	E355-L/WT	0.50	mg/L	4.02	<2.50 DLM	<10.0 DLM	<10.0 DLM	16.8
Ion Balance									
Anion sum	----	EC101/WT	0.10	meq/L	1.72	1.87	2.14	1.94	12.6
Cation sum	----	EC101/WT	0.10	meq/L	1.69	1.77	2.13	1.39	13.5
Ion balance (cations/anions)	----	EC101/WT	0.010	%	98.2	94.6	99.5	71.6	107
Total Metals									
Mercury, total	7439-97-6	E508/WT	0.0050	mg/L	0.0052	<0.0050	0.0062	<0.0050	0.0101
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/WT	1.0	mg/L	9.1	5.5	2.2	9.4	62.5 DLHC
Antimony, dissolved	7440-36-0	E421/WT	0.10	mg/L	0.80	<0.10	<0.10	<0.10	<1.00 DLHC
Arsenic, dissolved	7440-38-2	E421/WT	0.10	mg/L	12.3	1.12	1.75	4.76	67.6 DLHC
Barium, dissolved	7440-39-3	E421/WT	0.10	mg/L	1.83	5.61	10.8	2.75	2470 DLHC
Beryllium, dissolved	7440-41-7	E421/WT	0.020	mg/L	<0.020	<0.020	<0.020	<0.020	<0.200 DLHC
Bismuth, dissolved	7440-69-9	E421/WT	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.500 DLHC
Boron, dissolved	7440-42-8	E421/WT	10	mg/L	100	<10	<10	15	333 DLHC
Cadmium, dissolved	7440-43-9	E421/WT	0.0050	mg/L	0.0052	<0.0050	<0.0050	<0.0050	<0.0500 DLHC
Calcium, dissolved	7440-70-2	E421/WT	50	mg/L	4840	26600	28000	8220	84900 DLHC

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW27-B	MW28-B	MW29-B	MW29-C	MW4-A
					Client sampling date / time	18-Sep-2024 11:45	18-Sep-2024 10:45	18-Sep-2024 09:30	18-Sep-2024 10:15	17-Sep-2024 17:05
						HA2402049-001	HA2402049-002	HA2402049-003	HA2402049-004	HA2402049-006
						Result	Result	Result	Result	Result
Dissolved Metals										
Cesium, dissolved	7440-46-2	E421/WT	0.010	mg/L		0.090	0.031	0.062	0.063	<0.100 DLHC
Chromium, dissolved	7440-47-3	E421/WT	0.50	mg/L		1.15	<0.50	<0.50	<0.50	<5.00 DLHC
Cobalt, dissolved	7440-48-4	E421/WT	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	10.7 DLHC
Copper, dissolved	7440-50-8	E421/WT	0.20	mg/L		0.71	0.35	0.36	0.34	<2.00 DLHC
Iron, dissolved	7439-89-6	E421/WT	10	mg/L		<10	<10	<10	18	19900 DLHC
Lead, dissolved	7439-92-1	E421/WT	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	<0.500 DLHC
Lithium, dissolved	7439-93-2	E421/WT	1.0	mg/L		30.8	<1.0	1.8	11.0	12.6 DLHC
Magnesium, dissolved	7439-95-4	E421/WT	5.0	mg/L		690	2650	3900	1150	18300 DLHC
Manganese, dissolved	7439-96-5	E421/WT	0.10	mg/L		0.37	2.15	0.60	1.19	972 DLHC
Mercury, dissolved	7439-97-6	E509/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Molybdenum, dissolved	7439-98-7	E421/WT	0.050	mg/L		0.993	<0.050	0.314	<0.050	1.12 DLHC
Nickel, dissolved	7440-02-0	E421/WT	0.50	mg/L		<0.50	<0.50	<0.50	<0.50	15.6 DLHC
Phosphorus, dissolved	7723-14-0	E421/WT	50	mg/L		<50	54	<50	<50	<500 DLHC
Potassium, dissolved	7440-09-7	E421/WT	50	mg/L		4280	1400	3720	3760	52000 DLHC
Rubidium, dissolved	7440-17-7	E421/WT	0.20	mg/L		2.68	1.64	3.18	2.88	<2.00 DLHC
Selenium, dissolved	7782-49-2	E421/WT	0.050	mg/L		0.059	<0.050	<0.050	<0.050	<0.500 DLHC
Silicon (as SiO2), dissolved	7440-21-3	EC421.SiO2/WT	0.15	mg/L		10.3	8.70	10.2	7.21	36.6
Silicon, dissolved	7440-21-3	E421/WT	50	mg/L		4800	4070	4790	3370	17100 DLHC
Silver, dissolved	7440-22-4	E421/WT	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.100 DLHC
Sodium, dissolved	7440-23-5	E421/WT	50	mg/L		29500	4380	7280	18100	41600 DLHC
Strontium, dissolved	7440-24-6	E421/WT	0.20	mg/L		65.7	232	326	111	562 DLHC

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)

					Client sample ID	MW27-B	MW28-B	MW29-B	MW29-C	*MW4-A*
					Client sampling date / time	18-Sep-2024 11:45	18-Sep-2024 10:45	18-Sep-2024 09:30	18-Sep-2024 10:15	17-Sep-2024 17:05
Analyte	*CAS Number*	*Method/Lab/Accreditation*	*LOR*	*Unit*		HA2402049-001	HA2402049-002	HA2402049-003	HA2402049-004	HA2402049-006
						Result	Result	Result	Result	Result
Dissolved Metals										
Sulfur, dissolved	7704-34-9	E421/WT	500	mg/L		<500	1210	750	1240	<5000 DLHC
Tellurium, dissolved	13494-80-9	E421/WT	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	<2.00 DLHC
Thallium, dissolved	7440-28-0	E421/WT	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.100 DLHC
Thorium, dissolved	7440-29-1	E421/WT	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<1.00 DLHC
Tin, dissolved	7440-31-5	E421/WT	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<1.00 DLHC
Titanium, dissolved	7440-32-6	E421/WT	0.30	mg/L		<0.30	<0.30	<0.30	0.77	<3.00 DLHC
Tungsten, dissolved	7440-33-7	E421/WT	0.10	mg/L		14.8	<0.10	1.37	0.39	<1.00 DLHC
Uranium, dissolved	7440-61-1	E421/WT	0.010	mg/L		3.03	0.273	2.20	1.01	<0.100 DLHC
Vanadium, dissolved	7440-62-2	E421/WT	0.50	mg/L		4.52	0.92	0.76	4.95	<5.00 DLHC
Zinc, dissolved	7440-66-6	E421/WT	1.0	mg/L		1.6	1.4	<1.0	<1.0	<10.0 DLHC
Zirconium, dissolved	7440-67-7	E421/WT	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	<2.00 DLHC
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)

					Client sample ID	MW22-A	MW22-B	MW22-C	MW23-A	*MW23-B*
					Client sampling date / time	16-Sep-2024 16:00	17-Sep-2024 10:00	17-Sep-2024 10:45	17-Sep-2024 11:00	17-Sep-2024 11:30
Analyte	*CAS Number*	*Method/Lab/Accreditation*	*LOR*	*Unit*		HA2402049-007	HA2402049-008	HA2402049-009	HA2402049-010	HA2402049-011
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	1.0	mg/L		467	791	71.6	74.3	89.9

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW22-A	MW22-B	MW22-C	MW23-A	MW23-B
					Client sampling date / time	16-Sep-2024 16:00	17-Sep-2024 10:00	17-Sep-2024 10:45	17-Sep-2024 11:00	17-Sep-2024 11:30
						HA2402049-007	HA2402049-008	HA2402049-009	HA2402049-010	HA2402049-011
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L		382	649	58.7	60.9	73.7
Colour, apparent	----	E330/WT	2.0	CU		1220	720	72.2	2780	2270
Conductivity	----	E100/WT	1.0	µS/cm		844	1470	154	217	309
Hardness (as CaCO3), dissolved	----	EC100/WT	0.50	mg/L		243	635	45.8	49.6	91.0
Langelier index (@ 20°C)	----	EC105/WT	0.010	-		-0.328	0.570	-0.768	-1.31	-1.21
Langelier index (@ 4°C)	----	EC105/WT	0.010	-		-0.577	0.323	-1.02	-1.56	-1.46
pH	----	E108/WT	0.10	pH units		6.68	6.97	7.65	7.05	6.84
pH, saturation (@ 20°C)	----	EC105/WT	0.010	pH units		7.01	6.40	8.42	8.36	8.05
pH, saturation (@ 4°C)	----	EC105/WT	0.010	pH units		7.26	6.65	8.67	8.62	8.30
Solids, total dissolved [TDS]	----	E162/HA	10	mg/L		457 DLDS	875 DLDS	91 DLDS	145 DLDS	173 DLDS
Turbidity	----	E121/WT	0.10	NTU		232	180	30.0	696	763
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L		20.7	2.74	0.0122	0.0101	0.412
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L		38.0	111 DLDS	11.2	24.4	42.0
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L		0.048	<0.100 DLDS	0.029	0.052	0.020
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L		<0.020	<0.100 DLDS	0.040	<0.020	0.101
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L		<0.0224	<0.112	0.0400	<0.0224	0.259
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L		<0.010	<0.050 DLDS	<0.010	<0.010	0.158
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L		<0.0010	<0.0010	0.0075	0.0428	0.0013

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW22-A	MW22-B	MW22-C	MW23-A	MW23-B
					Client sampling date / time	16-Sep-2024 16:00	17-Sep-2024 10:00	17-Sep-2024 10:45	17-Sep-2024 11:00	17-Sep-2024 11:30
						HA2402049-007	HA2402049-008	HA2402049-009	HA2402049-010	HA2402049-011
						Result	Result	Result	Result	Result
Anions and Nutrients										
Silicate (as SiO2)	7631-86-9	E392/WP	0.50	mg/L		21.1	19.4	9.33	11.1	10.8
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L		<0.30	<1.50 DLDS	1.29	8.10	13.9
Organic / Inorganic Carbon										
Carbon, total organic [TOC]	----	E355-L/WT	0.50	mg/L		10.2	17.3	4.86	28.5	6.31
Ion Balance										
Anion sum	----	EC101/WT	0.10	meq/L		8.71	16.1	1.52	2.08	2.97
Cation sum	----	EC101/WT	0.10	meq/L		10.7	16.8	1.45	2.00	3.34
Ion balance (cations/anions)	----	EC101/WT	0.010	%		123	104	95.4	96.2	112
Total Metals										
Mercury, total	7439-97-6	E508/WT	0.0050	mg/L		<0.0050	<0.0050	0.0071	0.0171	0.0330
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/WT	1.0	mg/L		<10.0 DLHC	<10.0 DLHC	10.3	4.9	<1.0
Antimony, dissolved	7440-36-0	E421/WT	0.10	mg/L		<1.00 DLHC	<1.00 DLHC	0.12	<0.10	<0.10
Arsenic, dissolved	7440-38-2	E421/WT	0.10	mg/L		76.9 DLHC	17.2 DLHC	1.40	0.16	11.4
Barium, dissolved	7440-39-3	E421/WT	0.10	mg/L		1150 DLHC	637 DLHC	7.59	50.9	242
Beryllium, dissolved	7440-41-7	E421/WT	0.020	mg/L		<0.200 DLHC	<0.200 DLHC	<0.020	<0.020	<0.020
Bismuth, dissolved	7440-69-9	E421/WT	0.050	mg/L		<0.500 DLHC	<0.500 DLHC	<0.050	<0.050	<0.050
Boron, dissolved	7440-42-8	E421/WT	10	mg/L		260 DLHC	380 DLHC	<10	<10	16
Cadmium, dissolved	7440-43-9	E421/WT	0.0050	mg/L		<0.0500 DLHC	<0.0500 DLHC	0.0477	0.0654	0.0769
Calcium, dissolved	7440-70-2	E421/WT	50	mg/L		74000 DLHC	209000 DLHC	14200	16400	28700
Cesium, dissolved	7440-46-2	E421/WT	0.010	mg/L		<0.100 DLHC	0.236 DLHC	0.053	<0.010	<0.010

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW22-A	MW22-B	MW22-C	MW23-A	MW23-B
					Client sampling date / time	16-Sep-2024 16:00	17-Sep-2024 10:00	17-Sep-2024 10:45	17-Sep-2024 11:00	17-Sep-2024 11:30
						HA2402049-007	HA2402049-008	HA2402049-009	HA2402049-010	HA2402049-011
						Result	Result	Result	Result	Result
Dissolved Metals										
Chromium, dissolved	7440-47-3	E421/WT	0.50	mg/L		<5.00 DLHC	<5.00 DLHC	0.65	<0.50	<0.50
Cobalt, dissolved	7440-48-4	E421/WT	0.10	mg/L		17.1 DLHC	10.9 DLHC	<0.10	<0.10	3.50
Copper, dissolved	7440-50-8	E421/WT	0.20	mg/L		<2.00 DLHC	<2.00 DLHC	0.65	<0.20	<0.20
Iron, dissolved	7439-89-6	E421/WT	10	mg/L		55400 DLHC	8910 DLHC	22	<10	5780
Lead, dissolved	7439-92-1	E421/WT	0.050	mg/L		<0.500 DLHC	<0.500 DLHC	0.382	<0.050	<0.050
Lithium, dissolved	7439-93-2	E421/WT	1.0	mg/L		<10.0 DLHC	33.3 DLHC	12.1	<1.0	1.1
Magnesium, dissolved	7439-95-4	E421/WT	5.0	mg/L		14100 DLHC	27500 DLHC	2500	2100	4700
Manganese, dissolved	7439-96-5	E421/WT	0.10	mg/L		3500 DLHC	4340 DLHC	5.79	693	4250 DLHC
Mercury, dissolved	7439-97-6	E509/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Molybdenum, dissolved	7439-98-7	E421/WT	0.050	mg/L		0.844 DLHC	<0.500 DLHC	0.242	<0.050	0.142
Nickel, dissolved	7440-02-0	E421/WT	0.50	mg/L		13.8 DLHC	21.3 DLHC	<0.50	1.29	2.93
Phosphorus, dissolved	7723-14-0	E421/WT	50	mg/L		<500 DLHC	<500 DLHC	<50	<50	<50
Potassium, dissolved	7440-09-7	E421/WT	50	mg/L		19400 DLHC	8060 DLHC	4030	1080	2530
Rubidium, dissolved	7440-17-7	E421/WT	0.20	mg/L		8.83 DLHC	8.41 DLHC	3.04	1.12	0.84
Selenium, dissolved	7782-49-2	E421/WT	0.050	mg/L		<0.500 DLHC	<0.500 DLHC	0.052	<0.050	<0.050
Silicon (as SiO2), dissolved	7440-21-3	EC421.SiO2/ WT	0.15	mg/L		21.0	22.2	8.68	11.8	12.4
Silicon, dissolved	7440-21-3	E421/WT	50	mg/L		9830 DLHC	10400 DLHC	4060	5500	5790
Silver, dissolved	7440-22-4	E421/WT	0.010	mg/L		<0.100 DLHC	<0.100 DLHC	<0.010	<0.010	<0.010
Sodium, dissolved	7440-23-5	E421/WT	50	mg/L		40000 DLHC	73600 DLHC	9770	21900	24500
Strontium, dissolved	7440-24-6	E421/WT	0.20	mg/L		387 DLHC	1810 DLHC	202	23.3	59.3
Sulfur, dissolved	7704-34-9	E421/WT	500	mg/L		<5000 DLHC	<5000 DLHC	<500	3030	5080

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW22-A	MW22-B	MW22-C	MW23-A	MW23-B
					Client sampling date / time	16-Sep-2024 16:00	17-Sep-2024 10:00	17-Sep-2024 10:45	17-Sep-2024 11:00	17-Sep-2024 11:30
						HA2402049-007	HA2402049-008	HA2402049-009	HA2402049-010	HA2402049-011
						Result	Result	Result	Result	Result
Dissolved Metals										
Tellurium, dissolved	13494-80-9	E421/WT	0.20	mg/L		<2.00 DLHC	<2.00 DLHC	<0.20	<0.20	<0.20
Thallium, dissolved	7440-28-0	E421/WT	0.010	mg/L		<0.100 DLHC	<0.100 DLHC	0.021	<0.010	0.013
Thorium, dissolved	7440-29-1	E421/WT	0.10	mg/L		<1.00 DLHC	<1.00 DLHC	<0.10	<0.10	<0.10
Tin, dissolved	7440-31-5	E421/WT	0.10	mg/L		<1.00 DLHC	<1.00 DLHC	0.40	<0.10	<0.10
Titanium, dissolved	7440-32-6	E421/WT	0.30	mg/L		<3.00 DLHC	<3.00 DLHC	1.23	<0.30	<0.30
Tungsten, dissolved	7440-33-7	E421/WT	0.10	mg/L		<1.00 DLHC	<1.00 DLHC	<0.10	<0.10	<0.10
Uranium, dissolved	7440-61-1	E421/WT	0.010	mg/L		<0.100 DLHC	6.21 DLHC	5.93	0.039	0.026
Vanadium, dissolved	7440-62-2	E421/WT	0.50	mg/L		<5.00 DLHC	<5.00 DLHC	1.62	<0.50	<0.50
Zinc, dissolved	7440-66-6	E421/WT	1.0	mg/L		<10.0 DLHC	<10.0 DLHC	43.5	1.7	1.5
Zirconium, dissolved	7440-67-7	E421/WT	0.20	mg/L		<2.00 DLHC	<2.00 DLHC	<0.20	<0.20	<0.20
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Field	Field	Field	Field
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW23-C	MW25-B	TH1	GW DUP	----
					Client sampling date / time	17-Sep-2024 12:15	17-Sep-2024 14:40	17-Sep-2024 16:00	17-Sep-2024 00:00	----
						HA2402049-012	HA2402049-013	HA2402049-014	HA2402049-015	----
						Result	Result	Result	Result	----
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	1.0	mg/L		69.1	330	546	567	----
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1.0	mg/L		1.2	<1.0	<1.0	<1.0	----

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW23-C	MW25-B	TH1	GW DUP	----
					Client sampling date / time	17-Sep-2024 12:15	17-Sep-2024 14:40	17-Sep-2024 16:00	17-Sep-2024 00:00	----
						HA2402049-012	HA2402049-013	HA2402049-014	HA2402049-015	----
						Result	Result	Result	Result	----
Physical Tests										
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	----
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L		58.7	270	448	465	----
Colour, apparent	----	E330/WT	2.0	CU		23000	607	1870	1600	----
Conductivity	----	E100/WT	1.0	µS/cm		128	752	905	924	----
Hardness (as CaCO3), dissolved	----	EC100/WT	0.50	mg/L		26.3	291	275	278	----
Langelier index (@ 20°C)	----	EC105/WT	0.010	-		-0.231	0.560	0.385	0.473	----
Langelier index (@ 4°C)	----	EC105/WT	0.010	-		-0.480	0.312	0.136	0.224	----
pH	----	E108/WT	0.10	pH units		8.39	7.62	7.26	7.33	----
pH, saturation (@ 20°C)	----	EC105/WT	0.010	pH units		8.62	7.06	6.88	6.86	----
pH, saturation (@ 4°C)	----	EC105/WT	0.010	pH units		8.87	7.31	7.12	7.10	----
Solids, total dissolved [TDS]	----	E162/HA	10	mg/L		78 DLDS	444 DLDS	426 DLDS	434 DLDS	----
Turbidity	----	E121/WT	0.10	NTU		640	250	864	711	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L		<0.0050	0.0089	30.2	28.8	----
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L		3.88	78.7	17.8	17.6	----
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L		0.047	<0.020	0.028	0.029	----
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L		0.170	<0.020	0.050	0.052	----
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L		0.170	<0.0224	0.122	0.0980	----
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L		<0.010	<0.010	0.072	0.046	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L		0.0163	0.0062	<0.0010	<0.0010	----
Silicate (as SiO2)	7631-86-9	E392/WP	0.50	mg/L		8.58	13.5	28.3	28.7	----

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW23-C	MW25-B	TH1	GW DUP	----
					Client sampling date / time	17-Sep-2024 12:15	17-Sep-2024 14:40	17-Sep-2024 16:00	17-Sep-2024 00:00	----
						HA2402049-012	HA2402049-013	HA2402049-014	HA2402049-015	----
						Result	Result	Result	Result	----
Anions and Nutrients										
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L		1.16	0.52	2.17	1.03	----
Organic / Inorganic Carbon										
Carbon, total organic [TOC]	----	E355-L/WT	0.50	mg/L		<5.00 DLM	7.39	6.61	12.4	----
Ion Balance										
Anion sum	----	EC101/WT	0.10	meq/L		1.32	7.63	9.51	9.82	----
Cation sum	----	EC101/WT	0.10	meq/L		1.25	6.77	10.2	10.2	----
Ion balance (cations/anions)	----	EC101/WT	0.010	%		94.7	88.7	107	104	----
Total Metals										
Mercury, total	7439-97-6	E508/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/WT	1.0	mg/L		17.6	1.5	1.2	<1.0	----
Antimony, dissolved	7440-36-0	E421/WT	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	----
Arsenic, dissolved	7440-38-2	E421/WT	0.10	mg/L		7.31	2.95	30.5	31.1	----
Barium, dissolved	7440-39-3	E421/WT	0.10	mg/L		37.2	10.2	904	899	----
Beryllium, dissolved	7440-41-7	E421/WT	0.020	mg/L		<0.020	<0.020	<0.020	<0.020	----
Bismuth, dissolved	7440-69-9	E421/WT	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
Boron, dissolved	7440-42-8	E421/WT	10	mg/L		13	75	144	144	----
Cadmium, dissolved	7440-43-9	E421/WT	0.0050	mg/L		<0.0050	0.0087	<0.0050	<0.0050	----
Calcium, dissolved	7440-70-2	E421/WT	50	mg/L		8960	92900	84600	85300	----
Cesium, dissolved	7440-46-2	E421/WT	0.010	mg/L		0.034	0.121	0.072	0.070	----
Chromium, dissolved	7440-47-3	E421/WT	0.50	mg/L		2.18	<0.50	<0.50	<0.50	----

Analytical Results

Sub-Matrix: Groundwater (Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW23-C	MW25-B	TH1	GW DUP	----
					Client sampling date / time	17-Sep-2024 12:15	17-Sep-2024 14:40	17-Sep-2024 16:00	17-Sep-2024 00:00	----
						HA2402049-012	HA2402049-013	HA2402049-014	HA2402049-015	----
						Result	Result	Result	Result	----
Dissolved Metals										
Cobalt, dissolved	7440-48-4	E421/WT	0.10	mg/L		<0.10	0.25	4.37	4.34	----
Copper, dissolved	7440-50-8	E421/WT	0.20	mg/L		<0.20	0.29	<0.20	0.21	----
Iron, dissolved	7439-89-6	E421/WT	10	mg/L		25	<10	11600	11900	----
Lead, dissolved	7439-92-1	E421/WT	0.050	mg/L		<0.050	<0.050	<0.050	<0.050	----
Lithium, dissolved	7439-93-2	E421/WT	1.0	mg/L		14.0	13.8	23.9	24.1	----
Magnesium, dissolved	7439-95-4	E421/WT	5.0	mg/L		964	14300	15400	15700	----
Manganese, dissolved	7439-96-5	E421/WT	0.10	mg/L		5.90	26.6	1280	1260	----
Mercury, dissolved	7439-97-6	E509/WT	0.0050	mg/L		<0.0050	<0.0050	<0.0050	<0.0050	----
Molybdenum, dissolved	7439-98-7	E421/WT	0.050	mg/L		0.110	0.087	0.555	0.562	----
Nickel, dissolved	7440-02-0	E421/WT	0.50	mg/L		<0.50	6.13	3.76	3.73	----
Phosphorus, dissolved	7723-14-0	E421/WT	50	mg/L		<50	<50	63	69	----
Potassium, dissolved	7440-09-7	E421/WT	50	mg/L		2790	7480	26600	26800	----
Rubidium, dissolved	7440-17-7	E421/WT	0.20	mg/L		1.81	6.17	5.07	5.08	----
Selenium, dissolved	7782-49-2	E421/WT	0.050	mg/L		0.085	0.059	0.913	1.02	----
Silicon (as SiO2), dissolved	7440-21-3	EC421.SiO2/ WT	0.15	mg/L		9.24	13.3	35.1	35.3	----
Silicon, dissolved	7440-21-3	E421/WT	50	mg/L		4320	6210	16400	16500	----
Silver, dissolved	7440-22-4	E421/WT	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
Sodium, dissolved	7440-23-5	E421/WT	50	mg/L		15000	17700	33200	32900	----
Strontium, dissolved	7440-24-6	E421/WT	0.20	mg/L		75.6	1200	386	381	----
Sulfur, dissolved	7704-34-9	E421/WT	500	mg/L		<500	<500	<500	<500	----
Tellurium, dissolved	13494-80-9	E421/WT	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	----

Analytical Results

Sub-Matrix: Groundwater
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	MW23-C	MW25-B	TH1	GW DUP	----
					Client sampling date / time	17-Sep-2024 12:15	17-Sep-2024 14:40	17-Sep-2024 16:00	17-Sep-2024 00:00	----
						HA2402049-012	HA2402049-013	HA2402049-014	HA2402049-015	----
						Result	Result	Result	Result	----
Dissolved Metals										
Thallium, dissolved	7440-28-0	E421/WT	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	----
Thorium, dissolved	7440-29-1	E421/WT	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	----
Tin, dissolved	7440-31-5	E421/WT	0.10	mg/L		<0.10	0.11	0.18	0.18	----
Titanium, dissolved	7440-32-6	E421/WT	0.30	mg/L		<2.00 DLUI	<0.30	<0.30	<0.30	----
Tungsten, dissolved	7440-33-7	E421/WT	0.10	mg/L		0.79	0.28	<0.10	<0.10	----
Uranium, dissolved	7440-61-1	E421/WT	0.010	mg/L		4.78	17.3	0.042	0.038	----
Vanadium, dissolved	7440-62-2	E421/WT	0.50	mg/L		4.91	1.02	0.60	0.59	----
Zinc, dissolved	7440-66-6	E421/WT	1.0	mg/L		<1.0	1.6	3.3	3.4	----
Zirconium, dissolved	7440-67-7	E421/WT	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	----
Dissolved mercury filtration location	----	EP509/WT	-	-		Field	Field	Field	Field	----
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	Field	Field	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **HA2402049**	Page	: 1 of 36
Amendment	: **2**		
Client	: **Englobe Corp.**	Laboratory	: ALS Environmental - Halifax
Contact	: Nathalie Sahakyan	Account Manager	: Emily Smith
Address	: 97 Troop Avenue Dartmouth NS Canada B3B 2A7	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	: ----	Telephone	: +1 902 707 4888
Project	: 2408035.000	Date Samples Received	: 19-Sep-2024 12:05
PO	: ----	Issue Date	: 09-Oct-2024 12:35
C-O-C number	: ----		
Sampler	: ----		
Site	:		
Quote number	: Meadowview Landfill		
No. of samples received	: 14		
No. of samples analysed	: 14		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW27-B	E298	18-Sep-2024	23-Sep-2024	28 days	5 days	✓	23-Sep-2024	28 days	5 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW28-B	E298	18-Sep-2024	24-Sep-2024	28 days	6 days	✓	26-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW29-B	E298	18-Sep-2024	24-Sep-2024	28 days	6 days	✓	26-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW29-C	E298	18-Sep-2024	24-Sep-2024	28 days	6 days	✓	26-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) GW DUP	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW22-B	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW22-C	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW23-A	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW23-B	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW23-C	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW25-B	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW4-A	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) TH1	E298	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) MW22-A	E298	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	26-Sep-2024	28 days	10 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW27-B	E235.Cl	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW28-B	E235.Cl	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE MW29-B	E235.Cl	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW29-C	E235.Cl	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE GW DUP	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW22-B	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW22-C	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW23-A	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW23-B	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW23-C	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW25-B	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE MW4-A	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE TH1	E235.Cl	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE MW22-A	E235.Cl	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE MW27-B	E378-U	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE MW28-B	E378-U	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE MW29-B	E378-U	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE MW29-C	E378-U	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE GW DUP	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE MW22-B	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE										
MW22-C	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE										
MW23-A	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE										
MW23-B	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE										
MW23-C	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE										
MW25-B	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE										
MW4-A	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE										
TH1	E378-U	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE										
MW22-A	E378-U	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
MW27-B	E235.F	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW28-B	E235.F	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW29-B	E235.F	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW29-C	E235.F	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE GW DUP	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW22-B	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW22-C	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW23-A	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW23-B	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW23-C	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW25-B	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW4-A	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE TH1	E235.F	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE MW22-A	E235.F	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW27-B	E235.NO3	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW28-B	E235.NO3	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW29-B	E235.NO3	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW29-C	E235.NO3	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE GW DUP	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW22-B	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW22-C	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW23-A	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW23-B	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW23-C	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW25-B	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW4-A	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE TH1	E235.NO3	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrate in Water by IC										
HDPE MW22-A	E235.NO3	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW27-B	E235.NO2	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW28-B	E235.NO2	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW29-B	E235.NO2	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW29-C	E235.NO2	18-Sep-2024	20-Sep-2024	3 days	2 days	✓	24-Sep-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE GW DUP	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW22-B	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW22-C	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW23-A	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW23-B	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW23-C	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW25-B	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW4-A	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE TH1	E235.NO2	17-Sep-2024	20-Sep-2024	3 days	3 days	✓	24-Sep-2024	3 days	7 days	× EHT
Anions and Nutrients : Nitrite in Water by IC										
HDPE MW22-A	E235.NO2	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW27-B	E392	18-Sep-2024	----	----	----		23-Sep-2024	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW28-B	E392	18-Sep-2024	----	----	----		23-Sep-2024	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW29-B	E392	18-Sep-2024	----	----	----		23-Sep-2024	28 days	5 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW29-C	E392	18-Sep-2024	----	----	----		23-Sep-2024	28 days	5 days	✓

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE GW DUP	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW22-B	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW22-C	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW23-A	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW23-B	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW23-C	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW25-B	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW4-A	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE TH1	E392	17-Sep-2024	----	----	----		23-Sep-2024	28 days	6 days	✓

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE MW22-A	E392	16-Sep-2024	----	----	----		23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW27-B	E235.SO4	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW28-B	E235.SO4	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW29-B	E235.SO4	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW29-C	E235.SO4	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	24-Sep-2024	28 days	6 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE GW DUP	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW22-B	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW22-C	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW23-A	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓

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			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW23-B	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW23-C	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW25-B	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW4-A	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE TH1	E235.SO4	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	24-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE MW22-A	E235.SO4	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW27-B	E509	18-Sep-2024	23-Sep-2024	28 days	5 days	✓	24-Sep-2024	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW28-B	E509	18-Sep-2024	23-Sep-2024	28 days	5 days	✓	24-Sep-2024	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW29-B	E509	18-Sep-2024	23-Sep-2024	28 days	5 days	✓	24-Sep-2024	28 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW29-C	E509	18-Sep-2024	23-Sep-2024	28 days	5 days	✓	24-Sep-2024	28 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
GW DUP	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW22-B	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW22-C	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW23-A	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW23-B	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW23-C	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW25-B	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
MW4-A	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) TH1	E509	17-Sep-2024	23-Sep-2024	28 days	6 days	✓	24-Sep-2024	28 days	7 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) MW22-A	E509	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	24-Sep-2024	28 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW27-B	E421	18-Sep-2024	23-Sep-2024	180 days	5 days	✓	23-Sep-2024	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW28-B	E421	18-Sep-2024	23-Sep-2024	180 days	5 days	✓	23-Sep-2024	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW29-B	E421	18-Sep-2024	23-Sep-2024	180 days	5 days	✓	23-Sep-2024	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW29-C	E421	18-Sep-2024	23-Sep-2024	180 days	5 days	✓	23-Sep-2024	180 days	5 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW4-A	E421	17-Sep-2024	23-Sep-2024	180 days	5 days	✓	23-Sep-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) GW DUP	E421	17-Sep-2024	23-Sep-2024	180 days	6 days	✓	23-Sep-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) MW22-B	E421	17-Sep-2024	23-Sep-2024	180 days	6 days	✓	23-Sep-2024	180 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW22-C	E421	17-Sep-2024	23-Sep-2024	180 days	6 days	✓	23-Sep-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW23-A	E421	17-Sep-2024	23-Sep-2024	180 days	6 days	✓	23-Sep-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW23-B	E421	17-Sep-2024	23-Sep-2024	180 days	6 days	✓	23-Sep-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW23-C	E421	17-Sep-2024	23-Sep-2024	180 days	6 days	✓	23-Sep-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW25-B	E421	17-Sep-2024	23-Sep-2024	180 days	6 days	✓	23-Sep-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
TH1	E421	17-Sep-2024	23-Sep-2024	180 days	6 days	✓	23-Sep-2024	180 days	6 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
MW22-A	E421	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
MW27-B	E355-L	18-Sep-2024	23-Sep-2024	28 days	5 days	✓	26-Sep-2024	28 days	8 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
MW28-B	E355-L	18-Sep-2024	24-Sep-2024	28 days	6 days	✓	27-Sep-2024	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MW29-B	E355-L	18-Sep-2024	24-Sep-2024	28 days	6 days	✓	27-Sep-2024	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MW29-C	E355-L	18-Sep-2024	24-Sep-2024	28 days	6 days	✓	27-Sep-2024	28 days	9 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) GW DUP	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MW22-B	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MW22-C	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MW23-A	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MW23-B	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MW23-C	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) MW25-B	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
MW4-A	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
TH1	E355-L	17-Sep-2024	24-Sep-2024	28 days	7 days	✓	27-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
MW22-A	E355-L	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	27-Sep-2024	28 days	11 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW27-B	E290	18-Sep-2024	20-Sep-2024	14 days	2 days	✓	21-Sep-2024	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW28-B	E290	18-Sep-2024	20-Sep-2024	14 days	2 days	✓	21-Sep-2024	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW29-B	E290	18-Sep-2024	20-Sep-2024	14 days	2 days	✓	21-Sep-2024	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW29-C	E290	18-Sep-2024	20-Sep-2024	14 days	2 days	✓	21-Sep-2024	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
GW DUP	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
MW22-B	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE MW22-C	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW23-A	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW23-B	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW23-C	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW25-B	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW4-A	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE TH1	E290	17-Sep-2024	20-Sep-2024	14 days	3 days	✓	21-Sep-2024	14 days	4 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE MW22-A	E290	16-Sep-2024	20-Sep-2024	14 days	4 days	✓	21-Sep-2024	14 days	5 days	✓
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE GW DUP	E330	17-Sep-2024	----	----	----		25-Sep-2024	48 hrs	190 hrs	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW25-B	E330	17-Sep-2024	----	----	----		25-Sep-2024	48 hrs	190 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW23-C	E330	17-Sep-2024	----	----	----		25-Sep-2024	48 hrs	193 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW23-B	E330	17-Sep-2024	----	----	----		25-Sep-2024	48 hrs	193 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW22-C	E330	17-Sep-2024	----	----	----		25-Sep-2024	48 hrs	194 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW23-A	E330	17-Sep-2024	----	----	----		25-Sep-2024	48 hrs	194 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW22-B	E330	17-Sep-2024	----	----	----		25-Sep-2024	48 hrs	195 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW22-A	E330	16-Sep-2024	----	----	----		25-Sep-2024	48 hrs	213 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW27-B	E330	18-Sep-2024	----	----	----		27-Sep-2024	48 hrs	216 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW28-B	E330	18-Sep-2024	----	----	----		27-Sep-2024	48 hrs	217 hrs	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW29-C	E330	18-Sep-2024	----	----	----		27-Sep-2024	48 hrs	218 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW29-B	E330	18-Sep-2024	----	----	----		27-Sep-2024	48 hrs	219 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE MW4-A	E330	17-Sep-2024	----	----	----		27-Sep-2024	48 hrs	235 hrs	× EHTL
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE TH1	E330	17-Sep-2024	----	----	----		27-Sep-2024	48 hrs	236 hrs	× EHTL
Physical Tests : Conductivity in Water										
HDPE MW27-B	E100	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	21-Sep-2024	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE MW28-B	E100	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	21-Sep-2024	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE MW29-B	E100	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	21-Sep-2024	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE MW29-C	E100	18-Sep-2024	20-Sep-2024	28 days	2 days	✓	21-Sep-2024	28 days	3 days	✓
Physical Tests : Conductivity in Water										
HDPE GW DUP	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE MW22-B	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MW22-C	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MW23-A	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MW23-B	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MW23-C	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MW25-B	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MW4-A	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE TH1	E100	17-Sep-2024	20-Sep-2024	28 days	3 days	✓	21-Sep-2024	28 days	4 days	✓
Physical Tests : Conductivity in Water										
HDPE MW22-A	E100	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	21-Sep-2024	28 days	5 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE MW27-B	E108	18-Sep-2024	20-Sep-2024	0.25 hrs	55 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	72 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW28-B	E108	18-Sep-2024	20-Sep-2024	0.25 hrs	56 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	73 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW29-C	E108	18-Sep-2024	20-Sep-2024	0.25 hrs	57 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	73 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW29-B	E108	18-Sep-2024	20-Sep-2024	0.25 hrs	57 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	74 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW4-A	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	74 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	91 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE TH1	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	75 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	92 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE GW DUP	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	76 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	93 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW25-B	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	76 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	93 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW23-C	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	79 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	95 hrs	× EHTR-FM

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : pH by Meter										
HDPE MW23-B	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	79 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	96 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW22-C	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	80 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	97 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW23-A	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	80 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	97 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW22-B	E108	17-Sep-2024	20-Sep-2024	0.25 hrs	81 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	98 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE MW22-A	E108	16-Sep-2024	20-Sep-2024	0.25 hrs	99 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	116 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE GW DUP	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW22-B	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW22-C	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW23-A	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE MW23-B	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW23-C	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW25-B	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW4-A	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE TH1	E162	17-Sep-2024	----	----	----		20-Sep-2024	7 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW22-A	E162	16-Sep-2024	----	----	----		20-Sep-2024	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW27-B	E162	18-Sep-2024	----	----	----		24-Sep-2024	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW28-B	E162	18-Sep-2024	----	----	----		24-Sep-2024	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE MW29-B	E162	18-Sep-2024	----	----	----		24-Sep-2024	7 days	6 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE MW29-C	E162	18-Sep-2024	----	----	----		24-Sep-2024	7 days	6 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MW27-B	E121	18-Sep-2024	----	----	----		21-Sep-2024	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MW28-B	E121	18-Sep-2024	----	----	----		21-Sep-2024	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MW29-B	E121	18-Sep-2024	----	----	----		21-Sep-2024	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE MW29-C	E121	18-Sep-2024	----	----	----		21-Sep-2024	3 days	3 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE GW DUP	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MW22-B	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MW22-C	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MW23-A	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Turbidity by Nephelometry										
HDPE MW23-B	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MW23-C	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MW25-B	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MW4-A	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE TH1	E121	17-Sep-2024	----	----	----		21-Sep-2024	3 days	4 days	× EHT
Physical Tests : Turbidity by Nephelometry										
HDPE MW22-A	E121	16-Sep-2024	----	----	----		21-Sep-2024	3 days	5 days	× EHTL
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW27-B	E508	18-Sep-2024	24-Sep-2024	0 hrs	145 hrs	× UCP	26-Sep-2024	0 hrs	191 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW28-B	E508	18-Sep-2024	24-Sep-2024	0 hrs	146 hrs	× UCP	26-Sep-2024	0 hrs	192 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW29-C	E508	18-Sep-2024	24-Sep-2024	0 hrs	146 hrs	× UCP	26-Sep-2024	0 hrs	192 hrs	× UCP

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW29-B	E508	18-Sep-2024	24-Sep-2024	0 hrs	147 hrs	× UCP	26-Sep-2024	0 hrs	193 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW4-A	E508	17-Sep-2024	24-Sep-2024	0 hrs	164 hrs	× UCP	26-Sep-2024	0 hrs	209 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle TH1	E508	17-Sep-2024	24-Sep-2024	0 hrs	165 hrs	× UCP	26-Sep-2024	0 hrs	211 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle GW DUP	E508	17-Sep-2024	24-Sep-2024	0 hrs	166 hrs	× UCP	26-Sep-2024	0 hrs	212 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW25-B	E508	17-Sep-2024	24-Sep-2024	0 hrs	166 hrs	× UCP	26-Sep-2024	0 hrs	212 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW23-C	E508	17-Sep-2024	24-Sep-2024	0 hrs	168 hrs	× UCP	26-Sep-2024	0 hrs	214 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW23-B	E508	17-Sep-2024	24-Sep-2024	0 hrs	169 hrs	× UCP	26-Sep-2024	0 hrs	215 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW22-C	E508	17-Sep-2024	24-Sep-2024	0 hrs	170 hrs	× UCP	26-Sep-2024	0 hrs	216 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle MW23-A	E508	17-Sep-2024	24-Sep-2024	0 hrs	170 hrs	× UCP	26-Sep-2024	0 hrs	216 hrs	× UCP

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times*		*Eval*	*Analysis Date*	*Holding Times*		*Eval*
				Rec	*Actual*			*Rec*	*Actual*	
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle										
MW22-B	E508	17-Sep-2024	24-Sep-2024	0 hrs	171 hrs	× UCP	26-Sep-2024	0 hrs	217 hrs	× UCP
Total Metals : Total Mercury in Water by CVAAS										
Lab Split - Subsample from unpreserved or incorrectly preserved bottle										
MW22-A	E508	16-Sep-2024	24-Sep-2024	0 hrs	189 hrs	× UCP	26-Sep-2024	0 hrs	235 hrs	× UCP

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1664163	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	1666839	3	60	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1664159	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	1671962	2	32	6.2	5.0	✓
Conductivity in Water	E100	1664162	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1666954	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1666609	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1664164	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1664156	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1664157	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1664158	1	20	5.0	5.0	✓
pH by Meter	E108	1664161	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	1667333	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1664160	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	1662588	2	35	5.7	5.2	✓
Total Mercury in Water by CVAAS	E508	1669182	1	14	7.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1666840	3	60	5.0	5.0	✓
Turbidity by Nephelometry	E121	1664811	2	37	5.4	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1664163	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	1666839	3	60	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1664159	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	1671962	2	32	6.2	5.0	✓
Conductivity in Water	E100	1664162	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1666954	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1666609	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1664164	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1664156	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1664157	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1664158	1	20	5.0	5.0	✓
pH by Meter	E108	1664161	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	1667333	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1664160	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	1662588	2	35	5.7	5.2	✓
Total Mercury in Water by CVAAS	E508	1669182	1	14	7.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1666840	3	60	5.0	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Turbidity by Nephelometry	E121	1664811	2	37	5.4	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1664163	1	20	5.0	5.0	✓
Ammonia by Fluorescence	E298	1666839	3	60	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1664159	1	20	5.0	5.0	✓
Colour (Apparent) by Spectrometer	E330	1671962	2	32	6.2	5.0	✓
Conductivity in Water	E100	1664162	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1666954	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1666609	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1664164	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1664156	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1664157	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1664158	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	1667333	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1664160	1	20	5.0	5.0	✓
TDS by Gravimetry	E162	1662588	2	35	5.7	5.2	✓
Total Mercury in Water by CVAAS	E508	1669182	1	14	7.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1666840	3	60	5.0	5.0	✓
Turbidity by Nephelometry	E121	1664811	2	37	5.4	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1666839	3	60	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1664159	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1666954	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1666609	1	20	5.0	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1664164	1	20	5.0	5.0	✓
Fluoride in Water by IC	E235.F	1664156	1	20	5.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1664157	1	20	5.0	5.0	✓
Nitrite in Water by IC	E235.NO2	1664158	1	20	5.0	5.0	✓
Reactive Silica by Colourimetry	E392	1667333	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1664160	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1669182	1	14	7.1	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1666840	3	60	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Waterloo	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Waterloo	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 ALS Environmental - Halifax	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 ALS Environmental - Waterloo	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 ALS Environmental - Winnipeg	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 ALS Environmental - Waterloo	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS
Dissolved Mercury in Water by CVAAS	E509 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Waterloo	Water	APHA 2340B	“Hardness (as $CaCO_3$), dissolved” is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. “Total Hardness” refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ion Balance using Dissolved Metals	EC101 ALS Environmental - Waterloo	Water	APHA 1030E	Cation Sum, Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Dissolved species are used where available. Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Saturation Index using Laboratory pH (Ca-D)	EC105 ALS Environmental - Waterloo	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO3. Negative values indicate undersaturation of CaCO3. This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential. If available, Field pH measurements are recommended for best accuracy (test code EC104).
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Dissolved Silicon as Silica (Calculation)	EC421.SiO2 ALS Environmental - Waterloo	Water	N/A	Dissolved Silicon (as SiO2) is a calculated parameter. Dissolved Silicon (as SiO2 mg/L) = 2.139 x Dissolved Silicon (mg/L).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Waterloo	Water		Preparation for Total Organic Carbon by Combustion
Dissolved Metals Water Filtration	EP421 ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **HA2402049**	Page	: 1 of 14
Amendment	: **2**		
Client	: Englobe Corp.	Laboratory	: ALS Environmental - Halifax
Contact	: Nathalie Sahakyan	Account Manager	: Emily Smith
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Telephone	: ----	Telephone	: +1 902 707 4888
Project	: 2408035.000	Date Samples Received	: 19-Sep-2024 12:05
PO	: ----	Date Analysis Commenced	: 20-Sep-2024
C-O-C number	: ----	Issue Date	: 09-Oct-2024 12:35
Sampler	: ----		
Site	:		
Quote number	: Meadowview Landfill		
No. of samples received	: 14		
No. of samples analysed	: 14		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Manager - Inorganics	Halifax Inorganics, Dartmouth, Nova Scotia
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Halifax Inorganics, Dartmouth, Nova Scotia
Jon Fisher	Production Manager, Environmental	Waterloo Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Waterloo Metals, Waterloo, Ontario
Kelly Fischer	Technical Specialist	Waterloo Inorganics, Waterloo, Ontario
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Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Metals, Waterloo, Ontario

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1662588)											
HA2402049-006	MW4-A	Solids, total dissolved [TDS]	----	E162	20	mg/L	589	586	0.596%	20%	----
Physical Tests (QC Lot: 1664161)											
HA2402049-002	MW28-B	pH	----	E108	0.10	pH units	8.15	8.15	0.00%	4%	----
Physical Tests (QC Lot: 1664162)											
HA2402049-002	MW28-B	Conductivity	----	E100	1.0	µS/cm	187	188	0.641%	10%	----
Physical Tests (QC Lot: 1664163)											
HA2402049-002	MW28-B	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	70.5	70.8	0.425%	20%	----
Physical Tests (QC Lot: 1664811)											
HA2402049-001	MW27-B	Turbidity	----	E121	0.10	NTU	378	377	0.265%	15%	----
Physical Tests (QC Lot: 1665483)											
HA2402049-014	TH1	Turbidity	----	E121	0.10	NTU	864	862	0.232%	15%	----
Physical Tests (QC Lot: 1668745)											
HA2402049-001	MW27-B	Solids, total dissolved [TDS]	----	E162	13	mg/L	122	128	6	Diff <2x LOR	----
Physical Tests (QC Lot: 1671962)											
HA2402049-007	MW22-A	Colour, apparent	----	E330	20.0	CU	1220	1240	1.11%	20%	----
Physical Tests (QC Lot: 1677011)											
HA2402049-001	MW27-B	Colour, apparent	----	E330	20.0	CU	1200	1230	2.41%	20%	----
Anions and Nutrients (QC Lot: 1664156)											
HA2402049-001	MW27-B	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.202	0.200	0.625%	20%	----
Anions and Nutrients (QC Lot: 1664157)											
HA2402049-001	MW27-B	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.167	0.168	0.0010	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664158)											
HA2402049-001	MW27-B	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664159)											
HA2402049-001	MW27-B	Chloride	16887-00-6	E235.Cl	0.50	mg/L	3.36	3.35	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664160)											
HA2402049-001	MW27-B	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1.30	1.29	0.01	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664164)											
HA2402049-001	MW27-B	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0067	0.0060	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1666839)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 1666839) - continued											
HA2402049-001	MW27-B	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0088	0.0077	0.0011	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1667333)											
HA2402049-001	MW27-B	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	9.31	10.7	14.2%	20%	----
Anions and Nutrients (QC Lot: 1669085)											
HA2402049-003	MW29-B	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0068	0.0067	0.0001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1669113)											
HA2402049-012	MW23-C	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1666840)											
HA2402050-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.09	2.90	0.19	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1669086)											
HA2402049-002	MW28-B	Carbon, total organic [TOC]	----	E355-L	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1669114)											
HA2402049-011	MW23-B	Carbon, total organic [TOC]	----	E355-L	5.00	mg/L	6.31	6.12	0.19	Diff <2x LOR	----
Total Metals (QC Lot: 1669182)											
HA2402049-001	MW27-B	Mercury, total	7439-97-6	E508	0.0000050	mg/L	0.0052 µg/L	<0.0000050	0.0000002	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1666609)											
HA2402049-001	MW27-B	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	9.1 µg/L	0.0099	0.0008	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.80 µg/L	0.00082	0.00002	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	12.3 µg/L	0.0123	0.438%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	1.83 µg/L	0.00190	3.73%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	100 µg/L	0.100	0.191%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0052 µg/L	<0.0000050	0.0000002	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	4840 µg/L	4.76	1.78%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.090 µg/L	0.000088	0.000003	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	1.15 µg/L	0.00116	0.000002	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.71 µg/L	0.00070	0.000006	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	<10 µg/L	<0.010	0	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	30.8 µg/L	0.0301	2.39%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	690 µg/L	0.687	0.466%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.37 µg/L	0.00038	0.00002	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Dissolved Metals (QC Lot: 1666609) - continued											
HA2402049-001	MW27-B	Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.993 µg/L	0.00102	2.30%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.50 µg/L	<0.00050	0	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<50 µg/L	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	4280 µg/L	4.10	4.41%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	2.68 µg/L	0.00270	0.895%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.059 µg/L	0.000066	0.000007	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	4800 µg/L	4.78	0.443%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	29500 µg/L	29.9	1.27%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	65.7 µg/L	0.0663	0.933%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<500 µg/L	<0.50	0	Diff <2x LOR	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.30 µg/L	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	14.8 µg/L	0.0150	1.67%	20%	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	3.03 µg/L	0.00308	1.52%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	4.52 µg/L	0.00459	0.00007	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	1.6 µg/L	0.0018	0.0001	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1666954)											
HA2402049-001	MW27-B	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0050 µg/L	<0.0000050	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1662588)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1664162)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 1664163)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1664811)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 1665483)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 1668745)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1671962)						
Colour, apparent	----	E330	2	CU	<2.0	----
Physical Tests (QCLot: 1677011)						
Colour, apparent	----	E330	2	CU	<2.0	----
Anions and Nutrients (QCLot: 1664156)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1664157)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1664158)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 1664159)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1664160)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1664164)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1666839)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1667333)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1669085)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 1669085) - continued						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1669113)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 1666840)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1669086)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1669114)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 1669182)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1666609)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1666609) - continued						
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 1666954)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1662588)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	90.4	85.0	115	----
Physical Tests (QCLot: 1664161)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1664162)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 1664163)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	98.4	85.0	115	----
Physical Tests (QCLot: 1664811)									
Turbidity	----	E121	0.1	NTU	200 NTU	95.0	85.0	115	----
Physical Tests (QCLot: 1665483)									
Turbidity	----	E121	0.1	NTU	200 NTU	96.5	85.0	115	----
Physical Tests (QCLot: 1668745)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	94.8	85.0	115	----
Physical Tests (QCLot: 1671962)									
Colour, apparent	----	E330	2	CU	25 CU	98.3	70.0	130	----
Physical Tests (QCLot: 1677011)									
Colour, apparent	----	E330	2	CU	25 CU	99.7	70.0	130	----
Anions and Nutrients (QCLot: 1664156)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	96.5	90.0	110	----
Anions and Nutrients (QCLot: 1664157)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 1664158)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1664159)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1664160)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 1664164)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	99.8	80.0	120	----
Anions and Nutrients (QCLot: 1666839)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	101	85.0	115	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1667333)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 1669085)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	99.7	85.0	115	----
Anions and Nutrients (QCLot: 1669113)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	100	85.0	115	----
Organic / Inorganic Carbon (QCLot: 1666840)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1669086)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1669114)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Total Metals (QCLot: 1669182)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	95.9	80.0	120	----
Dissolved Metals (QCLot: 1666609)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	0.1 mg/L	98.2	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	0.05 mg/L	99.3	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	0.05 mg/L	105	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.012 mg/L	95.7	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.005 mg/L	96.1	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	0.05 mg/L	102	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	0.05 mg/L	96.2	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.005 mg/L	96.9	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	2.5 mg/L	96.7	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.002 mg/L	99.5	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.012 mg/L	100	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.012 mg/L	98.9	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.012 mg/L	99.6	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	0.05 mg/L	98.5	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.025 mg/L	102	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.012 mg/L	88.5	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	2.5 mg/L	113	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.012 mg/L	100	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.012 mg/L	96.7	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1666609) - continued									
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.025 mg/L	99.7	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	0.5 mg/L	106	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	2.5 mg/L	97.6	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.005 mg/L	104	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	0.05 mg/L	102	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	0.5 mg/L	101	60.0	140	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.005 mg/L	88.1	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	2.5 mg/L	105	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.012 mg/L	98.7	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	2.5 mg/L	95.4	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.005 mg/L	94.2	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	0.05 mg/L	103	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.005 mg/L	98.6	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.025 mg/L	98.7	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.012 mg/L	97.9	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.005 mg/L	100	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0 mg/L	102	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.025 mg/L	100	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	98.2	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.005 mg/L	94.7	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	104	80.0	120	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1664156)										
HA2402049-001	MW27-B	Fluoride	16984-48-8	E235.F	0.931 mg/L	1 mg/L	93.1	75.0	125	----
Anions and Nutrients (QCLot: 1664157)										
HA2402049-001	MW27-B	Nitrate (as N)	14797-55-8	E235.NO3	2.48 mg/L	2.5 mg/L	99.4	75.0	125	----
Anions and Nutrients (QCLot: 1664158)										
HA2402049-001	MW27-B	Nitrite (as N)	14797-65-0	E235.NO2	0.501 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1664159)										
HA2402049-001	MW27-B	Chloride	16887-00-6	E235.Cl	99.8 mg/L	100 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 1664160)										
HA2402049-001	MW27-B	Sulfate (as SO4)	14808-79-8	E235.SO4	99.3 mg/L	100 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 1664164)										
HA2402049-001	MW27-B	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0194 mg/L	0.02 mg/L	99.2	70.0	130	----
Anions and Nutrients (QCLot: 1666839)										
HA2402049-001	MW27-B	Ammonia, total (as N)	7664-41-7	E298	0.0998 mg/L	0.1 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 1667333)										
HA2402049-002	MW28-B	Silicate (as SiO2)	7631-86-9	E392	8.55 mg/L	10 mg/L	85.5	75.0	125	----
Anions and Nutrients (QCLot: 1669085)										
HA2402049-003	MW29-B	Ammonia, total (as N)	7664-41-7	E298	0.0992 mg/L	0.1 mg/L	99.2	75.0	125	----
Anions and Nutrients (QCLot: 1669113)										
HA2402049-012	MW23-C	Ammonia, total (as N)	7664-41-7	E298	0.102 mg/L	0.1 mg/L	102	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1666840)										
HA2402050-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	5.37 mg/L	5 mg/L	107	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1669086)										
HA2402049-002	MW28-B	Carbon, total organic [TOC]	----	E355-L	25.5 mg/L	25 mg/L	102	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1669114)										
HA2402049-011	MW23-B	Carbon, total organic [TOC]	----	E355-L	ND mg/L	----	ND	70.0	130	----
Total Metals (QCLot: 1669182)										
HA2402049-002	MW28-B	Mercury, total	7439-97-6	E508	0.0000921 mg/L	0 mg/L	92.1	70.0	130	----
Dissolved Metals (QCLot: 1666609)										
HA2402049-002	MW28-B	Aluminum, dissolved	7429-90-5	E421	0.0970 mg/L	0.1 mg/L	97.0	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0513 mg/L	0.05 mg/L	102	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0558 mg/L	0.05 mg/L	112	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 1666609) - continued										
HA2402049-002	MW28-B	Barium, dissolved	7440-39-3	E421	0.0122 mg/L	0.012 mg/L	97.7	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.00490 mg/L	0.005 mg/L	98.0	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.0483 mg/L	0.05 mg/L	96.6	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.046 mg/L	0.05 mg/L	92.0	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00520 mg/L	0.005 mg/L	104	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00256 mg/L	0.002 mg/L	102	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0126 mg/L	0.012 mg/L	101	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0124 mg/L	0.012 mg/L	99.6	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0125 mg/L	0.012 mg/L	99.7	70.0	130	----
		Iron, dissolved	7439-89-6	E421	0.049 mg/L	0.05 mg/L	98.1	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0251 mg/L	0.025 mg/L	100	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0114 mg/L	0.012 mg/L	91.6	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0122 mg/L	0.012 mg/L	97.4	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0125 mg/L	0.012 mg/L	99.8	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0248 mg/L	0.025 mg/L	99.4	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	0.549 mg/L	0.5 mg/L	110	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	2.62 mg/L	2.5 mg/L	105	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.00528 mg/L	0.005 mg/L	106	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0576 mg/L	0.05 mg/L	115	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	ND mg/L	----	ND	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00446 mg/L	0.005 mg/L	89.2	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	----	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	2.61 mg/L	2.5 mg/L	104	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.00549 mg/L	0.005 mg/L	110	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0510 mg/L	0.05 mg/L	102	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.00482 mg/L	0.005 mg/L	96.4	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0252 mg/L	0.025 mg/L	101	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0121 mg/L	0.012 mg/L	96.9	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.00498 mg/L	0.005 mg/L	99.6	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	ND mg/L	----	ND	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0254 mg/L	0.025 mg/L	102	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.0261 mg/L	0.025 mg/L	104	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.00488 mg/L	0.005 mg/L	97.5	70.0	130	----
Dissolved Metals (QCLot: 1666954)										
HA2402049-002	MW28-B	Mercury, dissolved	7439-97-6	E509	0.0000868 mg/L	0 mg/L	86.8	70.0	130	----

ALS Canada Ltd.

CERTIFICATE OF ANALYSIS

Work Order	:	**HA2402050**			
Amendment	:	**1**			
Client	:	**Englobe Corp.**	Laboratory	:	ALS Environmental - Winnipeg
Contact	:	Nathalie Sahakyan	Account Manager	:	Emily Smith
Address	:	97 Troop Avenue Dartmouth Nova Scotia Canada B3B 2A7	Address	:	1329 Niakwa Road East, Unit 12 Winnipeg MB Canada R2J 3T4
Telephone	:	----	Telephone	:	+1 204 255 9720
Project	:	2408035.000	Date Samples Received	:	19-Sep-2024 12:05
PO	:	----	Date Analysis Commenced	:	20-Sep-2024
C-O-C number	:	----	Issue Date	:	09-Oct-2024 12:34
Sampler	:	----			
Site	:	----			
Quote number	:	Meadowview Landfill			
No. of samples received	:	7			
No. of samples analysed	:	7			

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Manager - Inorganics	Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Metals, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Inorganics, Dartmouth, Nova Scotia
Melissa Freeman	Metal Analyst	Metals, Waterloo, Ontario
Nik Perkio	Senior Analyst	Inorganics, Waterloo, Ontario
Oleksandr Busel		Inorganics, Winnipeg, Manitoba

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

Unit	*Description*
mg/L	milligrams per litre
pH units	pH units
µS/cm	microsiemens per centimetre
NTU	nephelometric turbidity units
CU	colour units (1 cu = 1 mg/l pt)
-	no units
%	percent
meq/L	milliequivalents per litre

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Workorder Comments

Amendment (08/10/2024): This report has been amended following minor LIMS report formatting corrections. All analysis results are as per the previous report. Revised to update metals reporting units.

Qualifiers

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Analytical Results

Sub-Matrix: Surface Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	SW24-1	SW24-3	SW19B	SW7	SW7A
					Client sampling date / time	16-Sep-2024 11:55	16-Sep-2024 09:45	16-Sep-2024 13:20	16-Sep-2024 13:00	16-Sep-2024 12:30
						HA2402050-001	HA2402050-002	HA2402050-003	HA2402050-004	HA2402050-005
						Result	Result	Result	Result	Result
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	1.0	mg/L		73.3	74.7	43.0	77.2	117
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L		60.1	61.2	35.3	63.3	95.9
Colour, apparent	----	E330/WT	2.0	CU		32.3	36.2	505	68.0	212
Conductivity	----	E100/WT	1.0	µS/cm		293	302	177	190	255
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	0.50	mg/L		94.9	96.2	24.9	60.2	81.7
Langelier index (@ 20°C)	----	EC105A/WT	0.010	-		-0.273	-0.391	-1.76	-0.693	-0.699
Langelier index (@ 4°C)	----	EC105A/WT	0.010	-		-0.520	-0.642	-2.01	-0.944	-0.951
pH	----	E108/WT	0.10	pH units		7.83	7.70	7.18	7.55	7.26
pH, saturation (@ 20°C)	----	EC105A/WT	0.010	pH units		8.10	8.09	8.94	8.24	7.96
pH, saturation (@ 4°C)	----	EC105A/WT	0.010	pH units		8.35	8.34	9.19	8.49	8.21
Solids, total dissolved [TDS]	----	E162/HA	10	mg/L		178 DLDS	188 DLDS	117 DLDS	109 DLDS	144 DLDS
Turbidity	----	E121/WT	0.10	NTU		4.51	4.23	45.1	5.74	25.9
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L		0.0371	0.0724	0.264	0.256	1.40
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L		32.4	35.0	31.4	17.0	18.6
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L		0.036	0.037	<0.020	0.022	0.021
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L		2.27	2.17	0.051	0.086	0.068
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L		2.28	2.20	0.0770	0.122	0.0680
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L		0.012	0.034	0.026	0.036	<0.010

Analytical Results

Sub-Matrix: Surface Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	SW24-1	SW24-3	SW19B	SW7	SW7A
Client sample ID									
Client sampling date / time					16-Sep-2024 11:55	16-Sep-2024 09:45	16-Sep-2024 13:20	16-Sep-2024 13:00	16-Sep-2024 12:30
					HA2402050-001	HA2402050-002	HA2402050-003	HA2402050-004	HA2402050-005
					Result	Result	Result	Result	Result
Anions and Nutrients									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L	0.0469	0.0318	0.0067	0.0050	<0.0010
Phosphorus, total	7723-14-0	E372-U/WT	2.0	mg/L	109	86.2	73.8	10.4	32.2
Silicate (as SiO2)	7631-86-9	E392/WP	0.50	mg/L	7.34	7.28	8.33	11.0	12.0
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L	22.1	21.4	2.04	2.97	2.44
Organic / Inorganic Carbon									
Carbon, total organic [TOC]	----	E355-L/WT	0.50	mg/L	3.09	2.99	12.2	3.11	3.52
Ion Balance									
Anion sum	----	EC101A/WT	0.10	meq/L	2.74	2.82	1.64	1.82	2.50
Cation sum (total)	----	EC101A/WT	0.10	meq/L	2.75	2.83	2.01	1.90	2.79
Ion balance (cations/anions)	----	EC101A/WT	0.01	%	100	100	122	104	112
Total Metals									
Aluminum, total	7429-90-5	E420/WT	3.0	mg/L	239	122	88.3	14.1	10.3
Antimony, total	7440-36-0	E420/WT	0.10	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic, total	7440-38-2	E420/WT	0.10	mg/L	1.26	1.39	1.25	1.95	7.61
Barium, total	7440-39-3	E420/WT	0.10	mg/L	35.6	38.8	139	159	286
Beryllium, total	7440-41-7	E420/WT	0.020	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020
Bismuth, total	7440-69-9	E420/WT	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050
Boron, total	7440-42-8	E420/WT	10	mg/L	16	17	<10	<10	29
Cadmium, total	7440-43-9	E420/WT	0.0050	mg/L	0.0075	<0.0050	0.0071	<0.0050	<0.0050
Calcium, total	7440-70-2	E420/WT	100	mg/L	31700	32100	7320	20200	26600
Cesium, total	7440-46-2	E420/WT	0.010	mg/L	0.074	0.038	0.018	<0.010	<0.010

Analytical Results

Sub-Matrix: Surface Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	SW24-1	SW24-3	SW19B	SW7	SW7A
Client sample ID									
Client sampling date / time					16-Sep-2024 11:55	16-Sep-2024 09:45	16-Sep-2024 13:20	16-Sep-2024 13:00	16-Sep-2024 12:30
					HA2402050-001	HA2402050-002	HA2402050-003	HA2402050-004	HA2402050-005
					Result	Result	Result	Result	Result
Total Metals									
Chromium, total	7440-47-3	E420/WT	0.50	mg/L	0.68	<0.50	<0.50	0.54	<0.50
Cobalt, total	7440-48-4	E420/WT	0.10	mg/L	0.25	0.19	1.26	0.36	1.98
Copper, total	7440-50-8	E420/WT	0.50	mg/L	0.55	<0.50	<0.50	<0.50	<0.50
Iron, total	7439-89-6	E420/WT	10	mg/L	530	525	8710	1890	7380
Lead, total	7439-92-1	E420/WT	0.050	mg/L	0.233	0.139	0.388	0.064	0.099
Lithium, total	7439-93-2	E420/WT	1.0	mg/L	2.8	2.5	<1.0	<1.0	2.0
Magnesium, total	7439-95-4	E420/WT	5.0	mg/L	3820	3890	1610	2370	3720
Manganese, total	7439-96-5	E420/WT	0.10	mg/L	121	158	4960	1440	1980
Mercury, total	7439-97-6	E508/WT	0.0050	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Molybdenum, total	7439-98-7	E420/WT	0.050	mg/L	0.449	0.418	0.079	<0.050	0.091
Nickel, total	7440-02-0	E420/WT	0.50	mg/L	0.51	<0.50	<0.50	<0.50	1.00
Potassium, total	7440-09-7	E420/WT	50	mg/L	2570	2680	1350	1850	3540
Rubidium, total	7440-17-7	E420/WT	0.20	mg/L	1.84	1.87	2.96	0.99	1.62
Selenium, total	7782-49-2	E420/WT	0.050	mg/L	0.072	0.080	0.051	<0.050	<0.050
Silicon (as SiO2), total	7631-86-9	EC420.SiO2/WT	0.25	mg/L	9.54	8.92	10.3	13.1	14.9
Silicon, total	7440-21-3	E420/WT	100	mg/L	4460	4170	4810	6140	6970
Silver, total	7440-22-4	E420/WT	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
Sodium, total	7440-23-5	E420/WT	50	mg/L	17000	18400	21900	11700	14400
Strontium, total	7440-24-6	E420/WT	0.20	mg/L	119	123	25.0	44.1	82.3
Sulfur, total	7704-34-9	E420/WT	500	mg/L	7980	7670	980	1210	1080
Tellurium, total	13494-80-9	E420/WT	0.20	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20

Analytical Results

Sub-Matrix: Surface Water (Matrix: Water)

					Client sample ID	SW24-1	SW24-3	SW19B	SW7	SW7A
					Client sampling date / time	16-Sep-2024 11:55	16-Sep-2024 09:45	16-Sep-2024 13:20	16-Sep-2024 13:00	16-Sep-2024 12:30
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit		HA2402050-001	HA2402050-002	HA2402050-003	HA2402050-004	HA2402050-005
						Result	Result	Result	Result	Result
Total Metals										
Thallium, total	7440-28-0	E420/WT	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
Thorium, total	7440-29-1	E420/WT	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Tin, total	7440-31-5	E420/WT	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Titanium, total	7440-32-6	E420/WT	0.30	mg/L		5.41	2.96	0.97	<0.30	<0.30
Tungsten, total	7440-33-7	E420/WT	0.10	mg/L		<0.10	<0.10	<0.10	<0.10	<0.10
Uranium, total	7440-61-1	E420/WT	0.010	mg/L		0.989	0.918	<0.010	0.036	0.028
Vanadium, total	7440-62-2	E420/WT	0.50	mg/L		1.34	1.07	0.54	<0.50	<0.50
Zinc, total	7440-66-6	E420/WT	3.0	mg/L		<3.0	<3.0	<3.0	<3.0	<3.0
Zirconium, total	7440-67-7	E420/WT	0.20	mg/L		<0.20	<0.20	<0.20	<0.20	<0.20
Dissolved Metals										
Manganese, dissolved	7439-96-5	E421/WT	0.10	mg/L		98.0	145	4760	1350	1860
Zinc, dissolved	7440-66-6	E421/WT	1.0	mg/L		<1.0	1.6	1.0	<1.0	<1.0
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	Field	Field	Field

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Analytical Results

Sub-Matrix: Surface Water (Matrix: Water)

					Client sample ID	SW24-2	SW DUP	----	----	----
					Client sampling date / time	16-Sep-2024 10:55	16-Sep-2024 00:00	----	----	----
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit		HA2402050-007	HA2402050-008	----	----	----
						Result	Result	----	----	----
Physical Tests										
Alkalinity, bicarbonate (as HCO3)	71-52-3	E290/WT	1.0	mg/L		71.7	71.0	----	----	----

Analytical Results

Sub-Matrix: Surface Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	SW24-2	SW DUP	----	----	----
					Client sampling date / time	16-Sep-2024 10:55	16-Sep-2024 00:00	----	----	----
						HA2402050-007	HA2402050-008	----	----	----
						Result	Result	----	----	----
Physical Tests										
Alkalinity, carbonate (as CO3)	3812-32-6	E290/WT	1.0	mg/L		<1.0	<1.0	----	----	----
Alkalinity, hydroxide (as OH)	14280-30-9	E290/WT	1.0	mg/L		<1.0	<1.0	----	----	----
Alkalinity, total (as CaCO3)	----	E290/WT	1.0	mg/L		58.8	58.2	----	----	----
Colour, apparent	----	E330/WT	2.0	CU		36.3	30.7	----	----	----
Conductivity	----	E100/WT	1.0	µS/cm		299	291	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/WT	0.50	mg/L		94.6	94.8	----	----	----
Langelier index (@ 20°C)	----	EC105A/WT	0.010	-		-0.491	-0.464	----	----	----
Langelier index (@ 4°C)	----	EC105A/WT	0.010	-		-0.742	-0.715	----	----	----
pH	----	E108/WT	0.10	pH units		7.62	7.65	----	----	----
pH, saturation (@ 20°C)	----	EC105A/WT	0.010	pH units		8.11	8.11	----	----	----
pH, saturation (@ 4°C)	----	EC105A/WT	0.010	pH units		8.36	8.36	----	----	----
Solids, total dissolved [TDS]	----	E162/HA	10	mg/L		180 DLDS	182 DLDS	----	----	----
Turbidity	----	E121/WT	0.10	NTU		5.06	4.76	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/WT	0.0050	mg/L		0.0829	0.0277	----	----	----
Chloride	16887-00-6	E235.Cl/WT	0.50	mg/L		33.5	33.3	----	----	----
Fluoride	16984-48-8	E235.F/WT	0.020	mg/L		0.043	0.045	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3/WT	0.020	mg/L		2.51	2.32	----	----	----
Nitrate + Nitrite (as N)	----	EC235.N+N/WT	0.0032	mg/L		2.53	2.33	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2/WT	0.010	mg/L		0.017	0.014	----	----	----
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U/WT	0.0010	mg/L		0.0408	0.0518	----	----	----

Analytical Results

Sub-Matrix: Surface Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	SW24-2	SW DUP	----	----	----
					Client sampling date / time	16-Sep-2024 10:55	16-Sep-2024 00:00	----	----	----
						HA2402050-007	HA2402050-008	----	----	----
						Result	Result	----	----	----
Anions and Nutrients										
Phosphorus, total	7723-14-0	E372-U/WT	2.0	mg/L		96.4	99.5	----	----	----
Silicate (as SiO2)	7631-86-9	E392/WP	0.50	mg/L		6.90	6.91	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/WT	0.30	mg/L		22.7	22.8	----	----	----
Organic / Inorganic Carbon										
Carbon, total organic [TOC]	----	E355-L/WT	0.50	mg/L		3.00	2.86	----	----	----
Ion Balance										
Anion sum	----	EC101A/WT	0.10	meq/L		2.78	2.75	----	----	----
Cation sum (total)	----	EC101A/WT	0.10	meq/L		2.76	2.74	----	----	----
Ion balance (cations/anions)	----	EC101A/WT	0.01	%		99.3	99.6	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/WT	3.0	mg/L		161	176	----	----	----
Antimony, total	7440-36-0	E420/WT	0.10	mg/L		<0.10	<0.10	----	----	----
Arsenic, total	7440-38-2	E420/WT	0.10	mg/L		1.45	1.23	----	----	----
Barium, total	7440-39-3	E420/WT	0.10	mg/L		39.2	34.5	----	----	----
Beryllium, total	7440-41-7	E420/WT	0.020	mg/L		<0.020	<0.020	----	----	----
Bismuth, total	7440-69-9	E420/WT	0.050	mg/L		<0.050	<0.050	----	----	----
Boron, total	7440-42-8	E420/WT	10	mg/L		18	16	----	----	----
Cadmium, total	7440-43-9	E420/WT	0.0050	mg/L		0.0111	<0.0050	----	----	----
Calcium, total	7440-70-2	E420/WT	100	mg/L		31700	31800	----	----	----
Cesium, total	7440-46-2	E420/WT	0.010	mg/L		0.046	0.060	----	----	----
Chromium, total	7440-47-3	E420/WT	0.50	mg/L		0.58	0.54	----	----	----

Analytical Results

Sub-Matrix: Surface Water
(Matrix: Water)

					Client sample ID	SW24-2	SW DUP	----	----	----
					Client sampling date / time	16-Sep-2024 10:55	16-Sep-2024 00:00	----	----	----
Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit		HA2402050-007	HA2402050-008	----	----	----
						Result	Result	----	----	----
Total Metals										
Cobalt, total	7440-48-4	E420/WT	0.10	mg/L		0.25	0.21	----	----	----
Copper, total	7440-50-8	E420/WT	0.50	mg/L		0.87	<0.50	----	----	----
Iron, total	7439-89-6	E420/WT	10	mg/L		571	445	----	----	----
Lead, total	7439-92-1	E420/WT	0.050	mg/L		0.621	0.183	----	----	----
Lithium, total	7439-93-2	E420/WT	1.0	mg/L		2.3	2.5	----	----	----
Magnesium, total	7439-95-4	E420/WT	5.0	mg/L		3740	3740	----	----	----
Manganese, total	7439-96-5	E420/WT	0.10	mg/L		145	118	----	----	----
Mercury, total	7439-97-6	E508/WT	0.0050	mg/L		<0.0050	<0.0050	----	----	----
Molybdenum, total	7439-98-7	E420/WT	0.050	mg/L		0.438	0.442	----	----	----
Nickel, total	7440-02-0	E420/WT	0.50	mg/L		0.63	<0.50	----	----	----
Potassium, total	7440-09-7	E420/WT	50	mg/L		2670	2590	----	----	----
Rubidium, total	7440-17-7	E420/WT	0.20	mg/L		1.71	1.86	----	----	----
Selenium, total	7782-49-2	E420/WT	0.050	mg/L		0.082	0.076	----	----	----
Silicon (as SiO2), total	7631-86-9	EC420.SiO2/WT	0.25	mg/L		9.00	9.00	----	----	----
Silicon, total	7440-21-3	E420/WT	100	mg/L		4210	4210	----	----	----
Silver, total	7440-22-4	E420/WT	0.010	mg/L		<0.010	<0.010	----	----	----
Sodium, total	7440-23-5	E420/WT	50	mg/L		17200	16900	----	----	----
Strontium, total	7440-24-6	E420/WT	0.20	mg/L		122	117	----	----	----
Sulfur, total	7704-34-9	E420/WT	500	mg/L		7930	7980	----	----	----
Tellurium, total	13494-80-9	E420/WT	0.20	mg/L		<0.20	<0.20	----	----	----
Thallium, total	7440-28-0	E420/WT	0.010	mg/L		<0.010	<0.010	----	----	----

Analytical Results

Sub-Matrix: Surface Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab/Accreditation	LOR	Unit	Client sample ID	SW24-2	SW DUP	----	----	----
					Client sampling date / time	16-Sep-2024 10:55	16-Sep-2024 00:00	----	----	----
						HA2402050-007	HA2402050-008	----	----	----
						Result	Result	----	----	----
Total Metals										
Thorium, total	7440-29-1	E420/WT	0.10	mg/L		<0.10	<0.10	----	----	----
Tin, total	7440-31-5	E420/WT	0.10	mg/L		0.13	<0.10	----	----	----
Titanium, total	7440-32-6	E420/WT	0.30	mg/L		3.78	4.19	----	----	----
Tungsten, total	7440-33-7	E420/WT	0.10	mg/L		<0.10	<0.10	----	----	----
Uranium, total	7440-61-1	E420/WT	0.010	mg/L		0.961	0.984	----	----	----
Vanadium, total	7440-62-2	E420/WT	0.50	mg/L		1.18	1.22	----	----	----
Zinc, total	7440-66-6	E420/WT	3.0	mg/L		3.1	<3.0	----	----	----
Zirconium, total	7440-67-7	E420/WT	0.20	mg/L		<0.20	<0.20	----	----	----
Dissolved Metals										
Manganese, dissolved	7439-96-5	E421/WT	0.10	mg/L		133	102	----	----	----
Zinc, dissolved	7440-66-6	E421/WT	1.0	mg/L		1.7	<1.0	----	----	----
Dissolved metals filtration location	----	EP421/WT	-	-		Field	Field	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **HA2402050**	Page	: 1 of 23
Amendment	: 1		
Client	: **Englobe Corp.**	Laboratory	: ALS Environmental - Halifax
Contact	: Nathalie Sahakyan	Account Manager	: Emily Smith
Address	: 97 Troop Avenue Dartmouth NS Canada B3B 2A7	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	: ----	Telephone	: +1 902 707 4888
Project	: 2408035.000	Date Samples Received	: 19-Sep-2024 12:05
PO	: ----	Issue Date	: 09-Oct-2024 12:34
C-O-C number	: ----		
Sampler	: ----		
Site	:		
Quote number	: Meadowview Landfill		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW DUP	E298	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW19B	E298	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW24-1	E298	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW24-2	E298	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW24-3	E298	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW7	E298	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SW7A	E298	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Chloride in Water by IC										
HDPE SW DUP	E235.Cl	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW24-2	E235.Cl	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW19B	E235.Cl	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW24-1	E235.Cl	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW24-3	E235.Cl	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW7	E235.Cl	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SW7A	E235.Cl	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW DUP	E378-U	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW19B	E378-U	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW24-1	E378-U	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW24-2	E378-U	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW24-3	E378-U	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW7	E378-U	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)										
HDPE SW7A	E378-U	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW DUP	E235.F	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW24-2	E235.F	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW19B	E235.F	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW24-1	E235.F	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW24-3	E235.F	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW7	E235.F	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SW7A	E235.F	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW DUP	E235.NO3	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	23-Sep-2024	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW24-2	E235.NO3	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	23-Sep-2024	3 days	7 days	× EHTL
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW19B	E235.NO3	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW24-1	E235.NO3	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW24-3	E235.NO3	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW7	E235.NO3	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Nitrate in Water by IC										
HDPE SW7A	E235.NO3	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW DUP	E235.NO2	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	23-Sep-2024	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW24-2	E235.NO2	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	23-Sep-2024	3 days	7 days	× EHTL
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW19B	E235.NO2	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW24-1	E235.NO2	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW24-3	E235.NO2	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW7	E235.NO2	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Nitrite in Water by IC										
HDPE SW7A	E235.NO2	16-Sep-2024	20-Sep-2024	3 days	4 days	× EHTL	24-Sep-2024	3 days	8 days	× EHTL
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE SW DUP	E392	16-Sep-2024	----	----	----		23-Sep-2024	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE SW19B	E392	16-Sep-2024	----	----	----		23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE SW24-1	E392	16-Sep-2024	----	----	----		23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE SW24-2	E392	16-Sep-2024	----	----	----		23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE SW24-3	E392	16-Sep-2024	----	----	----		23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE SW7	E392	16-Sep-2024	----	----	----		23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Reactive Silica by Colourimetry										
HDPE SW7A	E392	16-Sep-2024	----	----	----		23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW DUP	E235.SO4	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW24-2	E235.SO4	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	23-Sep-2024	28 days	7 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW19B	E235.SO4	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW24-1	E235.SO4	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW24-3	E235.SO4	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW7	E235.SO4	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SW7A	E235.SO4	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	24-Sep-2024	28 days	8 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) SW DUP	E372-U	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	25-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) SW19B	E372-U	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	25-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) SW24-1	E372-U	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	25-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) SW24-2	E372-U	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	25-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) SW24-3	E372-U	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	25-Sep-2024	28 days	9 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
SW7	E372-U	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	25-Sep-2024	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
SW7A	E372-U	16-Sep-2024	24-Sep-2024	28 days	8 days	✓	25-Sep-2024	28 days	9 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SW DUP	E421	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SW19B	E421	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SW24-1	E421	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SW24-2	E421	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SW24-3	E421	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SW7	E421	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
SW7A	E421	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW DUP	E355-L	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW19B	E355-L	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW24-1	E355-L	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW24-2	E355-L	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW24-3	E355-L	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW7	E355-L	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	10 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SW7A	E355-L	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	26-Sep-2024	28 days	10 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW DUP	E290	16-Sep-2024	20-Sep-2024	14 days	4 days	✓	21-Sep-2024	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW19B	E290	16-Sep-2024	20-Sep-2024	14 days	4 days	✓	21-Sep-2024	14 days	5 days	✓

Matrix: **Water**

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			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Alkalinity Species by Titration										
HDPE SW24-1	E290	16-Sep-2024	20-Sep-2024	14 days	4 days	✓	21-Sep-2024	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW24-2	E290	16-Sep-2024	20-Sep-2024	14 days	4 days	✓	21-Sep-2024	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW24-3	E290	16-Sep-2024	20-Sep-2024	14 days	4 days	✓	21-Sep-2024	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW7	E290	16-Sep-2024	20-Sep-2024	14 days	4 days	✓	21-Sep-2024	14 days	5 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SW7A	E290	16-Sep-2024	20-Sep-2024	14 days	4 days	✓	21-Sep-2024	14 days	5 days	✓
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW DUP	E330	16-Sep-2024	----	----	----		23-Sep-2024	48 hrs	167 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW19B	E330	16-Sep-2024	----	----	----		23-Sep-2024	48 hrs	168 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW7	E330	16-Sep-2024	----	----	----		23-Sep-2024	48 hrs	169 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW7A	E330	16-Sep-2024	----	----	----		23-Sep-2024	48 hrs	169 hrs	× EHTR

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW24-1	E330	16-Sep-2024	----	----	----		23-Sep-2024	48 hrs	170 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW24-2	E330	16-Sep-2024	----	----	----		23-Sep-2024	48 hrs	171 hrs	× EHTR
Physical Tests : Colour (Apparent) by Spectrometer										
HDPE SW24-3	E330	16-Sep-2024	----	----	----		23-Sep-2024	48 hrs	172 hrs	× EHTR
Physical Tests : Conductivity in Water										
HDPE SW DUP	E100	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	21-Sep-2024	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE SW19B	E100	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	21-Sep-2024	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE SW24-1	E100	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	21-Sep-2024	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE SW24-2	E100	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	21-Sep-2024	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE SW24-3	E100	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	21-Sep-2024	28 days	5 days	✓
Physical Tests : Conductivity in Water										
HDPE SW7	E100	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	21-Sep-2024	28 days	5 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Conductivity in Water										
HDPE SW7A	E100	16-Sep-2024	20-Sep-2024	28 days	4 days	✓	21-Sep-2024	28 days	5 days	✓
Physical Tests : pH by Meter										
HDPE SW19B	E108	16-Sep-2024	20-Sep-2024	0.25 hrs	102 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	118 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW7	E108	16-Sep-2024	20-Sep-2024	0.25 hrs	102 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	119 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW7A	E108	16-Sep-2024	20-Sep-2024	0.25 hrs	102 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	119 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW DUP	E108	16-Sep-2024	20-Sep-2024	0.25 hrs	103 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	116 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW24-1	E108	16-Sep-2024	20-Sep-2024	0.25 hrs	103 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	120 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW24-3	E108	16-Sep-2024	20-Sep-2024	0.25 hrs	105 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	122 hrs	× EHTR-FM
Physical Tests : pH by Meter										
HDPE SW24-2	E108	16-Sep-2024	20-Sep-2024	0.25 hrs	107 hrs	× EHTR-FM	21-Sep-2024	0.25 hrs	120 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE SW DUP	E162	16-Sep-2024	----	----	----		20-Sep-2024	7 days	4 days	✓

Matrix: **Water**

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Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : TDS by Gravimetry										
HDPE SW19B	E162	16-Sep-2024	----	----	----		20-Sep-2024	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW24-1	E162	16-Sep-2024	----	----	----		20-Sep-2024	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW24-2	E162	16-Sep-2024	----	----	----		20-Sep-2024	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW24-3	E162	16-Sep-2024	----	----	----		20-Sep-2024	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW7	E162	16-Sep-2024	----	----	----		20-Sep-2024	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SW7A	E162	16-Sep-2024	----	----	----		20-Sep-2024	7 days	4 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE SW DUP	E121	16-Sep-2024	----	----	----		21-Sep-2024	3 days	5 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE SW19B	E121	16-Sep-2024	----	----	----		21-Sep-2024	3 days	5 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE SW24-1	E121	16-Sep-2024	----	----	----		21-Sep-2024	3 days	5 days	× EHTL

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Turbidity by Nephelometry										
HDPE SW24-2	E121	16-Sep-2024	----	----	----		21-Sep-2024	3 days	5 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE SW24-3	E121	16-Sep-2024	----	----	----		21-Sep-2024	3 days	5 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE SW7	E121	16-Sep-2024	----	----	----		21-Sep-2024	3 days	5 days	× EHTL
Physical Tests : Turbidity by Nephelometry										
HDPE SW7A	E121	16-Sep-2024	----	----	----		21-Sep-2024	3 days	5 days	× EHTL
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW DUP	E508	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW19B	E508	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW24-1	E508	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW24-2	E508	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW24-3	E508	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW7	E508	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) SW7A	E508	16-Sep-2024	23-Sep-2024	28 days	7 days	✓	23-Sep-2024	28 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW DUP	E420	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW19B	E420	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW24-1	E420	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW24-2	E420	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW24-3	E420	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW7	E420	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) SW7A	E420	16-Sep-2024	23-Sep-2024	180 days	7 days	✓	23-Sep-2024	180 days	7 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1664163	2	23	8.7	5.0	✓
Ammonia by Fluorescence	E298	1666839	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1664159	2	29	6.9	5.0	✓
Colour (Apparent) by Spectrometer	E330	1667340	1	20	5.0	5.0	✓
Conductivity in Water	E100	1664162	2	22	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1667512	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1664164	2	22	9.0	5.0	✓
Fluoride in Water by IC	E235.F	1664156	2	22	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1664157	2	34	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	1664158	2	34	5.8	5.0	✓
pH by Meter	E108	1664161	2	38	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	1667333	2	26	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1664160	2	22	9.0	5.0	✓
TDS by Gravimetry	E162	1662588	1	19	5.2	5.2	✓
Total Mercury in Water by CVAAS	E508	1666730	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1666553	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1666840	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1666838	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	1664811	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1664163	2	23	8.7	5.0	✓
Ammonia by Fluorescence	E298	1666839	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1664159	2	29	6.9	5.0	✓
Colour (Apparent) by Spectrometer	E330	1667340	1	20	5.0	5.0	✓
Conductivity in Water	E100	1664162	2	22	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1667512	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1664164	2	22	9.0	5.0	✓
Fluoride in Water by IC	E235.F	1664156	2	22	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1664157	2	34	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	1664158	2	34	5.8	5.0	✓
pH by Meter	E108	1664161	2	38	5.2	5.0	✓
Reactive Silica by Colourimetry	E392	1667333	2	26	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1664160	2	22	9.0	5.0	✓
TDS by Gravimetry	E162	1662588	1	19	5.2	5.2	✓
Total Mercury in Water by CVAAS	E508	1666730	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1666553	1	19	5.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1666840	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1666838	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	1664811	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1664163	2	23	8.7	5.0	✓
Ammonia by Fluorescence	E298	1666839	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1664159	2	29	6.9	5.0	✓
Colour (Apparent) by Spectrometer	E330	1667340	1	20	5.0	5.0	✓
Conductivity in Water	E100	1664162	2	22	9.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1667512	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1664164	2	22	9.0	5.0	✓
Fluoride in Water by IC	E235.F	1664156	2	22	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1664157	2	34	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	1664158	2	34	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	1667333	2	26	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1664160	2	22	9.0	5.0	✓
TDS by Gravimetry	E162	1662588	1	19	5.2	5.2	✓
Total Mercury in Water by CVAAS	E508	1666730	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1666553	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1666840	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1666838	1	20	5.0	5.0	✓
Turbidity by Nephelometry	E121	1664811	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1666839	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1664159	2	29	6.9	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1667512	1	19	5.2	5.0	✓
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U	1664164	2	22	9.0	5.0	✓
Fluoride in Water by IC	E235.F	1664156	2	22	9.0	5.0	✓
Nitrate in Water by IC	E235.NO3	1664157	2	34	5.8	5.0	✓
Nitrite in Water by IC	E235.NO2	1664158	2	34	5.8	5.0	✓
Reactive Silica by Colourimetry	E392	1667333	2	26	7.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1664160	2	22	9.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1666730	1	18	5.5	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1666553	1	19	5.2	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1666840	1	20	5.0	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1666838	1	20	5.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Waterloo	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Waterloo	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Waterloo	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
TDS by Gravimetry	E162 ALS Environmental - Halifax	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at 180 ± 2°C for 16 hours or to constant weight, with gravimetric measurement of the residue.
Chloride in Water by IC	E235.Cl ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC	E235.NO2 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC	E235.NO3 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Waterloo	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Waterloo	Water	APHA 2320 B (mod)	Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 ALS Environmental - Waterloo	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Colour (Apparent) by Spectrometer	E330 ALS Environmental - Waterloo	Water	APHA 2120 C (mod)	Colour (Apparent) is measured in an unfiltered sample spectrophotometrically using the single wavelength method. The colour contribution of settleable solids are not included in the result. This method is intended for potable waters. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Waterloo	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	E378-U ALS Environmental - Waterloo	Water	APHA 4500-P F (mod)	Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. Field filtration is recommended to ensure test results represent conditions at time of sampling.
Reactive Silica by Colourimetry	E392 ALS Environmental - Winnipeg	Water	APHA 4500-SiO2 E (mod)	Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method using a discrete analyzer. Method Limitation: Arsenic (5+) above 100 mg/L is a negative interference on this test
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Waterloo	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Waterloo	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 ALS Environmental - Waterloo	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Waterloo	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Ion Balance using Total Metals	EC101A ALS Environmental - Waterloo	Water	APHA 1030E	Cation Sum (using total metals), Anion Sum, and Ion Balance are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Minor ions are included where data is present. Ion Balance cannot be calculated accurately for waters with very low electrical conductivity (EC).
Saturation Index using Laboratory pH (Ca-T)	EC105A ALS Environmental - Waterloo	Water	APHA 2330B	Langelier Index provides an indication of scale formation potential at a given pH and temperature, and is calculated as per APHA 2330B Saturation Index. Positive values indicate oversaturation with respect to CaCO3. Negative values indicate undersaturation of CaCO3. This calculation uses laboratory pH measurements and provides estimates of Langelier Index at temperatures of 4, 15, 20, 25, 66, and 77°C. Ryznar Stability Index is an alternative index used for scale formation and corrosion potential.
Nitrate and Nitrite (as N) (Calculation)	EC235.N+N ALS Environmental - Waterloo	Water	EPA 300.0	Nitrate and Nitrite (as N) is a calculated parameter. Nitrate and Nitrite (as N) = Nitrite (as N) + Nitrate (as N).
Total Silicon as Silica (Calculation)	EC420.SiO2 ALS Environmental - Waterloo	Water	N/A	Total Silicon (as SiO2) is a calculated parameter. Total Silicon (as SiO2 mg/L) = 2.139 x Total Silicon (mg/L).

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Waterloo	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Waterloo	Water		Preparation for Total Organic Carbon by Combustion
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Waterloo	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 ALS Environmental - Waterloo	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **HA2402050**	Page	: 1 of 14
Amendment	: **1**		
Client	: Englobe Corp.	Laboratory	: ALS Environmental - Halifax
Contact	: Nathalie Sahakyan	Account Manager	: Emily Smith
Address	: 97 Troop Avenue Dartmouth NS Canada B3B 2A7	Address	: 13-100 Wright Ave Dartmouth, Nova Scotia Canada B3B 1L2
Telephone	: ----	Telephone	: +1 902 707 4888
Project	: 2408035.000	Date Samples Received	: 19-Sep-2024 12:05
PO	: ----	Date Analysis Commenced	: 20-Sep-2024
C-O-C number	: ----	Issue Date	: 09-Oct-2024 12:34
Sampler	: ----		
Site	:		
Quote number	: Meadowview Landfill		
No. of samples received	: 7		
No. of samples analysed	: 7		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Greg Pokocky	Manager - Inorganics	Waterloo Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Halifax Inorganics, Dartmouth, Nova Scotia
Jon Fisher	Production Manager, Environmental	Waterloo Inorganics, Waterloo, Ontario
Jon Fisher	Production Manager, Environmental	Waterloo Metals, Waterloo, Ontario
Melissa Freeman	Metal Analyst	Waterloo Metals, Waterloo, Ontario
Nik Perkio	Senior Analyst	Waterloo Inorganics, Waterloo, Ontario
Oleksandr Busel		Winnipeg Inorganics, Winnipeg, Manitoba

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1662588)											
HA2402049-006	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	589	586	0.596%	20%	----
Physical Tests (QC Lot: 1664161)											
HA2402049-002	Anonymous	pH	----	E108	0.10	pH units	8.15	8.15	0.00%	4%	----
Physical Tests (QC Lot: 1664162)											
HA2402049-002	Anonymous	Conductivity	----	E100	1.0	µS/cm	187	188	0.641%	10%	----
Physical Tests (QC Lot: 1664163)											
HA2402049-002	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	70.5	70.8	0.425%	20%	----
Physical Tests (QC Lot: 1664381)											
HA2402050-008	SW DUP	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	58.2	58.2	0.0343%	20%	----
Physical Tests (QC Lot: 1664382)											
HA2402050-008	SW DUP	pH	----	E108	0.10	pH units	7.65	7.62	0.393%	4%	----
Physical Tests (QC Lot: 1664383)											
HA2402050-008	SW DUP	Conductivity	----	E100	1.0	µS/cm	291	292	0.343%	10%	----
Physical Tests (QC Lot: 1664811)											
HA2402049-001	Anonymous	Turbidity	----	E121	0.10	NTU	378	377	0.265%	15%	----
Physical Tests (QC Lot: 1667340)											
HA2402050-001	SW24-1	Colour, apparent	----	E330	2.0	CU	32.3	31.9	1.41%	20%	----
Anions and Nutrients (QC Lot: 1664156)											
HA2402049-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.202	0.200	0.625%	20%	----
Anions and Nutrients (QC Lot: 1664157)											
HA2402049-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	0.167	0.168	0.0010	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664158)											
HA2402049-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664159)											
HA2402049-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	3.36	3.35	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664160)											
HA2402049-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	1.30	1.29	0.01	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664164)											
HA2402049-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0067	0.0060	0.0007	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664384)											

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Anions and Nutrients (QC Lot: 1664384) - continued											
HA2402050-007	SW24-2	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	22.7	22.6	0.571%	20%	----
Anions and Nutrients (QC Lot: 1664385)											
HA2402050-007	SW24-2	Nitrate (as N)	14797-55-8	E235.NO3	0.020	mg/L	2.51	2.52	0.367%	20%	----
Anions and Nutrients (QC Lot: 1664386)											
HA2402050-007	SW24-2	Nitrite (as N)	14797-65-0	E235.NO2	0.010	mg/L	0.017	0.016	0.0009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664387)											
HA2402050-007	SW24-2	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.043	0.040	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1664388)											
HA2402050-007	SW24-2	Chloride	16887-00-6	E235.Cl	0.50	mg/L	33.5	33.5	0.0492%	20%	----
Anions and Nutrients (QC Lot: 1664389)											
HA2402050-007	SW24-2	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0010	mg/L	0.0408	0.0406	0.565%	20%	----
Anions and Nutrients (QC Lot: 1666838)											
BF2400346-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0090	0.0095	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1666839)											
HA2402049-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0088	0.0077	0.0011	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1667333)											
HA2402049-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	9.31	10.7	14.2%	20%	----
Anions and Nutrients (QC Lot: 1667334)											
HA2402050-008	SW DUP	Silicate (as SiO2)	7631-86-9	E392	0.50	mg/L	6.91	7.14	3.24%	20%	----
Organic / Inorganic Carbon (QC Lot: 1666840)											
HA2402050-001	SW24-1	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.09	2.90	0.19	Diff <2x LOR	----
Total Metals (QC Lot: 1666553)											
HA2402050-001	SW24-1	Aluminum, total	7429-90-5	E420	0.0030	mg/L	239 µg/L	0.230	4.10%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	1.26 µg/L	0.00129	2.47%	20%	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	35.6 µg/L	0.0355	0.423%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.020 µg/L	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.050 µg/L	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	16 µg/L	0.016	0.0002	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0075 µg/L	0.0000069	0.0000006	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.100	mg/L	31700 µg/L	31.5	0.652%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.074 µg/L	0.000070	0.000004	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	0.68 µg/L	0.00069	0.000009	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.25 µg/L	0.00023	0.00002	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1666553) - continued											
HA2402050-001	SW24-1	Copper, total	7440-50-8	E420	0.00050	mg/L	0.55 µg/L	0.00054	0.00001	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	530 µg/L	0.517	2.55%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.233 µg/L	0.000228	0.000005	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	2.8 µg/L	0.0026	0.0002	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	3820 µg/L	3.76	1.34%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	121 µg/L	0.122	0.220%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.449 µg/L	0.000447	0.000002	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.51 µg/L	0.00056	0.00005	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	2570 µg/L	2.57	0.243%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	1.84 µg/L	0.00188	0.00004	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.072 µg/L	0.000082	0.000010	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	4460 µg/L	4.34	2.93%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	17000 µg/L	17.0	0.398%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	119 µg/L	0.120	0.987%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	7980 µg/L	7.74	3.05%	20%	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.010 µg/L	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	5.41 µg/L	0.00542	0.0369%	20%	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.10 µg/L	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.989 µg/L	0.000977	1.19%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	1.34 µg/L	0.00131	0.00003	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	<3.0 µg/L	<0.0030	0	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.20 µg/L	<0.00020	0	Diff <2x LOR	----
Total Metals (QC Lot: 1666730)											
HA2402050-001	SW24-1	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0050 µg/L	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1667512)											
HA2402050-001	SW24-1	Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	98.0 µg/L	0.0977	0.318%	20%	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<1.0 µg/L	<0.0010	0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1662588)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1664162)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 1664163)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1664381)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1664383)						
Conductivity	----	E100	1	µS/cm	1.5	----
Physical Tests (QCLot: 1664811)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 1667340)						
Colour, apparent	----	E330	2	CU	<2.0	----
Anions and Nutrients (QCLot: 1664156)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1664157)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1664158)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----
Anions and Nutrients (QCLot: 1664159)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1664160)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1664164)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1664384)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1664385)						
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1664386)						
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	<0.010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QCLot: 1664387)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1664388)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1664389)						
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1666838)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1666839)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1667333)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1667334)						
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1666840)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 1666553)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1666553) - continued						
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 1666730)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1667512)						
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1662588)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	90.4	85.0	115	----
Physical Tests (QCLot: 1664161)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1664162)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	100	90.0	110	----
Physical Tests (QCLot: 1664163)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	98.4	85.0	115	----
Physical Tests (QCLot: 1664381)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	150 mg/L	98.2	85.0	115	----
Physical Tests (QCLot: 1664382)									
pH	----	E108	----	pH units	7 pH units	101	98.0	102	----
Physical Tests (QCLot: 1664383)									
Conductivity	----	E100	1	µS/cm	1410 µS/cm	101	90.0	110	----
Physical Tests (QCLot: 1664811)									
Turbidity	----	E121	0.1	NTU	200 NTU	95.0	85.0	115	----
Physical Tests (QCLot: 1667340)									
Colour, apparent	----	E330	2	CU	25 CU	103	70.0	130	----
Anions and Nutrients (QCLot: 1664156)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	96.5	90.0	110	----
Anions and Nutrients (QCLot: 1664157)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 1664158)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1664159)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1664160)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 1664164)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	99.8	80.0	120	----
Anions and Nutrients (QCLot: 1664384)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1664385)									
Nitrate (as N)	14797-55-8	E235.NO3	0.02	mg/L	2.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1664386)									
Nitrite (as N)	14797-65-0	E235.NO2	0.01	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1664387)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1664388)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1664389)									
Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.001	mg/L	0.05 mg/L	101	80.0	120	----
Anions and Nutrients (QCLot: 1666838)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.333 mg/L	98.0	80.0	120	----
Anions and Nutrients (QCLot: 1666839)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 1667333)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 1667334)									
Silicate (as SiO2)	7631-86-9	E392	0.5	mg/L	10 mg/L	99.6	85.0	115	----
Organic / Inorganic Carbon (QCLot: 1666840)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Total Metals (QCLot: 1666553)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	0.1 mg/L	97.9	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	0.05 mg/L	99.5	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	0.05 mg/L	107	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.012 mg/L	102	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.005 mg/L	99.6	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	0.05 mg/L	99.7	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	0.05 mg/L	98.0	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.005 mg/L	101	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	2.5 mg/L	98.9	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.002 mg/L	103	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.012 mg/L	103	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.012 mg/L	102	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.012 mg/L	102	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	0.05 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1666553) - continued									
Lead, total	7439-92-1	E420	0.00005	mg/L	0.025 mg/L	98.2	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.012 mg/L	98.0	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	2.5 mg/L	107	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.012 mg/L	102	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.012 mg/L	99.6	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.025 mg/L	100.0	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	2.5 mg/L	103	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.005 mg/L	103	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	0.05 mg/L	103	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	0.5 mg/L	105	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.005 mg/L	94.0	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	2.5 mg/L	104	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.012 mg/L	99.4	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	2.5 mg/L	106	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.005 mg/L	100	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	0.05 mg/L	96.8	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.005 mg/L	101	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.025 mg/L	101	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.012 mg/L	99.8	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.005 mg/L	101	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0 mg/L	104	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.025 mg/L	104	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.025 mg/L	100	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.005 mg/L	94.9	80.0	120	----
Total Metals (QCLot: 1666730)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	108	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.012 mg/L	100.0	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.025 mg/L	99.5	80.0	120	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1664156)										
HA2402049-001	Anonymous	Fluoride	16984-48-8	E235.F	0.931 mg/L	1 mg/L	93.1	75.0	125	----
Anions and Nutrients (QCLot: 1664157)										
HA2402049-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3	2.48 mg/L	2.5 mg/L	99.4	75.0	125	----
Anions and Nutrients (QCLot: 1664158)										
HA2402049-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2	0.501 mg/L	0.5 mg/L	100	75.0	125	----
Anions and Nutrients (QCLot: 1664159)										
HA2402049-001	Anonymous	Chloride	16887-00-6	E235.Cl	99.8 mg/L	100 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 1664160)										
HA2402049-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	99.3 mg/L	100 mg/L	99.3	75.0	125	----
Anions and Nutrients (QCLot: 1664164)										
HA2402049-001	Anonymous	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	0.0194 mg/L	0.02 mg/L	99.2	70.0	130	----
Anions and Nutrients (QCLot: 1664384)										
HA2402050-007	SW24-2	Sulfate (as SO4)	14808-79-8	E235.SO4	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 1664385)										
HA2402050-007	SW24-2	Nitrate (as N)	14797-55-8	E235.NO3	ND mg/L	----	ND	75.0	125	----
Anions and Nutrients (QCLot: 1664386)										
HA2402050-007	SW24-2	Nitrite (as N)	14797-65-0	E235.NO2	0.508 mg/L	0.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1664387)										
HA2402050-007	SW24-2	Fluoride	16984-48-8	E235.F	1.01 mg/L	1 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1664388)										
HA2402050-007	SW24-2	Chloride	16887-00-6	E235.Cl	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 1664389)										
HA2402050-007	SW24-2	Phosphate, ortho-, dissolved (as P)	14265-44-2	E378-U	ND mg/L	----	ND	70.0	130	----
Anions and Nutrients (QCLot: 1666838)										
BF2400346-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0950 mg/L	0.1 mg/L	95.0	70.0	130	----
Anions and Nutrients (QCLot: 1666839)										
HA2402049-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0998 mg/L	0.1 mg/L	99.8	75.0	125	----
Anions and Nutrients (QCLot: 1667333)										
HA2402049-002	Anonymous	Silicate (as SiO2)	7631-86-9	E392	8.55 mg/L	10 mg/L	85.5	75.0	125	----
Anions and Nutrients (QCLot: 1667334)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1667334) - continued										
HA2402150-001	Anonymous	Silicate (as SiO2)	7631-86-9	E392	9.80 mg/L	10 mg/L	98.0	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1666840)										
HA2402050-001	SW24-1	Carbon, total organic [TOC]	----	E355-L	5.37 mg/L	5 mg/L	107	70.0	130	----
Total Metals (QCLot: 1666553)										
HA2402050-002	SW24-3	Aluminum, total	7429-90-5	E420	ND mg/L	----	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0503 mg/L	0.05 mg/L	101	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0527 mg/L	0.05 mg/L	105	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	----	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.00478 mg/L	0.005 mg/L	95.6	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0487 mg/L	0.05 mg/L	97.3	70.0	130	----
		Boron, total	7440-42-8	E420	0.049 mg/L	0.05 mg/L	97.4	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00497 mg/L	0.005 mg/L	99.4	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	----	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00260 mg/L	0.002 mg/L	104	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0127 mg/L	0.012 mg/L	102	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0124 mg/L	0.012 mg/L	99.6	70.0	130	----
		Copper, total	7440-50-8	E420	0.0122 mg/L	0.012 mg/L	97.6	70.0	130	----
		Iron, total	7439-89-6	E420	ND mg/L	----	ND	70.0	130	----
		Lead, total	7439-92-1	E420	0.0241 mg/L	0.025 mg/L	96.4	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0114 mg/L	0.012 mg/L	91.6	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	----	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	----	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0128 mg/L	0.012 mg/L	102	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0240 mg/L	0.025 mg/L	96.2	70.0	130	----
		Potassium, total	7440-09-7	E420	ND mg/L	----	ND	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.00507 mg/L	0.005 mg/L	101	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0518 mg/L	0.05 mg/L	104	70.0	130	----
		Silicon, total	7440-21-3	E420	ND mg/L	----	ND	70.0	130	----
		Silver, total	7440-22-4	E420	0.00464 mg/L	0.005 mg/L	92.8	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	----	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	----	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	----	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.00485 mg/L	0.005 mg/L	97.0	70.0	130	----
		Thallium, total	7440-28-0	E420	0.0480 mg/L	0.05 mg/L	95.9	70.0	130	----
		Thorium, total	7440-29-1	E420	0.00498 mg/L	0.005 mg/L	99.7	70.0	130	----
		Tin, total	7440-31-5	E420	0.0256 mg/L	0.025 mg/L	102	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0129 mg/L	0.012 mg/L	103	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.00508 mg/L	0.005 mg/L	102	70.0	130	----
		Uranium, total	7440-61-1	E420	ND mg/L	----	ND	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0257 mg/L	0.025 mg/L	103	70.0	130	----
		Zinc, total	7440-66-6	E420	0.0237 mg/L	0.025 mg/L	94.8	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.00449 mg/L	0.005 mg/L	89.9	70.0	130	----
Total Metals (QCLot: 1666730)										

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1666730) - continued										
HA2402050-002	SW24-3	Mercury, total	7439-97-6	E508	0.000102 mg/L	0 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 1667512)										
HA2402050-002	SW24-3	Manganese, dissolved	7439-96-5	E421	ND mg/L	----	ND	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.0256 mg/L	0.025 mg/L	102	70.0	130	----

Appendix E
Service Provider Statement

ENGLOBE

STATEMENT OF LIMITATIONS

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Since the passage of time, natural occurrences, and direct or indirect human intervention may affect the views, conclusions and recommendations (if any) provided in this Report, it is intended for immediate use.
This Statement of Limitations forms an integral part of the Report.

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The assessment should not be considered a comprehensive audit that covers and eliminates all present, past and future risks. The information presented in this Report is based on data collected during the completion of the monitoring conducted. The overall site/subsurface/groundwater conditions were extrapolated based on information collected at specific sampling locations. Professional judgement was exercised in gathering and analyzing data; however, no monitoring method can completely eliminate the possibility of obtaining partially imprecise or incomplete information; it can only reduce the possibility to an acceptable level. Consequently, the actual site/subsurface/groundwater conditions between the sampling points may vary. In addition, analysis has been carried out only for the chemical and physical parameters identified, and it should not be inferred that other chemical species or physical conditions are not present.]

It is recommended practice that the Company be retained during subsequent phases of the project, to confirm that the conditions throughout the site do not deviate materially from those encountered throughout the sampling program.]

Any description of the site and its physical setting documented in this Report is presented for informational purposes only, to provide the reader a better understanding of the site and scope of work. Any topographic benchmarks and elevations are primarily to establish relative elevation differences between sampling locations and should not be used for other purposes such as grading, excavation, planning, development, or similar purposes.

Any results from laboratory or other subcontractors reported herein have been carried out by others, and the Company cannot warrant their accuracy.

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